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# TABLE OF CONTENTS

## PART 1

Section	Page
PREFACE .....	1
Members and Alternate Members of the Advisory Committee on Fishery Management in 1994 .....	2
Participants at Meetings, Spring and Autumn 1994 .....	3
ACFM ADVICE .....	4
1. THE FORM OF ACFM ADVICE .....	4
2. REVIEW OF ADVICE FOR 1994 .....	4
3. THE FORMAT OF THE ACFM ADVICE .....	4
4. REQUESTS FOR ADVICE .....	5
Chart of ICES Fishing Areas .....	10
REPORT TO THE NORTH-EAST ATLANTIC FISHERIES COMMISSION .....	11
1. INTRODUCTORY ITEMS .....	11
1.1 Review of Nominal Catches in NEAFC Area .....	11
1.2 Deterioration of Quality of Fishery Statistics .....	11
1.3 Information on <i>Ichthyophonus hoferi</i> in Pelagic Stocks .....	11
2. STOCKS IN NEAFC REGION 1 .....	13
2.1 Overview of Demersal Stocks in Sub-areas I and II .....	13
2.2 Cod in Sub-areas I and II .....	14
2.2.1 North-East Arctic cod .....	14
2.2.2 Coastal cod .....	16
2.3 North-East Arctic haddock .....	18
2.4 North-East Arctic saithe .....	20
2.5 Redfish in Sub-areas I and II .....	22
2.5.1 <i>Sebastes mentella</i> in Sub-areas I and II .....	22
2.5.2 <i>Sebastes marinus</i> in Sub-areas I and II .....	23
2.6 Greenland halibut in Sub-areas I and II .....	24
2.7 Demersal stocks at Greenland and Iceland .....	25
2.7.1 Cod stocks off Greenland (ICES Sub-area XIV and NAFO Sub-area 1) .....	26
2.7.2 Icelandic cod (Division Va) .....	28
2.7.3 Icelandic saithe (Division Va) .....	32
2.7.4 Greenland halibut in Sub-areas V and XIV .....	34
2.8 Redfish in Sub-areas V, VI, XII and XIV .....	36

Section	Page
2.8.1 Redfish <i>Sebastes marinus</i> and deep-sea <i>Sebastes mentella</i> "traditional fishery" in Sub-areas V, VI and XIV .....	38
2.8.2 Oceanic redfish <i>Sebastes mentella</i> in Division Va and Sub-areas XII and XIV .....	40
2.9 Demersal Stocks at the Faroe Islands.....	41
2.9.1 Faroe saithe (Division Vb).....	42
2.9.2 Faroe Plateau cod (Sub-division Vb <sub>1</sub> ) .....	44
2.9.3 Faroe Bank cod (Sub-division Vb <sub>2</sub> ).....	46
2.9.4 Faroe haddock (Division Vb).....	48
2.10 Herring Stocks North of 62°N.....	50
2.10.1 Icelandic summer-spawning herring (Division Va).....	50
2.10.2 Norwegian spring-spawning herring .....	52
2.11 Capelin.....	55
2.11.1 Barents Sea capelin (Sub-areas I and II, excluding Division IIa west of 5°W) .....	55
2.11.2 Capelin in the Iceland-East Greenland-Jan Mayen area (Sub-areas V and XIV and Division IIa west of 5°W).....	56
3. STOCKS IN NEAFC REGION 2 .....	59
3.1 Herring Stocks South of 62°N.....	59
3.1.1 Overview.....	59
3.1.2 Herring in Sub-area IV, Division VIId and Division IIIa (autumn spawners).....	60
3.1.3 Herring in Divisions IVc and VIId (Downs herring).....	63
3.1.4 Herring in Sub-divisions 22–24 and Division IIIa (spring spawners) .....	64
3.1.5 Celtic Sea and Division VIIj herring .....	66
3.1.6 Herring in Division VIa (North).....	68
3.1.7 Clyde herring (Division VIa).....	70
3.1.8 Herring in Divisions VIa (South) and VIIb,c.....	71
3.1.9 Irish Sea herring (Division VIIa).....	72
3.1.10 Evaluation of a proposal for amendments to the Irish Sea - Douglas Bank (Division VIIa) spawning closure for Manx herring .....	73
3.2 Industrial Fisheries in the North Sea and Adjacent Waters .....	74
3.2.1 Overview.....	74
3.2.2 Sprat in Division IIIa .....	75
3.2.3 Sprat in Sub-area IV.....	76
3.2.4 Sprat in Divisions VIId,e.....	77
3.2.5 Norway pout in Division IIIa.....	78
3.2.6 Norway pout in Sub-area IV.....	79
3.2.7 Norway pout in Division VIa.....	80
3.2.8 Sandeel in Division IIIa.....	81
3.2.9 Sandeel in the southern North Sea.....	82
3.2.10 Sandeel in the northern North Sea.....	83
3.2.11 Sandeel in the Shetland area .....	84
3.2.12 Sandeel in Division VIa .....	85
3.3 Demersal Stocks in Division IIIa .....	86

Section	Page
3.3.1 Overview.....	86
3.3.2 Cod in the Kattegat .....	86
3.3.3 Plaice in Division IIIa .....	87
3.3.4 Sole in Division IIIa .....	88
3.3.5 Cod in the Skagerrak.....	89
3.3.6 Haddock in Division IIIa .....	90
3.3.7 Whiting in Division IIIa.....	91
3.4 <i>Pandalus borealis</i> in Division IIIa and the North Sea .....	92
3.4.1 <i>Pandalus borealis</i> in Division IIIa and Division IVa East (Skagerrak and Norwegian Deep) .....	92
3.4.2 <i>Pandalus borealis</i> in Division IVa - Fladen Ground .....	94
3.4.3 <i>Pandalus borealis</i> in Division IVb - Farn Deep.....	94
3.5 Demersal Stocks in the North Sea.....	95
3.5.1 Overview.....	95
3.5.2 Cod in Sub-area IV (North Sea) .....	98
3.5.3 Haddock in Sub-area IV (North Sea) .....	102
3.5.4 Whiting in Sub-area IV (North Sea) .....	104
3.5.5 Saithe in Sub-area IV and Division IIIa (North Sea).....	106
3.5.6 North Sea plaice.....	108
3.5.7 North Sea sole.....	110
3.6 Demersal Stocks in the Eastern English Channel.....	112
3.6.1 Overview.....	112
3.6.2 Cod in Division VIIId (Eastern English Channel).....	113
3.6.3 Whiting in Division VIIId (Eastern English Channel) .....	114
3.6.4 Sole in Division VIIId (Eastern English Channel) .....	116
3.6.5 Plaice in Division VIIId (Eastern English Channel).....	118
3.7 Demersal Stocks in Sub-area VI .....	120
3.7.1 Overview.....	120
3.7.2 Cod in Division VIa (West of Scotland).....	122
3.7.3 Cod in Division VIb (Rockall).....	123
3.7.4 Haddock in Division VIa (West of Scotland) .....	124
3.7.5 Haddock in Division VIb (Rockall).....	126
3.7.6 Whiting in Division VIa (West of Scotland) .....	128
3.7.7 Whiting in Division VIb (Rockall) .....	129
3.7.8 Saithe in Sub-area VI (West of Scotland and Rockall) .....	130
3.7.9 Megrim in Sub-area VI .....	132
3.7.10 Anglerfish in Sub-area VI .....	133
3.7.11 Blue ling, ling and tusk stocks in Sub-areas V, VI and XIV.....	134
3.7.12 Review of Advice for 1994 for Demersal Stocks in Sub-area VI.....	135
3.8 Demersal Stocks in the Irish Sea.....	137
3.8.1 Overview.....	137
3.8.2 Cod in Division VIIa (Irish Sea).....	138
3.8.3 Whiting in Division VIIa (Irish Sea) .....	140
3.8.4 Plaice in Division VIIa (Irish Sea) .....	142
3.8.5 Sole in Division VIIa (Irish Sea) .....	144
3.9 Demersal Stocks in the Celtic Sea and Western English Channel .....	146

Section	Page
3.9.1 Overview.....	146
3.9.2 Celtic Sea cod (Divisions VIIf,g and h) .....	148
3.9.3 Celtic Sea whiting (Divisions VIIf,g and h).....	150
3.9.4 Celtic Sea plaice (Divisions VIIf and g).....	152
3.9.5 Celtic Sea sole (Divisions VIIf and g).....	154
3.9.6 Cod in Division VIIe (Western English Channel).....	156
3.9.7 Whiting in Division VIIe (Western English Channel) .....	157
3.9.8 Plaice in Division VIIe (Western English Channel).....	158
3.9.9 Sole in Division VIIe (Western English Channel) .....	160
3.9.10 Stocks in Divisions VIIb,c,h-k .....	162
Tables 2.2.1 - 3.9.16 .....	163
Figures 2.8.1 - 3.4.1 .....	310

# TABLE OF CONTENTS

## PART 2

Section	Page
4. STOCKS IN NEAFC REGIONS 2 AND 3 .....	2
4.1 Hake in Sub-areas III, IV and VI-IX .....	2
4.1.1 Hake - Northern stock (Division IIIa, Sub-areas IV, VI and VII and Divisions VIIIa,b) .....	2
4.1.2 Hake - Southern stock (Divisions VIIIc and IXa) .....	6
4.2 Megrim ( <i>L. whiffiagonis</i> ) in Divisions VIIb,c,e-k and VIIIa,b .....	8
4.3 Anglerfish in Divisions VIIb-k and VIIIa,b ( <i>L. piscatorius</i> and <i>L. budegassa</i> ) .....	10
5. STOCKS IN NEAFC REGION 3 .....	15
5.1 Sardine in Divisions VIIIc and IXa .....	15
5.2 Anchovy in Sub-area VIII (Bay of Biscay) .....	16
5.3 Anchovy in Division IXa .....	17
5.4 Megrim in Divisions VIIIc and IXa .....	18
5.4.1 Megrim ( <i>L. bosatii</i> ) in Divisions VIIIc and IXa .....	18
5.4.2 Megrim ( <i>L. whiffiagonis</i> ) in Divisions VIIIc and IXa .....	20
5.5 Anglerfish in Divisions VIIIc and IXa ( <i>L. piscatorius</i> and <i>L. budegassa</i> ) .....	22
5.6 Sole in Divisions VIIIa,b (Bay of Biscay) .....	24
6. STOCKS IN NEAFC REGIONS 1, 2, AND 3 .....	27
6.1 <i>Nephrops</i> in Sub-areas III-X .....	27
6.1.1 Overview .....	27
6.1.2 <i>Nephrops</i> in Division IIIa .....	28
6.1.3 <i>Nephrops</i> in Division IVa Rectangles 44-48 E6-E7 + 44E8 .....	30
6.1.4 <i>Nephrops</i> in Divisions IVa (Rectangles not included under Section 6.1.3) .....	32
6.1.5 <i>Nephrops</i> in Divisions IVb,c east of 1°E .....	34
6.1.6 <i>Nephrops</i> in Divisions IVb,c west of 1°E .....	36
6.1.7 <i>Nephrops</i> in Division VIa .....	38
6.1.8 <i>Nephrops</i> in Divisions Vb (EU zone) and VIb .....	40
6.1.9 <i>Nephrops</i> in Division VIIa (excluding rectangles 33E2 - E5) .....	42
6.1.10 <i>Nephrops</i> in Divisions VIId,e .....	44
6.1.11 <i>Nephrops</i> in Divisions VIIb,c,j,k .....	45
6.1.12 <i>Nephrops</i> in Divisions VIIf,g,h and VIIa Rectangles 33E2 - E5 .....	46
6.1.13 <i>Nephrops</i> in Divisions VIIIa,b .....	48
6.1.14 <i>Nephrops</i> in Division VIIIc .....	50
6.1.15 <i>Nephrops</i> in Divisions VIIId,e .....	52
6.1.16 <i>Nephrops</i> in Division IXa .....	54
6.1.17 <i>Nephrops</i> in Division IXb and Sub-area X .....	56
6.2 Mackerel .....	57
6.2.1 General comments .....	57
6.2.2 North Sea mackerel .....	58

Section	Page
6.2.3 Western mackerel.....	60
6.2.4 Mackerel in Divisions VIIIc and IXa.....	62
6.3 Horse Mackerel .....	63
6.3.1 General comments.....	63
6.3.2 North Sea horse mackerel (Divisions IIIa, IVb,c, VIId) .....	63
6.3.3 Western horse mackerel (Divisions IIa, IVa, Vb, VIa, VIIa-c,e-k, VIIIa,b,d,e) .....	64
6.3.4 Southern horse mackerel (Divisions VIIIc and IXa).....	66
6.4 Blue Whiting.....	68
6.4.1 General comments.....	68
6.4.2 Blue whiting combined stock (Sub-areas I-IX, XII and XIV) .....	68
6.5 Deep-Water Fisheries Resources South of 63°N.....	69
Tables 4.1.1 - 6.5.4 .....	73
Figures 5.2.1 - 6.4.2.....	128
<b>REPORT TO THE EUROPEAN COMMISSION .....</b>	<b>135</b>
Evaluation of the North Sea Plaice Box.....	135
<b>REPORT TO THE INTERNATIONAL BALTIC SEA FISHERY COMMISSION .....</b>	<b>141</b>
Chart of Baltic Fishing Areas	
1. <b>GENERAL ADVICE TO THE INTERNATIONAL BALTIC SEA FISHERY COMMISSION .....</b>	<b>141</b>
1.1 Nominal Catches in the Baltic Area .....	141
2. <b>BALTIC PELAGIC STOCKS.....</b>	<b>142</b>
2.1 Overview .....	142
2.2 Herring.....	143
2.2.1 Herring in Sub-divisions 22-24 and Division IIIa (spring-spawners).....	143
2.2.2 Herring in Sub-divisions 25-29 (incl. Gulf of Riga) and 32.....	144
2.2.3 Herring in Sub-division 30, Bothnian Sea.....	145
2.2.4 Herring in Sub-division 31, Bothnian Bay .....	146
2.3 Sprat.....	147
2.3.1 Sprat in Sub-divisions 22-32.....	147
3. <b>BALTIC DEMERSAL STOCKS .....</b>	<b>149</b>
3.1 Cod.....	149



Section	Page
3.1.1 Overview.....	149
3.1.2 Cod in Sub-divisions 22 and 24.....	150
3.1.3 Cod in Sub-divisions 25-32.....	152
3.1.4 Selection properties of cod trawls.....	153
3.2 Flatfish Stocks in the Baltic.....	153
3.2.1 Flounder.....	153
3.2.2 Plaice.....	153
3.2.3 Dab.....	153
3.2.4 Turbot.....	153
3.2.5 Brill.....	153
4. BALTIC SALMON AND TROUT STOCKS.....	155
4.1 Overview.....	155
4.2 Salmon.....	156
4.2.1 Salmon in the Main Basin and the Gulf of Bothnia (Sub-divisions 24-31).....	156
4.2.2 Salmon in the Gulf of Finland (Sub-division 32).....	158
4.3 Sea Trout.....	159
4.4 Information on M74.....	160
5. SEALS IN THE BALTIC.....	162
5.1 Harbour seals.....	162
5.2 Ringed seals.....	162
5.3 Grey seals.....	162
Tables 1.1.1 - 4.3.1.....	163
REPORT TO THE NORTH ATLANTIC SALMON CONSERVATION ORGANISATION COUNCIL.....	195
1. EVENTS OF THE 1993 FISHERIES AND THE STATUS OF STOCKS BY COMMISSION AREAS.....	195
1.1 Overview of catches in the North Atlantic.....	195
1.1.1 Nominal catches of salmon in the North Atlantic.....	195
1.1.2 Unreported catches.....	195
1.2 Fisheries and stocks in the North-East Atlantic Commission (NEAC) Area.....	195
1.2.1 Fishery at Faroes.....	195
1.2.2 Homewater fisheries in the NEAC Area.....	196
1.2.3 Status of stocks in the NEAC Area.....	196
1.2.4 Data deficiencies and research needs for the NEAC Area.....	197
1.3 Fisheries in the North American Commission (NAC) Area.....	197
1.3.1 Fisheries in NAC Area.....	197
1.3.2 Status of stocks in the NAC Area.....	198

Section	Page
1.3.3 Data deficiencies and research needs for the NAC Area .....	198
1.4 Fishery in the West Greenland Commission (WGC) Area .....	198
1.4.1 Fishery at West Greenland .....	198
1.4.2 Status of stocks in the WGC Area .....	198
1.4.3 Data deficiencies and research needs for the WGC Area .....	198
2. <b>EVALUATION OF EFFECTS OF NEW MANAGEMENT MEASURES ON STOCKS AND FISHERIES</b> .....	198
2.1 Quota management measures and closures implemented after 1991 in the Canadian commercial salmon fisheries.....	198
2.2 Effects of the suspension of commercial fishing activity at Faroes .....	199
3. <b>ADVICE WITH RESPECT TO THE FISHERY IN THE WEST GREENLAND COMMISSION AREA</b> .....	200
3.1 Continue development of the model used in providing advice on catch quotas in relation to stock abundance .....	200
3.2 Estimate the pre-fishery abundance of non-maturing 1SW salmon at the time of the fishery.....	200
3.3 Provide catch options with an assessment of risks relative to the management objective of achieving various levels of target spawning escapement .....	200
3.4 Describe which stocks make the greatest numerical contributions of salmon to the fishery .....	201
3.5 Evaluate the relationship between spawning escapement and subsequent pre-fishery abundance ...	202
4. <b>IMPACTS OF FISH FARM ESCAPEES AND SEA-RANCHED FISH</b> .....	202
4.1 Evaluate the abundance of fish farm escapees and sea-ranched fish in fisheries and rivers .....	202
4.1.1 Faroes fishery.....	202
4.1.2 West Greenland fishery .....	202
4.1.3 Homewater fisheries and rivers in the NEAC Area.....	202
4.1.4 Homewater fisheries and rivers in the NAC Area .....	203
4.2 Evaluate the genetic, disease and parasite, ecological and environmental impacts of fish farm escapees and ranched fish on wild stocks .....	203
4.2.1 Genetic impacts.....	203
4.2.2 Disease and parasite impacts .....	203
4.2.3 Ecological and environmental impacts .....	203
4.3 Evaluate the impacts of current hatchery practices on wild stocks .....	203
5. <b>EVALUATE GRILSIFICATION MECHANISMS AND ASSESS THE IMPACT THAT GRILSIFICATION MAY HAVE ON STOCK ABUNDANCE AND FUTURE SPAWNING REQUIREMENTS</b> .....	203

<b>Section</b>	<b>Page</b>
6. <b>EVALUATE EVIDENCE FOR RECRUITMENT OVER-FISHING OCCURRING ON ATLANTIC SALMON POPULATIONS .....</b>	<b>204</b>
7. <b>EVALUATE THE PROSPECTS OF DEVELOPING PREDICTIVE MODELS OF ANNUAL MIGRATION AND DISTRIBUTION OF ATLANTIC SALMON STOCK COMPLEXES .....</b>	<b>204</b>
8. <b>EVALUATE THE RESULTS OF THE RESEARCH PROGRAMME AT FAROES .....</b>	<b>204</b>
9. <b>PROVIDE A COMPILATION OF MICROTAG, FINCLIP AND EXTERNAL TAG RELEASES BY MEMBER COUNTRIES IN 1993.....</b>	<b>205</b>
Tables 1.1.1 - 6.1.....	206
Figures 1.2.1 - 7.1.....	211
Appendix 1 <b>DECISION OF THE COUNCIL OF NASCO TO REQUEST SCIENTIFIC ADVICE FROM ICES.....</b>	<b>220</b>
Appendix 2 <b>NEW MANAGEMENT MEASURES FOR CANADIAN COMMERCIAL FISHERIES IN 1993 .....</b>	<b>221</b>
Appendix 3 <b>COMPUTATION OF CATCH ADVICE FOR WEST GREENLAND.....</b>	<b>222</b>



## **PREFACE**

This Cooperative Research Report (Parts 1 and 2) contains the Report of the Advisory Committee on Fishery Management (ACFM) prepared and issued in 1994. The Report was prepared in the form of separate reports to the North-East Atlantic Fisheries Commission (NEAFC), the International Baltic Sea Fishery Commission (IBSFC), the North Atlantic Salmon Conservation Organization (NASCO) and the European Commission (EC).

Shortly after the May meeting of ACFM, ICES issued the Report to the IBSFC, the first part of the Report to NEAFC, the Report to NASCO and a Report to the EC on the "North Sea Plaice Box". Shortly after the October-November ACFM meeting, the second part of the Report to NEAFC was issued.

In this publication the separate reports to NEAFC referred to above have been edited into a single report with the stocks in sequence and including all advice on each stock together. Part 1 contains an introductory section and sections 1-3 of the report to NEAFC. Part 2 contains sections 4-6 of the report to NEAFC, and the reports to the EC, IBSFC and NASCO.

The requests for advice from each of the Commissions named above are given in the introductory section to the report.

In 1994 ACFM adopted a new format for its report. A short description of the format is also given in the introduction.

ICES Fishery Secretary and Secretary to ACFM  
ICES Headquarters, Copenhagen  
March 1995

# MEMBERS AND ALTERNATE MEMBERS OF THE ADVISORY COMMITTEE ON FISHERY MANAGEMENT IN 1994

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<sup>1</sup>From 1 November 1994.

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<sup>2</sup>Substitute for Dr J.W. Horwood

## ACFM ADVICE

### 1 THE FORM OF ACFM ADVICE

At its autumn 1991 meeting, ACFM redefined the basis and form of the advice which it would provide, and this was described in the introductory section "ACFM Advice" of the 1991 Reports of ACFM (ICES Cooperative Research Report No. 179). The new Form of Advice has been formally presented at the annual meetings of NEAFC in 1991, and NASCO and IBSFC in 1992, and has also been discussed within ICES. In addition, comments have been received from some ICES Member Countries. ACFM intends to keep its Form of Advice under constant review and encourages management bodies to comment upon it and suggest how it can be improved.

### 2 REVIEW OF ADVICE FOR 1994

ACFM wishes to stress that its definitive advice on each stock is based on all the data available to ICES, and that the timing of the advice on each stock is determined by the need for that advice to be as accurate as possible.

While new information can be used to redefine the advice, ACFM considers that mid-year revisions are in general unnecessary. The precision of stock size estimates is such that there would need to be quite major changes before any revision in advice was justified. Minor changes would simply serve to create instability in advice.

ACFM nevertheless recognizes that it has a responsibility to draw the attention of managers, as early as possible, to any necessary alteration in scientific advice and to the need for a change in management action.

### 3 THE FORMAT OF THE ACFM ADVICE

The information about each stock is given on a separate page. Where the information for a stock extends over more than one page, the pages are arranged so that the information can be seen on facing pages. In some cases this means that blank pages are included in the report.

Each summary sheet contains the essential information needed by managers. For each stock the following sections are included where relevant:

#### Catch data

This section gives a table of recommended TACs (Rec TAC), Agreed TACs and catches for the last eight years, in almost all cases in thousand tonne units. Catches are normally given as "ACFM catch", i.e. the catch used by ACFM in its assessments. In some cases the officially-reported landings ("off. lndgs") and quantities discarded are given. The ACFM catches often differ from the official catches which are in most cases given in the tables referred to in the Section heading. Where the areas to which the recommended TACs, agreed TACs and catches refer differ, the areas are given in the headings. Footnotes are kept to a minimum.

#### Historical development of the fishery

A brief account is given of the most important features and events in the development of the fishery, where possible from its early stages. Landings figures are presented in the summary diagram of landings at the foot of each page and in the summary table under "Catch data".

#### State of stock

A brief summary is given of the present state of the stock in terms of the spawning stock biomass (SSB), the level of fishing mortality (F) and the recruitment of new year classes with an indication of what has led up to the present situation. For those stocks where an analytical assessment has been carried out, a pictorial account of the development of the stock is given in the figures at the foot of the page. The same information is also given in the tables referred to in this section.

#### Forecast for 1995

Whenever possible, a range of forecasts of catch and SSB for the next year is given in a table, together with the assumptions about catch and F in the current year on which they are based. The predicted SSB in the current year is also given for reference. Following the table are give brief comments on the short-term consequences to the stock of the alternative forecasts given. Where it is possible to make statements about the longer-term effects of exploiting the stock at different levels of F, these are given under a section dealing with "medium-term considerations" or in the "Special Comments" Section.

For those stocks for which forecasts are made figures are included showing the short-term forecast and the



long-term forecast in terms of yield per recruit and SSB per recruit at different levels of  $F$ .

### Management advice

This section contains the advice for each stock. Recommendations are given in bold type.

### Special comments

This section includes additional information about each stock.

### Data and assessment

This section indicates the type of assessment carried out on each stock and lists the types of data used. It also provides a comment on the reliability of the basic catch and effort data and of the biological data used.

### Source of information

This indicates the Working Group report or other source used by ACFM in framing the advice.

## 4. REQUESTS FOR ADVICE

Listed on the following pages are the requests for advice received from NEAFC, IBSFC, NASCO and the EC. Responses to additional requests from individual member countries of ICES are included within the relevant section of the report.

### 4.1 Request from the North-East Atlantic Fisheries Commission (NEAFC), Twelfth Annual Meeting, November 1993.

1. ICES is requested to provide information and advice on the management of all fish stocks in the NEAFC Convention area for which sufficient data are available to provide such advice.
2. For each stock for which data are available to make an analytical dynamic pool type assessment, ICES is requested to provide short-term predictions of catches in 1995 and spawning stock biomass in 1996 for a range of fishing mortality rates; yield per recruit curves; evaluation of medium-term effects of different management options.
3. For other stocks, depending on the data available, ICES is requested to make either General Production-type assessments or provide yield per recruit curve, showing in each case the present level of exploitation.

4. Wherever the appropriate information is available ICES should include multispecies considerations in terms of TAC compatibility and biological interactions.

5. It is particularly requested to:

- a) provide quantitative information on the distribution and migration of the "Oceanic" stock of *Sebastes mentella*;
- b) evaluate, if possible, the medium-term consequences of TAC levels for the "Oceanic" stock of *Sebastes mentella* in the range of 50,000-150,000 tonnes and to indicate whether these levels are within safe biological limits;
- c) provide information on the present spatial and temporal distribution of the Norwegian spring-spawning herring stock;
- d) assess the impact of *Ichthyophonus hoferi* disease on stocks of herring and other pelagic fish;
- e) for blue whiting stocks, evaluate the development of the total stock biomass and spawning stock biomass over a three-year period (1995-1997) if at all possible.
- f) provide descriptions of deep water fisheries in waters inside and beyond coastal state jurisdiction south of 63° N, especially catch statistics by species, fleets and gear; and advise on any appropriate management action, if required.

### 4.2 Request from the International Baltic Sea Fishery Commission, Nineteenth Session, September 1993

The International Baltic Sea Fishery Commission requests ICES to provide to its Twentieth Session the following:

- a) assessments of the state of the stocks (by appropriate areas) of Cod, Herring, Sprat and Salmon (including SD 23 for Cod),
- b) advice on catch options for Cod, Herring and Sprat for 1995 (including biological reference points) inside safe biological limits,
- c) advice on catch options (in numbers of fish) for Salmon inside safe biological limits, which have been defined to "safeguard the wild stocks",

- d) any new information on the state of the Flatfish and Sea Trout stocks in the Baltic,
- e) an evaluation of all available information on the causes of M74 and its impacts on the wild and reared stocks of Salmon and Trout stocks in the Baltic,
- f) a review of the available information on the status of Baltic ringed seals and an evaluation of the impact of incidental catches of these seals in the Baltic Salmon drift net fishery and other sources of man-induced mortality on the seal populations.

#### **4.3 Request from the North Atlantic Salmon Conservation Organization, Tenth Annual Meeting, June 1993**

1. With respect to Atlantic salmon in each Commission area, where relevant;
  - a) describe the events of the 1993 fisheries with respect to catches (including unreported catches), gear, effort, composition and origin of the catch and rates of exploitation;
  - b) describe the status of the stocks occurring in the Commission area, and where possible evaluate escapement against targets;
  - c) specify data deficiencies and research needs.
2. Evaluate the following management measures on the stocks and fisheries occurring in the respective Commission areas:
  - a) quota management and closures implemented after 1991 in the Canadian commercial salmon fisheries;
  - b) the suspension of commercial fishing activity at Faroes.
3. With respect to the fishery in the West Greenland Commission area:
  - a) continue the development of the model used in providing advice on catch quotas in relation to stock abundance;
  - b) estimate the pre-fishery abundance of non-maturing 1SW salmon at the time of the fishery;
  - c) provide catch options with an assessment of risks relative to the management

objective of achieving various levels of target spawning escapement;

- d) describe which stocks make the greatest numerical contributions of salmon to the fishery;
- e) evaluate the relationship between spawning escapement and subsequent pre-fishery abundance.

4. Evaluate the abundance of fish farm escapees and sea-ranched fish in fisheries and rivers and the genetic, disease and parasite, ecological and environmental impacts of these fish on the wild stocks and any impacts from current hatchery practices.
5. Evaluate grilsification mechanisms and assess the impact that grilsification may have on stock abundance and future spawning requirements.
6. Evaluate evidence for recruitment overfishing occurring on Atlantic salmon populations.
7. Evaluate the prospects of developing predictive models of annual migration and distribution of Atlantic salmon stock complexes.
8. Evaluate the results of the research programme at the Faroes.
9. With respect to Atlantic salmon in the NASCO area, provide a compilation of microtag, finclip and external tag releases by ICES Member Countries in 1993.

#### **4.4 Request from the European Commission. Directorate General for Fisheries, September 1993**

The list on page 9 shows the management units for which the European Economic Community establishes total allowable catches.

ICES is requested to review the state of the stocks, except for common prawn in French Guyana, and to provide management advice for all the management units in question on a biological stock basis. It is known that some of these management units represent sub-divisions of biological stocks while others may represent aggregations of stocks. The descriptions of the management areas also include in many cases sub-areas where the species either does not occur at all or occurs rarely. These sub-areas are included for enforcement purposes.

For each stock for which the data are available to make an analytical assessment and a catch forecast, ICES is requested to provide graphs of estimated catches in 1994 and spawning stock biomass as at 1.01.1995 for a range of fishing mortality rates which cover the range -50% to +25% of the current fishing mortality as well as yield per recruit curves. The likely consequences on yield and SSB in the medium term should also be expressed.

For other stocks, depending upon the data available, ICES is requested to make either general production-type assessments or provide yield per recruit curves, showing in each case the present level of exploitation.

The Commission would again strongly emphasize the need for ICES to use yield per recruit models in order to advise on the state of stocks for which it is not possible to advise on annual catch possibilities. The Commission is seriously concerned that a lack of scientific advice, even on the probable level of exploitation of a stock, can be used to argue that regulation of that stock is unjustified. On the other hand, analyses of this type are also useful for a sound handling of the fishing effort independently of TAC regulations, and give important clues in relation to improvement of exploitation patterns.

In the context of the new form of ACFM advice, the Commission reiterates its view that a single and precise management option is required only when a stock is in a likely danger of approaching its MBAL (minimum biologically acceptable level), is already at that level or is below it. In all other cases, ranges of options as above described are preferable. Whenever ICES considers it appropriate to make specific recommendations concerning measures other than catch limitations, it is requested to identify and examine different options. Should technical interactions occur, the impact of proposed measures in respect of one species/stock on fisheries for other species should be examined. As a minimum, these other fisheries and possible management problems should be identified.

For all stocks, and more particularly for those mentioned above, risk-type analysis should also be conducted. The Commission would welcome an evaluation, even in qualitative terms, of the likely risk of an unwanted event to occur when moving away from a management action.

On the other hand, the recent EC regulation establishing a system for fisheries and aquaculture foresees the use of management tools which can be considered new at the Community level. These can be summarized as i) management of the inputs, and ii) multispecies and/or multiannual procedures. In addition, the Community must establish their mid-term management objectives by fishery or groups of

fisheries and the strategies by which they should be achieved. In this context, ICES is requested to:

- a) For each main fishery or group of fisheries, analyse where appropriate mid-term management objectives which could be considered more pertinent from a biological point of view. These objectives should be expressed in terms of target SSB and exploitation rates. Whenever a fishery affects stocks which are safely over a MBAL, a range of options should be given rather than a single objective.
- b) For each fishery or group of fisheries, analyse the possible strategies required to achieve these objectives progressively, indicating the consequences, advantages and disadvantages.
- c) For each fishery or group of fisheries, indicate whether it is more appropriate to manage directly the fishing effort instead of or as a complement of a management by TAC.
- d) As the case may be, indicate when it is possible to fix TACs more than one year in advance and when the TAC can be defined on a multispecies basis. ICES is also requested to indicate when, due to technical interactions in mixed fisheries, TACs for the individual species which are taken together should be made compatible for a given management decision.

Although the Community wishes to have comprehensive answers, it is acknowledged the difficulties of the exercise during 1994. In that respect, ICES is requested to give priority to the following fisheries or stocks:

- roundfish in the North Sea, the West of Scotland, Division IIIa and Baltic Sea,
- North Sea flatfish and
- main herring stocks
- hake North and South

Finally, the STECF requests ICES to investigate the likely effects on the stock of horse mackerel of changing the current minimum landing size from its current value of 15 cm to 12 cm.

#### **4.5 Request from the European Commission, Directorate General XIV Fisheries, May 1994**

The Commission of the European Communities (DG XIV) requests ICES to respond to the items indicated below:

- a) Investigate appropriate modifications to the plaice box;

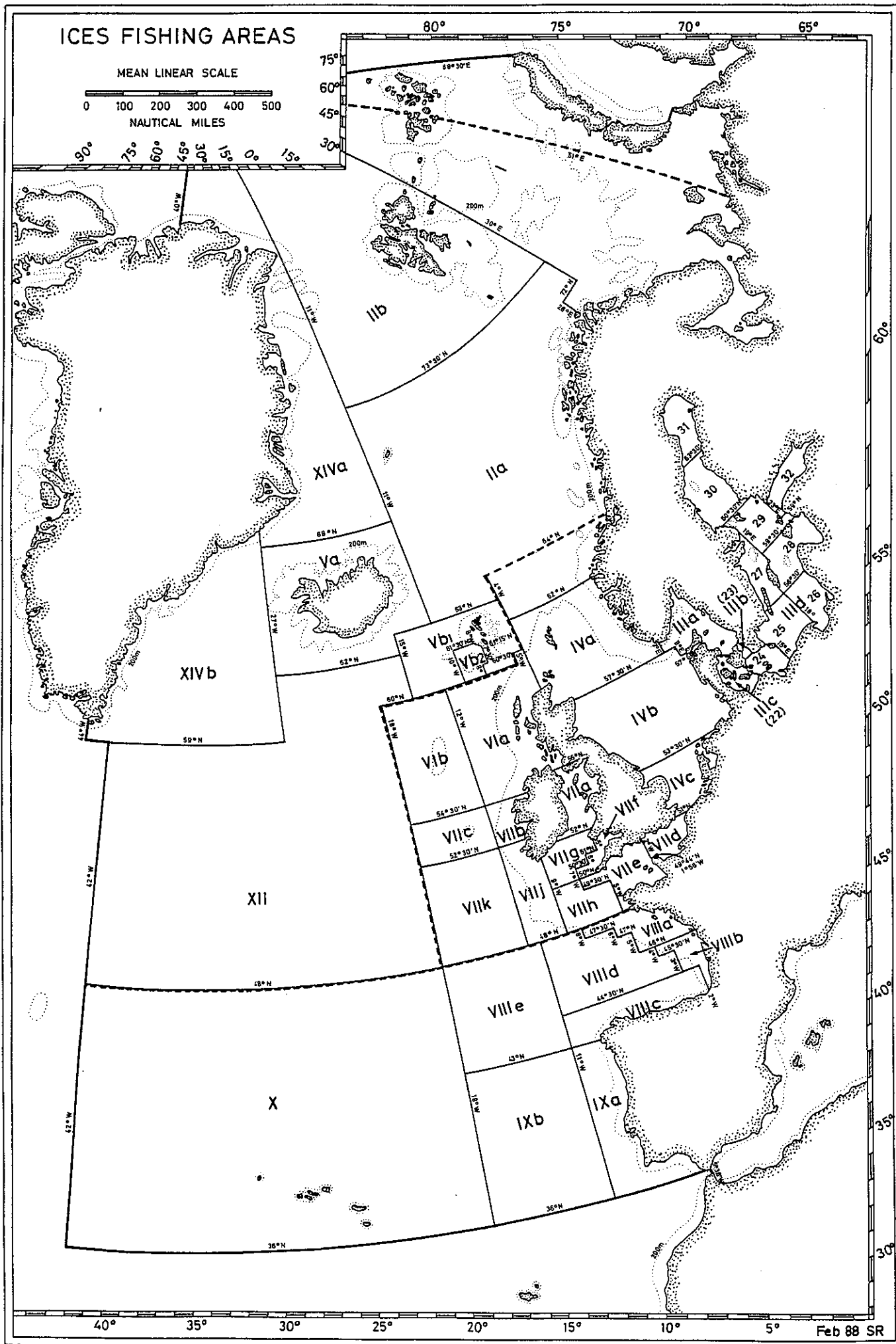
b) Quantify the expected short- and long-term effects of such modifications on both yield and biomass for plaice and all other relevant species;

c) Identify possible additional regulations associated with the plaice box.

# STOCKS FOR WHICH THE EEC FIXES TACs

Herring	IIIa	Hake	IIa(1),IV(1)
Herring	IIIbcd(1)	Hake	Vb(1),VI,VII,XII,XIV
Herring	IIa(1),IVab	Hake	VIIIabde
Herring	IVc(7),VIIId	Hake	VIIIc,IX,X,COPACE(1)
Herring	Vb(1),VlaN,VIB	Horse mackerel	IIa(1),IV(1)
Herring	VlaS,VIIbc	Horse mackerel	Vb(1),VI,VII,VIIIabde,XII,XIV
Herring	Vla Clyde	Horse mackerel	VIIIc,IX
Herring	VIIa	Mackerel	IIa(1),IIla,IIIbcd(1),IV
Herring	VIIef	Mackerel	II,Vb(1),VI,VII,VIIIabde,XII,XIV
Herring	VIIghjk	Mackerel	VIIIc,IX,X,COPACE(1)
Sprat	IIla	Plaice	IIla Skagerrak
Sprat	IIIbcd(1)	Plaice	IIla Kattegat
Sprat	IIa(1),IV(1)	Plaice	IIIbcd(1)
Sprat	VIIde	Plaice	IIa(1),IV
Anchovy	VIII	Plaice	Vb(1),VI,XII,XIV
Anchovy	IX,X,COPACE(1)	Plaice	VIIa
Salmon	IIIbcd(1)	Plaice	VIIbc
Capelin	IIb	Plaice	VIIde
Cod	IIb	Plaice	VIIIfg
Cod	IIla Skagerrak	Plaice	VIIhjk
Cod	IIla Kattegat	Plaice	VIII,IX,X,COPACE(1)
Cod	IIIbcd(1)	Sole	IIla,IIIbcd(1)
Cod	IIa(1),IV	Sole	II,IV
Cod	Vb(1),VI,XII,XIV	Sole	Vb(1),VI,XII,XIV
Cod	VIIa	Sole	VIIa
Cod	VIIb-k,VIII,IX,X,COPACE(1)	Sole	VIIbc
Haddock	IIla, IIIbcd(1)	Sole	VIIId
Haddock	IIa(1),IV	Sole	VIIe
Haddock	Vb(1),VI,XII,XIV	Sole	VIIIfg
Haddock	VII,VIII,IX,X,COPACE(1)	Sole	VIIhjk
Saithe	IIa(1),IIla,IIIbcd(1),IV	Sole	VIIIab
Saithe	Vb(1),VI,XII,XIV	Sole	VIIIcde,IX,X,COPACE(1)
Saithe	VII,VIII,IX,X,COPACE(1)	Megrim	Vb(1),VI,XII,XIV
Pollack	Vb(1),VI,XII,XIV	Megrim	VII
Pollack	VII	Megrim	VIIIabde
Pollack	VIIlab	Megrim	VIIIc,IX,X,COPACE(1)
Pollack	VIIIc	Anglerfish	Vb(1),VI,XII,XIV
Pollack	VIIId	Anglerfish	VII
Pollack	VIIIf	Anglerfish	VIIlaode
Pollack	IX,X,COPACE(1)	Anglerfish	VIIIe
Norway pout	IIa(1),IIla,IV(1)	Anglerfish	VIIIc,IX,X,COPACE(1)
Blue whiting	IIa(1),IV(1)	Penaeus	French Guyana
Blue whiting	Vb(1),VI,VII	N. deepwater prawn	IIla Skagerrak
Blue whiting	VIIIabde	Norway lobster	IIla,IIIbcd(1)
Blue whiting	VIIIe	Norway lobster	IIa(1),IV(1)
Blue whiting	VIIIc,IX,X,COPACE(1)	Norway lobster	Vb(1),VI
Whiting	IIla	Norway lobster	VII
Whiting	IIa(1),IV	Norway lobster	VIIIab
Whiting	Vb(1),VI,XII,XIV	Norway lobster	VIIIc
Whiting	VIIa	Norway lobster	VIIId
Whiting	VIIb-k	Norway lobster	IX,X,COPACE(1)
Whiting	VIII		
Whiting	IX,X,COPACE(1)		
Hake	IIla, IIIbcd(1)		

## ICES FISHING AREAS



# REPORT TO THE NORTH-EAST ATLANTIC FISHERIES COMMISSION

## 1. INTRODUCTORY ITEMS

### 1.1 Review of Nominal Catches in NEAFC Area

The assessments presented in this report are carried out using the best catch data available to the working groups and to ACFM. These data are not necessarily identical with the official statistics but, where appropriate, include estimates of unreported landings as well as corrections for misallocation of catches by area and species. Despite considerable effort exerted on this problem, there is no guarantee that all instances of misreporting were discovered. Often working group catch data are collated on a stock basis rather than an area basis, and so straightforward comparisons between these figures and the official statistics, which are provided on an area basis, are not appropriate.

In the assessments, the working groups try to estimate the total catch taken, including slipped catches, discards, landings which are not officially reported, and the composition of the industrial by-catches. These amounts of different species, which have to be included in the estimates of what has been taken from a given stock in order for the assessments to be correct, thus appear in the tables and figures produced by the working groups. These levels of discards, slipped fish, unreported landings, and industrial by-catches vary considerably between different stocks and fisheries, being negligible in some cases and constituting important parts of the total removal from other stocks.

The catch data used in the assessments are given in the table section. In cases where there might be doubt, it has been indicated if discards, by-catches, and estimates of unreported landings are included in the assessments. Estimates of catches landed as by-catches, especially from the industrial fisheries, are included in the assessments wherever data allow it and are included in the catch options.

It should be noted that, in general, catches in the industrial fisheries of protected species above the minimum landing size which are sorted and landed for human consumption, are included in the estimates of human consumption landings, both in the catch input data and in the projected catch options. Estimates of industrial by-catches cover, in most cases, that part of the by-catch which is used for reduction purposes.

ACFM in the past has noted the problems associated with discrepancies between the official landing figures reported to ICES by member countries and

corresponding catch data used by assessment working groups. ACFM recognizes the need for a clear identification of the categories of the catch data used for assessments. Working groups have been requested to specify the composition of the catch data used to estimate fishing mortalities. It is necessary that the working groups clearly identify factors contributing to the total fishing mortality in the various stocks, e.g.:

- recorded landings,
- discards at sea,
- slipping of unwanted catches,
- losses due to burst nets etc.,
- unreported landings,
- catch reported as other species,
- catch reported as taken in other areas,
- catch taken as by-catch in other fisheries.

It is recognized by ACFM that working groups should not be required to reveal the sources of the data. The groups should, however, indicate whether the data originate from sampling programmes, field observations, interviews, etc., in order to allow ACFM and other interested parties to evaluate the quality of the data, and hence the basis for the assessment.

The overall responsibility of obtaining reliable, adequate and timely fisheries statistics for publication in *ICES Fisheries Statistics* does not rest with ACFM. It is the opinion of ACFM that national offices for fisheries statistics are responsible for providing the catch data needed for assessments. These offices should ensure that catch statistics are collected on a gear basis and that the species composition of landings is determined in the case where landings are made unsorted by species.

### 1.2 Deterioration of Quality of Fishery Statistics

ACFM expressed the greatest concern over the quality of catch and effort data from most of the important fisheries in the ICES area. Under-reporting and misreporting have increased dramatically in recent years. ACFM stressed that the immediate consequences of this are that ACFM will be unable to provide reliable estimates of current stock sizes and forecasts that have been used to set TACs. Trends in stock size and the overall status of the stock can sometimes be evaluated from research vessel surveys, but such information alone cannot be used to give the short-term TAC advice usually required.

### 1.3 Information on *Ichthyophonus hoferi* in Pelagic Stocks.

The first observations of *Ichthyophonus*-infected herring in European waters were made in July 1991. These observations were made in the Norwegian Sea and in the northern North Sea. In early autumn 1991

mass mortality was reported from Division IIIa where dead and dying herring were observed in coastal waters from the Skagerrak to the Sound.

Monitoring of mackerel catches has not revealed any infection and herring is the only pelagic species reported so far to be affected by the infection. The following herring stock units have been reported to be infected:

Norwegian Spring-spawning herring  
North Sea Autumn-spawning herring  
SW Baltic- Division IIIa Spring-spawning herring

The *Ichthyophonus* infection is regarded to be lethal for herring. The present knowledge of the taxonomy, pathogenicity and, in particular, the dynamics of the disease is limiting the possibility of assessing the impact of *Ichthyophonus* on the affected stocks. Large scale monitoring of the disease has been carried out since 1991, but a comprehensive evaluation has not been made.

#### North Sea and Division IIIa

In the case of the North Sea and SW-Baltic-Division IIIa stocks simulations of impact have been carried out. These trial calculations have indicated that the infection could have a significant impact on both stock and catch projections. In 1993 ACFM concluded, on the basis of information from the infection rates in 1992, that the likely impact on these stocks was a reduction in the order of 10% or less in stock size. Further analysis in 1994 suggests a high sensitivity of the results to information available about the dynamics of the disease in 1991. The analysis indicates that the North Sea stock may have suffered considerable disease mortality in 1991 which gives a perception of stock abundance in 1993 that is around 30% lower than would be estimated if the disease were ignored. The data from sampling in 1991 is, however, very sparse and it is not possible to confirm this indication of high mortality. Available sampling shows a clear decrease in prevalence in both these areas and ACFM concluded in May 1994 that there is no evidence from this information that *Ichthyophonus*-induced mortality is significant at present although there are substantial indications that high mortality occurred in 1991.

#### Norwegian Sea-Barents Sea

Sampling since 1991 has shown infection of herring both in feeding grounds and in over-wintering fjords. There is no clear trend in the prevalence in this stock and in contrast to other herring stocks the disease has not been observed to decrease in recent years.

Samples of Norwegian spring-spawning herring taken in 1994 revealed a variable but significant prevalence of *Ichthyophonus*, and in contrast to 1993 the immature part of the stock was also infested.

Norwegian samples from winter to summer indicated lower prevalence in winter increasing through the year. The rates varied by gear type used for sampling and by location but were generally lower than 10%. Russian samples taken in January to March and July indicated a 100% infestation rate. Due to different techniques used in obtaining and analyzing the samples between the two countries it is difficult to compare the different estimates, and it is not possible at present to assess the impact of the disease on this stock.

Tagging experiments, however, have shown an increase in natural mortality from 0.13 estimated around 1980 to 0.23 estimated in recent years. The increase is assumed to reflect the impact of *Ichthyophonus*-induced mortality on the stock and the higher value has been used in the assessment.



## 2. STOCKS IN NEAFC REGION 1

### 2.1 Overview of Demersal stocks in Sub-areas I and II

The fishery in the North-East Arctic has been strongly regulated in recent years, but despite these management measures some of the stocks continue to be in a poor state and, because of too high fishing rates, the prognosis for some of them is very dependent on the estimates or assumptions of current recruitment levels.

For North-East Arctic cod recent recruitment has been above average and the stock is considered to be inside safe biological limits. The spawning stock is currently above the long-term average. For the coastal part of this stock there is at present no analytical assessment but preliminary forecasts show an increase of catch level in 1995.

The spawning stock of haddock is increasing but still below the long-term average and in the region where the probability of poor recruitment is high. The stock is currently considered to be outside safe biological limits.

For saithe, the spawning stock is at an historically low level. The improved recruitment in recent years indicates that the spawning stock will increase and that the stock may increase within safe biological limits. If subsequent year classes are weak, however, this situation could be reversed in a few years.

The stock of *Sebastes mentella* is considered to be outside safe biological limits and the exploitable biomass is decreasing. For *Sebastes marinus* the available data from surveys in the Barents Sea and Svalbard waters indicate a fairly stable situation for the stock. However, it is not possible to assess the state of the stock with accuracy.

All available data indicate that for the Greenland halibut stock, there was an almost total recruitment failure in 1991 and 1992 and that spawning stock biomass is in the region where the probability of poor recruitment is high. Thus the stock is considered to be outside safe biological limits.

## 2.2 Cod in Sub-areas I and II

### 2.2.1 North-East Arctic cod

Catch data (Tables 2.2.1-2.2.2):

Year	Rec. TAC <sup>1</sup>	Agreed TAC <sup>1</sup>	Off. Indgs.	ACFM catch <sup>1</sup>	Unreported catches
1987	<645	560	552	523	
1988	530 <sup>2</sup>	590 <sup>2</sup>	459	435	
1989	300	300	343	332	
1990	172	160	187	212	25
1991	215	215	269	319	50
1992	250 <sup>3</sup>	356 <sup>4</sup>	383	513	130
1993	385 <sup>3</sup>	500	532	582	50
1994	649 <sup>3</sup>	700			

<sup>1</sup>Norwegian coastal cod not included. <sup>2</sup>New advice May 1988: 325,000-363,000 t, agreed TAC reduced to 451,000 t. <sup>3</sup>Status quo F. <sup>4</sup>Revised from 300 due to information on increased individual growth. Weights in '000 t.

**Historical development of the fishery:** The fishery is conducted both with an international trawler fleet and with coastal vessels using traditional fishing gears. In 1978 quotas were introduced in trawler fleets and in 1989 in the coastal fleets. In addition to quotas the fishery is regulated

by a minimum landing size, a minimum mesh size in trawls and Danish seines, a maximum by-catch of undersized fish, closure of areas with high density of juveniles and by seasonal and areal restrictions.

**State of stock:** The fishing mortality is close to  $F_{med}$ . The spawning stock biomass is currently above the long-term mean. Recent year classes are above average. The stock is considered to be within safe biological limits. Details given in Table 2.2.3.

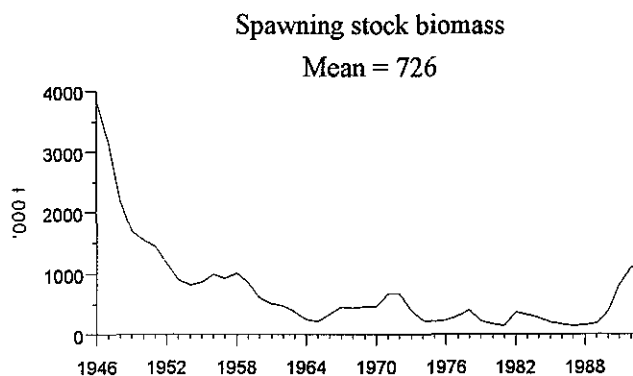
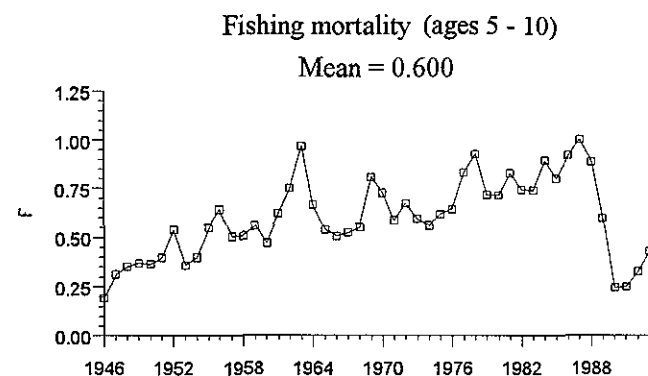
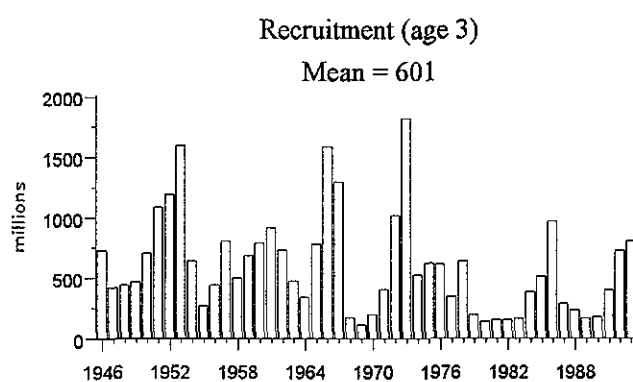
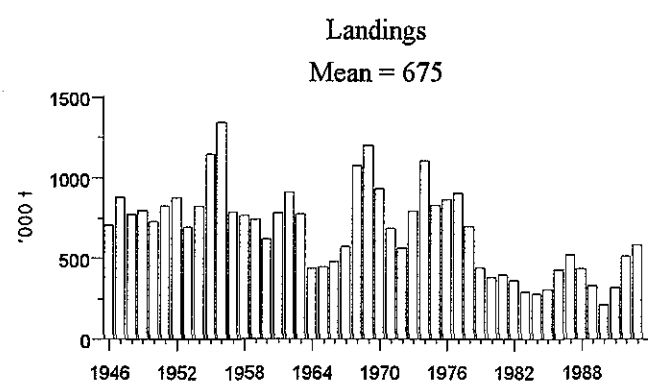
**Forecast for 1995:**

SSB(94) = 830,  $F(94) = 0.55$ , Basis: Expected Catch(94) = 770.

Option	Basis	F (95)	SSB (95)	Catch (95)	SSB (96)
A	0.4 $F_{93}$	0.17	747	306	980
B	0.6 $F_{93}$	0.26		442	898
C	0.8 $F_{93}$	0.35		567	823
D	$F_{93}$	0.43		682	755
E	$F_{med}$	0.46		720	730
F	1.2 $F_{93}$	0.52		788	692

Weights in '000 t.

Options A and B will give an increase in spawning stock and option C will stabilize it. All other options will reduce the spawning stock. However, options A-E show that SSB will remain above the long-term average in 1996.



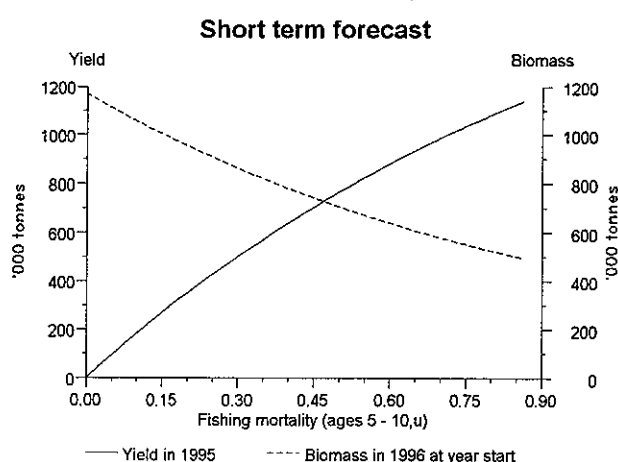
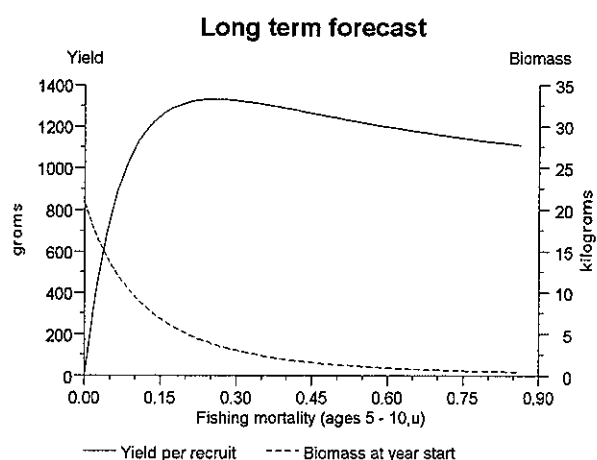
**Management advice:** ACFM notes that there are no long-term benefits in yield from increasing fishing mortality above the present level.

**Special comments:** Revision of the time series for catch-at-age data is in progress. This will provide updated weight-at-age and maturity figures which may change the perception of the historical development of the stock. The growth of cod is expected to be low in the near future, because of the decrease of the capelin stock.

**Data and assessment:** Analytical assessment based on catch-at-age data. The level of unreported catches has decreased from the very high level in the latest years.

**Source of information:** Report of the Arctic Fisheries Working Group, August/September 1994 (C.M.1995/Assess: 3).

### Yield and Spawning Stock Biomass



## 2.2.2 Coastal cod

Catch data (Table 2.2.4):

Year	Rec. TAC <sup>1</sup>	Agreed TAC <sup>2</sup>	Off. Ldgs.	ACFM catch <sup>3</sup>
1987		40	31	31
1988		40	22	22
1989		40	17	17
1990		40	24	24
1991		40	25	25
1992		40	35	35
1993		40	43	43
1994		40	-	-

<sup>1</sup>No separate TAC recommended. <sup>2</sup>Added to the agreed TAC of North-East Arctic cod. <sup>3</sup>Norwegian landings from Division IIa (see also Table 2.2.4). Weights in '000 t.

**Historical development of the fishery:** The directed fishery for coastal cod is conducted using a variety of traditional gears except trawl. The management of the coastal cod fishery is integrated into that for North-East Arctic cod and follows the same regulations and restrictions.

**State of the stock:** Unknown.

**Forecast for 1995:** A SHOT forecast, assuming catches in 1994 to be 43 000 tonnes, predicts a catch of 51 000 tonnes in 1995.

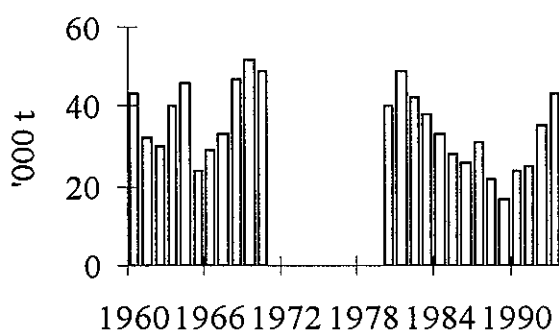
**Special comments:** Acoustic and trawl surveys were conducted on parts of this stock in 1992 and 1993. An analytical assessment of this stock will be attempted in 1995.

**Data and assessment:** Catch-at-age data for coastal cod in Sub-areas I and II are not available and thus only a status quo forecast was made for 1995.

**Source of information:** Report of the Arctic Fisheries Working Group, August/September 1994 (C.M.1995/Assess: 3).

Norwegian landings in Division IIa

Mean = 26





## 2.3 North-East Arctic haddock

Catch data (Tables 2.3.1-2.3.2):

Year	Rec. TAC <sup>1</sup>	Agreed TAC <sup>1</sup>	Off. Indgs.	ACFM catch
1987	160	250	155	151
1988	<240	240	95	92
1989	<103	83	60	55
1990	- <sup>2</sup>	25	27	26
1991	- <sup>2</sup>	28	34	34
1992	35	63 <sup>4</sup>	58	54
1993	56 <sup>3</sup>	72	76	76
1994	97	120	-	-

<sup>1</sup>Norwegian coastal haddock not included. <sup>2</sup>No directed fishery. <sup>3</sup>Predicted catch at *status quo*. <sup>4</sup>Increased during the year by 8,000 totalling 63 000 t. Weights in '000 t.

**Historical development of the fishery:** The fishery is mainly a trawl fishery, in periods only as by-catch in the fishery for cod. The fishery is also restricted by quotas for the traditional gears. The fishery is regulated by a minimum landing size, a minimum mesh size in trawls and Danish seine, a maximum by-catch of undersized fish, closure of areas with high density of juveniles and other seasonal and areal restrictions.

**State of stock:** The spawning stock biomass in 1994 is estimated to be at a record low level. Fishing mortality in 1993 is above  $F_{med}$  and thus the stock is considered at present to be outside safe biological limits.

Details in Table 2.3.3.

**Forecast for 1995:**

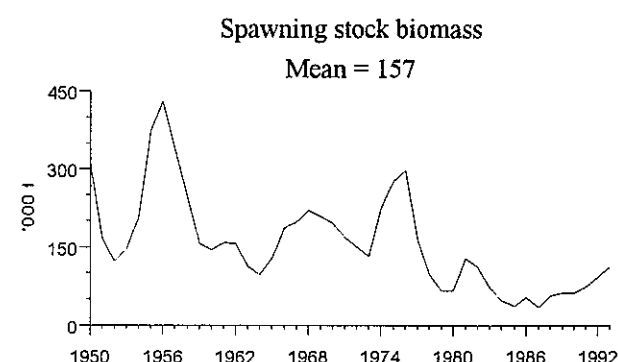
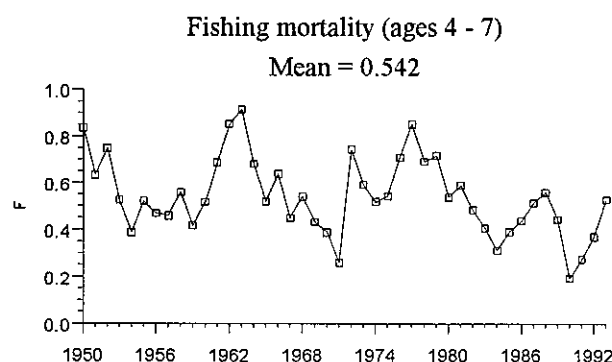
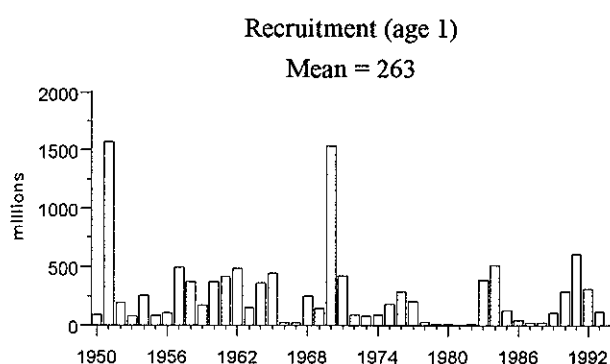
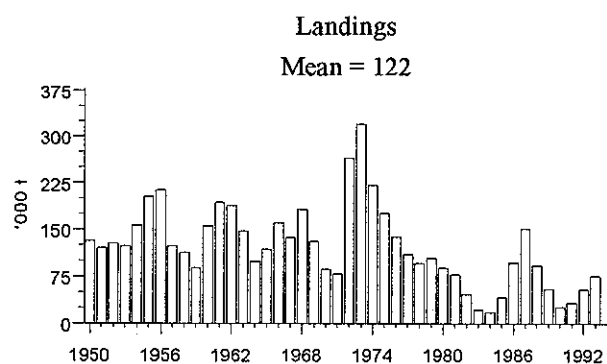
SSB(94) = 54,  $F(94) = 0.46$ , Basis: Expected Catch (94) = 120, Landings (94) = 120, Growth: Medium.

Option	Basis	F (95)	SSB (95)	Catch (95)	SSB (96)
A	$0.4F_{93}$	0.21	113	85	197
B	$F_{med} = 0.6F_{93}$	0.32		122	177
C	$0.8F_{93}$	0.42		155	159
D	$F_{93}$	0.53		185	142

Weights in '000 t.

For all options the SSB will increase in 1996 ; options A and B will bring it well above the long-term average level, and option C to about the average level.

**Management advice:** The fishing mortality is at present above  $F_{med}$ . ACFM notes that there are no long-term benefits in yield to be expected from increasing fishing mortality beyond  $F_{med}$ .

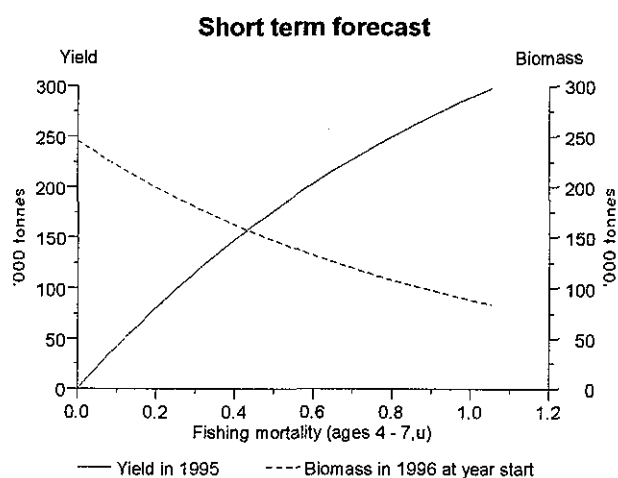
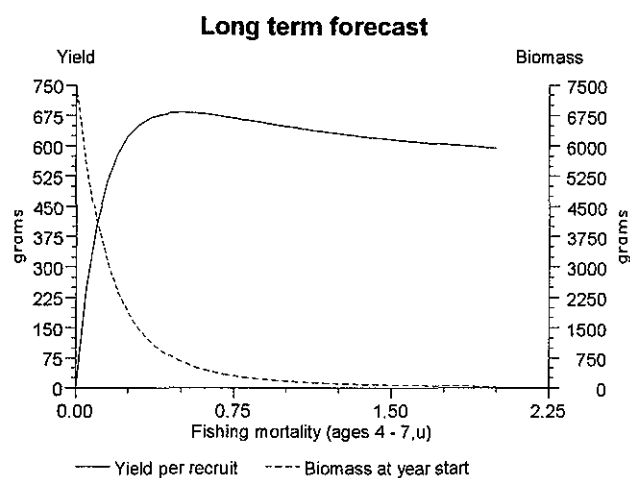


**Special comments:** Revision of the available time series for basic data is in progress. This will provide updated weights-at-age and maturity figures which may change the perception of the historical development of the stock.

**Source of information:** Report of the Arctic Fisheries Working Group, August/September 1994 (C.M.1995/Assess: 3).

**Data and assessment:** Analytical assessment based on catch-at-age and surveys.

### Yield and Spawning Stock Biomass



## 2.4 North-East Arctic saithe

Catch data (Table 2.4.1):

Year	Rec. TAC	Agreed TAC	Off. Indgs	ACFM catch
1987	<90	-	92	92
1988	<83	-	114	115
1989	120	120	122	123
1990	93	103	96	95
1991	90	100	108	107
1992	115	115	125	125
1993	132 <sup>1</sup>	132	144	144
1994	158 <sup>1</sup>	145	-	-

<sup>1</sup> Predicted catch at *status quo* F. Weights in '000 t.

**Historical development of the fishery:** The fishery has since the early 1960s been dominated by purse seine and trawl, with a traditional gill net fishery for spawning saithe as the third major component. The purse seine fishery is carried out in coastal areas and fjords and typically exploits somewhat smaller fish than the trawlers. Over the years purse seine and trawl have taken roughly equal shares of the catches, but in the last couple of years trawls have taken a larger share.

Quotas have been set for purse seine and trawl, while expected catches of other gears have been estimated on the basis of recent trends.

**State of the stock:** The spawning stock biomass is at an historical low level. Recruitment has improved in recent years. The 1988 year class is abundant and the 1989 year class is the strongest on record. These year classes will give a considerable increase in the SSB, but it will still be well below historical high levels. The stock is currently considered to be outside safe biological limits. The fishing mortality is about  $F_{med}$  and has been at that level for some years.

Details in Table 2.4.2

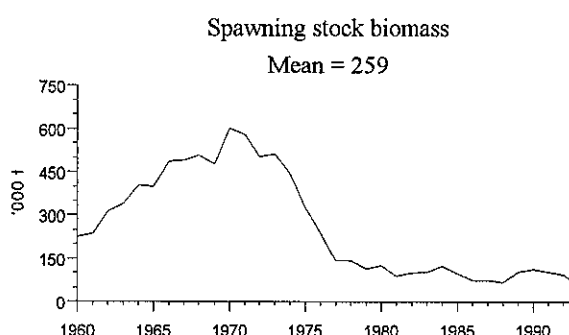
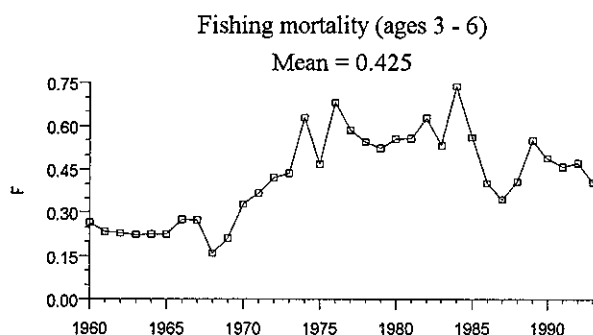
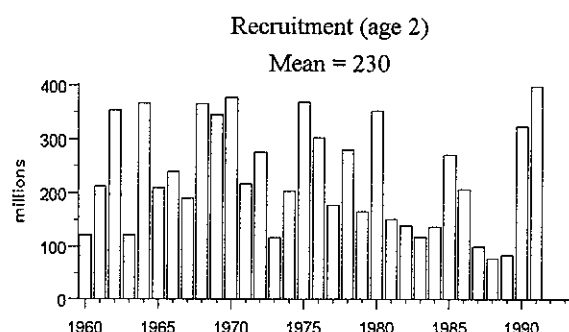
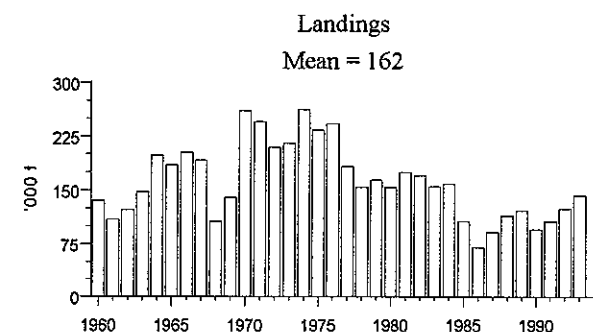
### Forecast for 1995:

SSB(94) = 139,  $F(94) = 0.30$ , Basis: Expected Catch(94) = 145 (target for management based on quotas for major fleets), Landings(94) = 145.

Option	Basis	F (95)	SS B (95)	Catch (95)	Indgs (95)	SSB (96)
A	0.4F(93)	0.17	271	102	102	320
B	0.6F(93)	0.26		145	145	285
C	$F_{med} =$ 0.8F(93)	0.34		185	185	255
D	F(93)	0.43		221	221	228

Weights in '000 t.

Options A and B show increases in SSB. Options C and D show a decline in SSB in 1996 compared to 1995. The projected increase in spawning stock biomass would bring the stock within safe biological limits but if subsequent year classes are weak the situation could reverse in a few years.





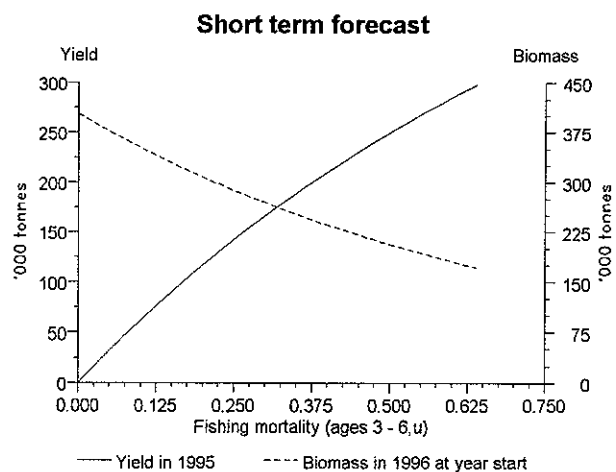
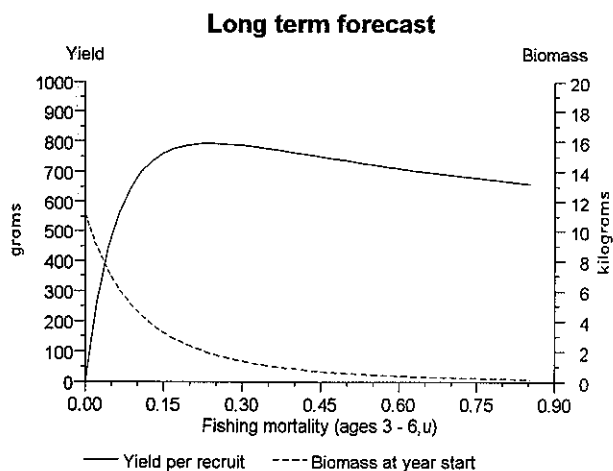
**Management advice:** Sustained exploitation at the current level may bring the spawning stock biomass down to an historical low level where the probability of low recruitment increases. **Therefore ACFM recommends that the fishing mortality should not be allowed to increase.**

**Special comments:** The lack of reliable recruitment estimates for this stock makes the predictions uncertain.

**Data and assessment:** Analytical assessment based on catch-at-age data. Catch per unit of effort data from Norwegian purse seiners and trawlers and abundance indices from an acoustic trawl survey.

**Source of information:** Report of the Arctic Fisheries Working Group, August/September 1994 C.M.1995/Assess: 3)

## Yield and Spawning Stock Biomass



## 2.5 Redfish in Sub-areas I and II (Tables 2.5.1-2.5.5)

### 2.5.1 *Sebastes mentella* in Sub-areas I and II

Catch data (Tables 2.5.5 and 2.5.6):

Year	Rec. TAC	Agreed TAC	Off Indgs <sup>3</sup>	ACFM catch
1987	70 <sup>1</sup>	85	35	11
1988	11	-	41	16
1989	12	-	47	23
1990	18	-	63	35
1991	12	-	68	49
1992	22 <sup>1</sup>	-	33	16
1993	18	18	29	13
1994	- <sup>1</sup>	-	-	13 <sup>2</sup>

<sup>1</sup>Precautionary TAC. <sup>2</sup>Expected catch. <sup>3</sup>Includes both *S. mentella* and *S. marinus*. Weights in '000 t.

**Historical development of the fishery:** The only directed fishery for *S. mentella* is a trawl fishery. By-catches are taken in cod and shrimp-trawl fisheries. The total landings have been at a relatively low level since 1986.

Traditionally this fishery was conducted by Russia and other East-European countries on grounds from south of Bear Island towards Spitsbergen. From the mid-1980s Norwegian trawlers started fishing on grounds never harvested before, i.e. along the continental slope further southwards. This resulted in an increase in the landings up to 1991, but these have since decreased.

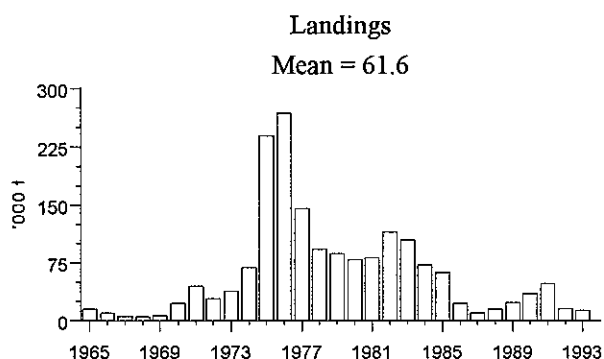
**State of stock:** The CPUE data indicate that the spawning stock is at an historical low level and the stock may be outside safe biological limits. The year classes 1991-1993 as 0-group are the lowest on record.

**Forecast for 1995:** Not available.

**Management advice:** ACFM recommends that the fishing mortality should be kept at the lowest level possible until a significant increase in spawning stock biomass has been detected.

**Data and assessment:** CPUE and survey data are available. An analytical assessment was attempted, but considered unreliable.

**Source of information:** Report of the Arctic Fisheries Working Group, August/September 1994 (C.M.1995/Assess:3).



## 2.5.2 *Sebastes marinus* in Sub-areas I and II

Catch data (Tables 2.5.5 and 2.5.7):

Year	Rec. TAC	Agreed TAC	Off Indgs <sup>3</sup>	ACFM catch
1987	-	-	35	24
1988	15	-	41	26
1989	24	-	47	23
1990	23	-	63	28
1991	24	-	68	19
1992	25 <sup>1</sup>	-	33	17
1993	12 <sup>1</sup>	12	29	15
1994	- <sup>1</sup>	-	-	16 <sup>2</sup>

<sup>1</sup>Precautionary TAC. <sup>2</sup>Expected catch. <sup>3</sup>Includes both *S. mentella* and *S. marinus*. Weights in '000 t.

**Historical development of the fishery:** The fishery is mainly conducted by Norway accounting for 80-90% of the total catch. The fish are mainly caught by trawl and gill-net, and to a lesser extent by longline and handline, but some of the catches are also taken in mixed fisheries. Germany has also long traditions in a trawl fishery for this species. The landings decreased in 1991 from a level of 23,000-30,000 t in 1984-1990.

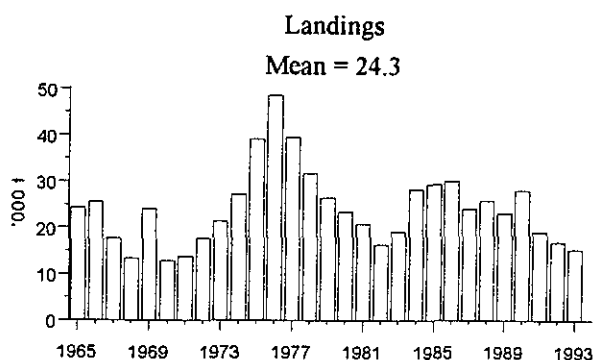
**State of stock:** Indices from surveys in youngfish areas in the Barents Sea and Svalbard waters indicate a fairly stable situation for the stock. It is not possible to assess the state of the stock.

**Forecast for 1995:** Not available.

**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.

**Data and assessment:** Catch-at-age and tuning data are improving for this stock. An analytical assessment was attempted, but the results were not considered reliable.

**Source of information:** Report of the Arctic Fisheries Working Group, August/September 1994 (C.M.1995/Assess: 3).



## 2.6 Greenland halibut in Sub-areas I and II

### Catch data (Tables 2.6.1-2.6.4):

Year	Rec. TAC	Agreed TAC	Off. Indgs.	ACFM catch
1987	-	-	19	19
1988	19	-	20	20
1989	21	-	20	21
1990	15	-	23	23
1991	9	-	30	32
1992	6	7 <sup>1</sup>	8	9
1993	7	7 <sup>1</sup>	12	12
1994	<12	11 <sup>1</sup>	-	-

<sup>1</sup>Target set by Norwegian authorities. Weights in '000 t.

**Historical development of the fishery:** Following the introduction of trawlers in the fishery in the late 1960s the landings increased to a level of about 80,000 t in the early 1970s. However, landings decreased to a level of around 20,000 in the 1980s. The fishery from 1992 has been regulated by allowing a directed fishery only by small coastal long line and gill net vessels. By-catches in the trawl fishery for other species have been limited. The by-catch of Greenland halibut in the shrimp fishery is regulated by mandatory use of a sorting grid.

**State of stock:** All available data indicate that there was almost total recruitment failure in 1991 and 1992 and that spawning stock biomass is in the region where the probability of poor recruitment is high. The stock is at present considered to be outside safe biological limits.

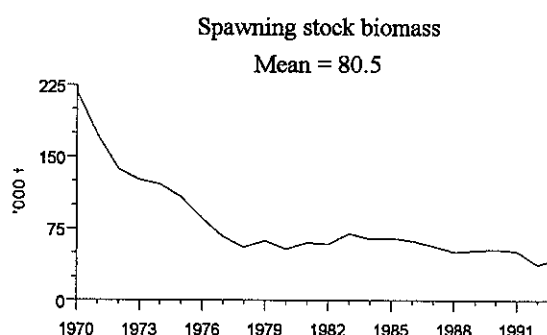
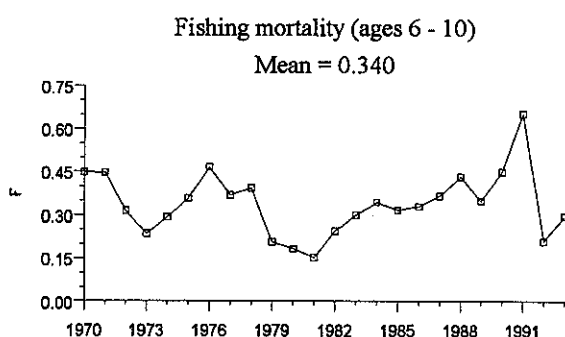
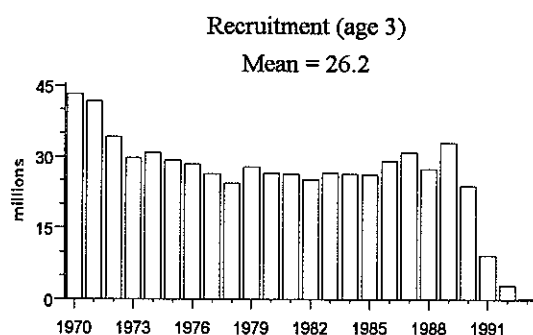
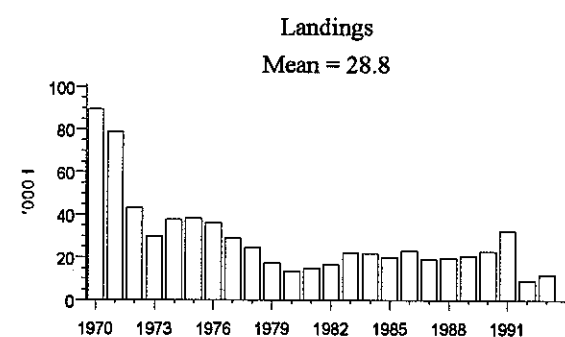
Details in Table 2.6.5.

**Forecast for 1995:** At *status quo* fishing mortality ( $F_{95} = F_{93} = 0.30$ ) the catch in 1995 is predicted to be 12,900 tonnes.

**Management advice:** To prevent a further decline in the spawning stock biomass, **ACFM recommends that no fishing should take place in 1995.**

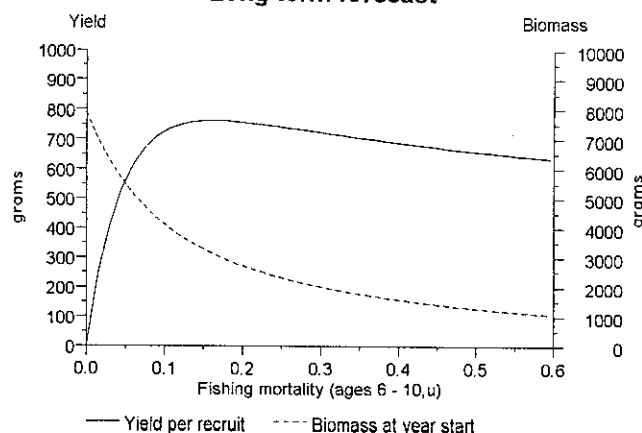
**Data and assessment:** Analytical assessment based on catch-at-age data. Three survey data series used for assessment. The assessment is very dependent on the estimated recruitment from the surveys.

**Source of information:** Report of the Arctic Fisheries Working Group, August/September 1994 (C.M.1995/Assess: 3).



## Yield and Spawning Stock Biomass

### Long term forecast



## 2.7 Demersal stocks at Greenland and Iceland

### Overview

The cod at Greenland and Iceland can be considered as being composed of four components spawning in different areas: a West Greenland offshore component spawning off Southwest Greenland, inshore components found in various fjords, a component spawning off East Greenland and a component spawning off Iceland. Larvae and 0-group fish from the East Greenland-Iceland components are carried by the Irminger current to West Greenland. The inflow of larvae varies from year to year but for some year classes, such as those of 1973 and 1984, it was very important.

Tagging studies off West Greenland showed that inshore cod remained mainly within the area where they were tagged whereas recaptures of Greenland offshore cod were taken at Iceland. The emigration from West Greenland was most evident for year classes which were earlier observed as 0-group drifting from Iceland to Greenland.

The fishery off West Greenland has traditionally consisted of an offshore trawl fishery and an inshore fishery mostly using poundnets. Over the last decade, the fisheries have fluctuated substantially, but after 1989 the catches declined dramatically.

Catches off East Greenland also fluctuated widely, but they decreased sharply in 1993 when the directed cod fishery failed totally due to very low catch rates.

All available information confirms the severely depleted state of the cod stock off Greenland. The offshore stock may be considered to be almost non-existent at the present time, and no substantial recruitment is expected in the foreseeable future.

The inshore stock component has historically been small and available information indicates that recruitment will be at a low level during the next few years.

ACFM therefore recommends that no fishing should take place on the offshore cod stock at Greenland until a substantial increase in recruitment and biomass is evident.

With the extension of fisheries jurisdiction to 200 miles in 1975, Iceland introduced new measures to protect juvenile fish. In the trawl fisheries for cod, saithe and haddock the mesh size was increased from 120mm to 135mm in 1976 and to 155mm the following year. A mesh size of 135mm was allowed only in the fishery for redfish. In addition, fishing can be prohibited immediately in areas where the number of small fish exceeds a certain percentage. A limitation of the number of fishing days was set up from 1977 to 1983 and in 1984 a quota system was introduced.

In Icelandic waters, the cod stock is at a very low level and the SSB has been declining since 1955. The present situation can be explained by poor recruitment since the mid 1980's and by high fishing pressure. In such conditions there is no prospect of recovery of the stock and ACFM therefore recommends, as last year, a drastic reduction in fishing effort to ensure that the SSB does not decrease further.

The Icelandic saithe stock is considered to be within safe biological limits and the SSB is close to the highest level observed in the past decade. There is no immediate cause for concern for this stock. In the long term, however, an increase in fishing effort will not lead to a substantial increase in the landings.

The fishery for Greenland halibut in Sub-areas V and XIV is mainly conducted by Icelandic trawlers in Division Va. As no surveys are carried out for Greenland halibut, there are a number of uncertainties concerning the status and state of that stock in Greenland and Icelandic waters. The low catch rates experienced by the Icelandic trawlers and the results of the assessment of the stock, however, are in accordance and indicate that the stock has been declining since the mid 1980's. Fishing mortality has reached a very high level in recent years and might not be sustainable in the medium term. ACFM therefore recommends a reduction in fishing mortality of at least 20% in 1995.

## 2.7.1 Cod stocks off Greenland (ICES Sub-area XIV and NAFO Sub-area 1)

Catch data (Tables 2.7.1 - 2.7.2):

Year	Rec TAC	Agreed TAC	ACFMCatch
<u>East Greenland</u>			
1987	5	11.5	7
1988	5	11.5	9
1989	5	15	15
1990		15	33
1991		25	22
1992		17.25	12
1993		17.25	1
1994		17.25	
<u>West Greenland</u>			
1987		12.5	12
1988		53	62
1989		90	112
1990		110	68
1991		90	20
1992		66	6
1993		66	2
1994		66	
<u>Greenland (total)</u>			
1987			19
1988			72
1989			126
1990		125	102
1991		115	42
1992		83.25	17
1993		83.25	3
1994		83.25	

(Weights in '000 t).

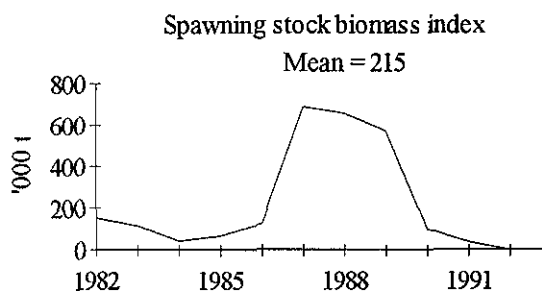
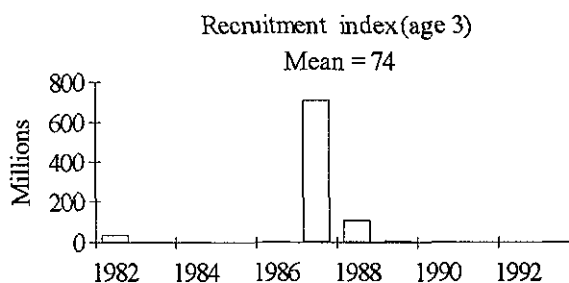
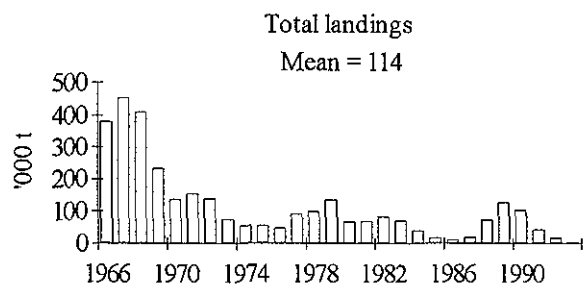
**Historical development of the fishery:** Catches in the 1970s remained stable at about 50,000t annually off West and East Greenland, and most of this was taken off West Greenland. The offshore fishery was based almost exclusively on the 1984 and 1985 year classes during the years 1987-1989 after which the surveys and catches indicated a stock collapse. Off West Greenland low catches have been taken in recent years by the inshore fishery while off East Greenland catches have been taken as by-catches in the redfish and shrimp fishery.

**State of stock:** The offshore component is severely depleted and no recovery is expected in the next few years. The inshore component has never been assessed separately, but inshore catches are declining substantially.

The dramatic decrease in stock abundance is associated with very high fishing mortalities and low recruitment since 1989.

**Forecast:** None available.

**Management advice:** ACFM considers that the offshore cod stock complex is well below the minimum biologically acceptable level and therefore recommends that no fishing should take place until a substantial increase in recruitment and biomass is evident.



**Special comments:** A TAC of 83,250t has been fixed until 1994 in an agreement between Greenland and the European Union.

In Greenland waters there are inshore fjord stocks and an offshore cod stock. Given suitable climatic conditions (water temperature) and prudent management, sustained production of offshore cod in this area is possible. However, interaction between the East Greenland and Irminger currents since the mid-1980s has apparently rendered climatic conditions unsuitable for offshore cod. Combined with high fishing mortality, this has caused the offshore cod stock to be severely depleted. In order to take advantage of suitable climatic conditions when they occur, it is necessary to protect the remaining biomass of offshore cod.

**Data and assessment:** Analytical assessments have been attempted for the total Greenland stock and for the combined Iceland-Greenland stock to take into account migration of cod from Greenland waters to Iceland. However, the results are still unreliable and were not used to derive any catch projections.

**Source of information:** Report of the North-Western Working Group, May 1994 (C.M.1994/Assess:19).

## 2.7.2 Icelandic cod (Division Va)

Catch data (Table 2.7.3):

Year	Rec TAC	Agreed TAC	ACFM Catch
1987	300	330	392
1988	300	350	378
1989	300	325	356
1990	250	300	335
1991	240	245	308
1992	250	265	265
1993	154	205	251
1994	150	165	

(Weights in '000 t).

**Historical development of the fishery:** Iceland extended its fisheries jurisdiction to 200 miles in 1975. In the demersal fisheries, the mesh size in trawls was increased from 120mm to 135mm in 1976 and to 155mm the following year.

In order to protect juvenile fish, fishing is prohibited in areas where the number of small cod in the catches exceeds a certain percentage.

From 1977 to 1983, demersal fishing was limited to a certain number of days each year, but this system, as implemented, failed to meet the objective of limiting fishing mortality and a transferable boat quota system was introduced in 1984.

Catches have exceeded national advice and national TAC levels considerably for the past decade. ACFM's catch advice on this stock, first given for 1993, has also been considerably exceeded.

**State of stock:** SSB has shown a declining trend since 1955 and recent estimates are the lowest on record. Recruitment has been poor since the 1985 year class, but

the 1993 year class may be around the average level. The stock size may be so low that it is not able to replenish itself at the current level of exploitation.

Details given in Table 2.7.4.

**Forecast for 1995:** Assuming a catch in 1994 of 190,000t (TAC-based), corresponding to a 20% reduction in fishing mortality from the 1993 level, the following catch options were derived for 1995:

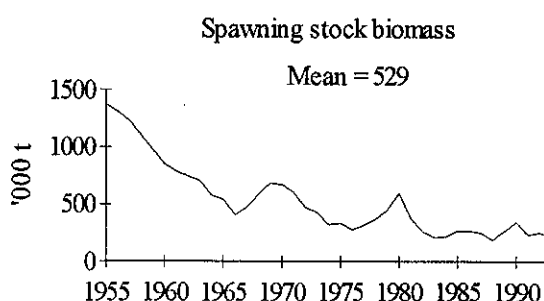
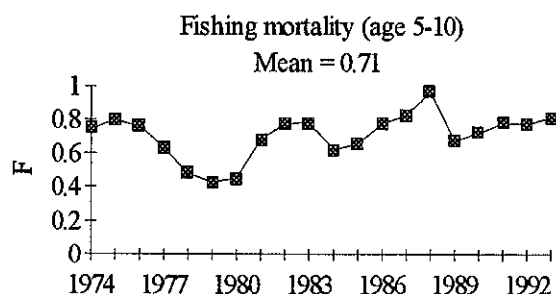
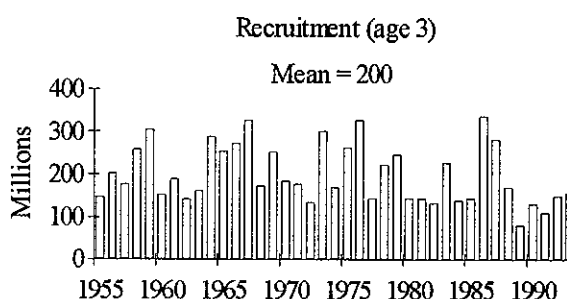
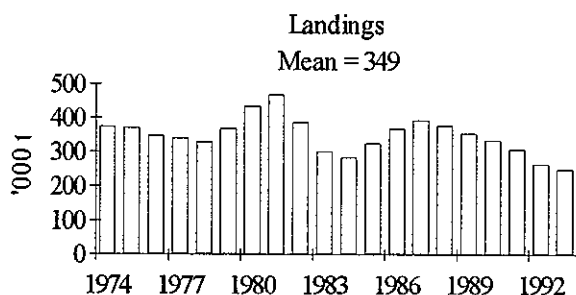
$$F(94)=0.67, \text{Catch}(94)=\text{Landings}(94)=190, \text{SSB}(94)=231$$

Option	Basis	F (95)	SSB (95)	Catch (95)	Lnogs (95)	SSB (96)
A	0.5 F(93)	0.41	228	130	130	240
B	0.6 F(93)	0.49	223	152	152	220
C	0.8 F(93)	0.66	212	191	191	186
D	1.0 F(93)	0.82	203	226	226	158

(Weights in '000 t).

- A-C Fishing mortality must be reduced by at least 50% to obtain an increase in SSB.  
D. Continued fishing at the 1993 level will reduce the SSB to a new historic low level in 1996.

**Management advice:** The spawning stock biomass is currently at a historically low level. At current levels of fishing mortality it is predicted to decrease further and is considered to be outside safe biological limits. ACFM therefore recommends a reduction in fishing mortality by at least 50% from the 1993 level, corresponding to a total catch in 1995 of not more than 130,000 t.

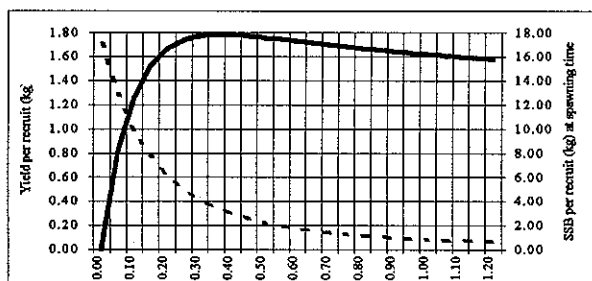
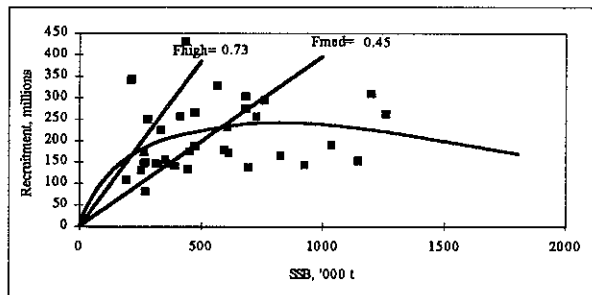




**Special comments:** Fishing mortality has been high since the beginning of the 1980s and was far above  $F_{max}$  and above  $F_{high}$  in 1993. It is expected to be below  $F_{high}$  in 1994. This is illustrated in the stock-recruitment diagram and yield-per-recruit curve given below:

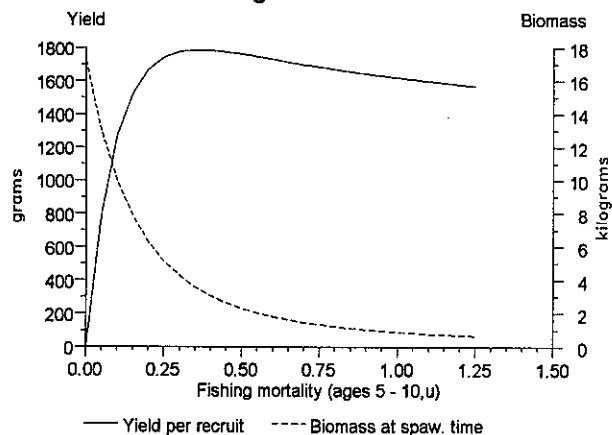
Although the TAC is set at 165,000t in 1994, the TAC is not completely binding since there are certain exceptions in terms of, e.g., transferring part of the TAC between years and the fact that long-liners can fish twice their allocated TAC. Taking these exceptions into account leads to an expected catch of 190,000t in 1994.

All short-term results depend heavily on the assumed development in maturity at age which is difficult to estimate and predict accurately.

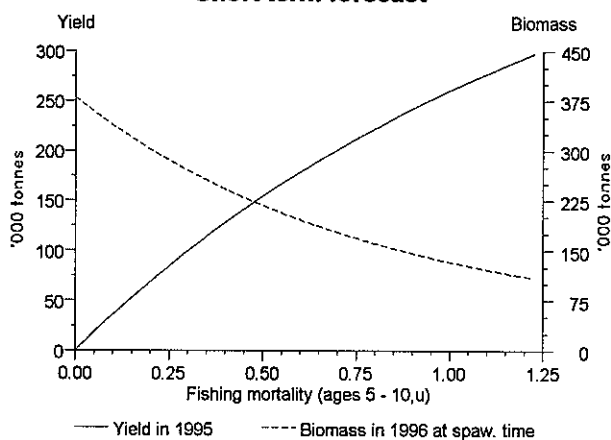


## Yield and Spawning Stock Biomass

### Long term forecast



### Short term forecast



**Medium-term considerations:** Several medium-term predictions have been considered, taking into account biological interactions between cod, capelin and shrimp. In each simulation the cod TAC in each year is set at a percentage of the biomass of 4 year olds and older. The effect of not following such a strategy, but instead insisting on a minimum catch, was also investigated. Two such simulations are described below:

- A A fishery from this stock with a strategy which attempts to continue to take as a minimum the same level of catches as in 1994 (and later increasing catches as the stock increases) leads to a 15% probability of stock collapse.
- B A different strategy, which takes 22% of the 4+ biomass, is likely to rebuild the stock and lead to greater gains in the long run. Application of such a medium-term strategy would lead to a TAC of 130,000t in 1995.

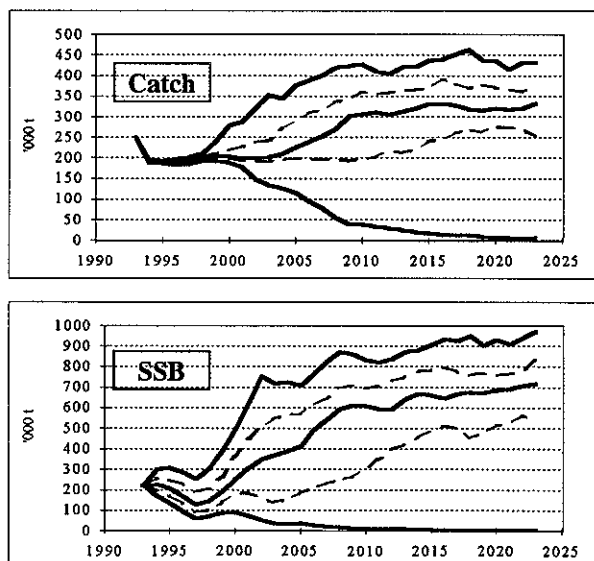
The result of the simulations are shown at the bottom of this page.

Although there are several uncertainties in this assessment, the conclusion about the importance of reducing fishing mortality is quite robust to changes in assumptions.

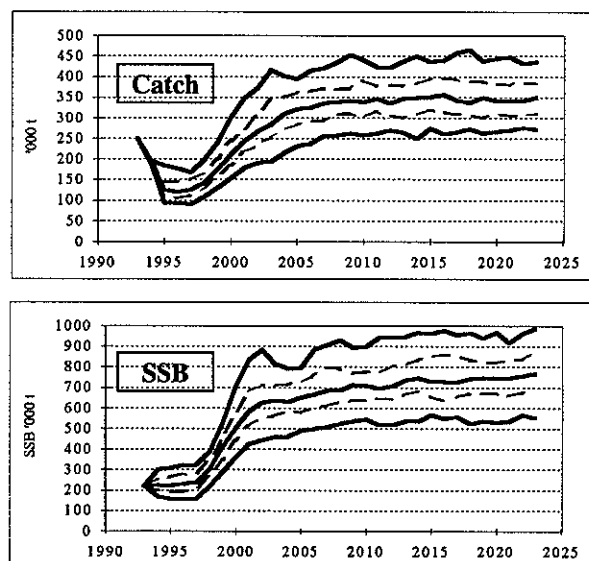
**Data and assessment:** Analytical assessment based on catch, survey and CPUE data. Catch-at-age data considered reliable.

**Source of information:** Report of the North-Western Working Group, May 1994 (C.M.1994/Assess:19).

**A** Medium-term simulations based on a minimum catch of 190,000 t. The resulting upper and lower 5, 25 and 50% lines are given for the SSB and catch.



**B** Medium-term simulations based on a strategy which takes 22% of the 4 + biomass without a minimum catch. The resulting upper and lower 5, 25 and 50% lines are given for the SSB and catch.





### 2.7.3 Icelandic saithe (Division Va)

Catch data (Table 2.7.5):

Year	Rec TAC	Agreed TAC	ACFM Landings
1987	64	70	81
1988	64	80	77
1989	80	80	82
1990	80	90	98
1991	87	65	103
1992	70	75	80
1993	75	95	72
1994	(84)	85	

(Weight in '000 t); ( ) catch at *status quo* F

**Historical development of the fishery:** Iceland extended its fisheries jurisdiction to 200 miles in 1975. In the demersal fisheries, the mesh size in trawls was increased from 120mm to 135mm in 1976 and to 155mm the following year.

In order to protect juvenile fish, fishing is prohibited in areas where the number of small saithe in the catches exceeds a certain percentage.

From 1977 to 1983, demersal fishing was limited to a certain number of days each year, but this system, as implemented, failed to meet the objective of limiting fishing mortality and a transferable boat quota system was introduced in 1984.

In most recent years, catches have exceeded the agreed TAC.

**State of stock:** The stock is considered to be within safe biological limits. The fishing mortality has been below  $F_{max}$  in recent years. Recruitment has fluctuated without trend; the 1984 year class was the highest on record and the SSB is close to the highest level in the past decade.

Details given in Table 2.7.6.

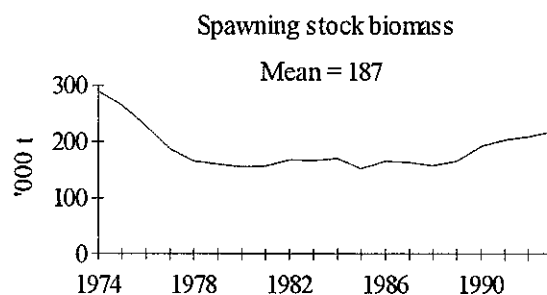
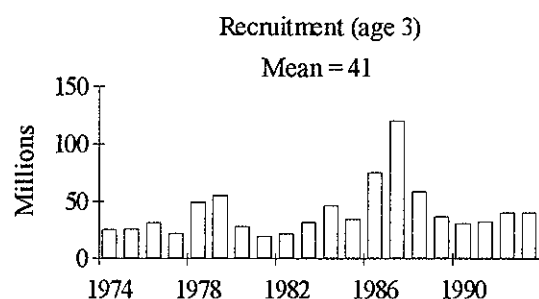
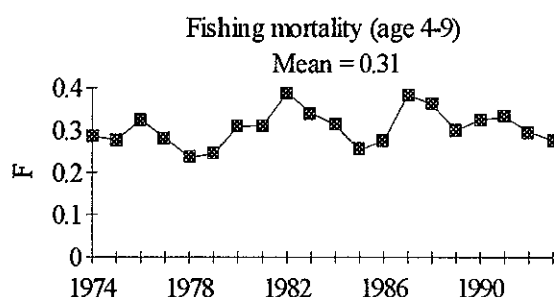
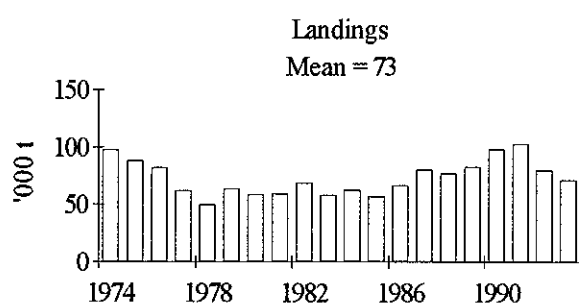
**Forecast for 1995:** Assuming that fishing mortality in 1994 is equal to that in 1993, corresponding to a catch of 73,000t in 1994, the following catch options were derived for 1995.

$F(94) = F(93) = 0.28$ ,  $SSB(94) = 205$ ,  $landings(94) = 73$ .

Option	Basis	F 95	SSB 95	Catch 95	Lndgs 95	SSB 96
A	$F_{0.1}$	0.18	200	50	50	215
B	$0.8F(93)$	0.22	200	59	59	206
C	$1.0F(93)$	0.28	200	72	72	195
D	$1.2F(93)$	0.33	200	83	83	185
E	$F_{max}$	0.44	200	105	105	165

(Weights in '000 t).

- A This option results in a 32% reduction in catch in 1995 compared with 1993 and a rather stable SSB at about the 1993 level;
- B-D These options result in a rather stable SSB at about the 1994 level (variations less than 8% from 1994);
- E This option results in a 48% increase in catch and a 20% reduction in SSB compared to the 1994 level.



**Management advice:** This stock is within safe biological limits. An increase in fishing mortality from the 1993 level will not lead to a measurable increase in catches in the longterm.

**Special comments:** Although part of the saithe catch is taken in a mixed fishery, the reduction in the cod TAC is not expected to affect the catch possibilities for saithe. The independence of these fisheries can be seen from the fact that the catches of saithe in 1993 were much lower than predicted. This was mainly due to the low price of saithe and thus to lack of interest by the industry.

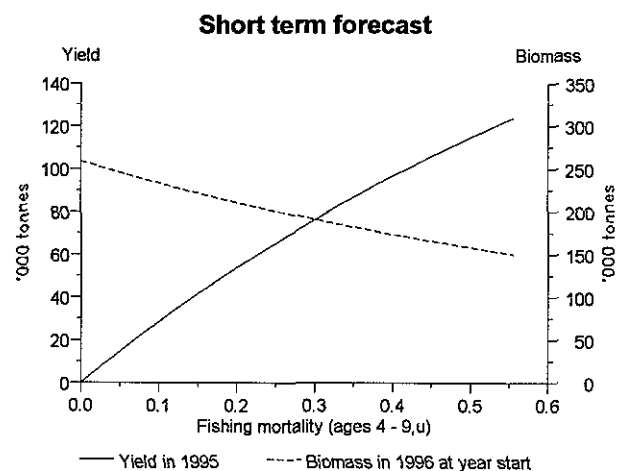
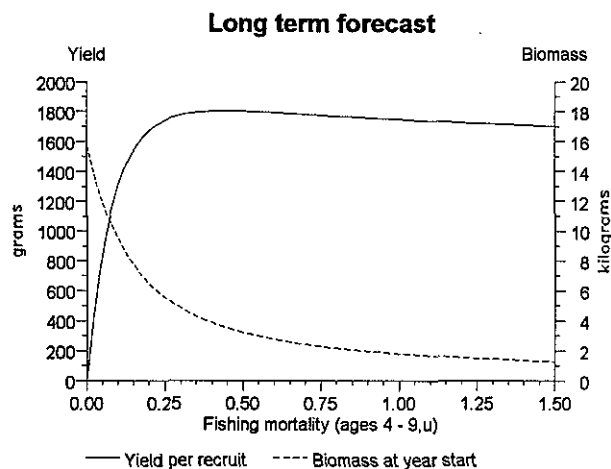
**Data and assessment:** Increased mean weight at age and proportion mature at age was observed in 1993 for all age groups.

Time series analysis using only catch at age data was used to estimate fishing mortalities.

No recruitment indices are available for this stock, and average recruitment was assumed for the more recent year classes.

**Source of information:** Report of the North-Western Working Group, May 1994 (C.M.1994/Assess:19).

### Yield and Spawning Stock Biomass



## 2.7.4 Greenland halibut in Sub-areas V and XIV

Catch data (Table 2.7.7-2.7.10):

Year	Rec TAC	Agreed TAC (Va)	Catch in Va	ACFM catch V, XIV
1987	<28	30	45	47
1988	<28	30	49	51
1989	33	30	59	62
1990		45	37	39
1991	40	30	35	38
1992	30	25	32	35
1993	30	30	34	41
1994	(34)	30		

Weights in 000' t; ( ) Catch at *status quo* F

**Historical development of the fishery:** The catches increased from 3,000 t to about 30,000 t in the 1960s but dropped again to some 3,000 t in 1975. Since then the catches steadily increased during the 1970s and 1980s, reaching a peak in 1989.

Catches have been higher than the recommended TACs in most years. The fishery is concentrated in Division Va where the catch has been higher than the agreed TAC in most years. The catch of 41,000 t in 1993 was considerably higher than the predicted catch of 34,000t.

**State of stock:** Year class strength has been fluctuating. Fishing mortality is close to the highest historical level; SSB reached a record high level in 1988 and is now declining.

Details given in Table 2.7.11.

**Forecast for 1995:** Assuming a catch level of 41,000t in 1994 equal to the total catch in 1993, the following catch options were derived for 1995.

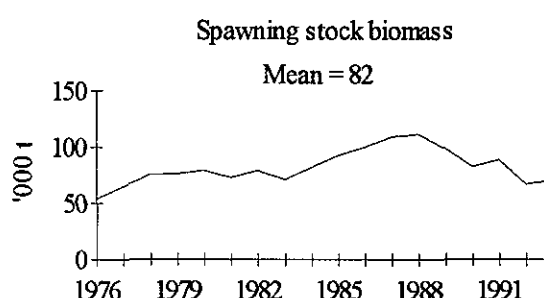
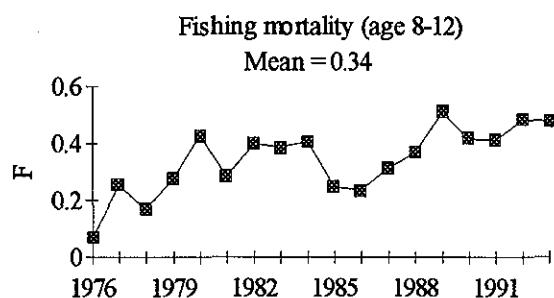
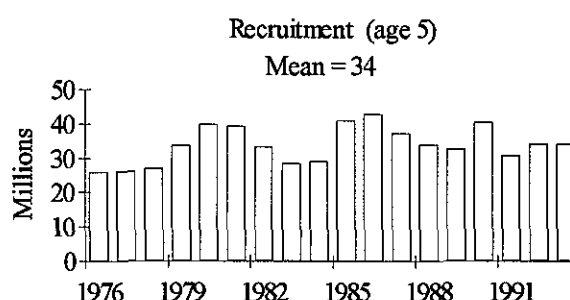
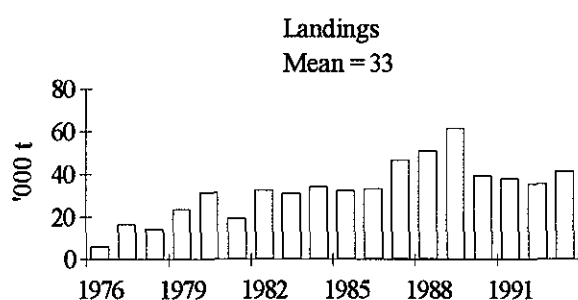
Assuming  $F(94) = 0.53$ . Basis: Catch(94) = Catch(93) = Landings (94) = 41. SSB(94)=73.

Option	Basis	F 95	SSB 95	Catch 95	Lndgs 95	SSB 96
A	$F_{0.1}$	0.17	69	15	15	84
B	$0.6F(94)$	0.31	69	25	25	77
C	$0.8F(94)$	0.42	69	32	32	72
D	$F(94)$	0.53	69	38	38	67
E	$1.2F(94)$	0.64	69	44	44	62

Weights in 000' t.

- A. Fishing at  $F_{0.1}$  results in a considerable reduction in fishing mortality and catch and a 19% increase in SSB in 1996.
- B-E Only a considerable decrease in fishing mortality will prevent a further decline in the SSB.

**Management advice:** There are indications that the stock has decreased in recent years and that fishing mortality is at a record high level. The current fishing mortality may not be sustainable in the medium term and will probably drive the SSB close to a record low level. In order to prevent a further decrease, **ACFM recommends that fishing mortality be reduced by at least 20%, corresponding to a total catch of 32,000t in 1995.**



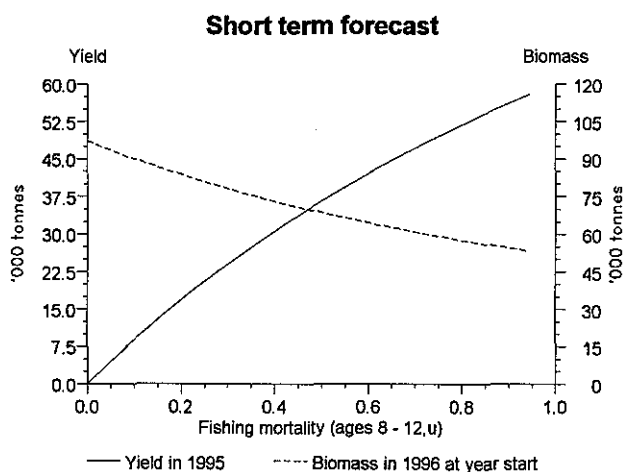
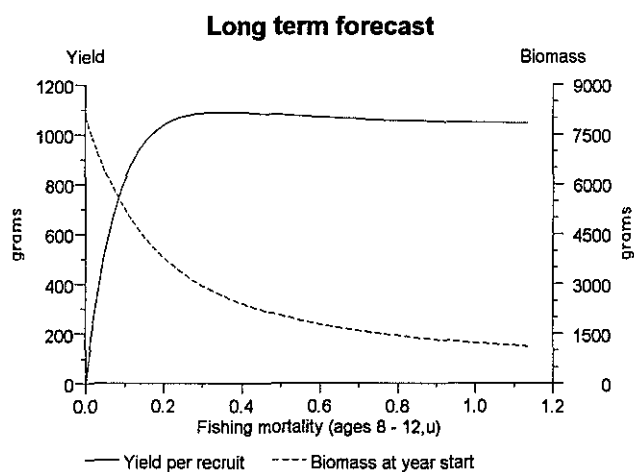
**Special comments:** The assessment is based entirely on Icelandic data. Although this fishery accounts for over 80% of the catches, the database should be broadened, especially to include data from the Faroese fishery.

It is, however, clear that survey information would be of great use in assessing the stock.

**Data and assessment:** The use of only one commercial fleet for tuning is a cause for concern because of possible catchability changes. No recruitment indices are available for this stock.

**Source of information:** Report of the North-Western Working Group, May 1994 (C.M.1994/Assess:19).

### Yield and Spawning Stock Biomass



## 2.8 Redfish in Sub-areas V, VI, XII and XIV

### Overview

**Stocks:** The redfish stock complex comprises *S. marinus* and deep-sea *S. mentella* stocks on which the so-called "traditional" redfish fishery along the East Greenland, Iceland and Faroese coasts is based, as well as the oceanic *S. mentella* stock which is fished in the open sea, mainly in international waters outside national economic zones. At present, ACFM has no new evidence at hand to justify splitting the *S. marinus* and deep-sea *S. mentella* stocks fished in the traditional redfish fishery into separate stock units in Greenland, Iceland or Faroese waters. Although the area separation of the spawning stocks of the oceanic and deep-sea *S. mentella* has not yet been well defined, ACFM considers the oceanic type to be a separate stock.

**Landings:** The total landings from this redfish stock complex (i.e. redfish in all sub-areas) reached their highest level on record in 1982. Since then, landings declined in 1990 but increased again to 216,000 t in 1993 (Tables 2.8.1-2.8.14).

**Stock Distribution with Respect to National Fisheries Zones:** The distribution of the *S. marinus* and deep-sea *S. mentella* stocks in the national fisheries zones is reflected in the catch statistics. All catches taken in Sub-area XIV are within the national fisheries zone of Greenland. Likewise, catches reported in Divisions Va and Vb are taken within the national fisheries zones of Iceland and the Faroes, respectively. In Sub-area VI the catches could be taken within the fisheries zone of the EU or the Faroe Islands, depending on where they are taken.

ACFM noted that the established extension of the distribution of deep-sea *S. mentella* into international waters in the Irminger Sea might also have an impact on considerations on stock distribution with respect to national fisheries zones, but this needs further research.

Catches from the oceanic *S. mentella* stock have so far all been taken in Sub-areas XII and XIV, and recently also in minor quantities in Division Va, almost exclusively in international waters, i.e. outside the national fisheries zones of the neighbouring countries with the exception of some catches within the national fisheries zone of Greenland and, at the beginning of 1991, also in the Icelandic fisheries zone.

From distribution information available it is obvious that a substantial part of the adult oceanic *S. mentella* stock is, at least at times, to be found within the national fisheries zones of Iceland and Greenland. In the present state of knowledge, ACFM has no way of quantifying the proportion of the adult stock occurring in the respective national zones.

**Assessments:** ACFM would like to point out some inherent problems in assessing redfish stocks and in advising TACs for them:

To a large extent the catch is landed as redfish with no specification as to species. The necessary allocation of the landings by species therefore has to be done on the basis of sampling, which is difficult because of increased processing at sea.

Age determination of redfish is a very difficult task for several reasons. The growth is very slow, the growth increments are indistinct both in scales and otoliths, and the fish recruit to the fishery at an advanced age. Furthermore, validation of the ageing methods is badly needed.

Area coverage on ichthyoplankton and acoustic surveys for oceanic *S. mentella* has differed from year to year and the survey results therefore do not necessarily reflect changes in stock abundance. The acoustic estimates have (apparently) improved and a comparison of the estimates in a given area between 1991 and 1992 gave rather encouraging results (differing by only 7%).





## 2.8.1 Redfish *Sebastes marinus* and deep-sea *Sebastes mentella* "traditional fishery" in Sub-areas V, VI and XIV

Catch data (Tables 2.8.11-2.8.12):

Year	Rec TAC	ACFM Landings
1987	< 83	115
1988	< 84	121
1989	117	111
1990	116	111
1991	117	123
1992	116	117
1993	120	124
1994	100	

**Historical development of the fishery:** Total catches reached a peak in 1982 but declined from 1989-1993. In 1993 a decrease was seen in Division Vb, while an increase, mainly due to an increase in the landings of juvenile redfish, was reported from Sub-area XIV.

**State of stocks:** Unknown, but CPUE for the Icelandic trawlers fishing in Division Va has shown a decline since 1986, and a considerable decline since 1992. This is confirmed by the groundfish survey which indicates a considerable (over 50%) decline in fishable biomass of *S. marinus* since 1986. Recruitment failure does not seem to have occurred but the effort seems to have doubled in the fishery for *S. marinus* in Division Va.

No information is available on fishing mortality.

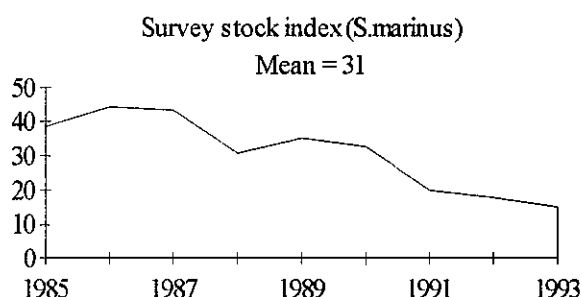
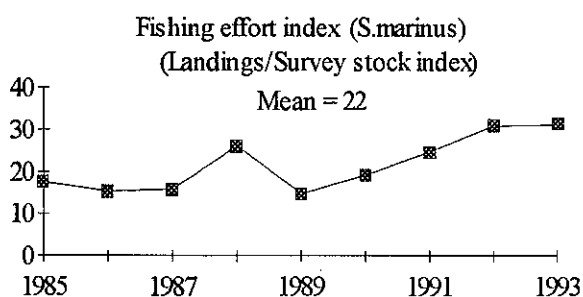
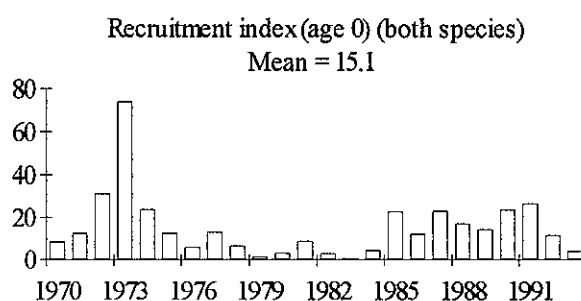
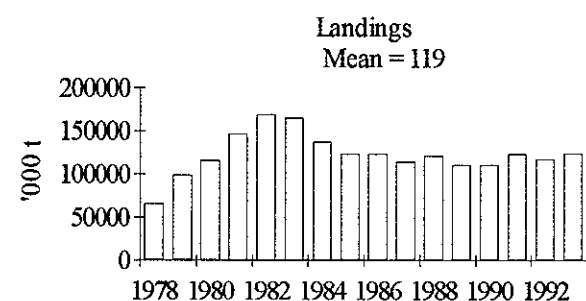
Results from the Icelandic groundfish survey show that recruitment to the *S. marinus* stock is quite variable, but there is no indication of recruitment failure in recent years. Indices for 0-group redfish in the Irminger Sea and at East Greenland (this index probably also includes oceanic *S. mentella*) in 1992 and 1993 were below the long-term average.

**Forecast:** Not available

**Management advice:** It is important to reduce effort on *S. marinus* from the present level since this level does not seem sustainable. Within the present management regime there is little possibility of controlling the effort in the fishery for *S. marinus* independently of the fishery for deep-sea *S. mentella* and hence both stocks need to be considered simultaneously (see Special comments).

ACFM therefore recommends that the combined catches of *S. marinus* and deep-sea *S. mentella* in Sub-areas V and XIV do not exceed 90,000 t in 1995.

**Special comments:** In view of the decrease in the survey index in Division Va, fishing effort for *S. marinus* should be reduced by 50% to the level in the 1980s, which would result in a catch of about 25,000t of *S. marinus* in Division Va.



Further, if a precautionary TAC is to be set separately for deep-sea *S. mentella*, then this could be set at the average catches in the years 1989-1993, or about 40,000t.

Such a catch limit would thus correspond to a catch of 65,000 t of redfish in Division Va in 1995.

If a precautionary TAC in the traditional fishery for redfish is to be set for Division Vb and Sub-area XIV, then it could be set at the level of the average catch in the years 1989-1993, i.e. at about 15,000 t in Division Vb and 10,000 t in Sub-area XIV.

**Data and assessment:** No analytical assessment could be made due to age reading problems. CPUE from Icelandic trawlers and groundfish survey. A multiplicative model assuming that catch over groundfish survey index is proportional to effort allowed for a one-year prediction of the catch of *S. marinus* in Division Va assuming constant effort.

**Source of information:** Report of the North-Western Working Group, May 1994 (C.M.1994/Assess:19).

## 2.8.2 Oceanic redfish *Sebastes mentella* in Division Va and Sub-areas XII and XIV

Catch data (Tables 2.8.13-2.8.14; Figure 2.8.1):

Year	Rec TAC	ACFM Lndgs
1987		91
1988		91
1989		38
1990		32
1991	66	25
1992	<sup>1</sup>	60
1993	~50	87
1994	100	

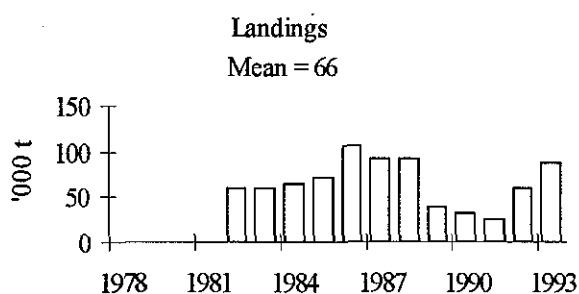
(Weights in '000 t)

<sup>1</sup>Preference for no major expansion of the fishery

**Historical development of the fishery:** The fishery started in 1982. After decreasing from 1988 to 1991 landings increased again. This decrease was mostly due to a reduction in the Russian effort. The catches from Sub-area XII in 1993 were at the same level as those in Sub-area XIV. There was an increasing trend in fishing effort as a result of new fleets entering the fishery in Division Va and other areas during the last decade.

**State of stock:** The size and productivity of the stock are uncertain. In 1992 Icelandic and Russian acoustic surveys estimated a biomass of 1.9 million t for a given area. The 1993 Russian acoustic survey estimated a stock biomass of 2.5 million t in international waters and in the East Greenland zone. A joint Icelandic/Norwegian acoustic survey was carried out in June/July 1994. The present stock biomass is estimated to be 2.2 million t.

No information is available on fishing mortality or recruitment.



**Forecast:** Simulations (see special comments) indicate that a TAC of over 150,000 t may reduce the stock to low levels during the next 10 years. A TAC of 100,000 t for the years 1994-2000 will result in less than 50% reduction from the virgin (1982) biomass level.

**Management advice:** Because of the uncertainties in the productivity of the stock, ACFM is not in a position to provide medium and long-term advice on this stock. However, ACFM considers that with a catch of 100,000 t the stock will be within safe biological limits.

**Special comments:** Due to uncertainties regarding this stock, simulations with various input parameters were carried out in order to examine the possible response of this stock to fishing.

Since this is an expanding fishery, ACFM notes that careful monitoring of the stock is important in order to measure the actual response of the stock.

**Data and assessment:** No analytical assessment is available due to age reading problems. Effort series are available for three fleets. Acoustic estimates are available for a given area in 1992, 1993 and 1994.

**Stock Distribution and Migration with Respect to National Fishing Zones:** Oceanic redfish inhabits the pelagic waters of the Irminger Sea both within the 200-mile economic zones of Iceland and East Greenland and in international waters. The fishing season starts in March in the north-eastern part of the area and the EEZ of Iceland as far north as 63°N. In June/July the Oceanic redfish migrate in a south-westerly direction and become distributed in the open part of the Irminger Sea as well as in the 200 mile zone of East Greenland (Fig. 2.8.1).

In autumn the greatest concentrations are found more to the east suggesting an eastward migration of fish after June/July. The migration pattern is also reflected by the movement of the fishing fleet.

From distribution information available it is obvious that a substantial part of the adult oceanic *S. mentella* stock is, at least at times, to be found within the national fisheries zones of Iceland and Greenland. In the present state of knowledge, ACFM cannot quantify the proportion of the adult stock occurring in the respective national zones.

**Source of information:** Report of the North-Western Working Group, May 1994 (C.M.1994/Assess:19) and Report of the Joint Icelandic/Norwegian Survey on Oceanic Redfish in the Irminger Sea and Adjacent Waters, in June/July 1994 (C.M. 1994/G:44).

## 2.9 Demersal Stocks at the Faroe Islands

### Overview

In 1977 an EEZ was introduced in the Faroe area. In 1987 a system of fishing licences was introduced. The demersal fishery at Faroes has been regulated by technical measures (minimum mesh sizes and closed areas). In order to protect young juvenile fish, fishing can be prohibited in areas where the number of small cod, haddock and saithe exceeds 30% in the trawl catches. A reduction of effort has been attempted through banning the issue of new licences and by a buy back of licences.

As a result of the combined effect of poor recruitment in the last decade and high fishing effort the SSB's of cod and haddock on the Faroe Plateau have been reduced to the lowest level on record. In 1993 ACFM considered them to be well below the minimum biologically acceptable level and consequently advised no fishing. The Faroe saithe stock has sustained a high fishing mortality due to above-average recruitment in the last decade. In 1993 the SSB was assessed to be the lowest on record and ACFM advised a significant reduction in effort.

A new quota system introduced in 1994, which is basically based on individual quotas, aims through fixed TAC's for the period 1994-1998 to increase the SSB of cod and haddock on the Faroe Plateau to 52,000 and 40,000 t respectively. For saithe the TAC for the period 1994-1998 is based on a fishing mortality of 0.48 from the 1993 assessment. From 1998 onwards the aim is to reduce the fishing mortality on saithe to 0.4.

Based on the present assessments ACFM has assessed the probability of reaching the management objectives and the risks associated with the fixed TAC's for the period 1994-1998. The analysis shows the probability of reaching the goals for the SSB of cod (10%) and haddock (25%) in 1998, and similarly a small probability of the stocks declining further. With respect to saithe no analysis of this kind could be performed. ACFM, however, advises that, for this stock, there are considerable risks of a stock collapse in the medium term of applying a fixed annual TAC of 42,000 t.

The stocks of cod and haddock are depleted and the saithe stock is at a low level. For 1995, ACFM recommends no fishing on the cod and haddock stock and that catches of saithe be limited to 22,000t.

## 2.9.1 Faroe saithe (Division Vb)

### Catch data (Table 2.9.1):

Year	Rec TAC	Agreed TAC	ACFM landings
1987	<32		40
1988	<32		45
1989	40		44
1990			62
1991	30		55
1992	27		38
1993	<37		33
1994	26	42	

(Weight in '000 t)

**Historical development of the fishery:** From the very high catches in 1990 the catches have declined to 33,000 t in 1993.

A TAC of 42,000 t has been fixed for the 1994-1998 period.

**State of stock:** Despite a high level of recruitment during the 1980s, the SSB has decreased significantly in recent years due to high fishing mortalities and reduced growth. The stock is presently assessed to be only marginally above the 1993 level, which was the lowest on record. The growth is increasing from the low level observed in 1990-1991. Fishing mortality peaked in 1991, but has decreased since and is now close to  $F_{max}$ .

Details given in Table 2.9.2.

**Forecast for 1995:** Assuming a catch of 42,000 t (= TAC) in 1994 corresponding to a fishing mortality of 0.54, the following catch options were derived for 1995:

Assuming  $F(94) = 0.54$ , Basis: TAC, Catch(94) = Landings (94) = 42, SSB (94) = 69.

Option	Basis	F (95)	SSB (95)	Catch (95)	Lnrgs (95)	SSB (96)
A	No fishing	0	60	0	0	95
B	$F_{0.1}$	0.17		16	16	82
C	0.5 $F(94)$	0.25		22	22	77
D	$F_{max}$	0.44		36	36	65
E	TAC	0.54		42	42	59
F	1.2 $F(94)$	0.59		45	45	57

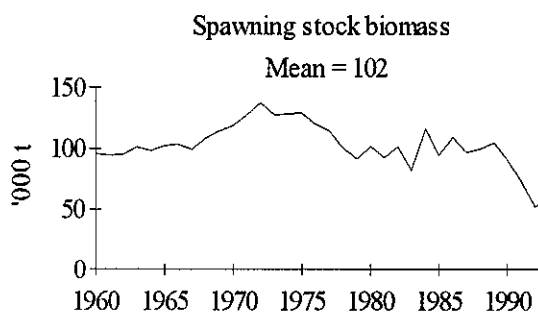
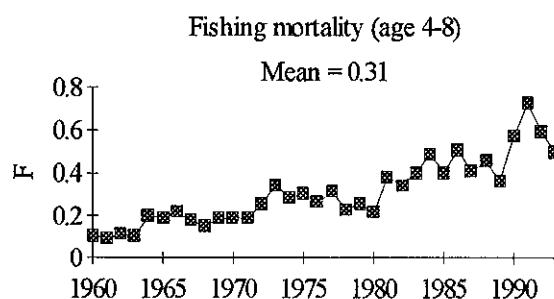
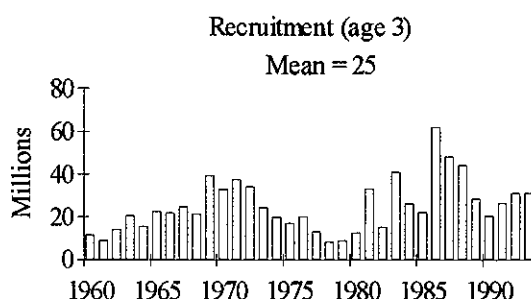
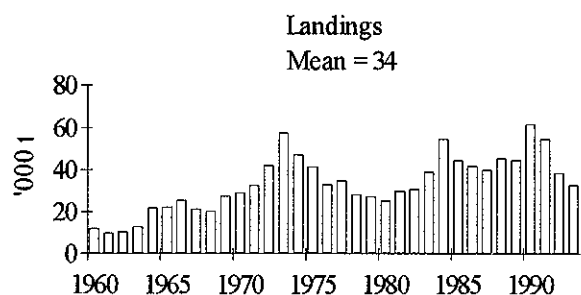
(Weights in '000 t)

A-C The SSB will increase during 1995 by over 20% if the fishing mortality is kept below 50% of the 1994 level.

D The SSB will increase slightly if F is reduced to 0.44.

E-F Fishing mortalities at the present level or above will not lead to any increase in the SSB.

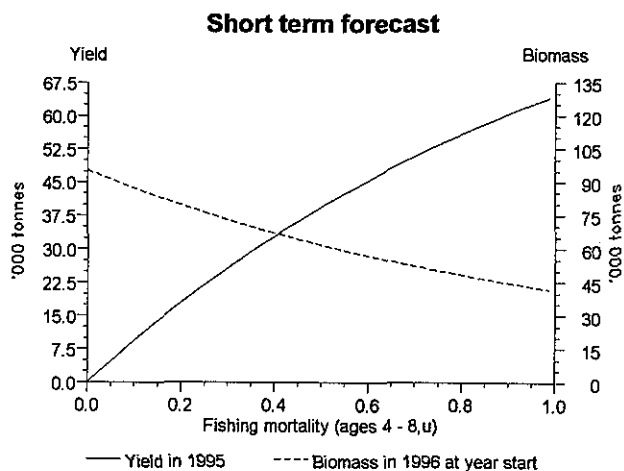
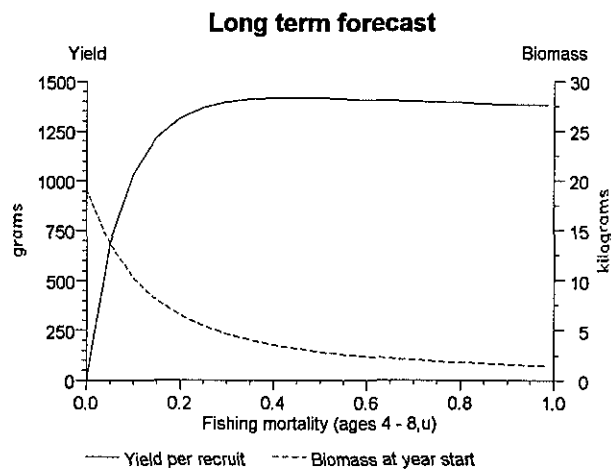
**Management advice:** The spawning stock biomass is at a historically low level and the stock is considered to be on or outside safe biological limits. ACFM therefore recommends that fishing mortality be reduced significantly to allow the SSB to increase towards safer levels. A reduction of fishing mortality by less than 50% will not give a noticeable increase in SSB in the short term. ACFM therefore recommends that the catch in 1995 should not exceed 22,000 t.



**Data and assessment:** Assessment tuned with effort data from a group of pair trawlers. No recruitment indices are available.

**Source of information:** Report of the North-Western Working Group, May 1994 (C.M.1994/Assess:19).

**Yield and Spawning Stock Biomass**



## 2.9.2 Faroe Plateau cod (Sub-division Vb<sub>1</sub>)

Catch data (Table 2.9.3):

Year	Rec TAC	Agreed TAC	ACFM Catch
1987	<31		21
1988	<29		23
1989	<19		22
1990			13
1991	16		9
1992	20		7
1993	0		6
1994	0	7	

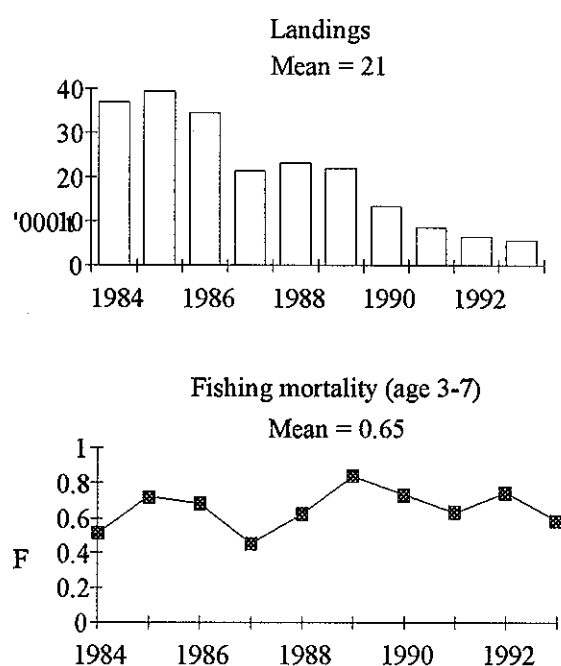
**Historical development of the fishery:** The landings of cod have declined steadily in the last decade, and have in the last three years been at a very low level, with the 1993 catch the lowest on record.

Historically SSB's above 52,000 t have shown good recruitment. With the aim of rebuilding the stock to this level a TAC of 7000 t has been fixed for the 1994-1998 period.

**State of stock:** Due to the combined effect of high fishing mortality and poor recruitment since 1984 the SSB is at a very low level, and is estimated to be the lowest on record. The mean weight at age has steadily decreased over the last three decades. However, since 1991 an increasing trend has been observed.

Fishing mortality is at a high level (twice as high as  $F_{max}$  in 1993).

Details given in Table 2.9.4.



**Forecast for 1995:** The TAC in 1994 corresponds to a fishing mortality of 0.59, and the following catch options were derived for 1995:

Assuming  $F(94) = 0.59$ , Basis: TAC, Catch(94) = Landings (94) = 7.5, SSB (94) = 22.

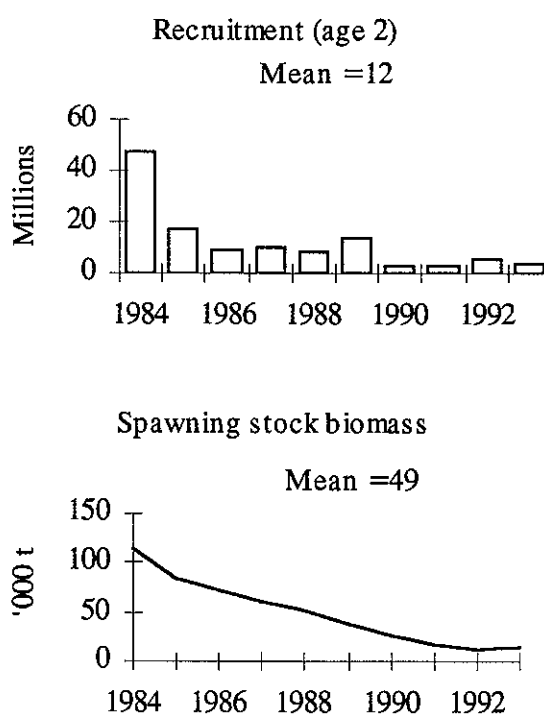
Option	Basis	F (95)	SSB (95)	Catch (95)	Lndgs (95)	SSB (96)
A	No fishing	0	19	0	0	31
B		0.23		4	4	27
C	F(94)	0.59		7	7	23

Weights in '000 t.

- A A 41% increase in SSB compared to the 1994 level.
- B A 23% increase in SSB compared to the 1994 level.
- C Fishing the TAC of 7,000 t in 1994 will stabilize the SSB at a low level.

The medium-term effect of implementing a catch limit of 7,000 t for the period 1994-1998 is a slow recovery of the stock and the probability that SSB will increase to 52,000t in 1998 is only 10%.

**Management advice:** The SSB is the lowest on record, and substantial recruitment failure has been observed in recent years. ACFM considers this stock to be well below the minimum biologically acceptable level and therefore recommends no fishery to be undertaken until substantial improvement has been observed in the stock and recruitment.

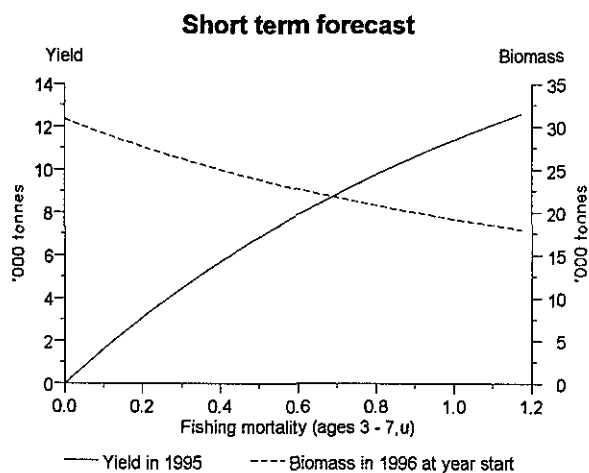
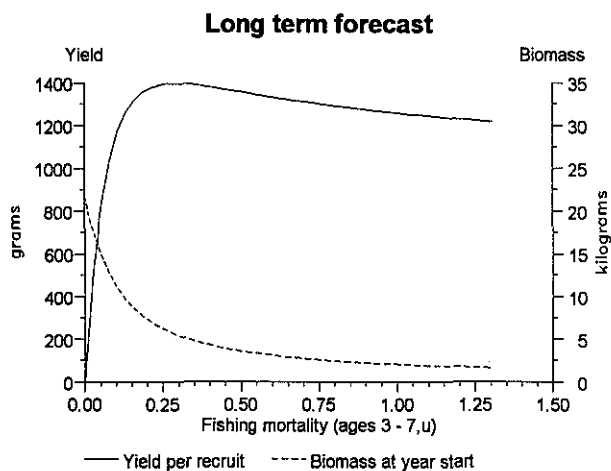




**Data and assessment:** The assessment is tuned using one survey series and 7 commercial CPUE series. Recruiting year classes are assessed from O-group and bottom trawl surveys. Although there might be some reservations on the quality of the data used for the tuning, the assessment is in accordance with the general understanding regarding the situation of this stock.

**Source of information:** Report of the North-Western Working Group, May 1994 (C.M.1994/Assess:19).

### Yield and Spawning Stock Biomass



### 2.9.3 Faroe Bank cod (Sub-division Vb<sub>2</sub>)

Catch data (Table 2.9.5):

Year	Rec TAC	Catch
1987		3.5
1988		3.1
1989		1.4
1990		0.6
1991		0.4
1992	0.3	0.3
1993	0.5	0.4
1994	0.5	

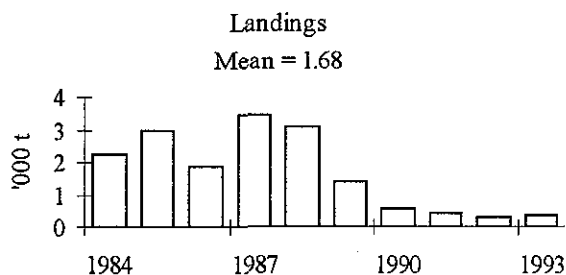
(Weights in '000 t)

**Historical development of the fishery:** Total landings reached a peak of 5,000 t in 1973. In recent years the catches have declined from 3,500 t in 1987 to 380 t in 1993.

**State of stock:** There are no data for an analytical assessment of this stock. The Faroese groundfish surveys of the Bank indicate a steady significant decline in the stock from 1984 to 1990 after which a slight increase has been observed. Based on the length distribution in the catches from the surveys, the improvement in the stock in 1991-1993 could primarily be attributed to the growth of older fish with some contribution from recruitment. In 1994 slightly better but still very small recruitment was observed compared to the years 1991-1993. This indicates that the stock would still be vulnerable to future fishing.

**Management advice:** In view of the uncertainties about the state of this stock, ACFM advises that it still requires protection and that a precautionary TAC of not more than 500 t be set for the entire Bank area (<350 m depth).

**Source of information:** Report of the North-Western Working Group, May 1994 (C.M.1994/Assess: 19).





## 2.9.4 Faroe haddock (Division Vb)

Catch data (Tables 2.9.6-2.9.7):

Year	Rec TAC	Agreed TAC	ACFM Catch
1987	< 17		15
1988	< 18		12
1989	< 11		14
1990			12
1991	11		8
1992	13-15		5
1993	< 8		4
1994	0	6.2	

(Weights in '000 t)

**Historical development of the fishery:** From a stable level the catches of Faroe Plateau haddock have decreased in the most recent years and the 1993 catch is the lowest on record.

Historically SSB's above 40,000 t have shown good recruitment. With the aim of rebuilding the stock to this level a TAC of 6,200 t has been fixed for the 1994-1998 period.

**State of stock:** SSB has been decreasing since the middle of the 1970s and in 1993 was at the lowest level on record. The fishing mortality increased close to the level of  $F_{max}$  in 1991, but has since declined.

Recruitment has declined since 1983 to the present very low level. From the bottom trawl survey in 1994 the 1993 year class appears to be above average.

Details given in Table 2.9.8.

**Forecast for 1995:** The TAC in 1994 corresponds to a fishing mortality of 0.46 (64% increase compared to 1993), and the following catch options were derived for 1995:

Assuming  $F(94) = 0.46$ , Basis: TAC,

Catch(94) = Landings (94) = 6, SSB(94)=19.

Option	Basis	F (95)	SSB (95)	Catch (95)	Landgs (95)	SSB (96)
A	No catch	0	16	0	0	23
B	$F_{93}$	0.28		3	3	20
C	$F_{max}$	0.39		4.5	4.5	19
D	TAC	0.55		6	6	17

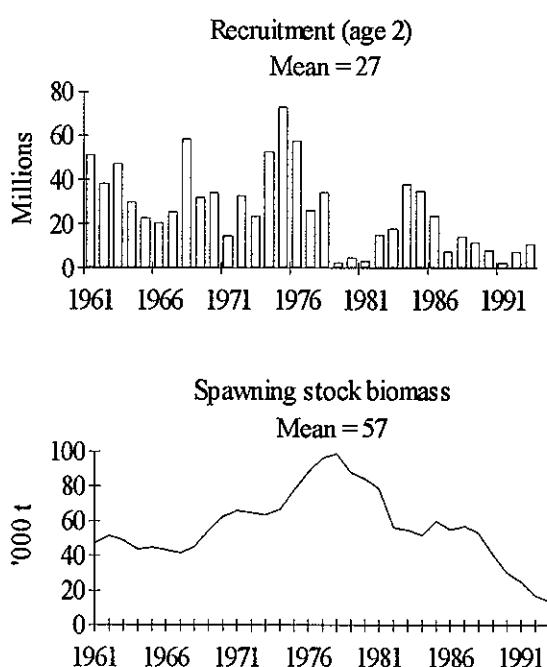
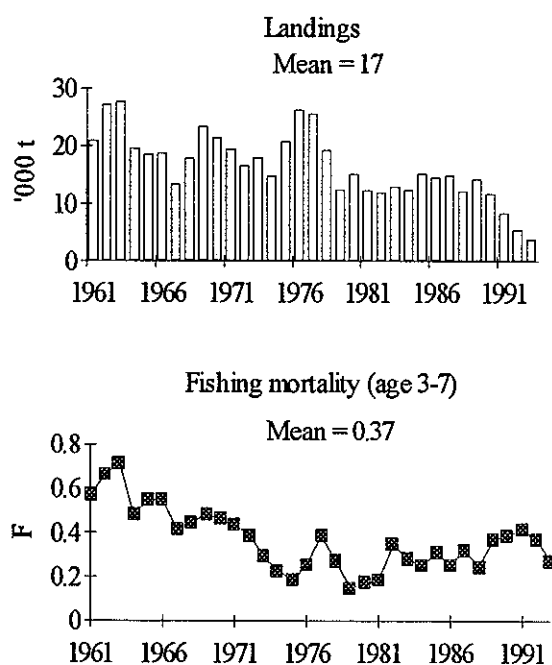
(Weights in '000 t)

A-C. Even a closure of the fishery will leave the SSB at a low level.

D. A 20% increase in fishing mortality in 1995 compared to 1994 will be necessary to reach the fixed TAC of 6,200 t; SSB will be stable at a low level compared to 1994 (-10%).

The medium-term effect of implementing a catch limit of 6,200 t for the period 1994-1998 is a slow recovery of the stock, and the probability that the SSB will increase to 40,000 t in 1998 is about 25%.

**Management advice:** The SSB is the lowest on record, and significantly reduced recruitment has been observed in most recent years. ACFM considered this stock to be well below the minimum biologically acceptable level and consequently recommends no fishery to be undertaken until a substantial improvement has been observed in the stock and recruitment.

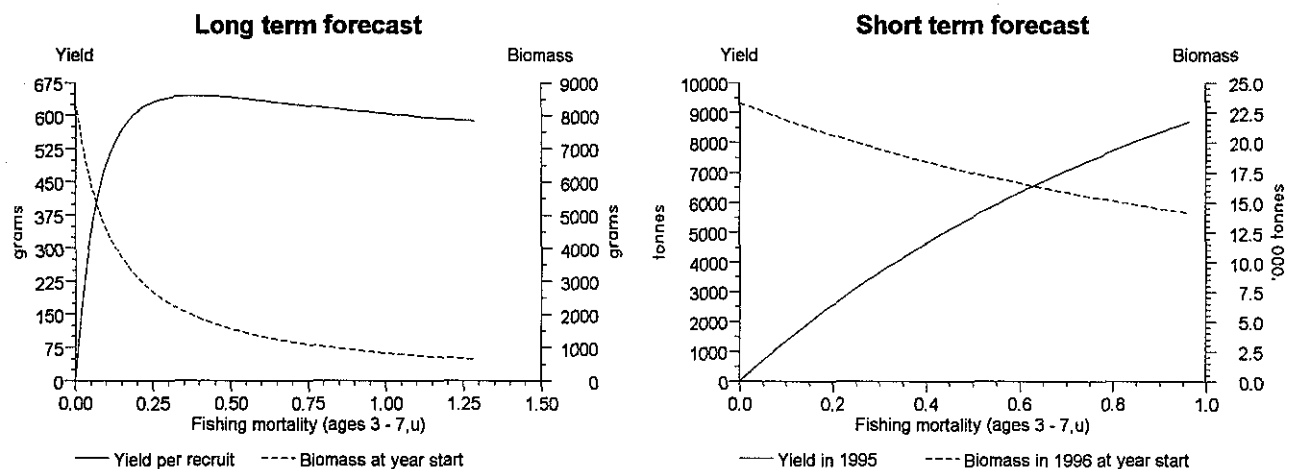


**Special comments:** Analysis of spawning stock and recruitment estimates indicates that a spawning stock below 40,000 t has only produced small year classes. It is therefore advisable to allow the stock to increase towards that level.

**Data and assessment:** Assessment tuned using groundfish survey and commercial trawl and longline data. Recruitment indices from 0-group and bottom trawl surveys

**Source of information:** Report of the North-Western Working Group, May 1994 (C.M.1994/Assess:19).

### Yield and Spawning Stock Biomass



## 2.10 Herring Stocks North of 62°N

### 2.10.1 Icelandic summer-spawning herring (Division Va)

Catch data (Tables 2.10.1 and 2.10.2):

Year	Rec. TAC	Agreed TAC	ACFM catch
1987	70	72.9	75
1988	100	90	92
1989	90	90	101
1990/91	90	100	106
1991/92	79	110	109
1992/93	86	110	107
1993/94	110	110	103
1994/95	83 <sup>1)</sup>	120	

<sup>1)</sup> Catch at  $F_{0.1}$ . Weights in '000 t.

**Historical development of the fishery:** The catches of Icelandic summer spawning herring increased rapidly in the early 1960s due to the development of the purse seine fishery along the south coast of Iceland. This resulted in a rapidly increasing exploitation rate until the stock collapsed in the late 1960s. A fishing ban was enforced during 1972 - 1975. Thereafter the catches have increased gradually to just over 100,000 t.

**State of stock:** The spawning stock biomass is currently at a historically high level. SSB has shown an increasing trend during the last 20 years. In 1993 the SSB was about 570,000 t, i.e. 80% higher than prior to the collapse. Moreover, recruitment has shown an increasing trend coinciding with the development of the SSB. The stock has been managed at an exploitation rate at or near the  $F_{0.1}$

level. The stock is considered to be within safe biological limits.

Details in Table 2.10.2.

Forecast for the 1995/96 season:

$F_{(94)} = 0.22$ , Basis: TAC, Catch<sub>(94/95)</sub> = 120, SSB<sub>(94)</sub> = 620

Option	Basis	F (95)	SSB (95)	Catch (95)	Lndgs (95)	SSB (96)
A	0.6F(93)	0.13	690	80	80	740
B	$F_{0.1}$	0.20	690	120	120	700
C	1F(93)	0.22	690	130	130	690
D	1.2F(93)	0.27	690	150	150	665

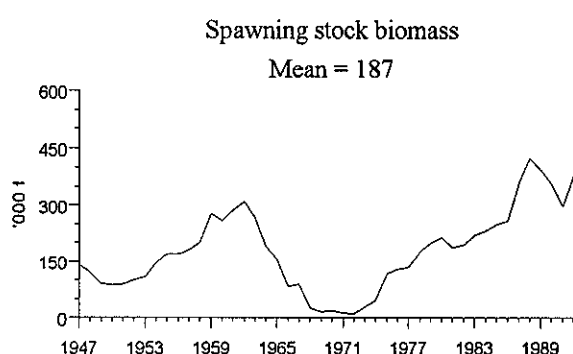
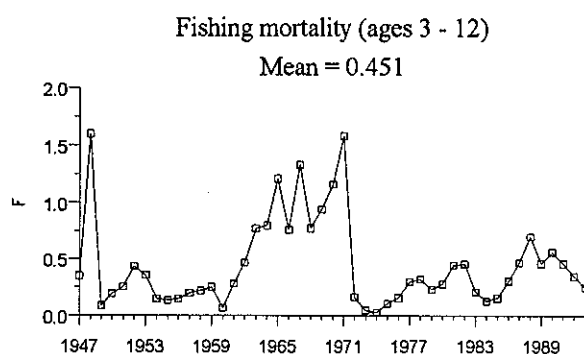
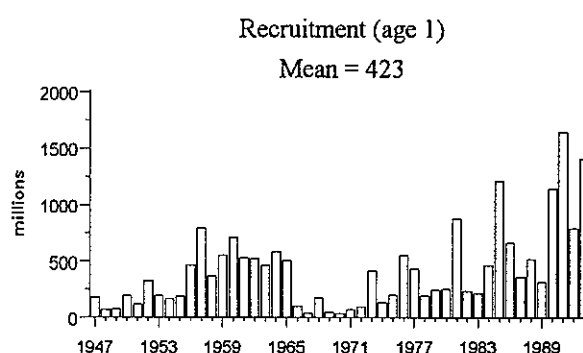
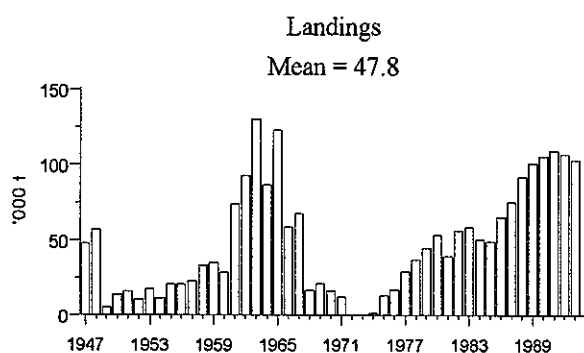
Weights in '000 t. F values are weighted and do not correspond exactly with those in Table 2.10.2.

The change in SSB in the near future is very much dependent on the 1991 yearclass, which was estimated as very strong as one ringers in 1993.

**Management advice:** This stock is within safe biological limits. ACFM notes that fishing mortalities have been above  $F_{0.1}$  and that fishing at higher levels of F will not lead to any gain in long-term yield.

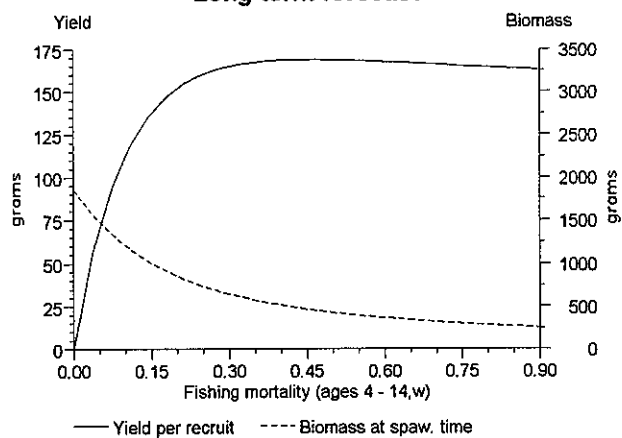
**Data and assessment:** Analytical assessment based on catch, acoustic survey and catch-at-age data is considered reliable.

**Source of information:** Report of the Atlanto-Scandian Herring and Capelin Working Group, October 1994 (C.M. 1995/Assess:9).

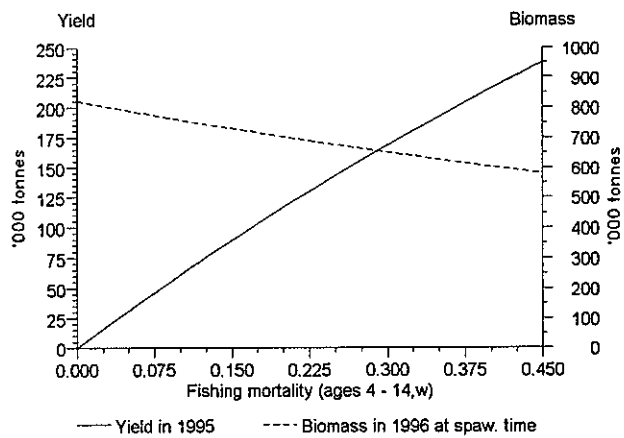


## Yield and Spawning Stock Biomass

**Long term forecast**



**Short term forecast**



## 2.10.2 Norwegian spring-spawning herring

Catch data (Tables: 2.10.3-2.10.5)

Year	Rec TAC	Agreed TAC	ACFM Catch
1987	150	115	127
1988	120-150	120	135
1989	100	100	104
1990	80	80	86
1991	0	76	85
1992	0	98	104
1993	119	200	232
1994		450	

Weights in '000 t.

**Historical development of the fishery:** A large increase in fishing effort and new technology led to the collapse of this stock around 1970. Recruitment failed when the SSB was reduced below 2.5 million tonnes. Since the collapse the aim has been to rebuild the spawning stock above this minimum level. In order to reach the goal, after a period of almost no fishing, the management of the stock has since 1985 aimed at restricting the fishing mortality to  $F = 0.05$ . Since 1992 the fishery has increased sharply. During the summer 1994 there was also an international fishery in the open areas of the Norwegian Sea for the first time in 26 years.

**State of the stock:** The stock is considered to be close to safe biological limits. The current fishing mortality is low.

Details in Table 2.10.5.

## Forecast for 1995:

$F(94)=0.20$ , Basis: Expected catch based on 1.2  $F(93)$ .

Catch(94)=Landings(94)=485, SSB(94)=2523,

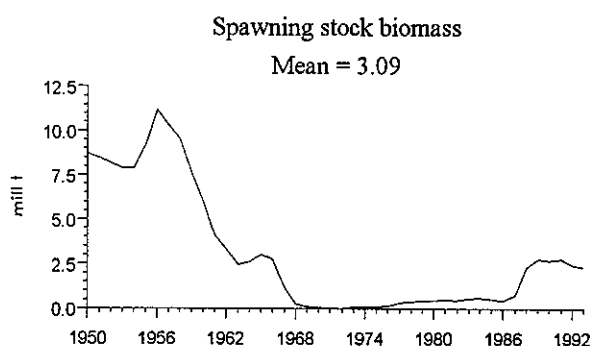
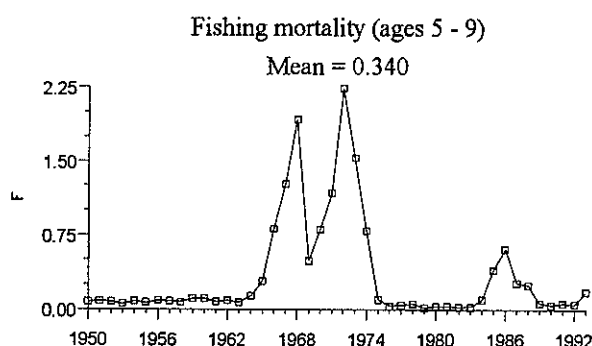
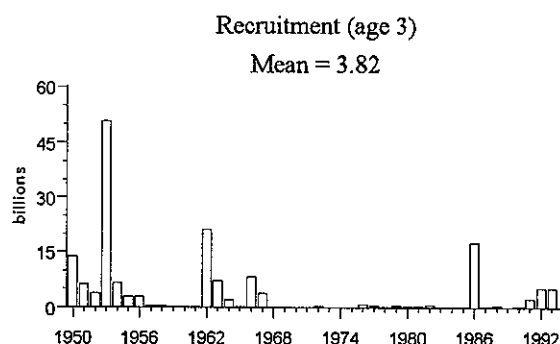
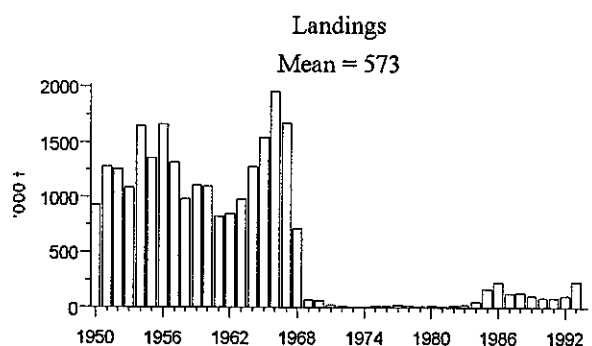
Scenario	Basis	F (95)	SSB (95)	Catch (95)	Landgs (95)	SSB (96)
A	0.4F(93)	0.07	2337	213	213	4077
B	1.0F(93)	0.17	2314	513	513	3823
C	1.2F(93)	0.20	2306	608	608	3744
D	1.6F(93)	0.27	2291	792	792	3591
E	2.0F(93)	0.33	2276	967	967	3448

(Weights in '000 t).

The SSB is estimated to fall below the minimum biologically acceptable level (MBAL) of 2.5 million tonnes in 1995 but the state of the stock is one of recovery and the forecast increase of the spawning stock in 1996 and coming years is due to the expected recruitment of a single strong year class (1992).

**Management advice:** The SSB is predicted to fall below MBAL in 1995. Therefore ACFM advises no increase in the present fishing mortality in 1995. The management objectives for the medium term are discussed below.

**Medium term considerations:** The 1992 year class, which will recruit to the spawning stock in 1996-1998, is very strong. However, the 1993 year class is weak and the prospects for the 1994 year classes are also regarded as poor. In order to assess the likely development of the spawning stock in the medium term, and the probability that it will fall below 2.5 million tonnes, several stochastic simulation runs for the period 1994-2002 have been made





for various levels of fishing mortality. The resulting SSB from one of these simulations (constant  $F=0.166$  for the entire period) is shown in the top figure on the next page. The yield will follow a similar trajectory with a peak in 1997 and decline thereafter. The simulations have been based on a natural mortality modeled as normally distributed with a mean of 0.23 as the expected value and on historical evidence that there is an increased probability of a series of poor year classes following a strong year class.

The analysis should be regarded as preliminary as not all of the variability and uncertainties about the present stock size have been incorporated in the analysis. However, the results indicate that SSB may fall below 2.5 million tonnes in the medium term if it is fished at a fishing mortality higher than 0.17.

**Special comments:** The present forecast of the SSB for 1995 is about 1 million tonnes less than forecast in 1993. This lower estimate is due to major revision of the abundance of the 1990 year class, which in 1993 was estimated to be 8.3 billions as 3 years old and is now estimated as being equivalent to 5.4 billions. In addition reduced mean weights and maturity at age are forecast in 1995 and onward.

**Multispecies Dimension:** The juveniles and adults of this stock form an important part of the ecosystem in the Barents Sea and Norwegian Sea. The herring has an important role as transformer of the plankton production to higher trophic levels (cod, seabirds and marine mammals). It is therefore important to secure a high production of the herring stock, by allowing the stock to recover to, and be managed at, a level above the MBAL. In the 1950s and 1960s the spawning stock was in the order of 5-10 million tonnes.

At present the capelin stock in this area is very depleted and an improvement is not expected in the coming few years. The importance of the herring stock in the ecosystem

is therefore enhanced in a medium-term perspective.

**Data and assessment:** Analytical assessment based on catch and survey data (acoustic estimates of adults and recruits, tagging estimates). Catch-at-age data considered reliable.

**Information on *Ichthyophonus hoferi*:** Samples of Norwegian spring-spawning herring taken in 1994 revealed a variable but significant prevalence of the parasitic fungus *I. hoferi*, and in contrast to 1993 the juveniles of the stock were also infested.

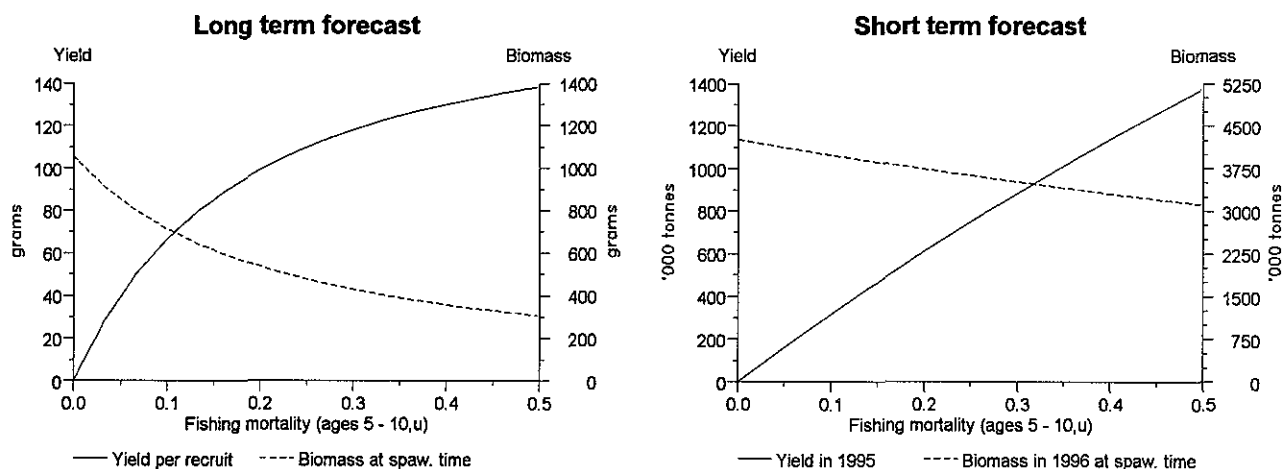
Norwegian samples from winter to summer indicated lower prevalence in winter and an increase through the year. The observed prevalence depends on the gear type used for sampling and on the location of the samples but was generally lower than 10%. Russian samples taken in January to March and July indicated a 100% prevalence. Due to different techniques used in obtaining and analyzing the samples between the two countries it was difficult to compare the different estimates. It is therefore not possible at present to assess the impact of the fungus on the stock. However, tagging estimates indicate that the natural mortality has increased from 0.13 in 1980 to 0.23 in recent years. The outbreak of *Ichthyophonus hoferi* may have contributed to the increase. The 0.23 value has been applied in the analysis and in the forecast.

**Information on the Spatial and Temporal Distribution of Norwegian Spring-Spawning Herring.**

In 1994 most of the spawning took place on the coastal banks off Norway from  $62^{\circ}$  N to  $70^{\circ}$  N. In 1992 only very little spawning took place south of  $62^{\circ}$  N.

The feeding areas for the adult stock are in the Norwegian Sea and have gradually been extended in recent years. In June-July 1994 herring were distributed over large areas of the Norwegian Sea as far west as the eastern border of the

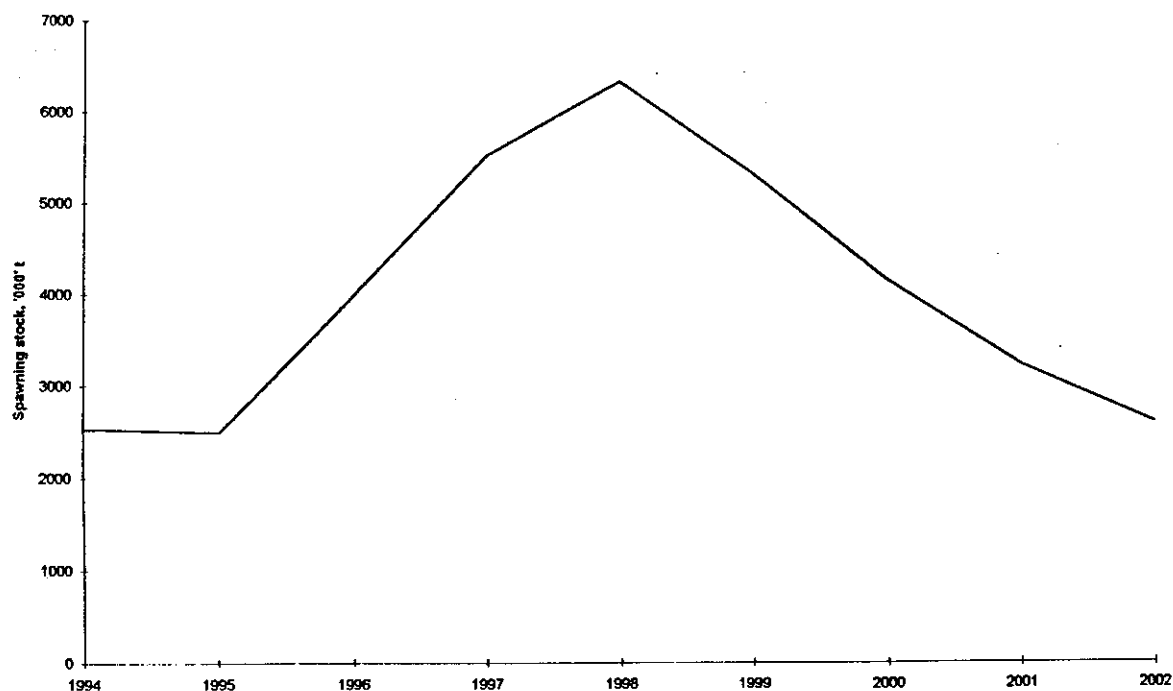
## Yield and Spawning Stock Biomass



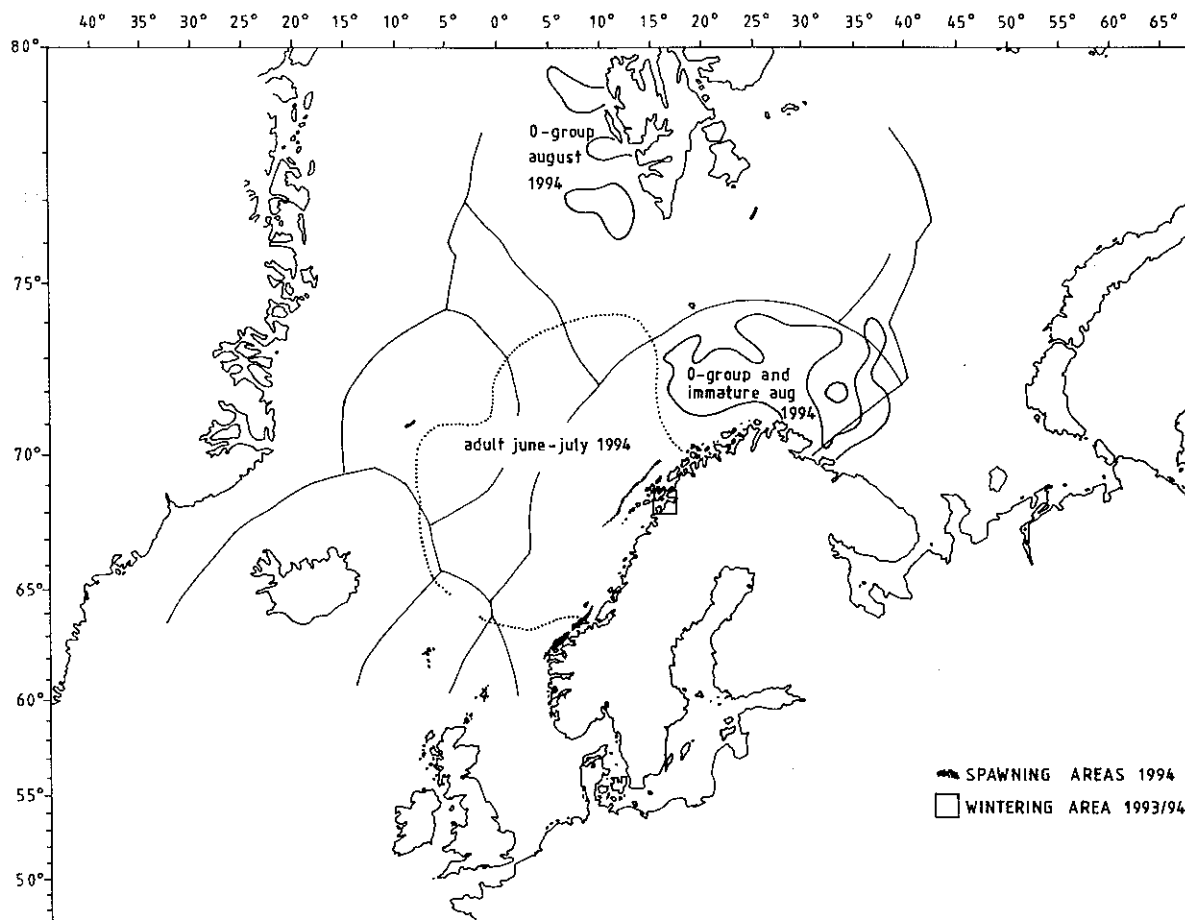
East Icelandic current. In this area a purse seine fishery for herring took place for the first time in 26 years. An overview of the distribution in the summer of 1994 is given in the second figure below.

**Source of information:** Report of the Atlanto-Scandian Herring and Capelin Working Group, October 1994 (C.M.1995/Assess:9).

Medium term projection of SSB for Norwegian Spring Spawning herring.



Norwegian spring spawning herring. A general picture of the distribution in 1994.



## 2.11 Capelin

### 2.11.1 Barents Sea capelin (Sub-areas I and II, excluding Division IIa west of 5°W)

Catch data (Tables 2.11.1):

Year	Rec. TAC	Agreed TAC	ACFM catch
1987	0	0	0
1988	0	0	0
1989	0	0	0
1990	0	0	0
1991	1000 <sup>1)</sup>	900	933
1992	834	1100	1123
1993	600	630	586
1994	0	0	

<sup>1)</sup> Winter-spring fishery. Weights in '000 t.

**Historical development of the fishery:** Since 1979 the fishery has been regulated by a bilateral fishery management agreement between Norway (purse seine) and USSR (now Russia) (trawl). TACs have been set separately for the winter fishery and the autumn fishery. From the autumn of 1986 to the winter of 1991, no fishery took place. The fishery was re-opened in the winter season in 1991, on a recovered stock, but from the autumn of 1993 the fishery was again closed.

Following the recommendation from ACFM, there was no fishing for Barents Sea capelin during 1994.

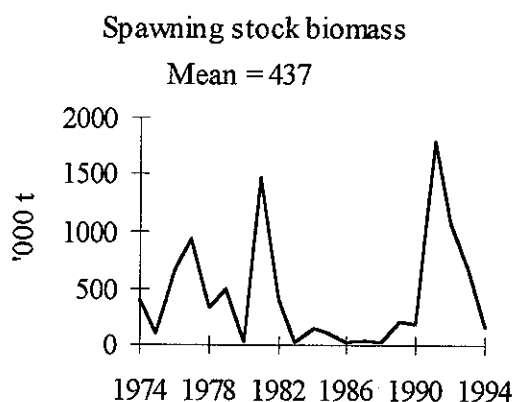
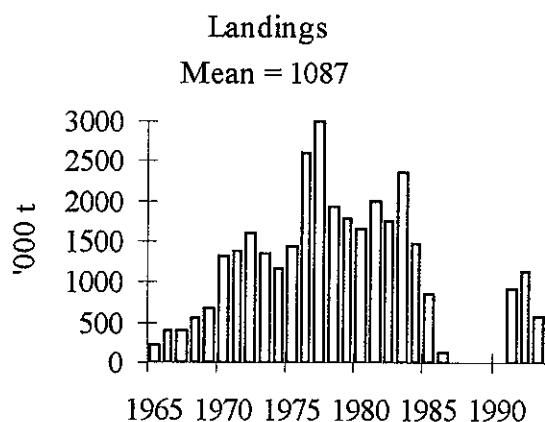
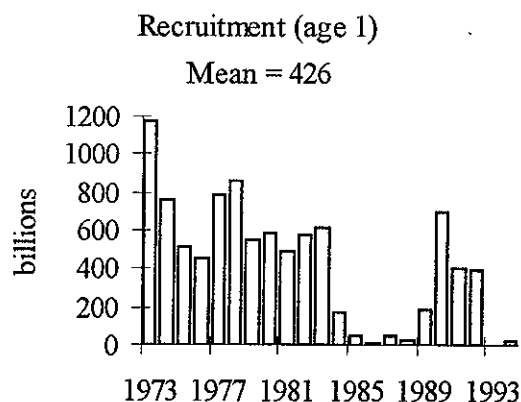
**State of stock:** SSB from 1993 to 1994 has shown a declining trend to the level in 1985 to 1987. Recruitment has been poor since the 1992 year class. The stock is considered to be outside safe biological limits.

Details in Table 2.11.2.

**Management advice:** This stock is considered to be outside safe biological limits, and no fishing should take place on this stock in 1995.

**Data and assessment:** Analytical assessment based on acoustic survey.

**Source of information:** Report of the Atlanto-Scandian Herring and Capelin Working Group, October 1994 (C.M.1995/Assess:9).



### 2.11.2 Capelin in the Iceland-East Greenland-Jan Mayen area (Sub-areas V and XIV and Division IIa west of 5°W).

Catch data (Table 2.11.3):

Year	Rec TAC <sup>1,2</sup>	ACFM catch <sup>1</sup>
1987	1,115	1,116
1988	1,065	1,036
1989		808
1990	250	370
1991	740	677
1992	900	787
1993	1,250	1,179

(Weights in '000 t) <sup>1</sup>July-March of following year.

<sup>2</sup>Recommended by national scientists.

**Historical development of the fishery:** The fishery is based mainly on maturing capelin, i.e. the 2- and 3-group in the autumn which spawn at age 3 and 4 in March.

After being low in the 1989/90 and 1990/91 seasons, catches have been increasing. Because of difficult fishing conditions for considerable periods, the TAC was not taken in the last three seasons.

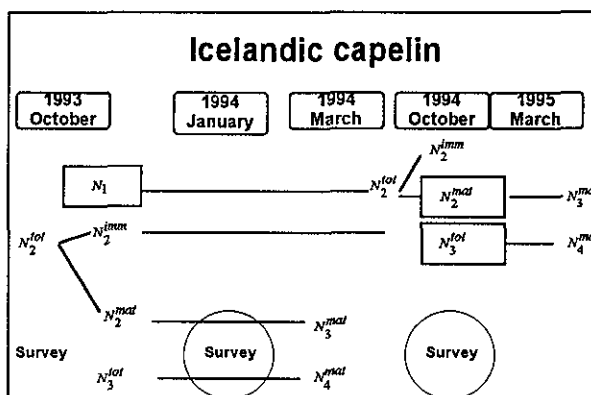
**State of stock:** The stock is managed by aiming at maintaining a residual spawning stock biomass of 400,000 t.

Recruitment to the stock is highly variable. In the seasons starting in the autumn of 1989 and 1990 the recruiting year classes did not appear in the expected strength. Recruitment in 1991 was stronger than expected but it was close to the expected level in 1992 and 1993.

The spawning stock fell below the minimum safe level of 400,000t in the 1989/90 and 1990/91 seasons. The stock recovered quickly due to good recruitment and appears to be strong at present.

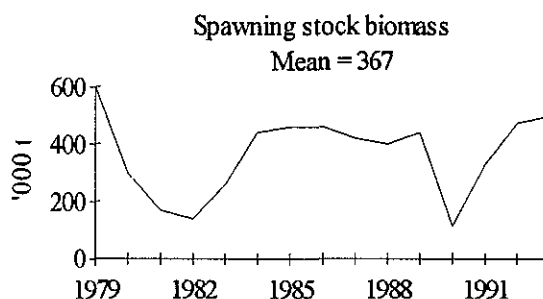
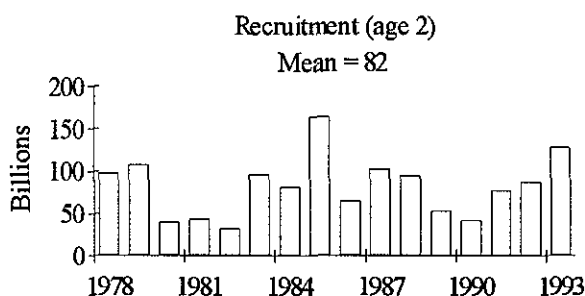
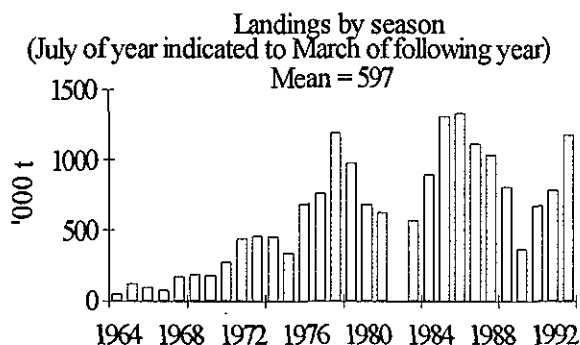
Details given in Table 2.11.4.

**Forecast:** The precautionary TAC computations are based on the method which was first used in 1992. This involves the use of 1-group indices from the October-November survey for predicting the mature 2-group in the following year. The total 2-group abundance from the same survey and the relationship between maturation ratios and year class abundance are used for predicting numbers of capelin in the 3-group. The relevant relationships are indicated below:



To reduce the risk of overexploitation the computation further includes a rule in which only two thirds of the TAC is allocated to the summer-autumn fishery.

**Management advice:** In order to ensure a spawning stock biomass of 400,000t in March 1995, a precautionary TAC for the first half of the 1994/95 season should not exceed



950,000t. This corresponds to approximately 2/3 of the predicted TAC of 1,430,000t.

New information will become available during the summer-autumn fishery and from acoustic surveys in October-November 1994 and in January-February 1995. ACFM recommends that the data from these surveys be used when the final TAC is set for the 1994/95 season.

It is known from acoustic surveys that the main distribution area of juvenile 1-group capelin is usually in the shelf area north and north-east of Iceland. In order to avoid excessive mortalities of juveniles due to their repeated escape through

the mesh used in capelin seines, ACFM recommends that the most important areas of juvenile abundance remain closed to a commercial fishery, at least until surveys have identified the current situation.

**Data and assessment:** The stock size is assessed using acoustic surveys.

**Source of information:** Report of the Atlanto-Scandian Herring and Capelin Working Group, October 1992 (C.M. 1993/Assess:6) and Working Paper, April 1994.



### 3 STOCKS IN NEAFC REGION 2

#### 3.1 Herring Stocks South of 62°N

##### 3.1.1 Overview

The herring stocks south of 62°N include stocks in the North Sea, Skagerrak and Kattegat, west of the British Isles and Ireland, and the Irish Sea.

##### 1. Stock identity, separation and assessment basis

These stocks migrate extensively between nursery areas, feeding grounds and spawning grounds. The stock delineations are not always known and there is considerable spatial overlap between certain stocks outside the spawning season. Separate assessments are entirely dependent on the possibility of separating stock components in catches and surveys. These possibilities may not always be present in which case the only option is to make combined assessments. An example is the Downs herring in the North Sea, which is assessed as part of the overall North Sea stock. Assessment problems may also emerge even when separation is possible if a smaller stock is to be separated from a large stock. Small errors in the separation may be insignificant for the assessment of the large stock at the same time invalidating the assessment of the small stock.

This problem is found in the northeastern North Sea and in Division IIIa, where North Sea autumn-spawning herring mix with Baltic spring-spawning herring during the feeding period. Juvenile North Sea autumn-spawning herring are also found in Division IIIa. Catches and survey results are separated on the basis of meristic characters and the stocks are assessed and forecasts presented separately for the North Sea autumn-spawning (Section 3.1.2) and Baltic spring-spawning stocks (Section 3.1.4).

A related problem is found in the stocks west of the British Isles and Ireland. These stocks are presently assessed as separate entities in spite of problems with stock definition, separation of catches etc. This, combined with the lack of coordination of surveys between areas, has resulted in the data sets being inconsistent and not useful as a basis for assessments in some areas.

##### 2. Data basis

The catch statistics for most of the stocks continue to be a cause for concern. Discarding is known to occur frequently and may occur to a considerable extent in certain fisheries, but data are only available for very few fisheries. It is not possible to extrapolate overall discard levels from the data available. The data presented on discards and slipping are therefore gross underestimates. The present data on landings are generally of satisfactory quality, but the historical databases for most stocks include periods with uncertain landings data. The separation into stocks is still uncertain in many areas, (see point 1 above).

##### 3. Assessment

Due to the problems mentioned above analytical assessments have only been made for three stocks in the area (herring in the North Sea, VIa North and the Celtic Sea and Division VIIj).

##### 4. General state of stocks

Most of the stocks concerned are fully exploited. An exception is the herring stock in Division VIa (North). Most stocks are, however, considered to be within safe biological limits. The major exception is the stock of autumn spawners in the North Sea and Skagerrak (Sub-area IV, Division VIId and Division IIIa) which now seems to be close to or below the minimum biologically acceptable level of spawning stock.

### 3.1.2 Herring in Sub-area IV, Division VIIId and Division IIIa (autumn spawners).

Catch data for Sub-area IV and Division VIIId:  
(Tables 3.1.1 - 3.1.5)

Year	Rec. TAC	Agreed TAC	ACFM Indgs	ACFM catch
1987	610	600	625	625
1988	515	530	698	698
1989	514	514	696	700
1990	403	415	544	553
1991	423	420	561	566
1992	406	430	544	549
1993	340 <sup>1</sup>	430	521	524
1994	346 <sup>1</sup>	440		

(Weights in '000 t).<sup>1</sup> Catch in directed fishery corresponding to  $F=0.3$ .

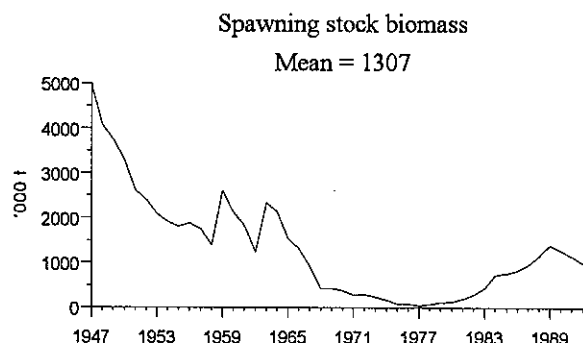
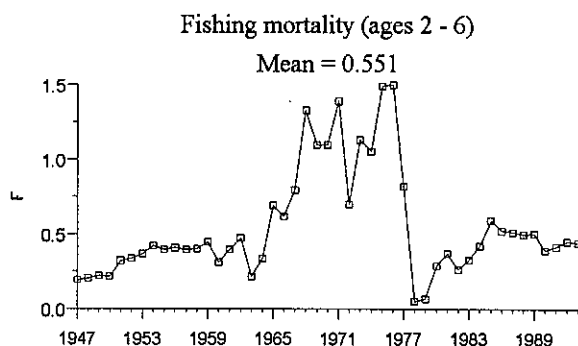
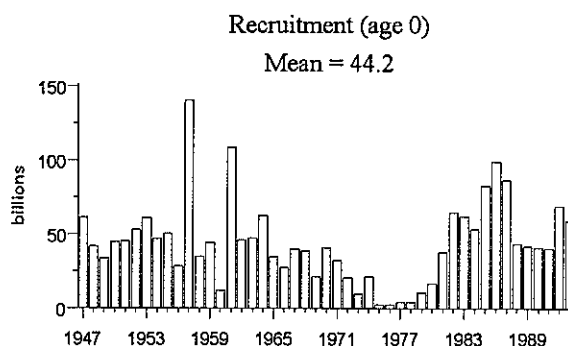
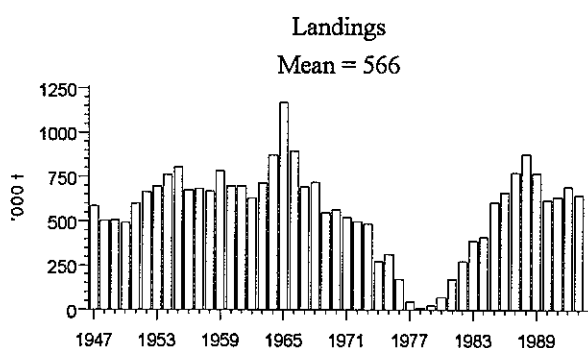
Details of catches by fleet, stock and area are provided in Table 3.1.6.

**Historical development of the fishery:** After a period with low spawning stock biomass, low recruitment and closure of the fishery in the second half of the 1970s the

stock recovered through the early 1980s. The fishery has been managed by TACs since the fishery opened again in 1981 but the total catches have exceeded the recommended TAC. ACFM advises a minimum biologically acceptable level of 800,000 t spawning stock biomass for this stock.

**State of Stock:** The spawning stock biomass has been declining since 1989. Fishing mortalities on the adult stock have been constant while the exploitation of 0-ringers has increased in recent years. The estimate of spawning stock biomass in 1993 was below the minimum biologically acceptable level (MBAL). This estimate was the combined result of decreasing numbers and the lower mean weight and maturity of the youngest year classes entering the spawning population in 1993. The assessment and the acoustic estimates suggest that the spawning stock number is still decreasing but the new estimate of mean weights and maturity in 1994 have increased the SSB to a level of about 1 million tonnes. ACFM therefore considers this stock to be within safe biological levels.

Details given in Table 3.1.7.





# Forecast for 1995 for North Sea autumn spawners by fleet, total North Sea and Division IIIa combined.

The forecast is given for a combination of the following fleets :

- a : Directed herring fisheries (mainly for human consumption) in the North Sea.
- b: Small mesh fisheries in the North Sea
- c: Human consumption fisheries in Division III
- d: Mixed clupeoid fisheries in Division IIIa
- e: Other industrial fisheries in Division IIIa

Basis : Landings (94): Fleet A=435,; B=154; C=34,; D=16; E=52;  
Catch(94)=691; SSB(94)=974; F(94)=F(93)=0.45

	F(95) multiplier rel. to F(93) by fleet					F <sub>2-6</sub> (95)	Catch (95) by fleet					SSB (95)
	a	b	c	d	e		a	b	c	d	e	
A	.6	1	1	1	1	0.28	276	127	38	16	48	1088
B	.8	1	1	1	1	0.36	355	126	38	16	47	1033
C	1	1	1	1	1	0.44	429	126	37	16	47	981
D	1	1	.6	1	.6	0.43	430	126	23	16	29	989
E	1	1	.8	1	.8	0.44	430	126	30	16	38	985
F	1	.6	1	.6	.6	0.44	431	79	38	10	29	988
G	1	.8	1	.8	.8	0.44	430	103	38	13	38	984
H	1.2	1.2	1.2	1.2	1.2	0.53	495	148	44	18	55	926

A-G : Spawning stock biomass in 1995 higher than in 1994 and above the minimum acceptable level

H : Decrease in spawning stock biomass but above the minimum acceptable level

Options reducing the fishing mortality on juvenile fish will only result in increased SSB in the medium and long-term (see Special Comment 1).

**Management Advice:** The stock is considered to be above MBAL. ACFM advises that long-term gains in yield could be achieved by reducing the fishing mortality for this stock.

## Special Comments:

1. ACFM notes that the catches of juveniles in 1992-93 reached the high levels of the early 1980s. This exploitation pattern will endanger the future spawning stock biomass. A closure of all fisheries in Subarea IV and Division IIIa landing herring as industrial by-catch (fleets b, d and e) would result in a long-term net gain in the order of 23% in total yield and 98% in spawning stock biomass when mean recruitment is assumed. Details are given in the table on the following page.

2. A decrease in growth in 1993 is indicated by a decrease in mean weight and maturity of the youngest age groups contributing to the spawning stock. This change is an important reason for the decrease in spawning stock biomass in 1993. A return to the former growth pattern as observed in 1994 has improved the situation although the spawning stock biomass will remain close to critical levels.

3. A limited number of catch options by fleet and area are provided by ACFM. Given the complexity of the fishery on North Sea herring the number of possible scenarios is virtually unlimited. ACFM would therefore welcome clearly formulated guidelines from managers on the management objective(s) for this stock and on which catch options should be investigated in the future.

4. In the case of catch sampling, some improvements have been achieved, but there are still some 15% of the landings from the North Sea fisheries that are not covered. In Division IIIa large quantities of landings for industrial purposes were not sampled in 1993. The national sampling by Sweden has improved and sampling of industrial landings started in late 1993. In general the sampling is still at a low level. ACFM strongly recommends that all landings should be covered by national sampling programmes. The sampling programme should also include discards.

5. Available information on the fungus disease *Ichthyophonus* sp which was identified in 1991 shows that the prevalence has decreased in the stock since 1991. In 1993 ACFM concluded, on the basis of information from the infection rates in 1992, that the likely impact on the stock was in the order of a 10% or less reduction in stock size. Further analysis suggests a high sensitivity of the results to information available about the dynamics of the disease in 1991. The preliminary analysis indicates that the stock may have suffered considerable disease mortality in 1991 which gives a perception of stock abundance in 1993 that is around 30% lower than would be estimated if the disease were ignored. In conclusion, there is no evidence from currently available information that *Ichthyophonus*-induced

mortality is significant at present although there are substantial indications that high mortality occurred in 1991.

**Data and Assessment:** Autumn spawners in Division IIIa are included in this assessment. Sampling by some countries is still low and about 15% of the landings are not covered by sampling. Estimates of discards are only available from one country but may be considerable in certain fisheries. Acoustic and larval survey indices of spawning stock and recruitment indices from bottom trawl

surveys are used. The assessment shows consistency with previous assessments and the observed inconsistency between age-disaggregated and spawning stock biomass indices have been overcome. This has reduced the uncertainty concerning the precise level of stock size.

**Source of Information:** Report of the Herring Assessment Working Group for the Area South of 62° N, March 1994 (C.M. 1994/Assess:13), and new data on maturity and weights provided to ACFM.

**Equilibrium prediction based on average recruitment and F at the 1993 level for closures of various fisheries landing juvenile herring .**

Based on mean weights and maturities.

Fleet multipliers					F2-6	Yield						SSB
a	b	c	d	e		a	b	c	d	e	Total	
1	1	1	1	1	0.443	314	133	21	16	44	527	696
1	0	1	0	0	0.421	609	0	37	0	0	647	1376
1	1	1	0	1	0.443	333	135	22	0	47	537	741
1	0	1	1	1	0.433	505	0	31	17	52	606	1131
1	1	1	1	0	0.432	365	137	24	17	0	544	816

Mean w. stock : 1991-1994, mean w catch : 1991-1993, maturity : 1991-1994

Mean recruitment : AM 1947-93 = 44236 million

### 3.1.3 Herring in Divisions IVc and VIId (Downs herring).

Catch data (Tables 3.1.5, 3.1.7 and 3.1.8):

Year	Rec TAC	Agreed TAC	Disc. slip.	ACFM catch
1987	10	40		45
1988	15	30		52
1989	30	30	1	79
1990	30	30	5	61
1991	50-60	50	3	61
1992	54	50	2	74
1993	50	50	2	85
1994	50	50		

(Weights in '000 t)

**Historical development of the fishery:** The catches have increased after the reopening of the fishery and the 1993 catch is the highest since 1964. The catches have been higher than the agreed TAC since 1987 and the 1993 catch was 70% above the agreed TAC.

**State of stock:** The current state of the stock is not known, but larvae data suggest low hatching success in the most recent years.

**Forecast:** No separate forecast is made for this stock which is included in the forecast for the total North Sea.

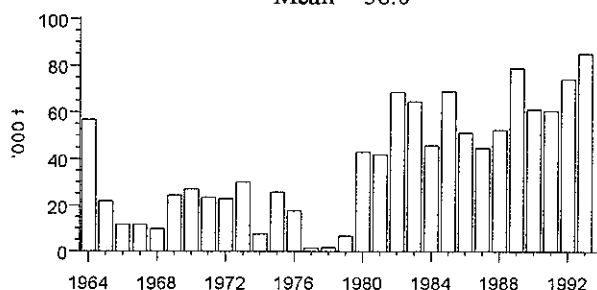
**Management advice:** This stock is assessed as part of the total North Sea stock. If a TAC is required for this area it should be subtracted from the total TAC for the North Sea stock.

**Special comments:** The spawning grounds and spawning season seem to be very restricted suggesting a high susceptibility of the stock to environmental conditions and fishing operations. The population spawning in the southern North Sea is part of the total North Sea stock and the catches taken in this area are part of the total North Sea TAC (see Section 3.1.2).

**Data and assessment:** Catch-at-age data were provided but no assessment was made as the stock also supports catches in Divisions IVa,b. No reliable fishery-independent data were available. Larvae survey data are available for 1992 and 1993.

**Source of information:** Report of the Herring Assessment Working Group for the Area South of 62° N, March 1994 (C.M. 1994/Assess:13).

Landings  
Mean = 38.0



### 3.1.4 Herring in Sub-divisions 22-24 and Division IIIa (spring spawners)

Catch data for Division IIIa and Sub-divisions 22-24 (Table 3.1.9):

Year	Rec. TAC <sup>2</sup>	ACFM catch of stock <sup>1</sup>
1987	-	175
1988	196	251
1989	174	186
1990	131	204
1991	178	192
1992	170	168
1993	150-181	171
1994	130-180	

(Weights in '000 t). <sup>1</sup>Including North Sea.

<sup>2</sup>Spring-spawners in IIIa and 22-24.

Details by fleet, stock, and area are provided in Table 3.1.10.

**Historical development of the fishery :** After a period of high landings in the early 1980s the landings in 1993 have decreased to the long-term average.

**State of Stock:** The state of the stock is uncertain as the information available provides conflicting evidence. Indications are, however, that the stock is well inside safe biological limits and that the spawning stock biomass has increased and the fishing mortality decreased since the late 1970s.

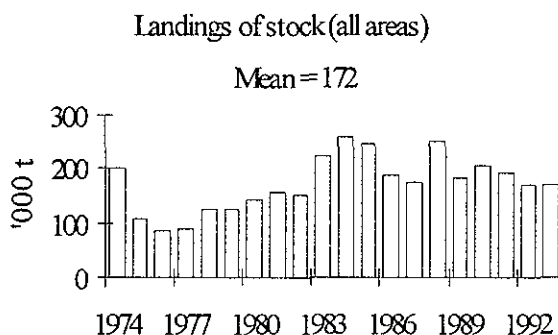
**Forecast for 1995:** Due to the uncertainties in the data sources it is not possible to provide a reliable catch forecast.

**Management Advice:** If a precautionary TAC is required, ACFM advises that it should not exceed recent catch levels.

**Special Comments:** In Division IIIa this stock is exploited in fisheries which also exploit the North Sea stock. An increase in this fishery may hamper recovery of the North Sea stock which is considered to be close to the minimum biologically acceptable level (see Section 3.1.2). This should be taken into consideration when a precautionary TAC is to be set for Division IIIa.

**Data and Assessment:** Catch at age data are uncertain due to undersampling of landings, particularly in Division IIIa, and to problems with stock separation in the historical data. Data from acoustic and bottom trawl surveys do not signal the same development as the catch data. The analytical assessment may indicate major trends but it is considered too unreliable as a basis for forecasts.

**Source of Information :** Report of the Herring Assessment Working Group for the Area South of 62° N, March 1994 (C.M. 1994/Assess:13).





### 3.1.5 Celtic Sea and Division VIIj herring

#### Catch data (Tables 3.1.11 - 3.1.12)

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	20.2
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		

(Weights in '000 t)

**Historical development of the fishery:** The catches have been stable in recent years at slightly above the agreed TAC.

**State of stock:** The spawning stock appears to have been stable for a number of years. The fishing mortality fluctuates considerably at a comparatively high level as has always been the case in this stock. The 1990/1991 year class is the strongest year class to recruit since 1987.

Details given in Table 3.1.13.

#### Forecast for 1995:

Assuming  $F(94) = 0.58$ , Basis : TAC, Catch(94) = 21.0, SSB(94)=59.6

Option	Basis	F (95)	SSB (95)	Catch (95)	SSB (96)
A	0.4F(93)	0.17	62.9	7.1	75.2
B	0.6F(93)	0.25	62.1	10.2	71.4
C	0.8F(93)	0.34	61.4	13.2	67.9
D	1.0F(93)	0.42	60.7	15.9	64.7
E	1.2F(93)	0.51	60.0	18.4	61.8

(Weights in '000 t)

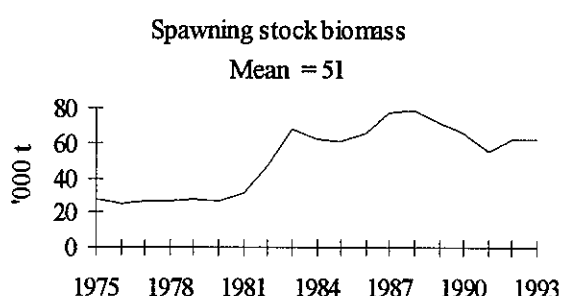
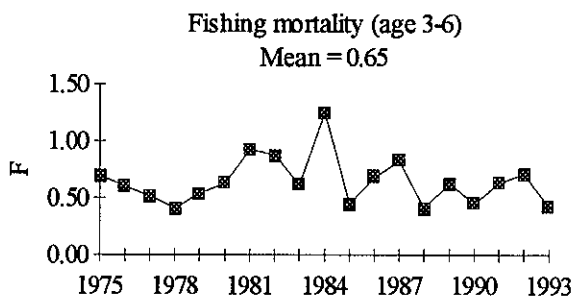
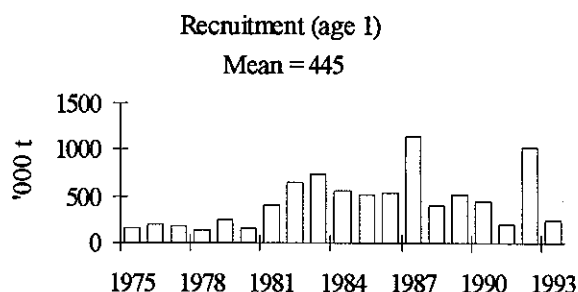
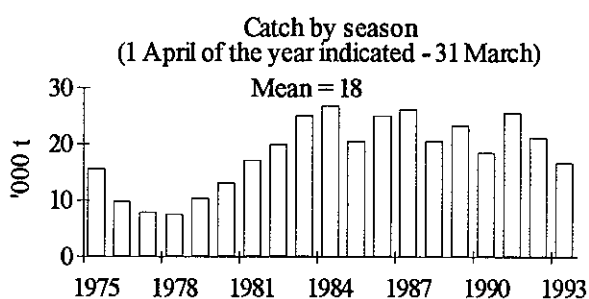
Continued fishing at current levels of fishing mortality will lead to little change in SSB in the immediate future.

**Management advice:** The stock is considered to be within safe biological limits

**Special comments:** Because of the history of the stock and the existence of a roe fishery the present spawning box closures should be retained. A reevaluation is recommended in 1995.

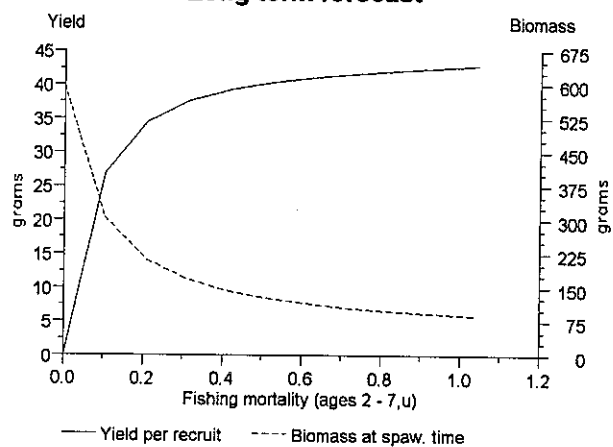
**Data and assessment:** Recent sampling data are considered to be good. The assessment was carried out using age-disaggregated catch data and acoustic survey information. The results appear reasonable but should be viewed with caution because of doubts about catches in earlier years.

**Source of information:** Report of the Herring Assessment Working Group for the Area South of 62°N, March 1994 (C.M.1994/Assess:13).

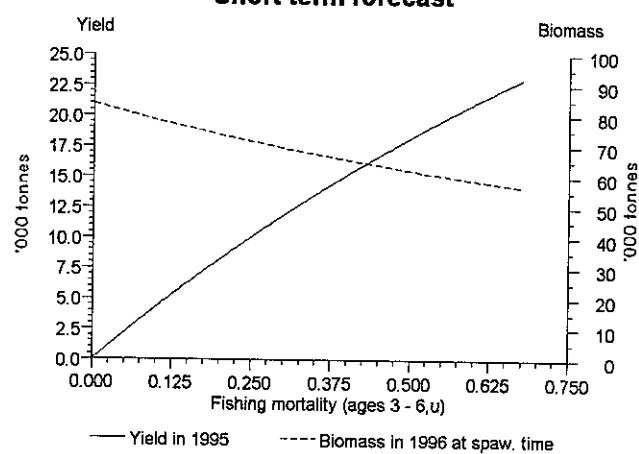


## Yield and Spawning Stock Biomass

### Long term forecast



### Short term forecast



### 3.1.6 Herring in Division VIa (North)

Catch data (Table 3.1.14):

Year	Rec TAC	Agreed TAC	Disc. slip.	ACFM catch
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		

(Weights in '000 t)

**Historic development of the fishery:** The catches have been stable in recent years and below the TAC.

**State of stock:** The stock is within safe biological limits. The fishing mortality is low and it is difficult to estimate such low mortalities accurately. Recent recruitment is unknown.

Details given in Table 3.1.15.

#### Forecast:

Assuming  $F(94) = 0.21$ , Basis: TAC,  $Catch(94) = 62$ ,  $Landings(94) = 62$ ,  $SSB(94) = 341$

Option	Basis	F (95)	SSB (95)	Catch (95)	Lnogs (95)
A	0.4F(93)	0.08	386	25	25
B	0.6F(93)	0.12	376	37	37
C	0.8F(93)	0.16	367	49	49
D	1.0F(93)	0.20	359	60	60
E	1.2F(93)	0.24	350	71	71

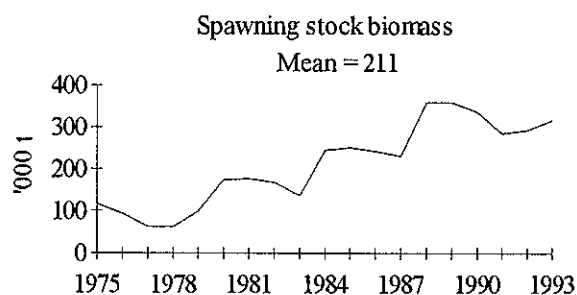
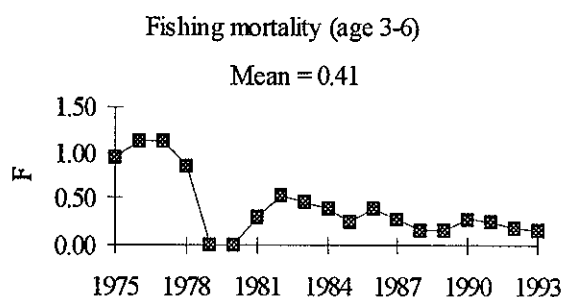
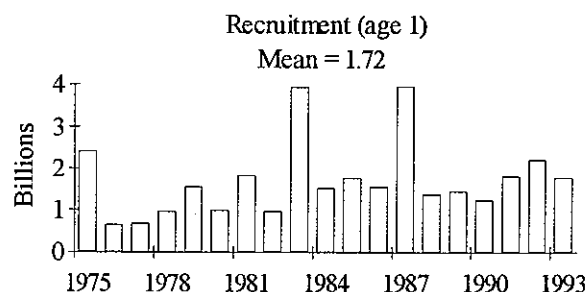
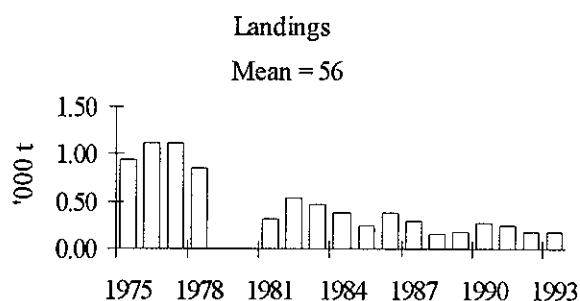
(Weights in '000 t)

Continued fishing at current levels of fishing mortality will lead to no foreseeable adverse effects.

**Management advice:** The stock is considered to be within safe biological limits.

**Special comments:** The difference between official landings and catches used in the assessment is largely due to misreporting.

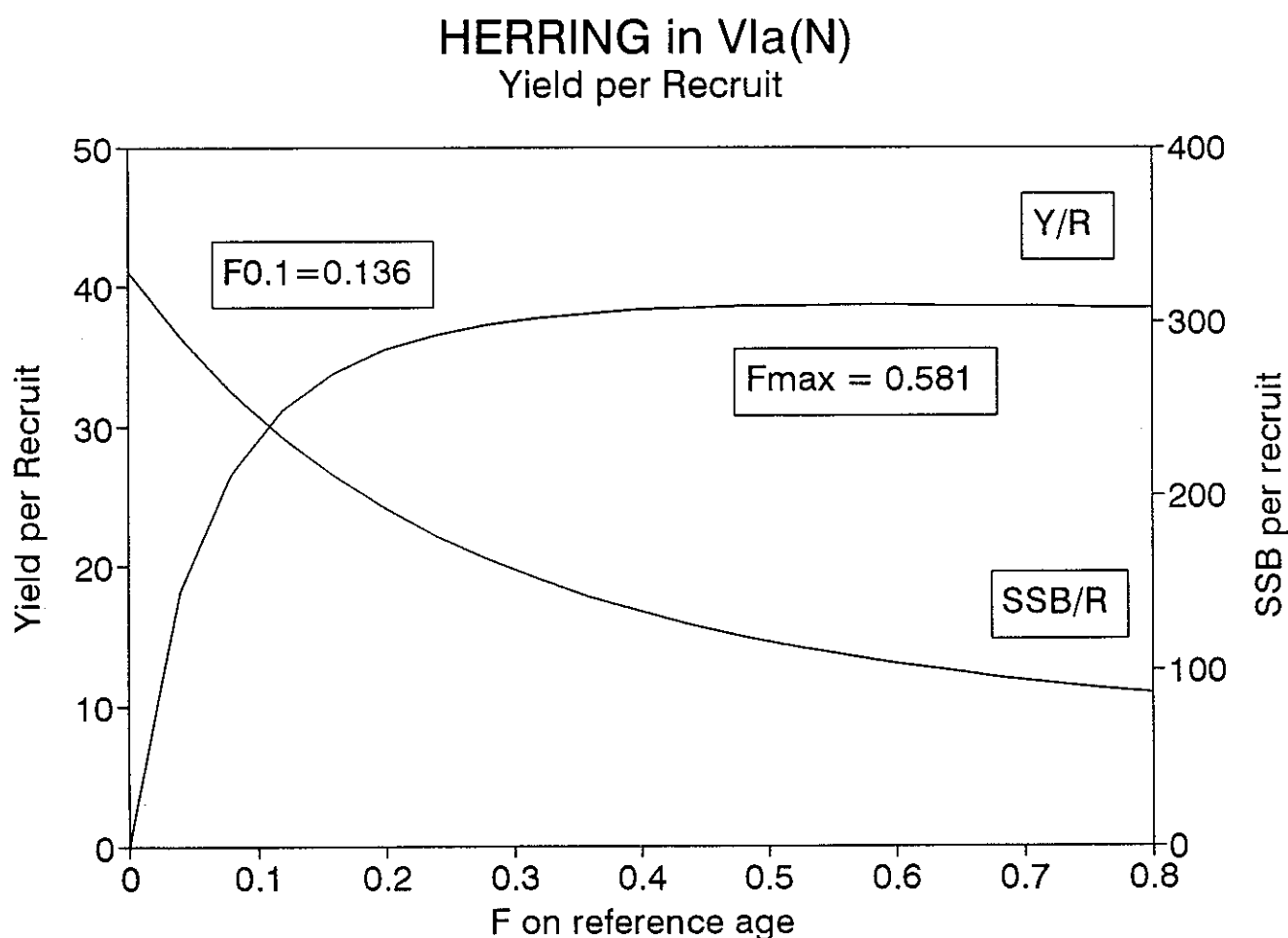
If misreporting by area is as important as some reports suggest, the results of the assessment may be misleading.





**Data and assessment:** Sampling levels are adequate, but there is concern that catches in other areas may be misreported as Division VIa (North) landings. Otherwise the data and assessment appear acceptable. The assessment is based on a catch-at-age analysis using larval and acoustic survey data.

**Source of information:** Report of the Herring Assessment Working Group for the Area South of 62°N, March 1994 (C.M.1994/Assess:13).



Herring in VIa(N). Yield per recruit analysis. Yield (g/recruit) and spawning stock biomass (g/recruit) calculated for a range of values of fishing mortality on reference age 4.

### 3.1.7 Clyde herring (Division VIa)

Catch data (Table 3.1.16):

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	1.0		0.9
1994	LPL	1.0		

(Weights in '000 t)

**Historical development of the fishery:** Catches have remained at a very low level and below the TAC.

**State of stock:** The Clyde herring consists of two stocks. The spring-spawning stock is at a very low level, but there are some indications of recovery. It is not possible to assess the immigrant autumn-spawning stock. The fishing mortality level is not known.

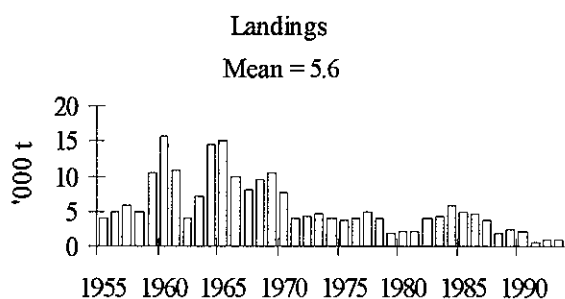
**Forecast:** Not available.

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

**Special comments:** Further surveys are required if the state of the spring-spawning stock is to be monitored.

**Data and assessment:** Catch at age data are available but were not used due to uncertainty about the stock structure. An egg survey in 1993 suggests that the spring-spawning stock is still at a low level.

**Source of information:** Report of the Herring Assessment Working Group for the Area South of 62°N, March 1994 (C.M.1994/Assess: 13).



### 3.1.8 Herring in Divisions VIa (South) and VIIb,c

Catch data (Table 3.1.17)

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		

(Weights in '000 t)

**Historical development of the fishery:** Catches have fluctuated in the past 10 years within the range 23-49 thousand t. The catches from this area have consistently been above the agreed TAC. There has been no increase in effort and little change in the composition of the fleets in recent years.

**State of stock:** The present state of the stock is not known. There are indications of low fishing mortalities at present. The recruitment is not known in recent years.

**Forecast:** Forecast not available.

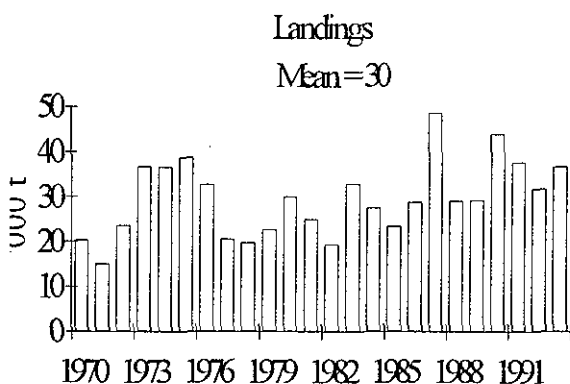
**Management advice:** If a precautionary TAC is required, ACFM advises that it should be set such that the resulting catches do not exceed the recent catch level of 36,000 t as estimated during 1990-1993.

**Special comments:** There are uncertainties concerning the stock definition in this area.

**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 for the fishery and good coverage of the catches has been maintained. No analytical assessment can be carried out due to the absence of any fishery-independent data.

**Source of information:** Report of the Herring Assessment Working Group for the Area South of 62°N, March 1994 (C.M.1994/Assess:13).



### 3.1.9 Irish Sea herring (Division VIIa)

Catch data (Table 3.1.18):

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	

(Weights in '000 t)

**Historical development of the fishery:** Catches since 1984 have fluctuated between 4,400 and 12,200 t with recent catches (1989-1993) between 4,400 t and 6,300 t. The majority of catches have been taken by the Northern Irish fleet.

**State of stock:** The present state of the stock is not precisely known. There are no fishery-independent estimates of recruitment. The catch-at-age data indicate that the 1990 year class is strong.

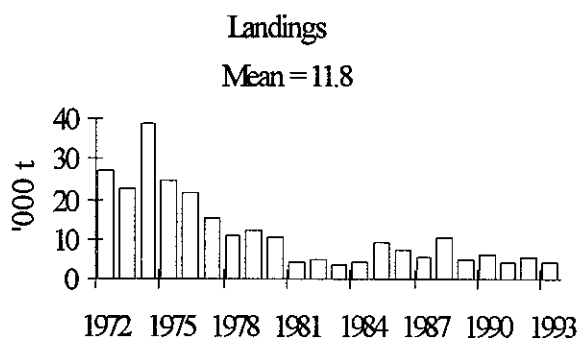
**Forecast:** No reliable forecast is available.

**Management advice:** If a precautionary TAC is required, ACFM advises that it should not exceed recent catch levels of 5,100 tonnes estimated during 1990-1993.

**Special comments:** The request from UK (Northern Ireland) for an evaluation of a proposed amendment to the spawning box closure on Douglas bank in the Irish Sea is dealt with in Section 3.1.10.

**Data and assessment:** Biological sampling of catches is reasonable but there are some serious doubts about the accuracy of landings data especially between 1981 and 1987. 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 1994 (C.M.1994/Assess:13).



### **3.1.10 Evaluation of a proposal for amendments to the Irish Sea - Douglas Bank (Division VIIa) spawning closure for Manx herring**

Following a request from UK (Northern Ireland) ACFM considered four options for the amendment of the spawning closure.

The current herring spawning closure was implemented in 1973 by the UK Government following a recommendation from ICES. At that time the herring catches in this area were in excess of 30,000 t and the stock was rapidly declining. The closure was expected to reduce the fishing mortality by a third. Closure of the spawning grounds at Douglas bank has since been a feature of the management of herring in Division VIIa. The original closed area was amended in 1985 by the EC following advice from ACFM in that year. The closure of the fishery on the Manx spawning stock and cessation of the industrial fishery on juveniles when the stock was collapsing in the 1970s, together with the subsequent reduction in TAC, is considered

to have contributed to a reduction in fishing mortality and to the recovery of the stock. However, the effect of the spawning closure has not been scientifically evaluated and the contribution of that closure is not known.

ACFM has not been able to assess the herring stock in Division VIIa for several years due to lack of adequate data and the present status of the stock is not known with certainty. On the basis of the available data it is not possible for ACFM to evaluate on scientific grounds the effect of the current closure or of the proposed amendment.

Without improvement of fishery data and fishery-independent estimates for this stock and research directed at evaluating the success or failure of the spawning closure, the present situation will persist.

**Source of information:** Report prepared by a Sub-group of the Herring Assessment Working Group for the Area South of 62° N, May 1994.

## 3.2 Industrial Fisheries in the North Sea and Adjacent Waters

### 3.2.1 Overview

#### Definition of industrial fisheries

The usual definition of industrial fisheries is that these are fisheries with small-mesh gear directed at catching fish for reduction purposes, but in terms of the Working Group on the Assessment of Norway Pout and Sandeel "industrial landings" derive from industrial fisheries with small-mesh trawl only. Data on such landings do not include a) fish caught by small-mesh trawl but used for human consumption, b) fish caught for human consumption but used for industrial purposes due to market conditions and c) fish caught by other small-mesh gears (e.g. purse seines) and used for reduction purposes.

Total catches are, however, used for the assessment of sprat, sandeel and Norway pout. Sandeel assessment areas are shown in Figure 3.2.1.

#### Data available

Data on landings, fishing effort and species composition are available from all industrial fisheries. The sampling schemes for length and age data, which broke down in 1990, were restarted in 1991 and data were available to estimate the 1990 age compositions.

The stocks of these relatively short-lived species are inherently variable and, with the exception of some of the sprat stocks, the available evidence suggests that the stocks can sustain fisheries at the present level of exploitation. Therefore, there does not seem to be an urgent need to impose management measures on these fisheries for conservation of those species. However, sandeel, Norway pout and sprat serve as fish food for many of the species caught in the human consumption fisheries and also as food for other top predators in the ecosystem. Multispecies

assessment has clearly identified these interactions. For a proper evaluation of the status of all fish stocks in the North Sea, monitoring of the changes in the prey stocks in response to fishing and predation is extremely important. Further, by-catches in these fisheries can impact on other fisheries. Therefore, adequate sampling of the industrial catches is needed to obtain reliable information on length, weight and age distributions. In addition, fishery-independent information (i.e. research vessel surveys) is needed to clarify several important aspects of the population dynamics of these species which have a bearing on their assessment and management.

#### Trends in industrial landings

The total annual landings of sandeel, sprat and Norway pout together with by-catches of herring and blue whiting in Division IIIa during the period 1974-1991 have varied around a mean of 160,000 t (Table 3.2.4). Landings have been below the mean since 1987 but increased from 102,000 t in 1991 to 158,000 t in 1993. [In addition about 26,000 t of herring and a small quantity of sprat were taken in the mixed clupeoid fishery in 1993.]

Industrial landings from the North Sea (Table 3.2.5) over the same period have varied from 1.0 million to 1.9 million t. In 1993 the catch dropped to 1.1 million t, mainly due to a reduction in sandeel and Norway pout catches. This reverses the recent upward trend for these two species. Industrial landings of herring in the small-mesh trawl fishery also decreased by about 25 %

Landings from the industrial fisheries in Division VIa are given in Table 3.2.6.

#### By-catches of protected species

The annual landings of haddock, whiting and saithe taken in the industrial fisheries in the North Sea decreased to 31,000 t in 1993, of which an estimated 20,000 t was whiting and 11,000 t haddock (Table 3.2.5).

### 3.2.2 Sprat in Division IIIa

Catch data (Table 3.2.1):

Year	Agreed TAC	Official Indgs.	Other <sup>1</sup> species	ACFM catch
1987	80	68	-53	14
1988	80	63	-53	9
1989	80	62	-52	10
1990	65	43	-33	10
1991	50	44	-32	14
1992	50	40	-30	10
1993	45	31	-22	9
1994	43			

(Weights in '000 t). <sup>1</sup> Species reported as "sprat" taken in "mixed clupeoid fishery".

**Historical development of the fishery:** The catches in the period 1974-1993 varied between 9,000 and 100,000 t. Since the mid 1980's they have been at a low but stable level averaging around 11,000 t.

**State of stock:** There are no reliable estimates of this stock.

**Forecast:** No forecast is available.

**Management advice:** Most of the catches in the "mixed clupeoid" fishery are of species other than sprat. A reduction of the catches of juvenile "human consumption" species will improve the yield per recruit for these species.

This could be obtained by managing the sprat fishery by a separate TAC based on recent estimated catch levels and reducing the catches of other species to the lowest possible level.

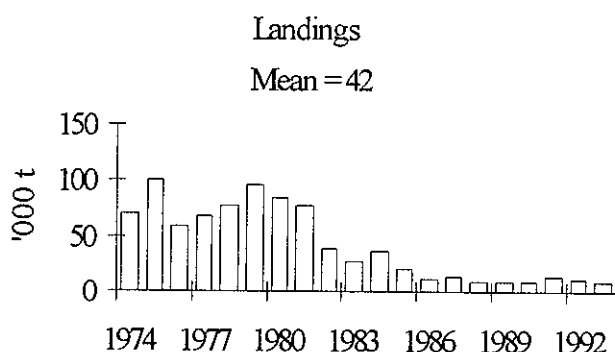
**Special comments:** ACFM recommends that the landings of sprat should be covered by national sampling. It is important that sampling in the human consumption sprat fisheries is established.

Sprat in Division IIIa are caught in both the "mixed clupeoid" fishery and in the directed fisheries for human consumption, mainly with purse seine. The catches of sprat in the "mixed clupeoid" fishery have been at a low level (about 15%) in recent years and the estimated catch is mainly from the purse seine fisheries (85%) in the fjords.

**Data and assessment:** There are no reliable fishery-independent estimates of this stock. Biological sampling improved in 1993 (Danish) but no sampling was carried out of the Swedish catches, which take about 70% of the total.

Bottom Trawl Survey indices are available but have not been validated. The 1994 index was slightly lower than the 1993 index, but higher than the indices in the late 1980s. There is little consistency between the 1-group and 2-group indices for the 1983-1992 year classes.

**Source of information:** Report of the Herring Assessment Working Group for the Area South of 62°N, March 1994 (C.M.1994/Assess: 13).



### 3.2.3 Sprat in the North Sea (Sub-area IV)

Catch data (Table 3.2.2):

Year	Rec TAC	Agreed TAC <sup>1</sup>	Official Indgs	ACFM catch
1987	0	57	78	33
1988	0	57	93	87
1989	-	59	50	63
1990	-	59	49	71
1991	-	55	92	110
1992	-	55	72	124
1993	-	114	127	200
1994	-	114		

(Weights in '000 t) <sup>1</sup>EU zone

**Historical development of the fishery:** The sprat fishery peaked in the 1960s and has again increased considerably in recent years, from 16,000 t in 1986 to 200,000 t in 1993.

**State of stock:** The present state of the stock is not precisely known. However, the stock does not show signs of overexploitation and the catch and abundance indices from surveys indicate an increase in stock size.

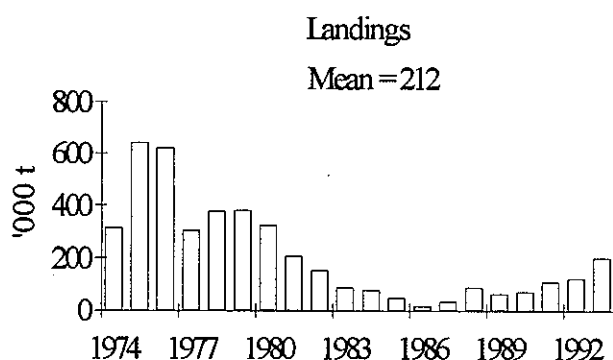
**Forecast:** No forecast is available.

**Management advice:** The existing by-catch regulations should be maintained.

**Data and assessment:** The catch-at-age data are of poor quality with severe inconsistencies in the age composition data. This may be caused by problems with age reading.

Sampling of the landings deteriorated in 1993. Inadequate catch-at-age data prevent the use of standard VPA techniques for assessing the stock.

**Source of information:** Report of the Herring Assessment Working Group for the Area South of 62°N, March 1994 (C.M.1994/Assess: 13).





### 3.2.4 Sprat in Divisions VII d,e

#### Catch data (Table 3.2.3):

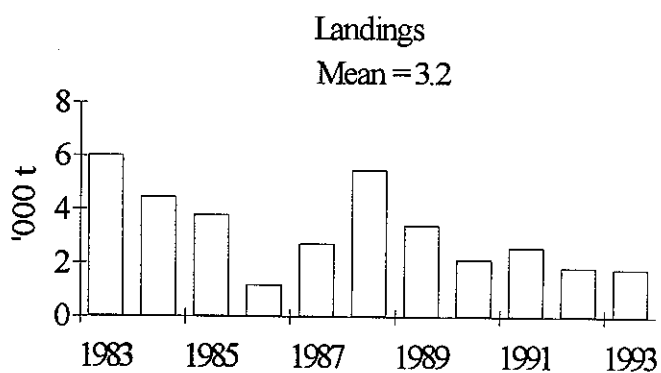
Year	Rec TAC	Agreed TAC	ACFM catch
1987	-	5	2.7
1988	-	5	5.5
1989	-	12	3.4
1990	-	12	2.1
1991	-	12	2.6
1992	-	12	1.8
1993	-	12	1.8
1994	-	12	

(Weights in '000 t)

**Historical development of the fishery:** Landings were at a low level in 1987-1993, ranging from 1,800 to 5,500 t.

**State of stock:** Not known

**Source of information:** Report of the Herring Assessment Working Group for the Area South of 62°N, March 1994 (C.M.1994/Assess: 13).



### 3.2.5 Norway pout in Division IIIa

Catch data (Tables 3.2.7 and 3.2.8):

Year	ACFM catch
1987	3
1988	8
1989	6
1990	27
1991	32
1992	42
1993	8

Weights in '000 t.

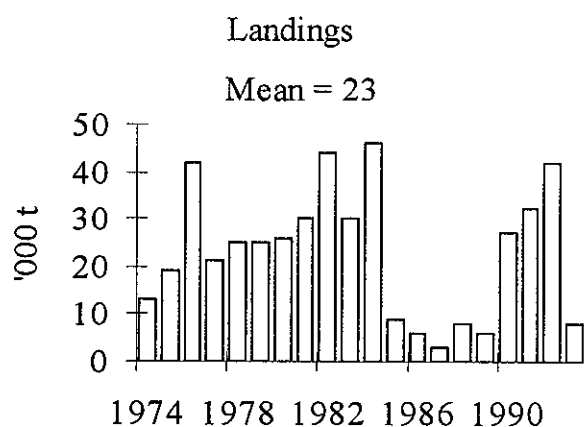
**Historical development of the fishery:** Small mesh trawl fishery directed at Norway Pout which takes place near the edge of the Norwegian Deep. The fishery is effectively a continuation of the North Sea fishery in Division IIIa. Fishing takes place mostly in the winter in quarters one and four. A variable fraction of the catch is Norway pout.

State of stock: Unknown.

**Special comments:** It is likely that the Norway pout in Division IIIa is part of the North Sea stock since the fishery takes place in a continuous area which overlaps both Division IIIa and Sub-area IV. Further studies are considered necessary before Norway pout from Division IIIa can be included in the assessment of the Norway pout in Sub-area IV.

**Data and assessment:** Catch-at-age and weight-at-age data available since 1986 but of variable quality. No effort data. Survey data are at present insufficient for tuning.

**Source of information:** Report of the Norway Pout and Sandeel Assessment Working Group, August/September 1994 (C.M.1995/Assess:5).



### 3.2.6 Norway pout in Sub-area IV

Catch data (Tables 3.2.9 and 3.2.10):

Year	Rec. TAC	Agreed TAC <sup>1</sup>	Off. Indgs.	ACFM catch
1987	-	200	215	147
1988	-	200	187	102
1989	-	200	276	163
1990	-	200	216	140
1991	-	200	223	155
1992	-	200	342	255
1993	-	220	239	174
1994	-	220		

<sup>1</sup>IIa(EC), IIIa, IV(EC). Weights in '000 t.

**Historical development of the fishery:** The fishery expanded during the early 1970s and is prosecuted largely by Danish and Norwegian vessels using small mesh trawls. The fishery declined during the 1980s following a decline in the stock size. Most fishing for Norway pout takes place during the winter. There is a bycatch of protected species, mostly other gadoids and particularly whiting. The "Norway pout box", which excludes fishing for this species, was introduced in the 1980s to reduce the by-catch of juvenile fish in the northern North sea.

**State of stock:** Recruitment is highly variable and can influence the SSB rapidly due to the short life span of the

species. The 1991 year class is strong, that of 1992 intermediate, and that of 1993 still uncertain. SSB has increased in recent years and is at a high level. Fishing mortality has declined. At present the stock is considered to be within safe biological limits.

Details in Table 3.2.10.

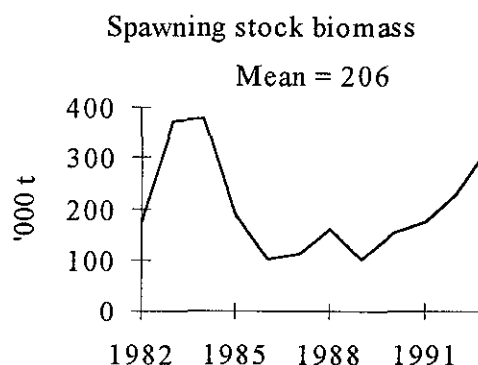
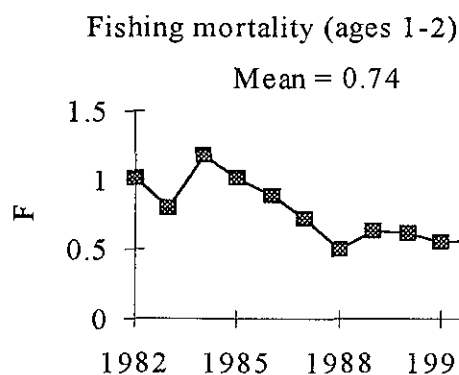
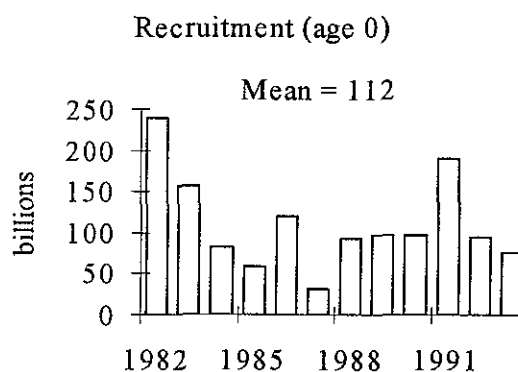
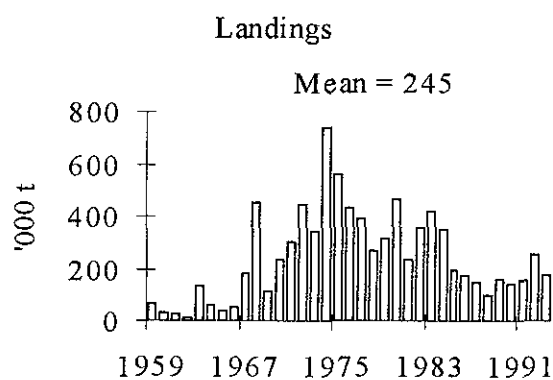
**Forecast for 1995:** As this is a short-lived species, forecasts are not reliable.

**Management advice:** The stock can sustain current fishing mortality in the short term.

**Special comments:** The by-catch of protected species in this fishery has an impact on the catches of these species in the human consumption fisheries, particularly whiting. This needs to be considered in the management of the Norway pout fishery.

**Data and assessment:** Catch-at-age data available except for 1990. Standardized effort and survey data available. The assessment is considered adequate to indicate trends in the stock. A recruitment survey index is available for forecasts but can only usefully be used during the TAC year. This is because the catches of Norway pout are dominated by 0 and 1-group fish.

**Source of information:** Report of the Norway Pout and Sandeel Assessment Working Group, August/September 1994 (C.M.1995/Assess: 5).



### 3.2.7 Norway pout in Division VIa

Catch data (Table 3.2.11):

Year	Official landings
1987	38.3
1988	6.7
1989	28.2
1990	3.3
1991	4.3
1992	5.1
1993	7.3 <sup>1</sup>

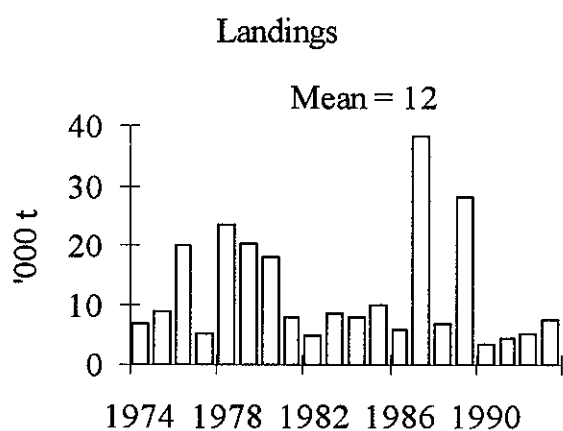
Weights in '000 t. <sup>1</sup>Preliminary.

**Historical development of the fishery:** Small mesh trawl fishery operated by Danish, UK and Faroese vessels. Catches are highly variable but have been at a low level since 1989.

**State of stock:** Unknown.

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

**Source of information:** Report of the Norway Pout and Sandeel Assessment Working Group, August/September 1994 (C.M.1995/Assess: 5).



### 3.2.8 Sandeel in Division IIIa

Catch data (Tables 3.2.12 and 3.2.13):

Year	ACFM landings
1987	5.4
1988	23.2
1989	18.2
1990	15.8
1991	23.0
1992	38.8
1993	44.8

Weights in '000 t.

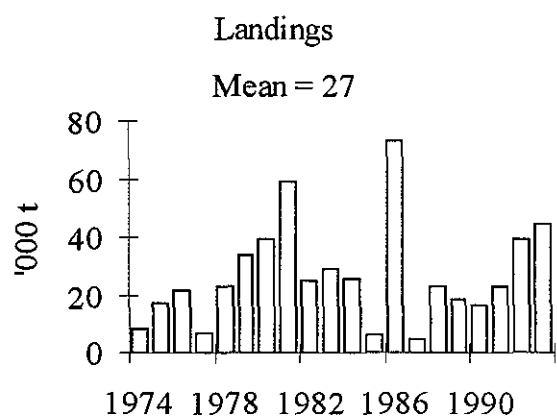
**Historical development of the fishery:** An extension of the North Sea fishery into Division IIIa but with smaller vessels working further inshore, mostly along the coast of Jutland.

State of stock: Uncertain.

**Special comments:** Biological samples taken since 1992 indicate a mixture of several sandeel species. This mixture is greater than in other sandeel fisheries.

**Data and assessment:** Insufficient data for an assessment.

**Source of information:** Report of the Norway Pout and Sandeel Assessment Working Group, August/September 1994 (C.M.1995/Assess:5).



### 3.2.9 Sandeel in the southern North Sea (Figure 3.2.1)

Catch data (Catches in the total North Sea are given in Table 3.2.14 and for this assessment area in Tables 3.2.15 and 3.2.16):

Year	ACFM catch
1987	403
1988	488
1989	526
1990	367
1991	459
1992	669
1993	302

Weights in '000 t.

**Historical development of the fishery:** Small mesh trawl fishery which developed in the 1970s. The fishery began in the areas around the Dogger Bank and later expanded northwards. The fishery is seasonal, taking place mostly in the spring and summer. In recent years part of the fishery

has concentrated in an area close to the Firth of Forth. In 1993 the catch in this area was approximately 115 000 t.

**State of stock:** Since 1982, the SSB has fluctuated without any particular trend. Fishing mortality has recently declined. The stock appears to be within safe biological limits.

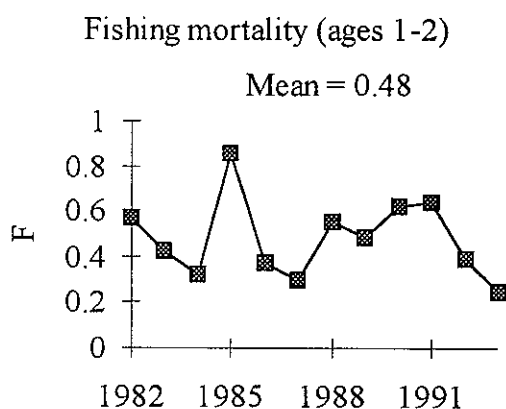
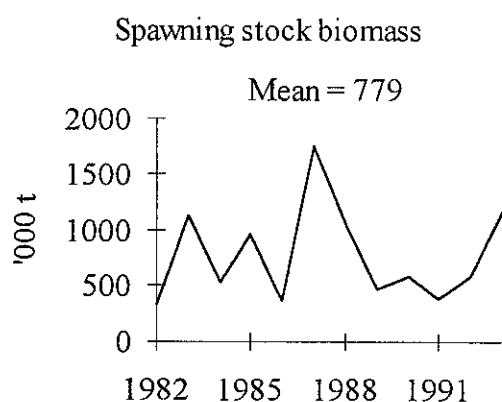
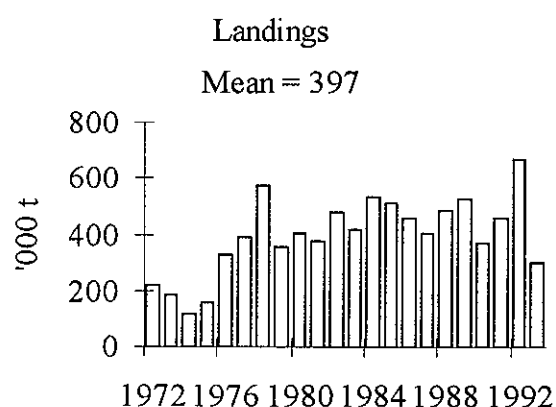
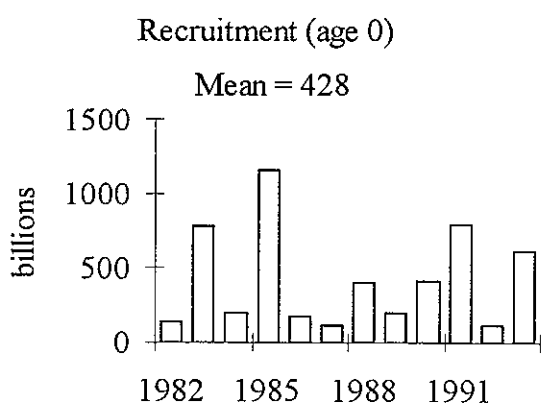
Details in Table 3.2.16.

**Management advice:** The stock can sustain the present level of fishing mortality in the short term.

**Special comments:** The fishery in the early part of the season concentrates mostly on 1-group fish while later in the summer (August) the fishery exploits 0-group fish. Most of the catch consists of *Ammodytes marinus* and there is very little by-catch of protected species.

**Data and assessment:** Catch-at-age data available except for 1990. Standardized effort data available. No survey data.

**Source of information:** Report of the Norway Pout and Sandeel Assessment Working Group, August/September 1994 (C.M.1995/Assess: 5).



### 3.2.10 Sandeel in the northern North Sea

(Figure 3.2.1)

**Catch data** (Catches in the total North Sea are given in Table 3.2.14 and for this assessment area in Tables 3.2.15 and 3.2.17):

Year	ACFM catch
1987	396
1988	385
1989	492
1990	220
1991	373
1992	177
1993	276

Weights in '000 t.

**Historical development of the fishery:** This fishery is effectively an extension of the fishery which began in the southern North Sea and expanded into northern areas. The catches in the northern North sea are generally smaller than in the southern areas.

**State of stock:** During most of the years since 1982 the spawning stock has been relatively stable. In 1987 and 1988, however, the stock increased substantially due to the combination of two consecutive strong year classes in 1985 and 1986. It is not possible to determine if the stock is within safe biological limits at present.

Details in Table 3.2.17

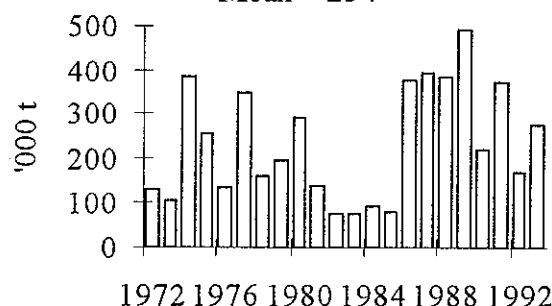
**Special comments:** The fishery in the early part of the season concentrates mostly on 1-group fish while later in the summer (August) the fishery exploits 0-group fish. Most of the catch consists of *Ammodytes marinus* and there is very little by-catch of protected species.

**Data and assessment:** Catch-at-age data available except for 1990. Standardized effort data available. No survey data.

**Source of information:** Report of the Norway Pout and Sandeel Assessment Working Group, August/September 1994 (C.M.1995/Assess:5 ).

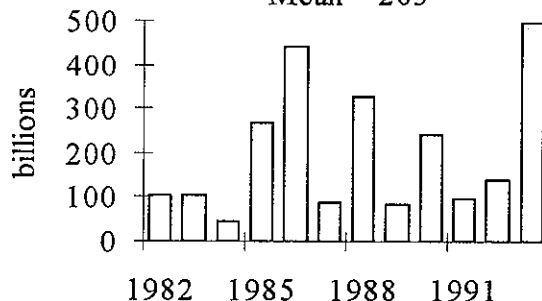
Landings

Mean = 234



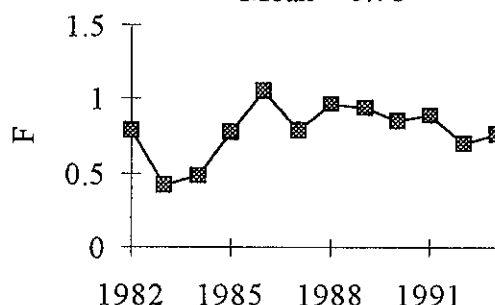
Recruitment (age 0)

Mean = 203



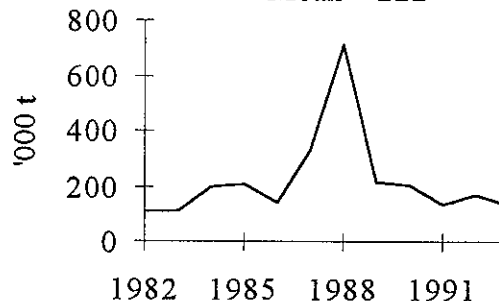
Fishing mortality (ages 1-2)

Mean = 0.78



Spawning stock biomass

Mean = 222



### 3.2.11 Sandeel in the Shetland area

(Figure 3.2.1)

Catch data (Catches in the total North Sea are given in Table 3.2.14 and for this assessment area in Tables 3.2.15 and 3.2.18):

Year	Rec. TAC	ACFM catch
1987	-	7.2
1988	-	4.7
1989	-	3.5
1990	-	2.3
1991	<sup>1</sup>	+
1992	<sup>2</sup>	-
1993	<sup>2</sup>	-
1994	3	

<sup>1</sup>ACFM recommended low level of effort. <sup>2</sup>ACFM advised continuation of closure. Weights in '000 t.

**Historical development of the fishery:** The fishery started at a low level in 1974, after which catches rose to a peak of 52 thousand tonnes in 1982. After this, landings declined,

partly because of a series of poor year classes in the mid to late 1980s. Following this, the fishery was closed during the second half of 1989 and 1990, and has been completely closed since the start of 1991.

**State of stock:** Spawning biomass has increased due to maturation of the strong 1991 year class, but precise level uncertain. 1993 year class is above average.

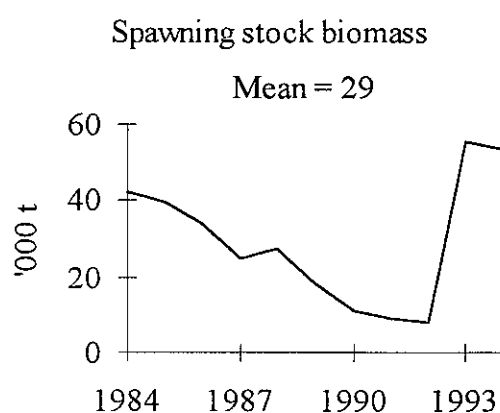
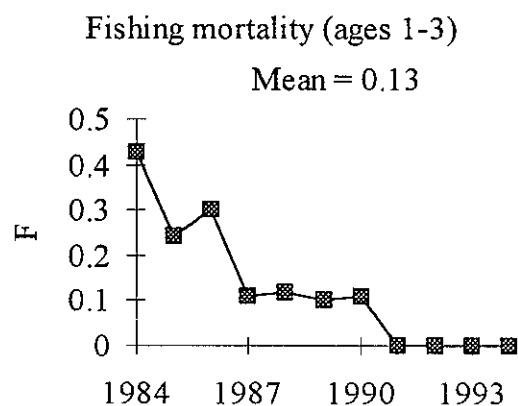
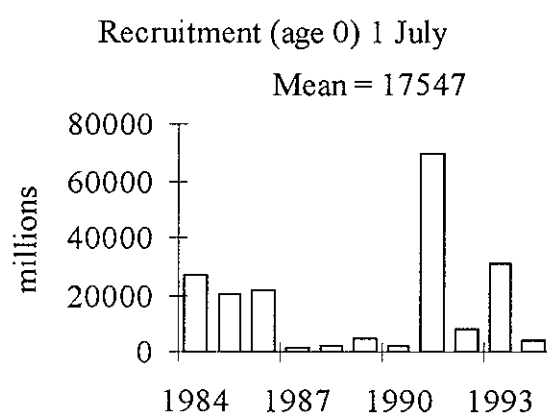
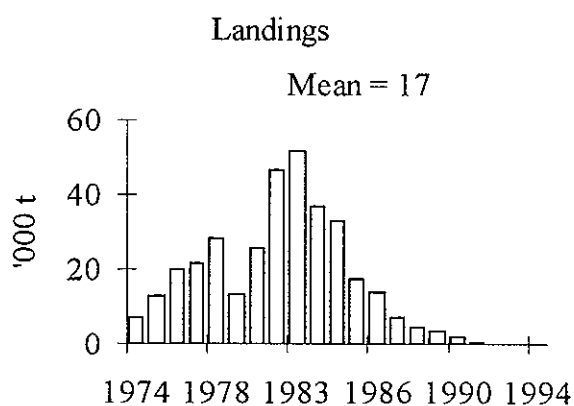
Details in Table 3.2.18.

**Forecast for 1995:** Not available.

**Management advice:** As there is evidence of improved recruitment in this stock, ACFM recommends that a limited fishery could be allowed in 1995 with a precautionary TAC of 3,000 t, equal to the average of the 1989 and 1990 landings.

**Data and assessment:** Catch-at-age and standardized effort data are available. Trawl survey indices are available for 1984-1994. An analytical assessment was done utilizing indices and effort data.

**Source of information:** Report of the Norway Pout and Sandeel Assessment Working Group, August/September 1994 (C.M.1995/Assess:5).





### 3.2.12 Sandeel in Division VIa

Catch data (Tables 3.2.19 and 3.2.20):

Year	Official landings	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	5.0	5.0
1993	6.2	6.2

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

Details in Table 3.2.20.

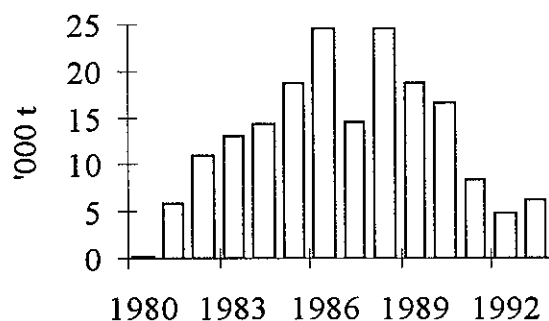
**Forecast for 1995:** Not available.

**Data and assessment:** Catch-at-age and effort data available. An analytical assessment was done utilizing effort data.

**Source of information:** Report of the Norway Pout and Sandeel Assessment Working Group, August/September 1994 (C.M.1995/Assess:5).

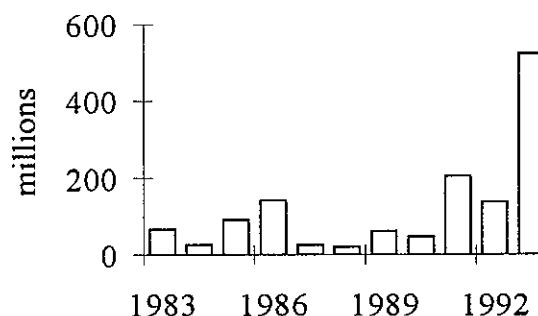
Landings

Mean = 13



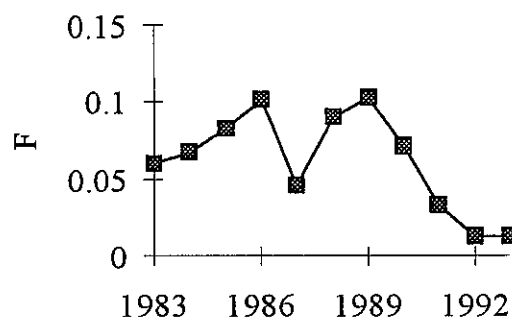
Recruitment (age 0) 1 July

Mean = 123



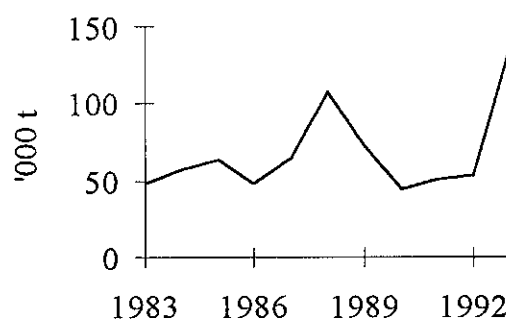
Fishing mortality (ages 1-3)

Mean = 0.06



Spawning Stock biomass

Mean = 68



### 3.3 Demersal stocks in Division IIIa

#### 3.3.1 Overview

The stocks in Division IIIa dealt with in this section are cod in the Kattegat and Skagerrak, Sole in the Kattegat and haddock, whiting and plaice in the whole of Division IIIa.

These stocks are mainly exploited by Danish and Swedish fleets consisting of bottom trawlers, gill netters and Danish seiners. The total fishing effort in terms of the number of vessels operating in Division IIIa has decreased in recent years. This is partly an effect of the EU withdrawal programme which affected the Danish fleets only, but these fleets still dominate the fishery in Division IIIa.

The assessments of the demersal stocks in this area are hampered by the poor quality of the data. Major deficiencies are insufficient age sampling, too short time series of age samples from landings of the industrial fisheries and lack of effort and discard data. Misreporting and non-reporting of catches occurred in recent years particularly in the case of cod, but the amount probably varies considerably between years.

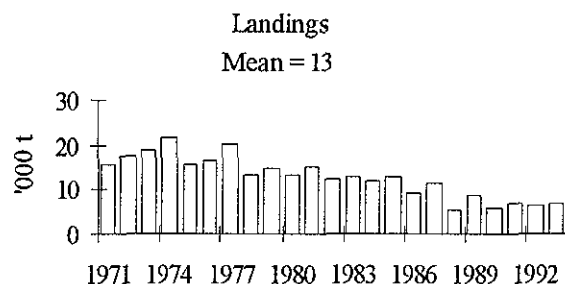
#### 3.3.2 Cod in the Kattegat

Catch data (Table 3.3.1):

Year	Rec TAC	Agreed TAC	ACFM catch
1987	<13.0	15.5	11.5
1988	<15.0	15.0	5.5
1989	10.0	12.5	8.6
1990	7.0	8.5	5.9
1991	6.3	6.65	6.8
1992	- <sup>1</sup>	6.65	6.3
1993	- <sup>1</sup>	6.8	7.0
1994	<6.3	6.7	

(Weights in '000 t). <sup>1)</sup> Effort reduction

**Historical development of the fishery:** Landings were rather stable up to the middle of the 1980s and have since decreased substantially. Catch figures are considered unreliable for recent years due to under-reporting and misreporting.



Survey indices of abundance are available for some of the stocks, but the time series are too short in some cases or do not correspond well with abundances calculated from catch data and are therefore of limited value in assessments.

Some of the discrepancies between various data sets may be due to an inadequate stock definition. It can be doubted whether cod and haddock in this area are unit stocks, or rather should be considered as part of the North Sea stocks.

An analytical assessment could only be made for cod in the Skagerrak, but there are reasons to doubt its validity including the possible association of this stock with the North Sea cod. The state of this stock could not be defined on this basis. For other stocks reliable assessments could not be made.

**Management advice for cod in the Skagerrak and haddock, whiting and plaice in Division IIIa:**

ACFM advises precautionary TACs to be based on recent catch levels. For cod the TAC should be consistent with the management measures implemented for North Sea cod.

**State of stock:** Available data indicate a high fishing mortality, but the precise level of the stock size is not known.

**Forecast:** Not available

**Management advice:** ACFM advises a precautionary TAC to be set for this stock based on catches in the most recent years. A decrease of the high exploitation level will lead to future gains in both landings and stock size.

**Special comments:** Survey data indicate that both the 1992 and 1993 year classes are of below average size.

**Data and assessment:** Most catch-based data unreliable and not usable for an analytical assessment. Survey data used for recruitment estimates.

**Source of information:** Report of the Working Group on the Assessment of Demersal Stocks in the Baltic, April 1994 (C.M.1994/Assess:17).

### 3.3.3 Plaice in Division IIIa

#### Catch data (Table 3.3.2):

Year	Rec. TAC: <sup>1</sup>		Agreed TAC:		ACFM catch
	Kattegat	Skagerrak	Kattegat	Skagerrak	
1987	- <sup>2</sup>	- <sup>2</sup>	4.75	14.5	15.8
1988	≤3.7	- <sup>2</sup>	4.75	15.0	12.9
1989	≤2.9	- <sup>2</sup>	4.0	15.0	7.7
1990	1.3	10.0	2.0	11.0	12.1
1991	1.1 <sup>3</sup>	10.3 <sup>3</sup>	1.3	10.0	8.7
1992		14.0	2.8	11.2	11.8
1993		- <sup>2</sup>	2.8	11.2	11.3
1994		- <sup>2</sup>	2.8	11.2	-

<sup>1</sup>From 1992 onwards recommended TACs are combined.

<sup>2</sup>Precautionary TAC. <sup>3</sup>In May 1991 ACFM revised its advice to 12.0 for both areas combined. Weights in '000 t.

**Historical development of the fishery:** Catches are taken by seine, trawl and gill net typically in mixed fisheries. The fishery has declined since the late 1970s especially in the Kattegat.

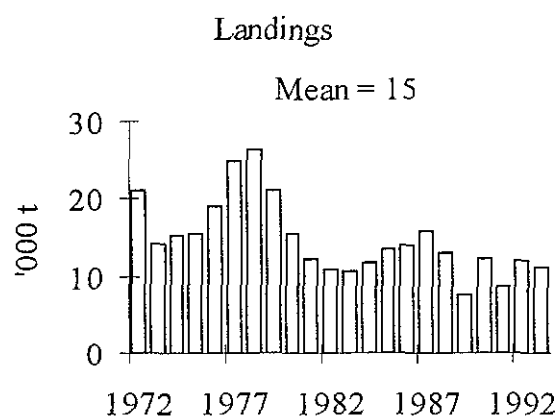
**State of stock:** Unknown but there are indications from catch and CPUE data that it may be at a low level in the Kattegat.

**Forecast for 1995:** No projection is available.

**Management advice:** ACFM recommends that if a TAC for plaice in Division IIIa is set for 1995, it should be set on a precautionary basis.

**Data and assessment:** There are catch-at-age data available and CPUE series from commercial fisheries. However, there are problems with the age reading of otoliths. No analytical assessment was available.

**Source of information:** Report of the Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak, October 1994 (C.M.1995/Assess: 8).



### 3.3.4 Sole in Division IIIa

Catch data (Table 3.3.3):

Year	Rec TAC	Agreed TAC	ACFM catch
1987		850	722
1988		950	706
1989	< 800	800	824
1990	600	500	1050
1991	600	1000	<sup>-1</sup>
1992	1000	1400	<sup>-1</sup>
1993	1000	1600	<sup>-1</sup>
1994		2100	

(Weights in t). <sup>1)</sup>Uncertain.

**Historical Development of the Fishery:** Landings around 200-400 t up to 1986, then an increase to twice that level in 1987-1989. Landings reported after 1989 have been very high but are regarded as unreliable. The likely level is thought to be in the range 2,500 to 4,500 t.

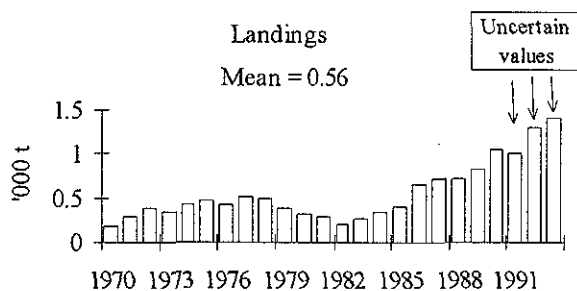
**State of stock:** Stock size not known precisely. Based on last year's assessment the exploitation is estimated to be close to the  $F_{max}$  level. Data from surveys indicate that recruitment in 1994 has decreased compared to the very high levels seen in 1992 and 1993.

**Forecast:** Not available

**Management advice:** ACFM is not in a position to provide management advice for this stock.

**Data and assessment:** Catch curve analysis to estimate level of exploitation. Age-based assessment not possible. Recruitment indices from trawl surveys.

**Source of information:** Report of the Working Group on the Assessment of Demersal Stocks in the Baltic, April 1994 (C.M.1994/Assess:17).



### 3.3.5 Cod in the Skagerrak

#### Catch data (Table 3.3.4):

Year	Rec. TAC <sup>1</sup>	Agreed TAC <sup>1</sup>	ACFM catch <sup>1</sup>
1987	<21	22.5	19.9
1988	- <sup>2</sup>	21.5	17.0
1989	<23	20.5	18.8
1990	21.0	21.0	17.8
1991	15.0	15.0	12.1
1992	- <sup>3</sup>	15.0	14.0
1993	- <sup>2</sup>	15.0	14.7
1994	- <sup>2</sup>	15.5	-

<sup>1</sup>Norwegian fjords not included. <sup>2</sup>Precautionary TAC (based on recent catch levels). <sup>3</sup>Effort should be reduced, preferably by 30%. Weights in '000 t.

**Historical development of the fishery:** Catches are taken by trawl, seine and gillnet in mixed fisheries. The number of vessels as well as the effort have declined in the most recent years. Landings have remained fairly stable in the last decade. The industrial by-catch was a large component of the catch but has decreased in recent years.

**State of stock:** The assessment is uncertain but suggests that the SSB has remained stable in recent years and that fishing mortality has been decreasing (see also Table 3.3.5).

The state of the stock cannot be defined because the relationship with the North Sea stock is at present not clear.

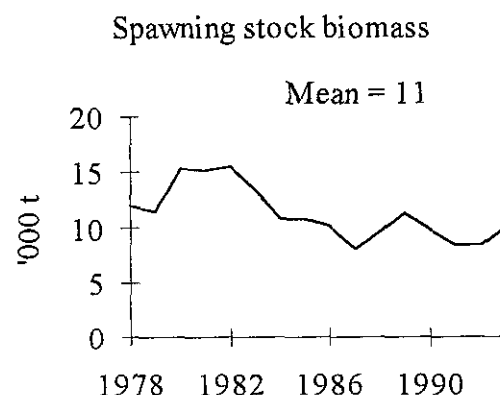
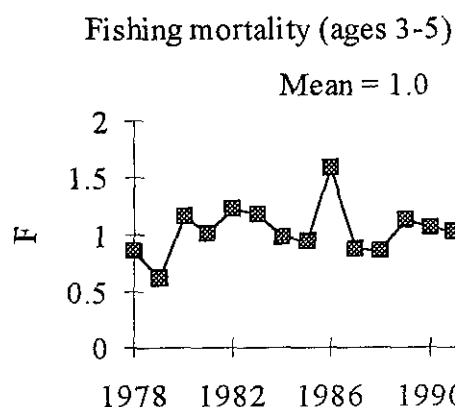
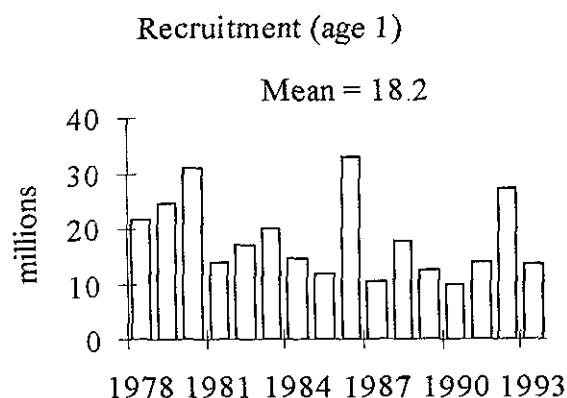
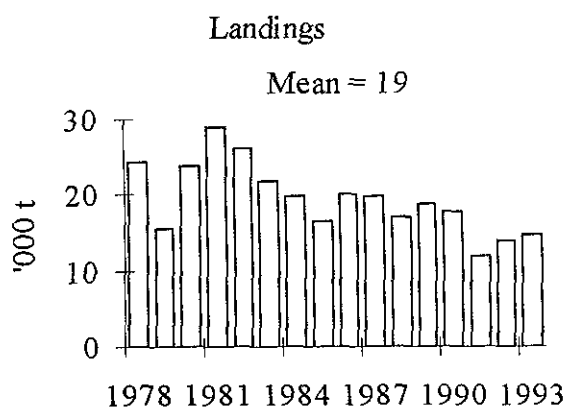
**Forecast for 1995:** At current levels of fishing mortality a catch of 22,000 t is predicted for 1995.

**Management advice:** ACFM recommends that if a TAC for cod in the Skagerrak is set for 1995, it should be set on a precautionary basis, taking into account a possible link with the cod in the North Sea.

**Special comments:** Recruitment to this stock is influenced by influx of larvae and 0-group from the North Sea.

**Data and assessment:** Analytical assessment based on commercial CPUE and survey data. Industrial by-catches and discards not included. Misallocation of catches between the North Sea and the Skagerrak may have taken place in recent years.

**Source of information:** Report of the Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak, October 1994 (C.M.1995/Assess:8).



### 3.3.6 Haddock in Division IIIa

Catch data (Table 3.3.6):

Year	Rec. TAC	Agreed TAC	ACFM catch <sup>3</sup>
1987	- <sup>1</sup>	11.5	5.3
1988	- <sup>1</sup>	10.0	4.4
1989	- <sup>1</sup>	10.0	4.5
1990	- <sup>1</sup>	10.0	6.1
1991	4.6 <sup>2</sup>	4.6	6.7
1992	4.6 <sup>2</sup>	4.6	9.0
1993	- <sup>1</sup>	4.6	4.4
1994	- <sup>1</sup>	10.0	-

<sup>1</sup>Precautionary TAC based on recent catch levels.

<sup>2</sup>Precautionary TAC. <sup>3</sup>Including by-catches in small-mesh industrial fishery. Weights in '000 t.

**Historical development of the fishery:** Catches are taken by trawl, seine and gill-net in a mixed fishery. A significant part of the catches is taken in small mesh

fisheries directed towards Norway pout. The fishery declined from high levels in the early 1980s and has since remained fairly stable.

**State of stock:** Unknown.

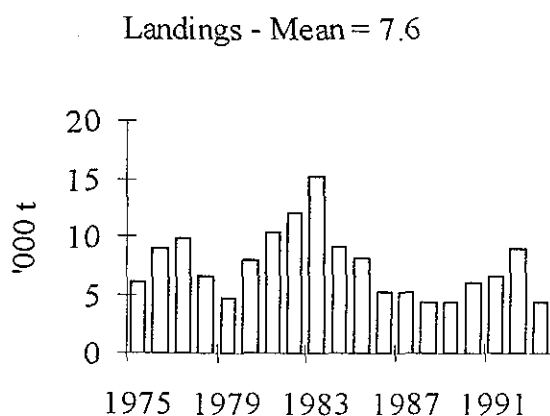
**Forecast for 1995:** Not available.

**Management advice:** ACFM recommends that if a TAC for haddock in Division IIIa is set for 1995, it should be set on a precautionary basis, taking into account a possible link with haddock in the North Sea.

**Special comments:** There are probably links with the haddock in the North Sea.

**Data and assessment:** Data for 1987-1990 for the industrial fishery are missing. An analytical assessment is not available at present.

**Source of information:** Report of the Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak, October 1994 (C.M.1995/Assess:8).



### 3.3.7 Whiting in Division IIIa

Catch data (Table 3.3.7):

Year	Rec. TAC	Agreed TAC	ACFM catch <sup>2</sup>
1987	- <sup>1</sup>	17.0	16.7
1988	- <sup>1</sup>	17.0	11.8
1989	- <sup>1</sup>	17.0	13.2
1990	- <sup>1</sup>	17.0	19.3
1991	- <sup>1</sup>	17.0	14.1
1992	-	17.0	12.2
1993	- <sup>1</sup>	17.0	4.6
1994	- <sup>1</sup>	17.0	-

<sup>1</sup>Precautionary TAC based on recent catch levels. <sup>2</sup>Includes by-catch in small-mesh industrial fishery. Weights in '000 t.

**Historical development of the fishery:** The major part of the catch is taken in small mesh fisheries directed at Norway pout.

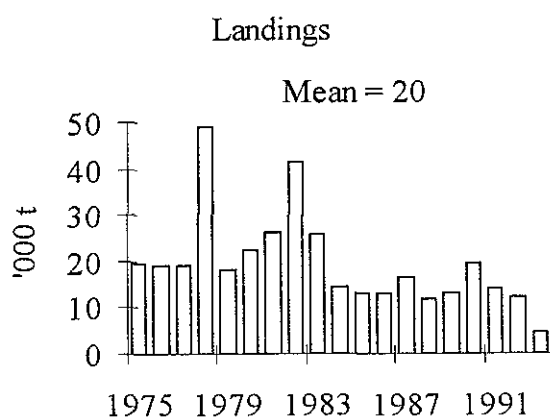
**State of stock:** Unknown.

**Forecast for 1995:** No projection is available.

**Management advice:** ACFM recommends that if a TAC for whiting in Division IIIa is set for 1995, it should be on a precautionary basis.

**Data and assessment:** Age composition data are missing for most years. No analytical assessment is available.

**Source of information:** Report of the Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak, October 1994 (C.M.1995/Assess:8).



### 3.4 *Pandalus borealis* in Division IIIa and the North Sea.

Figure 3.4.1 shows the management units for *Pandalus* in the North Sea and Division IIIa. Table 3.4.1 summarises the landings by country.

#### 3.4.1 *Pandalus borealis* in Division IIIa and Division IVa East (Skagerrak and Norwegian Deeps)

Catch data (Table 3.4.2):

Year	Rec TAC	Agreed TAC Skager- rak	Agreed TAC IIIa + IVaE	Disc slip.	ACFM Lndgs	ACFM catch
1987				0.8	14.3	15.1
1988				0.8	12.0	12.9
1989		3.1 <sup>1</sup>		1.5	11.0	12.5
1990	10.0	2.75 <sup>1</sup>		1.7	10.2	11.9
1991	12.0	8.55		0.8	11.6	12.3
1992		10.5	15.0	0.7	13.0	13.7
1993		10.5	15.0	1.1	12.6	13.7
1994		12.6	18.0			

(Weights in '000 t); <sup>1</sup>EU zone only.

**Historical development of the fishery:** Swedish and Norwegian catches increased, while Danish catches decreased. Overall, total landings have remained fairly stable in the last 9 years.

**State of stock:** Both total and spawning stock biomass increased from 1990 to 1993 and SSB is presently about average.

Norwegian and Swedish effort increased; Danish effort decreased. Estimated F decreased in 1993 compared to the high value in 1992.

According to Norwegian surveys the 1993 year class is about average and the 1992 year class is still estimated to be well above average. Owing to a series of good year classes the stock will increase to a high level in 1994 and then decline slightly.

Details given in Table 3.4.3.

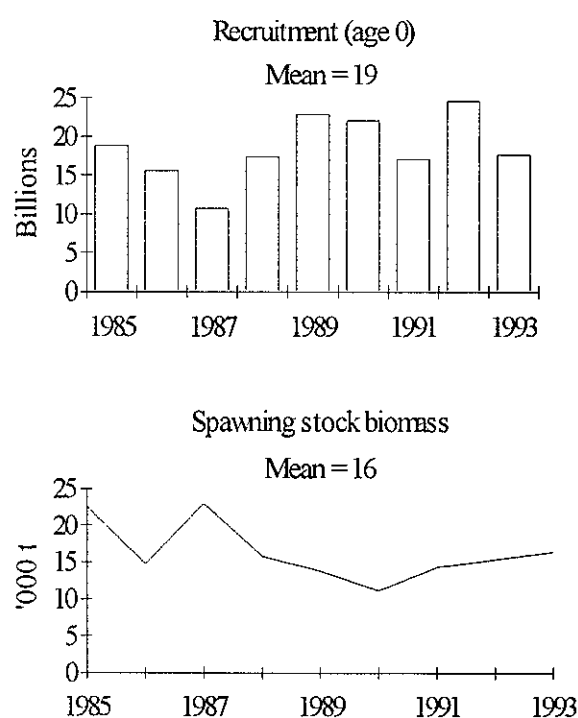
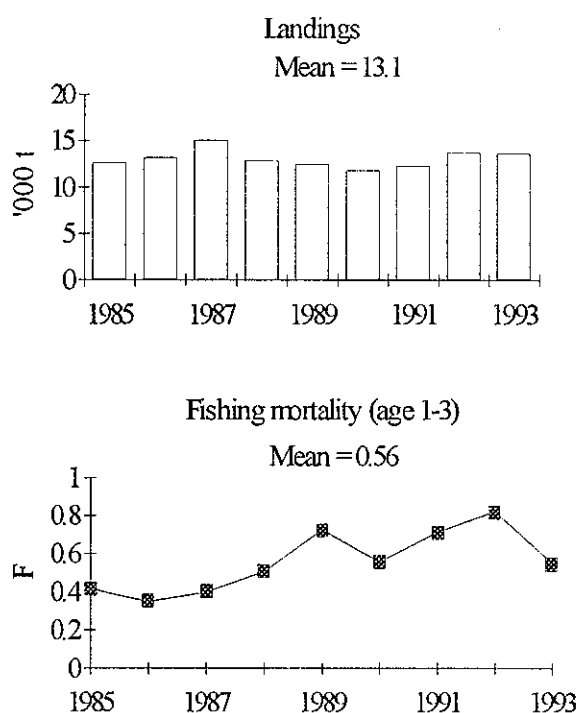
**Forecast:** Two forecasts have been carried out, one assuming *status quo* fishing mortality, the other assuming that the TAC of 18,000 t will be taken in 1994.

Assuming that fishing mortality in 1994 equals that in 1993 (0.55) the following catch forecast was derived:

1994: SSB=19,600 t; F=0.55; (Basis:F(94)=F(93)); catch= 12,750 t;

Option	Basis	F (95)	SSB (95)	Catch (95)	Lndgs (95)	SSB (96)
A	0.4 F(93)	0.22	20.8	6.1	5.2	24.5
B	0.6 F(93)	0.33	20.3	8.7	7.8	22.1
C	0.8 F(93)	0.44	19.8	11.1	10.2	20.1
D	1.0 F(93)	0.55	19.3	13.2	12.3	18.3
E	1.2 F(93)	0.66	18.8	15.2	14.3	16.6

(Weight in '000 t)





Catch at F-status quo in 1995 will result in a stable and high SSB in 1995 and 1996.

If the TAC of 18,000 t is taken in 1994, the following catch forecast was derived:

1994: SSB=19,600 t; F=0.87; (Basis: TAC); catch = 18,000 t.

Option	Basis	F	SSB	Catch	Lndgs	SSB
		(95)	(95)	(95)	(95)	(96)
A	0.4	0.22	17.3	5.3	4.4	22.5
	F(93)					
B	0.6	0.33	16.9	7.5	6.6	20.4
	F(93)					
C	0.8	0.44	16.4	9.6	8.7	18.6
	F(93)					
D	1.0	0.55	16.0	11.5	10.6	17.0
	F(93)					
E	1.2	0.66	15.6	13.2	12.3	15.5
	F(93)					
F	1.6	0.88	15.2	16.2	15.3	14.0
	F(93)					

(Weight in '000 t)

The catch at status quo F will result in a decrease in SSB in 1995 from its high level in 1994, but SSB will increase again in 1996.

**Management advice:** The stock is considered to be well within safe biological limits.

**Special comments:** In previous years, the final forecast has been given at the autumn meeting of ACFM based on the results of the Norwegian survey. This year, the survey is scheduled for a later date and the results will not be available to ACFM. The stock will therefore not be considered by ACFM at its meeting in October-November 1994.

**Data and assessment:** Age-based assessment tuned using effort data from three fleets. Recruitment estimates from surveys.

**Source of information:** Report of the Working Group on *Nephrops* and *Pandalus* Stocks, March 1994 (C.M.1994/Assess:12)

### 3.4.2 *Pandalus borealis* in Division IVa - Fladen Ground

Catch data (Table 3.4.4):

Year	ACFM landings
1987	8.0
1988	1.2
1989	3.0
1990	2.1
1991	0.5
1992	1.6
1993	2.0

(Weights in '000 t).

The catches have fluctuated widely.

**State of stock:** Not known.

**Forecast:** Not available.

**Management advice:** No management advice is given.

**Special comments:** The stock is composed of only 3-4 age groups and is therefore very dependent on the magnitude of annual recruitment. Very good recruitment information is required if short-term predictions are to be made. The effort in this fishery in recent years has also been very dependent on the market price for shrimp.

**Data and assessment:** Catch data were updated. No assessment has been presented for this stock since 1992.

**Source of information:** Report of the Working Group on *Nephrops* and *Pandalus* Stocks, March 1994 (C.M.1994/Assess:12)

### 3.4.3 *Pandalus borealis* in Division IVb - Farn Deep

Catch data (Table 3.4.5):

Year	ACFM Landings
1987	0.39
1988	0.50
1989	0.25
1990	0.14
1991	+
1992	+
1993	0

(Weights in '000 t)

**Historical development of the fishery:** This is a sporadic fishery which reached a peak in the mid- to late 1980s but declined rapidly to zero landings in 1993. The reason is not thought to be a low stock level, rather a reduction in market price and a drop in demand.

**Data and assessment:** Few data are available and no assessments were attempted.

**Source of information:** Report of the Working Group on *Nephrops* and *Pandalus* Stocks, March 1994 (C.M.1994/Assess:12).

## 3.5 Demersal stocks in the North Sea

### 3.5.1 Overview

ACFM recommends that the fishing effort in 1995 in the directed fisheries on North Sea roundfish, except saithe, is reduced significantly and on a sustained basis relative to effort levels in the most recent years.

A significant reduction is, as a minimum, a reduction to 70% of the effort level in recent years implemented in such a way that a similar reduction in fishing mortality is achieved.

For saithe, plaice and sole, separate recommendations are given under the respective stocks.

The main demersal stocks harvested for human consumption purposes (cod, haddock, saithe, whiting, sole and plaice) are all intensively exploited. The recent fishing mortality rates for all the stocks, except for saithe, are the highest in their respective historical series.

The high exploitation level has resulted in the roundfish stocks and the fisheries on them being entirely dependent on the irregular occurrence of abundant year classes. For some of these stocks the low spawning stock biomass in recent years has been accompanied by a series of poor year classes. If the present level of fishing mortality is maintained in the future all these stocks are expected to remain close to or outside safe biological limits for long periods, possibly interrupted by short temporary periods of recovery when a good year class is produced.

The data available from scientific sources for the assessment of these stocks are relatively good. Most biological sampling of commercial landings has been maintained and discard data are available for haddock and whiting. However, the restrictive TACs of recent years have caused a significant part of the catch of some species to go unreported. This clearly may introduce substantial bias into conventional assessments and inevitably leads to poorer quality results. In 1993 the main stocks affected by misreporting were cod, and in some areas, saithe. Where possible, corrections to the official estimates of landings have been made to account for the missing catch. Unlike 1991 and 1992 it does not appear that haddock was subject to any significant misreporting in 1993.

The roundfish stocks, particularly cod, haddock, and whiting are subjected to a high exploitation rate which removes approximately 60% of the biomass each year. This makes the fisheries on them highly dependent on recruiting year classes and makes catch forecasting difficult.

The present situation for the stocks is that:

- The SSB of cod has stabilised at approximately 60,000t though there is some uncertainty about the 1992 year class which seems to be poor. Present indications are that

the 1993 year class may be strong. Thus, in the short term a small recovery in the stock might be expected. Medium term projections, however, demonstrate that the underlying problem of heavy exploitation remains. Any recovery is, therefore, not likely to be sustained.

A notable feature of the cod fishery during 1993 was that catch rates in the northern North Sea were higher than expected from the depleted state of the stock, whereas in the southern North Sea vessels had difficulty reaching their quotas. This may indicate a change in distribution of the stocks, which needs to be investigated.

- Although haddock have been more abundant in recent years due to a series of better than average year classes, the recovery has not been as strong as predicted and vessels have been unable to take their quotas. This means the fishery has been effectively unconstrained. The 1993 year class seems to be poor, so some halt to the recovery can be expected. Preliminary indications of the 1994 year class are that it is strong, and further recovery may occur in the future.
- The assessment of whiting has always been of lower precision than the assessment for other stocks and estimates of recruitment from surveys do not correlate well with the VPA. An analysis of survey data has shown that the VPA and survey data estimate different historical stock trends. The surveys suggest that the SSB is declining from a peak in the early 1990s while the VPA indicates a stable SSB over the last decade.
- The saithe stock is still at a low level but has stabilised and the SSB now indicates a recovery.
- Recent trends in the SSB of sole have been upwards but in 1993 SSB has declined. However, the 1991 year class appears to be strong and should augment the SSB in 1994. Catches in 1993 were close to the TAC, which does not appear to have been particularly restrictive. Unallocated landings were the lowest for many years.
- Landings data for plaice have been substantially revised for 3 recent years. This has resulted in a downward revision of the stock size. This may explain why the catch predictions in recent years tended to be too high. The consequence of this has been that TACs have not been restrictive. Current estimates of the SSB show it to be declining from a peak in 1989 to about 253,000t. This is below the historical low value of 300,000t. There is evidence that the growth rate of plaice has reduced recently and this may ultimately affect the estimates of recruitment.

ACFM considers that the stock of cod is at present outside safe biological limits, whereas the stock of saithe is considered to be close to safe biological limits. Although the stock of haddock is considered to be within safe biological limits, it is by no means sure that this position will be maintained in the medium term. For whiting the

SSB is at a historical minimum. Plaice is considered to be outside safe biological limits, whereas sole is considered to be within such limits.

For plaice ACFM recommends a reduction in fishing mortality of 20% in order to allow the stock to return to safe biological limits in the medium term.

In view of the critical state of the cod stock, the increasing time period with low cod recruitment and the fact that continued haddock recruitment at the high level seen in recent years is without precedent, ACFM is of the opinion that strong, efficient and immediate measures must be taken to improve the situation.

Management considerations for North Sea roundfish stocks are complicated because, to varying degrees, they are caught simultaneously by various fleets in mixed fisheries. Saithe is the only stock which to a large extent is caught in single species fisheries and for which recommendations and management can be applied separately.

ACFM has for many years recommended reductions in fishing mortality, particularly in view of the situation for both cod and haddock. These recommendations were translated into TACs. However, this procedure did not result in decreases in fishing mortality rates. The reasons for this were discussed at length in the 1990 and 1991 reports of ACFM.

Therefore, since 1990, ACFM has refrained from advising a TAC and has recommended that fishing effort in the directed fisheries on North Sea Roundfish stocks, except saithe, should be limited to 70% of the effort in recent years. This was a compromise taking into consideration the fact that the demersal stocks are caught in mixed fisheries and that a total closure of the cod fisheries would amount to closing most demersal fisheries in the North Sea. In 1992 and 1993, in view of the deterioration of the situation for saithe, it was furthermore recommended that, for saithe "the fishing mortality . . . be reduced by 30%". ACFM has also stressed that a reduction in effort should be seen as a long-term strategy regardless of short-term fluctuations in fishing mortality.

ACFM reiterates its view that:

- seen in isolation the effort on cod should be reduced to zero in the short term,
- a significant and sustained reduction in overall effort in the directed fisheries on North Sea roundfish is a necessity if these stocks are to recover and be maintained within safe biological limits in the future,
- the fishing mortality on saithe should not be increased to enable the stock to recover further inside safe biological limits.

Although various regulations have been implemented the assessments of these stocks, with the exception of saithe, indicate that the regulations have so far failed to achieve the primary objective - to reduce fishing mortality. Fishing mortalities for cod, haddock and whiting, have not decreased and are at a historical high level.

In view of this and considering that a significant reduction in fishing effort is a necessity for the long-term recovery of all the stocks, ACFM is of the opinion that significantly stronger measures for effort reduction than those taken so far should be implemented.

**ACFM, therefore, recommends, as in 1993, that the fishing effort in 1995 in the directed fisheries on North Sea roundfish, except saithe, is reduced significantly and on a sustained basis relative to effort levels in the most recent years.**

A significant reduction is, as a minimum, a reduction to 70% of the effort level in recent years implemented in such a way that a similar reduction in fishing mortality is achieved.



### 3.5.2 Cod in Sub-area IV (North Sea)

#### Catch data (Tables 3.5.2 - 3.5.3):

Year	Rec. TAC	Agreed TAC	Off. Lndgs.	ACFM catch
1987	<125	175	167	175
1988	≤148	160	142	150
1989	<124	124	110	116
1990	113	105	99	105
1991	<sup>1</sup>	100	86	89
1992	<sup>1</sup>	100	98	97
1993	<sup>1</sup>	101	95	105
1994	<sup>2</sup>	102	-	-

<sup>1</sup>30% reduction in fishing effort relative to 1989.

<sup>2</sup>Significant reduction in fishing effort. Weights in '000 t.

**Historical development of the fishery:** Cod are mainly taken in directed fisheries using fixed gears, together with haddock and whiting in mixed roundfish fisheries using towed gears, and also as a by-catch in flatfish fisheries.

**State of stock:** Spawning stock biomass is at an historical low level and is well below MBAL (150,000 t). Only two year classes in the past 9 years have been average or above average. The stock is considered to be outside safe biological limits.

Details given in Table 3.5.3.

**Forecast for 1995:** Effort having not been reduced, ACFM assumed that fishing mortality in 1994 would be the same as in 1993 in making projections:

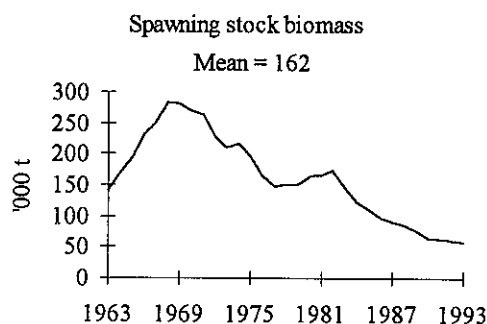
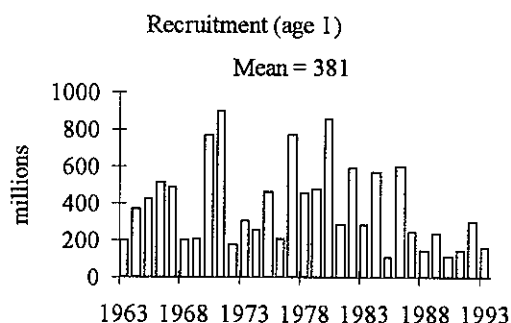
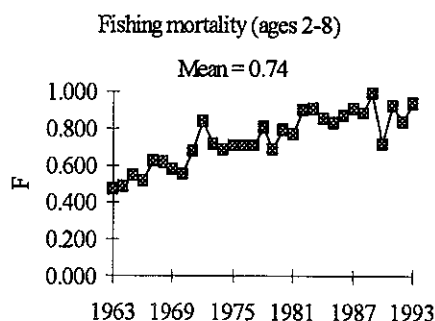
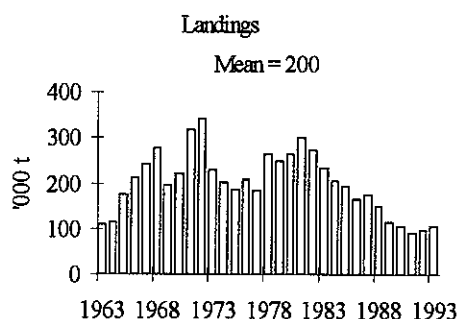
SSB(94)=63, F(94) = 0.94, Basis: F(94)=F(93)Catch(94) = 143, Landings (94) = 143.

Option	Basis	F (95)	SSB (95)	Catch (95)	Lndgs (95)	SSB (96)
A	0.0	0.00	69		0	180
B	0.2F93	0.19	69		46	150
C	0.4F93	0.38	69		84	125
D	0.6F93	0.56	69		118	105
E	0.7F93	0.66	69		132	96
F	0.8F93	0.75	69		146	88
G	1.0F93	0.94	69		170	74

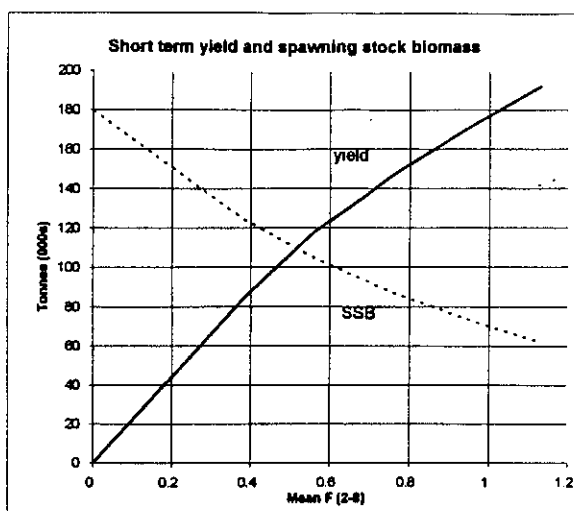
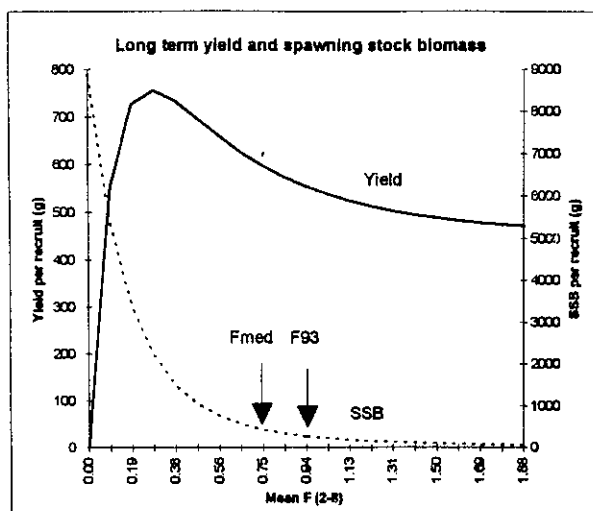
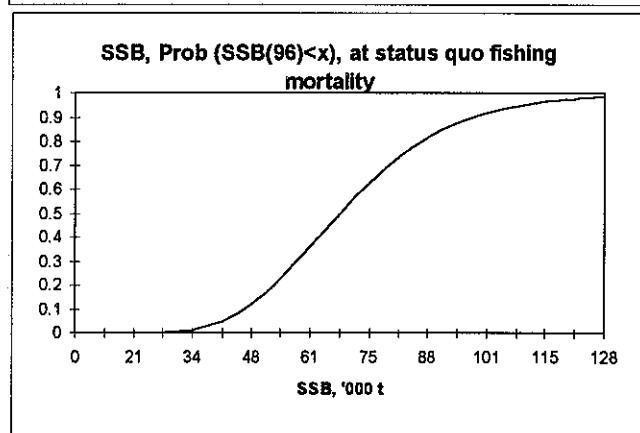
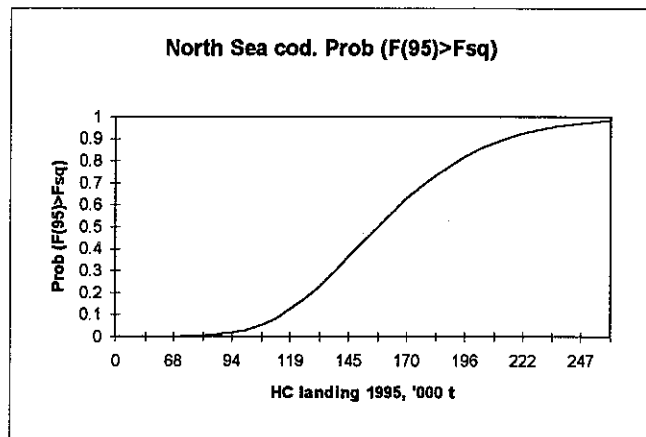
Weights in '000 t.

To reach the MBAL of 150,000 t in the short term requires that fishing mortality be reduced by at least 80% in 1995. The *status quo* option leads to an increase in SSB, due to the recruitment of a few good recent year classes, but this increase would be temporary.

Probability profiles indicate that a landings level around 130,000 t in 1995 is associated with a low (25%) probability of an increase in fishing mortality in 1995 compared with 1993. A landings level around 180,000 will on the other hand be associated with a 75% probability of fishing mortality increasing in 1995. If the 1993 fishing



mortality is maintained through 1995 there is a high (around 90%) probability that the SSB will be below 100,000 t in 1996. This is illustrated in the two figures below.



**Medium-term considerations:** Medium-term simulations indicate that SSB has a high probability of decreasing further at current levels of fishing mortality, whereas an increase is expected if fishing mortality is reduced by 30%. This is illustrated in the four figures at the foot of the page which show the time trajectories of the 5%, 25% 50%, 75% and 95% percentiles of the distributions of predicted human consumption yield and SSB for the two simulations.

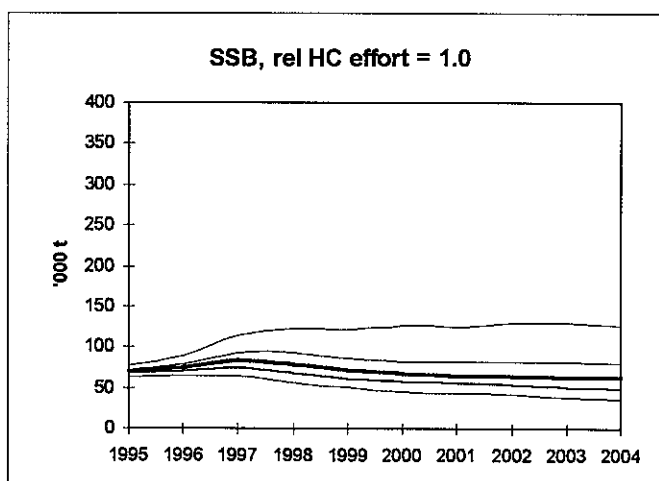
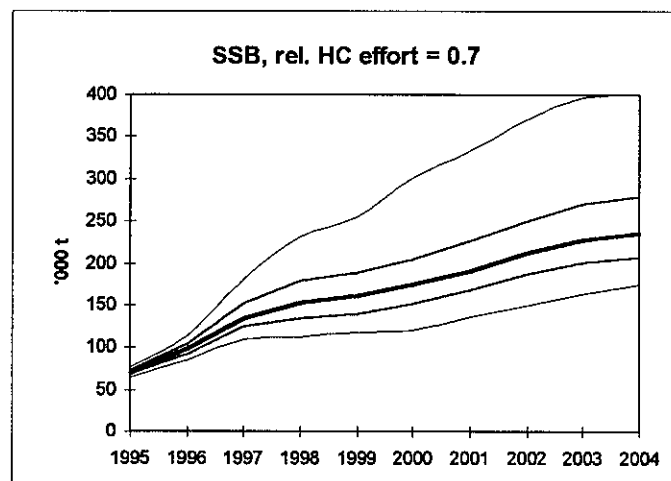
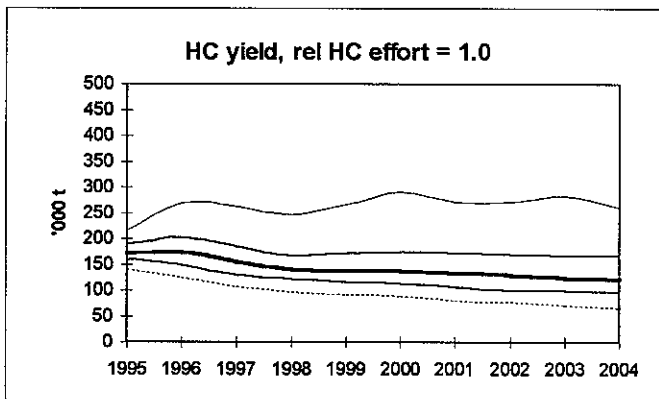
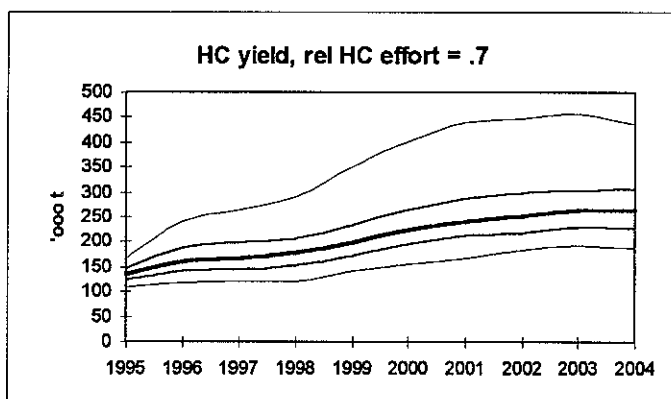
**Management advice:** ACFM recommends that the fishing effort in 1995 in the directed fisheries on North Sea roundfish, except saithe, is reduced significantly and on a sustained basis relative to effort levels in the most recent years.

**Special comments:** A significant reduction in fishing effort is, as a minimum, a reduction to 70% of the effort level in recent years, implemented in such a way that a similar reduction in fishing mortality is achieved.

In recent years, changes in the distribution seem to have taken place. Cod appears to be relatively scarce in the southern North Sea, but more abundant in the northern North Sea.

**Data and assessment:** Analytical assessment based on landings, survey and CPUE data. Discard data were only available for some fleets and were not used. Catch-at-age data considered reliable. Estimates of unreported landings up to 10% of the catch have been included in the assessment.

**Source of information:** Report of the Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak, October 1994 (C.M.1995/Assess: 8).







### 3.5.3 Haddock in Sub-area IV (North Sea)

#### Catch data (Tables 3.5.4.-3.5.5):

Year	Rec TAC	Agreed TAC	Off. Indgs	Hum.Con Indgs	Disc slip.	Indust Bycatch	ACFM catch
1987	<120	140	109	108	59	4	172
1988	<185	185	105	105	62	4	171
1989	<68	68	64	76	27	2	104
1990	50	50	43	51	32	3	87
1991	<sup>1</sup>	50	44	45	40	5	90
1992	<sup>1</sup>	60	51	70	48	11	129
1993	<sup>1</sup>	133	80	80	80	11	170
1994	<sup>2</sup>	160	-	-	-	-	-

<sup>1</sup>30% reduction in fishing effort relative to 1989.

<sup>2</sup>Significant reduction in fishing effort. Weights in '000 t.

**Historical development of the fishery:** Haddock are taken as part of a mixed fishery along with cod and whiting.

**State of stock:** Apart from 1993, all year classes since 1990 have been above average. This has resulted in an increase in the spawning stock from the historical low in

1991. At current levels of  $F$ , the stock will continue to be dependent upon the strength of incoming year classes. 0-group surveys suggest that the 1994 year class may be above average.

Despite the high level of fishing mortality ( $> F_{med}$ ), the stock is considered to be within safe biological limits.

Further details in Table 3.5.5.

#### Forecast for 1995:

SSB(94) = 194,  $F(94) = 1.00^1$ , Basis:  $F(94)=F(93)$ , Catch(94) = 259, Landings <sup>2</sup>(94) = 155.

Option	Basis	F (95) <sup>1</sup>	SSB (95)	Catch (95)	Lnogs <sup>2</sup> (95)	Disc. (95)	Bycatch (95) <sup>3</sup>	SSB (96)
A	0.4 F93	0.40	158	114	62	36	16	233
B	0.6 F93	0.60	158	153	84	53	16	205
C	0.7 F93	0.70	158	170	94	60	15	193
D	0.8 F93	0.80	158	186	103	68	15	182
E	1.0 F93	1.00	158	215	118	82	15	163
F	1.2 F93	1.20	158	241	131	96	14	147

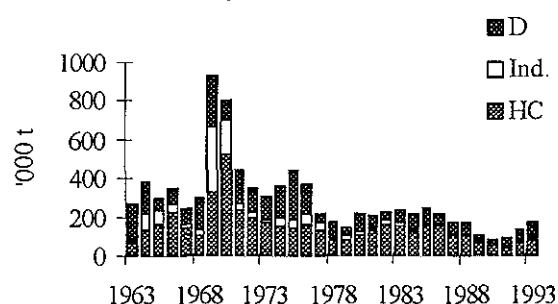
Weights in '000 t.

<sup>1</sup>Human consumption landings + discards

<sup>2</sup>Human consumption only

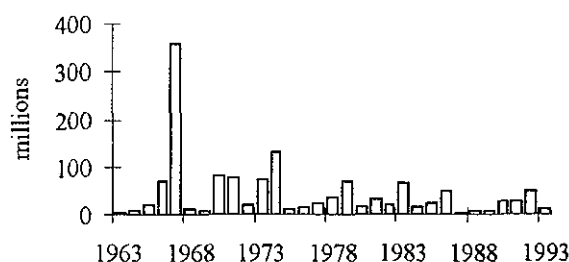
<sup>3</sup>All assume  $F(ind)95 = F(ind)93 = 0.03$ .

Landings and discards



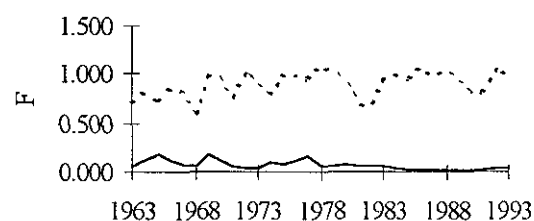
Recruitment (age 0)

Mean = 45



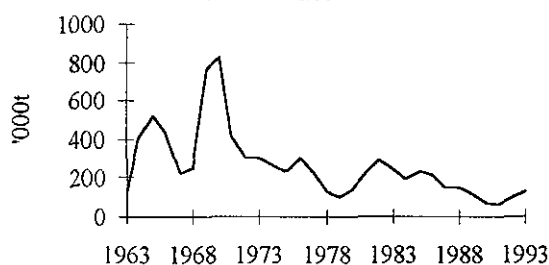
Fishing mortality

..... HC+D — Ind



Spawning stock biomass

Mean = 265



Ind = Industrial bycatch.  
HC = Human consumption.  
D = Discards.

For all options, SSB is expected to remain within safe biological limits in the short term. However, the forecast is not of high precision. Much of this is due to the dependence of the forecast on recruiting year-classes whose abundance cannot be determined precisely.

**Medium-term considerations:** Medium-term projections indicate that at the current level of exploitation there is a high probability that SSB will remain around its present level, and that it will increase if fishing mortality is reduced by 30%. Yield would be similar under both options.

**Management advice:** ACFM recommends that the fishing effort in 1995 in the directed fisheries on North Sea roundfish, except saithe, is reduced significantly and on a sustained basis relative to effort levels in the most recent years.

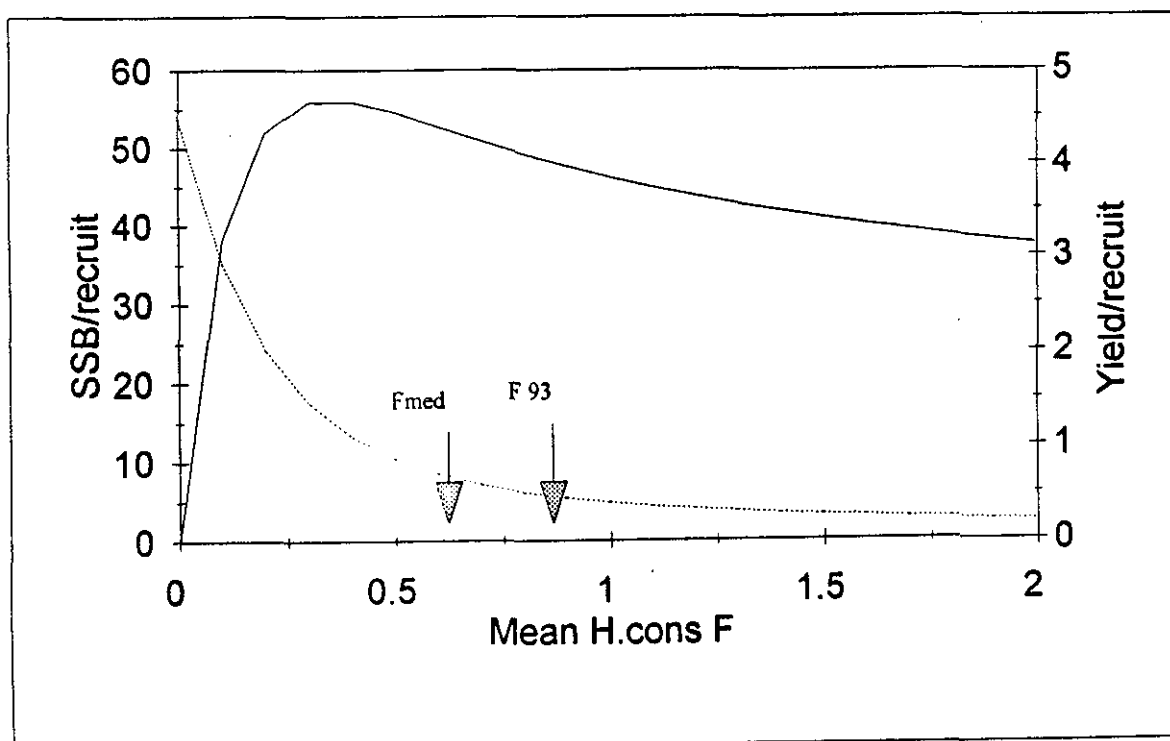
**Special comments:** A significant reduction in fishing effort is, as a minimum, a reduction to 70% of the effort level in recent years, implemented in such a way that a similar reduction in fishing mortality is achieved.

The forecast for 1995 is strongly dependent upon the strength of the 1992 year class which is estimated to be the largest since 1986.

**Data and assessment:** Analytical assessment using catch, effort and survey data. Previous assessments were hampered by mis-reporting leading to unreliable forecasts. There seem to have been no major mis-reporting problems in 1993.

**Source of information:** Report of the Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak, October 1994 (C.M.1995/Assess:8).

Haddock, North Sea.  
Human consumption yield and spawning stock per recruit.



### 3.5.4 Whiting in Sub-area IV (North Sea)

#### Catch data (Tables 3.5.6-3.5.7):

Year	Rec. TAC	Agreed TAC	Off. Indgs.	Hum.Con. Indgs.	Indust. bycatch	Disc. slip	ACFM catch
1987	127	135	65	64	16	54	132
1988	134	120	66	52	49	28	127
1989	115	115	40	41	43	36	118
1990	130	125	41	43	51	55	147
1991	- <sup>1</sup>	141	47	47	38	34	117
1992	- <sup>1</sup>	135	47	46	27	31	102
1993	- <sup>1</sup>	120	47	48	20	43	111
1994	- <sup>1</sup>	100	-	-	-	-	-

<sup>1</sup>30% reduction in fishing effort relative to 1989.

<sup>2</sup>Significant reduction in fishing effort. Weights in '000 t.

**Historical development of the fishery:** The fishery for whiting is part of a mixed fishery also for cod and haddock. Human consumption landings are stable but at lower levels than in the 1980s. A significant part of the landings is by-catch in the industrial fishery.

**State of stock:** VPA estimates indicate that SSB has been stable since 1984, whereas an analysis using survey data indicates that it has increased during 1986-1992, followed by a decrease. However, the stock is probably within safe biological limits.

Further details in Table 3.5.7.

#### Forecast for 1995:

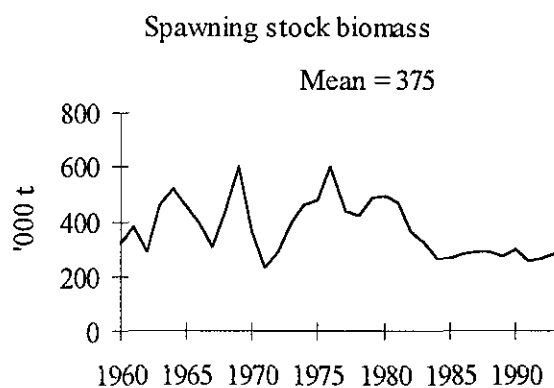
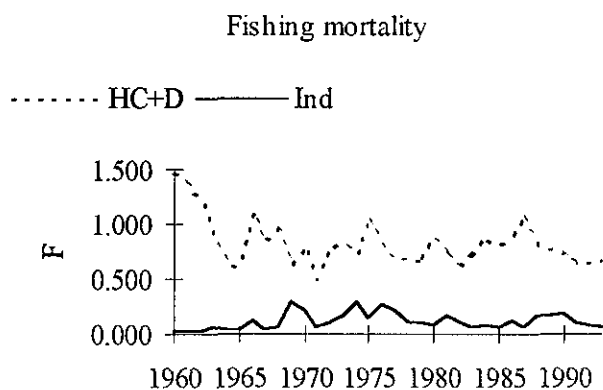
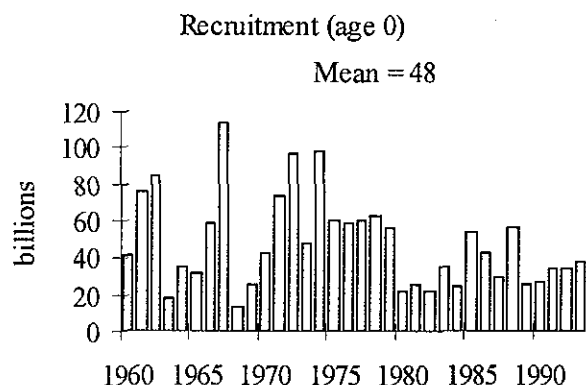
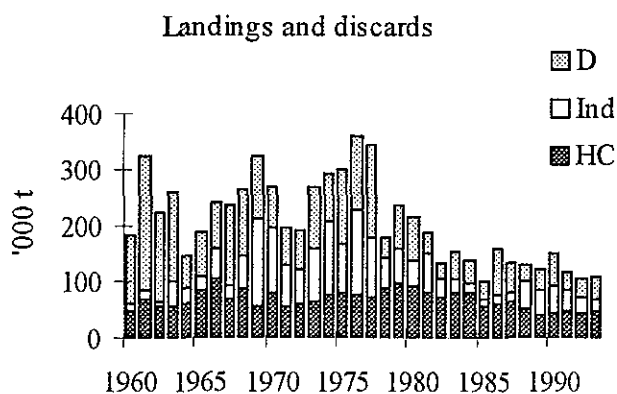
SSB(94) = 297, F(94) = 0.68<sup>1</sup>, Basis: F(94)=F(93) ,  
Catch(94) = 119, Landings (94) = 75.

Option	Basis /F93	F(95) <sup>1</sup>	SSB (95)	Catch (95)	h.c. land. (95)	Disc -ards (95)	ind.by catch (95) <sup>2</sup>	SSB (96)
A	0.4	0.27	325	75	26	21	28	412
B	0.6	0.41	325	95	37	31	28	393
C	0.7	0.47	325	104	42	35	27	384
D	0.8	0.54	325	113	46	40	27	376
E	1.0	0.68	325	130	55	48	26	360
F	1.2	0.82	325	145	63	56	26	346

Weights in '000 t.

<sup>1</sup>Human consumption landings + discards.

<sup>2</sup>All assume F(ind)95 = F(ind)93 = 0.06.



**Ind** = Industrial bycatch.  
**HC** = Human consumption.  
**D** = Discards.

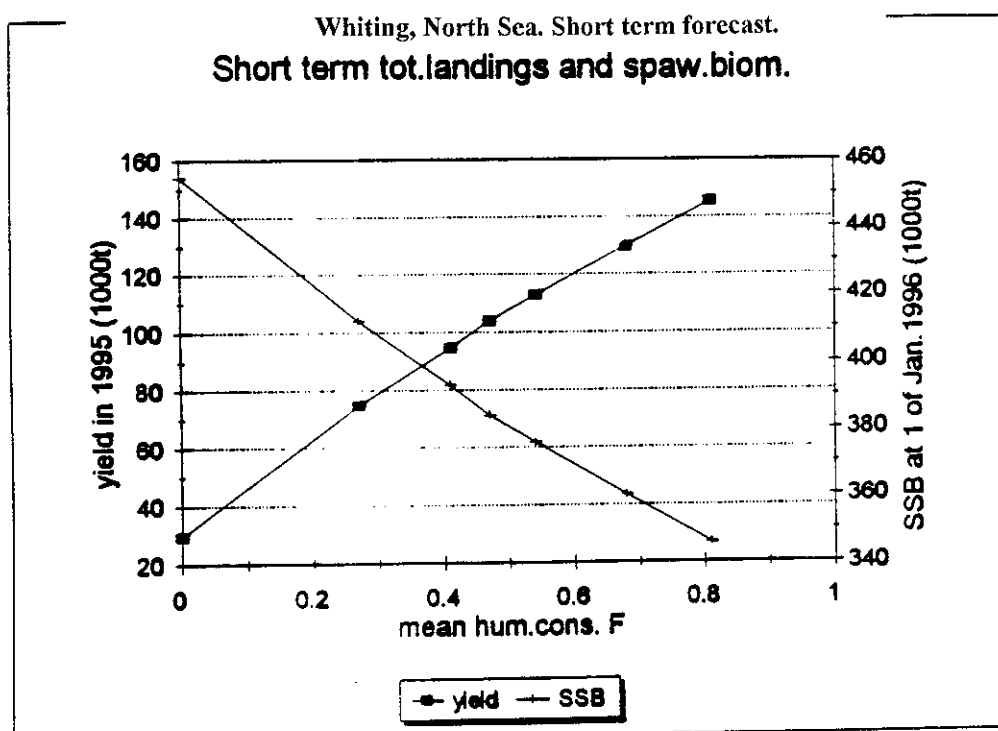
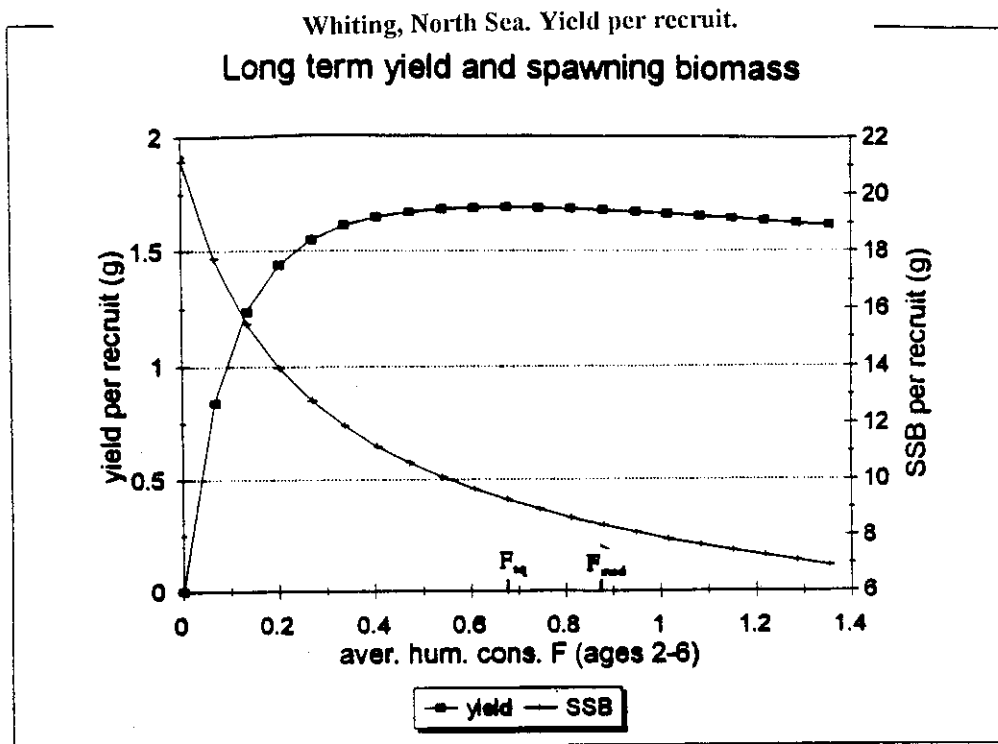
All options indicate an increase of SSB in the short-term. However, the forecast is not of high precision. Much of this is due to the dependence of the forecast on recruiting year-classes whose abundance cannot be determined precisely.

**Management advice:** ACFM recommends that the fishing effort in 1995 in the directed fisheries on North Sea roundfish, except saithe, is reduced significantly and on a sustained basis relative to effort levels in the most recent years.

**Special comments:** A significant reduction in fishing effort is, as a minimum, a reduction to 70% of the effort level in recent years, implemented in such a way that a similar reduction in fishing mortality is achieved.

**Data and assessment:** Analytical assessment based on landings, survey and cpue-data. Discards extrapolated from Scottish data. Uncertainties and conflicting trends in the assessment.

**Source of information:** Report of the Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak, October 1994 (C.M.1995/Assess:8)



### 3.5.5 Saithe in Sub-area IV and Division IIIa (North Sea)

#### Catch data (Tables 3.5.8-3.5.9):

Year	Rec. TAC	Agreed TAC	Off. Indgs.	ACFM catch
1987	<198	173	154	149
1988	156	165	113	105
1989	170	170	92	92
1990	120	120	85	88
1991	125	125	93	99
1992	≤102	110	94	93
1993	93	93	108	105
1994	72	97		

Weights in '000 t.

**Historical development of the fishery:** Saithe is mainly taken in a directed trawl fishery which started in the beginning of the 1970s. The French, Norwegian and German catches make up about 80% of the total international catch.

**State of stock:** Total biomass and spawning stock biomass show a continuous downward trend until 1990 when they were at historically low levels, but the present assessment indicates some improvement of the stock. Fishing mortality has shown a decreasing trend since 1986. The stock is considered to be close to safe biological limits.

Further details in Table 3.5.9.

#### Forecast for 1995:

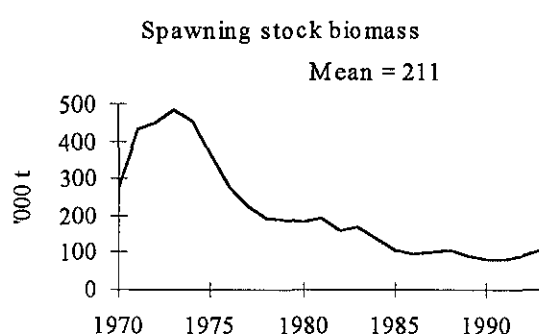
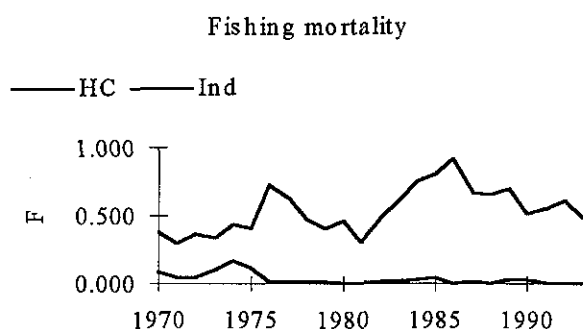
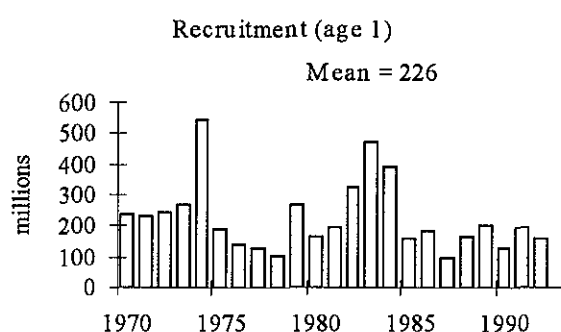
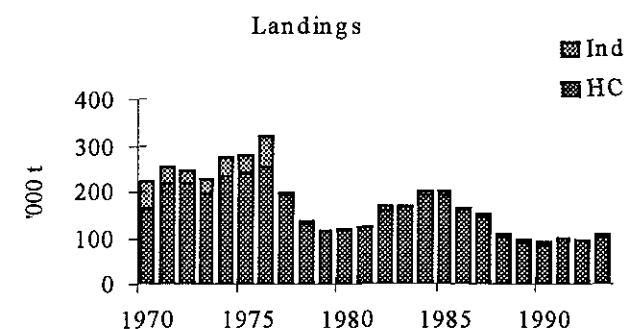
SSB(94) = 99, F(94) = 0.48, Basis:  $F_{94} = F_{93}$ , Catch(94) = 97, Landings (94) = 97.

Option	Basis	F (95)	SSB (95)	Catch (95)	Landgs. <sup>1</sup> (95)	SSB (96)
A	0.4F(93)	0.19	115	49	49	169
B	0.6F(93)	0.29	115	70	70	153
C	0.7F(93)	0.34	115	80	80	145
D	0.8F(93)	0.39	115	89	89	138
E	1.0F(93)	0.48	115	107	107	125

Weights in '000 t.

<sup>1</sup> Human consumption + Industrial by-catch

Under all options, SSB is expected to increase in the short term. However, this forecast is based on estimates of population numbers in 1994 and recruitment both of which are not well determined.



Ind = Industrial bycatch.  
HC = Human consumption.

**Management advice:** As the stock is close to safe biological limits, any increase in fishing mortality would have a high probability of leading the stock outside safe biological limits. ACFM, therefore, recommends that the fishing mortality in 1995 should not be increased.

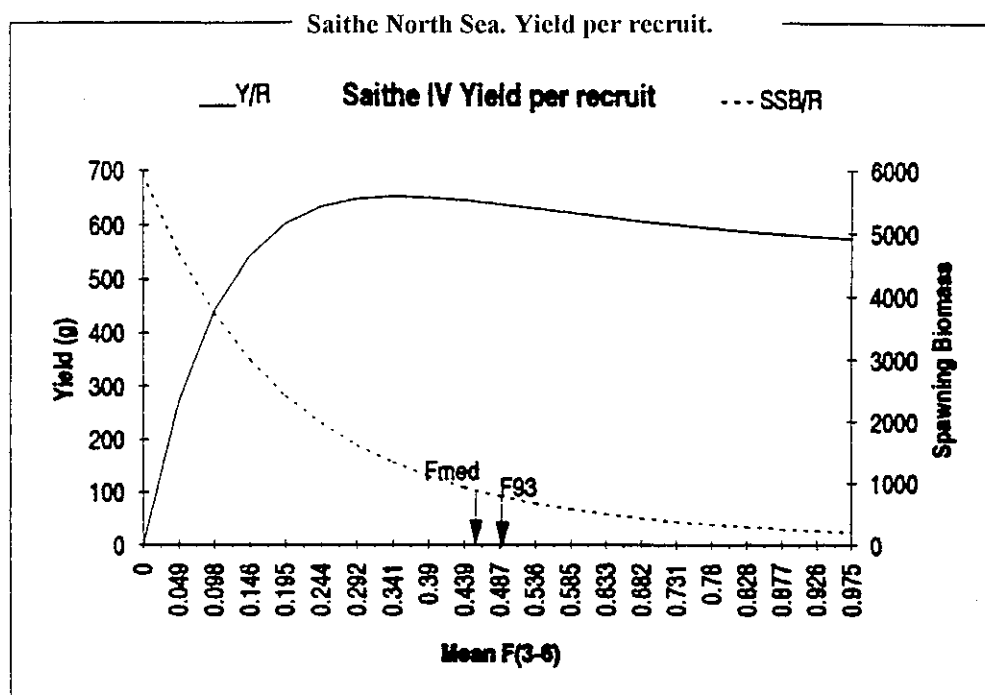
**Special comments:** This assessment is consistent with the previous ones, but the lack of recruitment indices for recent and incoming year classes remains a problem for catch predictions.

During 1993 the monthly saithe quotas for certain fleets were very rapidly exhausted suggesting that the assessment had been too pessimistic. Similar problems have occurred during 1994.

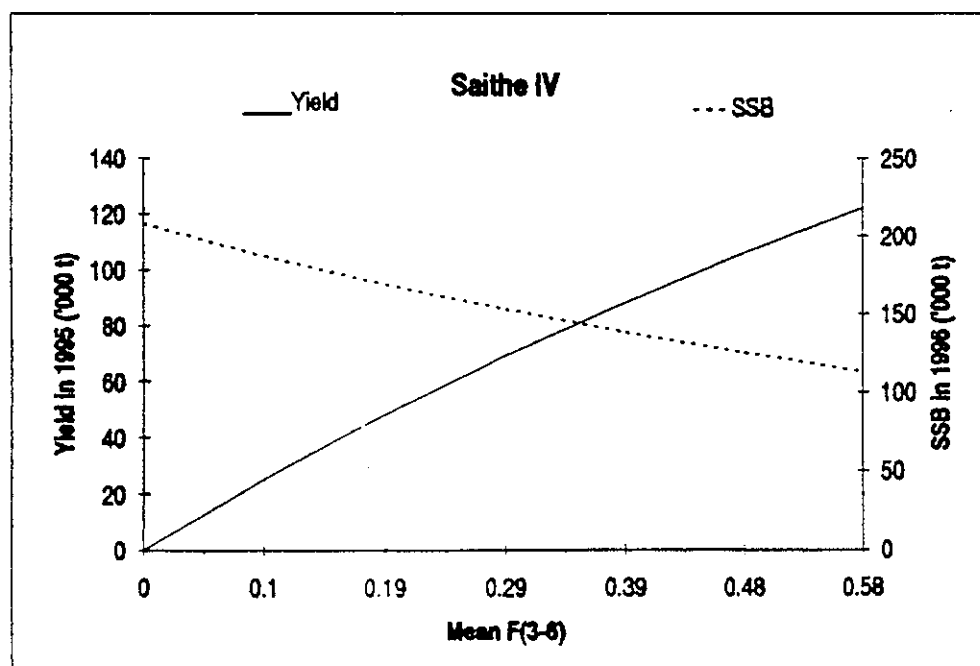
It is difficult to judge whether the problems were caused by the TAC being set at a lower level of fishing mortality than intended, or whether it was simply a problem related to the allocation of quotas.

**Data and assessment:** Analytical assessment of catch-at-age data using CPUE.

**Source of information:** Report of the Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak, October 1994 (C.M.1995/Assess:8).



Saithe North Sea. Yield and SSB in the short term prediction.



### 3.5.6 North Sea plaice

Catch data (Tables 3.5.10 and 3.5.11):

Year	Rec. TAC	Agreed TAC	Off. Lndgs.	ACFM catch
1987	120	150	131	154
1988	150	175	138	154
1989	<175	185	152	170
1990	171	180	155	156
1991	169	175	143	147
1992	<sup>1</sup>	175	123	125
1993	<sup>1</sup>	175	115	110
1994	<sup>1</sup>	165	-	-

<sup>1</sup>No long-term gain in increasing F. Weights in '000 t.

**Historical development of the fishery:** North Sea plaice is taken mainly in a mixed flatfish fishery by beam trawlers in the southern and south-eastern North Sea. Directed fisheries are also carried out with seine and gill net, and by beam trawlers in the central North Sea. Due to the minimum mesh size (80 mm) in the mixed beam trawl fishery, large numbers of plaice are discarded. Since 1989, an area with high concentrations of undersized plaice ("plaice box") was closed for beam trawl fisheries with vessels >300 hp during the second and third quarter, and, since 1994, during the fourth quarter as well. Exemption fleets of vessels ≤300 hp were allowed to fish inside the

box and their effort more than doubled between 1989-1993. A report on the effects of the North Sea "plaice box" was issued by ACFM to the Commission of the European Union at its meeting in May 1994.

**State of stock:** Fishing mortality has increased steadily since the 1950s and is currently at a record high level. Spawning stock biomass has varied in relation to good recruitment, but has declined to a historical low in 1994. Since the mid 1980s a decrease has been observed in mean weights at age which has intensified the recent reduction in yield and SSB.

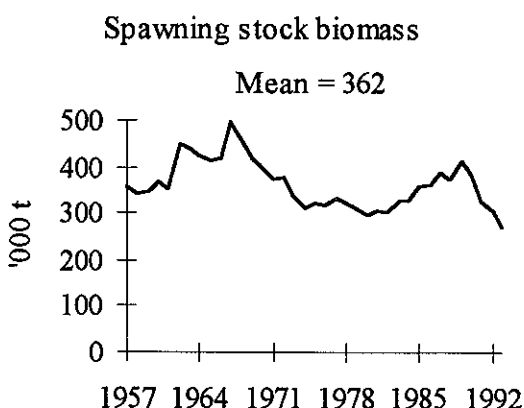
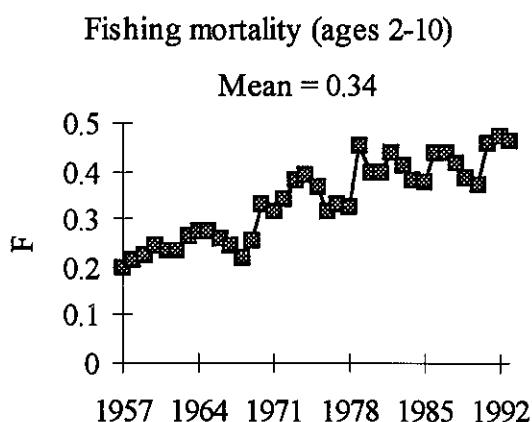
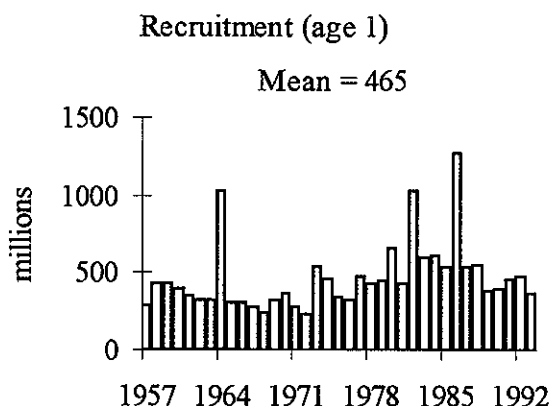
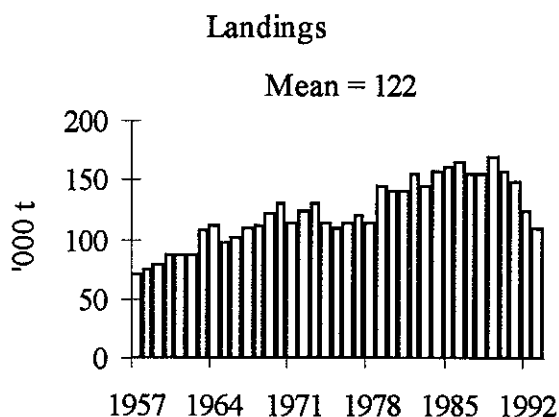
The stock is considered to be outside safe biological limits. Further details in Table 3.5.11.

#### Forecast for 1995:

SSB(94) = 253, F(94) = 0.46, Basis: F(94) = F(93), Catch(94) = , Landings (94) = 113.

Option	Basis	F (95)	SSB (95)	Catch (95)	Lndgs (95)	SSB (96)
A	0.0	0.00	236	0	0	348
B	0.2F(93)	0.09	236	25	25	323
C	0.4F(93)	0.19	236	48	48	301
D	0.6F(93)	0.28	236	69	69	281
E	0.8F(93)	0.37	236	87	87	263
F	F(93)	0.46	236	104	104	247

Weights in '000 t.





Fishing mortality in 1995 has to be reduced by 60% to increase SSB to the historical low level of 300,000 t observed before the recent decline.

**Medium-term considerations:** At *status quo* fishing mortality there is a 75% probability that SSB will continue to decline. With a 20% reduction in fishing mortality, SSB will increase and there is a 50% probability that it will reach 300,000 t in the medium term. The results of this analysis are dependent on the assumption that recruitment is independent of spawning stock biomass.

**Management advice:** SSB is at a historically low level. At current levels of fishing it is predicted to decrease further. To prevent SSB from decreasing further, **ACFM recommends a significant reduction in fishing mortality in 1995.**

**Special comments:** To achieve a significant reduction in fishing mortality requires, as a minimum, a reduction to 80% of the effort level in 1993, implemented in such a way that a similar reduction in fishing mortality is achieved. The corresponding catch in 1995 is 87,000 t. At this level of fishing mortality, a spawning stock close to 300,000 t would be reached within about 4 years.

In the previous two years, a large discrepancy between the *status quo* catch forecast and the realised catch occurred, which suggested that the assessment overestimated the stock size. In the current assessment, this discrepancy

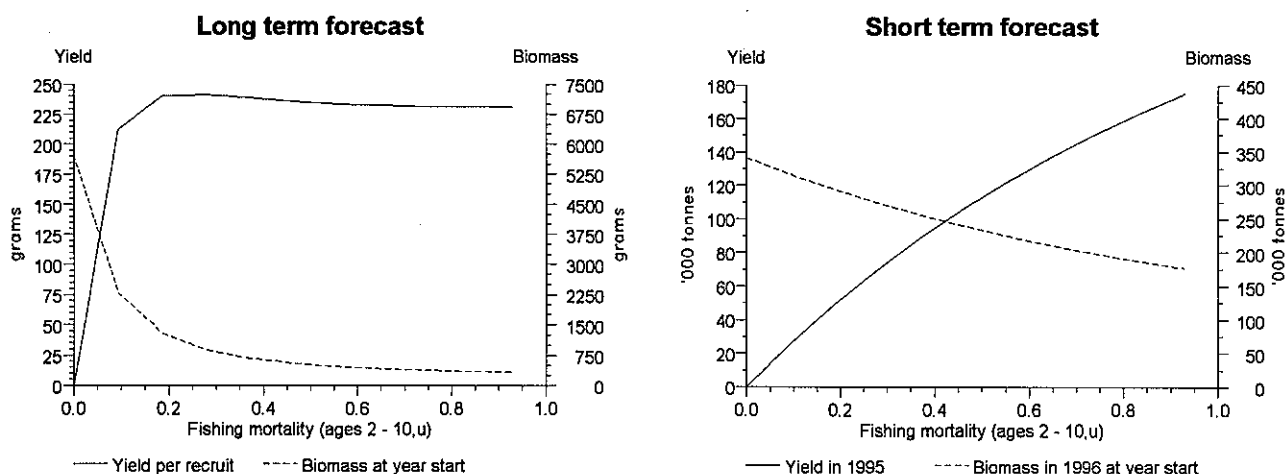
appears to have been resolved, due to a downward revision of unreported landings in 1988, 1990 and 1991. Therefore, this year's assessment is considered to be much more reliable, and indicates a significant reduction in SSB in recent years.

The recent fall in SSB is due partly to a decrease in the growth rate, partly to a decrease in the level of recruitment, and to an increase in fishing mortality. Effective protection of undersized fish through a closed area would help to enhance recruitment to the fisheries (see report on the effects of the North Sea "plaice box" issued to the Commission of the European Union in May 1994).

**Data and assessment:** Assessment based on analytical analysis of age compositions based on a sampling programme covering 90% of the landings. Recruitment estimates are based on pre-recruit surveys covering all important nursery grounds. Fishery-independent survey data available to evaluate trends in stock numbers of recruited fish. Forecasts use indices from 1994 surveys.

**Source of information:** Report of the Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak, October 1994 (C.M.1995/Assess:8). During the meeting of ACFM new indices from 1994 surveys were made available, and a new short-term forecast was made.

## Yield and Spawning Stock Biomass



### 3.5.7 North Sea sole

Catch data (Tables 3.5.12 and 3.5.13):

Year	Rec. TAC	Agreed TAC	Off. Indgs.	ACFM catch
1987	11.0	14.0	13.8	17.4
1988	11.0	14.0	13.4	21.6
1989	14.0	14.0	14.4	21.8
1990	25.0	25.0	26.4	35.1
1991	27.0	27.0	27.6	33.5
1992	21.0	25.0	31.2	29.3
1993	-	32.0	29.1	31.2
1994	<sup>1</sup>	32.0		

<sup>1</sup>No long-term gain in increasing F. Weights in '000 t.

**Historical development of the fishery:** Sole is mainly taken by beam trawl fleets in a mixed fishery for sole and plaice in the southern part of the North Sea. The minimum mesh size permitted in this fishery is 80 mm. Beam trawl fleets started to develop in the mid-sixties and have been expanded up to the present. A part of the catch is taken in a directed fishery by gill-netters in coastal areas, mostly in the 2nd quarter of the year. Since 1989, the distribution pattern of the beam trawl fleets > 300 HP has changed due to the introduction of the "Plaice Box" in the south-eastern part of the North Sea.

**State of stock:** The spawning stock is presently above average, and is well above the minimum biologically

acceptable level (35,000 t). Fishing mortality is stable at a high level. Recruitment is highly variable. The stock is considered to be within safe biological limits.

Further details in Table 3.5.13

#### Forecast for 1995:

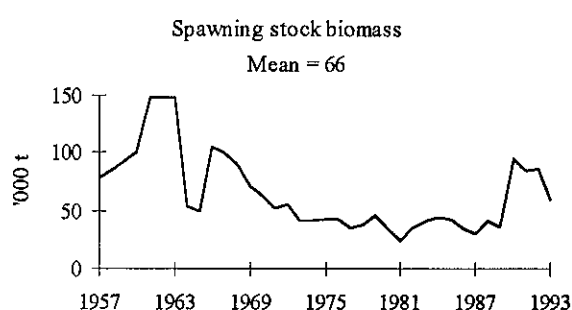
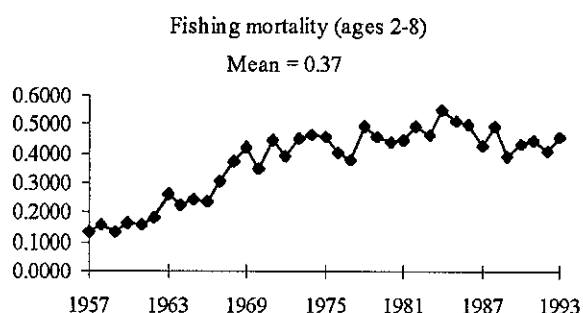
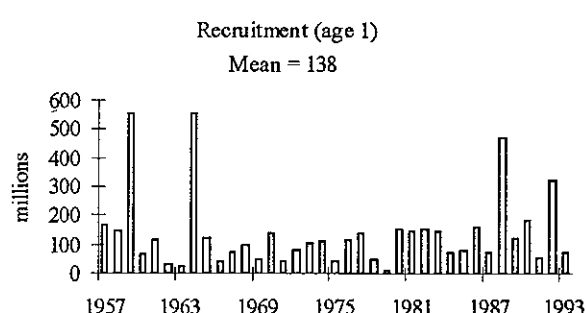
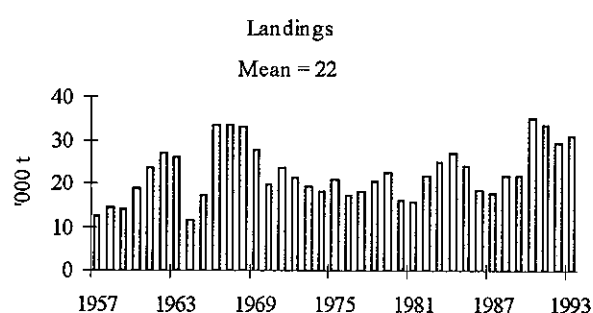
SSB(94) = 91, F(94) = 0.46, Basis: F(94)=F(93), Catch(94) = , Landings (94) = 38 .

Option	Basis	F (95)	SSB (95)	Catch (95)	Lndgs (95)	SSB (96)
A	0.4F(93)	0.18	71		13	69
B	0.6F(93)	0.27	71		18	63
C	0.8F(93)	0.37	71		23	57
D	F(93)	0.46	71		28	52
E	1.2F(93)	0.55	71		32	48

Weights in '000 t

For all options the spawning stock is expected to decrease in 1996 compared to 1994.

**Medium-term considerations:** Medium-term analyses indicate that at the present level of fishing mortality the spawning stock is expected to decrease to the level observed in the 1970s and 1980s. Equilibrium analyses indicate that the probability of the spawning stock decreasing below 35,000 t is 20% at the present fishing mortality level. If the fishing mortality is reduced to 80% of the present level, the probability that this will occur will be reduced to about 5%.



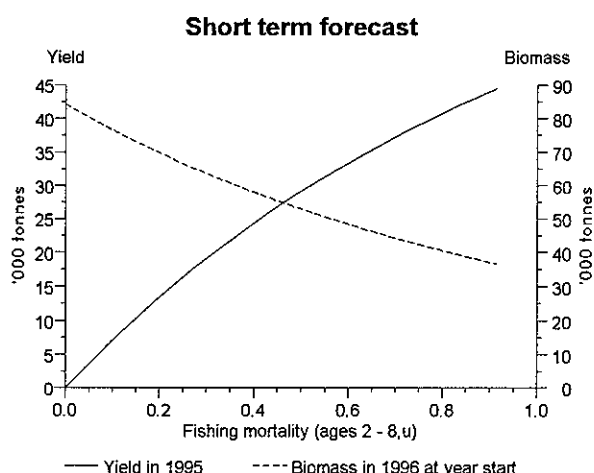
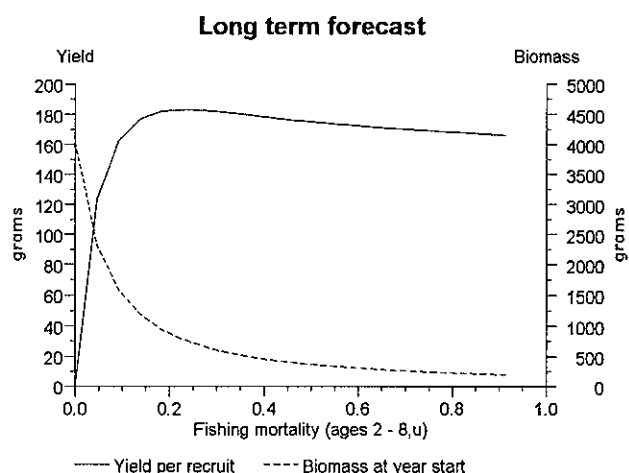
**Management advice:** There are no long-term gains in yield by increasing fishing mortality above the current level.

Sole is mainly taken in a mixed fishery with plaice, and management measures should take into account the recommended reduction in fishing mortality on plaice.

**Data and assessment:** The analytical assessment is based on catch, survey and CPUE data. The estimates of unreported landings in 1993 were the lowest since 1982. Forecasts use indices from 1994 surveys.

**Source of information:** Report of the Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak, October 1994 (C.M.1995/Assess:8). During the meeting of ACFM new indices from 1994 surveys were made available, and a new short-term forecast was made.

### Yield and Spawning Stock Biomass



### **3.6 Demersal Stocks in the Eastern English Channel (Division VIIId)**

#### **3.6.1 Overview**

Landings of cod and whiting are both at historically low levels while landings of sole remain near their peak and landings of plaice have decreased.

The database for both cod and whiting remains poor with uncertainties over the level of landings and no information on discards. Data have improved since 1986 for sole and since 1989 for plaice, with landings from all countries being sampled for age. No discard data, however, are available for either of the flatfish stocks.

The assessments for cod and whiting indicate inconsistencies with the databases. For both species this may be partly due to the linkage between the stocks in Division VIIId and those in the North Sea.

The SSB of cod remains near its historical minimum and recruitment since 1985 has been poor. Fishing mortality has fluctuated with no apparent trend but remains high.

The SSB of whiting is also at an historical low level but appears to have been stable since 1987.

The SSB of sole remains close to its historical low level but is likely to recover, since 4 out of 5 recent year classes seem to have been above average.

Plaice is mainly caught as a by-catch in the fishery for sole. In the second half of the year, however, there is also directed fishery by inshore vessels. Stock trends are similar to those in the North Sea, with an even stronger decline in SSB since 1988. Plaice seemed to be scarce, and quotas were not taken. Recent recruitment has been around average.

Since 1980 there has been an overall increase of effort by trawlers, especially in the English trawl fleet since 1988. The fisheries with fixed nets have slightly declined or remained stable since 1990-1991. French offshore trawler effort has been more or less stable since 1991, while the inshore effort has decreased.

### 3.6.2 Cod in Division VIId (Eastern English Channel)

Catch data (Table 3.6.1):

Year	Rec. TAC	Agreed TAC	Off. Indgs.	ACFM catch
1987	-	-	9.4	14.2
1988	-	-	10.1	9.4
1989	-	-	n/a	5.5
1990	-	-	n/a	2.7
1991	-	-	n/a	1.9
1992	-	-	2.7	2.7
1993	-	-	n/a	2.4
1994	<sup>1</sup>	-		

<sup>1</sup>Precautionary. Weights in '000 t.

**Historical development of the fishery:** Cod is mainly taken in a mixed fishery by English and French offshore trawlers and to a lesser extent by inshore fixed netters. The largest catches are made during the first quarter and at the end of the last quarter. In the Channel the minimum mesh size for trawls was increased from 75 to 80 mm in 1989.

**State of stock:** The spawning stock biomass is currently at its historical minimum. During 5 out of the last 6 years, the year classes spawned have been of below average strength. Fishing mortality is high and the stock is outside safe biological limits.

**Forecast for 1995:** Uncertain. At current levels of fishing mortality, assuming geometric mean recruitment for the year classes since 1992, a catch of 4,900 t is predicted for 1995.

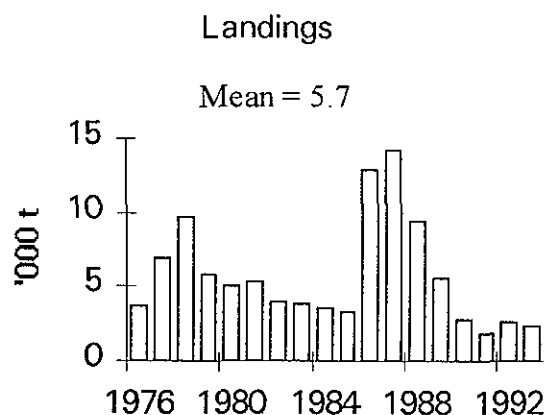
**Management advice:** ACFM recommends that the fishing effort in 1995 is reduced significantly and on a sustained basis relative to effort levels in the most recent years, taking into account a possible link with the cod in the North Sea.

**Special comments:** A significant reduction in fishing effort is, as a minimum, a reduction to 70% of the effort level in recent years, implemented in such a way that a similar reduction in fishing mortality is achieved.

This stock is managed by means of a TAC that applies to all of Sub-area VII (except VIIa).

**Data and assessment:** Analytical assessment based on CPUE data for one fleet only. No recruitment index is available. Results from this assessment should be treated with caution.

**Source of information:** Report of the Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak, October 1994 (C.M.1995/Assess:8).



### 3.6.3 Whiting in Division VIId (Eastern English Channel)

Catch data (Table 3.6.2):

Year	Rec. TAC	Agreed TAC	Off. Lndgs.	ACFM catch
1987	-	-	7.2	4.7
1988	-	-	7.8	4.4
1989	-	-	n/a	4.2
1990	-	-	n/a	3.5
1991	-	-	n/a	5.8
1992	-	-	5.9	5.8
1993	-	-	n/a	5.1
1994	-	-	-	-

Weights in '000 t.

**Historical development of the fishery:** Whiting is mainly taken in a mixed fishery by English and French offshore trawlers and to a lesser extent by inshore fixed netters. In the Channel the minimum mesh size for trawls was increased from 75 to 80 mm in 1989.

**State of stock:** SSB has decreased from a peak in 1979 to a stable level since 1986. Recruitment has fluctuated considerably over the period but the frequency of good year classes has decreased since 1984. The stock is close to safe biological limits.

Details are given in Table 3.6.3.

### Forecast for 1995:

Assuming GM recruitment for year classes since 1992.

SSB(94) = 8.6, F(94) = 0.67, Basis: F(94)=F(93), Catch(94) = 5.3, Landings (94) = 5.3.

Option	Basis	F (95)	SSB (95)	Catch (95)	Lndgs (95)	SSB (96)
A	0.4F(93)	0.27	9.8	4.1	4.1	11.8
B	0.6F(93)	0.40	9.8	5.2	5.2	10.7
C	0.8F(93)	0.53	9.8	6.2	6.2	9.8
D	F(93)	0.67	9.8	7.1	7.1	9.0

Weights in '000 t.

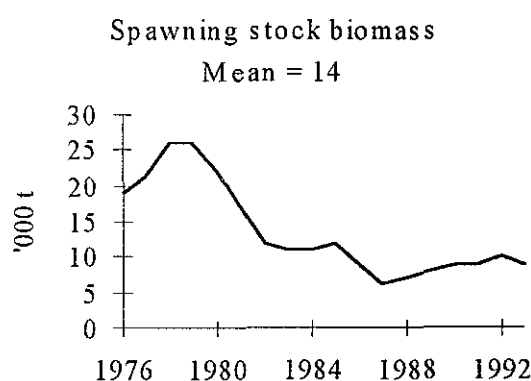
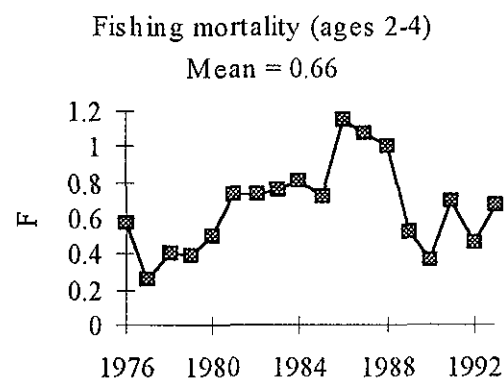
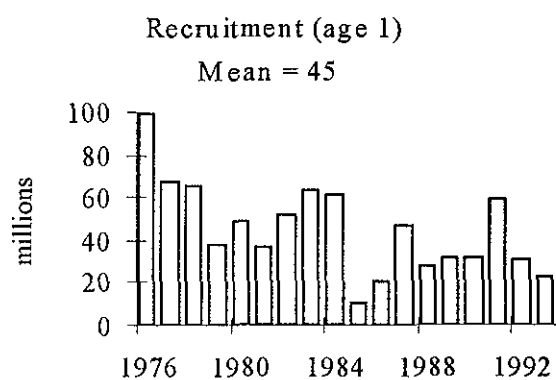
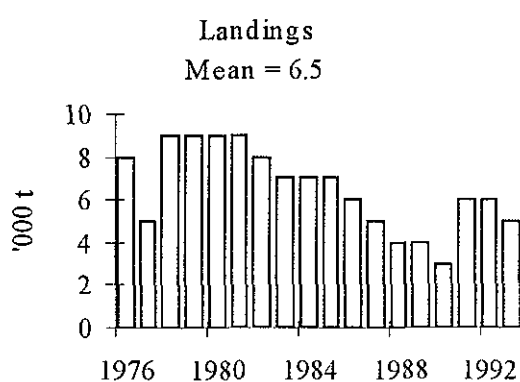
A-C: SSB increases relative to 1993 and 1994.

D: SSB stabilizes at current level.

**Management advice:** ACFM recommends that the fishing effort in 1995 is reduced significantly and on a sustained basis relative to effort levels in the most recent years, taking into account a possible link with the whiting in the North Sea.

**Special comments:** A significant reduction in fishing effort is, as a minimum, a reduction to 70% of the effort level in recent years, implemented in such a way that a similar reduction in fishing mortality is achieved.

This stock is managed by means of a TAC that applies to all of Sub-area VII (except VIIa).

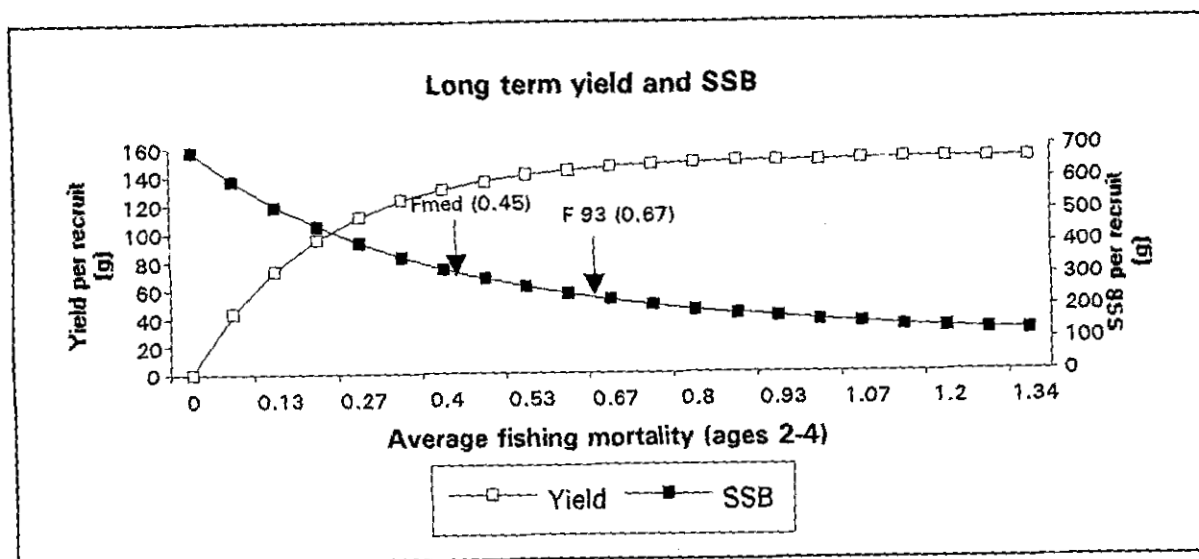


**Data and assessment:** Analytical assessment based on CPUE data for one fleet only. No recruitment index is available. Results from this assessment should be treated with caution.

**Source of information:** Report of the Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak, October 1994 (C.M.1995/Assess:8).

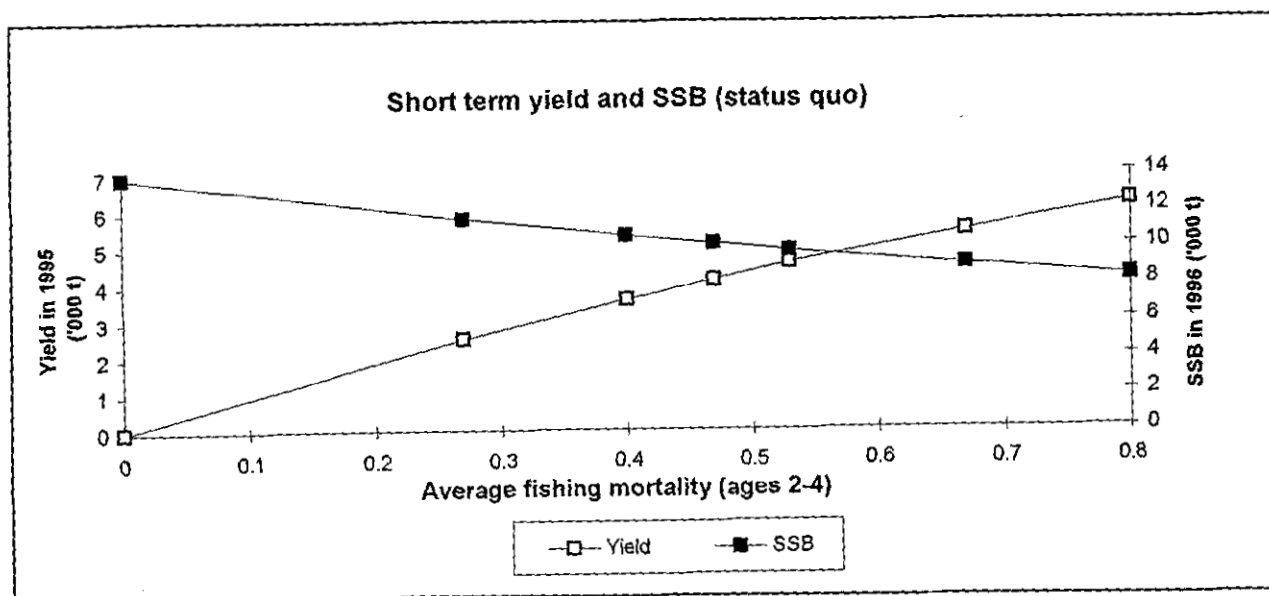
### WHITING in Division VIId.

#### Yield per recruit-Long term yield and spawning biomass.



### WHITING in Division VIId.

#### Short term yield and spawning biomass.



### 3.6.4 Sole in Division VIIId (Eastern English Channel)

Catch data (Table 3.6.4):

Year	Rec. TAC	Agreed TAC	Off. Indgs.	ACFM catch
1987	3.1	3.85	3.8	4.9
1988	3.4	3.85	3.3	3.9
1989	3.8	3.85	2.9	4.2
1990	3.7	3.85	3.0	4.0
1991	3.4	3.85	3.8	4.3
1992	≤2.7	3.5	3.8	4.1
1993	2.8	3.2	3.4	4.4
1994	<3.8	3.8		

Weights in '000 t.

**Historical development of the fishery:** The main directed fisheries are the offshore beam trawlers from England and Belgium and the inshore, mainly fixed net, fleets along the English and French coasts. Sole is also taken by the French offshore trawl fleet. Overall effort has more than doubled since the early 1980s.

**State of stock:** The spawning stock has shown a recovery after declining steadily since 1986 to near the historical minimum in 1991. Fishing mortality is stable. Although the time series is short, the stock is considered to be within safe biological limits. Further details in Table 3.6.5.

Forecast for 1995:

SSB(94) = 9.2, F(94) = 0.46, Basis: F(94) = F(93), Catch(94) = 4.3, Landings (94) = 4.3.

Option	Basis	F (95)	SSB (95)	Catch (95)	Landgs (95)	SSB (96)
A	0.4F(93)	0.19	7.5	1.7	1.7	9.4
B	0.6F(93)	0.28	7.5	2.5	2.5	8.7
C	0.8F(93)	0.37	7.5	3.2	3.2	8.0
D	(F93)	0.46	7.5	3.8	3.8	7.4
E	1.2(F93)	0.56	7.5	4.4	4.4	6.8

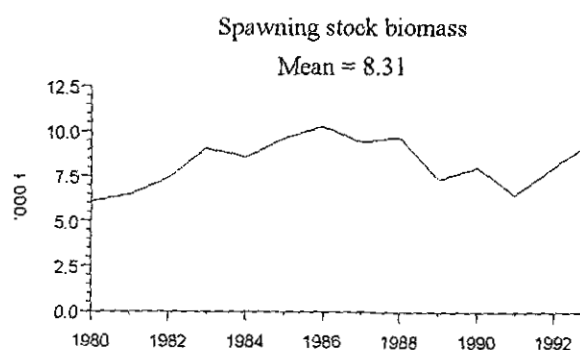
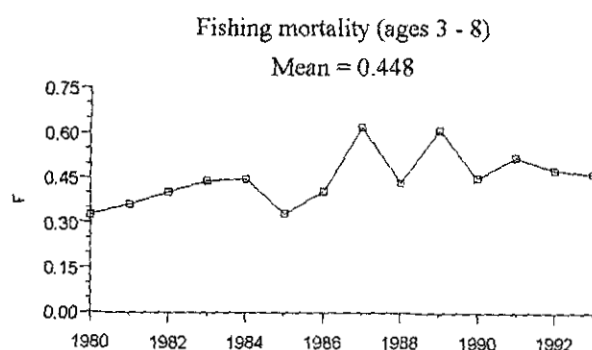
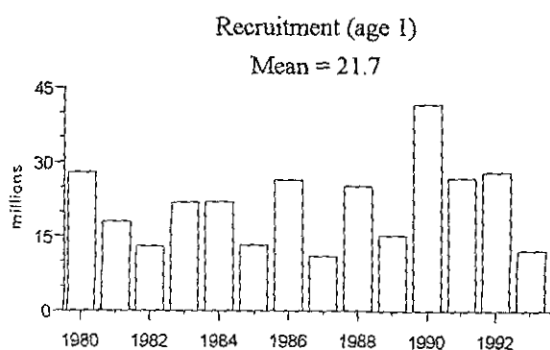
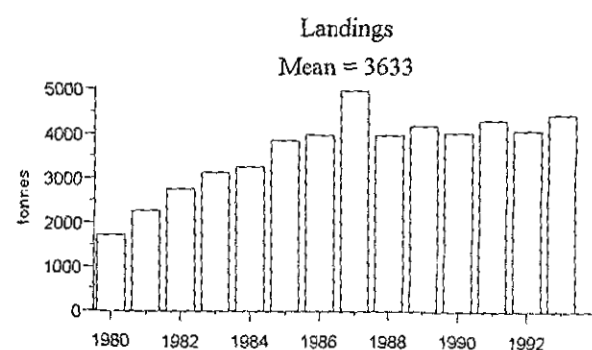
Weights in '000 t.

At present levels of fishing mortality, SSB is expected to decline in the short term.

**Management advice:** To prevent a decrease in SSB, ACFM recommends that fishing mortality should not be allowed to increase.

**Data and assessment:** Analytical assessment using data from commercial fleets and surveys. Recruitment indices available for 0, 1 and 2-group from English and French surveys. Data collected before 1983 are of poor quality.

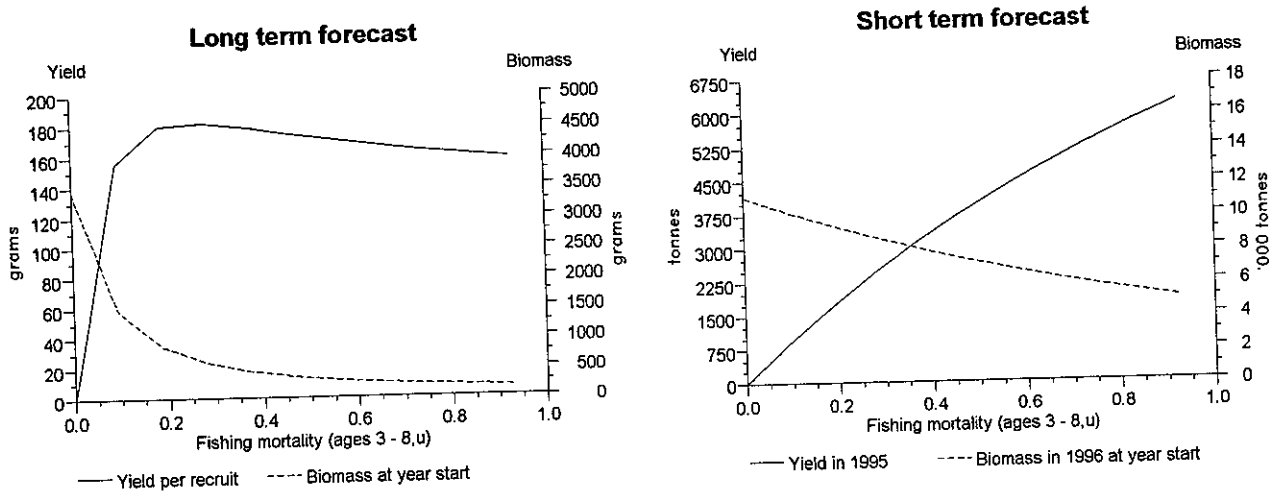
**Source of information:** Report of the Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak, October 1994 (C.M.1995/Assess:8).





3.6.4 Sole in Division VIIId (Eastern English Channel)  
continued..

Yield and Spawning Stock Biomass



### 3.6.5 Plaice in Division VIId (Eastern English Channel)

Catch data (Table 3.6.6.):

Year	Rec. TAC <sup>1</sup>	Agreed TAC <sup>1</sup>	Off. Lndgs.	ACFM catch
1987	6.8	8.3	7.9	8.4
1988	6.9	9.96	9.1	10.4
1989	11.7	11.7	6.7 <sup>2</sup>	8.8
1990	10.7	10.7	7.7 <sup>2</sup>	9.0
1991	8.8	10.7	7.4 <sup>2</sup>	7.8
1992	-	9.6	5.9 <sup>2</sup>	6.3
1993	-	8.5	4.4 <sup>2</sup>	5.3
1994	-	9.1		

<sup>1</sup>TACs for Divisions VIId,e. <sup>2</sup>For France Division VIId landings are estimated by ACFM. Weights in '000 t.

**Historical development of the fishery:** In the Channel, plaice is taken mainly in a mixed flatfish fishery by otter and beam trawlers. French offshore otter trawlers have a directed fishery in winter. Due to the minimum mesh size (80 mm) large numbers of plaice are discarded.

**State of stock:** SSB increased rapidly until 1989 following recruitment of the strong 1985 year class but is now close to the historical low. However, fishing mortality has decreased somewhat in recent years. The stock may be close to safe biological limits but the time series is too

short to evaluate this with confidence. Further details in Table 3.6.7.

#### Forecast for 1995:

SSB(94) = 7.9, F(94) = 0.48, Basis: F(94)=F(93), Catch(94) = , Landings (94) = 6.0.

Option	Basis	F (95)	SSB (95)	Catch (95)	Lndgs (95)	SSB (96)
A	0.4F(93)	0.19	8.2	-	2.6	10.5
B	0.6F(93)	0.29	8.2	-	3.7	9.6
C	0.8F(93)	0.39	8.2	-	4.7	8.7
D	F(93)=Fmed	0.48	8.2	-	5.6	7.9
E	1.2F(93)	0.58	8.2	-	6.5	7.2

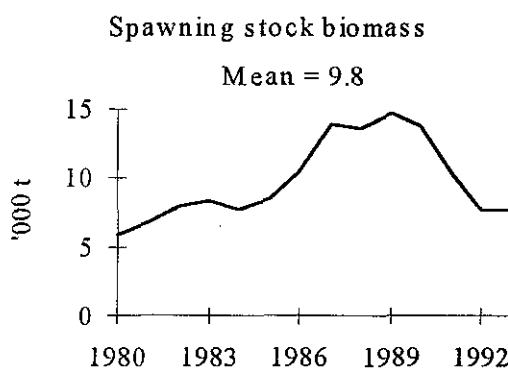
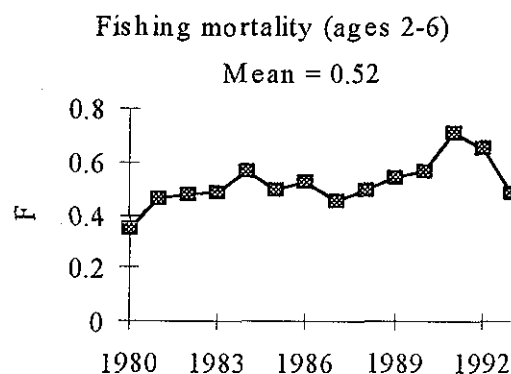
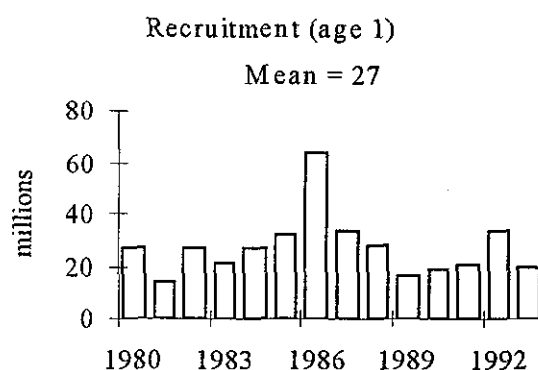
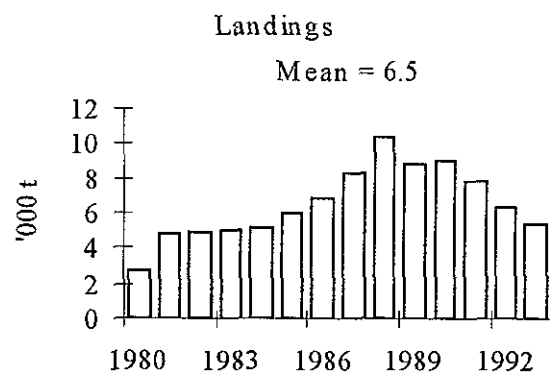
Weights in '000 t.

At fishing mortalities below the present level, SSB is expected to be stable or to increase.

**Management advice:** To prevent a decrease in SSB, fishing mortality should not be allowed to increase.

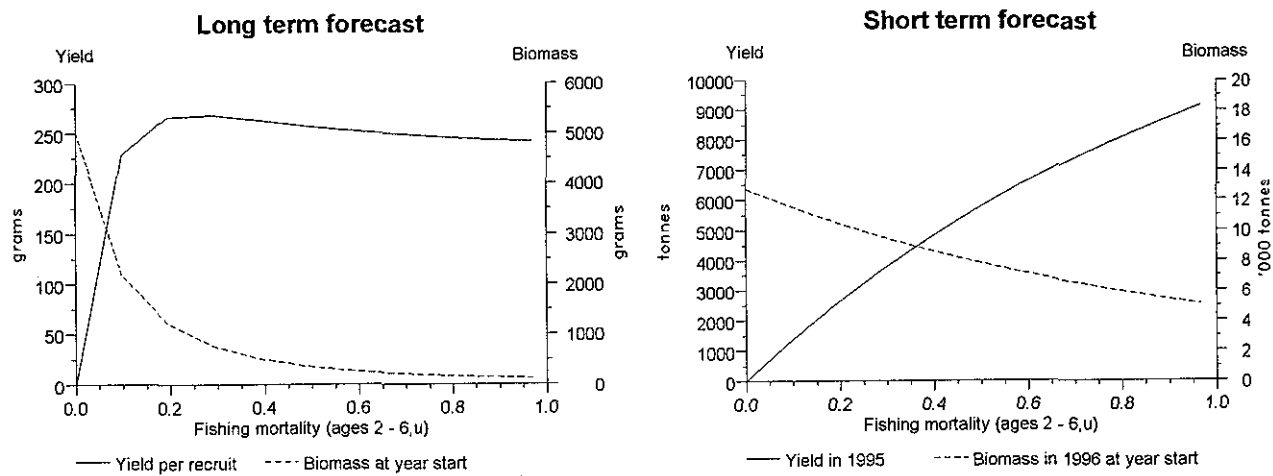
**Data and assessment:** Analytical assessment using CPUE data from 2 commercial fleets and 4 surveys. Database poor prior to 1985. Independent recruitment data available. Information on discards not available.

**Source of information:** Report of the Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak, October 1994 (C.M.1995/Assess: 8).



### 3.6.5 Plaice in Division VIIId (Eastern English Channel) continued..

#### Yield and Spawning Stock Biomass



## 3.7 Demersal stocks in Sub-area VI

### 3.7.1 Overview

The assessment of demersal stocks in Sub-area VI continued to be hampered by the poor quality of the catch data which continue to deteriorate. It has thus not been possible to make reliable short-term forecasts for most stocks because of unquantified misreporting in recent years.

All roundfish stocks were close to their lowest recorded spawning stock levels in 1993. Fishing mortalities continue to fluctuate about high levels. For cod and whiting recent recruitment has been below average with the 1992 year class amongst the lowest on record for each species. Recruitment of haddock and saithe has been around average.

The evaluation of the status of the gadoid stocks remains unchanged with fishing rates excessively high and spawningbiomasses

critically low. The stocks of cod and whiting in Division VIa and saithe in Sub-area VI are considered to be outside safe biological levels, and the Division VIa haddock stock to be at or close to the safe biological limit.

As last year, management advice concerning the roundfish stocks is to reduce fishing effort to no more than 70% of the level recorded in recent years rather than to rely on TACs by themselves.

Data are not sufficient for complete assessments of the stock status of anglerfish and megrim. A directed fishery for these species has developed in recent years and this development is further accelerated by effort being diverted onto these stocks due to restrictions on the fisheries for other stocks in the area. The few data available on anglerfish show that larger fish are disappearing from the stock and that exploitation is increasing rapidly .



### 3.7.2 Cod in Division VIa (West of Scotland)

Catch data (Tables 3.7.1 and 3.7.2):

Year	Rec. TAC	Agreed TAC <sup>1</sup>	Off. Indgs.	ACFM catch
1987	22.0	22.0	19	19
1988	16.0	18.4	19	20
1989	16.0	18.4	15.3	17
1990	15.0	16.0	11.8	12
1991	- <sup>2</sup>	16.0	10.6	11 <sup>3</sup>
1992	- <sup>2</sup>	13.5	9.0	9 <sup>3</sup>
1993	- <sup>2</sup>	14.0	11.2	10 <sup>3</sup>
1994	- <sup>2</sup>	13.0		

<sup>1</sup>TAC is for the whole of Sub-area VI. <sup>2</sup>30% reduction in fishing effort. <sup>3</sup> Not 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:** SSB has decreased since 1988 to a historical low in 1992. The occasional strong year classes have had progressively less impact on SSB due to higher levels of fishing mortality. ACFM considers that this stock

is outside safe biological limits.

Details in Table 3.7.2.

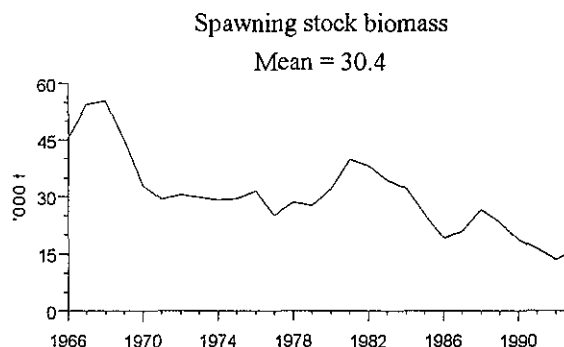
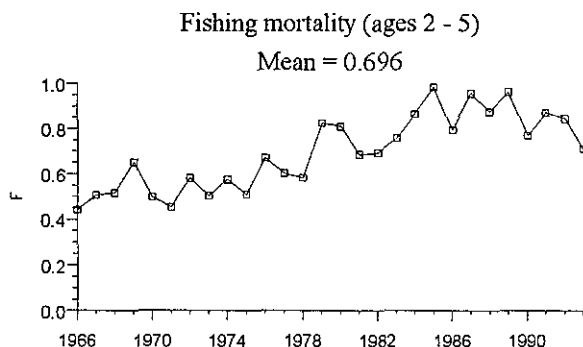
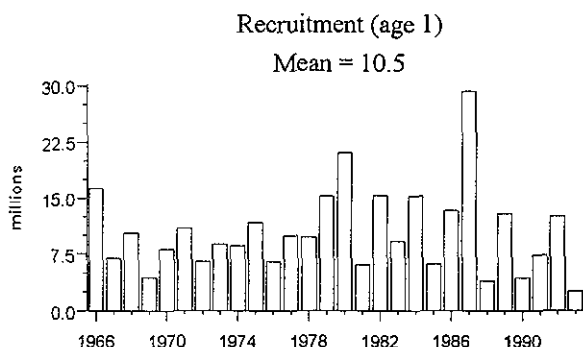
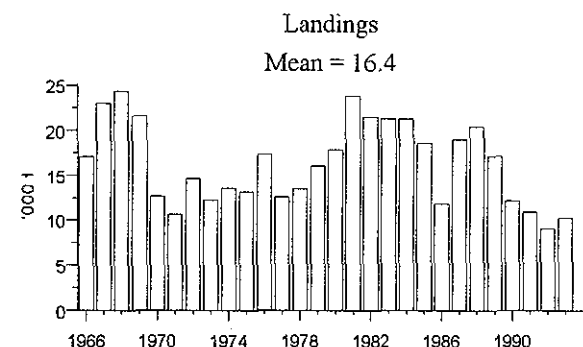
**Forecast for 1995:** A catch forecast is not considered reliable due to misreporting in recent years. Within probable levels of misreporting in recent years the SSB is predicted to remain at low levels in the near future with current levels of fishing mortality.

**Management advice:** ACFM recommends that the fishing effort in 1995 in the directed fisheries on roundfish (cod, haddock, whiting and saithe) in Division VIa is reduced significantly, and on a sustained basis, relative to effort levels in the most recent years.

**Special comments:** 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 underreporting.

A significant reduction in fishing effort is, as a minimum, a reduction to 70% of the effort level in recent years, implemented in such a way that a similar reduction in fishing mortality is achieved.

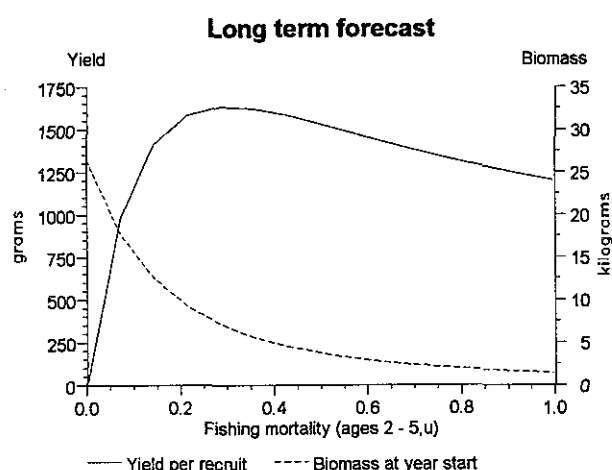
The extent of recent misreporting does not invalidate an analysis of past trends but a catch prediction cannot be given. If the problem continues it may no longer be possible to advise on this stock in the future.



**Data and assessment:** Analytical assessment based on catch-at-age, commercial CPUE and survey CPUE data. Catch and effort data in 1991-1993 are considered poor due to misreporting.

**Source of information:** Report of the Working Group on the Assessment of Northern Shelf Demersal Stocks, June 1994 (C.M.1995/Assess:1)

### Yield and Spawning Stock Biomass



### 3.7.3 Cod in Division VIb (Rockall)

#### Catch data (Table 3.7.3):

**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.

**Source of information:** Report of the Working Group on the Assessment of Northern Shelf Demersal Stocks, June 1994 (C.M.1995/Assess:1).

### 3.7.4 Haddock in Division VIa (West of Scotland)

Catch data (Tables 3.7.4 - 3.7.5):

Year	Rec. TAC	Agreed TAC <sup>1</sup>	Off Indgs.	ACFM Indgs <sup>3</sup>	Disc. slip.	ACFM catch <sup>3</sup>
1987	<23.0	32.0	27	27	16	43
1988	25.0	35.0	21	19	9	28
1989	15.0	35.0	N/A	17	3	20
1990	14.0	24.0	N/A	10	5	16
1991	- <sup>2</sup>	15.2	N/A	11	9	20
1992	- <sup>2</sup>	12.5	N/A	7	6	13
1993	- <sup>2</sup>	17.6	N/A	13	11	24
1994	- <sup>2</sup>	16.0				

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

<sup>2</sup>30% reduction in fishing effort. <sup>3</sup> Not including 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:** The spawning stock has declined since 1982 to a historical low in 1991, but seems to have improved slightly since then. Recent recruitment has been at or below average. The stock may be at or close to safe biological limits.

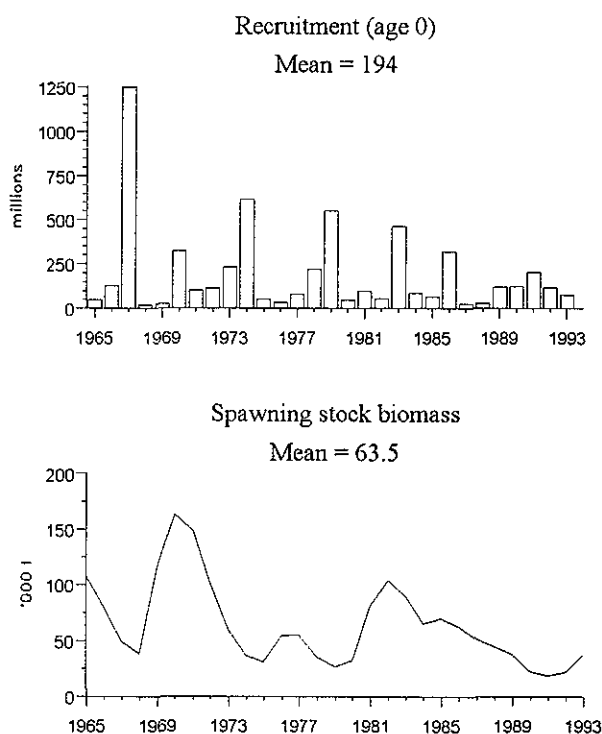
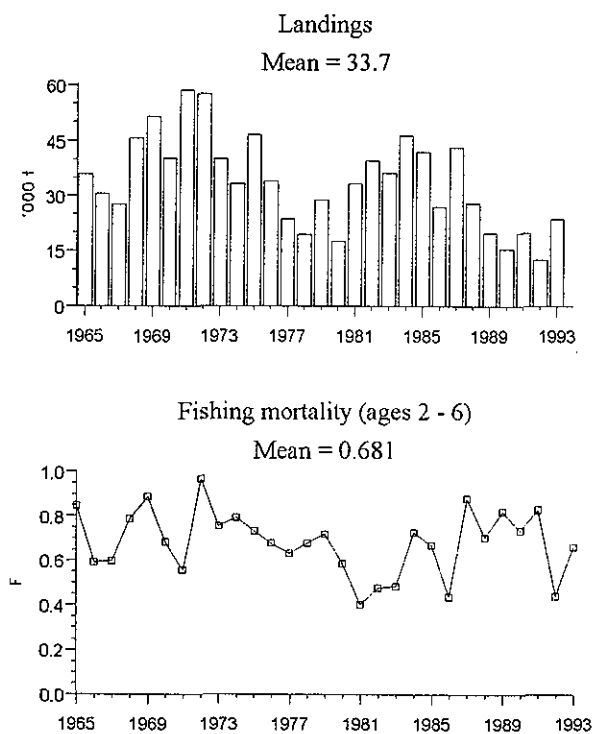
Details in Table 3.7.5.

**Forecast for 1995:** A catch forecast cannot be given due to misreporting in recent years. Within probable levels of misreporting in recent years the SSB is predicted to remain at low levels in the near future with current levels of fishing mortality.

**Management advice:** ACFM recommends that the fishing effort in 1995 in the directed fisheries on roundfish (cod, haddock, whiting and saithe) in Division VIa is reduced significantly, and on a sustained basis relative to effort levels in the most recent years.

**Special comments:** 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.

A significant reduction in fishing effort is, as a minimum, a reduction to 70% of the effort level in recent years, implemented in such a way that a similar reduction in fishing mortality is achieved.



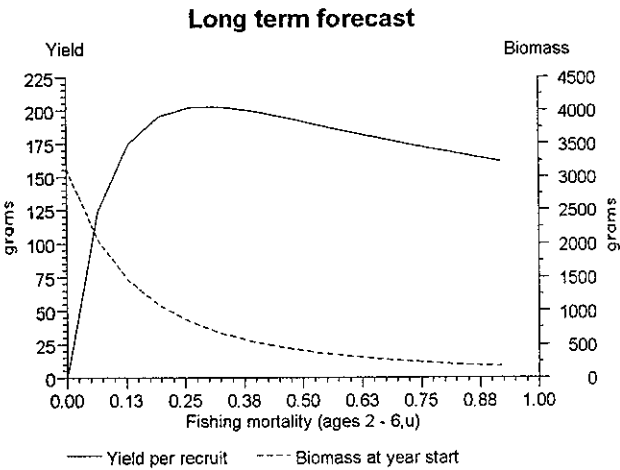


Following a request from the European Commission, ACFM provided a review of its advice for 1994 (see Section 3.7.12). Following this review the TAC for 1994 has been revised.

Source of information: Report of the Working Group on the Assessment of Northern Shelf Demersal Stocks, June 1994 (C.M.1995/Assess:1).

**Data and assessment:** Analytical assessment based on catch, effort and survey data. Continued uncertainty about the true level of catch and effort due to mis-reporting and non-reporting of landings.

Yield and Spawning Stock Biomass



### 3.7.5 Haddock in Division VIb (Rockall)

Catch data (Tables 3.7.6 - 3.7.7):

Year	Rec. TAC	Agreed TAC <sup>1</sup>	Off. Indgs.	ACFM catch <sup>4</sup>
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 <sup>2</sup>		N/A	5.3
1993	3.0		N/A	4.8
1994	- <sup>3</sup>			

<sup>1</sup>Included in Sub-area VI. <sup>2</sup>Precautionary. <sup>3</sup>Precautionary TAC should be set in line with recent catches. <sup>4</sup> Excluding some misreporting. Weights in '000 t.

**Historical development of the fishery:** The Rockall fishery is presently dominated by a Scottish fishery. 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 3.7.7.

**Forecast for 1995:** A precise forecast is not possible because of uncertainties in the assessment and misreporting.

SSB(94) = 9.7, F(94) = 0.58 Basis: F(94) = F(93)  
Catch(94) = 5.5, Landings (94) = 5.5

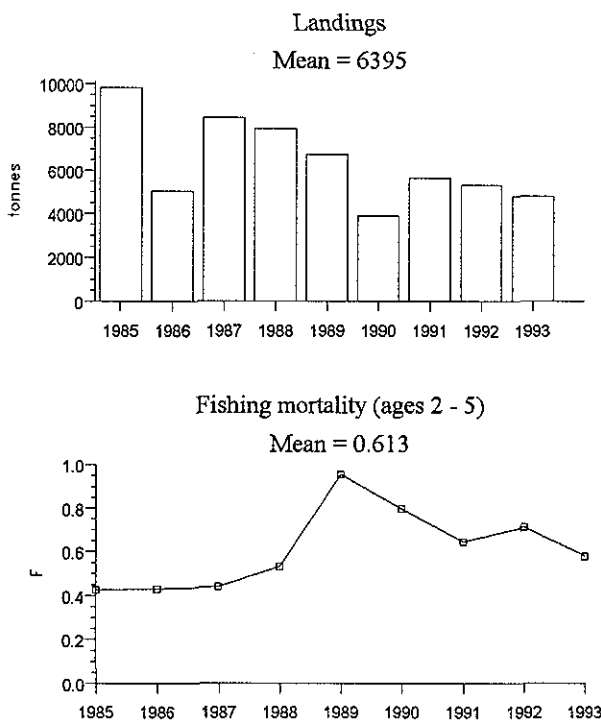
Option	Basis	F (95)	SSB (95)	Catch (95)	Indgs (95)	SSB (96)
A	0.4 F93	0.23	8.8		2.4	11.4
B	0.6 F93	0.35	8.8		3.4	10.3
C	0.8 F93	0.46	8.8		4.3	9.3
D	1.0 F93	0.58	8.8		5.1	8.4
E	1.2 F93	0.70	8.8		5.9	7.6

Weights in '000 t.

For options A-C there will be small increases in SSB; for options D and E, SSB will remain at its current level or decrease further towards its lowest recorded level.

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

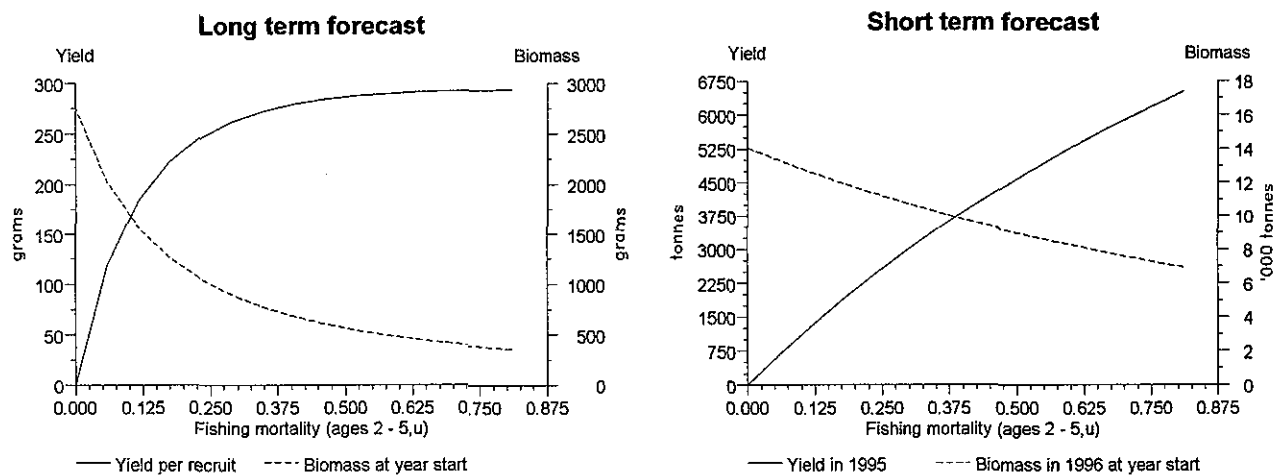
**Special comments:** The fishery in Division VIb is closely associated with fisheries in Division VIa and the fishery at Rockall is to a considerable extent opportunistic. This makes it difficult to predict actual fishing mortality levels as fishing fleet behaviour will be dependent on fishing opportunities elsewhere. Specifically, if a *status quo* TAC for this area is combined with a TAC for Division VIa this may serve as an opening for excessive fishing in Division VIa rather than as a restrictive measure in Division VIb.



**Data and assessment:** Analytical assessment based on catch, effort and survey data. Continued uncertainty about the true level of catch and effort due to misreporting of landings.

**Source of information:** Report of the Working Group on the Assessment of Northern Shelf Demersal Stocks, June 1994 (C.M.1995/Assess:1).

### Yield and Spawning Stock Biomass



### 3.7.6 Whiting in Division VIa (West of Scotland)

Catch data (Tables 3.7.8 - 3.7.9.):

Year	Rec. TAC	Agreed TAC <sup>1</sup>	Off. Indgs.	ACFM catch <sup>4</sup>
1987	15.0	16.4	12.4	11.5
1988	15.0	16.4	11.9	11.3
1989	13.0	16.4	7.7 <sup>3</sup>	7.5
1990	11.0	11.0	6.0	5.6
1991	- <sup>2</sup>	9.0	7.0	6.7
1992	- <sup>2</sup>	7.5	6.0	6.0
1993	- <sup>2</sup>	8.7	6.6	7.2
1994	- <sup>2</sup>	6.8		

<sup>1</sup>TAC is set for Divisions VIa and VIb combined. <sup>2</sup>30% reduction in fishing effort. <sup>3</sup>Preliminary. <sup>4</sup>Not including misreporting. Weights in '000 t.

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

**State of stock:** SSB remains well below the long-term average and close to the historical low level. Recruitment has been below the long-term mean since 1980 and the 1992 year class is estimated to be around the lowest recorded level. ACFM considers that this stock is outside safe biological limits. Details in Table 3.7.9.

**Forecast for 1995:** Landings in 1995 will be dominated by year classes which cannot yet be estimated. This, combined with uncertain recent misreporting levels, makes a short-term forecast unreliable.

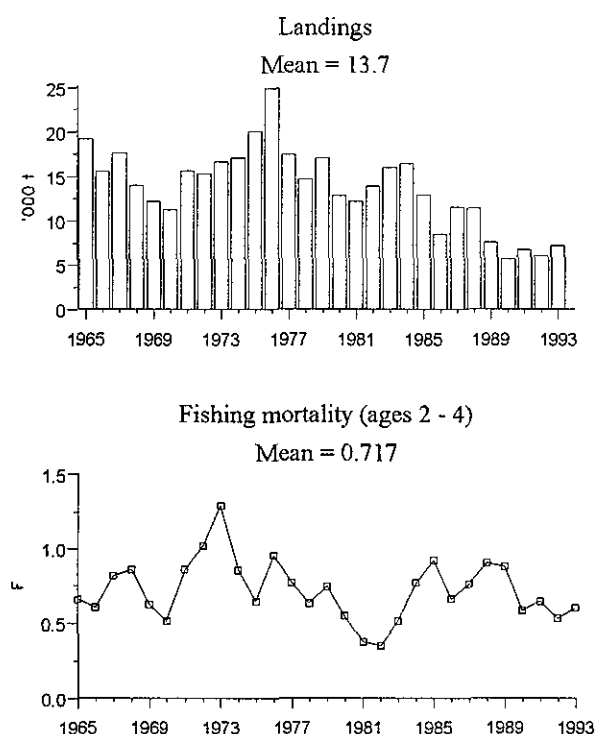
**Management advice:** ACFM recommends that the fishing effort in 1995 in the directed fisheries on roundfish (cod, haddock, whiting and saithe) in Division VIa is reduced significantly and on a sustained basis relative to effort levels in the most recent years.

**Special comments:** 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 underreporting.

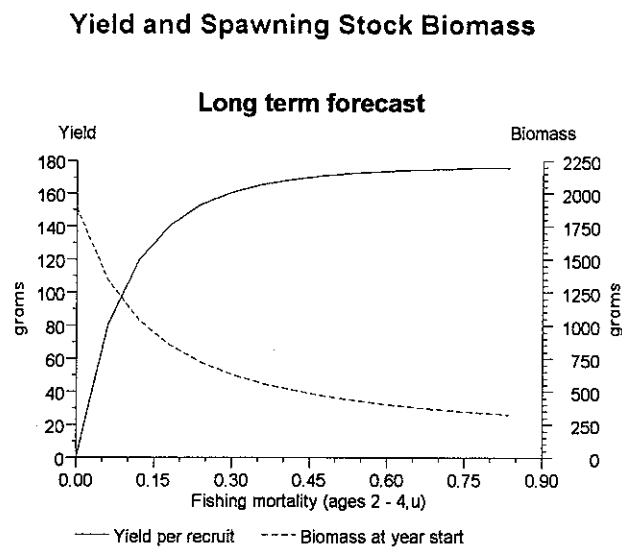
A significant reduction in fishing effort is, as a minimum, a reduction to 70% of the effort level in recent years, implemented in such a way that a similar reduction in fishing mortality is achieved.

**Data and assessment:** Analytical age-based assessment, tuned with four fleets and indices from research vessel surveys. Estimates of misreporting are not considered reliable for inclusion in the assessment.

**Source of information:** Report of the Working Group on the Assessment of Northern Shelf Demersal Stocks, June 1994 (C.M.1995/Assess:1).



3.7.6 Whiting in Division VIa (West of Scotland)  
continued...



3.7.7 Whiting in Division VIb (Rockall)

**Source of information:** Report of the Working Group on the Assessment of Northern Shelf Demersal Stocks, June 1994 (C.M.1995/Assess:1).

**Catch data (Table 3.7.10):**

**Special comments:** Landings of whiting from Division VIb are negligible

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

Catch data (Tables 3.7.11 - 3.7.12.):

Year	Rec. TAC	Agreed TAC	Off. Indgs.	ACFM catch
1987	23	27.8	33	31
1988	35	35	33	34
1989	20	30	N/A	26
1990	24	29	N/A	20
1991	21	22	N/A	17
1992	<16	17	N/A	12
1993	6.3	14	N/A	15
1994	LPL <sup>1</sup>	14	-	-

<sup>1</sup>LPL=Lowest possible level. Weights in '000 t.

**Historical development of the fishery:** The fishery consists of a French fishery operating on the shelf edge and a Scottish fishery operating inshore. These vessels also land about 40% of the cod taken in Division VIa. The directed fishery is relatively new, starting in the early 1970's. The fishery is linked to similar fisheries in the North Sea.

**State of stock:** Spawning biomass is close to the lowest recorded level. The 1989 and 1990 year classes were the lowest recorded. Fishing mortality is close to F<sub>high</sub>. The stock is considered to be outside safe biological limits.

Details in Table 3.7.12.

Forecast for 1995:

SSB(94) = 14, F(94) = 0.53, Basis: F(94) = F(93), Catch(94) = 14, Landings (94) = 14.

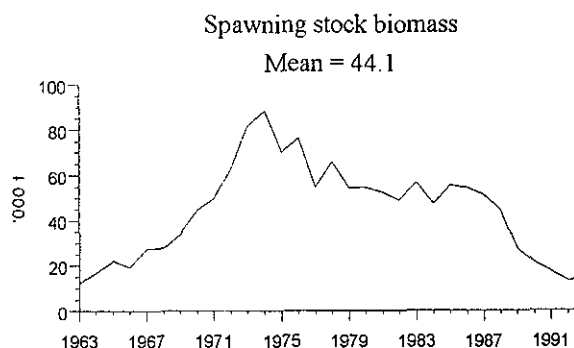
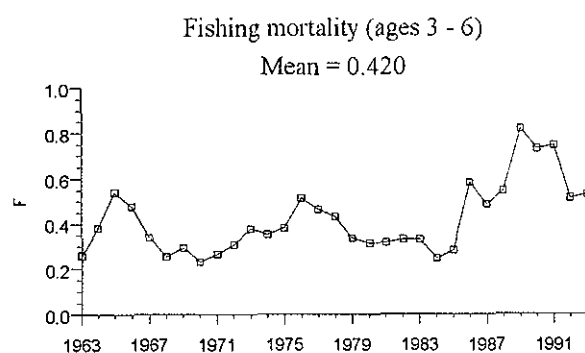
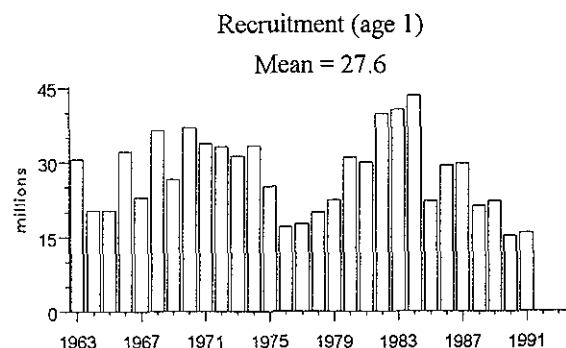
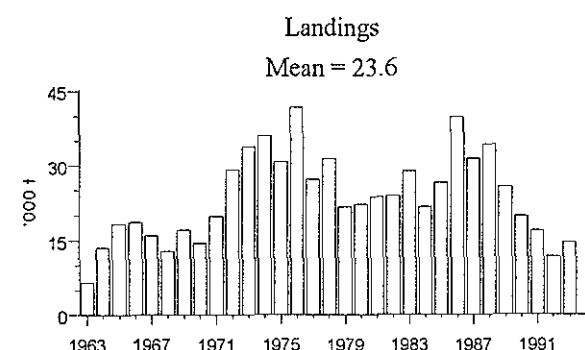
Option	Basis	F (95)	SSB (95)	Catch (95)	Lnogs (95)	SSB (96)
A	0.4 F93	0.21	13	7	7	22
B	0.6 F93	0.32	13	11	11	19
C	0.8 F93	0.42	13	14	14	17
D	1.0 F93	0.53	13	16	16	15

Weights in '000 t.

The forecast is to a large degree an average prediction since recruiting year classes, for which independent estimates cannot yet be made, are assumed to be of average size. These year classes constitute a majority of the catch projected for 1995.

**Management advice:** ACFM recommends that the fishing effort in 1995 in the directed fisheries on roundfish (cod, haddock, whiting and saithe) in Division VIa and on saithe in Division VIb is reduced significantly, and on a sustained basis relative to effort levels in the most recent years.

**Special comments:** A significant reduction in fishing effort is, as a minimum, a reduction to 70% of the effort level in recent years, implemented in such a way that a



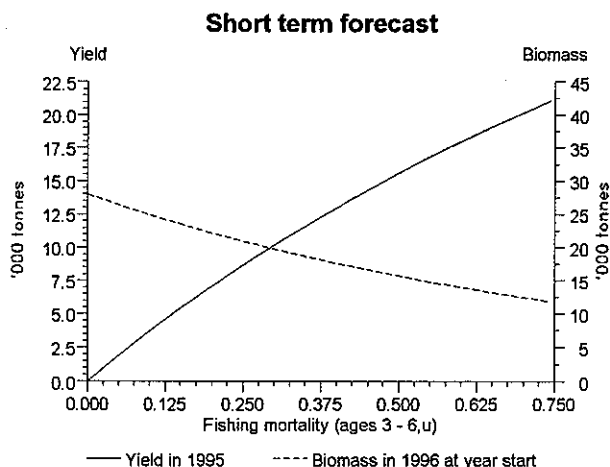
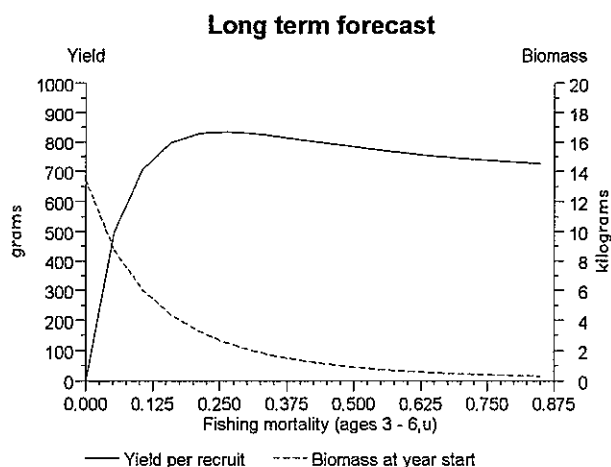
This stock is associated with the North Sea stock, both in terms of stock distribution and in terms of some of the fisheries exploiting the stocks.

**Data and assessment:** Analytical assessment of catch-at-age data using commercial CPUE series. Tuning data set of poor quality. The assessment demonstrates inconsistencies in historical data which have led to upward revisions of fishing mortality in recent years. No independent estimates

of recruitment. Catches in the 1960s were probably underestimated due to large unrecorded discards at the time. This results in a corresponding underestimation of SSB in the 1960s.

**Source of information:** Report of the Working Group on the Assessment of Northern Shelf Demersal Stocks, June 1994 (C.M.1995/Assess:1).

### Yield and Spawning Stock Biomass



### 3.7.9 Megrim in Sub-area VI

Catch data (Table 3.7.13):

Year	Rec TAC	Agreed TAC <sup>1,3</sup>	Off. Indgs.	ACFM catch <sup>2</sup>
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	2.2
1994	-	4.84	-	-

<sup>1</sup>Vb(EC), VI, XII and XIV. <sup>2</sup>Division VIa. <sup>3</sup>Precautionary. 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 has led to increased fishing pressure on megrim in that area.

**State of stock:** Not known. Previous yield-per-recruit analyses indicated that the stock was fully exploited.

**Forecast for 1995:** 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. Age data in 1993 were insufficient to permit an analytical assessment.

**Source of information:** Report of the Working Group on the Assessment of Northern Shelf Demersal Stocks, June 1994 (C.M.1995/Assess:1).



### 3.7.10 Anglerfish in Sub-area VI

Catch data (Table 3.7.14):

Year	Rec. TAC	Agreed TAC <sup>1,3</sup>	Off. Indgs.	ACFM catch <sup>2</sup>
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	-	-

<sup>1</sup>Vb(EC), VI, XII and XIV. <sup>2</sup>Division VIa. <sup>3</sup>Precautionary. 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 has led to increased fishing pressure on anglerfish in that area.

**State of stock:** Not known. Previous yield-per-recruit analyses indicated that the stock was 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 1995:** 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 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 1994 (C.M.1995/Assess:1).

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

**Source of information:** Report of the Working Group on the Assessment of Northern Shelf Demersal Stocks, June 1994 (C.M.1995/Assess 1).

**Catch data:** Catch data are presented in Tables 3.7.15 - 3.7.26.

**Special comments:** It is not at present possible to conduct any assessments of these stocks. Improved data on catch and effort should be made available, if at all possible.

### **3.7.12 Review of Advice for 1994 for Demersal Stocks in Sub-area VI**

Following a request from the European Commission dated 7 July 1994 ACFM reviewed the predictions of stock size and catches and the advice on the stocks of cod, haddock, whiting and saithe in Divisions VIa and b for 1994 given by ACFM in 1993. The review is based on information from the Report of the Working Group on the Assessment of Northern Shelf Demersal Stocks (C.M. 1995/Assess:1).

For those stocks on which ACFM gave advice for 1994 at its autumn 1993 meeting the advice was as follows:

1. For cod, haddock and whiting in Division VIa, ACFM recommended that restrictions on effort are still required to protect these stocks and that effort should not be allowed to exceed 70% of that in the late 1980s.
2. For haddock in Division VIb, ACFM advised that, if a TAC is to be set for this stock, a precautionary TAC should be set in line with recent catches.
3. For saithe in Sub-area VI, ACFM recommended that fishing mortality be reduced to the lowest possible level.

#### **Cod in Division VIa (West of Scotland)**

The landings increased from about 12 000 t in the early 1970s to almost 24 000 t in 1981, but decreased thereafter reaching a record low of only 9,000 t in 1992. The level of landings in 1992 and 1993 is not precisely known due to incomplete reporting. For 1993 ACFM has estimated the unreported landings to be 6 300 t. The official landings for 1993 are 11 221 t.

Because an estimate of unreported landings is available only for 1993 it has not been possible to include the data in the assessment. ACFM is therefore not in a position to give reliable predictions of catches and stock for 1994. The information available to ACFM, however, indicates that the stock is still at a very low level, and that it is not likely to improve significantly in the near future.

ACFM therefore has no basis for changing its advice and forecast for 1994.

#### **Cod in Division VIb (Rockall)**

There is no new information on the status of Division VIb cod and recent catch data are considered unreliable due to misreporting.

#### **Haddock in Division VIa (West of Scotland)**

After relatively high landings of more than 40,000 t on average in 1984-1987 the official landings declined to a record low level of 7,000 t in 1992. Discards in the most recent years have been at the same level as the landings. In 1992 discards were estimated to be 6,000 t, in line with the very low landings. For 1993, the official landings were 12,900 t and discards were estimated to have increased accordingly to 11,000 t. However, the level of landings and discards in 1992 and 1993 is very uncertain due to nonreporting. For 1993 ACFM has estimated the nonreported landings to be 6,500 t. This implies a further 5,700 t of discards.

Because an estimate of nonreported landings is available only for 1993 it has not been possible to include the data in the assessment. ACFM is therefore not in a position to give reliable predictions of catches and stock for 1994. The information available to ACFM does, however, indicate that, due to improved recruitment, the stock size is significantly higher than estimated by ACFM in 1993 and that the TAC agreed for 1994 (after deduction of the expected catch in Division VIb) corresponds to a larger effort reduction than was recommended by ACFM in November 1993.

The landings for Division VIa in 1994 corresponding to the effort level advised by ACFM is likely to be in the order of 15,000 - 17,000 t.

Non-reporting and misreporting of catches from this stock has occurred during 1994, perhaps to a significant degree, but it is not yet possible to quantify the effect. Thus true landings from the stock may already be above the agreed TAC. Any catch limit revision for 1994 should therefore take into consideration the actual (as opposed to reported) landings up to the present and the time remaining to the end of the TAC year.

#### **Haddock in Division VIb (Rockall)**

The catches since 1985 have varied between 9,800 and 3,900 t. The catch in 1993 is estimated to be 4,800 t.

ACFM has no basis for changing its advice for 1994.

#### **Whiting in Division VIa**

Landings have shown a declining trend since 1976 and reached a record low level of 5,600 t in 1990. The level of landings in 1992 and 1993 is not precisely known due to incomplete reporting. The official landings in 1993 were 7,200 t (including 600 t not allocated to country). In addition, ACFM estimated that approximately 3,000 t were not reported.

Because an estimate of unreported landings is available only for 1993 it has not been possible to include the data in the assessment. ACFM is therefore not in a position to give reliable predictions of catches and stock for 1994. The information available to ACFM, however, indicates that the stock is still at a very low level, and that it is not likely to improve significantly in the near future.

ACFM therefore has no basis for changing its advice and forecast for 1994.

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

From a peak of over 40,000 t in 1986 landings have fallen sharply to less than 12,000 t in 1992. The landings in 1993 were about 15,000 t, with an additional unspecified quantity of nonreported landings.

The assessment of this stock is considered to be uncertain and ACFM is not in a position to give reliable predictions of catches and stock for 1994. The information available to ACFM, however, indicates that the stock is still at a very low level, and that it is not likely to improve significantly in the near future.

ACFM therefore has no basis for changing its advice and forecast for 1994.

The review was sent to the European Commission in September 1994.

## 3.8 Demersal Stocks in the Irish Sea

### 3.8.1 Overview

Current fishing mortalities remain very high for cod and whiting stocks in the Irish Sea. Cod remained at a historical low spawning biomass level in 1993. Remedial management measures are required if the stock is to return to safe biological levels. The spawning stock biomass of whiting continued to increase from its record low in 1990.

This development has been sustained, in spite of high fishing mortality, by average or strong recruitment over the period 1989-1991.

The spawning stock biomass of plaice and sole in the Irish Sea are close to historical minimum levels, having declined from above average levels in 1987. The fishing mortality on these stocks has been fairly stable, but they have both suffered from low recruitment levels for several years. With the present levels of fishing mortality and recent low recruitment these stocks are expected to remain at low levels or even to decrease further in the near future.

### 3.8.2 Cod in Division VIIa (Irish Sea)

#### Catch data (Table 3.8.1-3.8.2):

Year	Rec. TAC	Agreed TAC	Off. Indgs.	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 <sup>1</sup>	12.8
1990	15.3	15.3	9.9 <sup>1</sup>	7.4
1991	6.0	10.0	6.9 <sup>1</sup>	7.6 <sup>2</sup>
1992	10.0	10.0	7.4 <sup>1</sup>	7.5 <sup>2</sup>
1993	10.2	11.0	5.8 <sup>1</sup>	7.6 <sup>2</sup>
1994	3.7	6.2	-	-

<sup>1</sup>Preliminary. <sup>2</sup>Including estimates of misreporting. Weights in '000 t.

**Historical development of the fishery:** The fishery has traditionally been carried out by 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:** The spawning stock biomass decreased to a historical low level in 1992. Due to the above-average 1991 year class the stock has increased somewhat since then. All year classes since 1987, other than that of 1991, have been below average. Fishing mortality is at a high level. ACFM considers this stock to be outside safe biological limits.

Details in Table 3.8.2.

#### Forecast for 1995:

SSB(94) = 4.8, F(94) = 1.04, Basis: F(94)=F(93), Catch(94) = 7.3, Landings (94) = 7.3.

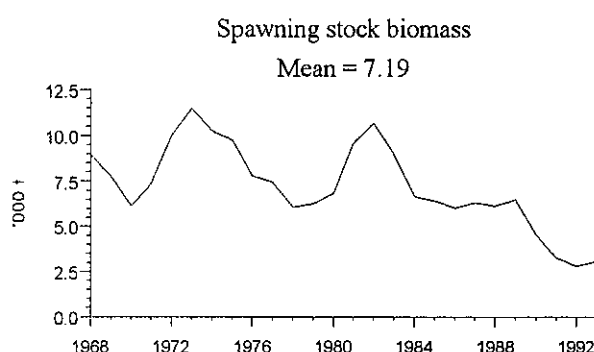
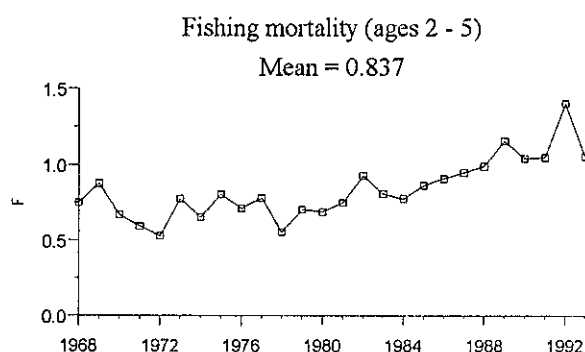
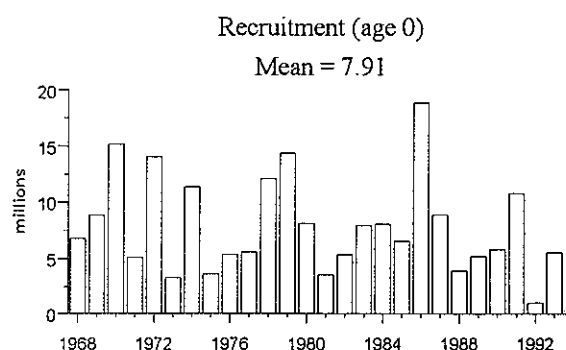
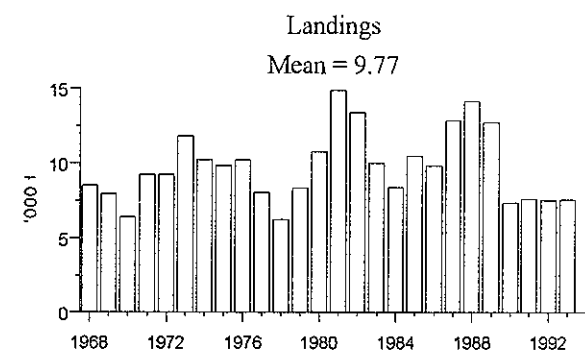
Option	Basis	F (95)	SSB (95)	Catch (95)	Landgs (95)	SSB (96)
A	0.4 F93	0.41	4.1	3.3	3.3	7.5
B	0.5 F93	0.52	3.9	3.9	3.9	6.5
C	0.6 F93	0.62	3.7	4.5	4.5	5.7
D	0.8 F93	0.83	3.3	5.6	5.6	4.4
E	1.0 F93	1.04	2.9	6.5	6.5	3.4

Weights in '000 t.

A,B : SSB is expected to increase to the level of the late 1980s.

C,D : SSB is expected to increase above the historical minimum.

E : SSB remains close to the historical minimum.



**Management advice:** ACFM recommends a significant reduction in fishing mortality in 1995 to restore the spawning biomass to levels experienced in the late 1980s when good recruitment was observed. To achieve this a 50% reduction in fishing mortality is required in 1995.

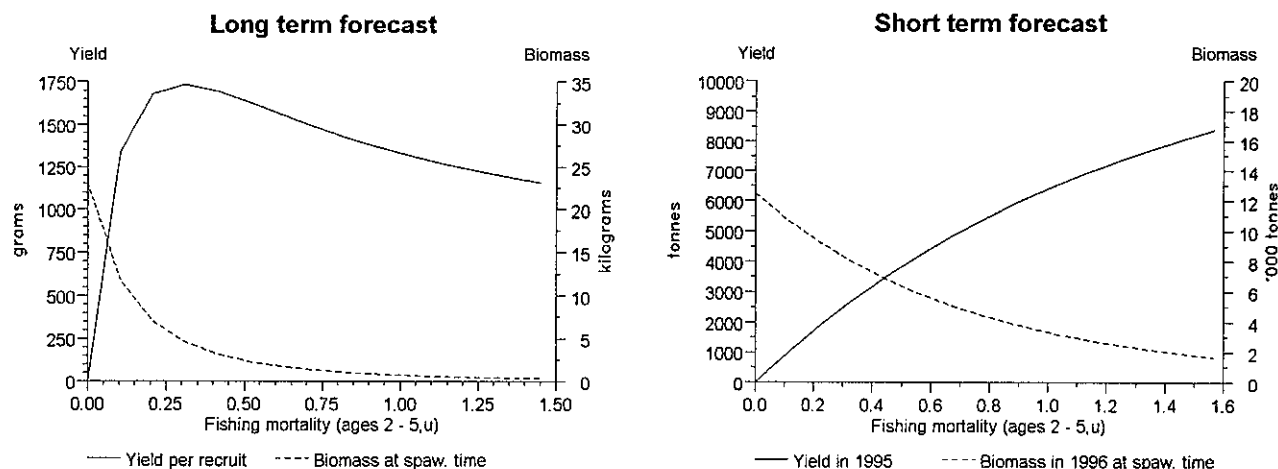
**Special comments:** Quotas in 1993 proved restrictive for some countries, and there was substantial misreporting which has continued in 1994 following the reduction in TAC to 6,200 t. It is vital that the already high risk to this stock is not exacerbated by deteriorating data on catches and effort, and the remedial measures needed for this stock must be formulated to avoid this. Technical measures are unlikely, on their own, to provide the reduction in fishing mortality necessary to increase the biomass to the level of the late 1980s.

The projected recovery of the SSB to the levels of the late 1980s within one year with reduced fishing mortality is contingent on the large 1991 year class entering the spawning stock. Subsequent year classes seem to be of below average strength. The opportunity for a fast recovery through moderate fishing mortality in 1995 may thus be unique to this year. A postponement may mean that stronger measures, or a longer time period, are needed to achieve the same goal.

**Data and assessment:** Analytical assessment based on catch-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 1994 (C.M.1995/Assess:1).

## Yield and Spawning Stock Biomass



### 3.8.3 Whiting in Division VIIa (Irish Sea)

Catch data (Tables 3.8.3-3.8.4):

Year	Rec. TAC	Agreed TAC	Off. Indgs.	Disc. <sup>2</sup>	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 <sup>1</sup>	15.0	8.2	2.7	10.7
1991	6.4 <sup>1</sup>	10.0	7.4	2.7	10.1 <sup>3</sup>
1992	9.7 <sup>1</sup>	10.0	7.1	4.1	13.1 <sup>3</sup>
1993	6.5	8.5	6.2	2.7	9.2 <sup>3</sup>
1994	-	9.9			

<sup>1</sup>Not including discards from the *Nephrops* fishery. <sup>2</sup>From *Nephrops* fishery. <sup>3</sup>Including 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. Square mesh panels have been mandatory in all UK trawlers (excluding beam trawlers) in the Irish Sea since 1993 and for Irish trawlers since 1994.

**State of stock:** The time series is too short for an evaluation of the state of the stock in a historical perspective. However, the yield has been decreasing while the fishing mortality has been increasing to a very high

level. The spawning stock has only been increasing recently from historically low levels due to a single large year class and is expected to decrease again in the future. Therefore, the stock is considered to be close to safe biological limits.

Details in Table 3.8.4.

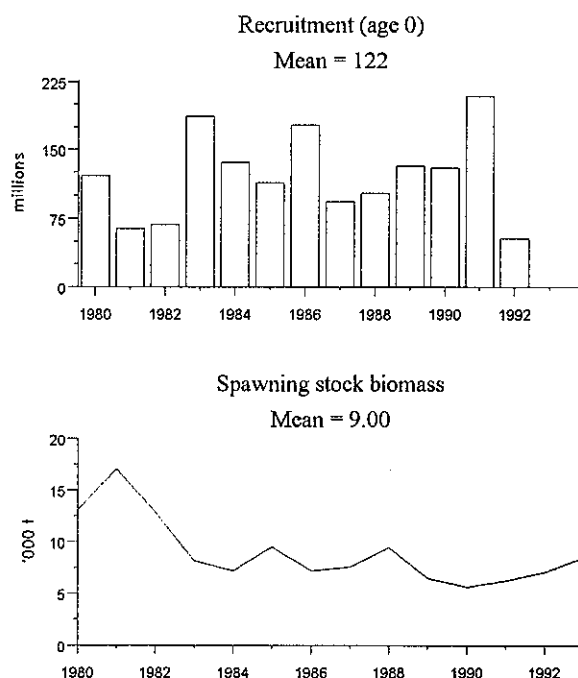
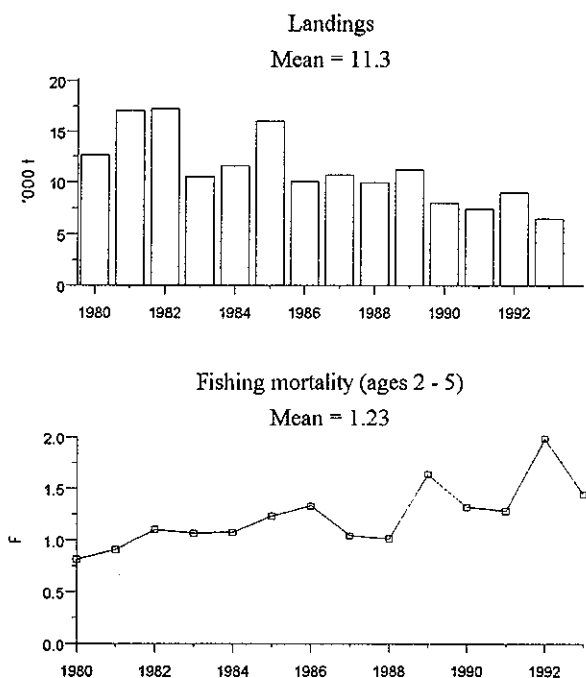
**Forecast for 1995:** Landings in 1995 will be dominated by year classes which cannot yet be estimated. The precision of the assessment is furthermore low. This makes a short-term forecast unreliable. *Status quo* landings of 8,300 t are projected in 1995 on the basis of average recruitment.

**Management advice:** ACFM considers that any increase in fishing mortality on this stock would increase the probability of the stock falling below safe biological limits. ACFM therefore recommends that fishing mortality should not be increased.

**Special comments:** Although a prediction cannot be made due to lack of information on recent recruitment, the by-catch nature of the exploitation would limit the utility of a prediction to control future fishing mortality levels. The effects of square mesh panels have not been evaluated.

**Data and assessment:** Analytical assessment based on catch-at-age, commercial CPUE and indices from surveys in Division VIIa. Estimates of discarded whiting 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 1994 (C.M.1995/Assess: 1).







### 3.8.4 Plaice in Division VIIa (Irish Sea)

Catch data (Tables 3.8.5-3.8.6):

Year	Rec. TAC	Agreed TAC	Off. Indgs.	Disc	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	-	2.5
1992	3.0	3.8	3.2	-	3.2
1993	2.8	2.8	2.0	-	2.0
1994	<3.7	3.1			

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 has declined in the 1990s.

**State of stock:** Even though the SSB is slightly above the historical minimum and  $F$  is at a relatively high level the historical data do not indicate that recruitment is reduced at the present SSB levels. The stock is therefore considered to be within safe biological limits.

Details in Table 3.8.6.

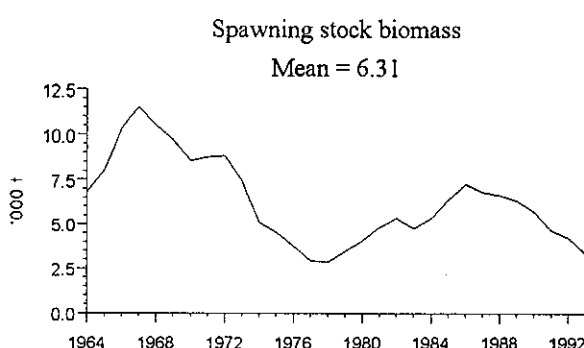
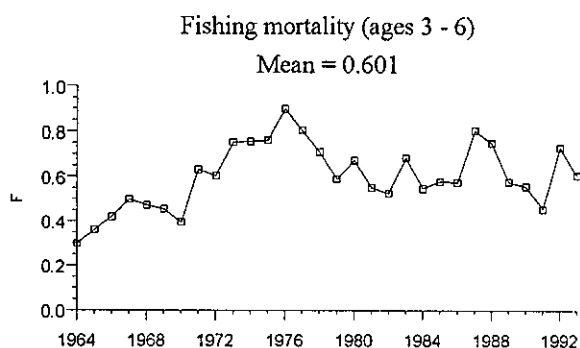
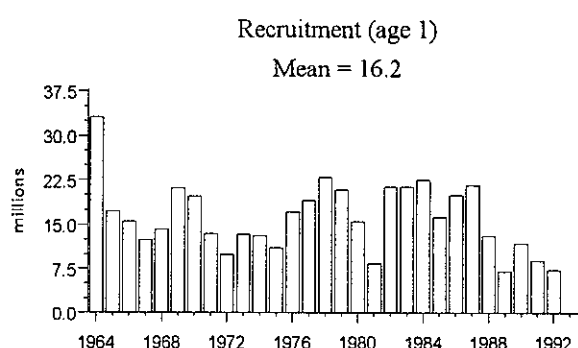
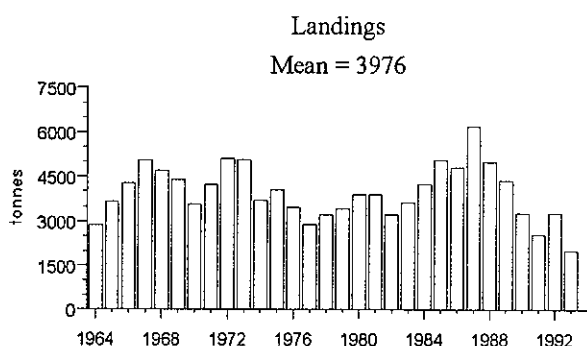
**Forecast for 1995:** Landings in 1995 will be dominated by year classes which cannot yet be estimated. The precision of the assessment, furthermore, is low. This makes a short-term forecast impossible. With present levels of fishing mortality and average recruitment the SSB is expected to remain at its present historical low level. *Status quo* landings of 2,400 t are projected in 1995 on the basis of average recruitment.

**Management advice:** ACFM advises that increases in long-term yield and SSB would result from a decrease in fishing mortality.

**Special comments:** There have been four successive years of low recruitment.

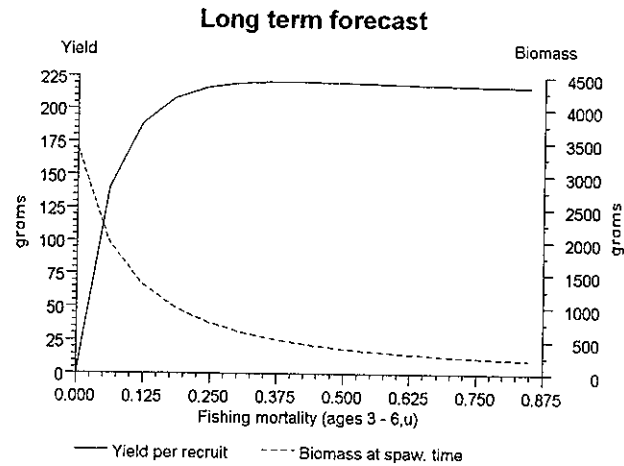
**Data and assessment:** Analytical assessment based on catch-at-age, commercial CPUE and survey CPUE data.

**Source of information:** Report of the Working Group on the Assessment of Northern Shelf Demersal Stocks, June 1994 (C.M.1995/Assess:1).



3.8.4 Plaice in Division VIIa (Irish Sea) continued.....

Yield and Spawning Stock Biomass



### 3.8.5 Sole in Division VIIa (Irish Sea)

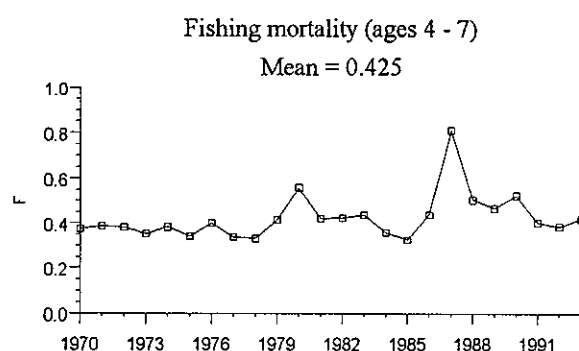
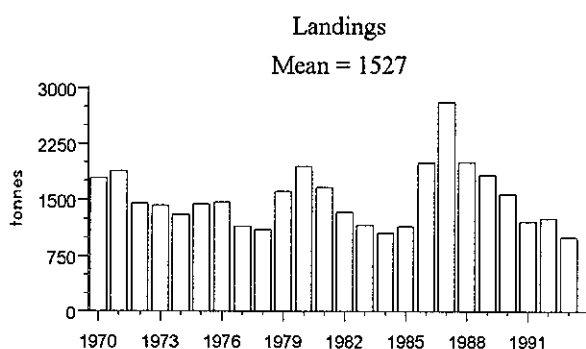
Catch data (Tables 3.8.7-3.8.8):

Year	Rec. TAC	Agreed TAC	Off. Indgs.	ACFM catch <sup>3</sup>
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	<sup>1</sup>	1.35	1.2	1.3
1993	0.92	1.0	1.0	1.0
1994	1.51 <sup>2</sup>	1.5		

<sup>1</sup>No long-term gains in yield by increasing F. <sup>2</sup>Catch at *Status quo* F. <sup>3</sup>Not 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.

**State of stock:** The SSB is close to the historical low level.



Yield follows F which is at high levels. Recruitment is very variable compared to other flatfish stocks, but since 1986 all year classes but one have been estimated to be below average. The stock is considered to be close to safe biological limits.

Details in Table 3.8.8.

**Forecast for 1995:**

SSB(94) = 3.2, F(94) = 0.42, Basis: F(94)=F(93),  
Catch(94) = 1.1, Landings (94) = 1.1.

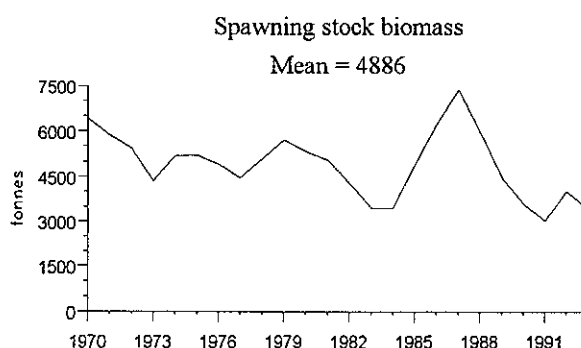
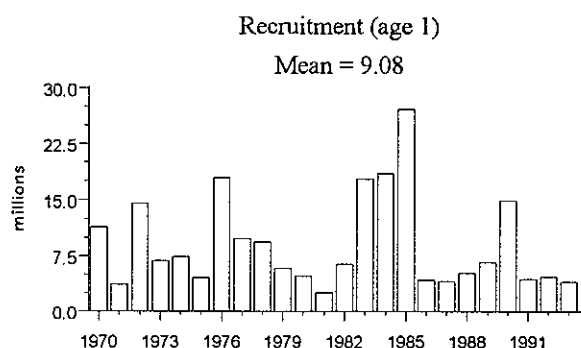
Option	Basis	F (95)	SSB (95)	Catch (95)	Landgs. (95)	SSB (96)
A	0.4 F <sub>93</sub>	0.17	2.8	0.4	0.4	3.3
B	0.6 F <sub>93</sub>	0.25	2.7	0.6	0.6	3.1
C	0.8 F <sub>93</sub>	0.33	2.7	0.8	0.8	2.9
D	1.0 F <sub>93</sub>	0.42	2.7	1.0	1.0	2.7
E	1.2 F <sub>93</sub>	0.50	2.6	1.1	1.1	2.5

Weights in '000 t.

A,B,C : SSB will increase through 1995 but will still be below the historical minimum.

D, E : SSB will remain constant at historical minimum level or decrease even further.

**Management advice:** To prevent a further decrease in SSB ACFM recommends a 20% reduction in fishing mortality, corresponding to a catch of 800 t in 1995.

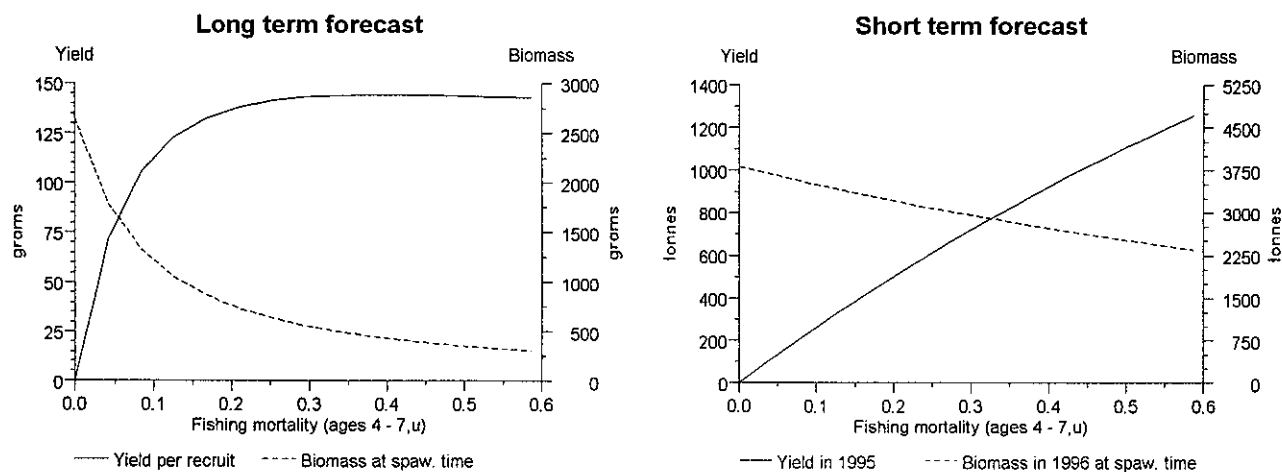


**Special comments:** Last year's forecast was made on the assumption of average recruitment for 2 year classes which have subsequently been shown to be below average. Based on this over-estimation of recruiting year class strength, ACFM considered the stocks to be within safe biological limits. However, assuming an average 1993 year class, SSB is now expected to remain near the lowest recorded level and all forecasts with F levels at or above 60% of the present level will lead to SSB levels in 1996 which are lower than any previously recorded.

**Data and assessment:** Biological sampling data are incomplete for some fleets with age data missing for a major fleet in 1993 and this may have influenced the reliability of this assessment. The inclusion of a new beam trawl survey has made it possible to estimate all the main year classes contributing to catches in 1995 and SSB in 1996.

**Source of information:** Report of the Working Group on the Assessment of Northern Shelf Demersal Stocks, June 1994 (C.M.1995/Assess: 1).

### Yield and Spawning Stock Biomass



### 3.9 Demersal Stocks in the Celtic Sea and Western English Channel

#### 3.9.1 Overview

Fisheries for cod, whiting, sole and plaice are conducted by Belgium, France, Ireland and UK. The fisheries are carried out using mainly otter trawls and beam trawls. Use of beam trawls for catching sole and plaice became prevalent during the mid-1970s and subsequent increases in the landings of these two species have been attributed to the gradual replacement of otter trawls by beam trawls by the Belgian and UK fleets.

Sufficient information is available to complete analytical assessments for sole and plaice in the Western Channel (Division VIIe) and for cod, whiting, sole and plaice in the Celtic Sea. Data were inadequate to support any assessment of cod and whiting in the Western Channel. Stocks in ICES Divisions VIIb, c, h-k were not assessed because of the lack of age data prior to 1993. In 1993 Ireland initiated a comprehensive stock monitoring programme with the goal of eventually providing an adequate time series of biological data for assessment purposes.

Previously, assessments for Celtic Sea stocks of cod and whiting had been based on data from Divisions VII f and g alone. However, recent examination of data from research

vessel surveys and commercial logbooks indicate a continuity in the distribution of these stocks with those in Division VII h. Consequently, catches from Division VII h have been included in the Celtic Sea cod and whiting assessments carried out this year.

Most of the stocks in this region have experienced relatively high exploitation rates and, as a consequence, SSB has declined in recent years. In the Western English Channel, fishing mortality on stocks of plaice and sole are above average and SSB levels are declining. Fishing mortality on Celtic Sea cod is close to 1.0 and SSB is expected to decline to a level close to the previous record-low. Fishing mortality on Celtic Sea whiting is above 1.0 and, as a result, recent good recruitment will not have contributed towards any substantial increase in SSB. Exploitation on Celtic Sea plaice and sole is considered to be high relative to the replacement level and SSB for both stocks is approaching record low levels.

Many of these stocks are now considered to be outside or close to being outside safe biological limits. Therefore, fishing effort should be reduced or, at least, should not be allowed to increase from the present levels.



### 3.9.2 Celtic Sea cod (Divisions VIII, VIIg and VIIh)

Catch data (Tables 3.9.1. and 3.9.2):

Year	Rec. TAC	Agreed TAC <sup>1</sup>	ACFM catch
1987	<6.4		8.5
1988	7.0		13.8
1989	8.6		17.0
1990	9.2		9.9
1991	4.5		6.6
1992	2		7.4
1993	6.5	17.5	8.6
1994	5.6	17.0	

<sup>1</sup>TAC covers Sub-areas VII (except Division VIIa) and VIII. <sup>2</sup>Reduced fishing mortality. Weights in '000 t.

This assessment has been extended to include catches from Division VIIh.

**Historical development of the fishery:** Celtic Sea cod is taken as a component of mixed trawl fisheries. Landings are made predominantly by French gadoid trawlers.

**State of stock:** SSB fluctuates widely, depending on recruitment. Good year classes fished out rapidly due to high fishing mortality. The stock is considered to be close to safe biological limits.

Further details in Table 3.9.2

Forecast for 1995:

SSB(94) = 9.7, F(94) = 0.93, Basis: F(94)=F(93), Catch(94) = -, Landings (94) = 7.1

Recruitment of the 1993 and 1994 year classes set equal to the geometric mean for the period 1971-1991.

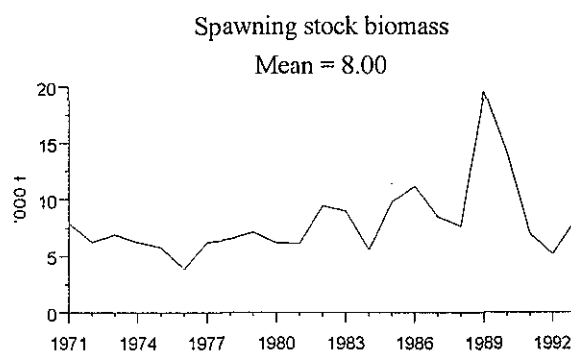
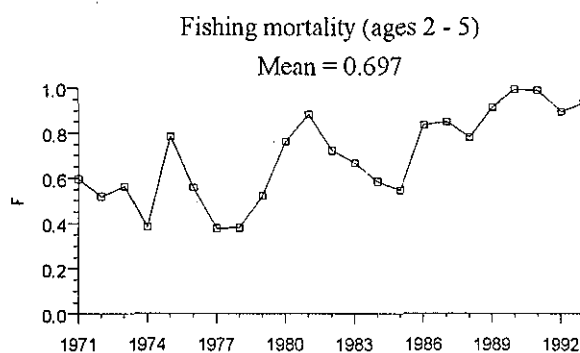
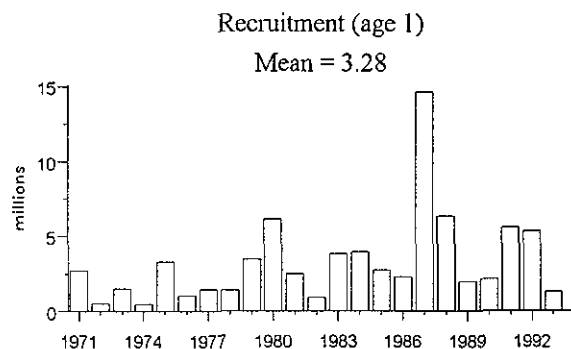
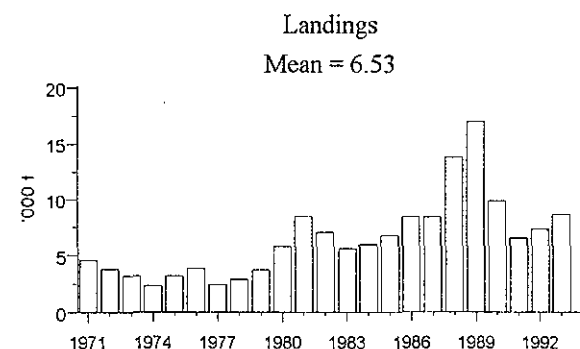
Option	Basis	F (95)	SSB (95)	Catch (95)	Lnogs (95)	SSB (96)
A	0.4F <sub>93</sub>	0.37	5.8	-	2.7	8.8
B	0.6F <sub>93</sub>	0.56	5.8	-	3.8	7.3
C	0.8F <sub>93</sub>	0.75	5.8	-	4.7	6.2
D	1.0F <sub>93</sub>	0.93	5.8	-	5.4	5.2

Weights in '000 t.

For options B, C and D, SSB remains below average in 1996.

**Management advice:** If fishing mortality is not reduced there is a high probability that the stock will fall outside of safe biological limits in 1996. Therefore, **ACFM** recommends that fishing mortality in 1995 be reduced to 80% of the level in recent years.

**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.

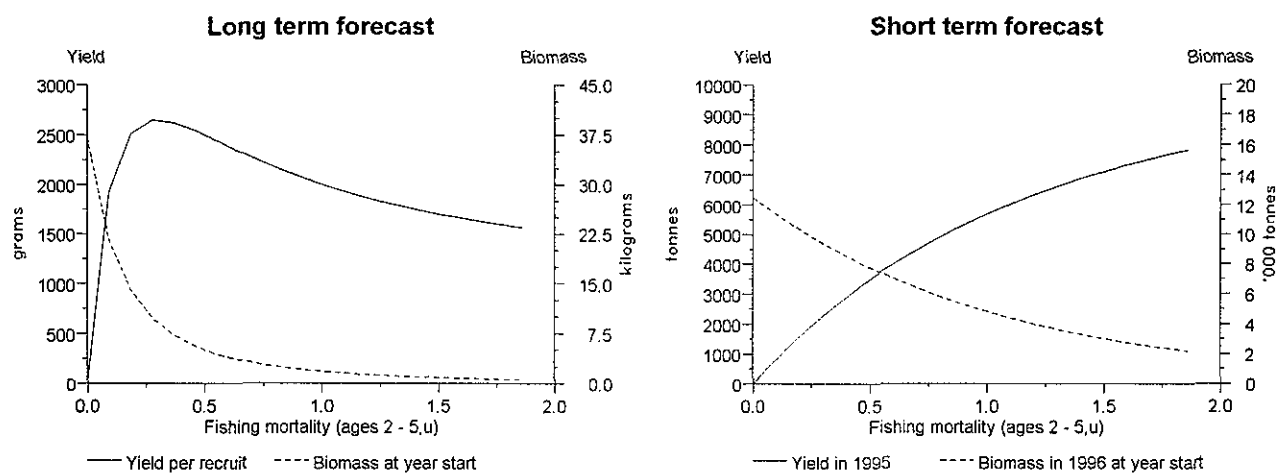




**Data and assessment:** Assessment now includes data for Division VIIIh. Analytical assessment based on landings and commercial CPUE data for two fleets. No recruitment indices are available for this stock. SSB now estimated at 1 January.

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

### Yield and Spawning Stock Biomass



### 3.9.3 Celtic Sea whiting (Divisions VIIg, VIIh and VIIi)

Catch data (Tables 3.9.3 and 3.9.4):

Year	Rec. TAC	Agreed TAC <sup>1</sup>	ACFM catch
1987	7.1		9.0
1988	7.0		10.3
1989	7.9		12.9
1990	8.4		10.5
1991	8.0		9.7
1992	8.0		8.9
1993	6.6	22.0	10.9
1994	<9.4	22.0	

<sup>1</sup>TAC covers Sub-area VII (except Division VIIa). Weights in '000 t.

This assessment has been extended to include Division VIIh.

**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 (England and Wales) catches in the 1950s were 4–5 times their present level.

**State of stock:** SSB fluctuates depending on recruitment and is currently above the long-term mean. The 1990 and

1991 year classes are both above average. Although fishing mortality is very high, the stock is considered to be within safe biological limits.

Further details in Table 3.9.4.

**Forecast for 1995:**

SSB(94) = 18.2, F(94) = 1.05, Basis: F(94) = F(93)  
Catch(94) = - , Landings (94) = 11.3

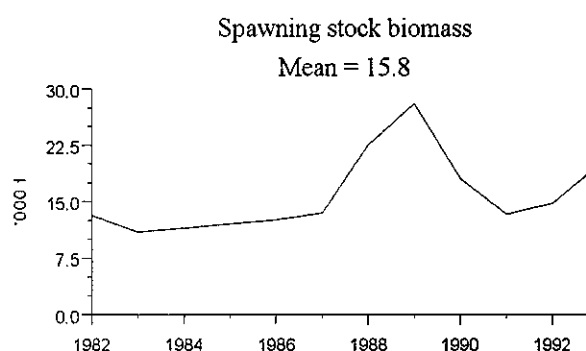
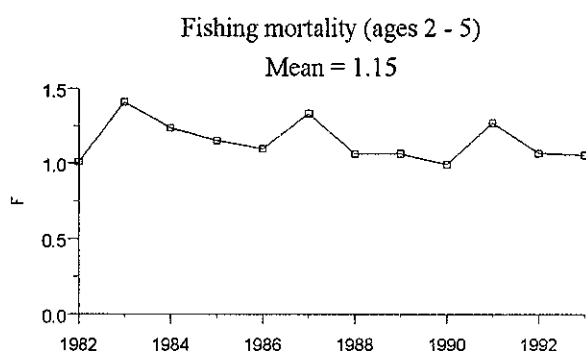
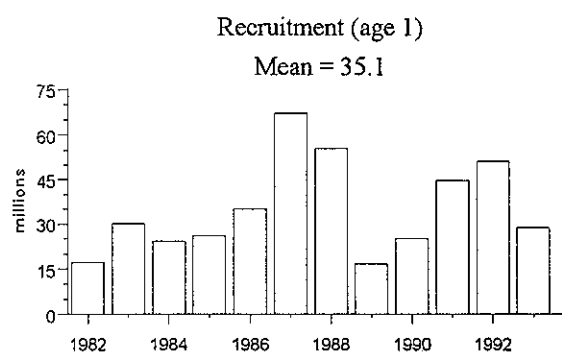
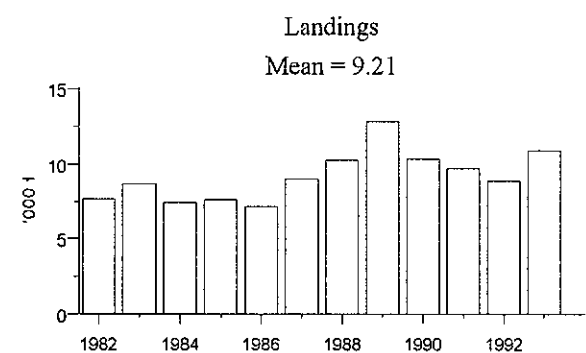
Recruitment of the 1993 and 1994 year classes set equal to the geometric mean for the period 1982–1991.

Option	Basis	F (95)	SSB (95)	Catch (95)	Lndgs (95)	SSB (96)
A	0.6F <sub>93</sub>	0.63	15.4	-	6.6	17.6
B	0.8F <sub>93</sub>	0.84	15.4	-	8.2	15.9
C	1.0F <sub>93</sub>	1.05	15.4	-	9.5	14.5
D	1.2F <sub>93</sub>	1.27	15.4	-	10.6	13.3

Weights in '000 t.

For all options, SSB remains below the 1993–1994 level in 1996. At current levels of F, SSB is predicted to decrease below the long-term average and below the level in 1995.

**Management advice:** In order to achieve the reduction in fishing mortality recommended for Celtic Sea cod, ACFM recommends that fishing mortality in 1995 be reduced to 80% of the level in recent years.



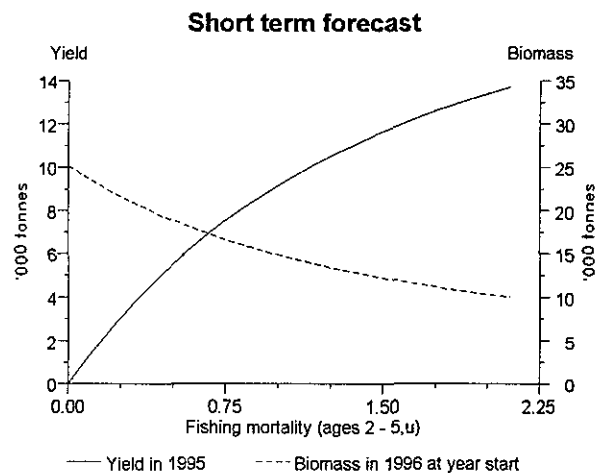
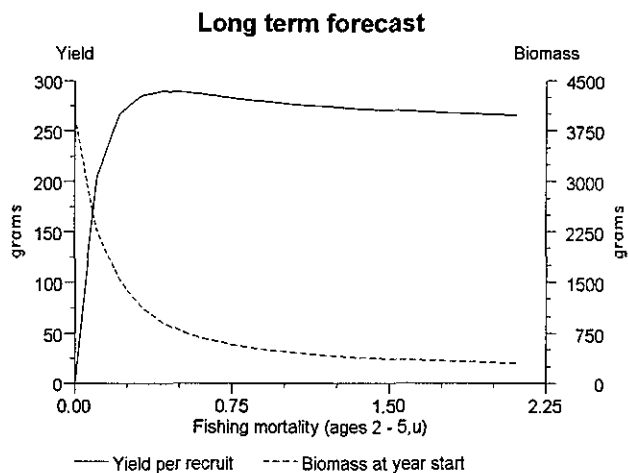
**Special comments:** The forecast is not of high precision. Much of this is due to dependence of the forecast on recruiting year classes whose abundance cannot be precisely determined.

**Data and assessment:** Assessment now includes data for Division VIIh. Analytical assessment based on landings

and commercial CPUE data for two fleets. No recruitment indices are available for this stock. SSB now estimated at 1 January.

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

### Yield and Spawning Stock Biomass



### 3.9.4 Celtic Sea plaice (Divisions VIIIf and g)

Catch data (Tables 3.9.5 and 3.9.6):

Year	Rec. TAC	Agreed TAC	Off. Indgs.	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		

<sup>1</sup>No 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(E+W) 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:** SSB rose to a peak in the mid-1980s but has declined rapidly since 1988. Fishing mortality increased steadily during the 1980s. Recent recruitment has been poor. The stock is considered to be close to safe biological limits. Further details in Table 3.9.6.

#### Forecast for 1995:

SSB(94) = 1.23, F(94) = 0.77, Basis: F(94)=F(93), Catch(94) = -, Landings (94) = 1.28.

Recruitment of the 1993 and 1994 year classes was set equal to the geometric mean for the period 1977-1991.

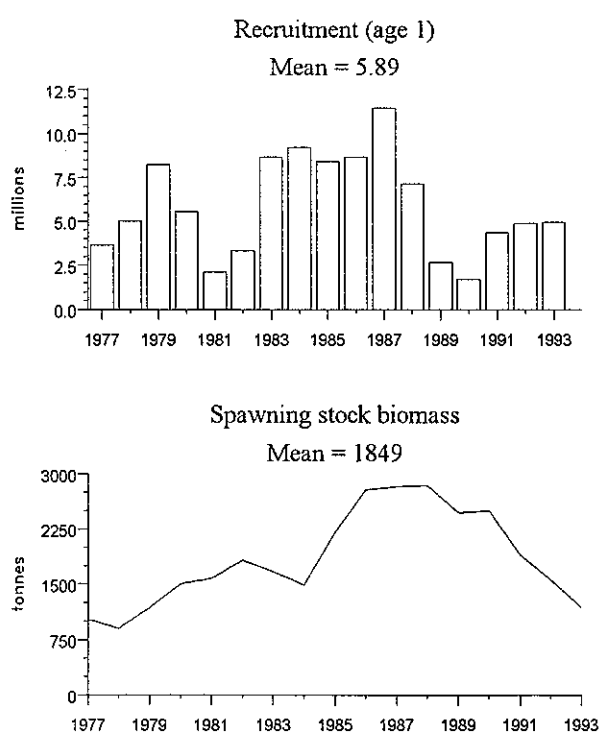
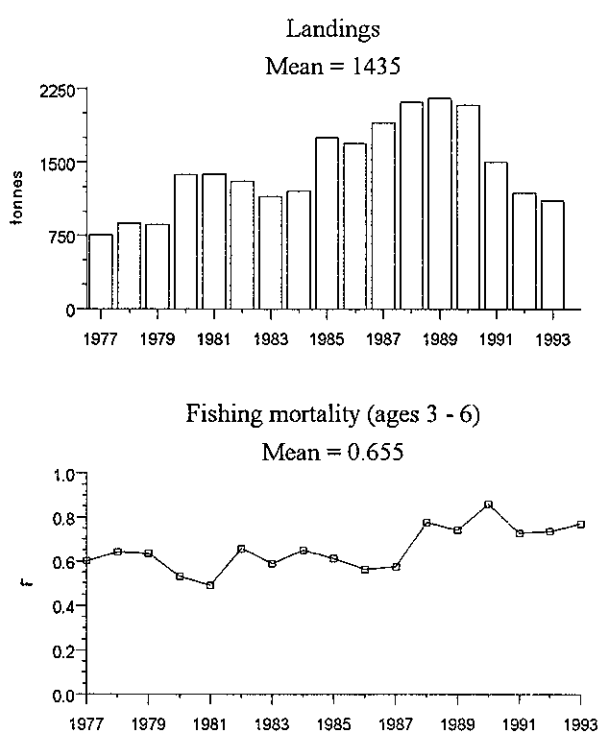
Option	Basis	F (95)	SSB (95)	Catch (95)	Landgs (95)	SSB (96)
A	0.6F <sub>93</sub>	0.46	1.29	-	1.81	1.64
B	0.8F <sub>93</sub>	0.62	1.25	-	1.09	1.42
C	1.0F <sub>93</sub>	0.77	1.21	-	1.29	1.23

Weights in '000 t.

For options A and B, SSB increases in 1996 compared with 1994 but, for all options, SSB remains below average in 1996. Any increase in F will result in a decrease in SSB.

**Management advice:** To prevent further reductions in SSB, ACFM recommends that fishing mortality should not be allowed to increase from the recent level. Management of this stock should be viewed in conjunction with Celtic Sea sole.

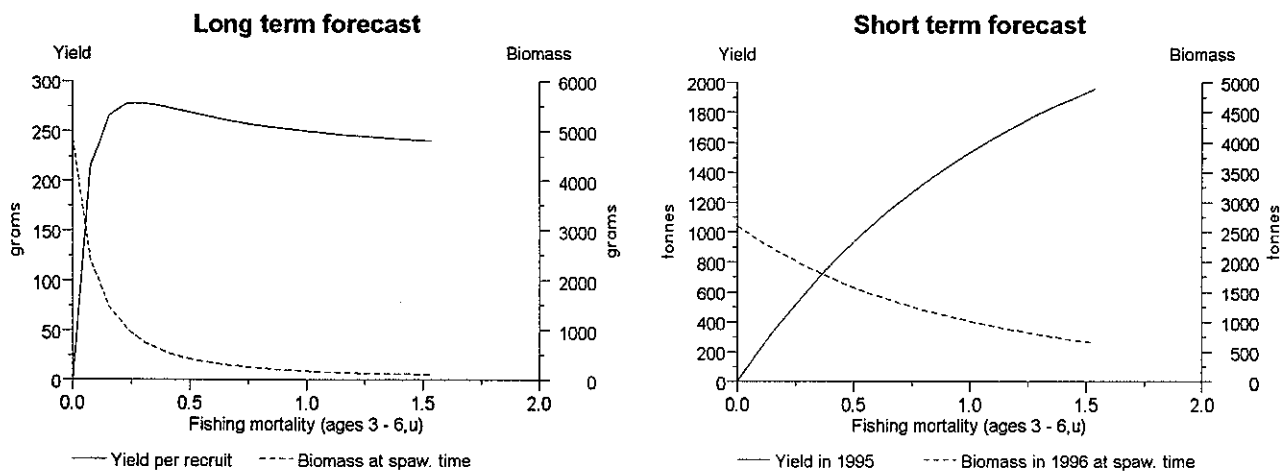
**Special comments:** Plaice and sole in the Celtic Sea are taken in a mixed fishery. If departure from *status quo* fishing mortality is implemented for either species, the implications for the associated species should be considered. The forecast is not of high precision. Much of this is due to dependence of the forecast on recruiting year classes whose abundance cannot be precisely determined.



**Data and assessment:** Analytical age-based assessment based on landings, survey and commercial CPUE data. No information on discards. Possible misreporting of landings but no quantitative information.

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

### Yield and Spawning Stock Biomass



### 3.9.5 Celtic Sea sole (Divisions VIIIf and g)

Catch data (Tables 3.9.7 and 3.9.8):

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	<sup>1</sup>	1.1	0.9
1994	<sup>1</sup>	1.1	

<sup>1</sup>No 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 (E+W) 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:** Fishing mortality increased in the 1970s to a peak value in 1990; it has since decreased, but remains above  $F_{high}$ . SSB has steadily declined since the early 1970s, reaching a record low value in 1991 and has

remained close to that level through 1993. The 1989 year class was confirmed to be strong. The stock is considered to be close to safe biological limits.

Further details in Table 3.9.8.

#### Forecast for 1995:

SSB(94) = 2.2  $F(94) = 0.50$ , Basis:  $F(94) = F(93)$ ,  
Catch(94) = -, Landings (94) = 1.1.

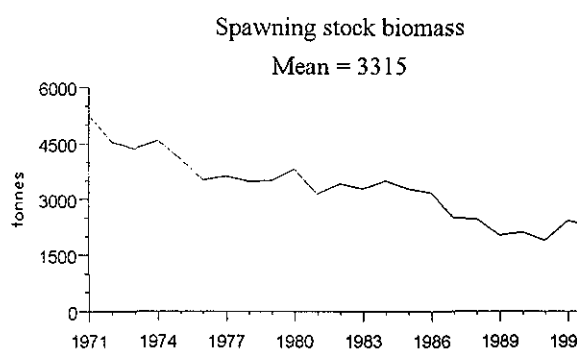
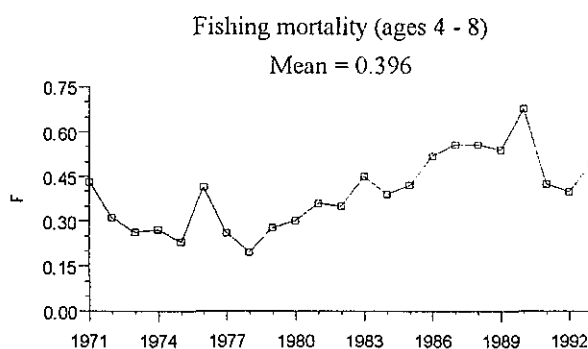
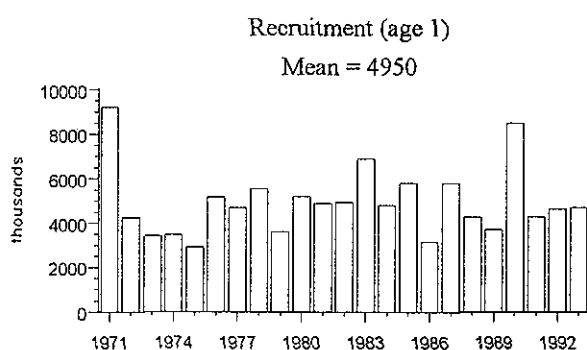
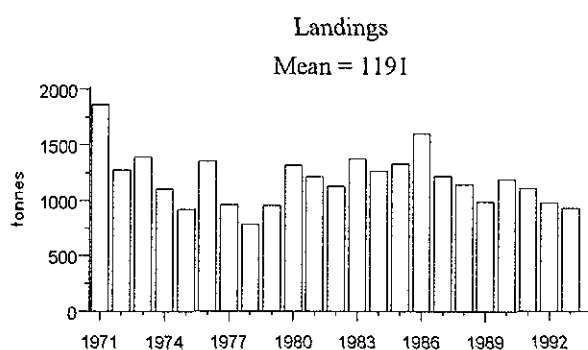
Option	Basis	F (95)	SSB (95)	Catch (95)	Lndgs (95)	SSB (96)
A	$F_{max}$	0.23	2.3	-	0.6	2.7
B	$0.6F_{93}$	0.30	2.2	-	0.7	2.5
C	$0.8F_{93}$	0.40	2.2	-	0.9	2.2
D	$F_{93}$	0.50	2.1	-	1.0	2.0

Weights in '000' t.

Options A and B, SSB increases in 1996 compared to 1994. Option C, SSB stable and option D, SSB decreases.

At the current level of F, SSB is predicted to decrease in 1996. If F is increased, SSB will reach record low levels. Even at  $F_{max}$  (about half the present F) the SSB will still be below average in 1996.

**Management advice:** To prevent further reductions in SSB, ACFM recommends that fishing mortality should not be allowed to increase from the recent level. Management of this stock should be viewed in conjunction with Celtic Sea plaice.

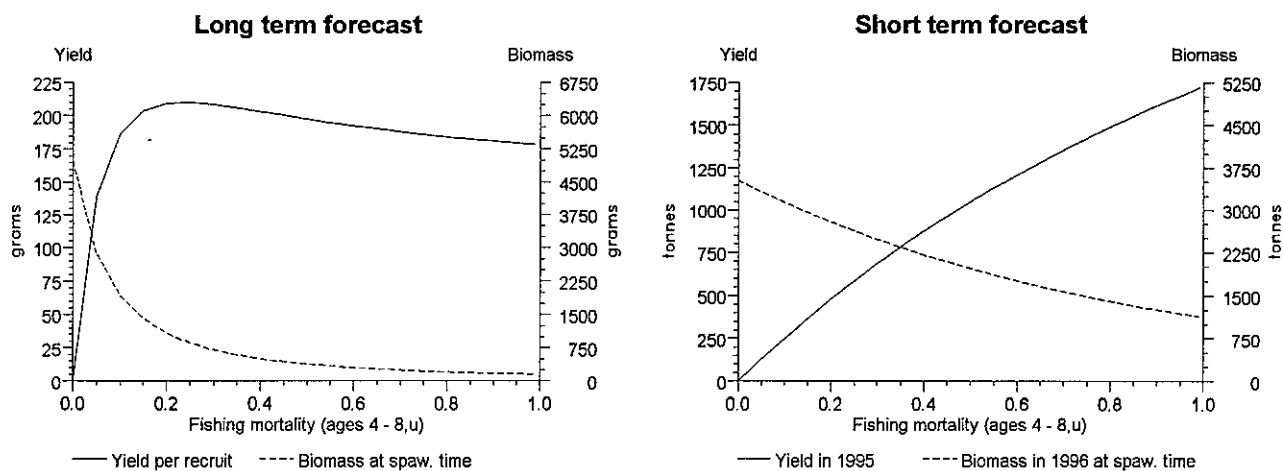


**Special comments:** Sole and plaice in the Celtic Sea are taken in a mixed fishery. If departure from *status quo* fishing mortality is implemented for either species, the implications for the associated species should be considered.

**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 1994 (C.M.1995/Assess:6).

### Yield and Spawning Stock Biomass



### 3.9.6 Cod in Division VIIe (Western English Channel)

Catch data (Table 3.9.9):

Year	Rec. TAC	Agreed TAC <sup>1</sup>	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	

Weights in '000 t.

<sup>1</sup>TAC covers Sub-area VII (except Division VIIa).

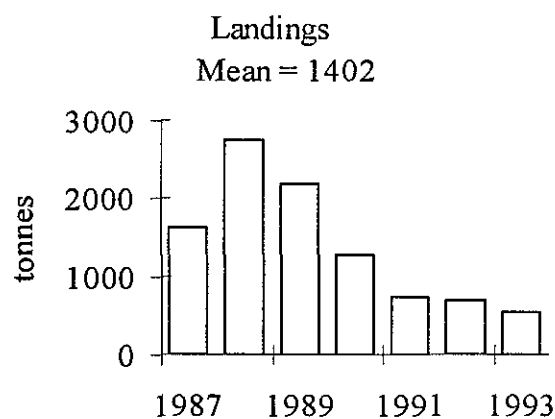
**Historical development of the fishery:** France and UK account for most of the landings. Catch in 1993 is only 19% of the catch in 1988 and 34% of the mean catch in the period (1987-1992). TAC is for a wider area.

**State of stock:** Unknown, but 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:** Data not available for an analytical assessment.

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





### 3.9.7 Whiting in Division VIIe (Western English Channel)

Catch data (Table 3.9.10):

Year	Rec. TAC	Agreed TAC <sup>1</sup>	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	-

Weights in '000 t.

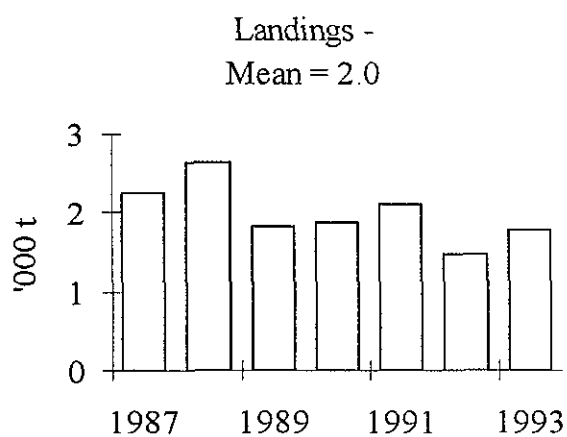
<sup>1</sup>TAC for Sub-area VII (except Division VIIa).

**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 1994 (C.M.1995/Assess:6).



### 3.9.8 Plaice in Division VIIe (Western English Channel)

Catch data (Tables 3.9.11 and 3.9.12):

Year	Rec. TAC <sup>1</sup>	Agreed TAC <sup>1</sup>	Off. Indgs.	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	2.3	2.4
1990	10.7	10.7	n/a <sup>2</sup>	2.6
1991	8.8	10.7	n/a <sup>2</sup>	1.8
1992	-	9.6	n/a <sup>2</sup>	1.6
1993	-	8.5	n/a <sup>2</sup>	1.4
1994	-	9.1		

<sup>1</sup>TACs for Divisions VIIId,e. <sup>2</sup>Not reported for all countries. Weights in '000 t.

**Historical development of the fishery:** UK (E+W) landings were stable at a low level between 1950 and the mid-1970s but increased rapidly after 1978 as beam trawling began to replace otter trawls in this fishery. Landings increased during the late 1970s and reached a peak in 1988-1990 due to increased exploitation and improved recruitment.

**State of stock:** SSB reached a peak level in 1990 following a series of good year classes, but has declined rapidly and is currently below the long-term mean. Current fishing

mortality is close to a record high. The stock is considered to be within safe biological limits.

Further details in Table 3.9.12.

**Forecast for 1995:**

SSB(94) = 2.24, F(94) = 0.64, Basis: F(94)=F(93), Catch(94) = - , Landings (94) = 1.56.

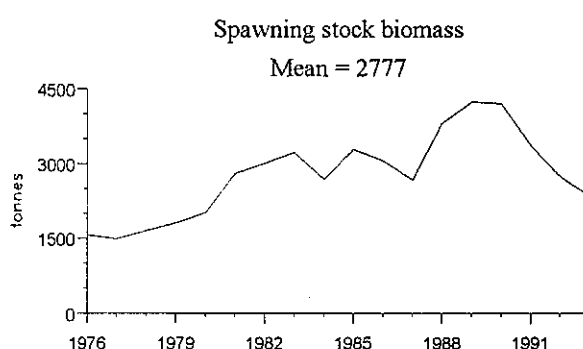
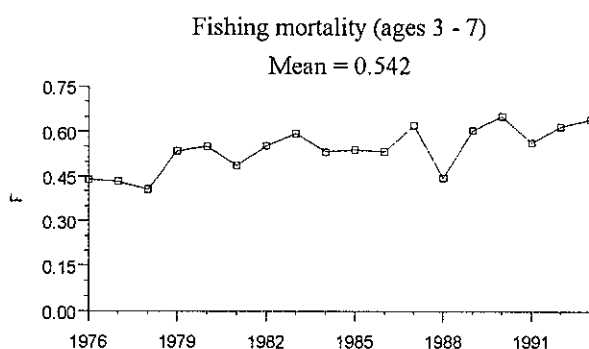
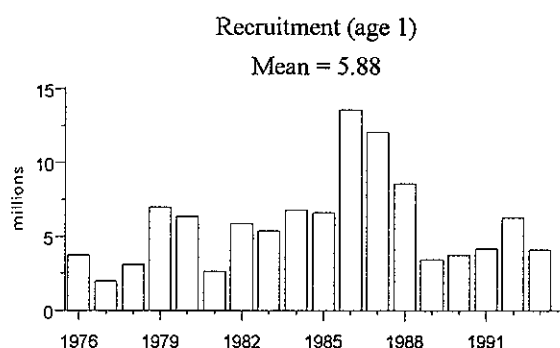
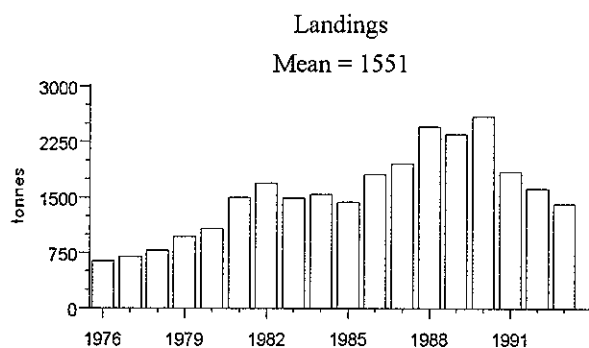
Recruitment of the 1993 and 1994 year classes set equal to the geometric mean for the period 1976-1991.

Option	Basis	F (95)	SSB (95)	Catch (95)	Indgs (95)	SSB (96)
A	0.6F <sub>93</sub>	0.38	2.01	-	0.95	2.35
B	0.8F <sub>93</sub>	0.51	2.07	-	1.20	2.12
C	1.0F <sub>93</sub>	0.64	2.07	-	1.41	1.92
D	1.2F <sub>93</sub>	0.77	2.07	-	1.61	1.74

Weights in '000 t.

Under all options, SSB is expected to decline in 1996 compared to 1993. At the current fishing mortality rate SSB is expected to decline further, approaching historical low levels.

**Management advice:** The stock is in danger of falling outside safe biological limits. However, because of the linkage between this stock and the larger Division VIIId plaice stock, ACFM recommends that, as a minimum, fishing mortality in 1995 should not be allowed to increase above recent levels.



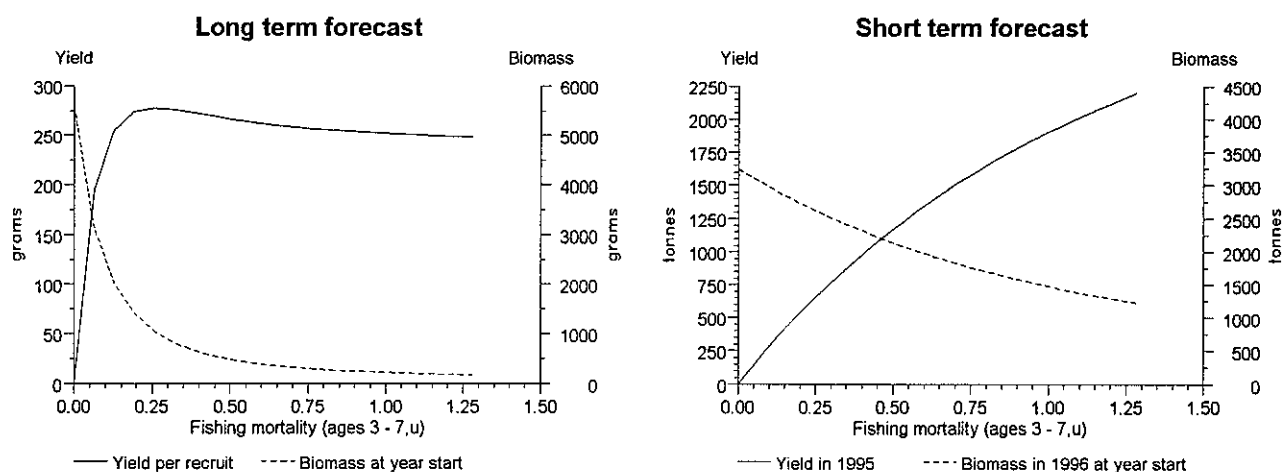
**Special comments:** The TAC is set for Divisions VIIId,e combined, so the results from this assessment need to be considered along with the much larger Division VIIId stock.

**Data and assessment:** Analytical age-based assessment based on landings, survey and commercial CPUE data. No information on discards available. Possible misreporting of

landings but no quantitative information. When comparing with previous assessments, it should be noted that SSB is now estimated for January 1.

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

### Yield and Spawning Stock Biomass



### 3.9.9 Sole in Division VIIe (Western English Channel)

Catch data (Tables 3.9.13 and 3.9.14):

Year	Rec. TAC	Agreed TAC	Off. Indgs.	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	0.8	0.8
1994	1.0	1.0		

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 but plaice and other species are 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:** SSB has been declining since 1980 due to

an increase in fishing mortality. Fishing mortality has decreased since 1989 but is still at a relatively high level. The 1989 year class was strong but subsequent year classes have been average or below average. The stock is considered to be close to safe biological limits.

Further details in Table 3.9.14.

**Forecast for 1995:**

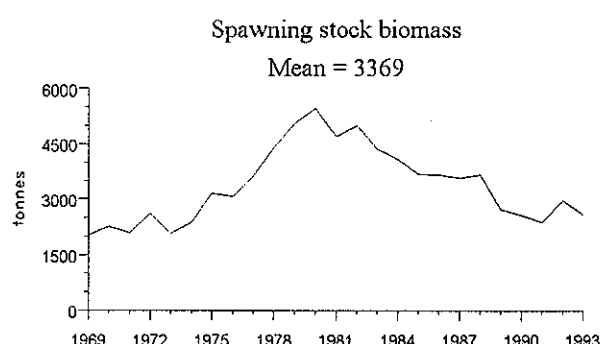
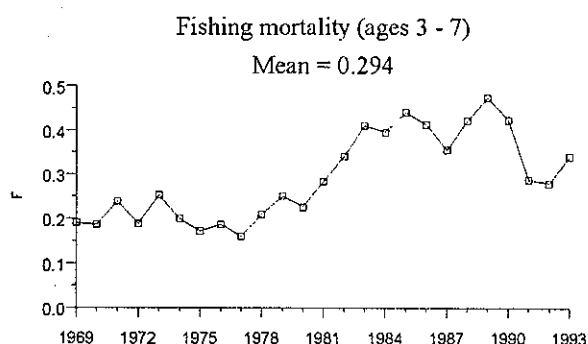
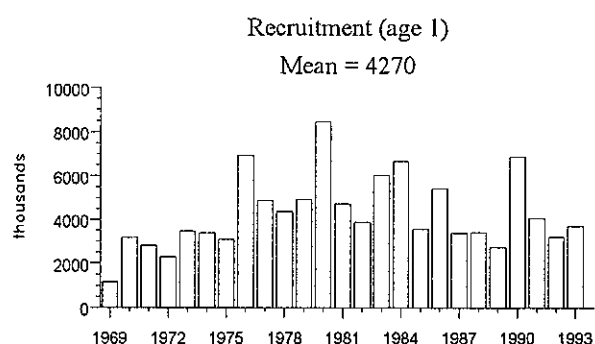
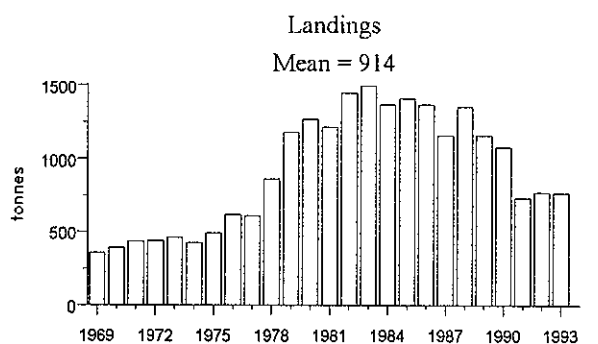
SSB(94) = 2.8, F(94) = 0.34, Basis: F(94) = F(93), Catch(94) = -, Landings (94) = 0.90.

Recruitment of the 1993 and 1994 year classes set equal to the geometric mean for the period 1969-1991.

Option	Basis	F (95)	SSB (95)	Catch (95)	Lndgs (95)	SSB (96)
A	0.6 F <sub>93</sub>	0.20	2.70	-	0.55	3.01
B	0.8 F <sub>93</sub>	0.21	2.70	-	0.71	2.85
C	1.0 F <sub>93</sub>	0.34	2.70	-	0.86	2.69

Weights in '000 t.

SSB remains close to the current level for all options. The equilibrium SSB with the current exploitation pattern and level of F, assuming GM recruitment, is 3347 t, which can be compared with the SSB of 2700 t predicted for 1994-96.



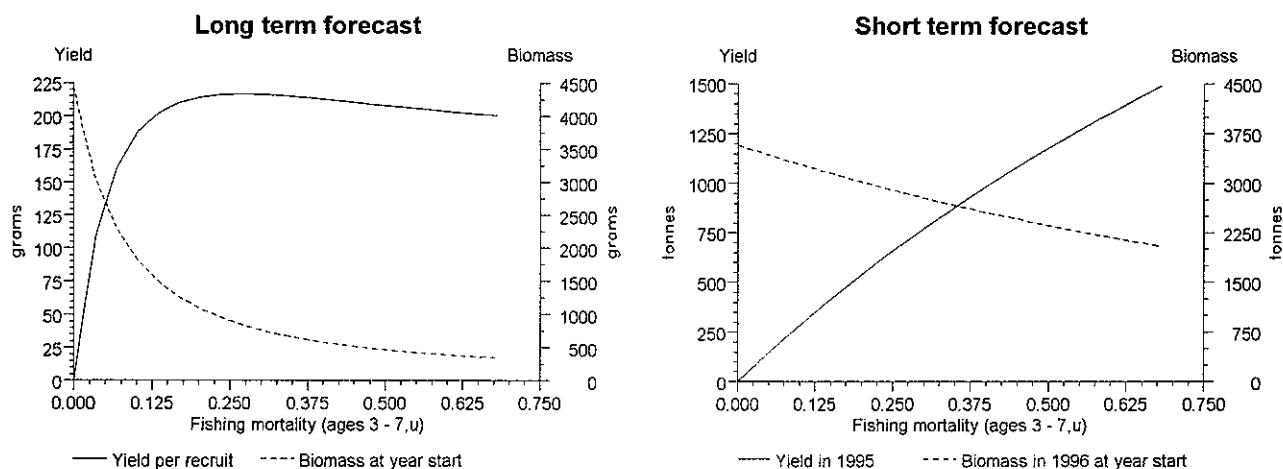
**Management advice:** The decline in SSB is expected to continue in the short term unless fishing mortality is reduced below the current level. To prevent the stock from falling outside safe biological limits, fishing mortality should not be allowed to increase.

**Data and assessment:** Analytical assessment based on landings, survey and commercial CPUE data. No

information on discards. Possible mis-reporting of landings but no objective information.

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

### Yield and Spawning Stock Biomass



### **3.9.10 Stocks in Divisions VIIb,c,h-k**

Officially reported landings of cod, whiting, plaice and sole in Divisions VIIb,c, h-k are given in Tables 3.9.15-3.9.16.

Data are at present insufficient for assessment purposes.

**Table 2.2.1** North-East Arctic COD. Total catch (t) by fishing areas and unreported catch.  
(Data provided by Working Group members)

Year	Sub-area I	Division IIa	Division IIb	Unreported catches	Total catch
1961	409,694	153,019	220,508		783,221
1962	548,621	139,848	220,797		909,266
1963	547,469	117,100	111,768		776,337
1964	206,883	104,698	126,114		437,695
1965	241,489	100,011	103,430		444,983
1966	292,253	134,805	56,653		483,711
1967	322,798	128,747	121,060		572,605
1968	642,452	162,472	269,254		1,074,084
1969	679,373	255,599	262,254		1,197,226
1970	603,855	243,835	85,556		933,246
1971	312,505	319,623	56,920		689,048
1972	197,015	335,257	32,982		565,254
1973	492,716	211,762	88,207		792,685
1974	723,489	124,214	254,730		1,102,433
1975	561,701	120,276	147,400		829,377
1976	526,685	237,245	103,533		867,463
1977	538,231	257,073	109,997		905,301
1978	418,265	263,157	17,293		698,715
1979	195,166	235,449	9,923		440,538
1980	168,671	199,313	12,450		380,434
1981	137,033	245,167	16,837		399,037
1982	96,576	236,125	31,029		363,730
1983	64,803	200,279	24,910		289,992
1984	54,317	197,573	25,761		277,651
1985	112,605	173,559	21,756		307,920
1986	157,631	202,688	69,794		430,113
1987	146,106	245,387	131,578		523,071
1988	166,649	209,930	58,360		434,939
1989	164,512	149,360	18,609		332,481
1990	62,272	99,465	25,263	25,000	212,000
1991	70,970	156,966	41,222	50,000	319,158
1992	124,219	172,792	86,483	130,000	513,494
1993 <sup>1</sup>	195,676	269,249	67,555	50,000	582,480

<sup>1</sup>Provisional figures.

**Table 2.2.2 North-East Arctic COD. Nominal catch (t) by countries (Sub-area I and Divisions IIa and IIb combined).**  
(Data provided by Working Group members).

Year	Faroe Islands	France	German Dem. Rep.	Fed. Rep Germany	Norway	Poland	United Kingdom	Russia <sup>2</sup>	Others	Total all countries
1961	3,934	13,755	3,921	8,129	268,377	-	158,113	325,780	1,212	783,221
1962	3,109	20,482	1,532	6,503	225,615	-	175,020	476,760	245	909,266
1963	-	18,318	129	4,223	205,056	108	129,779	417,964	-	775,577
1964	-	8,634	297	3,202	149,878	-	94,549	180,550	585	437,695
1965	-	526	91	3,670	197,085	-	89,962	152,780	816	444,930
1966	-	2,967	228	4,284	203,792	-	103,012	169,300	121	483,704
1967	-	664	45	3,632	218,910	-	87,008	262,340	6	572,605
1968	-	-	225	1,073	255,611	-	140,387	676,758	-	1,074,084
1969	29,374	-	5,907	5,543	305,241	7,856	231,066	612,215	133	1,197,226
1970	26,265	44,245	12,413	9,451	377,606	5,153	181,481	276,632	-	933,246
1971	5,877	34,772	4,998	9,726	407,044	1,512	80,102	144,802	215	689,048
1972	1,393	8,915	1,300	3,405	394,181	892	58,382	96,653	166	565,287
1973	1,916	17,028	4,684	16,751	285,184	843	78,808	387,196	276	792,686
1974	5,717	46,028	4,860	78,507	287,276	9,898	90,894	540,801	38,453	1,102,434
1975	11,309	28,734	9,981	30,037	277,099	7,435	101,843	343,580	19,368	829,377
1976	11,511	20,941	8,946	24,369	344,502	6,986	89,061	343,057	18,090	867,463
1977	9,167	15,414	3,463	12,763	388,982	1,084	86,781	369,876	17,771	905,301
1978	9,092	9,394	3,029	5,434	363,088	566	35,449	267,138	5,525	698,715
1979	6,320	3,046	547	2,513	294,821	15	17,991	105,846	9,439	440,538
1980	9,981	1,705	233	1,921	232,242	3	10,366	115,194	8,789	380,434
<u>Spain</u>										
1981	12,825	3,106	298	2,228	277,818	14,500	5,262	83,000	-	399,037
1982	11,998	761	302	1,717	287,525	14,515	6,601	40,311	-	363,730
1983	11,106	126	473	1,243	234,000	14,229	5,840	22,975	-	289,992
1984	10,674	11	686	1,010	230,743	8,608	3,663	22,256	-	277,651
1985	13,418	23	1,019	4,395	211,065	7,846	3,335	62,489	4,330	307,920
1986	18,667	591	1,543	10,092	232,096	5,497	7,581	150,541	3,505	430,113
1987	15,036	1	986	7,035	268,004	16,223	10,957	202,314	2,515	523,071
1988	15,329	2,551	605	2,803	223,412	10,905	8,107	169,365	1,862	434,939
1989	15,625	3,231	326	3,291	158,684	7,802	7,056	134,593	1,273	332,481
1990	9,584	592	169	1,437	88,737	7,950	3,412	74,609	510	187,000
1991	8,981	975	<u>Greenland</u>	2,613	126,226	3,677	3,981	119,427 <sup>3</sup>	3,278	269,158
1992	11,663	262	3,337	3,911	168,460	6,217	6,120	182,315	1,209	383,494
1993 <sup>1</sup>	17,435	3,572	5,389	5,912	221,822	8,800	11,337	244,860	13,353	532,480

<sup>1</sup>Provisional figures.

<sup>2</sup>USSR prior to 1991.

<sup>3</sup>Includes Baltic countries.



**Table 2.2.3** North East Arctic Cod. Weights in '000 t and numbers in millions.

Year	Recruitment	Spawning Stock	Fishing Mortality	
	Age 3	Biomass	Landings	Age 5-10
1946	730	3,839	706	0.19
1947	420	3,163	882	0.31
1948	441	2,203	774	0.35
1949	467	1,697	800	0.37
1950	706	1,539	732	0.37
1951	1,086	1,443	827	0.40
1952	1,191	1,168	877	0.54
1953	1,592	905	696	0.36
1954	644	826	826	0.40
1955	273	867	1,148	0.55
1956	440	989	1,343	0.64
1957	805	924	793	0.51
1958	497	1,012	769	0.51
1959	685	855	745	0.56
1960	790	598	622	0.47
1961	919	510	783	0.62
1962	730	469	909	0.75
1963	473	373	776	0.97
1964	339	240	438	0.67
1965	778	212	445	0.54
1966	1,582	337	484	0.51
1967	1,293	456	573	0.53
1968	170	435	1,074	0.55
1969	112	468	1,197	0.81
1970	197	466	933	0.73
1971	405	676	689	0.59
1972	1,016	674	565	0.67
1973	1,819	391	793	0.59
1974	525	232	1,102	0.56
1975	622	213	829	0.62
1976	614	230	867	0.65
1977	348	312	905	0.83
1978	639	401	699	0.93
1979	199	228	441	0.72
1980	140	168	380	0.72
1981	158	151	399	0.83
1982	158	372	364	0.75
1983	169	325	290	0.74
1984	384	271	278	0.90
1985	509	200	308	0.80
1986	972	171	430	0.92
1987	289	149	523	1.01
1988	234	157	435	0.89
1989	166	178	332	0.60
1990	177	389	212	0.25
1991	398	831	319	0.25
1992	726	1,115	513	0.33
1993	808	1,024	582	0.43
<b>Average</b>	<b>601</b>	<b>726</b>	<b>675</b>	<b>0.60</b>

**Table 2.2.4 Landings of Coastal cod in:****A) Norway in Division IIa - area: 05, 00, 06 and 07. (In '000 tonnes).**

1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
43	32	30	40	46	24	29	33	47	52
1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
49	1	1	1	1	1	1	1	1	1
1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
40	49	42	38	33	28	26	31	22	17
1990	1991	1992	1993						
24	25	35	43 <sup>2</sup>						

<sup>1</sup>No data<sup>2</sup>Provisional data**B) USSR/Russia data of Murman cod in Division I. (In '000 t)**

1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
71	108	114	127	63	52	73	79	118	122
1970	1971	1972	1973	1974					
70	48	23	122	99					

**Table 2.3.1** North-East Arctic HADDOCK. Total nominal catch (t) by fishing areas. (Data provided by Working Group members).

Year	Sub-area I	Division IIa	Division IIb	Total
1960	125,657	27,925	1,854	155,434
1961	165,165	25,642	2,427	193,234
1962	160,972	25,189	1,727	187,888
1963	124,774	21,031	939	146,744
1964	79,056	18,735	1,109	98,900
1965	98,505	18,640	939	118,079
1966	124,115	34,892	1,614	160,621
1967	108,066	27,980	440	136,486
1968	140,970	40,031	725	181,726
1969	88,960	40,208	1,341	130,509
1970	59,493	26,611	497	86,601
1971	56,300	21,567	435	78,302
1972	221,183	41,979	2,155	265,317
1973	283,728	23,348	2,989	320,065
1974	159,037	47,033	5,068	221,138
1975	121,686	44,330	9,726	175,742
1976	94,065	37,566	5,649	137,279
1977	72,159	28,452	9,547	110,158
1978	63,965	30,478	979	95,422
1979	63,841	39,167	615	103,623
1980	54,205	33,616	68	87,889
1981	36,834	39,864	455	77,153
1982	17,948	29,005	2	46,955
1983	7,550	13,872	185	21,607
1984	4,000	13,247	71	17,318
1985	30,385	10,774	111	41,270
1986	69,865	26,006	714	96,585
1987	109,429	38,182	3,048	150,659
1988	43,990	47,086	668	91,744
1989	31,265	23,502	355	55,122
1990	15,138	10,375	304	25,817
1991	18,772	14,417	416	33,605
1992	30,746	22,177	964	53,887
1993 <sup>1</sup>	46,596	26,840	2,480	75,916

<sup>1</sup>Provisional figures.

**Table 2.3.2 North-East Arctic HADDOCK. Nominal catch (t) by countries (Sub-area I and Divisions IIa and IIb combined). (Data provided by Working Group members).**

Year	Faroe Islands	France	German Dem. Rep.	Germany, Fed. Rep.	Norway	Poland	United Kingdom	Russia <sup>2</sup>	Others	Total
1960	172	-	-	5,597	46,263	-	45,469	57,025	125	155,651
1961	285	220	-	6,304	60,862	-	39,650	85,345	558	193,234
1962	83	409	-	2,895	54,567	-	37,486	91,910	58	187,438
1963	17	363	-	2,554	59,955	-	19,809	63,526	-	146,224
1964	-	208	-	1,482	38,695	-	14,653	43,870	250	99,158
1965	-	226	-	1,568	60,447	-	14,345	41,750	242	118,578
1966	-	1,072	11	2,098	82,090	-	27,723	48,710	74	161,778
1967	-	1,208	3	1,705	51,954	-	24,158	57,346	23	136,397
1968	-	-	-	1,867	64,076	-	40,129	75,654	-	181,726
1969	2	-	309	1,490	67,549	-	37,234	24,211	25	130,820
1970	541	-	656	2,119	37,716	-	20,423	26,802	-	87,257
1971	81	-	16	896	45,715	43	16,373	15,778	3	78,905
1972	137	-	829	1,433	46,700	1,433	17,166	196,224	2,231	266,153
1973	1,212	3,214	22	9,534	86,767	34	32,408	186,534	2,501	322,626
1974	925	3,601	454	23,409	66,164	3,045	37,663	78,548	7,348	221,157
1975	299	5,191	437	15,930	55,966	1,080	28,677	65,015	3,163	175,758
1976	536	4,459	348	16,660	49,492	986	16,940	42,485	5,358	137,265
1977	213	1,510	144	4,798	40,118	-	10,878	52,210	287	110,158
1978	466	1,411	369	1,521	39,955	1	5,766	45,895	38	95,422
1979	343	1,198	10	1,948	66,849	2	6,454	26,365	454	103,623
1980	497	226	15	1,365	61,886	-	2,948	20,706	246	87,889
1981	381	414	22	2,398	58,856	<u>Spain</u>	1,682	13,400	-	77,153
1982	496	53	-	1,258	41,421	-	827	2,900	-	46,955
1983	428	-	1	729	19,371	139	259	680	-	21,607
1984	297	15	4	400	15,186	37	276	1,103	-	17,318
1985	424	21	20	395	17,490	77	153	22,690	-	41,270
1986	893	33	75	1,079	48,314	22	431	45,738	-	96,585
1987	464	26	83	3,106	69,333	99	563	76,980	-	150,654
1988	1,113	116	78	1,324	57,273	72	435	31,293	41	91,745
1989	1,218	125	26	171	31,825	1	853	20,903	-	55,122
1990	875	-	5	128	17,634	-	569	6,605	-	25,816
1991	1,117	60	<u>Greenland</u>	219	19,285	-	514	12,388	22	33,605
1992	1,093	151	1,719	387	30,203	38	596	19,699	1	53,887
1993 <sup>1</sup>	546	1,215	880	1,165	35,469	76	1,802	34,700	63	75,916

<sup>1</sup>Provisional figures.

<sup>2</sup>USSR prior to 1991.

**Table 2.3.3** North-East Arctic Haddock. Weights in '000 t and numbers in millions.

Year	Recruitment	Spawning Stock	Landings	Fishing Mortality
	Age 1	Biomass		Age 4-7
1950	91	309	132	0.84
1951	1,568	165	120	0.63
1952	193	123	128	0.75
1953	78	147	123	0.53
1954	256	205	156	0.39
1955	82	375	203	0.52
1956	102	431	213	0.47
1957	493	340	123	0.46
1958	368	245	113	0.56
1959	170	157	88	0.42
1960	372	144	155	0.52
1961	417	159	193	0.69
1962	480	157	188	0.85
1963	150	113	147	0.92
1964	356	98	99	0.68
1965	445	128	118	0.52
1966	26	187	161	0.64
1967	26	198	136	0.45
1968	248	219	182	0.54
1969	142	208	131	0.43
1970	1,532	195	87	0.39
1971	418	168	78	0.26
1972	88	151	265	0.75
1973	78	133	320	0.59
1974	91	222	221	0.52
1975	184	277	176	0.54
1976	288	298	137	0.71
1977	206	165	110	0.85
1978	28	99	95	0.69
1979	9	66	104	0.72
1980	12	67	88	0.54
1981	8	128	77	0.59
1982	13	112	47	0.48
1983	387	73	22	0.41
1984	505	48	18	0.31
1985	126	37	41	0.39
1986	46	54	97	0.44
1987	24	34	151	0.51
1988	25	57	92	0.56
1989	104	63	55	0.44
1990	284	63	26	0.19
1991	610	73	34	0.27
1992	308	93	54	0.37
1993	116	112	76	0.53
<b>Average</b>	263	157	122	0.54

**Table 2.4.1** North-East Arctic SAI THE. Nominal catch (tonnes) by countries in Sub-area I and Divisions IIa and IIb combined as officially reported to ICES.

Country	1984	1985	1986	1987	1988
Denmark	-	-	-	1	-
Faroe Islands	503	490	426	712	441
France	431	657	308	576	411
German Dem. Rep.	6	11	-	-	17
Germany, Fed. Rep.	4,532	1,837	3,470	4,909	4,557
Greenland	-	-	-	-	-
Iceland	-	-	-	-	-
Norway	152,818	103,899	63,090	85,710	108,244
Spain	-	-	-	-	-
UK (Engl. & Wales)	335	202	54	54	436
UK (Scotland)	-	+	21	3	6
USSR	161	51	27	426	130
Total	158,786	107,147	67,396	92,391	114,242

Country	1989	1990	1991	1992	1993 <sup>1</sup>
Denmark	-	-	5	-	1
Faroe Islands	388	1,207	963	165	31
France	460 <sup>2</sup>	340 <sup>2</sup>	77 <sup>2</sup>	1,980	307 <sup>2</sup>
German Dem. Rep.	-	14	-	-	-
Germany, Fed. Rep.	606	1,129	2,003	3,451	3,686
Greenland	-	-	-	734	78
Iceland	-	-	-	-	3
Norway	119,625	92,397	103,283	116,722 <sup>1</sup>	137,323
Russia <sup>3</sup>	506	52	504 <sup>4</sup>	964	2,209
Spain	-	-	-	6	4
UK (Engl. & Wales)	702	681	449	515	407
UK (Scotland)	23	28	42	25	7
Total	122,310	95,848	107,326	124,562	144,056

<sup>1</sup>Provisional figures.

<sup>2</sup>As reported to Norwegian authorities.

<sup>3</sup>USSR prior to 1991.

<sup>4</sup>Includes Estonia.

**Table 2.4.2** North-East Arctic Saithe. Weights in '000 t and numbers in millions.

<b>Year</b>	<b>Recruitment</b>	<b>Spawning Stock</b>	<b>Fishing Mortality</b>	
	<b>Age 2</b>	<b>Biomass</b>	<b>Landings</b>	<b>Age 3-6</b>
1960	121	225	136	0.27
1961	212	237	110	0.23
1962	353	312	123	0.23
1963	121	340	148	0.22
1964	366	403	198	0.23
1965	209	399	185	0.23
1966	240	486	202	0.28
1967	191	491	191	0.28
1968	365	508	107	0.16
1969	344	477	140	0.21
1970	376	602	260	0.33
1971	217	579	245	0.37
1972	275	503	211	0.42
1973	116	513	216	0.44
1974	204	445	262	0.63
1975	369	326	233	0.47
1976	302	240	242	0.68
1977	177	144	183	0.59
1978	281	144	154	0.55
1979	166	113	164	0.52
1980	352	127	154	0.56
1981	151	89	176	0.56
1982	139	101	171	0.63
1983	118	103	155	0.53
1984	136	123	159	0.74
1985	271	99	107	0.56
1986	207	75	70	0.40
1987	100	73	92	0.35
1988	76	67	115	0.41
1989	82	102	123	0.55
1990	323	111	95	0.49
1991	397	103	107	0.46
1992		94	125	0.47
1993		56	144	0.41
<b>Average</b>	<b>230</b>	<b>259</b>	<b>162</b>	<b>0.42</b>

**Table 2.5.1 REDFISH in Sub-areas I and II. Nominal catch (t) by countries in Sub-areas I, Divisions IIa and IIb combined as officially reported to ICES.**

Country	1984	1985	1986	1987	1988
Denmark	-	-	-	+	-
Faroe Islands	-	-	29	450 <sup>3</sup>	973
France	2,970	3,326	2,719	1,611	3,369
German Dem. Rep.	4,168	3,260	1,323	417	994
Germany, Fed. Rep.	3,289	3,306	3,561	5,412	1,361
Norway	18,650	20,456	23,255	18,051	24,662
Portugal	1,806	2,056	1,591	1,175	500
Spain	25	38	-	25	26
UK (England & Wales)	716	167	129	230	468
UK (Scotland)	-	-	14	9	2
USSR	69,689	59,943	20,694	7,215	9,139
Total	101,313	92,552	53,315	34,595	41,494

Country	1989	1990	1991	1992 <sup>1</sup>	1993 <sup>1</sup>
Canada	-	-	-	-	8 <sup>3</sup>
Denmark	-	37 <sup>3</sup>	23	623	19
Faroe Islands	338	386	644	58	152
France	1,877 <sup>1</sup>	1,826 <sup>1</sup>	804	1,306	278 <sup>3</sup>
German Dem. Rep.	1,978	5,351	-	-	-
Germany, Fed. Rep.	2,267	1,390	981	530	680
Norway	25,295	34,090	49,464	24,895 <sup>2</sup>	20,289 <sup>2</sup>
Portugal	340	830	166	977	1,069 <sup>3</sup>
Spain	5 <sup>2</sup>	-	1	16	65
UK (England & Wales)	259	332	285	447	734
UK (Scotland)	13	1	64	34	1
Russia <sup>4</sup>	14,344	18,918	15,354	4,335	5,309 <sup>2</sup>
Total	46,716	63,161	67,786	33,221	28,604

<sup>1</sup>Provisional figures.

<sup>2</sup>Working Group figure.

<sup>3</sup>As reported to Norwegian authorities.

<sup>4</sup>USSR prior to 1991.



**Table 2.5.2 REDFISH in Sub-areas I and II. Nominal catch (t) by countries in Sub-area I as officially reported to ICES.**

Country	1984	1985	1986	1987	1988
Faroe Islands	-	-	-	-	1
Germany, Fed. Rep.	1	143	50	10	6
Norway	1,472	2,378	4,260	2,331	2,232
UK (England & Wales)	22	43	32	14	20
UK (Scotland)	-	-	3	-	-
USSR	532	368	1,066	769	199
<b>Total</b>	<b>2,027</b>	<b>2,932</b>	<b>5,411</b>	<b>3,124</b>	<b>2,458</b>

Country	1989	1990	1991	1992 <sup>1</sup>	1993 <sup>1</sup>
Faroe Islands	13	7	-	-	26
Germany, Fed. Rep.	+	-	-	-	-
Norway	1,823 <sup>2</sup>	1,263 <sup>2</sup>	2,001 <sup>2</sup>	2,891 <sup>2</sup>	1,353 <sup>2</sup>
UK (England & Wales)	12	+	-	-	-
UK (Scotland)	2	-	-	-	-
Russia <sup>3</sup>	594	114	512	582	659 <sup>2</sup>
<b>Total</b>	<b>2,444</b>	<b>1,384</b>	<b>2,513</b>	<b>3,473</b>	<b>2,038</b>

<sup>1</sup>Provisional figures.

<sup>2</sup>Working Group figure.

<sup>3</sup>USSR prior to 1991.

**Table 2.5.3** REDFISH in Sub-areas I and II. Nominal catch (t) by countries in Division IIa as officially reported to ICES.

Country	1984	1985	1986	1987	1988
Faroe Islands	-	-	29	450 <sup>2</sup>	970
France	2,970	3,326	2,719	1,611	3,349
German Dem. Rep.	2,570	2,800	1,252	375	879
Germany, Fed. Rep.	3,288	2,972	3,319	3,562	1,320
Norway	17,111	18,062	18,693	15,409	22,288
Portugal	1,134	1,327	1,273	1,156	467
UK (England & Wales)	672	120	94	205	412
UK (Scotland)	-	-	11	8	2
USSR	63,342	59,047	19,099	4,953	7,598
Total	91,087	87,654	46,489	27,729	37,285

Country	1989	1990	1991	1992 <sup>1</sup>	1993 <sup>1</sup>
Faroe Islands	315	371	639	58	126
France	1,849 <sup>1</sup>	1,821 <sup>1</sup>	791 <sup>1</sup>	1,301	243 <sup>3</sup>
German Dem. Rep.	1,468	722	-	-	-
Germany, Fed. Rep.	2,144	1,338	678	211	503
Greenland	-	-	-	614 <sup>5</sup>	15 <sup>5</sup>
Norway	23,406 <sup>2</sup>	31,286 <sup>2</sup>	46,645 <sup>2</sup>	21,605 <sup>2</sup>	18,772 <sup>2</sup>
Portugal	251	824	159	824	586 <sup>3</sup>
UK (England & Wales)	240	269	247	217	433
UK (Scotland)	9	1	51	18	1
Russia <sup>4</sup>	10,661	6,884	8,130	1,500	4,359 <sup>2</sup>
Total	40,343	43,516	57,340	26,348	25,038

<sup>1</sup>Provisional figures.

<sup>2</sup>Working Group figure.

<sup>3</sup>As reported to Norwegian authorities.

<sup>4</sup>USSR prior to 1991.

<sup>5</sup>Includes Division IIb.

**Table 2.5.4 REDFISH in Sub-areas I and II. Nominal catch (t) by countries in Division IIb as officially reported to ICES.**

Country	1984	1985	1986	1987	1988
Denmark	-	-	-	+	-
Faroe Islands	-	-	-	-	2
France	-	-	-	-	20 <sup>3</sup>
German Dem. Rep.	1,598	460	71	42	115
Germany, Fed. Rep.	-	190	192	1,840	35
Norway	67	16	302	311	142
Portugal	672	729	318	19	33
Spain	25	38	-	25 <sup>2</sup>	26 <sup>2</sup>
UK (England & Wales)	22	4	3	11	36
UK (Scotland)	-	-	+	1	-
USSR	5,815	528	529	1,493	1,342
Total	8,199	1,965	1,415	3,742	1,751

Country	1989	1990	1991	1992 <sup>1</sup>	1993 <sup>1</sup>
Canada	-	-	-	-	8 <sup>3</sup>
Denmark	-	37 <sup>3</sup>	23	9	4
Faroe Islands	10	8	5 <sup>3</sup>	-	-
France	28 <sup>3</sup>	5 <sup>3</sup>	13 <sup>3</sup>	5 <sup>3</sup>	35 <sup>3</sup>
German Dem. Rep.	510	4,629	-	-	-
Germany, Fed. Rep.	123	52	303	319	177
Norway	66 <sup>2</sup>	1,541 <sup>2</sup>	818 <sup>2</sup>	399 <sup>2</sup>	164 <sup>2</sup>
Portugal	89	6	7	153	483 <sup>3</sup>
Spain	5 <sup>2</sup>	-	1	16	65
UK (England & Wales)	7	63	38	230	301
UK (Scotland)	2	-	13	16	-
Russia <sup>4</sup>	3,089	11,920	6,712	2,253	291 <sup>2</sup>
Total	3,929	18,261	7,933	3,400	1,528

<sup>1</sup>Provisional figures.

<sup>2</sup>Working Group figure.

<sup>3</sup>As reported to Norwegian authorities.

<sup>4</sup>USSR prior to 1991.

**Table 2.5.5 REDFISH in Sub-areas I and II. Nominal catch (t) of *Sebastes marinus* and *Sebastes mentella* in Sub-area I and Divisions IIa and IIb combined.**

Species	1983	1984	1985	1986	1987
<i>S. marinus</i>	19,260	28,379	29,484	30,203	24,077
<i>S. mentella</i>	105,273	72,934	63,068	23,112	10,518
Total	124,533	101,313	92,552	53,315	34,595

Species	1988	1989	1990	1991	1992 <sup>1</sup>	1993 <sup>1</sup>
<i>S. marinus</i>	25,908	23,222	28,091	19,051	16,972	15,274
<i>S. mentella</i>	15,586	23,494	35,070	48,735	16,249	13,330
Total	41,494	46,716	63,161	67,786	33,221	28,604

<sup>1</sup>Provisional figures.

**Table 2.5.6** *Sebastes mentella* in Sub-areas I and II.  
Weights in '000 t.

<b>Year</b>	<b>Landings</b>
1965	16
1966	10
1967	6
1968	5
1969	7
1970	23
1971	45
1972	29
1973	38
1974	69
1975	239
1976	269
1977	146
1978	93
1979	87
1980	79
1981	82
1982	115
1983	105
1984	73
1985	63
1986	23
1987	11
1988	16
1989	23
1990	35
1991	49
1992	16
1993	13
<b>Average</b>	<b>62</b>

**Table 2.5.7** *Sebastes marinus* in Sub-areas I and II.  
Weights in t.

Year	Landings
1965	24,313
1966	25,632
1967	17,734
1968	13,348
1969	24,071
1970	12,817
1971	13,816
1972	17,730
1973	21,436
1974	27,272
1975	39,125
1976	48,584
1977	39,509
1978	31,741
1979	26,475
1980	23,411
1981	20,826
1982	16,366
1983	19,260
1984	28,379
1985	29,484
1986	30,203
1987	24,077
1988	25,908
1989	23,222
1990	28,091
1991	19,051
1992	16,972
1993	15,274
<b>Average</b>	<b>24,279</b>

**Table 2.6.1 GREENLAND HALIBUT in Sub-areas I and II. Nominal catch (t) by countries (Sub-area I, Divisions IIa and IIb combined) as officially reported to ICES.**

Country	1984	1985	1986	1987	1988
Denmark	-	-	-	+	-
Faroe Islands	-	-	42	-	186
France	138	239	13	13	67
German Dem. Rep.	2,089	3,807	2,659	1,855	712
Germany, Fed. Rep.	76	193	59	169	32
Norway	4,376	5,464	7,890	7,261	9,076
UK (England & Wales)	23	5	10	61	82
UK (Scotland)	-	-	2	20	2
USSR	15,181	10,237	12,200	9,733	9,430
Spain	-	-	-	-	-
<b>Total</b>	<b>21,883</b>	<b>19,945</b>	<b>22,875</b>	<b>19,112</b>	<b>19,587</b>

Country	1989	1990	1991	1992 <sup>1</sup>	1993 <sup>1</sup>
Denmark	-	-	11	-	2 <sup>2</sup>
Estonia	-	-	2,564	-	-
Faroe Islands	67	163	314	16	61
France	31	49	119	111 <sup>1</sup>	40 <sup>3</sup>
German Dem. Rep.	589	909	-	-	-
Germany, Fed. Rep.	11	45	101	13	22
Greenland	-	-	-	13	8
Iceland	-	-	-	-	56
Lithuania	-	-	-	-	30 <sup>3</sup>
Norway	11,043 <sup>2</sup>	16,825 <sup>2</sup>	26,400 <sup>2</sup>	8,256 <sup>2</sup>	10,322 <sup>2</sup>
Portugal	-	-	-	31	20 <sup>3</sup>
UK (England & Wales)	6	10	+	7	16
UK (Scotland)	-	-	2	3	-
Russia <sup>4</sup>	8,812	4,764 <sup>2</sup>	2,490 <sup>2</sup>	718	1,235
Spain	-	-	132 <sup>2</sup>	23	-
<b>Total</b>	<b>20,559</b>	<b>22,765</b>	<b>32,133</b>	<b>9,191</b>	<b>11,812</b>

<sup>1</sup>Provisional figures.

<sup>2</sup>Working Group figure.

<sup>3</sup>As reported to Norwegian authorities.

<sup>4</sup>USSR prior to 1991.

**Table 2.6.2 GREENLAND HALIBUT in Sub-areas I and II. Nominal catch (t) by countries in Sub-area I as officially reported to ICES.**

Country	1984	1985	1986	1987	1988
Estonia	-	-	-	-	-
Faroe Islands	-	-	-	-	9
Germany, Fed. Rep.	-	-	1	2	4
Iceland	-	-	-	-	-
Norway	593	602	557	984	978
UK (England & Wales)	17	1	5	10	7
UK (Scotland)	-	-	1	+	-
USSR	81	122	615	259	420
<b>Total</b>	<b>691</b>	<b>725</b>	<b>1,179</b>	<b>1,255</b>	<b>1,418</b>

Country	1989	1990	1991	1992	1993 <sup>1</sup>
Estonia	-	-	164	-	-
Faroe Islands	-	7	-	-	32
Germany, Fed. Rep.	-	-	-	+	-
Iceland	-	-	-	-	56
Norway	335 <sup>2</sup>	304 <sup>2</sup>	1,946 <sup>2</sup>	2,265 <sup>2</sup>	1,724 <sup>2</sup>
UK (England & Wales)	+	-	-	-	-
UK (Scotland)	-	-	-	-	-
USSR/Russia	482	321 <sup>2</sup>	522 <sup>2</sup>	467 <sup>2</sup>	867
<b>Total</b>	<b>817</b>	<b>632</b>	<b>2,632</b>	<b>2,732</b>	<b>2,679</b>

<sup>1</sup>Provisional figures.

<sup>2</sup>Working Group figures.



**Table 2.6.3** GREENLAND HALIBUT in Sub areas I and II. Nominal catch (t) by countries in Division IIa as officially reported to ICES.

Country	1984	1985	1986	1987	1988
Estonia	-	-	-	-	-
Faroe Islands	-	-	6	-	177
France	138	239	13	13	67
German Dem. Rep.	189	82	55	12	130
Germany, Fed. Rep.	76	172	42	63	20
Norway	3,703	4,791	6,389	5,705	7,859
UK (England & Wales)	1	2	5	44	56
UK (Scotland)	-	-	1	10	2
USSR	5,459	6,894	5,553	4,739	4,002
Total	9,566	12,180	12,064	10,586	12,313

Country	1989	1990	1991	1992 <sup>1</sup>	1993 <sup>1</sup>
Estonia	-	-	1,400	-	-
Faroe Islands	67	133	314	16	29
France	31	49	119 <sup>1</sup>	108 <sup>1</sup>	38 <sup>3</sup>
German Dem. Rep.	94	10	-	-	-
Germany, Fed. Rep.	10	2	21	1	14
Greenland	-	-	-	13 <sup>4</sup>	8 <sup>4</sup>
Norway	7,208 <sup>2</sup>	8,025 <sup>2</sup>	9,826 <sup>2</sup>	4,113 <sup>2</sup>	7,934 <sup>2</sup>
Portugal	-	-	-	15 <sup>3</sup>	6 <sup>3</sup>
UK (England & Wales)	6	1	+	1	2
UK (Scotland)	-	-	1	-	-
USSR/Russia	4,964	1,246 <sup>2</sup>	305 <sup>2</sup>	58	210
Total	12,380	9,466	11,985	4,325	8,241

<sup>1</sup>Provisional figures.

<sup>2</sup>Working Group figure.

<sup>3</sup>As reported to Norwegian authorities.

<sup>4</sup>Includes Division IIb.

**Table 2.6.4 GREENLAND HALIBUT in Sub-areas I and II. Nominal catch (t) by countries in Division IIb as officially reported to ICES.**

Country	1984	1985	1986	1987	1988
Denmark	-	-	-	+	-
Estonia	-	-	-	-	-
Faroe Islands	-	-	36	-	-
German Dem. Rep.	1,900	3,725	2,604	1,843	582
Germany, Fed. Rep.	-	21	16	104	8
Lithuania	-	-	-	-	239
Norway	80	71	944	572	19
UK (England & Wales)	5	2	+	7	+
UK (Scotland)	-	-	-	10	5,008
USSR	9,641	3,221	6,032	4,735	-
Spain	-	-	-	-	-
<b>Total</b>	<b>11,626</b>	<b>7,040</b>	<b>9,632</b>	<b>7,271</b>	<b>5,856</b>

Country	1989	1990	1991	1992	1993 <sup>1</sup>
Denmark	-	-	11	-	2 <sup>3</sup>
Estonia	-	-	1,000	-	-
Faroe Islands	-	23 <sup>2</sup>	-	-	-
France	-	-	-	3 <sup>2</sup>	2 <sup>3</sup>
German Dem. Rep.	495	899	-	-	-
Germany, Fed. Rep.	1	43	80	12 <sup>2</sup>	8
Lithuania	-	-	-	-	30
Norway	3,500 <sup>2</sup>	8,496 <sup>2</sup>	14,629 <sup>2</sup>	1,878 <sup>2</sup>	664 <sup>2</sup>
Portugal	-	-	-	16 <sup>2</sup>	14 <sup>3</sup>
UK (England & Wales)	-	9	+	6	14
UK (Scotland)	-	-	1	3	-
USSR/Russia	3,366	3,197 <sup>2</sup>	1,663 <sup>2</sup>	193	158
Spain	-	-	132 <sup>2</sup>	23	-
<b>Total</b>	<b>7,362</b>	<b>12,667</b>	<b>17,516</b>	<b>2,134</b>	<b>892</b>

<sup>1</sup>Provisional figures.

<sup>2</sup>Working Group figure.

<sup>3</sup>As reported to Norwegian authorities.

**Table 2.6.5** Greenland Halibut in Sub-areas I and II. Weights in '000 t and numbers in millions.

Year	Recruitment	Spawning Stock	Landings	Fishing Mortality
	Age 3	Biomass		Age 6-10
1970	43	218	89	0.45
1971	42	172	79	0.45
1972	34	136	43	0.32
1973	30	126	30	0.24
1974	31	121	38	0.29
1975	29	108	38	0.36
1976	28	86	36	0.47
1977	26	66	29	0.37
1978	24	56	25	0.39
1979	28	63	17	0.21
1980	26	53	13	0.18
1981	26	61	15	0.15
1982	25	59	17	0.24
1983	27	70	22	0.30
1984	26	64	22	0.35
1985	26	65	20	0.32
1986	29	62	23	0.33
1987	31	57	19	0.37
1988	27	51	20	0.43
1989	33	52	21	0.35
1990	24	53	23	0.45
1991	9	51	32	0.65
1992	3	38	9	0.21
1993	0	44	12	0.30
<b>Average</b>	26	81	29	0.34

**Table 2.7.1** Nominal catch (tonnes) of COD in ICES Sub-area XIV, 1981-1993 as officially reported to ICES.

Country	1981	1982	1983	1984	1985	1986
Faroe Islands	292	-	368	-	-	86
Germany, Fed. Rep.	7,367	8,940	8,238	7,035	2,006	4,063
Greenland	890	898	438	1,051	106	606
Iceland	1	-	-	-	-	-
Norway	-	-	-	794	-	-
UK(England & Wales)	-	-	-	-	-	-
UK(Scotland)	-	-	-	-	-	-
<b>Total</b>	<b>8,550</b>	<b>9,838</b>	<b>9,044</b>	<b>8,880</b>	<b>2,112</b>	<b>4,755</b>
<b>Working Group estimate</b>	<b>16,000</b>	<b>27,000</b>	<b>13,377</b>	<b>8,914</b>	<b>2,112</b>	<b>4,755</b>

Country	1987	1988	1989	1990	1991	1992 <sup>1</sup>	1993 <sup>1</sup>
Faroe Islands	-	12	40	-	-	-	-
Germany, Fed. Rep.	5,358	12,049	10,613	26,419	8,434	5,895	164
Greenland	1,476	345	3,715	4,442	6,677	1,283	198
Iceland	1	9	-	-	-	22	-
Norway	-	-	-	17	828 <sup>1</sup>	1,030	597 <sup>1</sup>
UK(England & Wales)	-	-	1,158	2,365	5,832	2,532	163
UK(Scotland)	-	-	135	93	29	463	13
<b>Total</b>	<b>6,835</b>	<b>12,415</b>	<b>15,661</b>	<b>33,336</b>	<b>21,800</b>	<b>11,225</b>	<b>1,135</b>
<b>Working Group estimate</b>	<b>6,658</b>	<b>9,415<sup>2</sup></b>	<b>14,504<sup>3</sup></b>	<b>33,465<sup>4</sup></b>	<b>22,219<sup>4</sup></b>	<b>11,500</b>	

<sup>1</sup>Preliminary.

<sup>2</sup>Excluding 3,000 t assumed to be from NAFO Division 1F.

<sup>3</sup>Excluding 2,741 t assumed to be from NAFO Division 1F and including 1,500 t reported from other areas assumed to be from Sub-area XIV and including 94 tonnes by Japan.

<sup>4</sup>Includes additional catches by Japan.

<sup>5</sup>Includes additional catches reported to Greenland authorities.

**Table 2.7.2** Nominal catch of COD in NAFO Sub-area 1, 1981-1993 as officially reported to NAFO.

Country	1981	1982	1983	1984	1985	1986
Faroe Islands	-	-	1,339	-	-	-
Germany, Fed. Rep.	417	8,139	10,158	8,941	2,170	41
Greenland	53,039	47,693	44,970	24,457	12,651	6,549
Japan	-	-	-	13	54	11
Norway	-	-	-	5	1	2
United Kingdom	-	-	1,174	-	-	-
<b>Total</b>	<b>53,456</b>	<b>55,832</b>	<b>57,641</b>	<b>33,416</b>	<b>14,876</b>	<b>6,603</b>

Country	1987	1988	1989	1990 <sup>1</sup>	1991 <sup>2</sup>	1992 <sup>3</sup>	1993
Faroe Islands	-	-	-	-	-	-	-
Germany, Fed. Rep.	55	6,574	12,892	7,515	82	-	-
Greenland	12,283	52,166	92,152	59,043	20,238	5,665	1,924
Japan	33	10	-	-	-	-	-
Norway	1	7	2	57	-	-	-
United Kingdom	-	927	3,780	1,632	-	-	-
<b>Total</b>	<b>12,372</b>	<b>59,684</b>	<b>108,826</b>	<b>68,247</b>	<b>20,320</b>		<b>1,924</b>
Working Group estimate <sup>3</sup>	-	62,684	111,642	-	-	5,665	1,924

<sup>1</sup>Provisional data (NAFO SCS 91/17 (except for Greenland)).

<sup>2</sup>Reported to Greenland authorities. (NAFO SCS 92/25).

<sup>3</sup>Only Greenland available.

<sup>4</sup>Includes 3,000 t in 1988 and 2,741 t in 1989 reported to be from ICES Sub-area XIV.

**Table 2.7.3** Nominal catch (tonnes) of COD in Division Va, 1979-1993, as officially reported to ICES.

Country	1979	1980	1981	1982	1983	1984	1985
Belgium	1,485	840	1,321	236	188	254	207
Faroe Is.	6,163	4,802	6,183	5,297	5,626	2,041	2,203
Iceland	360,077	429,044	461,038	382,297	293,890	281,481	322,810
Norway	288	358	559	557	109	90	46
UK (Engl. & Wales)	-	-	-	-	-	2	1
Total	368,013	435,044	469,101	388,387	299,813	283,868	325,267

Country	1986	1987	1988	1989	1990	1991	1992	1993 <sup>1</sup>
Belgium	226	597	365	309	26	548	222	137
Faroe Islands	2,554	1,848	1,966	2,012	1,78	1,323	883	-
Iceland	365,852	389,808	375,741	353,985	333,34	306,697	266,662	236,561
Norway	1	4	4	3		-	-	-
UK (Engl. & Wales)	-	-	-	-		-	-	-
Total	368,633	392,257	378,076	356,309	335,39	308,568	267,767	236,561

Working Group estimate	251,867 <sup>2</sup>
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<sup>1</sup>Preliminary.

<sup>2</sup>Additional catch by Iceland of 14,505 t and by the Faroes 664 t included.

Table 2.7.4 Icelandic cod. Weights in '000 t and numbers in millions.

Year	Recruitment	Spawning Stock		Fishing Mortality
	Age 3	Biomass	Landings	Age 5-10
1955	147	1380		
1956	202	1313		
1957	176	1231		
1958	258	1100		
1959	305	977		
1960	152	851		
1961	189	783		
1962	142	748		
1963	162	699		
1964	289	578		
1965	253	542		
1966	271	408		
1967	326	470		
1968	172	587		
1969	252	686		
1970	185	675		
1971	177	607		
1972	135	470		
1973	300	432		
1974	169	327	375	0.75
1975	263	338	371	0.80
1976	326	283	348	0.76
1977	143	319	340	0.63
1978	222	375	328	0.48
1979	246	447	368	0.43
1980	144	602	435	0.45
1981	143	389	469	0.68
1982	134	266	388	0.78
1983	226	214	300	0.78
1984	139	219	284	0.62
1985	144	268	325	0.66
1986	337	268	369	0.78
1987	282	253	392	0.83
1988	169	193	378	0.97
1989	81	270	356	0.68
1990	131	349	335	0.72
1991	110	238	308	0.78
1992	150	252	265	0.78
1993	155	228	251	0.82
Average	200	529	349	0.71

**Table 2.7.5** Nominal catch (tonnes) of SAITHE in Division Va, 1979-1993 as officially reported to ICES.

Country	1979	1980	1981	1982	1983	1984	1985	1986
Belgium	980	980	532	201	224	269	158	218
Faroe Islands	5,457	4,930	3,545	3,582	2,138	2,044	1,778	783
France	-	-	-	23	-	-	-	-
Iceland	57,066	52,436	54,921	65,124	55,904	60,406	55,135	63,867
Norway	1	1	3	1	+	-	1	-
UK (Engl. & Wales)	-	-	-	-	-	-	29	-
Total	63,504	58,347	59,001	68,933	58,266	62,719	57,101	64,868
Total used in the assessment								66,376 <sup>2</sup>

Country	1987	1988	1989	1990	1991	1992	1993 <sup>1</sup>
Belgium	217	268	369	190	236	195	91
Faroe Islands	2,139	2,596	2,246	2,905	2,690	1,570	-
France	-	-	-	-	-	-	-
Iceland	78,175	74,383	79,796	95,032	99,390	77,832	67,025
Norway	-	-	-	-	-	-	-
UK (Engl. & Wales)	-	-	-	-	-	-	-
Total	80,531	77,247	82,411	98,127	102,316	79,597	67,116
Total used in the assessment	-	-	82,425 <sup>3</sup>	-	102,737 <sup>3</sup>		71,249 <sup>4</sup>

<sup>1</sup>Preliminary.

<sup>2</sup>Additional catch by Faroe Islands of 1,508 t included.

<sup>3</sup>Additional catch by Iceland of 451 t included.

<sup>4</sup>Additional catch by Iceland of 2,571 t and by Faroes 1,562 t included.



**Table 2.7.6 Icelandic saithe. Weights in '000 t and numbers in millions.**

Year	Recruitment	Spawning Stock		Fishing Mortality
	Age 3	Biomass	Landings	Age 4-9
1974	25	288	98	0.29
1975	26	265	88	0.28
1976	31	227	82	0.33
1977	22	187	62	0.28
1978	49	166	50	0.24
1979	55	160	64	0.25
1980	28	155	58	0.31
1981	19	157	59	0.31
1982	22	168	69	0.39
1983	32	166	58	0.34
1984	46	170	63	0.31
1985	35	152	57	0.25
1986	75	166	66	0.27
1987	120	163	81	0.38
1988	59	158	77	0.36
1989	37	166	82	0.30
1990	31	192	98	0.32
1991	32	203	103	0.33
1992	40 *	209	80	0.30
1993	40 *	218	72	0.28
<b>Average</b>	<b>41</b>	<b>187</b>	<b>73</b>	<b>0.31</b>

\*Assumed values.

**Table 2.7.7 GREENLAND HALIBUT.** Nominal catches (tonnes) in Sub-areas V and XIV, 1980-1993, as officially reported to ICES.

Country	1980	1981	1982	1983	1984	1985	1986
Denmark	-	-	-	-	-	-	-
Faroe Islands	1,042	767	1,532	1,146	2,502	1,052	853
France	51	8	27	236	489	845	52
Germany, Fed. Rep.	2,318	3,007	2,581	1,142	936	863	858
Greenland	-	+	1	5	15	81	177
Iceland	27,838	15,455	28,300	28,360	30,080	29,231	31,044
Norway	3	-	+	2	2	3	+
UK (Engl. & Wales)	-	-	-	-	-	-	-
<b>Total</b>	<b>31,252</b>	<b>19,239</b>	<b>32,441</b>	<b>30,888</b>	<b>34,024</b>	<b>32,075</b>	<b>32,984</b>
Working Group estimate	-	-	-	-	-	-	-

Country	1987	1988	1989	1990	1991	1992 <sup>1</sup>	1993
Denmark	6	+	-	-	-	-	-
Faroe islands	1,096	1,378	2,319	1,803	1,566	2,128	4,233
France	19	25	-	-	-	3	-
Germany, Fed. Rep.	565	637	493	336	303	382	415
Greenland	154	37	11	40	66	437	289
Iceland	44,780	49,040	58,330	36,557	34,883	31,955	34,506
Norway	2	1	3	50	34	273	642
Russia	-	-	-	-	-	5	-
UK (Engl. & Wales)	-	-	-	27	38	127	809
<b>Total</b>	<b>46,622</b>	<b>51,118</b>	<b>61,396</b>	<b>38,813</b>	<b>36,890</b>	<b>35,310</b>	<b>40,894</b>
Working Group estimate	-	-	61,936	39,326	37,950	35,487	41,247

<sup>1</sup>Preliminary data.

**Table 2.7.8 GREENLAND HALIBUT.** Nominal catches (tonnes) in Division Vb, 1980-1993, as officially reported to ICES.

Country	1980	1981	1982	1983	1984	1985	1986
Denmark	-	-	-	-	-	-	-
Faroe Islands	951	442	863	1,112	2,456	1,052	775
France	51	8	27	236	489	845	52
Germany, Fed. Rep.	172	114	142	86	118	227	113
Norway	3	2	+	2	2	2	+
UK (Engl. & Wales)	-	-	-	-	-	-	-
UK (Scotland)	-	-	-	-	-	-	-
Total	1,177	566	1,032	1,436	3,065	2,126	940
Working Group estimate	-	-	-	-	-	-	-

Country	1987	1988	1989	1990	1991 <sup>1</sup>	1992	1993 <sup>1</sup>
Denmark	6	+	-	-	-	-	-
Faroe Islands	907	901	1,513	1,064	1,293	2,105	4,058
France	19	25	-	-	-	3	-
Germany, Fed. Rep.	109	42	73	43	24	71	24
Norway	2	1	3	42	16 <sup>1</sup>	25 <sup>1</sup>	371
UK (Engl. & Wales)	-	-	-	-	-	1	13
UK (Scotland)	-	-	-	-	-	1	-
Total	1,043	969	-	-	1,333	2,206	4,466
Working Group estimate	-	-	-	-	1,662 <sup>4</sup>	2,269 <sup>5</sup>	-

<sup>1</sup>Preliminary.

<sup>2</sup>Includes 17 t taken by France.

<sup>3</sup>Includes 133 t taken in Division IIa (Faroes waters)

<sup>4</sup>Includes 317 t taken in Division IIa (Faroes waters) + France 12 t.

<sup>5</sup>Includes 63 t taken in Division IIa (Faroes waters).

**Table 2.7.9** GREENLAND HALIBUT. Nominal catches (tonnes) in Division Va, 1980-1993, as reported officially to ICES.

Country	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993 <sup>1</sup>
Faroe Islands	91	325	669	33	46	-	-	15	379	719	739	273	23	166
Iceland	27,836	15,455	28,300	28,359	30,078	29,195	31,027	44,644	49,000	58,330	36,557	34,883	31,955	34,340
Norway	-	+	-	+	+	2	-	-	-	-	-	-	-	-
Total	27,927	15,780	28,969	28,392	30,124	29,196	31,027	44,659	49,379	59,049	37,296	35,156	31,978	
Working Group estimate	-	-	-	-	-	-	-	-	-	59,272 <sup>2</sup>	37,308 <sup>3</sup>	35,413 <sup>4</sup>	31,978	34,506

<sup>1</sup>Preliminary.<sup>2</sup>Includes 223 t by Norway.<sup>3</sup>Includes 12 t by Norway.<sup>4</sup>Includes additional catches by Iceland. 257 t in 1991.**Table 2.7.10** GREENLAND HALIBUT. Nominal catches (tonnes) in Sub-area XIV, 1980-1993, as reported officially to ICES.

Country	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993 <sup>1</sup>
Faroe Islands	-	-	-	-	-	-	78	74	98	87	-	-	-	9
Germany, Fed. Rep.	2,146	2,893	2,439	1,054	818	636	745	456	595	420	293	279	311	391
Greenland	-	+	1	5	15	81	177	154	37	11	40	66	437	289
Iceland	2	-	-	1	2	36	17	136	40	+	-	-	-	-
Norway	-	-	-	-	+	-	-	-	-	-	8	18 <sup>1</sup>	248 <sup>1</sup>	271
Russia	-	-	-	-	-	-	-	-	-	-	-	-	5	-
UK (Engl. & Wales)	-	-	-	-	-	-	-	-	-	+	27	38	108	796
UK (Scotland)	-	-	-	-	-	-	-	-	-	-	-	-	18	-
Total	2,148	2,893	2,440	1,060	835	753	1,017	820	770	518	368	401	1,127	1,756
Working Group estimate <sup>2</sup>	-	-	-	-	-	-	-	-	-	-	736 <sup>2</sup>	875 <sup>3</sup>	1,240 <sup>4</sup>	2,275 <sup>5</sup>

<sup>1</sup>Preliminary.<sup>2</sup>Includes 370 t catches by Japan.<sup>3</sup>Includes 315 t catch by Japan and 159 t by other countries as reported to Greenland.<sup>4</sup>Indicates additional catches taken by Germany (96 t) and UK (17 t) as reported to Greenland.<sup>5</sup>Indicates additional catches taken by Germany (37 t), Norway (238 t), UK (182 t) and Japan (62 t) as reported to Greenland.

**Table 2.7.11 Greenland halibut in Sub-areas V and XIV. Weights in '000 t and numbers in millions.**

<b>Year</b>	<b>Recruitment</b>	<b>Spawning Stock</b>	<b>Fishing Mortality</b>	
	<b>Age 5</b>	<b>Biomass</b>	<b>Landings</b>	<b>Age 8-12</b>
1976	26	54	6	0.07
1977	26	65	17	0.25
1978	27	76	14	0.17
1979	34	77	24	0.27
1980	40	79	31	0.43
1981	39	73	19	0.28
1982	33	79	32	0.40
1983	29	71	31	0.39
1984	29	82	34	0.41
1985	41	93	32	0.25
1986	43	100	33	0.23
1987	37	109	47	0.31
1988	34	112	51	0.37
1989	32	99	61	0.51
1990	40	83	39	0.42
1991	31	89	38	0.41
1992	34	67	35	0.48
1993	34	71	41	0.48
<b>Average</b>	<b>34</b>	<b>82</b>	<b>33</b>	<b>0.34</b>

**Table 2.8.1** Nominal catch of REDFISH (in tonnes) by countries in Division Va (Iceland) as reported officially to ICES.

Country	1978	1979	1980	1981	1982	1983	1984
Belgium	1,549	1,385	1,381	924	283	389	291
Faroe Is.	242	629	1,055	1,212	1,046	1,357	686
Iceland	33,318	62,253	69,780	93,349	115,051	122,749	108,270
Norway	93	43	33	32	11	32	12
Total	35,202	64,310	72,249	95,517	116,391	124,527	109,259

Country	1985	1986	1987	1988	1989	1990	1991	1992	1993 <sup>1</sup>
Belgium	400	423	398	372	190	70	146	107	91
Faroe Is.	291	144	332	372	394	624	412	389	-
Iceland	91,381	85,992	87,768	93,995	91,536	90,891	96,770	94,382	90,387
Norway	8	2	7	7	1	-	-	-	-
Total	92,080	86,561	88,505	94,746	92,121	91,585	97,328	94,878	90,478

<sup>1</sup>Provisional data.

**Table 2.8.2** Landings of REDFISH in Va (in tonnes) by countries in Division Va as used by the working group.

Year	Belgium	Faroese	Iceland	Norway	Total
1978	1,549	242	33,318	93	35,202
1979	1,385	629	62,253	43	64,310
1980	1,381	1,055	69,780	33	72,249
1981	924	1,212	93,349	32	95,517
1982	283	1,046	115,051	11	116,391
1983	389	1,357	122,749	32	124,527
1984	291	686	108,270	12	109,259
1985	400	291	91,381	8	92,080
1986	423	253	85,992	2	86,670
1987	398	332	87,768	7	88,505
1988	372	372	94,011	7	94,762
1989	190	394	91,488	1	92,073
1990	70	624	90,891	0	91,585
1991	146	412	96,772	0	97,330
1992	107	389	93,478	0	94,974
1993 <sup>1</sup>	91	438	96,578 <sup>2</sup>	0	97,107

<sup>1</sup>Provisional data

<sup>2</sup>Including 614 tonnes oceanic *S. Mentella*

**Table 2.8.3** Nominal catch of REDFISH (in tonnes) by countries in Division Vb (Faroe Islands) as reported officially to ICES.

Country	1978	1979	1980	1981	1982	1983	1984
Denmark	-	-	-	-	-	-	-
Faroe Islands	1,525	5,693	5,509	3,232	3,999	4,642	8,770
France	448	862	627	59	204	439	559
Germany, Fed. Rep.	7,767	6,108	3,891	3,841	4,660	4,300	4,460
Iceland	-	-	-	-	1	-	-
Netherlands	+	-	-	-	-	-	-
Norway	9	11	12	13	7	3	1
UK	57	+	-	-	-	-	-
USSR	-	-	-	-	-	-	142
<b>Total</b>	<b>9,806</b>	<b>12,674</b>	<b>10,039</b>	<b>7,145</b>	<b>8,871</b>	<b>9,384</b>	<b>13,932</b>

Country	1985	1986	1987	1988	1989	1990	1991	1992 <sup>1</sup>	1993 <sup>1</sup>
Denmark	-	36	176	8	-	+	-	-	-
Faroe Islands	12,634	15,224	13,477	12,966	12,636	10,017	14,090	15,279	-
France	1,157	752	819	582	996 <sup>1</sup>	909 <sup>1</sup>	473 <sup>1</sup>	114	-
Germany, Fed. Rep. <sup>2</sup>	5,091	5,142	3,060	1,595	1,191	441	447	450	239
Iceland	-	-	-	-	-	-	-	-	-
Netherlands	4	2	5	5	21	21	20	35 <sup>1</sup>	22
Norway	-	-	-	-	-	+	3	29	8
UK	-	-	-	-	-	-	-	15	-
USSR/Russia <sup>3</sup>	-	-	-	-	-	-	-	-	-
<b>Total</b>	<b>18,886</b>	<b>21,156</b>	<b>17,537</b>	<b>15,156</b>	<b>14,844</b>	<b>10,476</b>	<b>15,033</b>	<b>15,922</b>	

<sup>1</sup>Provisional data.

<sup>2</sup>Includes former GDR.

<sup>3</sup>As from 1991

**Table 2.8.4** Landings of Redfish (in tonnes) by countries in Division Vb as used by the Working Group.

Year	Denmark	Faroes	France	Germany	Iceland	Lithuania	Norway	UK	Russia <sup>1</sup>	Total
1978	0	1,525	448	7,767	0	0	9	57	0	9,806
1979	0	5,693	862	6,108	0	0	11	0	0	12,674
1980	0	5,509	627	3,891	0	0	12	0	0	10,039
1981	0	3,232	59	3,841	0	0	13	0	0	7,145
1982	0	3,999	204	5,230	1	0	7	0	0	9,441
1983	0	4,642	439	4,300	0	0	3	0	0	9,384
1984	0	8,770	559	4,460	0	0	1	0	142	13,932
1985	0	12,634	1,157	5,091	0	0	4	0	868	19,754
1986	36	15,224	752	5,142	0	0	2	0	320	21,476
1987	176	13,478	819	3,060	0	0	5	0	0	17,538
1988	8	13,318	582	1,595	0	0	5	0	0	15,508
1989	0	12,860	996	1,191	0	0	21	0	0	15,068
1990	0	10,364	909	441	0	0	21	0	2	11,737
1991	0	14,090	473	447	0	0	20	3	4	15,037
1992	0	15,279	114	450	0	4	35	39	47	15,968
1993 <sup>2</sup>	0	9,690	-	239	0	0	22	8	0	9,959

<sup>1</sup>USSR 1978-1991, Russia 1992-1993.

<sup>2</sup>Provisional data.

**Table 2.8.5** Nominal catch of REDFISH (in tonnes) by countries in Sub-area VI as reported officially to ICES.

Country	1978	1979	1980	1981	1982	1983	1984
Faroe Islands	-	1	-	-	-	-	19
France	307	215	202	24	44	93	102
Germany, Fed. Rep.	18	604	907	983	604	359	563
Norway	4	4	2	3	4	2	9
Spain	-	-	-	1	-	2	-
UK (Engl. & Wales)	1	-	-	-	2	-	1
UK (Scotland)	1	1	-	-	-	-	1
<b>Total</b>	<b>331</b>	<b>825</b>	<b>1,111</b>	<b>1,011</b>	<b>654</b>	<b>456</b>	<b>695</b>

Country	1985	1986	1987	1988	1989	1990	1991	1992	1993 <sup>1</sup>
Faroe Islands	18	-	-	1	61	-	22	6	
France	397	480	1,032	1,024	726	684 <sup>1</sup>	483 <sup>1</sup>	127	
Germany, Fed. Rep.	76	24	-	16	1	6	8	1	77
Ireland	-	-	-	-	-	-	-	-	1
Norway	-	14	2	1	2	5	-	4	3
Spain	-	-	-	-	-	-	-	-	-
UK (Engl. & Wales)	1	2	3	75	-	29	11	4	-
UK (Scotland)	-	10	17	6	4	6	39	32	83
<b>Total</b>	<b>492</b>	<b>530</b>	<b>1,054</b>	<b>1,123</b>	<b>798</b>	<b>730</b>	<b>563</b>	<b>174</b>	<b>164</b>

<sup>1</sup>Preliminary.

**Table 2.8.6** Landings of REDFISH (in tonnes) by countries in Sub-area VI as used by the Working Group.

Year	Faroese	France	Germany, F.R.	Ireland	Norway	Spain	UK	Total
1978	0	307	18	0	4	0	2	331
1979	1	215	604	0	4	0	1	825
1980	0	202	907	0	2	0	0	1,111
1981	0	24	983	0	3	1	0	1,011
1982	0	44	604	0	4	0	2	654
1983	0	93	359	0	2	2	0	456
1984	19	102	563	0	9	0	2	695
1985	18	397	76	0	0	0	1	492
1986	0	480	24	0	14	0	12	530
1987	0	1,032	0	0	2	0	20	1,054
1988	1	1,024	16	0	1	0	81	1,123
1989	61	726	1	0	2	0	8	798
1990	0	684	6	0	5	0	35	730
1991	22	483	8	0	+	0	50	563
1992	9	127	0	1	4	0	36	177
1993 <sup>1</sup>	6		77	1	3	0	83	170

<sup>1</sup>Provisional data.



**Table 2.8.7** Nominal catch of REDFISH (in tonnes) by country in Sub-area XII as reported officially to ICES.

Country	1982	1983	1984	1985	1986
Bulgaria	-	-	-	-	-
German Dem. Rep.	-	-	-	-	-
Germany, Fed. Rep.	5,696	2,209	-	-	-
Greenland	-	-	-	-	-
Iceland	-	-	-	-	-
Norway	-	-	-	-	-
Poland	-	-	-	-	-
USSR	39,783	60,079	60,643	17,300	24,131
Total	45,479	62,288	60,643	17,300	24,131

Country	1987	1988	1989	1990	1991	1992	1993 <sup>1</sup>
Bulgaria	-	-	-	1,617	-	-	-
German Dem. Rep.	-	-	352	-	62	-	-
Germany, Fed. Rep.	-	-	1	7	-	1,084	6,459
Greenland	-	-	-	-	-	9	-
Iceland	-	-	567	185	95	361	8,098
Latvia	-	-	-	-	-	780	2,700
Norway	-	-	-	249	4,122	10,560 <sup>1</sup>	7,260
Poland	-	-	112	-	-	-	-
USSR/Russia <sup>2</sup>	2,948	9,772	15,543	4,274	6,624	2,485	-
Total	2,948	9,772	16,575	6,332	7,507	16,731	24,517

<sup>1</sup>Provisional.

<sup>2</sup>As from 1991

<sup>3</sup>As reported to FAO.

**Table 2.8.8 Landings of REDFISH (in tonnes) by countries in Sub-area XII as used by the Working Group.**

Year	Bulgaria	Estonia	France	Germany <sup>4</sup>	Greenland	Iceland	Latvia	Norway	Poland	Russia <sup>3</sup>	Total
1981	0	0	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0	39,783	39,783
1983	0	0	0	0	0	0	0	0	0	60,079	60,079
1984	0	0	0	0	0	0	0	0	0	60,643	60,643
1985	0	0	0	0	0	0	0	0	0	17,300	17,300
1986	0	0	0	0	0	0	0	0	0	24,131	24,131
1987	0	0	0	0	0	0	0	0	0	2,948	2,948
1988	0	0	0	0	0	0	0	0	0	9,772	9,772
1989	0	0	0	353	0	658 <sup>1</sup>	0	0	112	15,543	16,666
1990	1,617	0	0	7	0	215 <sup>1</sup>	0	926 <sup>2</sup>	0	4,274	7,039
1991	0	0	0	62	0	110 <sup>1</sup>	0	764 <sup>2</sup>	0	6,624	7,560
1992	0	1,452	2	1,084	9	419 <sup>1</sup>	780	369 <sup>2</sup>	0	11,266	15,381
1993 <sup>5</sup>	0	0	0	6,459	703	8,707 <sup>1</sup>	2,700	5,620 <sup>2</sup>	0	18,669	42,858

<sup>1</sup>Raised by 16% to account for discarding.

<sup>2</sup>According to official log-books and raised by 5% to account for discarding.

<sup>3</sup>USSR 1981-1991, Russia 1992-1993.

<sup>4</sup>Includes former GDR.

<sup>5</sup>Provisional data.

**Table 2.8.9** Nominal catch of REDFISH (in tonnes) by countries in Sub-area XIV (East Greenland) as reported officially to ICES

Country	1982	1983	1984	1985	1986
Bulgaria <sup>4</sup>	-	-	2,961	5,825	11,385
Denmark	11	-	-	-	-
Faroe Islands	-	27	-	-	5
German Dem. Rep.	-	155	989	5,438	8,574
Germany, Fed. Rep.	37,119	28,878	14,141	5,974	5,584
Greenland	+	1	10	5,519 <sup>2</sup>	9,542 <sup>2</sup>
Iceland	17	-	-	+	-
Norway	-	-	17	-	-
Poland	581	-	239	135	149
UK (Engl. & Wales)	-	-	-	-	-
UK (Scotland)	-	-	-	-	-
USSR	20,217	-	-	42,973	60,863
Total	57,945	29,061	18,357	65,864	96,102

Country	1987	1988	1989	1990	1991	1992	1993 <sup>1</sup>
Bulgaria	12,270	8,455	4,546	1,073	-	-	-
Denmark	-	-	-	-	-	-	-
Faroe Islands	382	1,634	226	-	115	3,765	-
German Dem. Rep.	7,023	16,848	6,444	7,950	-	-	-
Germany, Fed. Rep.	4,691	5,734	2,372	3,268	9,122	7,959	26,969
Greenland	670	42	3	24	42	962	+
Iceland	-	-	814	3,726	7,477	12,982	11,649
Norway	-	-	-	6,070	4,954	636 <sup>1</sup>	3,000
Poland	25	-	-	-	-	-	-
UK (Engl. & Wales)	-	-	5	39	219	178	241
UK (Scotland)	-	-	-	3	+	28	-
USSR/Russia <sup>3</sup>	68,521	55,254	7,177	3,040	2,665	1,844	-
Total	93,582	87,967	21,587	25,193	24,594	28,354	41,859

<sup>1</sup>Provisional.

<sup>2</sup>Fished mainly by the Japanese fleet.

<sup>3</sup>As from 1991.

<sup>4</sup>As reported to FAO.

**Table 2.8.10** Landings of REDFISH (in tonnes) by country in Sub-area XIV, as used by the Working Group.

Year	Bulgaria	Faroës	France	GDR	FRG	Greenland	Iceland	Japan	Norway	Poland	UK	Russia <sup>3</sup>	Total
1978	0	0	0	0	20,711	3	151	0	2	0	13	0	20,880
1979	0	0	490	0	20,428	0	0	0	0	0	0	0	20,918
1980	0	0	0	0	32,520	0	89	0	0	0	0	0	32,609
1981	0	18	0	0	42,980	1	0	0	0	0	0	0	42,999
1982	0	0	0	0	42,815	0	17	0	0	581	0	20,217	63,630
1983	0	27	0	155	30,815	1	0	0	0	0	0	0	30,998
1984	2,961	0	0	989	14,141	10	0	0	15	239	0	0	18,355
1985	5,825	0	0	5,438	5,974	5,519	0	0	0	135	0	42,973	65,864
1986	11,385	5	0	8,574	5,584	9,542	0	0	0	149	0	60,683	95,922
1987	12,270	382	0	7,023	4,691	2,912	0	0	0	25	0	68,521	95,824
1988	8,455	1,634	0	16,848	5,734	3,751	0	0	0	0	0	55,254	91,676
1989	4,546	226	0	6,444	2,372	285	3158 <sup>1</sup>	307	0	0	5	7,177	24,520
1990	1,073	0	0	7,950	3,268	24	4,322 <sup>1</sup>	3,450	6,159 <sup>2</sup>	0	42	4,973	31,261
1991	0	115	0	0	9,122	42	8,781 <sup>1</sup>	1,224	3,856 <sup>2</sup>	0	219	2,665	27,602
1992	0	3,765	0	0	7,959	3,769	16,059 <sup>1</sup>	0	15,380 <sup>2</sup>	0	206	4,467	50,547
1993 <sup>4</sup>	0	4,026	0	0	26,969	200	14,200	938	9,023 <sup>2</sup>	0	241	5,496	61,093

<sup>1</sup>Raised by 16% to account for discarding.

<sup>2</sup>According to official log-books and raised by 5% to account for discards in the oceanic *S. mentella* fishery.

<sup>3</sup>USSR 1978-1991; Russia 1992-1993.

<sup>4</sup>Provisional data.

**Table 2.8.11** *S. marinus*. Landings (in tonnes) by area as used by the Working Group.

Year	Va	Vb	VI	XII	XIV	Total
1978	31,300	2,039	313	0	15,477	49,129
1979	56,616	4,805	6	0	15,787	77,213
1980	62,052	4,920	2	0	22,203	89,177
1981	75,828	2,538	3	0	23,608	101,977
1982	97,899	1,810	28	0	30,692	130,429
1983	87,412	3,394	60	0	15,636	106,502
1984	84,766	6,228	86	0	5,040	96,120
1985	67,312	9,194	245	0	2,117	78,868
1986	67,772	6,300	288	0	2,988	77,348
1987	69,212	6,143	576	0	1,196	77,127
1988	80,472	5,020	533	0	3,964	89,989
1989	51,825	4,140	373	0	685	57,023
1990	63,156	2,407	382	0	687	66,632
1991	49,678	2,140	292	0	3,911	56,021
1992	55,403	3,435	40	0	714	59,592
1993 <sup>1</sup>	47,552	2,113	86	0	1,673	51,424

<sup>1</sup>Provisional data.

**Table 2.8.12** Deep-sea *S. mentella*. Landings (in tonnes) by area as used by the Working Group.

Year	Va	Vb	VI	XII	XIV	Total
1978	3,902	7,767	18	0	5,403	17,090
1979	7,694	7,869	819	0	5,131	21,513
1980	10,197	5,119	1,109	0	10,406	26,831
1981	19,689	4,607	1,008	0	19,391	44,695
1982	18,492	7,631	626	0	12,140	38,889
1983	37,115	5,990	395	0	15,207	58,707
1984	24,493	7,704	609	0	9,126	41,932
1985	24,768	10,560	248	0	9,376	44,952
1986	18,898	15,176	242	0	12,138	46,454
1987	19,293	11,395	478	0	6,407	37,573
1988	14,290	10,488	590	0	6,065	31,433
1989	40,248	10,928	425	0	2,284	53,885
1990	28,429	9,330	348	0	6,097	44,204
1991	47,652	12,897	271	0	6,514	67,334
1992	38,957	12,533	137	0	6,090	57,717
1993 <sup>1</sup>	49,555	7,846	84	0	15,032	72,517

<sup>1</sup>Provisional data.**Table 2.8.13** Oceanic *S.mentella*. Landings (in tonnes) by area as used by the Working Group.

Year	Va	Vb	VI	XII	XIV	Total
1978	0	0	0	0	0	0
1979	0	0	0	0	0	0
1980	0	0	0	0	0	0
1981	0	0	0	0	0	0
1982	0	0	0	39,783	20,798	60,581
1983	0	0	0	60,079	155	60,234
1984	0	0	0	60,643	4,189	64,832
1985	0	0	0	17,300	54,371	71,671
1986	0	0	0	24,131	80,976	105,107
1987	0	0	0	2,948	88,221	91,169
1988	0	0	0	9,772	81,647	91,419
1989	0	0	0	16,892	21,325	38,217
1990	0	0	0	7,039	24,477	31,516
1991	0	0	0	7,560	17,177	24,737
1992	614	0	0	15,381	43,743	59,738
1993 <sup>1</sup>	0	0	0	42,858	44,388	87,246

<sup>1</sup>Provisional data.

**Table 2.8.14** Oceanic *S. mentella*. Landings (in tonnes) by countries used by the Working Group.

Year	Bulgaria	Estonia	Faroes	France	GDR	Germany	Greenland	Iceland	Latvia	Norway	Poland	Russia	Total
1981	0	0	0	0	0	0	0	0		0	0	0	0
1982	0	0	0	0	0	0	0	0		0	581	60,000	60,581
1983	0	0	0	0	155	0	0	0		0	0	60,079	60,234
1984	2,961	0	0	0	989	0	0	0		0	239	60,643	64,832
1985	5,825	0	0	0	5,438	0	0	0		0	135	60,273	71,671
1986	11,385	0	5	0	8,574	0	0	0		0	149	84,994	105,107
1987	12,270	0	382	0	7,023	0	0	0		0	25	71,469	91,169
1988	8,455	0	1,090	0	16,848	0	0	0		0	0	65,026	91,419
1989	4,546	0	226	0	6,796	1	0	3,816		0	112	22,720	38,217
1990	2,690	0	0	0	7,950	7	0	4,537		7,085	0	9,247	31,516
1991	0	0	115	0		244	0	8,891		6,198	0	9,289	24,737
1992	0	1,452 <sup>3</sup>	3,765	2		6,251	9	17,092	780	14,654	0	15,733	59,738
1993 <sup>1</sup>	0	0	4,026	0		18,168	703	22,907	2,700	14,577	0	24,165	87,246

<sup>1</sup>Provisional data.

<sup>2</sup>USSR 1981-1991; Russia 1992-1993.

<sup>3</sup>Officially reported to ICES in 1993 but not in 1994.

**Table 2.9.1** Nominal catch (tonnes) of SAITHE in Division Vb, 1979-1993 as officially reported to ICES.

Country	1979	1980	1981	1982	1983	1984	1985	1986
Denmark	-	-	-	-	-	-	-	21
Faroe Islands	22003	23810	29682	30808	38963	54,344	42874	40139
France	2974	1110	258	130	180	243	839	87
German, Dem.Rep.	-	-	-	-	-	-	31	-
Germany, Fed.Rep.	581	197	20	19	28	73	227	105
Netherlands	-	-	-	-	-	-	-	-
Norway	1137	62	134	15	5	5	-	24
UK (Engl. & Wales)	190	13	-	-	-	-	4	-
UK (Scotland)	361	38	9	1	-	-	630	1340
USSR	-	-	-	-	-	-	-	-
Total	27,246	25,230	30,103	30,973	39,176	54,665	44,605	41,716

Country	1987	1988	1989	1990	1991	1992	1993 <sup>1</sup>
Denmark	255	94	-	2	-	-	-
Faroe Islands	39301	44402	43624	59,821	53321	35979	32443
France	153	313	-	-	-	1999	-
German, Dem.Rep.	-	-	9	-	-	-	-
Germany Fed.Rep.	49	74	20	15	32	5	2
Netherlands	-	-	22	67	65	-	-
Norway	14	52	51	46	103	34	38
UK (Engl. & Wales)	108	-	-	-	5	74	83
UK (Scotland)	140	92	9	33	79	98	53
USSR/Russia <sup>2</sup>	-	-	-	30	-	12	-
Total	40,020	45,027	43,735	60,014	53,605	38,201	32,619

<sup>1</sup>Provisional data.

<sup>2</sup>As of 1991.

**Table 2.9.2** Faroe saithe. Weights in '000 t and numbers in millions.

Year	Recruitment	Spawning Stock		Fishing Mortality
	Age 3	Biomass	Landings	Age 4-8
1960	11	95	12	0.11
1961	9	94	10	0.09
1962	14	95	10	0.11
1963	21	101	13	0.10
1964	15	98	22	0.20
1965	23	102	22	0.19
1966	22	104	26	+
1967	24	99	21	0.18
1968	21	109	20	0.15
1969	39	114	27	0.19
1970	33	119	29	0.19
1971	37	127	33	0.19
1972	34	138	42	0.25
1973	24	128	58	0.34
1974	20	128	47	0.28
1975	17	129	42	0.30
1976	20	120	33	0.26
1977	13	114	35	0.32
1978	8	100	28	0.23
1979	9	91	27	0.26
1980	12	102	25	0.22
1981	33	92	30	0.39
1982	15	102	31	0.35
1983	41	82	39	0.40
1984	26	116	55	0.49
1985	22	94	45	0.40
1986	62	109	42	0.51
1987	48	96	40	0.41
1988	44	100	45	0.46
1989	28	104	44	0.37
1990	20	91	62	0.57
1991	26	73	55	0.73
1992	31*	52	38	0.59
1993	31*	59	33	0.49
<b>Average</b>	<b>25</b>	<b>102</b>	<b>34</b>	<b>0.31</b>

\* Assumed values



**Table 2.9.3** Faroe Plateau cod in (Sub-division Vb1).

Nominal catches (t) by countries 1984-1993, as used in the assessment.

Nation/Year	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Faroe Islands	36,914	39,422	34,492	21,303	22,272	20,535	12,232	8,203	5,938	5524
France	34	29	4	17	17				318	
Germany	9	5	8	12	5	7	24	16	12	
Norway	22	28	83	21	163	285	124	89	41	34
UK England				8				1	79	177
UK Scotland										
Denmark			8	30	10					
<b>Total</b>	<b>36,979</b>	<b>39,484</b>	<b>34,595</b>	<b>21,391</b>	<b>22,467</b>	<b>20,827</b>	<b>12,380</b>	<b>8,309</b>	<b>6,388</b>	<b>5,735</b>

1) Preliminary

2) Sub-division Vb2 included

3) Included in Sub-division Vb2

4) Quantity unknown 1989-1991 and 1993.

**Table 2.9.4** Faroe Plateau cod. Weights in '000 t and numbers in millions.

Year	Recruitment	Spawning Stock		Fishing Mortality
	Age 2	Biomass	Landings	Age 3-7
1984	48	115	37	0.51
1985	17	84	39	0.72
1986	9	73	35	0.68
1987	10	61	21	0.45
1988	9	51	23	0.63
1989	13	37	22	0.84
1990	3	26	13	0.74
1991	3	17	9	0.63
1992	6*	13	7	0.75
1993	3*	13	6	0.59
<b>Average</b>	<b>12</b>	<b>49</b>	<b>21</b>	<b>0.65</b>

\*From surveys

**Table 2.9.5** Faroe Bank cod (Sub-division Vb2).

Nominal catches (t) by countries 1984-1993, as officially reported to ICES.

Nation/Year	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993 <sup>1</sup>
Faroe Islands	2,189	2,913	1,836	3,409	2,960	1,270	289	297	122	266
France <sup>2</sup>										
Norway	11	23	6	23	94	128	72	38	32 <sup>1</sup>	61
UK (Engl. & Wales)										1
UK Scotland <sup>3</sup>	16	25	63	47	37	14	207	90	172	55
<b>Total</b>	<b>2,216</b>	<b>2,961</b>	<b>1,905</b>	<b>3,479</b>	<b>3,091</b>	<b>1,412</b>	<b>568</b>	<b>425</b>	<b>326</b>	<b>383</b>

1) Preliminary

2) Catches included in Sub-division Vb1

3) Sub-division Vb1 included

**Table 2.9.6** Faroe Plateau (Sub-Division Vb1) HADDOCK. Nominal catches (tonnes) by countries, 1980-1993, as officially reported to ICES.

Country	1980	1981	1982	1983	1984	1985	1986
Denmark	-	-	-	-	-	-	1
Faroe Islands	13,633	10,891	10,319	11,898	11,418	13,597	13,359
France <sup>1</sup>	31	113	2	2	20	23	8
Germany	4	+	1	+	+	+	1
Norway	9	20	12	12	10	21	22
UK (Engl. & Wales)	6	-	-	-	-	-	-
UK (Scotland)	434	85	1	<sup>3</sup>	<sup>3</sup>	<sup>3</sup>	<sup>3</sup>
Others	6	-	-	-	-	-	-
Total	14,123	11,109	10,335	11,912	11,448	13,641	13,391
Total used in the assessment <sup>4,5</sup>	15,016	12,233	11,937	12,894	12,378	15,143	14,477

Country	1987	1988	1989	1990	1991	1992	1993 <sup>2</sup>
Denmark	8	4	-	-	-	-	-
Faroe Islands	13,954	10,867	13,506	11,106	8,074	4,655	3,464
France <sup>1</sup>	22	14	-	-	-	-	-
Germany	1	-	-	-	+	-	-
Norway	13	54	111	94 <sup>2</sup>	125 <sup>2</sup>	71	31
UK (Engl. & Wales)	2	-	-	7	-	71	78
UK (Scotland)	<sup>3</sup>	<sup>3</sup>	<sup>3</sup>	<sup>3</sup>	<sup>3</sup>	<sup>3</sup>	<sup>3</sup>
Total	14,000	10,939	13,617	11,207	8,199	4,961	3,573
Total used in the assessment <sup>4,5</sup>	14,882	12,178	14,325	11,726	8,429	5,473	3,814

<sup>1</sup>Including catches from Sub-division Vb2.

<sup>2</sup>Preliminary.

<sup>3</sup>Catches included in Sub-division Vb2.

<sup>4</sup>Includes catches from Sub-division Vb2 and Division IIa<sup>4</sup> in Faroese waters.

<sup>5</sup>Includes French catches from Division Vb, as reported to the Faroese coastal guard service.

**Table 2.9.7** Faroe Bank (Sub-Division Vb2) HADDOCK. Nominal catches (tonnes) by countries, 1980-1993 as officially reported to ICES.

Country	1980	1981	1982	1983	1984	1985	1986
Faroe Islands	690	1,103	1,553	967	925	1,474	1,050
France <sup>1</sup>	-	-	-	-	-	-	-
Germany	-	-	-	-	-	-	-
Norway	8	7	1	2	5	3	10
UK (Engl. & Wales)	152	-	-	-	-	-	-
UK (Scotland)	43	14	48	13 <sup>3</sup>	+ <sup>3</sup>	25 <sup>3</sup>	26 <sup>3</sup>
Total	893	1,124	1,602	982	930	1,502	1,086

Country	1987	1988	1989	1990	1991	1992	1993 <sup>2</sup>
Faroe Islands	832	1,160	659	325	217	338	186
France <sup>1</sup>	-	-	-	-	-	-	-
Germany	-	-	-	-	-	-	-
Norway	5	43	16	97 <sup>2</sup>	4 <sup>1</sup>	23	8
UK (Engl. & Wales)	-	-	-	-	-	17	-
UK (Scotland)	45 <sup>3</sup>	15 <sup>3</sup>	30 <sup>3</sup>	725 <sup>3</sup>	287	869	47
Total	882	1,218	705	1,147	508	1,247	241

<sup>1</sup>Catches included in Sub-division Vb1.

<sup>2</sup>Preliminary.

<sup>3</sup>Includes catches taken in Sub-division Vb1.

**Table 2.9.8 Faroe haddock. Weights in '000 t and numbers in millions.**

Year	Recruitment	Spawning Stock	Fishing Mortality	
	Age 2	Biomass	Landings	Age 3-7
1961	51	47	21	0.57
1962	38	51	27	0.66
1963	47	49	28	0.71
1964	30	44	19	0.48
1965	23	45	18	0.55
1966	20	43	19	0.55
1967	26	41	13	0.41
1968	59	45	18	0.44
1969	32	55	23	0.48
1970	34	63	21	0.46
1971	15	66	19	0.43
1972	33	65	16	0.39
1973	24	64	18	0.29
1974	53	67	15	0.23
1975	73	78	21	0.19
1976	58	88	26	0.25
1977	26	96	26	0.39
1978	34	99	19	0.27
1979	3	88	12	0.15
1980	5	84	15	0.17
1981	3	79	12	0.18
1982	15	56	12	0.35
1983	18	55	13	0.28
1984	38	52	12	0.25
1985	35	60	15	0.31
1986	24	55	14	0.26
1987	7	57	15	0.32
1988	14	53	12	0.25
1989	12	41	14	0.37
1990	8	30	12	0.39
1991	2	25	8	0.42
1992	7*	17	5	0.37
1993	11*	14	4	0.28
Average	27	57	17	0.37

\*From surveys.

**Table 2.10.1** Icelandic summer-spawning herring. Catch in weight (including discards since 1989) as used by the Working Group.

Year	Catch (tonnes)
1972	310
1973	255
1974	1,274
1975	13,280
1976	17,168
1977	28,924
1978	37,333
1979	45,072
1980	53,269
1981	39,544
1982	56,528
1983	58,665
1984	50,293
1985	49,092
1986	65,413
1987	75,439
1988	91,760
1989	100,733
1990/1991	105,593 <sup>1</sup>
1991/1992	109,499 <sup>1</sup>
1992/1993	106,825 <sup>1</sup>
1993/1994	102,802 <sup>1</sup>

<sup>1</sup>Seasonal catches.

**Table 2.10.2** Icelandic summer-spawning herring. Weights in '000 t and numbers in millions.

Year	Recruitment	Spawning Stock	Landings	Fishing Mortality
	Age 1	Biomass		Age 3-12
1947	180	141	48	0.35
1948	68	120	57	1.60
1949	77	91	5	0.09
1950	197	87	14	0.20
1951	116	88	16	0.26
1952	324	101	11	0.44
1953	197	108	18	0.36
1954	167	147	11	0.15
1955	191	169	21	0.14
1956	469	170	20	0.15
1957	791	180	23	0.20
1958	369	200	34	0.22
1959	555	278	35	0.25
1960	713	259	29	0.07
1961	531	287	74	0.28
1962	525	310	93	0.47
1963	467	267	130	0.78
1964	586	189	87	0.80
1965	507	157	123	1.21
1966	100	84	58	0.76
1967	39	89	68	1.33
1968	179	27	17	0.78
1969	47	17	21	0.95
1970	34	20	16	1.17
1971	70	13	12	1.58
1972	90	11	0	0.17
1973	419	29	0	0.05
1974	134	46	1	0.03
1975	200	117	13	0.11
1976	554	130	17	0.16
1977	436	134	29	0.30
1978	195	177	37	0.32
1979	248	199	45	0.23
1980	253	214	53	0.28
1981	876	187	40	0.45
1982	238	194	57	0.46
1983	217	220	59	0.21
1984	467	233	50	0.13
1985	1,206	250	49	0.16
1986	666	258	65	0.31
1987	359	360	75	0.47
1988	520	423	92	0.70
1989	312	394	101	0.46
1990	1,147	358	106	0.57
1991	1,648	299	109	0.46
1992	792	376	107	0.35
1993	1,407	572	103	0.25
<b>Average</b>	<b>423</b>	<b>187</b>	<b>48</b>	<b>0.45</b>

**Table 2.10.3** Catches of Norwegian spring-spawning herring (tonnes) since 1972.

Year	A	B <sup>1</sup>	C	D	Nominal catches	Total catch as used by the Working Group
1972	-	9,895	3,266 <sup>2</sup>	-	13,161	13,161
1973	139	6,602	276	-	7,017	7,017
1974	906	6,093	620	-	7,619	7,619
1975	53	3,372	288	-	3,713	13,713
1976	-	247	189	-	436	10,436
1977	374	11,834	498	-	12,706	22,706
1978	484	9,151	189	-	9,824	19,824
1979	691	1,866	307	-	2,864	12,864
1980	878	7,634	65	-	8,557	18,577
1981	844	7,814	78	-	8,736	13,736
1982	983	10,447	225	-	11,655	16,655
1983	3,857	13,290	907	-	18,054	23,054
1984	18,730	29,463	339	-	48,532	53,532
1985	29,363	37,187	197	4,300	71,047	169,872 <sup>3</sup>
1986	71,122 <sup>4</sup>	55,507	156	-	126,785	225,256 <sup>3</sup>
1987	62,910	49,798	181	-	112,899	127,306 <sup>3</sup>
1988	78,592	46,582	127	-	125,301	135,301
1989	52,003	41,770	57	-	93,830	103,830
1990	48,633	29,770	8	-	78,411	86,411
1991	48,353	31,280	50	-	79,683	84,683
1992	43,688	55,737	23	-	99,448	104,448
1993	117,195 <sup>5</sup>	110,212 <sup>5</sup>	50	-	227,457	232,457
1994	215,186 <sup>5</sup>	56,371 <sup>5</sup>	-	-	-	-

A = catches of adult herring in winter

B = mixed herring fishery in autumn

C = by-catches of 0- and 1-group herring in the sprat fishery

D = USSR-Norway by-catch in the capelin fishery (2-group)

<sup>1</sup> Includes also by-catches of adult herring in other fisheries<sup>2</sup> In 1972, there was also a directed herring 0-group fishery<sup>3</sup> Includes mortality caused by fishing operations in addition to unreported catches<sup>4</sup> Includes 26,000 t of immature herring (1983 year-class) fished by USSR in the Barents Sea<sup>5</sup> Preliminary Norwegian catch

**Table 2.10.4** Total catch of Norwegian spring-spawning herring (tonnes) from 1972-1993.

Year	Norway	USSR/Russia	Total
1972	13,161	-	13,161
1973	7,017	-	7,017
1974	7,619	-	7,619
1975	13,713	-	13,713
1976	10,436	-	10,436
1977	22,706	-	22,706
1978	19,824	-	19,824
1979	12,864	-	12,864
1980	18,577	-	18,577
1981	13,736	-	13,736
1982	16,655	-	16,655
1983	23,054	-	23,054
1984	53,532	-	53,532
1985	167,272	2,600	169,872
1986	199,256	26,000	225,256
1987	108,417	18,889	127,306
1988	115,076	20,225	135,301
1989	88,707	15,123	103,830
1990	74,604	11,807	86,411
1991	73,683	11,000	84,683
1992	91,111	13,337	104,448
1993	199,812 <sup>1</sup>	32,645	232,457

<sup>1</sup>Preliminary.



**Table 2.10.5** Norwegian spring-spawning herring. Weights in '000 t and numbers in millions.

Year	Recruitment	Spawning Stock	Fishing Mortality	
	Age 3	Biomass	Landings	Age 5-9
1950	13,768	8,729	933	0.07
1951	6,254	8,481	1,278	0.08
1952	3,782	8,182	1,255	0.08
1953	50,672	7,904	1,091	0.05
1954	6,529	7,902	1,645	0.08
1955	2,954	9,228	1,360	0.07
1956	3,011	11,197	1,659	0.09
1957	613	10,297	1,320	0.08
1958	518	9,530	987	0.07
1959	167	7,557	1,111	0.11
1960	252	5,942	1,102	0.11
1961	240	4,122	830	0.07
1962	21,168	3,323	849	0.09
1963	7,323	2,490	985	0.07
1964	2,158	2,604	1,282	0.14
1965	199	2,997	1,548	0.28
1966	8,272	2,755	1,955	0.81
1967	3,802	1,185	1,677	1.26
1968	108	247	712	1.92
1969	228	101	68	0.49
1970	16	52	62	0.81
1971	7	23	21	1.18
1972	421	9	13	2.24
1973	18	81	7	1.53
1974	4	95	8	0.79
1975	25	88	14	0.10
1976	839	148	10	0.03
1977	552	298	23	0.04
1978	149	374	20	0.06
1979	488	405	13	0.02
1980	324	472	19	0.03
1981	429	480	14	0.03
1982	755	472	17	0.02
1983	95	563	23	0.03
1984	116	613	54	0.10
1985	146	529	170	0.40
1986	17,542	406	225	0.61
1987	383	777	127	0.26
1988	601	2,305	135	0.24
1989	47	2,753	104	0.06
1990	149	2,682	86	0.04
1991	2,427	2,760	85	0.06
1992	5,243	2,449	104	0.05
1993	5,228	2,314	232	0.18
Average	3,819	3,089	573	0.34

**Table 2.11.1** Barents Sea CAPELIN. International catch ('000 t) as used by the Working Group.

Year	Winter				Summer-autumn			Total
	Norway	Russia	Other	Total	Norway	Russia	Total	
1965	217	7	0	224	0	0	0	224
1966	380	9	0	389	0	+	+	389
1967	403	6	0	408	0	+	+	408
1968	460	15	0	476	62	+	62	538
1969	436	1	0	436	243	+	243	680
1970	955	8	0	963	346	5	351	1314
1971	1300	14	0	1314	71	7	78	1392
1972	1208	25	0	1234	347	12	359	1593
1973	1078	34	0	1112	213	11	223	1336
1974	749	80	0	829	237	82	319	1148
1975	549	301	43	893	394	131	524	1417
1976	1230	230	0	1460	719	366	1085	2545
1977	1412	345	2	1758	704	477	1181	2940
1978	772	436	25	1233	350	311	661	1894
1979	539	342	5	886	569	327	896	1782
1980	539	253	9	801	459	388	847	1648
1981	784	429	28	1240	454	284	738	1978
1982	568	260	5	833	591	336	927	1760
1983	735	373	36	1145	758	439	1197	2342
1984	330	257	42	629	482	368	849	1478
1985	340	234	17	590	113	164	278	868
1986	72	51	0	123	0	0	0	123
1987	0	0	0	0	0	0	0	0
1988	0	0	0	0	0	0	0	0
1989	0	0	0	0	0	0	0	0
1990	0	0	0	0	0	0	0	0
1991	528	159	20	707	31	195	226	933 <sup>1</sup>
1992	620	247	24	891	73	159	232	1123 <sup>1</sup>
1993	402	170	14	586	0	0	0	586
1994	0	0	0	0	0	0	0	0

<sup>1</sup>Revised.

**Table 2.11.2** Barent Sea Capelin. (Sub-areas I and II, excluding Division IIa west of 5°W). Weights in '000 t.

Year	Recruitment Age 1	Spawning Stock Biomass	Landings
1965			224
1966			389
1967			409
1968			537
1969			680
1970			1,314
1971			1,392
1972			1,592
1973	1,175		1,336
1974	762	389	1,149
1975	510	95	1,440
1976	447	655	2,587
1977	789	919	2,987
1978	857	322	1,915
1979	553	502	1,783
1980	592	21	1,648
1981	487	1,462	1,986
1982	574	398	1,760
1983	613	25	2,358
1984	174	150	1,478
1985	43	102	868
1986	11	13	123
1987	49	31	0
1988	21	13	0
1989	181	198	0
1990	700	187	0
1991	405	1,794	933
1992	395	1,072	1,123
1993	3	663	586
1994	27	165	0
Average	426	437	1,087

**Table 2.11.3** The international capelin catch 1964-1993 ('000 tonnes).

Year	Winter season			Summer- and autumn season				Total <sup>1</sup>
	Iceland	Norway	Faroes	Iceland	Norway	Faroes	Others	
1964	8.6	-	-	-	-	-	-	8.6
1965	49.7	-	-	-	-	-	-	49.7
1966	124.5	-	-	-	-	-	-	124.5
1967	97.2	-	-	-	-	-	-	97.2
1968	78.1	-	-	-	-	-	-	78.1
1969	170.6	-	-	-	-	-	-	170.6
1970	190.8	-	-	-	-	-	-	190.8
1971	182.9	-	-	-	-	-	-	182.9
1972	276.5	-	-	-	-	-	-	276.5
1973	440.9	-	-	-	-	-	-	440.9
1974	461.9	-	-	-	-	-	-	461.9
1975	457.1	-	-	3.1	-	-	-	460.2
1976	338.7	-	-	114.4	-	-	-	453.1
1977	549.2	-	24.3	259.7	-	-	-	833.2
1978	468.4	-	36.2	497.5	154.1	3.4	-	1,159.6
1979	521.7	-	18.2	442.0	124.0	22.0	-	1,127.9
1980	392.1	-	-	367.4	118.7	24.2	17.3	917.7
1981	156.0	-	-	484.6	91.4	16.2	20.8	769.0
1982	13.2	-	-	-	-	-	-	13.2
1983	-	-	-	133.4	-	-	-	133.4
1984	439.6	-	-	425.2	104.6	10.2	8.5	988.1
1985	348.5	-	-	644.8	193.0	65.9	16.0	1,268.2
1986	341.8	50.0	-	552.5	149.7	65.4	5.3	1,164.7
1987	500.6	59.9	-	311.3	82.1	65.2	-	1,019.1
1988	600.6	56.6	-	311.4	11.5	48.5	-	1,028.6
1989	609.1	56.0	-	53.9	14.4	52.7	-	786.1
1990	612.0	62.5	12.3	83.7	21.9	5.6	-	798.0
1991	258.4	-	-	56.0	-	-	-	314.4
1992	573.5	47.6	-	213.4	65.3	18.9	*0.5	919.2
1993	489.1	-	-	450.0	127.5	23.9	*10.2	1,100.7
1994	550.3	15.0	*1.9					

\* Greenlandic vessel

<sup>1</sup>By calendar year.

**Table 2.11.4 Capelin. Weights in '000 t and numbers in billions.**

Year	Recruitment	Spawning Stock	
	Age 2	Biomass	Landings*
1964			50
1965			125
1966			97
1967			78
1968			171
1969			191
1970			183
1971			277
1972			441
1973			462
1974			457
1975			342
1976			688
1977			764
1978	97		1195
1979	108	600	980
1980	40	300	684
1981	43	170	626
1982	32	140	0
1983	96	260	573
1984	82	440	897
1985	165	460	1312
1986	65	460	1333
1987	103	420	1116
1988	94	400	1037
1989	53	440	808
1990	42	115	370
1991	77	330	677
1992	87	475	787
1993	128	499	1179
<b>Average</b>	<b>82</b>	<b>367</b>	<b>597</b>

\*Landings by season (July of year indicated to March of following year).

**Table 3.1.1** North Sea HERRING (Sub-area IV and Division VIId). Catch in tonnes by country, 1981-1993. These figures do not in all cases correspond to the official statistics and cannot be used for management purposes.

Country	1982	1983	1984	1985	1986	1987
Belgium	9,700	5,969	5,080	3,482	414	39
Denmark	67,851	10,467	38,777	129,305	121,631	138,596
Faroe Islands	-	-	-	-	623	2,228
France	15,310	16,353	20,320	14,400	9,729	7,266
Germany, Fed. Rep.	349	1,837	11,609	8,930	3,934	5,552
Netherlands	22,300	40,045	44,308	79,335	85,998	91,478
Norway <sup>4</sup>	-	32,512	98,706	159,947	223,058	241,765
Sweden	-	284	886	2,442	1,872	1,725
UK (England)	3,703	111	1,689	5,564	1,404	873
UK (Scotland)	1,780	17,260	31,393	55,795	77,459	76,413
UK (N.Ireland)	-	-	-	-	-	-
Unallocated landings	114,252	181,116	64,487	74,220	21,089	58,972
Total landings	235,245	305,954	317,255	533,420	547,211	624,907
Discards <sup>3</sup>	-	-	-	-	-	-
Total catch	235,245	305,954	317,255	533,420	547,211	624,907
Catches of spring spawners (included above)						
IIIa type	-	-	6,958	17,386	19,654	14,207
Coastal type	-	-	520	905	490	250

Country	1988	1989	1990	1991	1992	1993 <sup>1</sup>
Belgium	4	434	180	163	242	56
Denmark	263,006	210,315 <sup>2</sup>	159,280 <sup>2</sup>	194,358 <sup>2</sup>	193,968 <sup>2</sup>	164,817
Faroe Islands	810	1,916	633	334	-	-
France	8,384	29,085	23,480	24,625	16,587	12,627
Germany, Fed. Rep.	13,824	38,707	43,191	41,791	42,665	41,669
Netherlands	82,267	84,178	69,828	75,135	75,683	79,190
Norway <sup>4</sup>	222,719	221,891 <sup>2</sup>	157,850 <sup>2</sup>	124,991 <sup>2</sup>	116,863	122,815
Sweden	1,819	4,774	3,754	5,866	4,939	5,782
UK (England)	8,097	7,980	8,333	11,548	11,314	19,853
UK (Scotland)	64,108	68,106	56,812	57,572	56,171	55,531
UK (N.Ireland)	-	-	-	92	-	-
Unallocated landings	33,411	26,749 <sup>2</sup>	21,081	24,435	25,867	18,410
Total landings	698,449	694,135 <sup>2</sup>	544,422	560,910	544,299	520,550
Discards <sup>3</sup>	-	4,000	8,660	4,617	4,950	3,470
Total catch	698,449	698,135	553,082	565,527	549,249	524,020
Catches of spring spawners (included above)						
IIIa type	23,306	19,869	8,357	7,894	7,854	8,928
Coastal type	250	2,283	1,136	252 <sup>5</sup>	202 <sup>5</sup>	201 <sup>5</sup>

<sup>1</sup>Preliminary.

<sup>2</sup>Working Group estimates.

<sup>3</sup>Any discards prior to 1989 were included in unallocated landings.

<sup>4</sup>Catches of Norwegian spring spawners removed (taken under a separate TAC).

<sup>5</sup>Landings from the Thames estuary area.

**Table 3.1.2 HERRING, catch in tonnes in Division IVa West. These figures do not in all cases correspond to the official statistics and cannot be used for management purposes.**

Country	1984	1985	1986	1987	1988
Denmark	26,786	77,788	48,590	50,184	25,268
Faroe Islands	-	-	275	102	810
France	1,408	2,075	462	285	266
Germany, Fed.Rep.	12,092	4,790	2,510	3,250	9,308
Netherlands	19,143	49,965	42,900	44,358	32,639
Norway	21,305	10,507	63,848	55,311	30,657
Sweden	- <sup>1</sup>	- <sup>1</sup>	- <sup>1</sup>	768	1,197
UK (N.Ireland)	-	-	-	-	-
UK (England)	-	-	-	4,820	4,820
UK (Scotland)	24,634	52,100	71,285	66,774	48,791
Unallocated landings	24,030	4,249	-	16,092	-
Total Landings	129,398	197,225	229,870	221,032	153,751
Discards <sup>2</sup>	-	-	-	-	-
Total catch	129,298	201,474	229,870	237,124	153,751

Country	1989	1990	1991	1992	1993 <sup>3</sup>
Denmark	29,298	9,037	5,980	10,751	10,604
Faroe Islands	1,916	633	334	-	-
France	- <sup>1</sup>	2,581	3,393	4,714 <sup>4</sup>	3,362
Germany, Fed.Rep.	26,528	20,422	20,608	21,836	17,342 <sup>4</sup>
Netherlands	24,600	29,729	29,563	29,845	28,616
Norway	41,768	24,239	37,674	39,244	33,442
Sweden	742	-	1,130	985	1,372
UK (N.Ireland)	-	-	92	-	-
UK (England)	5,104	3,337	4,873	4,916	4,742
UK (Scotland)	58,455	46,431	42,745	39,269	36,628 <sup>4</sup>
Unallocated landings	3,173	4,621	5,492	4,855	-8,271 <sup>5</sup>
Total Landings	191,584	141,030	151,884	156,415	127,837
Discards <sup>2</sup>	900	750	883	850	825
Total catch	192,484	141,780	152,767	157,265	128,662

<sup>1</sup>Included in Division IVb.

<sup>2</sup>Any discards prior to 1989 were included in unallocated.

<sup>3</sup>Preliminary.

<sup>4</sup>Including IVa East.

<sup>5</sup>Negative unallocated catches due to misreporting from other areas.

**Table 3.1.3 HERRING, catch in tonnes in Division IVa East. These figures do not in all cases correspond to the official statistics and cannot be used for management purposes.**

Country	1984	1985	1986	1987	1988
Denmark	126	-	4,540	7,101	47,183
Faroe Islands	-	-	-	2,126	-
France	-	-	-	159	45
Netherlands	-	-	-	-	200
Norway <sup>1</sup>	51,581	109,975	118,408	145,843	153,496
Sweden	-	-	-	957	622
UK (Scotland)	74	-	-	-	-
Germany, Fed.Rep.	-	-	-	-	-
Unallocated landings	-	-	-	-	-
Total landings	51,781	109,975	122,348	156,186	201,546
Discards <sup>2</sup>	-	-	-	-	-
Total catch	51,781	109,975	122,948	156,186	201,546

Country	1989	1990	1991	1992 <sup>3</sup>	1993
Denmark	44,269	44,364	48,875	53,692	43,224
Faroe Islands	-	-	-	-	-
France	-	892	-	<sup>4</sup>	4
Netherlands	-	-	-	-	-
Norway <sup>1</sup>	168,365	121,405	77,465	61,379	56,215
Sweden	612	2,482	114	508	711
UK (Scotland)	-	-	173	196	<sup>4</sup>
Germany, Fed.Rep.	-	5,604	<sup>4</sup>	<sup>4</sup>	<sup>4</sup>
Unallocated landings	-	-	-	-	-
Total landings	213,246	174,747	126,627	115,775	100,154
Discards <sup>2</sup>	-	-	-	-	-
Total catch	213,246	174,747	126,627	115,775	100,154

<sup>1</sup>Catches of Norwegian spring spawners herring removed (taken under a separate TAC).

<sup>2</sup>Any discards prior to 1989 would have been included in unallocated.

<sup>3</sup>Preliminary.

<sup>4</sup>Included in IVa West.



**Table 3.1.4 HERRING**, catch in tonnes in Division IVb. These figures do not in all cases correspond to the official statistics and cannot be used for management purposes.

Country	1984	1985	1986	1987	1988
Denmark	13,808	51,517	67,966	81,280	190,555
France	2,299	1,037	605	387	617
Faroe Islands	-	-	348	-	-
Germany, Fed.Rep.	2	4,139	1,424	2,302	4,516
Netherlands <sup>4</sup>	4,600	- <sup>3</sup>	21,101	31,371	37,192
Norway	25,820	39,465	40,682	40,111	38,566
Sweden	884	2,442 <sup>2</sup>	1,872 <sup>2</sup>	-	-
UK (England)	1,956	5,214	1,101 <sup>1</sup>	329	2,011
UK (Scotland)	2,477	2,894	6,057	9,639	15,317
Unallocated landings	41,294	47,799	1,594	20,829	1,969
Total landings	93,140	154,507	142,750	186,248	290,743
Discards <sup>4</sup>	-	-	-	-	-
Total catch	93,140	154,507	142,750	186,248	290,743

Country	1989	1990	1991	1992	1993 <sup>6</sup>
Denmark	136,239	105,614	138,555	125,229	109,994
Belgium	-	-	3	13	-
France	14,415 <sup>5</sup>	10,289	4,120	2,313	2,086
Faroe Islands	-	-	-	-	-
Germany, Fed.Rep.	11,880	17,165	20,479	20,005	23,628
Netherlands <sup>4</sup>	47,388	28,402	26,266	26,987	31,370
Norway	11,758	12,207	9,852	16,240	33,158
Sweden	3,420	1,276	4,622	3,446	3,699
UK (England)	957	3,200	2,715	3,026	3,804
UK (Scotland)	9,651	10,381	14,587	16,707	18,904
Unallocated landings	-23,947 <sup>7</sup>	-15,616 <sup>7</sup>	3,180	-13,637 <sup>7</sup>	-16,415 <sup>7</sup>
Total landings	211,711	172,914	224,376	200,329	210,228
Discards <sup>4</sup>	1,900	2,560	1,072	1,900	245
Total catch	213,611	175,474	225,448	202,229	210,473

<sup>1</sup>Includes catches misreported from Division IVc.

<sup>2</sup>Includes Division IVa catches.

<sup>3</sup>Included in Division IVa.

<sup>4</sup>Any discards prior to 1989 were included in unallocated.

<sup>5</sup>Includes catch in Division IVa.

<sup>6</sup>Preliminary.

<sup>7</sup>Negative unallocated catches due to misreporting from other areas.

**Table 3.1.5 HERRING, catch in tonnes in Divisions IVc and VIId. These figures do not in all cases correspond to the official statistics and cannot be used for management purposes.**

Country	1984	1985	1986	1987	1988
Belgium	5,080	3,482	414	39	4
Denmark	53	-	535	31	-
France	16,613	11,288	8,662	6,435	7,456
Germany, Fed.Rep.	-	-	-	-	-
Netherlands	21,922	32,370	21,997	15,749	12,236
Norway	-	-	-	-	-
UK (England)	571	350	303	544	1,266
UK (Scotland)	-	799	117	-	-
Unallocated landings	1,788	21,595	19,495	22,051	31,442
Total landings	-	69,884	51,523	44,849	52,404
Discards <sup>1</sup>	-	-	-	-	-
Total catch	46,027	69,884	51,523	44,849	52,404
Coastal spring spawners included above	-	905	496	250	250

Country	1989	1990	1991	1992	1993 <sup>2</sup>
Belgium	434	180	163	229	56
Denmark	509	265	948	4,296	995
France	14,670	9,718	17,112	9,560	7,171
Germany, Fed.Rep.	299	-	704	824	649
Netherlands	12,240	11,697	19,306	18,851	19,204
Norway	-	-	-	-	-
UK (England)	1,919	1,796	3,960	3,372	11,307
UK (Scotland)	-	-	67	-	-
Unallocated landings	47,523	32,076	15,763	34,649	43,096
Total landings	77,594	55,732	58,023	71,781	82,478
Discards <sup>1</sup>	1,200	5,350	2,662	2,200	2,400
Total catch	78,794	61,082	60,685	73,981	84,878
Coastal spring spawners included above	2,283	1,136	252	202	201

<sup>1</sup>Any discards prior to 1989 would have been included in unallocated.

<sup>2</sup>Preliminary.

**Table 3.1.6 Herring in Sub-area IV, Division VIIId and Division IIIa.**

Year	1987	1988	1989	1990	1991	1992	1993	1994	Max <sup>1</sup>	Min <sup>1</sup>	Mean <sup>1</sup>
TAC (IV and VIIId)	SUB-AREA IV AND DIVISION VIIId										
Recommended Div. IVa,b <sup>4</sup>	600	500	484	373/332	363 <sup>9</sup>	352	290 <sup>10</sup>	296 <sup>10</sup>			
Recommended Div. IVc, VIIId	10	15	30	30	50-60 <sup>9</sup>	54	50	50			
Expected catch of spring spawners						10	8				
Agreed Div. IVa,b <sup>5</sup>	560	500	484	385	370 <sup>9</sup>	380	380	390			
Agreed Div. IVc, VIIId	40	30	30	30	50 <sup>9</sup>	50	50	50			
CATCH (IV and VIIId)											
National landings Div. IVa,b <sup>6</sup>	543	644	639	499	495	481	463				
Unallocated landings Div. IVa,b	37	2	-21	-11	8	-9	-25				
Discard/slipping Div. IVa,b <sup>7</sup>			3	4	2	3	1				
Total Catch Div. IVa,b <sup>8</sup>	580	646	621	492	505	475	439	646	10	328	
National landings Div. IVc, VIIId <sup>6</sup>	23	21	30	24	42	37	40				
Unallocated landings Div. IVc, VIIId	22	31	48	32	16	35	43				
Discard/slipping Div. IVc, VIIId			1	5	3	2	2				
Total Catch Div. IVc, VIIId	45	52	79	61	61	74	85				
Total catch IV and VIIId as used by ACFM <sup>8</sup>	625	698	700	553	566	549	524				
CATCH BY FLEET/STOCK (IV and VIIId) <sup>13)</sup>											
North Sea autumn spawners directed fisheries	Not available				421	419	418				
North Sea autumn spawners small mesh fishery	Not available				134	124	101				
North Sea autumn spawners total	611	675	678	544	555	543	519				
Baltic-IIIa-type spring spawners	14	23	20	8	8	8	9				
Coastal-type spring spawners	0.3	0.3	2.3	1.1	0.3	0.2	0.2				
TAC (IIIa)	DIVISION IIIa										
Predicted catch of autumn spawners						96	153	88			
Recommended spring spawners	112	99	84	67	91	90	93-113	- <sup>12</sup>			
Recommended mixed clupeoids	80	80	80	60	0	0	0	-			
Agreed herring TAC	138	138	138	120	104.5	124	165	148			
Agreed mixed clupeoid TAC	80	80	80	65	50	50	45	43			
CATCH (IIIa)											
National landings	234	333	192	202	188	227	214				
Catch as used by ACFM	220	330	162	195	191	227	214				
CATCH BY FLEET/STOCK (IIIa)											
Autumn spawners human consumption	Not available				26	47	44				
Autumn spawners mixed clupeoid	Not available				13	23	25				
Autumn spawners other industrial landings	Not available				38	82	63				
Autumn spawners total	161	201	91	77 <sup>11</sup>	77	152	132				
Spring spawners human consumption	Not available				68	53	68				
Spring spawners mixed clupeoid	Not available				5	2	1				
Spring spawners other industrial landings	Not available				40	20	12				
Spring spawners total	59	129	71	118	113	75	81				
NORTH SEA AUTUMN SPAWNERS											
Total catch as used by ACFM	773	876	769	620	635	694	647	876	11	438	

<sup>1</sup>Over period 1970-1993. <sup>2</sup>Forward projection. <sup>3</sup>Assumed. <sup>4</sup>Includes catches in directed fishery and catches of 1-ringers in small mesh fishery up to 1992. <sup>5</sup>IVa,b and EC zone of IIa. <sup>6</sup>Provided by Working Group members. <sup>7</sup>One fleet only. <sup>8</sup>Includes spring spawners not included in assessment. <sup>9</sup>Revised during 1991. <sup>10</sup>Based on F=0.3 in directed fishery only; TAC advised for IVc, VIIId subtracted. <sup>11</sup>Estimated. <sup>12</sup>130-180 for spring spawners in all areas. <sup>13</sup>Based on sum-of-products (number x mean weight at age) Weights in '000t.

**Table 3.1.7** Herring in the North Sea ( Sub-area IV and Division VIId and North Sea autumn-spawners in Division IIIa). Weights in '000 t and numbers in billions.

Year	Recruitment	Spawning Stock	Landings	Fishing Mortality
	Age 0	Biomass		Age 2-6
1947	61	4,939	587	0.19
1948	42	4,065	502	0.20
1949	34	3,751	509	0.22
1950	45	3,270	492	0.22
1951	45	2,619	600	0.32
1952	53	2,407	664	0.34
1953	61	2,088	699	0.37
1954	47	1,902	763	0.42
1955	50	1,806	806	0.40
1956	29	1,877	675	0.41
1957	141	1,747	683	0.40
1958	35	1,397	671	0.40
1959	45	2,601	785	0.45
1960	12	2,134	696	0.31
1961	109	1,831	697	0.40
1962	46	1,240	628	0.47
1963	48	2,330	716	0.22
1964	63	2,139	871	0.34
1965	35	1,528	1,169	0.69
1966	28	1,320	896	0.62
1967	40	929	696	0.79
1968	39	419	718	1.33
1969	22	427	547	1.10
1970	41	377	563	1.10
1971	32	273	520	1.39
1972	21	289	498	0.70
1973	10	233	484	1.13
1974	22	162	275	1.05
1975	3	80	313	1.49
1976	3	77	175	1.50
1977	4	45	46	0.82
1978	5	61	11	0.05
1979	11	104	25	0.07
1980	17	128	71	0.29
1981	38	195	175	0.37
1982	65	280	275	0.26
1983	62	433	387	0.33
1984	54	729	409	0.42
1985	83	763	609	0.59
1986	99	815	661	0.52
1987	87	944	773	0.51
1988	44	1,146	876	0.50
1989	42	1,391	769	0.50
1990	41	1,260	620	0.39
1991	41	1,149	636	0.42
1992	69	986	694	0.45
1993	57	730	647	0.44
<b>Average</b>	<b>44</b>	<b>1,307</b>	<b>566</b>	<b>0.55</b>

**Table 3.1.8** Herring in the Southern North Sea.  
(Fishing Areas IVc and VIId).  
Weights in '000 t.

<b>Year</b>	<b>Landings</b>
1964	57
1965	22
1966	12
1967	11
1968	10
1969	24
1970	27
1971	23
1972	23
1973	30
1974	7
1975	26
1976	18
1977	1
1978	2
1979	7
1980	43
1981	42
1982	69
1983	64
1984	46
1985	69
1986	51
1987	45
1988	52
1989	79
1990	61
1991	61
1992	74
1993	85
<b>Average</b>	<b>38</b>

Table 3.1.9

## HERRING in Division IIIa and Sub. Division 22-24. 1985 - 1993

Landings in thousands of tonnes.

(Data provided by Working Group members 1993).

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993*
<b>Skagerrak</b>									
Denmark	88.2	94.0	105.0	144.4	47.4	62.3	58.7	64.7	87.8
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
Sweden	40.3	43.0	51.2	57.2	47.9	56.5	54.7	88.0	56.4
<b>Total</b>	<b>133.5</b>	<b>139.1</b>	<b>157.4</b>	<b>207.3</b>	<b>96.9</b>	<b>124.4</b>	<b>121.5</b>	<b>166.6</b>	<b>168.4</b>
<b>Kattegat</b>									
Denmark	69.2	37.4	46.6	76.2	57.1	32.2	29.7	33.5	28.7
Sweden	39.8	35.9	29.8	49.7	37.9	45.2	36.7	26.4	16.7
<b>Total</b>	<b>109.0</b>	<b>73.3</b>	<b>76.4</b>	<b>125.9</b>	<b>95.0</b>	<b>77.4</b>	<b>66.4</b>	<b>59.9</b>	<b>45.4</b>
<b>Sub. Div. 22 + 24</b>									
Denmark	15.9	14.0	32.5	33.1	21.7	13.6	25.2	26.9	38.0
Germany	54.6	60.0	53.1	54.7	56.4	45.5	15.8	15.6	11.1
Poland	16.7	12.3	8.0	6.6	8.5	9.7	5.6	15.5	11.8
Sweden	11.4	5.9	7.8	4.6	6.3	8.1	19.3	22.3	16.2
<b>Total</b>	<b>98.6</b>	<b>92.2</b>	<b>101.4</b>	<b>99.0</b>	<b>92.9</b>	<b>76.9</b>	<b>65.9</b>	<b>80.3</b>	<b>77.1</b>
<b>Sub. Div. 23</b>									
Denmark	6.8	1.5	0.8	0.1	1.5	1.1	1.7	2.9	3.3
Sweden	1.1	1.4	0.2	0.1	0.1	0.1	2.3	1.7	0.7
<b>Total</b>	<b>7.9</b>	<b>2.9</b>	<b>1.0</b>	<b>0.2</b>	<b>1.6</b>	<b>1.2</b>	<b>4.0</b>	<b>4.6</b>	<b>4.0</b>

<b>Grand Total</b>	<b>349.0</b>	<b>307.5</b>	<b>336.2</b>	<b>432.4</b>	<b>286.4</b>	<b>279.9</b>	<b>257.8</b>	<b>311.4</b>	<b>294.9</b>
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\* Preliminary data.

**Table 3.1.10 Herring in Sub-divisions 22-24, and Division IIIa**

Year	1987	1988	1989	1990	1991	1992	1993	1994
<b>NORTH SEA</b>								
<b>CATCH</b>								
Baltic-Div.IIIa-type spring spawners	14	23	20	8	8	8	9	
<b>DIVISION IIIa</b>								
Pred. catch of autumn spawners						96	153	
Recommended spring spawners	112 <sup>1</sup>	99 <sup>1</sup>	84 <sup>1</sup>	67	91	90	93-113	<sup>5</sup>
Recommended mixed clupeoids	80	80	80	60	0	0	0 <sup>2</sup>	
Agreed herring TAC (spr. & aut. spawn.)	138	138	138	120	104.5	124	165	148
Agreed mixed clupeoid TAC	80	80	80	65	50	50	45	43
<b>CATCH</b>								
National landings <sup>3</sup>	234	333	192	202	188	227	214	
Catch as used by ACFM	220	330	162	195	191	227	214	
<b>CATCH BY FLEET/STOCK</b>								
Autumn spawners landed for human con.					26	47	44	
Autumn spawners in mixed clupeoid fish.		Not available			13	23	25	
Autumn spawners in other ind. landings					38	82	63	
Autumn spawners total	161	201	91	77 <sup>4</sup>	77	152	132	
Spring spawners landed for human con.					68	53	68	
Spring spawners in mixed clupeoid fishery		Not available			5	2	1	
Spring spawners in other ind. landings		Not available			40	20	12	
Spring spawners total	59	129	71	118 <sup>4</sup>	114	75	81	
<b>SUB-DIVISIONS 22-24</b>								
Recommended TAC		97	90	64	87	80	57-68	<sup>5</sup>
Agreed TAC Sub-divisions 22-29 and 32	399	399	399	399	402	402	560	560
(Agreed TAC Sub-divisions 30 and 31	91	91	91	84	84	84	90	90)
<b>CATCH</b>								
National landings	102	99	95	78	70	85	81	
Catch as used by ACFM	102	99	95	78	70	85	81	
<b>SUB-DIVISIONS 22-24 AND DIVISION IIIa SPRING SPAWNERS</b>								
Total catch as used by ACFM	175	251	186	204 <sup>4</sup>	192	168	171	

<sup>1</sup>Adult herring fishery in Division IIIa only. <sup>2</sup>Substantial reduction. <sup>3</sup>As reported by Working Group members. <sup>4</sup>Estimated.

<sup>5</sup>130-180 for spring spawners in all areas. Weights in '000 t.

**Table 3.1.11** Celtic Sea and Division VIIj HERRING landings by calendar year (t), 1977-1993. (Data provided by Working Group members.)

Year	France	Germany	Ireland	Netherlands	U.K.	Unallocated	Discards	Total
1977	100	100	5,500	1,500	-	-	+	7,200
1978	+	200	6,200	1,000	-	900	+	8,300
1979	600	+	7,000	900	-	3,700	+	12,200
1980	+	+	8,800	400	-	-	+	9,200
1981	100	-	15,600	1,200	-	-	+	16,900
1982	+	-	9,500	-	-	-	-	9,500
1983	500	-	10,000	1,500	-	10,200	4,000	26,200
1984	700	-	7,000	900	-	11,100	3,600	23,300
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

**Table 3.1.12** Celtic Sea and Division VIIj Herring landings (t) by season (1 April - 31 March). (Data provided by Working Group members.)

Year	France	Germany	Ireland	Netherlands	U.K.	Unallocated	Discards	Total
1977/1978	100	100	6,300	1,400	-	-	+	7,900
1978/1979	+	200	8,200	1,000	-	-	+	9,400
1979/1980	600	+	7,900	900	-	900	+	10,300
1980/1981	+	+	8,000	300	-	3,800	+	-
1981/1982	100	-	15,800	1,200	-	-	+	17,100
1982/1983	+	-	13,000	-	-	-	+	13,000
1983/1984	500	-	10,000	1,500	-	9,200	3,800	25,000
1984/1985	700	-	7,000	900	-	14,000	4,200	26,800
1985/1986	600	-	12,000	-	-	4,500	3,300	20,400
1986/1987	-	-	14,700	+	-	6,100	4,200	25,000
1987/1988	800	-	15,500	1,500	-	4,400	4,000	26,200
1988/1989	-	-	17,000	-	-	-	3,400	20,400
1989/1990	+	-	15,000	1,900	-	2,600	3,600	23,100
1990/1991	+	-	15,000	1,000	200	700	1,700	18,600
1991/1992	500	100	21,400	1,600	-	-100	2,100	25,600
1992/1993	-	-	18,000	1,300	-	-100	2,000	21,200
1993/1994	-	-	16,600	1,300	+	-1,100	1,800	18,600



**Table 3.1.13 Celtic Sea and Division VIIj herring. Weights in '000 t and recruitment in millions.**

<b>Year</b>	<b>Recruitment Age 1</b>	<b>Spawning Stock Biomass</b>	<b>Landings</b>	<b>Fishing Mortality Age 3-6</b>
1958			23	
1959			15	
1960			18	
1961			15	
1962			22	
1963			17	
1964			11	
1965			19	
1966			27	
1967			28	
1968			30	
1969			44	
1970			32	
1971			31	
1972			38	
1973			27	
1974			20	
1975	152	28	16	0.70
1976	207	25	10	0.60
1977	174	26	8	0.52
1978	135	26	8	0.41
1979	237	28	10	0.54
1980	146	27	13	0.63
1981	410	31	17	0.93
1982	660	47	20	0.88
1983	731	69	25	0.62
1984	566	62	27	1.24
1985	505	61	20	0.45
1986	528	66	25	0.68
1987	1136	77	26	0.83
1988	412	79	20	0.41
1989	526	72	23	0.63
1990	451	65	18	0.45
1991	204	55	26	0.63
1992	1022	62	21	0.72
1993	244	63	17	0.42
<b>Average</b>	<b>445</b>	<b>51</b>	<b>18</b>	<b>0.65</b>

**Table 3.1.14** Nominal catch (t), Division VIa (North) Herring, 1982-1992 as reported to the Working Group.

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 <sup>2</sup>	5 212 <sup>2</sup>
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 <sup>2</sup>	18 038 <sup>2</sup>
Discards	-	-	-	-	-	-
<b>Total</b>	<b>92 360</b>	<b>63 523</b>	<b>75 154</b>	<b>43 814</b>	<b>81 699</b>	<b>63 007</b>

Country	1988	1989	1990	1991	1992	1993
Denmark	-	-	-	-	-	-
Faroes	-	-	326	482	-	-
France	44	1342	1287	1168	119	818
FDR	1 860	4 290	7 096	6 450	5 640	4 693
Ireland	6 740	8 000	10 000	8 000	7 985	8 236
Netherlands	6 131	5 680	7 693	7 979	8 000	6 132
Norway	456	-	1 607	3 318	2 389	7 447
UK Eng. & Wales	1 892	1 977	2 376	2 998	3 327	2 965
UK Scotland	25 002	27 897	35 877	29 630	29 403	29 637
Unallocated	5 229 <sup>2</sup>	2 123 <sup>2</sup>	2 397	-10 597	-5 485	-3 753
Discards	-	1 550	1 300	1 180	200	820
<b>Total</b>	<b>47 354</b>	<b>53 039</b>	<b>69 959</b>	<b>50 606</b>	<b>51 585</b>	<b>56 175</b>

(Discards are included in national catches)

**Table 3.1.15 Herring in Division VIa (North). Weights in '000 t and numbers in millions.**

Year	Recruitment	Spawning Stock	Fishing Mortality	
	Age 1	Biomass	Landings	Age 3-6
1970			166	
1971			207	
1972			165	
1973			208	
1974			177	
1975	2410	116	112	0.94
1976	637	93	94	1.13
1977	674	62	41	1.13
1978	964	62	22	0.85
1979	1553	99	0	0.00
1980	992	174	0	0.00
1981	1835	177	51	0.31
1982	963	168	92	0.53
1983	3934	135	64	0.46
1984	1523	245	75	0.39
1985	1764	251	44	0.24
1986	1553	242	82	0.39
1987	3955	231	63	0.29
1988	1380	359	47	0.17
1989	1451	360	53	0.17
1990	1233	337	70	0.27
1991	1814	285	51	0.24
1992	2214	293	52	0.18
1993	1787	317	56	0.17
Average	1718	211	56	0.41

**Table 3.1.16.** Catches of HERRING from the Firth of Clyde. Spring and autumn-spawners combined.  
Tonnes.

Year	Scotland	Other UK	Unallocated	Discards	Total catch 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	4 361	
1984	2 991	247	224	2 308	5 770	3 000
1985	3 001	22	433	1 344 <sup>3</sup>	4 800	3 000
1986	3 395	-	576	679 <sup>3</sup>	4 650	3 100
1987	2 895	-	278	439 <sup>4</sup>	3 612	3 500
1988	1 568	-	110	245 <sup>4</sup>	1 923	3 200
1989	2 135	-	208	- <sup>2</sup>	2 343	3 200
1990	2 184	-	75	- <sup>2</sup>	2 259	2 600
1991	713	-	18	- <sup>2</sup>	731	2 900
1992	929	-	-	-	926	2 300
1993	852	-	-	-	852	1 000

<sup>2</sup> Reported to be at a low level, assumed to be zero

<sup>3</sup> Based on sampling

<sup>4</sup> Estimated assuming the same discarding rate as in 1986.

**Table 3.1.17** Estimated Herring catches in tonnes in Divisions VIa (South) and VIIb,c, 1984-1993.

Country	1984	1985	1986	1987	1988
France	-	-	-	-	-
Germany, Fed.Rep.	-	-	-	-	-
Ireland	10,000	13,900	15,540	15,000	15,000
Netherlands	6,400	1,270	1,550	1,550	300
UK (N.Ireland)	-	-	-	5	-
UK (England + Wales)	-	-	-	51	-
UK Scotland	-	-	-	-	-
Unallocated	11,000	8,204	11,785	31,994	13,800
Total landings	27,400	23,374	28,785	48,600	29,100
Discards	-	-	-	-	-
Total catch	27,400	23,374	28,785	48,600	29,100

Country	1989	1990	1991	1992	1993 <sup>1</sup>
France	-	+	-	-	-
Germany, Fed.Rep.	-	-	-	250	-
Ireland	18,200	25,000	22,500	26,000	27,600
Netherlands	2,900	2,533	600	900	2,500
UK (N.Ireland)	-	80	-	-	-
UK (England + Wales)	-	-	-	-	-
UK (Scotland)	+	-	+	-	200
Unallocated	7,100	13,826	11,200	4,600	6,250
Total landings	28,200	41,439	34,300	31,750	36,550
Discards	1,000	2,530	3,400	100	250
Total catch	29,200	43,969	37,700	31,850	36,800

<sup>1</sup>Provisional**Table 3.1.18** HERRING. Total catches (t) in North Irish Sea (Division VIIa, North), 1980-1993 as reported to the Working Group.

Country	1980	1981	1982	1983	1984	1985	1986
France	1	-	-	48	-	-	-
Ireland	1,340	283	300	860	1,084	1,000	1,640
UK	9,272	4,094	3,375	3,025	2,982	4,077	4,376
Unallocated	-	-	1,180	-	-	4,110	1,424
Total	10,613	4,377	4,855	3,933	4,066	9,187	7,440

Country	1987	1988	1989	1990	1991	1992	1993
France	-	-	-	-	-	-	-
Ireland	1,200	2,579	1,430	1,699	80	406	0
UK	3,290	7,593	3,532	4,613	4,318	4,864	4,408
Unallocated	1,333	-	-	-	-	-	-
Total	5,823	10,172	4,962	6,312	4,398	5,270	4,408

**Table 3.2.1** Landings of SPRAT in Division IIIa (tonnes  $10^{-3}$ ). (Data provided by Working Group members).

Year	Skagerrak				Kattegat			Div. IIIa total
	Denmark	Sweden	Norway	Total	Denmark	Sweden	Total	
1974	17.9	2.0	1.2	21.1	31.6	18.6	50.2	71.3
1975	15.0	2.1	1.9	19.0	60.7	20.9	81.6	100.6
1976	12.8	2.6	2.0	17.4	27.9	13.5	41.4	58.8
1977	7.1	2.2	1.2	10.5	47.1	9.8	56.9	67.4
1978	26.6	2.2	2.7	31.5	37.0	9.4	46.4	77.9
1979	33.5	8.1	1.8	43.4	45.8	6.4	52.2	95.6
1980	31.7	4.0	3.4	39.1	35.8	9.0	44.8	83.9
1981	26.4	6.3	4.6	37.3	23.0	16.0	39.0	76.3

Year	Skagerrak			Kattegat		Div. IIIa	Division IIIa Total
	Denmark	Sweden	Norway	Denmark	Sweden	Sweden	
1982	10.5	-	1.9	21.4	-	5.9	39.7
1983	3.4	-	1.9	9.1	-	13.0	26.4
1984	13.2	-	1.8	10.9	-	10.2	36.1
1985	1.3	-	2.5	4.6	-	11.3	19.7
1986	0.4	-	1.1	0.9	-	8.4	10.8
1987	1.4	-	0.4	1.4	-	11.2	14.4
1988	1.7	-	0.3	1.3	-	5.4	8.7
1989	0.9	-	1.1	3.0	-	4.8	9.8
1990	1.3	-	1.3	1.1	-	6.0	9.7
1991	4.2	-	1.0	2.2	-	6.6	14.0
1992	1.1	-	0.6	2.2	-	6.6	10.5
1993 <sup>1</sup>	0.6	4.7	1.3	0.8	1.7	-	9.1

<sup>1</sup>Preliminary.

**Table 3.2.2** Sprat catches in the North Sea ('000 t), 1982-1993. Catches in fjords of western Norway excluded. (Data provided by Working Group members except where indicated.)

Country	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993 <sup>1</sup>
<b>Division IVa West</b>												
Denmark	-	-	-	0.9	0.6	0.2	0.1	+	-		0.26	0.6
Germany	-	-	-	-	-	-	-	-	-		-	-
Netherlands	-	-	-	6.7	-	-	-	-	-	-	-	-
Norway	-	-	-	-	-	-	-	-	-	0.1	-	-
UK (Scotland)	+	-	+	6.1	+	+	-	-	+	-	-	-
Total	+	-	+	13.7	0.6	0.2	0.1	+	+	0.1	0.26	0.6
<b>Division IVa East (North Sea) stock</b>												
Denmark	+	-	-	+	0.2	+	+	+	-	-	-	+
Norway	0.3	-	-	-	-	-	-	-	-	-	0.54	2.5
Sweden	-	-	-	-	-	-	-	-	+ <sup>5</sup>	2.5	-	-
Total	0.3	-	-	+	0.2	+	+	+	+	2.5	0.64	2.5
<b>Division IVb West</b>												
Denmark	23.1	32.6	5.6	1.8	0.4	3.4	1.4	2.0	10.0	9.4	19.9	13.0
Faroe Islands	-	-	-	-	-	-	-	-	-	-	-	-
Norway	10.2	0.9	0.5	-	-	-	3.5	0.1	1.2	4.4	18.4	16.8
UK (England)	-	-	+	-	-	-	-	-	-	-	0.48	0.5
UK (Scotland)	0.2	+	+	-	-	0.1	-	-	-	-	-	0.5
Total	33.5	33.5	6.1	1.8	0.4	3.5	4.9	2.1	11.2	13.8	38.26	30.5
<b>Division IVb East</b>												
Denmark	91.2	39.2	62.1	36.6	10.3	28.0	80.7	59.2	59.2	67.0	66.56	136.2
Germany	1.5	-	0.6	0.6	0.6 <sup>3</sup>	-	-	-	-	-	-	-
Norway	7.6	10.8	3.1	-	-	-	0.6	-	0.6	25.1	9.5	24.1
Sweden	-	-	-	-	-	-	-	-	+ <sup>2</sup>	+ <sup>2</sup>	-	-
Total	100.3	50.0	65.8	37.2	10.9	28.0	81.3	59.2	59.8	92.1	76.49	160.3
<b>Division IVc</b>												
Belgium	-	-	-	+	+	+	-	+ <sup>2</sup>	+ <sup>2</sup>	+ <sup>2</sup>	-	-
Denmark	2.4	1.0	0.5	+	0.1	+	0.1	0.5	1.5	1.7	2.49	3.5
France	-	-	-	-	+	-	-	+ <sup>2</sup>	-	+ <sup>2</sup>	-	+
Netherlands	-	-	0.1	-	-	-	0.4	0.4 <sup>2,3</sup>	-	+ <sup>2,3</sup>	-	-
Norway	2.2	0.5	3.4	-	-	-	-	-	-	-	-	0.4
UK (England)	14.9	3.6	0.9	3.4	4.1	0.7	0.6	0.9	0.2	1.8	6.12 <sup>1</sup>	2.0
Total	20.1	5.1	4.9	3.4	4.3	0.7	1.1	1.8	1.7	3.5	8.61	5.9
<b>Total North Sea</b>												
Belgium	-	-	-	+	+	+	-	+	+ <sup>2</sup>	+ <sup>2</sup>	-	-
Denmark	116.6	72.6	68.1	39.5	11.7	31.7	82.3	61.9	69.2	78.1	89.1	153.3
Faroe Islands	-	-	-	-	-	-	-	-	-	-	-	-
France	-	-	-	-	+	-	-	+	-	+ <sup>2,3</sup>	-	+
Germany	1.5	-	0.6	-	0.6	-	-	-	-	-	-	-
Netherlands	-	-	0.1	0.6	-	0.5	0.4	0.4	-	+ <sup>2,3</sup>	-	-
Norway	20.6	12.0	7.0	6.1	-	-	4.1	0.1	1.8	29.6	28.5	43.8
Sweden	-	-	-	-	-	-	-	-	+ <sup>2</sup>	+ <sup>2</sup>	-	0.1
UK (England)	14.9	3.6	0.9	3.4	4.1	0.7	0.6	0.9	0.2	1.8	6.6	2.6
UK (Scotland)	0.2	+	+	-	+	0.2	-	-	+	-	-	0.5
Total	153.8	88.4	76.7	49.6	16.4	33.1	87.4	63.3	71.2	109.5	124.2	200.3

<sup>1</sup>Preliminary. <sup>2</sup>Official statistics. <sup>3</sup>Includes Divisions IVa-c. <sup>5</sup>Includes Division IVb East.  
+ = less than 0.1. - = magnitude known to be nil.

**Table 3.2.3** Nominal catch of sprat in Divisions VII d,e, 1983-1993.

Country	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993 <sup>1</sup>
Belgium	3	-	-	-	-	-	-	-	-	-	-
Denmark	638	1,417	-	15	250	2,529	2,092	608	-	-	-
France	60	47	14	-	23	2	10	-	-	35	2
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
Total	6,011	4,455	33,785	1,178	2,714	5,475	3,421	2,116	2,567	1,825	1,800

<sup>1</sup>Preliminary



**Table 3.2.4** Species composition in the industrial fisheries in Division IIIa ('000 t), 1974-1993<sup>1</sup>.

Year	Sandeel	Sprat <sup>2</sup>	Herring <sup>3</sup>	Norway pout	Blue whiting	Total
1974	8	71	76	13	-	168
1975	17	101	57	19	-	194
1976	22	59	38	42	-	161
1977	7	67	32	21	-	127
1978	23	78	16	25	-	142
1979	34	96	13	25	6	174
1980	39	84	25	26	14	188
1981	59	76	63	30	+	228
1982	25	40	54	44	5	168
1983	29	26	89	30	16	190
1984	26	36	112	46	15	235
1985	6	20	116	9	19	170
1986	73	11	65	6	9	164
1987	5	14	72	3	25	119
1988	23	9	97	8	15	152
1989	18	10	52	6	9	95
1990	16	10	51	27	10	114
1991	23	14	22	32	11	102
1992	39	2	47	42	18	148
1993 <sup>4</sup>	45	2	71	8	32	158
Mean 1974-1993	27	41	58	23	14 <sup>5</sup>	160

<sup>1</sup>Data from 1974-1984 from Anon. (1986), 1985-1993 provided by Working Group members.

<sup>2</sup>Total landings from all fisheries.

<sup>3</sup>For years 1974-1985, human consumption landings used for reduction are included in these data.

<sup>4</sup>Preliminary.

<sup>5</sup>Mean 1979-1993.

**Table 3.2.5** Species composition in the landings ('000 t) from the industrial fisheries in the North Working Group members).

Year	Norway			Blue		Haddock	Whiting	Saithe	Other	Total
	Sandeel	Sprat	Herring	pout	whiting					
1974	525	314	0	736	62	48	130	42		1857
1975	428	641	0	560	42	41	86	38		1836
1976	488	622	12	435	36	48	150	67		1858
1977	786	304	10	390	38	35	106	6		1675
1978	787	378	8	270	100	11	55	3		1612
1979	578	380	15	320	64	16	59	2		1434
1980	729	323	7	471	76	22	46	0		1674
1981	569	209	84	236	62	17	67	1		1245
1982	611	153	153	360	118	19	33	5	24	1476
1983	537	88	155	423	118	13	24	1	42	1401
1984	669	77	35	355	79	10	19	6	48	1298
1985	622	50	63	197	73	6	15	8	66	1100
1986	848	16	40	174	37	3	18	1	33	1170
1987	825	33	47	147	30	4	16	4	73	1179
1988	893	87	179	102	28	4	49	1	45	1388
1989	1039	63	146	162	28	2	36	1	59	1536
1990	591	71	115	140	22	3	50	8	40	1040
1991	843	110	131	155	28	5	38	1	38	1349
1992	854	214	128	252	45	11	27	0	30	1561
1993	578	153	102	174	17	11	20	0	27	1083
1993 q1	26	16	23	36	1	2	3	0	6	114
1993 q2	430	5	5	28	6	4	4	0	6	487
1993 q3	88	72	51	59	4	3	7	1	7	293
1993 q4	33	61	23	51	5	1	6		8	189
Mean		214	72	303	55	16	52	10	44	1439

**Table 3.2.6** Landings (t) from the fisheries for Sandeel and Norway pout in Division VIa. (Data as officially reported to ICES.)

Year	Norway pout	Sandeel	Total
1974	6,721	+	6,721
1975	8,655	+	8,655
1976	19,933	17	19,950
1977	5,206	67	5,273
1978	23,250	+	23,250
1979	20,502	-	20,502
1980	17,870	211	18,081
1981	7,757	5,972	13,729
1982	4,911	10,873	15,784
1983	8,325	13,051	21,376
1984	7,794	14,166	21,960
1985	9,697	18,586	28,283
1986	5,832	24,469	30,301
1987	38,267	14,479	52,746
1988	6,742	24,465	31,207
1989	28,196	18,785	46,981
1990	3,316	16,515	19,831
1991	4,348	8,532	12,880
1992	5,147	4,985	10,132
1993 <sup>1</sup>	7,338	6,236	13,574
Mean 1974-1992	12,519	9,220	21,739

<sup>1</sup>Preliminary

**Table 3.2.7** Norway pout. Annual landings (tonnes) in Division IIIa. (Data as officially reported to ICES.)

Country	1976	1977	1978	1979	1980	1981	1982	1983	1984
Denmark	40,144	20,694	23,922	23,951	26,235	29,273	51,317	36,124	67,007
Norway	50 <sup>2</sup>	104	362	1,182	141	752	1,265	990	947
Sweden	2,255	318	591 <sup>3</sup>	32	39	60	60	52	+
Total	42,449	21,116	24,875	25,165	26,415	30,085	52,685	37,166	67,954

Country	1985	1986	1987	1988	1989	1990	1991	1992	1993 <sup>1</sup>
Denmark	85,082	32,056	47,527	45,034	16,873	41,215	49,341	83,866	37,197
Norway	831	400	1,680	1,178	309	40	23	221 <sup>1</sup>	-
Sweden	-	+	-	-	+	+	3	5	-
Total	85,913	32,456	49,207	46,212	17,182	41,255	49,367	84,092	37,197

<sup>1</sup>Preliminary.<sup>2</sup>Including by-catch.<sup>3</sup>Includes North Sea.**Table 3.2.8** Norway pout in Division IIIa.  
Weights in '000 t.

Year	Landings
1974	13
1975	19
1976	42
1977	21
1978	25
1979	25
1980	26
1981	30
1982	44
1983	30
1984	46
1985	9
1986	6
1987	3
1988	8
1989	6
1990	27
1991	32
1992	42
1993	8
Average	23

**Table 3.2.9** Norway pout annual landings ('000 t) in Sub-area IV, the North Sea, by countries in 1958-1993.  
(Data provided by Working Group members.)

Year	Denmark	Faroes	Norway	Sweden	UK (Scotland)	Others	Total
1958	-	-	-	-	-	-	-
1959	-	-	7.8	-	-	-	69.3
1960	17.2	-	13.5	-	-	-	30.7
1961	20.5	-	8.1	-	-	-	28.6
1962	121.8	-	27.9	-	-	-	14.7
1963	67.4	-	70.4	-	-	-	137.8
1964	10.4	-	51.0	-	-	-	61.4
1965	8.2	-	35.0	-	-	-	43.2
1966	35.2	-	17.8	-	-	+	53.0
1967	169.6	-	12.9	-	-	+	182.6
1968	410.8	-	40.9	-	-	+	451.8
1969	52.5	19.6	41.4	-	-	+	113.5
1970	142.1	32.0	63.5	-	0.2	0.2	238.0
1971	178.5	47.2	79.3	-	0.1	0.2	305.3
1972	259.6	56.8	120.5	6.8	0.9	0.2	444.8
1973	215.2	51.2	63.0	2.9	13.0	0.6	345.9
1974	464.5	85.0	154.2	2.1	26.7	3.3	735.8
1975	251.2	63.6	218.9	2.3	22.7	1.0	559.7
1976	244.9	64.6	108.9	+	17.3	1.7	435.4
1977	232.2	50.9	98.3	2.9	4.6	1.0	389.9
1978	163.4	19.7	80.8	0.7	5.5	-	270.1
1979	219.9	21.9	75.4	-	3.0	-	320.2
1980	366.2	34.1	70.2	-	0.6	-	471.1
1981	167.5	16.6	51.6	-	+	-	235.7
1982	256.3	15.4	88.0	-	-	-	359.7
1983	301.1	24.5	97.3	-	+	-	422.9
1984	251.9	19.1 <sup>1</sup>	83.8	-	0.1	-	354.9
1985	163.7	9.9	22.8	-	0.1	-	196.5
1986	146.3	6.6	21.5	-	-	-	174.4
1987	108.3	4.8	34.1	-	-	-	147.2
1988	79.0	1.5	21.1	-	-	-	101.6
1989	95.6	0.8	65.3	-	0.1	0.3	162.7
1990	61.5	0.9	77.1	-	-	-	139.5
1991	85.0	1.3	68.3	-	-	+	154.6
1992	146.9	2.6	105.5	-	0	0.1	255.1
1993	97.3	n/a	76.7	-	-	-	174.0

**Table 3.2.10** Norway pout in Sub-area IV.  
Weights in '000 t and numbers in billions

<b>Year</b>	<b>Recruitment Age 0</b>	<b>Spawning Stock Biomass</b>	<b>Landings</b>	<b>Fishing Mortality Age 1-2</b>
1959			69	
1960			31	
1961			29	
1962			15	
1963			138	
1964			61	
1965			43	
1966			53	
1967			183	
1968			452	
1969			114	
1970			238	
1971			305	
1972			445	
1973			346	
1974			736	
1975			560	
1976			435	
1977			390	
1978			270	
1979			320	
1980			471	
1981			236	
1982	239	175	360	1.01
1983	156	374	423	0.79
1984	82	380	355	1.18
1985	59	188	197	1.01
1986	120	102	174	0.88
1987	32	113	147	0.71
1988	93	160	102	0.50
1989	98	103	163	0.62
1990	97	154	140	0.61
1991	190	173	155	0.55
1992	96	228	255	0.57
1993	76	322	174	0.47
<b>Average</b>	<b>112</b>	<b>206</b>	<b>245</b>	<b>0.74</b>

**Table 3.2.11** 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 <sup>3</sup>	-	82 <sup>3</sup>	-	-	-	-	-
Poland	75	-	-	-	-	-	-	-
UK (Scotland) <sup>2</sup>	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 <sup>4</sup>	37,714 <sup>5</sup>	5,849 <sup>5</sup>	28,180 <sup>5</sup>
Faroes	3,026	6,261	3,400	998	-	-	376	11
Germany	-	-	70	-	-	-	-	-
Netherlands	548	1,534	-	139	-	-	-	-
Norway	-	-	-	-	-	-	-	-
Poland	-	-	-	-	-	-	-	-
UK (Scotland) <sup>2</sup>	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 <sup>1</sup>
Denmark	3,316 <sup>5</sup>	4,348	5,147	7,338
Faroes	-	-	-	-
Germany	-	-	-	-
Netherlands	-	-	10	-
Norway	-	-	-	-
Poland	-	-	-	-
UK (Engl. & Wales)	-	-	2	-
UK (Scotland)	+	-	-	-
Russia	-	-	-	-
Total	3,316	4,348	5,159	7,338

<sup>1</sup>Preliminary.

<sup>2</sup>Amended using national data.

<sup>3</sup>Including by-catch.

<sup>4</sup>Includes Division VIb.

<sup>5</sup>Included in Division IVa.

**Table 3.2.12** Sandeel, Division IIIa. Landings in tonnes. Official figures 1982-85, estimates provided by Working Group members 1986-1993.

Year	Denmark	Norway	Sweden
1982	25364	-	5
1983	29169	178	31
1984	26436	-	-
1985	5610	-	-
1986	73133	-	-
1987	5410	-	-
1988	23159	-	-
1989	18170	-	-
1990	15831	-	-
1991	22989	-	-
1992	38830	-	-
1993 <sup>1</sup>	44804	-	-

**Table 3.2.13** Sandeel in Division IIIa.  
Weights in '000 t.

Year	Landings
1974	8
1975	17
1976	22
1977	7
1978	23
1979	34
1980	39
1981	59
1982	25
1983	29
1984	26
1985	6
1986	73
1987	5
1988	23
1989	18
1990	16
1991	23
1992	39
1993	45
<b>Average</b>	<b>27</b>



**Table 3.2.14** Landings ('000 t) of sandeel from the North Sea, 1952-1992. (Data provided by Working Group members.)

Year	Denmark	Germany	Faroese	Netherlands	Norway	Sweden	UK	Total
1952	1.6	-	-	-	-	-	-	1.6
1953	4.5	+	-	-	-	-	-	4.5
1954	10.8	+	-	-	-	-	-	10.8
1955	37.6	+	-	-	-	-	-	37.6
1956	81.9	5.3	-	+	1.5	-	-	88.7
1957	73.3	25.5	-	3.7	3.2	-	-	105.7
1958	74.4	20.2	-	1.5	4.8	-	-	100.9
1959	77.1	17.4	-	5.1	8.0	-	-	107.6
1960	100.8	7.7	-	+	12.1	-	-	120.6
1961	73.6	4.5	-	+	5.1	-	-	83.2
1962	97.4	1.4	-	-	10.5	-	-	109.3
1963	134.4	16.4	-	-	11.5	-	-	162.3
1964	104.7	12.9	-	-	10.4	-	-	128.0
1965	123.6	2.1	-	-	4.9	-	-	130.6
1966	138.5	4.4	-	-	0.2	-	-	143.1
1967	187.4	0.3	-	-	1.0	-	-	188.7
1968	193.6	+	-	-	0.1	-	-	193.7
1969	112.8	+	-	-	-	-	0.5	113.3
1970	187.8	+	-	-	+	-	3.6	191.4
1971	371.6	0.1	-	-	2.1	-	8.3	382.1
1972	329.0	+	-	-	18.6	8.8	2.1	358.5
1973	273.0	-	1.4	-	17.2	1.1	4.2	296.9
1974	424.1	-	6.4	-	78.6	0.2	15.5	524.8
1975	355.6	-	4.9	-	54.0	0.1	13.6	428.2
1976	424.7	-	-	-	44.2	-	18.7	487.6
1977	664.3	-	11.4	-	78.7	5.7	25.5	785.6
1978	647.5	-	12.1	-	93.5	1.2	32.5	786.8
1979	449.8	-	13.2	-	101.4	-	13.4	577.8
1980	542.2	-	7.2	-	144.8	-	34.3	728.5
1981	464.4	-	4.9	-	52.6	-	46.7	568.6
1982	506.9	-	4.9	-	46.5	0.4	52.2	610.9
1983	485.1	-	2.0	-	12.2	0.2	37.0	536.5
1984	596.3	-	11.3	-	28.3	-	32.6	668.6
1985	587.6	-	3.9	-	13.1	-	17.2	621.8
1986	752.5	-	1.2	-	82.1	-	12.0	847.8
1987	605.4	-	18.6	-	193.4	-	7.2	824.6
1988	686.4	-	15.5	-	185.1	-	5.8	892.8
1989	824.4	-	16.6	-	186.8	-	11.5	1039.1
1990	496.0	-	2.2	0.3	88.9	-	3.9	591.3
1991	701.4	-	11.2	-	128.8	-	1.2	842.6
1992	751.1	-	9.1	-	89.3	0.5	4.9	855.0
1993	482.2	-	-	-	95.5	-	0.2	577.9

+ = less than half unit.

- = no information or no catch.

**Table 3.2.15** Annual landings ('000 t) of Sandeels by area of the North Sea [Denmark, Norway and UK (Scotland)]. (Data provided by Working Group members.)

Year	Area										Assessment areas <sup>1</sup>		
	1A	1B	1C	2A	2B	2C	3	4	5	6	Shetland	Northern	Southern
1972	98.8	28.1	3.9	24.5	85.1	0.0	13.5	58.3	6.7	28.0	0.0	130.6	216.3
1973	59.3	37.1	1.2	16.4	60.6	0.0	8.7	37.4	9.6	59.7	0.0	107.6	182.4
1974	50.4	178.0	1.7	2.2	177.9	0.0	29.0	27.4	11.7	25.4	7.4	386.6	117.1
1975	70.0	38.2	17.8	12.2	154.7	4.8	38.2	42.8	12.3	19.2	12.9	253.7	156.5
1976	154.0	3.5	39.7	71.8	38.5	3.1	50.2	59.2	8.9	36.7	20.2	135.0	330.6
1977	171.9	34.0	62.0	154.1	179.7	1.3	71.4	28.0	13.0	25.3	21.5	348.4	392.3
1978	159.7	50.2		346.5	70.3		42.5	37.4	6.4	27.2	28.1	163.0	577.2
1979	194.5	0.9	61.0	32.3	27.0	72.3	34.1	79.4	5.4	44.3	13.4	195.3	355.9
1980	215.1	3.3	119.3	89.5	52.4	27.0	90.0	30.8	8.7	57.1	25.4	292.0	401.2
1981	105.2	0.1	42.8	151.9	11.7	23.9	59.6	63.4	13.3	45.1	46.7	138.1	378.9
1982	189.8	5.4	4.4	132.1	24.9	2.3	37.4	75.7	6.9	74.7	52.0	74.4	479.2
1983	197.4	-	2.8	59.4	17.7	-	57.7	87.6	8.0	66.0	37.0	78.2	419.0
1984	337.8	4.1	5.9	74.9	30.4	0.1	51.3	56.0	3.9	60.2	32.6	91.8	532.8
1985	281.4	46.9	2.8	82.3	7.1	0.1	29.9	46.6	18.7	84.5	17.2	79.7	513.5
1986	295.2	35.7	8.5	55.3	244.1	2.0	84.8	22.5	4.0	80.3	14.0	375.1	457.4
1987	275.1	63.6	1.1	53.5	325.2	0.4	5.6	21.4	7.7	45.1	7.2	395.9	402.8
1988	291.1	58.4	2.0	47.0	256.5	0.3	67.6	35.3	12.0	102.2	4.7	384.8	487.6
1989	228.3	31.0	0.5	167.9	334.1	1.5	125.3	30.5	4.5	95.1	3.5	492.4	526.3
1990	141.4	1.4	0.1	80.4	156.4	0.6	61.0	45.5	13.8	85.5	2.3	219.5	366.7
1991	228.2	7.1	0.7	114.0	252.8	1.8	110.5	22.6	1.0	93.1	+	372.9	458.9
1992	422.4	3.9	4.2	168.9	67.1	0.3	101.2	20.1	2.8	54.4	0	176.7	668.6
1993	196.5	21.9	0.1	26.2	164.9	0.3	88.0	26.6	3.9	48.7	0	276.0	301.9

<sup>1</sup>Assessment areas: Northern - Areas 1B, 1C, 2B, 2C, 3.  
Southern - Areas 1A, 2A, 4, 5, 6.

**Table 3.2.16** Sandeel in southern North Sea.  
Weights in '000 t and numbers in billions.

Year	Recruitment	Spawning Stock		Fishing Mortality
	Age 0	Biomass	Landings	Age 1-2
1972			216	
1973			182	
1974			117	
1975			157	
1976			331	
1977			392	
1978			577	
1979			356	
1980			401	
1981			379	
1982	134	343	479	0.57
1983	784	1,131	419	0.43
1984	197	534	533	0.32
1985	1,162	956	514	0.85
1986	171	377	457	0.37
1987	119	1,751	403	0.30
1988	406	1,061	488	0.55
1989	206	473	526	0.49
1990	419	587	367	0.62
1991	800	391	459	0.64
1992	117	586	669	0.39
1993	621	1,161	302	0.24
<b>Average</b>	<b>428</b>	<b>779</b>	<b>397</b>	<b>0.48</b>

**Table 3.2.17** Sandeel in northern North Sea.  
Weights in '000 t and numbers in billions.

Year	Recruitment	Spawning Stock		Fishing Mortality
	Age 0	Biomass	Landings	Age 1-2
1972			131	
1973			108	
1974			387	
1975			254	
1976			135	
1977			348	
1978			163	
1979			195	
1980			292	
1981			138	
1982	104	106	74	0.79
1983	105	111	78	0.41
1984	47	196	92	0.48
1985	266	211	80	0.77
1986	440	142	375	1.05
1987	91	330	396	0.78
1988	327	709	385	0.96
1989	83	214	492	0.95
1990	242	202	220	0.85
1991	96	133	373	0.89
1992	142	169	168	0.70
1993	496	138	276	0.77
<b>Average</b>	<b>203</b>	<b>222</b>	<b>234</b>	<b>0.78</b>

**Table 3.2.18** Sandeel in the Shetland area.  
Weights in '000 t and numbers in millions.

Year	Recruitment	Spawning Stock	Landings	Fishing Mortality
	Age 0	Biomass		Age 1-3
1974			7	
1975			13	
1976			20	
1977			22	
1978			28	
1979			13	
1980			25	
1981			47	
1983			52	
1982			37	
1984	27,265	42	33	0.43
1985	20,552	39	17	0.24
1986	21,681	34	14	0.30
1987	1,688	25	7	0.11
1988	1,809	28	5	0.12
1989	4,879	18	4	0.10
1990	2,333	11	2	0.11
1991	69,756	9	0	0.00
1992	8,269	8	0	0.00
1993	30,933	55	0	0.00
1994	3,850	53	0	0.00
<b>Average</b>	<b>17,547</b>	<b>29</b>	<b>17</b>	<b>0.13</b>

**Table 3.2.19** Sandeel, Division VIa. Landings in tonnes, 1981-1993, as officially reported to ICES.

Country	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Denmark	-	-	-	-	-	-	-	-	-	-	-	-	80 <sup>1</sup>
UK (Scotland)	5,972	10,786	13,051	14,166	18,586	24,469	14,479	24,465	18,785	16,515	8,532	4,985	6,156
Total	5,972	10,786	13,051	14,166	18,586	24,469	14,479	24,465	18,785	16,515	8,532	4,985	6,236

<sup>1</sup>Preliminary

**Table 3.2.20** Sandeel in Division VIa. Weights in '000 t and numbers in millions.

Year	Recruitment	Spawning Stock	Fishing Mortality	
	Age 0	Biomass	Landings	Age 1-3
1980			0	
1981			6	
1982			11	
1983	65	48	13	0.06
1984	28	57	14	0.07
1985	92	64	19	0.08
1986	145	48	25	0.10
1987	26	65	15	0.05
1988	21	108	25	0.09
1989	60	73	19	0.10
1990	45	45	17	0.07
1991	203	51	9	0.03
1992	140	54	5	0.01
1993	524	136	6	0.01
Average	123	68	13	0.06

**Table 3.3.1** Cod landings (in tonnes) from the Kattegat, 1971-1993.

Year	Kattegat			Total
	Denmark	Sweden	Germany <sup>2</sup>	
1971	11,748	3,962	22	15,732
1972	13,451	3,957	34	17,442
1973	14,913	3,850	74	18,837
1974	17,043	4,717	120	21,880
1975	11,749	3,642	94	15,485
1976	12,986	3,242	47	16,725
1977	16,668	3,400	51	20,119
1978	10,293	2,893	204	13,390
1979	11,045	3,763	22	14,830
1980	9,265	4,206	38	13,509
1981	10,673	4,380	284	15,337
1982	9,320	3,087	58	12,465
1983	9,149	3,625	54	12,828
1984	7,590	4,091	205	11,886
1985	9,052	3,640	14	12,706
1986	6,930	2,054	112	9,096
1987	9,396	2,006	89	11,491
1988	4,054	1,359	114	5,527
1989	7,056	1,483	51	8,590
1990	4,715	1,186	35	5,936
1991	4,664	2,066	104	6,834
1992	3,406	2,771	94	6,271
1993 <sup>1</sup>	4,464	2,549	0	7,013

<sup>1</sup>Preliminary.

<sup>2</sup>Landings statistics incomplete split on the Kattegat and the Skagerrak.  
The figures are estimated by the Study Group members.

**Table 3.3.2** PLAICE landings from the Kattegat and Skagerrak (in tonnes). Official figures, excluding misreported landings in the period 1983-1988. (See Anon., 1992.)

Year	Denmark		Sweden		Germany		Belgium	Norway	Total IIIa
	Kattegat	Skagerrak	Kattegat	Skagerrak	Kattegat	Skagerrak			
1972	15,504	5,095	348	70					21,017
1973	10,021	3,871	231	80					14,203
1974	11,401	3,429	255	70					15,155
1975	10,158	4,888	369	77					15,492
1976	9,487	9,251	271	81					19,090
1977	11,611	12,855	300	142					24,908
1978	12,685	13,383	368	94					26,530
1979	9,721	11,045	281	105					21,152
1980	5,582	9,514	289	92					15,477
1981	3,803	8,115	232	123					12,273
1982	2,717	7,789	201	140					10,847
1983	3,280	6,828	291	170			133	14	10,716
1984	3,252	7,560	323	356	32		27	22	11,572
1985	9,979	9,646	403	296	4		136	18	13,482
1986	2,468	10,653	170	215			505	24	14,035
1987	2,868	11,370	283	222	104		907	25	15,779
1988	1,818	9,781	210	281	2.8		716	41	12,850
1989	1,596	5,387	135	320	4	0.1	230	33	7,705
1990	1,831	8,726	201	777	2	0.7	471	69	12,078
1991	1,756	5,849	267	472	5.6	3.9	315	68	8,737
1992	2,071	8,522	208	381			507	107	11,796
1993 <sup>1</sup>	1,289	9,128	287	175			339	79	11,297

<sup>1</sup>Provisional.



**Table 3.3.3** Catch (in tonnes) of Sole from Division IIIa official statistics.

Year	Denmark		Netherlands		Sweden		Germany		Belgium <sup>2</sup>		WG corrections	Total
	Skagerrak	Kattegat	Skagerrak	Kattegat + Skagerrak	Kattegat	Skagerrak	Kattegat	Skagerrak	Kattegat	Skagerrak		
1970	25	158	-	-	-	-	-	-	-	-	-	183
1971	32	242	-	-	-	-	9	-	-	-	-	283
1972	31	327	-	-	-	-	12	-	-	-	-	370
1973	52	260	-	-	-	-	12	-	-	-	-	325
1974	39	388	-	-	-	-	9	-	-	-	-	436
1975	55	381	9	16	16	16	16	-	-	-	-9	468
1976	34	367	155	11	21	2	21	2	-	-	-155	435
1977	91	400	276	13	8	1	8	1	-	-	-276	513
1978	141	336	141	9	9	-	9	-	-	-	-141	495
1979	57	301	84	8	6	1	6	1	-	-	-84	373
1980	73	228	5	9	12	2	12	2	-	-	-5	324
1981	59	199	-	7	16	1	16	1	-	-	-	282
1982	52	147	1	4	8	1	8	1	-	-	-1	212
1983	70	180	31	11	15	-	15	-	-	-	-31	276
1984	76	235	54	13	13	-	13	-	-	-	-54	337
1985	102	275	132	19	1	+	1	+	-	-	-132	397
1986	158	456	109	26	1	2	1	2	-	-	-109	643
1987	137	564	70	19	-	2	-	2	-	-	-70	722
1988	138	540	-	24	-	4	-	4	-	-	-	706
1989	217	578	-	21	7	1	7	1	-	-	-	824
1990	128 <sup>2</sup>	464 <sup>2</sup>	-	29	8	2	8	2	-	-	-	629
1991	216	746	-	38	11 <sup>3</sup>	-	11 <sup>3</sup>	-	-	-	-	1,011
1992	372	856	-	54	12	-	12	-	-	-	-	1,294
1993 <sup>1</sup>	348	987	-	68	-	-	-	-	-	-	-	1,403

<sup>1</sup>Preliminary.

<sup>2</sup>Data as officially reported to ICES.

<sup>3</sup>1 tonnes in the Skagerrak.

**Table 3.3.4** COD in the Skagerrak (part of Division IIIa). Landings in tonnes as estimated by the Working Group, (same as official landings, preliminary for 1993).

Year	Open Skagerrak					Total	Norwegian Coast
	Denmark	Sweden	Norway	Germany	Others		
1971	5,914	2,040	1,355	-	13	9,322	-
1972	6,959	1,925	1,201	-	22	10,107	-
1973	6,673	1,690	1,253	-	27	9,643	-
1974	6,694	1,380	1,197	-	92	9,363	-
1975	14,171	917	1,190	-	52	16,330	-
1976	18,847	873	1,241	-	466	21,427	-
1977	18,618	560	-	-	675	19,853	-
1978	23,614	592	-	-	260	24,466	1,305
1979	14,007	1,279	-	-	213	15,499	1,752
1980	21,551	1,712	402	-	341	24,006	1,580
1981	25,498	2,835	286	-	294	28,913	1,792
1982	23,377	2,378	314	-	41	26,110	1,466
1983	18,467	2,803	346	-	163	21,779	1,520
1984	17,443	1,981	311	-	156	19,891	1,187
1985	14,521	1,914	193	-	-	16,628	990
1986	18,424	1,505	174	-	-	20,103	917
1987	17,824	1,924	152	-	-	19,900	838
1988	14,806	1,648	392	-	106	16,952	769
1989	16,634	1,902	256	12	34	18,838	888
1990	15,788	1,694	143	110	65	17,800	846
1991	10,396	1,579	72	12	12	12,071	854
1992	11,194	2,436	270	-	102	14,002	923
1993	11,997	2,574	77	-	91	14,737	909

**Table 3.3.5** Cod in the Skagerrak. Weights in '000 t and numbers in millions.

Year	Recruitment	Spawning Stock		Fishing Mortality
	Age 1	Biomass	Landings	Age 3-5
1978	21.61	11.90	24.47	0.86
1979	24.36	11.48	15.50	0.61
1980	31.00	15.35	24.01	1.15
1981	13.99	15.28	28.91	1.01
1982	17.01	15.55	26.11	1.23
1983	19.87	13.41	21.78	1.18
1984	14.68	10.79	19.89	0.97
1985	12.00	10.72	16.63	0.93
1986	33.03	10.10	20.10	1.58
1987	10.56	7.98	19.90	0.88
1988	17.51	9.52	16.95	0.85
1989	12.53	11.22	18.84	1.12
1990	9.90	9.82	17.80	1.06
1991	13.85	8.32	12.06	1.02
1992	26.98	8.34	14.00	0.78
1993	13.40	9.94	14.74	0.72
<b>Average</b>	18.27	11.23	19.48	1.00

**Table 3.3.6 Landings of HADDOCK in Division IIIa (in tonnes) as supplied by Working Group members.**

Year	Denmark		Total	Norway	Sweden	Others	Total consumption	Total reduction and consumption
	Human consumption	Reduction		Human consumption				
1975	-	-	5,015	122	921	57	-	6,115
1976	-	-	7,488	191	1,075	301	-	9,055
1977	-	-	6,907	156	2,485	215	-	9,763
1978	-	-	4,978	168	1,435 <sup>2</sup>	56	-	6,637
1979	-	-	4,120	248	361	56	-	4,785
1980	-	-	7,172	288	373	57	-	7,890
1981	-	-	9,568	271	391	120	-	10,350
1982	-	-	11,151	196	396	329	-	12,072
1983	6,425	7,225	13,65-	756	608	221	8,010	15,235
1984	5,516	2,707	08,223	321	499	30	6,366	9,073
1985	6,522	954	7,476	279	351	15	7,167	8,121
1986	3,265	1,682	4,947	226	151	5	3,647	5,329
1987	3,584	1,449	5,033	148	71	36	3,803	5,288
1988	2,543	1,480	4,023	245	64	48	2,852	4,380
1989	3,889	360	4,249	138	66	5	4,098	4,458
1990	3,887	1,968	5,855	84	102	27	4,100	6,068
1991	3,894	2,593	6,487	111	80	1	4,086	6,679
1992	3,811	4,254	8,065	177	744 <sup>2</sup>	14	4,396	9,000
1993	1,570	2,215	3,785	153 <sup>1</sup>	436 <sup>3</sup>		1,959 <sup>1</sup>	4,374 <sup>1</sup>

<sup>1</sup>Preliminary.

<sup>2</sup>Includes ~ 350 tonnes landed for reduction.

<sup>3</sup>Includes ~ 200 tonnes landed for reduction.

**Table 3.3.7** Nominal landings (in tonnes) of WHITING from Division IIIa as supplied by the Study Group on Division IIIa Demersal Stocks (Anon., 1992b) and updated by the Working Group.

Year	Denmark			Norway	Sweden	Others	Total
1975	19,018			57	611	4	19,690
1976	17,870			48	1,002	48	18,968
1977	18,116			46	975	41	19,178
1978	48,102			58	899	32	49,091
1979	16,971			63	1,033	16	18,083
1980	21,070			65	1,516	3	22,654
	Total consumption	Total industrial	Total				
1981	1,027	23,915	24,942	70	1,054	7	26,073
1982	1,183	39,758	40,941	40	670	13	41,664
1983	1,311	23,505	24,816	48	1,061	8	25,933
1984	1,036	12,102	13,138	51	1,168	60	14,417
1985	557	11,967	12,524	45	654	2	13,225
1986	484	11,979	12,463	64	477	1	13,005
1987	443	15,880	16,323	29	262	43	16,657
1988	391	10,872	11,263	42	435	24	11,764
1989	777	11,662	12,439	29	675	-	13,215
1990	1,016	17,829	18,845	46	435	73	19,333
1991	881	12,463	13,344	56	557	97	14,054
1992	538	10,675	11,213	67	959	1	12,240
1993 <sup>1</sup>	181	3,581	3,762	42	756	1	4,561

<sup>1</sup>Preliminary.

**Table 3.4.1** Nominal landings (tonnes) of *Pandalus borealis* in ICES Division IIIa and Sub-area IV as officially reported to ICES.

Year	Division IIIa				Sub-area IV					
	Denmark	Norway	Sweden	Total	Denmark	Norway	Sweden	UK (Engl.)	UK (Scotl.)	Total
1970	757	982	2740	4479	3460	1107		14	100	4681
1971	834	1392	2906	5132	3572	1265			438	5275
1972	773	1123	2524	4420	2448	1216		692	187	4543
1973	716	1415	2130	4261	196	931		1021	163	2311
1974	475	1186	2003	3664	337	767		50	432	1586
1975	743	1463	1740	3946	1392	604	261		525	2782
1976	865	2541	2212	5618	1861	1051	136	186	2006	5240
1977	763	2167	1895	4825	782	960	124	265	1723	3854
1978	757	1841	1529	4127	1592	692	78	98	2044	4504
1979	973	2489	1752	5214	962	594	34	238	309	2137
1980	1679	3498	2121	7298	1273	1140	38	203	406	3060
1981	2593	3753	2210	8556	719	1435	31	1	341	2527
1982	2920	3877	1421	8218	1069	1545	92		354	3060
1983	1571	3722	988	6281	5752	1657	112	65	1836	9422
1984	1717	3509	933	6159	4638	1274	120	277	25	6334
1985	4105	4772	1474	10351	4582	1785	128	415	1347	8257
1986	4686	4811	1357	10854	3896	1681	157	458	358	6550
1987	4140	5198	1085	10423	9223	3145	252	526	774	13920
1988	2278	3047	1075	6400	2647	4614	220	489	109	8098
1989	2527	3156	1304	6987	3298	3418	122	353	590	7802
1990	2277	3006	1471	6754	2079	3146	137	304	365	6031
1991	3256	3809	1747	8812	750	2310	161	64	54	3339
1992	3294	4563	2019	9876	1881	2568	135	31	116	4731
1993	2451	4539	2147	9137	1985	2835	153		490	5463

Includes small amounts of other Pandalid shrimp

Includes other Pandalid shrimp

1970 to 1974 for Sweden includes subarea IV.

Total 1988 and 1989 includes 19 and 21 t. by the Netherlands

1994 figures are preliminary.

**Table 3.4.2** *Pandalus borealis* landings from Division IIIa (Skagerrak) and IVa (eastern part). (Norwegian Deeps) as estimated by the Working Group.

Year	Denmark	Norway	Sweden	Total landings	Estimated discards
1970	1102	1729	2742	5573	
1971	1190	2486	2906	6582	
1972	1017	2477	2524	6018	
1973	755	2333	2130	5218	
1974	530	1809	2003	4342	
1975	817	2339	2003	5159	
1976	1204	3348	2529	7081	
1977	1120	3004	2019	6143	
1978	1459	2440	1609	5508	
1979	1062	3040	1787	5889	
1980	1678	4562	2159	8399	
1981	2593	5183	2241	10017	
1982	3766	5042	1450	10258	
1983	1567	5361	1136	8064	
1984	1747	4783	1022	7552	
1985	3827	6646	1571	12044	584
1986	4834	6490	1463	12787	477
1987	4599	8343	1321	14263	808
1988	3068	7661	1278	12007	830
1989	3150	6411	1433	10994	1548
1990	2479	6139	1540	10158	1723
1991	3583	6106	1908	11597	765
1992	3725	7131	2154	13010	713
1993	2915	7374	2300	12589	1128

**Table 3.4.3** *Pandalus borealis* in Division IIIa and Division IVa East. Weights in '000 t and numbers in billions.

Year	Recruitment Age 0	Spawning Stock Biomass	Landings	Fishing Mortality Age 1-3
1985	19	23	13	0.41
1986	16	15	13	0.35
1987	11	23	15	0.40
1988	17	16	13	0.50
1989	23	14	13	0.73
1990	22	11	12	0.56
1991	17	14	12	0.71
1992	25	15	14	0.82
1993	18	16	14	0.55
Average	19	16	13	0.56

**Table 3.4.4** Landings (t) of *Pandalus borealis* from the Fladen Ground (Division IVa) as estimated by the Working Group.

Year	Denmark	Sweden	Norway	UK (Scotland)	Total
1972	2,204	-	-	187	2,391
1973	157	-	-	163	320
1974	282	-	-	434	716
1975	1,308	-	-	525	1,833
1976	1,552	-	-	1,937	3,489
1977	425	-	112	1,692	2,229
1978	890	-	81	2,027	2,998
1979	565	-	44	268	877
1980	1,122	-	76	377	1,575
1981	685	-	1	347	1,033
1982	283	-	-	352	635
1983	5,729	-	8	1,827	7,564
1984	4,553	-	13	25	4,591
1985	3,649	-	-	1,341	4,990
1986	3,416	-	-	301	3,717
1987	7,326	-	-	686	8,012
1988	1,077	-	2	84	1,163
1989	2,438	-	25	547	3,010
1990	1,681	4	3	365	2,053
1991	422	-	31	53	506
1992	1,448	-	-	116	1,564
1993*	1,521	-	-	470	1,991

\*Provisional

**Table 3.4.5** Landings (t) of *Pandalus borealis* from Division IVb, the Farn Deep as estimated by the Working Group.

Year	UK (England)	UK (Scotland)	Denmark	Total	CPUE kg/hr (Scotland)
1977	227	-	No data	-	-
1978	91	2	-	-	No data
1979	235	34	-	-	No data
1980	203	17	-	-	60
1981	1	-	-	-	-
1982	-	-	-	-	-
1983	65	-	-	-	-
1984	30	-	-	-	-
1985	2	6	-	-	70
1986	137	57	106	300	127
1987	212	86	92	390	101
1988	91	25	384	500	67
1989	168	8	72	248	44
1990	144	+	1	145	-
1991	3	-	-	3	-
1992	1	-	-	1	-
1993	-	-	-	-	-

Table 3.5.2 Nominal catch (in tonnes) of COD in Sub-area IV, 1983-1993, as officially reported to ICES.

Country	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993 <sup>1</sup>
Belgium	6,704	5,804	4,815	6,604	6,693	5,508	3,398	2,934	2,331	3,356	3,374
Denmark	48,828	46,751	42,547	32,892	36,948	34,905	25,782	21,601	18,997	18,479	19,547
Faroe Islands	361	-	71	15	57	46	35	96	23	109	46
France	7,159	8,129	4,834	8,402	8,199	8,323	2,578 <sup>1,3</sup>	1,641 <sup>1,3</sup>	975 <sup>1,3</sup>	2,146 <sup>1</sup>	2,162 <sup>1,3</sup>
Germany	20,333	13,453	7,675	7,667	8,230	7,707	11,430	11,725	7,278	8,446	6,808 <sup>1</sup>
Netherlands	34,111	25,460	30,844	25,082	21,347	16,968 <sup>4</sup>	12,028	8,445 <sup>1</sup>	6,830 <sup>1</sup>	11,133	10,220
Norway <sup>2</sup>	6,625	7,005	5,766	4,864	5,000	3,585	4,813	5,168	5,425	10,053 <sup>1</sup>	8,760 <sup>1</sup>
Poland	75	7	-	10	13	19	24	53	15	-	-
Sweden	422	575	748	839	688	367	501	620	784	823	646
UK (Engl. & Wales)	53,860	35,605	29,692	25,361	29,960	23,496	18,250	15,596	14,481	14,836	14,894
UK (Isle of Man)	-	-	-	-	-	-	1	-	-	15	-
UK (N. Ireland)	-	-	-	-	-	-	124	26	70	72	47
UK (Scotland)	58,581	54,359	60,931	45,748	49,671	41,382	31,480	31,120	28,748	28,204	18,191
Russia	-	-	-	-	-	-	-	-	-	-	-
Total	237,059	197,148	187,923	157,484	166,806	142,306	110,444	99,025	85,957	97,672	94,695
Unreported landings	-3,397	7,723	5,043	5,745	8,671	7,815	5,180	5,726	2,554	332	10,009
Landings as used by Working Group	233,662	204,871	192,966	163,229	175,477	150,121	115,624	104,751	88,511	97,340	104,704

<sup>1</sup>Preliminary.<sup>2</sup>Figures do not include cod caught as industrial by-catch.<sup>3</sup>Includes Division IIa (EC).



**Table 3.5.3** Cod in Sub-area IV (North Sea). Weights in '000 t and numbers in millions.

Year	Recruitment	Spawning Stock	Landings	Fishing Mortality
	Age 1	Biomass		Age 2-8
1963	198	140	108	0.47
1964	367	168	116	0.48
1965	422	194	173	0.54
1966	512	231	212	0.52
1967	485	249	242	0.62
1968	197	284	277	0.62
1969	205	282	194	0.58
1970	766	269	219	0.56
1971	903	262	315	0.67
1972	174	228	341	0.84
1973	307	209	228	0.71
1974	253	218	202	0.68
1975	461	197	185	0.71
1976	208	167	209	0.71
1977	770	148	182	0.71
1978	451	149	263	0.81
1979	476	151	249	0.69
1980	851	164	265	0.79
1981	288	167	301	0.77
1982	594	173	273	0.90
1983	285	145	234	0.91
1984	566	123	205	0.86
1985	110	111	193	0.83
1986	601	98	163	0.87
1987	244	89	175	0.91
1988	150	85	150	0.89
1989	242	76	116	0.99
1990	112	64	105	0.71
1991	143	62	89	0.92
1992	300	61	97	0.84
1993	165	57	105	0.94
Average	381	162	200	0.74

Table 3.5.4 Nominal catch (in tonnes) of HADDOCK in Sub-area IV, 1983-1993, as officially reported to ICES.

Country	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992 <sup>1</sup>	1993 <sup>1</sup>
Belgium	985	494	719	317	165	220	145	192	168	415	292
Denmark	25,653	16,368	23,821	16,397	7,767	9,174	2,789	1,993	1,330	1,476	3,582
Faroe Islands	51	-	5	4	23	35	16	6	15	13	25
France	11,250	8,103	5,389	4,802	3,889	2,193	1,702 <sup>1,3</sup>	1,115 <sup>1,3</sup>	631 <sup>1,3</sup>	508 <sup>3</sup>	1,215 <sup>3</sup>
Germany, Fed. Rep.	3,654	2,571	2,796	1,984	1,231	802	447	749	535	764	347
Netherlands	1,722	1,052	3,875	1,627	1,093	894	328	102	100	148	192
Norway <sup>2</sup>	3,862	3,959	3,498	5,190	2,610	1,590	1,697 <sup>1</sup>	1,572	2,069	3,133	2,651
Poland	150	17	-	1	-	-	-	-	-	-	-
Sweden	1,360	1,518	1,942	1,550	937	614	1,051	900	957	1,289	908
UK (Engl. & Wales)	15,476	12,340	13,614	8,137	7,491	5,537	2,704	2,093	2,154	3,228	4,241
UK (Isle of Man)	-	-	-	-	-	-	-	-	-	11	-
UK (N. Ireland)	-	-	-	-	-	-	137	11	48	73	18
UK (Scotland)	100,390	87,479	112,549	126,650	84,063	84,104	53,252	34,459	36,443	39,512	66,732
Total	164,553	133,901	168,208	166,659	109,269	105,163	64,268	43,192	44,450	50,570	80,203
WG estimates human consumption landings	159,000	128,000	159,000	166,000	108,000	105,000	76,000	51,000	45,000	70,000	80,000
Unallocated landings	-5,553	-5,901	-9,208	-659	-1,269	-163	11,732	7,808	550	19,430	-203

<sup>1</sup>Preliminary.<sup>2</sup>Figures do not include haddock caught as industrial by-catch.<sup>3</sup>Includes Division IIa (EC).

n/a = Not available.

**Table 3.5.5** Haddock in North Sea. Weights in '000 t and numbers in millions.

Year	Recruitment	Spawning Stock	Landings		Discards	Fishing Mortality	Fishing Mortality
	Age 0	Biomass	HC	IB		HC + D (2-6)	Ind Byc (0-3)
1963	2	136	68	14	189	0.71	0.05
1964	6	412	131	89	160	0.81	0.11
1965	20	525	162	75	62	0.75	0.18
1966	71	443	226	47	74	0.84	0.13
1967	358	229	147	21	78	0.82	0.09
1968	14	256	105	34	162	0.57	0.07
1969	10	765	331	338	260	0.98	0.18
1970	83	824	525	180	101	0.96	0.12
1971	78	417	235	32	177	0.74	0.06
1972	21	304	193	30	128	1.04	0.05
1973	72	303	179	11	115	0.91	0.03
1974	132	261	150	48	167	0.79	0.10
1975	11	239	147	41	260	0.98	0.09
1976	16	304	166	48	154	0.98	0.12
1977	25	234	137	35	44	0.95	0.17
1978	39	128	86	11	77	1.08	0.06
1979	71	104	83	16	42	1.03	0.06
1980	15	147	99	22	95	0.92	0.09
1981	32	234	130	17	60	0.72	0.06
1982	20	292	166	19	41	0.66	0.07
1983	65	246	159	13	66	0.95	0.05
1984	17	192	128	10	75	1.00	0.03
1985	24	230	159	6	86	0.94	0.02
1986	49	213	166	3	52	1.06	0.02
1987	4	151	108	4	59	1.01	0.02
1988	8	154	105	4	62	1.03	0.02
1989	8	121	76	2	27	0.94	0.02
1990	27	68	51	3	32	0.83	0.02
1991	29	61	45	5	40	0.79	0.02
1992	51	99	70	11	48	1.06	0.03
1993	12	130	80	11	80	1.00	0.03
<b>Average</b>	<b>45</b>	<b>265</b>	<b>149</b>	<b>39</b>	<b>99</b>	<b>0.90</b>	<b>0.07</b>

**Landings**

HC = Human Consumption

IB = Industrial bycatch

DIS = Discards

**Fishing Mortality**

HC + D = Human Consumption and Discards Ages 2-6

Ind Byc = Industrial bycatch Ages 0-3

Table 3.5.6 Nominal catch (in tonnes) of WHITING in Sub-area IV, 1982-1993, as officially reported to ICES.

Country	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992 <sup>1</sup>	1993 <sup>1</sup>
Belgium	2,272	2,864	2,798	2,177	2,275	1,404	1,984	1,271	1,040	913	1,030	944
Denmark	27,043	18,054	19,771	16,152	9,076	2,047	12,112	803	1,207	1,529	1,377	1,418
Faroe Islands	57	18	-	6	-	12	222	1	26	-	16	7
France	23,780	21,263	19,209	10,853	8,250	10,493	10,569	5,277 <sup>1,2</sup>	4,951 <sup>1</sup>	5,188 <sup>1,2</sup>	5,115 <sup>1</sup>	5,503 <sup>1,2</sup>
Germany, Fed.Rep.	223	317	286	226	313	274	454	415	692	865	511	441 <sup>1</sup>
Netherlands	12,218	10,935	8,767	6,973	13,741	8,542	5,087 <sup>3</sup>	3,860	3,272 <sup>1</sup>	4,028 <sup>1</sup>	5,390	4,799
Norway	17	39	88	103	103	74	52	32	55	103	223	125 <sup>1</sup>
Poland	-	1	2	-	-	-	-	-	-	-	-	-
Sweden	11	44	53	22	33	17	5	17	16	48	22	18
UK (Engl.& Wales)	4,743	4,366	5,017	5,024	3,805	4,485	4,007	1,896	2,124	2,423	2,691	2,769
UK (Isle of Man)	-	-	-	-	-	-	-	-	-	-	6	-
UK (N. Ireland)	-	-	-	-	-	-	1	61	30	47	9	3
UK (Scotland)	29,640	41,248	42,967	30,398	29,113	37,630	31,804	26,491	27,632	30,452	30,643	31,254
Total	100,004	99,149	99,958	71,934	66,709	64,978	66,294	40,124	41,046	46,596	47,033	47,281
Total h,c, catch used by Working Group	73,000	81,000	79,000	55,000	59,000	64,000	52,000	41,000	43,000	47,000	46,000	48,000

<sup>1</sup>Preliminary.<sup>2</sup>Includes Division IIa (EC).

n/a = Not available.

**Table 3.5.7** Whiting in Sub-area IV (North Sea). Weights in '000 t and numbers in billions.

Year	Recruitment	Spawning Stock	Landings	Landings	Disc	Fishing Mortality	Fishing Mortality
	Age 0	Biomass	HC	Ind Byc		Total HC + D (2-6)	Ind Byc (0-4)
1960	42	322	48	11	122	1.49	0.01
1961	76	381	68	16	241	1.38	0.02
1962	85	285	56	8	157	1.24	0.01
1963	18	465	58	45	154	0.92	0.05
1964	36	519	60	28	59	0.65	0.04
1965	31	457	86	22	77	0.61	0.03
1966	59	393	105	51	84	1.10	0.13
1967	114	309	68	23	143	0.82	0.03
1968	14	433	88	58	115	0.95	0.07
1969	26	599	57	152	115	0.59	0.28
1970	42	362	79	115	74	0.80	0.21
1971	73	231	58	72	63	0.48	0.07
1972	96	290	60	61	67	0.78	0.11
1973	47	400	66	90	110	0.84	0.16
1974	97	459	75	130	85	0.72	0.30
1975	60	476	79	86	135	1.07	0.14
1976	59	606	75	150	136	0.81	0.27
1977	60	438	73	106	163	0.67	0.22
1978	62	422	88	55	35	0.69	0.10
1979	57	483	98	59	78	0.66	0.10
1980	22	497	92	46	77	0.87	0.09
1981	26	466	81	67	36	0.73	0.17
1982	22	360	73	33	27	0.60	0.10
1983	36	324	81	24	50	0.71	0.07
1984	25	264	79	19	41	0.87	0.08
1985	54	262	55	15	29	0.81	0.05
1986	43	281	59	18	79	0.85	0.12
1987	29	291	64	16	54	1.09	0.07
1988	56	286	52	49	28	0.81	0.16
1989	26	271	41	43	36	0.77	0.16
1990	27	301	43	51	55	0.74	0.19
1991	35	259	47	38	34	0.64	0.11
1992	35	267	46	27	31	0.64	0.07
1993	39	284	48	20	43	0.68	0.06
<b>Average</b>	48	375	68	53	83	0.82	0.11

**Landings**

HC = Human Consumption

Ind Byc = Industrial bycatch

Disc = Discards

**Fishing Mortality**

Total HC+D = Human Consumption and Discards ages 2-6

Ind Byc = Industrial bycatch ages 0-4

Table 3.5.8 Nominal catch (in tonnes) of Saithe in Sub-area IV and Division IIIa, 1983-1993, as officially reported to ICES.

Country	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Belgium	7	32	31	16	4	60	13	23	29	70	113
Denmark	10,530	8,526	9,033	10,343	7,928	6,868	6,550	5,800	6,314	4,669	4,232
Faroe Islands	806	-	895	224	691	276	739	1,650	671	2,480	2,875
France	38,782	43,592	42,200	43,958	38,356	28,913	30,761 <sup>1,2</sup>	29,892 <sup>1,2</sup>	14,795 <sup>1,2</sup>	9,061 <sup>1</sup>	22,615 <sup>1,2</sup>
Germany	13,649	25,262	22,551	22,277	22,400	18,528	14,339	15,006	19,574	13,177	14,813 <sup>1</sup>
Netherlands	89	181	233	134	334	345	257	206	199	180	79
Norway	81,330	88,420	101,808	67,341	66,400	40,021	24,737	19,122	36,240	50,065	48,725 <sup>1</sup>
Poland	415	413	-	495	832	1,016	809	1,244	1,336	1,238	937 <sup>1</sup>
Sweden	548	522	1,764	1,987	1,732	2,064	797	838	1,514	3,302	4,955
UK (Engl. & Wales)	6,845	8,183	5,455	4,480	3,233	3,790	4,441	3,654	4,709	3,158	2,426
UK (N. Ireland)	-	-	-	-	-	-	24	-	-	2	3
UK (Scotland)	6,321	6,970	9,932	15,520	11,911	10,850	8,726	7,383	7,962	6,593	5,913
USSR	-	-	-	-	-	-	-	-	116 <sup>3</sup>	-	-
Total reported to ICES	159,322	182,101	193,902	166,775	153,821	112,731	92,193	84,818	93,459	93,995	107,704
Unreported landings	9,562	15,900	5,839	-2,459	-4,627	-7,630	-200	3,257	5,464	-1,489	-2,958
Landings as used by W G	168,884	198,001	199,741	164,297	149,194	105,101	91,993	88,075	98,923	92,506	104,746

<sup>1</sup>Preliminary.<sup>2</sup>Includes IIa(EC), IIIa-d(EC).<sup>3</sup>Includes Estonia.

n/a = not available.

**Table 3.5.9** Saithe in Sub-area IV and Division IIIa (North Sea). Weights in '000 t and numbers in millions.

Year	Recruitment	Spawning Stock	Landings		Fishing Mortality	Fishing Mortality
	Age 1	Biomass	Human Consumption	Industrial By-catch	HC (3-6)	Ind Byc (2-5)
1970	237	276	163	59	0.37	0.08
1971	231	432	218	35	0.30	0.05
1972	242	450	218	28	0.36	0.05
1973	267	485	195	31	0.33	0.10
1974	542	456	231	42	0.43	0.16
1975	188	369	240	38	0.41	0.12
1976	141	277	253	67	0.72	0.02
1977	127	226	190	6	0.63	0.02
1978	104	194	132	3	0.47	0.01
1979	269	189	113	2	0.40	0.01
1980	165	183	120	0	0.46	0.00
1981	197	192	121	1	0.31	0.00
1982	326	160	161	5	0.49	0.02
1983	474	169	167	1	0.61	0.01
1984	394	137	192	6	0.75	0.02
1985	158	107	192	8	0.81	0.04
1986	185	98	163	1	0.92	0.01
1987	95	101	145	4	0.67	0.02
1988	167	109	104	1	0.65	0.00
1989	203	90	90	2	0.69	0.02
1990	128	81	86	2	0.51	0.03
1991	198	82	98	1	0.55	0.01
1992	159	91	92	0	0.61	0.00
1993		105	104	1	0.48	0.01
Average	226	211	158	14	0.54	0.78

**Fishing Mortality**

HC = Human Consumption Ages 3-6

Ind Byc = Industrial bycatch Ages 2-5

Table 3.5.10 North Sea PLAICE. Nominal landings (tonnes) in Sub-area IV as officially reported to ICES, 1983-1993.

Country	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Belgium	8,916	10,220	9,965	7,232	8,554	11,527	10,939	13,940	14,328	12,006	10,814
Denmark	19,114	23,361	28,236	26,332	21,597	20,259	23,481	26,474	24,356	20,891	16,452
Faroe Islands	-	-	-	-	-	43	-	-	-	-	-
France	1,185	1,145	1,010	751	1,580	1,773	2,037 <sup>1</sup>	1,339	508 <sup>1</sup>	537 <sup>1</sup>	593 <sup>1</sup>
Germany	2,397	2,485	2,197	1,809	1,794	2,566	5,341	8,747	7,926	6,818	6,896 <sup>1</sup>
Netherlands	53,608	61,478	90,950	74,447	76,612	77,724	84,173	78,204	67,945	51,064	48,552
Norway	17	17	23	21	12	21	321	1,756	560	843 <sup>1</sup>	753
Sweden	22	14	18	16	7	2	12	169	103	53	7
UK (Engl. & Wales)	13,248	12,988	11,335	12,428	14,891	17,613	19,735	17,563	17,672	20,191	19,238
UK (N.Ireland)	-	-	-	-	-	-	540	176	992	1,268	1,384
UK (Scotland)	4,159	4,195	4,577	4,866	5,747	6,884	5,516	6,789	9,047	9,743	10,541
UK (Isle of Man)	-	-	-	-	-	-	-	-	-	64	-
Total reported	102,666	115,903	148,311	127,902	130,794	138,412	152,095	155,157	143,437	123,478	115,230
Unreported landings <sup>2</sup>	41,369	40,244	11,526	37,445	22,876	16,063	17,548	1,050	4,041	1,234	-5,279
Landings as used by WG	144,035	156,147	159,837	165,347	153,670	154,475	169,643	156,207	147,478	124,712	109,951

<sup>1</sup>Provisional.<sup>2</sup>Estimated by the Working Group.



**Table 3.5.11** North Sea Plaice. Weights in '000 t and numbers in millions.

Year	Recruitment	Landings	Spawning Stock	Fishing Mortality
	Age 1		Biomass	Age 2-10
1957	296.17	70.56	354.63	0.20
1958	429.99	73.35	340.64	0.21
1959	433.45	79.30	345.19	0.23
1960	405.34	87.54	368.32	0.25
1961	359.40	85.98	352.89	0.23
1962	318.82	87.47	446.58	0.23
1963	315.19	107.12	439.99	0.26
1964	1021.97	110.54	422.96	0.27
1965	309.59	97.14	414.38	0.28
1966	305.42	101.83	416.42	0.26
1967	277.26	108.82	493.06	0.24
1968	245.56	111.53	456.16	0.22
1969	327.53	121.65	418.35	0.25
1970	370.50	130.34	399.66	0.33
1971	275.69	113.94	372.46	0.32
1972	234.71	122.84	375.96	0.34
1973	542.18	130.43	334.90	0.38
1974	451.69	112.54	309.06	0.39
1975	336.92	108.54	320.30	0.37
1976	325.85	113.67	314.93	0.31
1977	472.65	119.19	329.79	0.33
1978	431.82	113.98	323.51	0.33
1979	445.27	145.35	310.67	0.46
1980	661.10	139.95	296.81	0.40
1981	425.69	139.75	307.46	0.40
1982	1028.42	154.55	300.42	0.44
1983	592.38	144.04	324.19	0.42
1984	610.64	156.15	325.56	0.38
1985	534.05	159.84	358.07	0.38
1986	1269.11	165.35	359.81	0.44
1987	538.05	153.67	389.86	0.44
1988	555.08	154.48	373.34	0.42
1989	380.91	169.64	414.18	0.39
1990	391.29	156.21	385.10	0.37
1991	452.78	147.48	325.23	0.46
1992	476.30	124.71	308.11	0.47
1993	367.68	109.95	270.69	0.46
<b>Average</b>	465.31	122.42	362.15	0.34

Table 3.5.12 Nominal catch (tonnes) of SOLE in Sub-area IV and landings as estimated by the Working Group, 1982-1993

Year	Belgium	Denmark	France	Germany Fed. Rep.	Netherlands	UK (Engl. & Wales)	Other countries	Total reported	Unreported landings	Grand Total
1982	1,927	522	686	290	17,749	403		21,577	2	21,579
1983	1,740	730	332	619	16,101	435		19,957	4,970	24,927
1984	1,771	818	400	1,034	14,330	586	1	18,940	7,899	26,839
1985	2,390	692	875	303	14,897	774	3	19,934	4,313	24,247
1986	1,833	443	296	155	9,558	647	2	12,934	5,267	18,201
1987	1,644	342	318	210	10,635	676	4	13,829	3,539	17,368
1988	1,199	616	487	452	9,841	740	28	13,363	8,227	21,590
1989	1,596	1,020	312	864	9,620	966	65	14,443	7,378	21,821
1990	2,389	1,428	352	2,296	18,202	1,484	276	26,427	8,706	35,133
1991	2,977	1,307	465	2,107	18,758	1,605	361	27,580	5,955	33,535
1992	2,058	1,359	548	1,880	18,601	1,237	321	26,004	3,345	29,349
1993	2,783	1,661	484	1,378	22,015	688	60	29,069	2,101	31,170

all landings reported to ICES  
 unreported landings estimated by the Working Group  
 1993 data are provisional  
 No data on discards available

**Table 3.5.13** North Sea Sole. Weights in '000 t and numbers in millions,

Year	Recruitment Age 1	Spawning Stock Biomass	Landings	Fishing Mortality Age 2-8
1957	166	79	12	0.14
1958	145	86	14	0.16
1959	559	93	14	0.13
1960	67	101	19	0.17
1961	116	149	24	0.16
1962	28	149	27	0.18
1963	23	148	26	0.26
1964	554	54	11	0.23
1965	121	49	17	0.25
1966	41	105	33	0.24
1967	75	101	33	0.31
1968	100	89	33	0.37
1969	51	70	28	0.42
1970	141	63	20	0.35
1971	42	52	24	0.44
1972	77	56	21	0.39
1973	106	42	19	0.45
1974	111	42	18	0.46
1975	42	43	21	0.46
1976	114	43	17	0.40
1977	141	36	18	0.38
1978	47	39	20	0.49
1979	12	46	23	0.46
1980	155	36	16	0.44
1981	150	25	15	0.45
1982	153	35	22	0.50
1983	144	42	25	0.47
1984	72	45	27	0.55
1985	82	43	24	0.51
1986	162	36	18	0.50
1987	74	31	17	0.43
1988	474	42	22	0.50
1989	122	36	22	0.39
1990	185	96	35	0.43
1991	55	85	34	0.45
1992	326	87	29	0.41
1993	71	61	31	0.46
Average	138	66	22	0.37

Table 3.6.1 COD in Division VIId.  
Nominal landings (tonnes) as officially reported to  
ICES, 1982 to 1993.

Year	Belgium	France	Denmark	Netherlands	UK (E+W)	UK (S)	Total	Unreported landings	Total as used by Working Group
1982	251	2696	-	1	306	-	3254	726	3980
1983	368	2802	-	4	358	-	3532	308	3840
1984	331	2492	-	-	282	-	3105	415	3520
1985	501	2589	-	-	326	-	3416	-86	3330
1986	650	9938	4	-	830	-	11422	1398	12820
1987	815	7541	-	-	1044	-	9400	4820	14220
1988	486	8795	+	1	867	-	10149	-789	9360
1989	173	n/a	+	1	562	-	n/a	-	5540
1990	237	n/a	-	-	420	7	n/a	-	2730
1991	182	n/a	-	-*	340	2	n/a	-	1920
1992	187	2079*	1	2	441	22	2733	-	2680
1993*	157	n/a	-	-	530	2	n/a	-	2430

\* Preliminary

Table 3.6.2 WHITING in Division VIId.  
Nominal landings (tonnes) as officially reported to  
ICES, 1982 to 1993.

Year	Belgium	France	Netherlands	UK (E+W)	UK (S)	Total	Unreported landings	Total as used by Working Group
1982	93	7012	2	170	-	7277	633	7910
1983	84	5057	1	198	-	5340	1600	6940
1984	79	6914	-	88	-	7081	289	7370
1985	82	7563	-	186	-	7831	-491	7340
1986	65	4551	-	180	-	4796	704	5500
1987	136	6730	-	287	-	7153	-2463	4690
1988	69	7501	-	251	-	7821	-3391	4430
1989	38	n/a	-	231	-	n/a	-	4160
1990	83	n/a	-	237	1	n/a	-	3480
1991	83	n/a	-	292	1	n/a	-	5780
1992	66	5414*	-	417	24	5921	-	5760
1993*	74	n/a	-	321	2	n/a	-	5070

\* Preliminary

Table 3.6.3

Year	Recruitment Age 1	SSB	Landings	Fishing Mortality Age 2-4
1976	99	19	8	0.579
1977	67	21	5	0.26
1978	65	26	9	0.401
1979	38	26	9	0.387
1980	49	22	9	0.508
1981	37	17	9	0.737
1982	52	12	8	0.732
1983	63	11	7	0.758
1984	61	11	7	0.807
1985	10	12	7	0.721
1986	20	9	6	1.153
1987	47	6	5	1074
1988	28	7	4	1
1989	32	8	4	0.521
1990	32	9	3	0.371
1991	59	9	6	0.703
1992	31	10	6	0.46
1993	22	9	5	0.668
Average	45.11111	13.55556	6.5	0.657778

Table 3.6.4 SOLE in Division VIII. Nominal landings (tonnes) as officially reported to ICES, 1974-1993.

Year	Belgium	France	UK (E+W)	Others	Total reported	Unreported <sup>1</sup>	Total as used by WG
1974	159	469	309	3	940	-	940
1975	132	464	244	1	841	52	893
1976	203	599	404	-	1,206	90	1,296
1977	225	737	315	-	1,277	69	1,346
1978	241	782	366	-	1,389	75	1,464
1979	311	1,129	402	-	1,842	83	1,925
1980	302	1,075	159	-	1,536	183	1,719
1981	464	1,513	160	-	2,137	120	2,257
1982	525	1,828	317	4	2,674	145	2,819
1983	502	1,120	419	-	2,041	1,131	3,172
1984	592	1,309	505	-	2,406	880	3,286
1985	568	2,545	520	-	3,633	237	3,870
1986	858	1,528	551	-	2,937	991	3,928
1987	1,100	2,086	655	-	3,841	1,026	4,867
1988	667	2,057	578	-	3,302	644	3,946
1989	646	1,610 <sup>2</sup>	689	-	2,945	1,212	4,157
1990	996	1,255 <sup>2</sup>	742	-	2,993	964	3,957
1991	904	2,054 <sup>2</sup>	825	-	3,783	513	4,296
1992 <sup>2</sup>	891	2,187 <sup>2</sup>	706	10	3,794	267	4,061
1993 <sup>2</sup>	917	1,907 <sup>2</sup>	610	13	3,447	976	4,423

<sup>1</sup>Estimated by the Working Group.<sup>2</sup>Provisional.

**Table 3.6.5** Sole in Division VIId. Weights in '000 t and numbers in millions.

Year	Recruitment	Spawning Stock		Fishing Mortality
	Age 1	Biomass	Landings	Age 3-8
1980	27.87	6.07	1.72	0.33
1981	17.98	6.45	2.26	0.36
1982	12.92	7.37	2.75	0.40
1983	21.83	9.07	3.12	0.44
1984	22.07	8.60	3.25	0.44
1985	13.22	9.68	3.84	0.33
1986	26.61	10.36	3.98	0.40
1987	11.15	9.51	4.97	0.62
1988	25.31	9.70	3.98	0.44
1989	15.29	7.37	4.19	0.61
1990	41.77	8.05	4.02	0.45
1991	26.85	6.52	4.30	0.52
1992	28.13	8.09	4.06	0.48
1993	12.20	9.56	4.42	0.46
<b>Average</b>	<b>21.66</b>	<b>8.31</b>	<b>3.63</b>	<b>0.45</b>

**Table 3.6.6** PLAICE in Division VIId. Nominal landings (tonnes) as officially reported to ICES, 1976-1993.

Year	Belgium	Denmark	France	UK (E+W)	Others	Total reported	Un- reported <sup>1</sup>	Total as used by WG
1976	147	1 <sup>1</sup>	1,439	376	-	1,963	-	1,963
1977	149	81 <sup>2</sup>	1,714	302	-	2,246	-	2,246
1978	161	156 <sup>2</sup>	1,810	349	-	2,476	-	2,476
1979	217	28 <sup>2</sup>	2,094	278	-	2,617	-	2,617
1980	435	112 <sup>2</sup>	2,905	304	-	3,756	-1106	2,650
1981	815	-	3,431	489	-	4,735	34	4,769
1982	738	-	3,504	541	22	4,805	60	4,865
1983	1,013	-	3,119	548	-	4,680	363	5,043
1984	947	-	2,844	640	-	4,431	730	5,161
1985	1,148	-	3,943	866	-	5,957	65	6,022
1986	1,158	-	3,288	828	488 <sup>2</sup>	5,762	1,072	6,834
1987	1,807	-	4,768	1,292	-	7,867	499	8,366
1988	2,165	-	5,688 <sup>2</sup>	1,250	-	9,103	1,317	10,420
1989	2,019	+	3,265 <sup>1</sup>	1,382	-	6,666	2,092	8,758
1990	2,149	-	4,170	1,404	-	7,725	1,322	9,047
1991	2,265	-	3,606 <sup>1</sup>	1,565	-	7,436	377	7,813
1992 <sup>3</sup>	1,560	1	2,762 <sup>1</sup>	1,541	1	5,865	472	6,337
1993 <sup>3</sup>	0,877	+ <sup>2</sup>	2,408 <sup>1</sup>	1,075	27	4,387	944	5,331

<sup>1</sup>Estimated by the Working Group.

<sup>2</sup>Includes Division VIIe.

<sup>3</sup>Provisional.

**Table 3.6.7** Plaice in Division VIId. Weights in '000 t and numbers in millions.

Year	Recruitment	Spawning Stock	Landings	Fishing Mortality
	Age 1	Biomass		Age 2-6
1980	27.33	5.83	2.65	0.35
1981	13.90	6.78	4.77	0.46
1982	27.00	7.82	4.87	0.48
1983	21.48	8.39	5.04	0.49
1984	26.59	7.72	5.16	0.57
1985	31.79	8.45	6.02	0.49
1986	63.94	10.48	6.83	0.53
1987	33.37	13.94	8.37	0.45
1988	28.01	13.60	10.42	0.49
1989	16.71	14.71	8.76	0.54
1990	18.71	13.79	9.05	0.57
1991	20.10	10.37	7.81	0.71
1992	33.50	7.76	6.34	0.66
1993	19.66	7.67	5.33	0.48
<b>Average</b>	<b>27.29</b>	<b>9.81</b>	<b>6.53</b>	<b>0.52</b>

**Table 3.7.1** Nominal catch (in tonnes) of COD in Division VIa, 1980-1993, as officially reported to ICES.

Country	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989 <sup>3</sup>	1990 <sup>3</sup>	1991 <sup>3</sup>	1992 <sup>1,5</sup>	1993 <sup>1</sup>
Belgium	57	30	35	21	22	48	88	33	44	28	-	6	1	22
Denmark	27 <sup>2</sup>	-	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 <sup>1,4,3</sup>	2,220 <sup>1,4</sup>	2,503 <sup>1,4</sup>	1,962 <sup>1,5</sup>	4,022 <sup>1,4</sup>
Germany, Fed. Rep.	1	21	8	205	75	66	53	12	25	281	586	60 <sup>2</sup>	16 <sup>2</sup>	93
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	641 <sup>1,3</sup>
Netherlands	1	-	-	-	-	1	-	-	-	-	-	-	-	-
Norway	48	40	238	267	231	204	174	77	186	207	150	40 <sup>1</sup>	166 <sup>1</sup>	2
Spain	-	-	41	52	64	28	-	-	-	-	-	-	-	-
Sweden	-	-	1	-	-	-	-	-	-	-	-	-	-	-
UK (Engl. & Wales)	2,302	3,187 <sup>3</sup>	2,948	1,141	692	243	106	306	184	439	379	388	281	84
UK (Isle of Man)	-	-	-	-	-	-	-	-	-	3	-	6	-	-
UK (N. Ireland)	2	7	33	37	32	17	54	138	46	129	93	384	436 <sup>5</sup>	351
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 <sup>5</sup>	6,004
<b>Total</b>	<b>17,870</b>	<b>23,950</b>	<b>21,965</b>	<b>21,491</b>	<b>20,552</b>	<b>18,614</b>	<b>11,526</b>	<b>19,199</b>	<b>19,182</b>	<b>15,340</b>	<b>11,781</b>	<b>10,630</b>	<b>9,017</b>	<b>11,221<sup>1</sup></b>
<b>Unallocated</b>	<b>+9</b>	<b>-85</b>	<b>-455</b>	<b>-186</b>	<b>+719</b>	<b>+444</b>	<b>+294</b>	<b>-224</b>	<b>+1,447</b>	<b>+1,831</b>	<b>+395</b>	<b>+296</b>	<b>+69</b>	<b>-966</b>
<b>WG Estimate</b>	<b>17,879</b>	<b>23,865</b>	<b>21,510</b>	<b>21,305</b>	<b>21,271</b>	<b>18,608</b>	<b>11,820</b>	<b>18,975</b>	<b>20,413</b>	<b>17,171</b>	<b>12,176</b>	<b>10,926<sup>6</sup></b>	<b>9,086</b>	<b>10,255</b>

<sup>1</sup>Preliminary.

<sup>2</sup>Includes Division VIb.

<sup>3</sup>Including 37 t caught in Sub-area VI.

<sup>4</sup>Includes Divisions Vb(EC) and VIb.

<sup>5</sup>Revised.



**Table 3.7.2** Cod in Division VIa (West of Scotland). Weights in '000 t and numbers in millions.

Year	Recruitment	Spawning Stock		Fishing Mortality
	Age 1	Biomass	Landings	Age 2-5
1966	16	46	17	0.44
1967	7	54	23	0.51
1968	10	56	24	0.51
1969	4	45	22	0.65
1970	8	33	13	0.50
1971	11	29	11	0.45
1972	6	31	15	0.58
1973	9	30	12	0.50
1974	9	29	14	0.58
1975	12	30	13	0.51
1976	7	32	17	0.67
1977	10	25	13	0.60
1978	10	28	14	0.58
1979	15	28	16	0.83
1980	21	32	18	0.81
1981	6	40	24	0.69
1982	15	38	22	0.69
1983	9	34	21	0.76
1984	15	32	21	0.87
1985	6	25	19	0.98
1986	13	19	12	0.79
1987	29	21	19	0.96
1988	4	27	20	0.88
1989	13	23	17	0.96
1990	4	19	12	0.77
1991	7	16	11	0.87
1992	13	14	9	0.84
1993	3	16	10	0.71
<b>Average</b>	<b>10</b>	<b>30</b>	<b>16</b>	<b>0.70</b>

**Table 3.7.3** Nominal catch (in tonnes) of COD in Division VIb, 1982-1993, as officially reported to ICES.

Country	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993 <sup>1</sup>
Faroe Islands	77	112	18	-	1	-	31	-	-	-	-	-
France	27	97	9	17	5	7	2	... <sup>2</sup>	... <sup>2</sup>	... <sup>2</sup>	... <sup>2</sup>	... <sup>2</sup>
Germany, Fed.Rep.	+	195	-	3	-	-	3	+	-	126	... <sup>2</sup>	-
Ireland							-	-	400	236	235	472
Norway	51	462	373	202	95	130	195	148	119	303	199 <sup>1</sup>	73
Spain	58	42	241	1,200	1,219	808	1,345	n/a	n/a	n/a	n/a	n/a
UK (England & Wales)	3	163	161	114	93	69	56	130	25	40	75	60
UK (Isle of Man)	-	-	-	-	-	-	-	1	-	-	-	-
UK (N. Ireland)	-	-	-	-	1	-	-	3	2	2	7	3
UK (Scotland)	157	35	221	437	187	284	254	262	739	809	659	321
<b>Total</b>	<b>373</b>	<b>1,106</b>	<b>1,023</b>	<b>1,973</b>	<b>1,601</b>	<b>1,298</b>	<b>1,886</b>	<b>n/a</b>	<b>n/a</b>	<b>n/a</b>	<b>n/a</b>	<b>n/a</b>

<sup>1</sup>Preliminary.

<sup>2</sup>Included in Division VIa.

n/a = Not available.

Table 3.7.4 Nominal catch (tonnes) of HADDOCK in Divisions VIa, 1981-1993, as officially reported to ICES.

Country	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993 <sup>1</sup>
Belgium	1	2	1	6	7	-	29	8	9	-	9	1	4
Denmark	-	+	-	-	-	-	4	+	+	+	+	1	1
Faroe Islands	-	-	-	-	-	1	-	-	13	-	1	-	-
France	3,403	3,760	4,520	4,240	5,930	4,956	5,456	3,001	1,335 <sup>1,2</sup>	863 <sup>1,2</sup>	761 <sup>1,2</sup>	762 <sup>1</sup>	1,465 <sup>2</sup>
Germany, Fed. Rep.	7	71	65	83	38	25	21	4	4	15	1	2	9
Ireland	1,891	4,402	3,450	3,932	3,512	2,026	2,628	2,731	2,171	773	710	700	960 <sup>4</sup>
Netherlands	3	391	25	-	-	-	-	-	-	-	-	-	-
Norway	29	37	68	33	76	45	13	54	74	38	12	71 <sup>1</sup>	40
Spain	-	97	201	129	166	-	-	-	n/a	n/a	n/a	n/a	n/a
UK (England & Wales)	1,052	2,035	1,376	1,042	348	222	425	114	476	271	151	142	28
UK (Isle of Man)	-	-	-	-	-	-	-	-	4	-	-	+	-
UK (N. Ireland)	-	1	4	5	155	155	1	35	73	56	78	54	71
UK (Scotland)	12,051	19,249	21,593	18,472	15,036	12,955	18,503	15,151	19,651	10,803	8,341	5,200	10,302
Total	18,437	30,045	31,302	27,942	25,114	20,385	27,080	21,098	3	3	3	3	3
Discards	15,088	10,068	6,840	16,435	17,452	7,532	16,218	8,960	3,178	5,406	9,192	5,698	11,153
Unallocated landings	-219	-432	-1,856	1,987	-730	-991	-76	-2,010					
Total as used by WG	33,306	39,681	36,287	46,364	41,836	26,926	43,222	28,048	19,871	15,542	19,752	12,581	23,733

<sup>1</sup>Preliminary.<sup>2</sup>Includes Divisions Vb(EC) and Vlb.<sup>3</sup>Incomplete official figures.<sup>4</sup>Includes 22 tonnes reported as Sub-area VI.

n/a = Not available.

**Table 3.7.5** Haddock in Division VIa (West of Scotland).  
Weights in '000 t and numbers in millions.

Year	Recruitment	Spawning Stock		Fishing Mortality
	Age 0	Biomass	Landings	Age 2-6
1965	46	107	36	0.85
1966	128	80	31	0.59
1967	1,249	49	28	0.60
1968	20	38	46	0.79
1969	25	117	51	0.89
1970	322	163	40	0.68
1971	101	148	58	0.56
1972	114	101	57	0.97
1973	231	60	40	0.76
1974	615	37	33	0.79
1975	52	31	47	0.73
1976	33	54	34	0.68
1977	79	55	24	0.63
1978	220	35	20	0.68
1979	552	27	29	0.72
1980	48	32	17	0.59
1981	100	81	33	0.40
1982	55	104	40	0.48
1983	463	90	36	0.48
1984	87	66	46	0.73
1985	66	70	42	0.67
1986	317	63	27	0.44
1987	26	51	43	0.88
1988	28	45	28	0.70
1989	122	38	20	0.82
1990	122	22	16	0.73
1991	205	19	20	0.83
1992	117	22	13	0.44
1993	75	38	24	0.66
<b>Average</b>	194	64	34	0.68

**Table 3.7.6** Nominal catch (tonnes) of HADDOCK in Divisions VIb, 1981-1993, as officially reported to ICES.

Country	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Faroe Islands	1	21	3	3	1	-	-	5	-	-	-	-	-
France	10	32	48	12	116	103	99	5	... <sup>2</sup>	... <sup>2</sup>	... <sup>2</sup>	... <sup>2</sup>	..
Germany, Fed. Rep.	-	4	1	-	4	-	-	4	1	-	-	... <sup>2</sup>	-
Ireland	-	-	-	-	-	-	-	-	-	620	640	571	69
Norway	10	3	20	45	31	83	33	20	47	38	65	47	7
Spain	88	121	79	128	892	756	371	245	n/a	n/a	n/a	n/a	n/a
UK (England & Wales)	9,005	3,736	113	788	1,876	703	1,271	753	1,007	568	368	271	24
UK (Isle of Man)	-	-	-	-	-	-	-	-	+	-	-	n/a	-
UK (N. Ireland)	-	-	-	-	-	157	-	-	8	6	11	14	3
UK (Scotland)	27	5	136	1,654	6,397	2,961	6,221	6,542	5,210	6,797	4,578	3,777	3,04
<b>Total</b>	<b>9,141</b>	<b>3,992</b>	<b>400</b>	<b>2,630</b>	<b>9,317</b>	<b>4,763</b>	<b>7,995</b>	<b>7,574</b>	<b>n/a</b>	<b>n/a</b>	<b>n/a</b>	<b>n/a</b>	<b>n/a</b>
Working Group estimate	-	-	-	-	9,810	5,014	8,432	7,929	6,728	3,884	5,655	5,319	4,78
Unallocated catch	-	-	-	-	493	251	437	355	n/a	n/a	n/a	n/a	n/a

<sup>1</sup>Preliminary.<sup>2</sup>Included in Division VIa.

n/a = Not available.

**Table 3.7.7** Haddock in Division VIb (Rockall).

Weights in '000 t and numbers in millions.

Year	Recruitment	Spawning Stock		Fishing Mortality
	Age 1	Biomass	Landings	Age 2-5
1985	79	22	10	0.43
1986	9	14	5	0.43
1987	19	24	8	0.44
1988	14	14	8	0.53
1989	12	10	7	0.95
1990	23	7	4	0.79
1991	25	6	6	0.65
1992	16	7	5	0.71
1993		10	5	0.58
<b>Average</b>	<b>25</b>	<b>13</b>	<b>6</b>	<b>0.61</b>

Table 3.7.8 Nominal catch (tonnes) of WHITING in Division VIa, 1980-1992, as officially reported to ICES.

Country	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
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 <sup>1,2</sup>	180	352 <sup>1,2</sup>	105	271 <sup>2</sup>
Germany, Fed.Rep.	1	49	53	43	6	9	1	+	4	+	+	+	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	1,105 <sup>1</sup>
Netherlands	2	6	285	811	-	14	-	-	-	-	-	-	-	-
Spain	-	-	99	76	40	61	-	-	-	n/a	n/a	n/a	n/a	n/a
UK (Engl.& Wales)	227	145	166	157	162	63	26	62	30	83	82	140	139	17
UK (Isle of Man)	-	-	-	-	-	-	-	-	-	2	-	-	4	-
UK (N. Ireland)	-	-	-	52	40	17	5	13	89	18	73	703	186	61
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	5,131
Total	14,664	18,504 <sup>4</sup>	14,235	16,765	16,859	12,637	8,392	12,399	11,879	7,666	6,030 <sup>3</sup>	6,897 <sup>3</sup>	6,007 <sup>3</sup>	6,585 <sup>3</sup>
Unallocated	-1,848	-6,301	-364	-795	-401	+256	-62	-855	-527	-135	-387 <sup>3</sup>	-237 <sup>3</sup>	+2 <sup>3</sup>	+576 <sup>3</sup>
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	6,009	7,161

<sup>1</sup>Preliminary.

<sup>2</sup>Includes Divisions Vb (EC) and VIb.

<sup>3</sup>Incomplete.

<sup>4</sup>Total landings for 1981 may require revision downwards.

n/a = Not available.

**Table 3.7.9** Whiting in Division VIa (West of Scotland).  
Weights in '000 t and numbers in millions.

Year	Recruitment	Spawning Stock		Fishing Mortality
	Age 1	Biomass	Landings	Age 2-4
1965	51	50	19	0.66
1966	61	39	16	0.60
1967	56	32	18	0.81
1968	214	27	14	0.86
1969	20	51	12	0.62
1970	23	40	11	0.51
1971	31	30	16	0.86
1972	95	21	15	1.01
1973	200	23	17	1.29
1974	69	41	17	0.85
1975	155	39	20	0.64
1976	52	47	25	0.95
1977	82	30	17	0.77
1978	113	27	15	0.63
1979	81	33	17	0.74
1980	199	32	13	0.54
1981	40	53	12	0.37
1982	36	47	14	0.35
1983	44	38	16	0.51
1984	69	30	16	0.76
1985	64	25	13	0.92
1986	52	22	8	0.66
1987	69	23	12	0.76
1988	18	23	11	0.90
1989	51	13	8	0.87
1990	33	16	6	0.58
1991	43	15	7	0.64
1992	43	15	6	0.53
1993	18	18	7	0.60
<b>Average</b>	<b>72</b>	<b>31</b>	<b>14</b>	<b>0.72</b>

**Table 3.7.10** Nominal catch (tonnes) of WHITING in Division VIb, 1982-1993, as officially reported to ICES.

Country	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993 <sup>1</sup>
France	-	-	3	2	-	-	-	... <sup>2</sup>	... <sup>2</sup>	... <sup>2</sup>	... <sup>2</sup>	... <sup>2</sup>
Ireland							-	-	-	-	-	32
Spain	112	88	16	123	-	-	-	n/a	n/a	n/a	n/a	n/a
UK (Engl. & Wales)	-	+	2	+	5	4	-	2	5	1	5	-
UK (N. Ireland)	-	-	-	-	-	-	-	15	+	+	+	5
UK (Scotland)	-	5	25	6	13	108	23	18	482	458	283	86
<b>Total</b>	<b>112</b>	<b>93</b>	<b>46</b>	<b>131</b>	<b>18</b>	<b>112</b>	<b>23</b>					

<sup>1</sup>Preliminary.

<sup>2</sup>Included in Division VIa.

n/a = Not available.

**Table 3.7.11** Nominal catch (tonnes) of SAITHE in Sub-area VI, 1981-1993, as officially reported to ICES.

Country	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993 <sup>1</sup>
Belgium	2	-	-	-	2	-	12	14	15	-	6	2	-
Denmark	-	4	-	-	-	-	7	+	2	-	+	1	2
Faroe Islands	3	5	-	-	-	-	-	8	-	-	24	1	-
France	16,654	17,102	13,470	19,706	19,120	26,521	24,581	24,656	17,106 <sup>2</sup>	12,961 <sup>2</sup>	12,423 <sup>2</sup>	6,777 <sup>2</sup>	11,142 <sup>2</sup>
Germany, Fed. Rep.	581	441	179	713	838	2,345	1,486	1,584	1,116	275	590	685	222
Ireland	250	322	698	599	670	660	704	544	593	520	260	278	318
Netherlands	-	-	32	-	-	-	-	-	-	n/a	n/a	n/a	n/a
Norway	25	19	55	66	51	72	38	50	72	64	31	67	88
Spain	120	243	330	882	624	824	533	857	n/a	n/a	n/a	n/a	n/a
UK (Engl. & Wales)	1,364	1,966	2,760	1,800	1,349	1,259	1,708	1,193	555	1,027	799	577	274
UK (Isle of Man)	-	-	-	-	-	-	-	-	+	-	-	n/a	-
UK (N. Ireland)	10	7	12	49	15	21	26	13	21	53	129	48	74
UK (Scotland)	3,117	2,141	2,642	3,170	3,118	3,697	3,442	3,925	2,851	3,035	3,554	2,608	2,630
<b>Total</b>	<b>22,126</b>	<b>22,250</b>	<b>26,178</b>	<b>26,985</b>	<b>25,787</b>	<b>35,399</b>	<b>32,537</b>	<b>32,844</b>	<b>n/a</b>	<b>n/a</b>	<b>n/a</b>	<b>n/a</b>	
<b>Unallocated</b>	<b>1,448</b>	<b>1,634</b>	<b>2,712</b>	<b>-5,344</b>	<b>808</b>	<b>4,487</b>	<b>-1,168</b>	<b>1,334</b>					
<b>Total figures used by WG</b>	<b>23,574</b>	<b>23,884</b>	<b>28,890</b>	<b>21,641</b>	<b>26,595</b>	<b>39,886</b>	<b>31,369</b>	<b>34,178</b>	<b>25,577</b>	<b>19,865</b>	<b>16,995</b>	<b>11,804</b>	<b>14,674</b>

<sup>1</sup>Preliminary.

<sup>2</sup>Includes Division Vb (EC).

n/a = Not available.

**Table 3.7.12** Saithe in Sub-area VI (West of Scotland and Rockall).  
Weights in '000 t and numbers in millions.

Year	Recruitment	Spawning Stock		Fishing Mortality
	Age 1	Biomass	Landings	Age 3-6
1963	31	12	7	0.26
1964	20	17	14	0.38
1965	20	22	18	0.54
1966	32	19	19	0.48
1967	23	28	16	0.34
1968	36	28	13	0.26
1969	26	34	17	0.30
1970	37	44	15	0.23
1971	34	50	20	0.27
1972	33	63	29	0.31
1973	31	82	34	0.38
1974	33	89	36	0.35
1975	25	70	31	0.38
1976	17	76	42	0.51
1977	18	54	27	0.46
1978	20	66	31	0.43
1979	22	54	22	0.34
1980	31	55	22	0.31
1981	30	52	24	0.32
1982	40	49	24	0.33
1983	41	57	29	0.33
1984	43	47	22	0.25
1985	22	55	27	0.28
1986	29	54	40	0.58
1987	30	51	31	0.49
1988	21	45	34	0.55
1989	22	27	26	0.82
1990	15	21	20	0.73
1991	16	17	17	0.75
1992		13	12	0.52
1993		14	15	0.53
<b>Average</b>	<b>28</b>	<b>44</b>	<b>24</b>	<b>0.42</b>



Table 3.7.13 MEGRIM in Sub-area VI. Nominal landings (tonnes) as officially reported to ICES, 1982-1993.

A. Division VIa												
Country	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993 <sup>1</sup>
Belgium	1	-	-	-	-	1	1	1	-	1	-	-
Denmark	-	-	-	-	-	-	-	1	-	-	+	-
France	1,337	1,530	1,398	1,411	777	997	1,295	457 <sup>1,2</sup>	398 <sup>1,2</sup>	455 <sup>2,1</sup>	504 <sup>2</sup>	589 <sup>2</sup>
Germany, Fed.Rep.	-	-	1	+	-	-	2	+	+	-	+	-
Ireland	112	113	134	151	243	403	685	474	317	260	317	329
Spain	510	601	310	422	137	102	121	n/a	n/a	n/a	n/a	n/a
UK (Engl. & Wales)	28	9	14	84	55	369	284	115	29	157	398	17
UK (N. Ireland)	-	+	-	-	+	11	70	1	8	40	18	21
UK (Scotland)	436	424	862	919	660	991	1,068	1,165	1,083	1,192	860	869
Total	2,424	2,677	2,719	2,987	1,872	2,874	3,525	n/a	n/a	n/a	n/a	n/a
As used by Working Group									2,924	2,672	2,321	2,262

<sup>1</sup>Preliminary.  
<sup>2</sup>Includes Divisions Vb (EC) and VIb.  
n/a = Not available.

B. Division VIb												
Country	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993 <sup>1</sup>
France	9	2	9	6	11	2	1	... <sup>1,2</sup>	... <sup>1,2</sup>	... <sup>1,2</sup>	... <sup>2</sup>	... <sup>2</sup>
Ireland										240	139	128
Spain	816	784	640	646	730	583	751	n/a	n/a	n/a	n/a	n/a
UK (Engl. & Wales)	-	6	6	32	88	261	77	49	46	27	68	5
UK (N. Ireland)	-	-	-	-	-	-	-	1	1	2	5	9
UK (Scotland)	-	-	10	82	79	174	185	145	198	189	178	132
Total	825	792	665	766	908	1,020	1,014	n/a	n/a	n/a	n/a	n/a

<sup>1</sup>Preliminary.  
<sup>2</sup>Included in Division VIa.  
n/a = Not available.

C. Total for Sub-area VI										
1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
3,249	3,469	3,384	3,753	2,780	3,894	4,539				

**Table 3.7.14** ANGLERFISH in Sub-area VI. Nominal landings (tonnes) as officially reported to ICES, 1982-1993.

A. Division VIa												
Country	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993 <sup>1</sup>
Belgium	-	-	-	4	2	15	2	8	-	3	2	9
Denmark	+	-	-	-	-	4	+	34	+	1	3	4
Faroe Islands	-	-	-	-	-	-	-	1	-	-	-	-
France	1,421	1,543	1,723	2,036	1,505	1,601	2,329	1,901 <sup>1,2</sup>	2,182 <sup>1,2</sup>	1,910 <sup>2,1</sup>	2,189 <sup>2</sup>	2,938
Germany, Fed.Rep.	5	+	4	24	3	4	9	10	+	1	2	61
Ireland	113	110	172	119	295	187	324	556	398	250	403	428
Norway	6	9	6	5	6	3	8	27	8	6 <sup>1</sup>	14	8
Spain	358	405	355	281	142	130	269	n/a	n/a	n/a	n/a	n/a
UK (Engl.& Wales)	74	36	56	52	36	241	403	176	130	272	385	22
UK (N. Ireland)	-	2	2	-	2	2	30	15	21	47	44	46
UK (Scotland)	1,177	1,312	1,617	1,522	1,099	1,768	2,629	2,975	2,841	2,562	2,313	2,257
Total	3,154	3,417	3,935	4,043	3,090	3,955	6,003	n/a	n/a	n/a	n/a	n/a
As used by Working Group									5,799	5,357	4,632	4,999

<sup>1</sup>Preliminary.

<sup>2</sup>Includes Divisions Vb(EC) and VIb.

n/a = Not available.

B. Division VIb												
Country	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993 <sup>1</sup>
Faroe Islands	3	-	5	4	-	-	6	1	-	-	2	-
France	24	24	35	13	19	4	4	...	...	...	...	...
Ireland								-	400	272	417	96
Germany								-	-	-	-	102
Norway	1	8	14	7	9	11	7	13	16	18	10 <sup>1</sup>	17
Spain	423	377	598	642	990	730	1,340	n/a	n/a	n/a	n/a	n/a
UK (Engl.& Wales)	-	22	20	85	112	253	123	48	41	122	141	9
UK (N. Ireland)	-	-	-	-	-	-	-	2	1	1	3	14
UK (Scotland)	2	2	35	262	196	296	250	167	225	177	217	108
Total	454	433	707	1,013	1,326	1,294	1,730	n/a	n/a	n/a	n/a	n/a

<sup>1</sup>Preliminary.

<sup>2</sup>Included in Division VIa.

n/a = Not available.

C. Total for Sub-area VI										
1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
3,608	3,850	4,642	5,056	4,416	5,249	7,733				

**Table 3.7.15** Nominal catch (tonnes) of BLUE LING in Division Va, 1982-1993, as officially reported to ICES.

BLUE LING Va												
Country	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993 <sup>1</sup>
Faroe Islands	224	1,195	353	59	69	75	271	403	1,029	241	321	38
Iceland	5,945	5,117	3,122	1,407	1,774	1,693	1,093	2,124	1,992	1,582	2,584	5,300
Norway	64	402	31	7	8	8	7	5	-	- <sup>1</sup>	- <sup>1</sup>	-
Total	6,233	6,714	3,506	1,473	1,851	1,776	1,371	2,532	3,021	1,823	2,905	5,338

<sup>1</sup>Preliminary.

**Table 3.7.16** Nominal catch (tonnes) of BLUE LING in Division Vb, 1982-1993, as officially reported to ICES.

BLUE LING Vb												
Country	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993 <sup>1</sup>
Faroe Islands	2,889	4,396	7,210	4,434	4,880	3,071	6,275	3,090	1,014	1,644	3,623	2,270
France	843	668	515	1,193	2,578	3,246	3,036	1,599 <sup>1</sup>	1,595 <sup>1</sup>	347 <sup>1</sup>	171 <sup>1</sup>	151
Germany, Fed.Rep.	2,538	223	214	217	197	152	49	51	71	36	21	24
Norway	187	438	155	210	126	171	166	323	641	247	646 <sup>1</sup>	240
UK	-	-	-	-	-	-	-	-	-	3 <sup>1</sup>	4 <sup>1</sup>	21
Total	6,457	5,725	8,094	6,054	7,781	6,640	9,526	5,063	3,321	2,277	4,465	2,706
Unallocated	-	-	-	-	-	-	75 <sup>2</sup>	126 <sup>2</sup>	228 <sup>2</sup>	114 <sup>2</sup>	168	-
Total figures as used by Working Group	6,457	5,725	8,094	6,054	7,781	6,640	9,601 <sup>2</sup>	5,189 <sup>2</sup>	3,549 <sup>2</sup>	2,391 <sup>2</sup>	4,633	2,706

<sup>1</sup>Preliminary.

<sup>2</sup>Includes Faroese catches in Sub-Division IIa.

**Table 3.7.17** Nominal catch (tonnes) of BLUE LING in Sub-area VI, 1982-1993, as officially reported to ICES.**BLUE LING Division VIa**

Country	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993 <sup>1</sup>
Faroe Islands	-	-	-	56	-	-	14	6	-	8	4	-
France	3,430	5,233	3,653	5,670	7,628	9,389	6,335	7,010 <sup>1</sup>	3,730 <sup>1</sup>	3,157 <sup>1</sup>	3,151 <sup>1</sup>	3,116
Germany, Fed.Rep.	79	11	183	5	7	44	2	2	44	18	4	48
Norway	16	118	45	75	50	51	29	143	54	63	127 <sup>1</sup>	27
UK	99	13	5	2	3	13	3	+	1	37	28	51
<b>Total</b>	<b>3,624</b>	<b>5,375</b>	<b>3,886</b>	<b>5,808</b>	<b>7,688</b>	<b>9,497</b>	<b>6,383</b>	<b>7,161</b>	<b>3,829</b>	<b>3,283</b>	<b>3,314</b>	<b>3,242</b>
Unallocated	-	-	-	-	-	-	-	-	-	169 <sup>2</sup>	179 <sup>2</sup>	-
<b>Total as used by Working Group</b>	<b>3,624</b>	<b>5,375</b>	<b>3,886</b>	<b>5,808</b>	<b>7,688</b>	<b>9,497</b>	<b>6,383</b>	<b>7,161</b>	<b>3,829</b>	<b>3,452<sup>2</sup></b>	<b>3,493<sup>2</sup></b>	<b>3,242</b>

<sup>1</sup>Preliminary.<sup>2</sup>Includes French catches reported by IFREMER.**BLUE LING Division VIb**

Country	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993 <sup>1</sup>
Faroe Islands	-	-	133	11	1,845	-	2,000	1,292	360	111	231	51
France	263	243	3,281	7,263	2,141	10	499	60 <sup>1</sup>	695 <sup>1</sup>	2,259 <sup>1</sup>	524	824
Germany, Fed.Rep.	554	38	-	31	39	333	37	22	-	6	2	109
Norway	13	50	43	38	66	76	42	217	127	102	50 <sup>1</sup>	50
UK	1	2	-	-	8	72	23	16	3	20	16	108
<b>Total</b>	<b>831</b>	<b>333</b>	<b>3,457</b>	<b>7,343</b>	<b>4,099</b>	<b>491</b>	<b>2,601</b>	<b>1,607</b>	<b>1,185</b>	<b>2,498</b>	<b>823</b>	<b>1,142</b>
Unallocated	-	-	-	-	-	-	-	-	-	-	767 <sup>2</sup>	-
<b>Total as used by Working Group</b>	<b>831</b>	<b>333</b>	<b>3,457</b>	<b>7,343</b>	<b>4,099</b>	<b>491</b>	<b>2,601</b>	<b>1,607</b>	<b>1,185</b>	<b>2,498</b>	<b>1,586</b>	<b>1,142</b>

<sup>1</sup>Preliminary.<sup>2</sup>Includes French catches reported by IFREMER.**Table 3.7.18** Nominal catch (tonnes) of BLUE LING in Sub-area XIV, 1982-1993, as officially reported to ICES.**BLUE LING XIV**

Country	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993 <sup>1</sup>
Faroe Islands	-	-	-	-	-	-	21	13	-	-	-	37
Germany, Fed.Rep.	1,946	621	537	314	150	199	218	58	64	105	27	16
Greenland	-	-	-	-	-	-	3	-	5	5	2	-
Norway	-	-	-	-	-	-	-	-	-	+	50 <sup>1</sup>	173
UK (England & Wales)	-	-	-	-	-	-	-	-	11	45	32	21
<b>Total</b>	<b>1,946</b>	<b>621</b>	<b>537</b>	<b>314</b>	<b>150</b>	<b>199</b>	<b>242</b>	<b>71</b>	<b>80</b>	<b>155</b>	<b>111</b>	<b>247</b>

<sup>1</sup>Preliminary.

**Table 3.7.19** Nominal catch (tonnes) of LING in Division Va, 1982-1993, as officially reported to ICES.

LING Va												
Country	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993 <sup>1</sup>
Belgium	116	128	103	59	88	157	134	95	42	69	34	15
Faroe Islands	524	644	450	384	556	657	619	614	399	530	526	480
Iceland	3,733	4,256	3,304	2,980	2,946	4,161	5,098	4,896	5,153	5,206	4,550	4,200
Norway	612	115	21	17	4	6	10	5	-	-	- <sup>1</sup>	-
Total	4,985	5,143	3,878	3,440	3,594	4,981	5,861	5,610	5,594	5,805	5,116	4,695

<sup>1</sup>Preliminary.**Table 3.7.20** Nominal catch (tonnes) of LING in Division Vb, 1982-1993, as officially reported to ICES.

LING Vb												
Country	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993 <sup>1</sup>
Denmark	-	-	-	-	4 <sup>4</sup>	16	4	-	-	-	-	-
Faroe Islands	2,370	2,505	2,821	3,190	2,583	3,958	2,215	1,860	1,737	2,320	1,795	1,524
France	16	155	11	40	123	384	53	40 <sup>1</sup>	34 <sup>1</sup>	9 <sup>1</sup>	2 <sup>1</sup>	6
Germany, Fed.Rep.	3	5	6	3	6	8	4	2	1	2	+	1
Norway	3,614	2,746	1,566	1,955	2,240	1,999	2,168	2,743	2,074	2,149 <sup>1</sup>	1,790 <sup>1</sup>	1,253
UK	94	48	4	2	1	2	6	3	9	4	31	20
Total	6,097	5,459	4,408	5,190	4,957	6,367	4,450	4,648	3,855	4,484	3,618	2,804
Unallocated	-	-	-	-	-	-	3 <sup>2</sup>	2 <sup>2</sup>	14 <sup>2</sup>	17 <sup>2</sup>	10 <sup>2,3</sup>	
Total Figures as used by Working Group	6,097	5,459	4,408	5,190	4,957	6,367	4,453 <sup>2</sup>	4,650 <sup>2</sup>	3,869 <sup>2</sup>	4,501 <sup>2</sup>	3,624 <sup>2,3</sup>	

<sup>1</sup>Preliminary.<sup>2</sup>Includes Faroese catches in Sub-Division IIa4.<sup>3</sup>Includes French and German catches reported by the Faroese Coastal Guard service.<sup>4</sup>Includes 1 t reported as Division Vb.

**Table 3.7.21** Nominal catch (tonnes) of LING in Sub-area VI, 1982-1993, as officially reported to ICES.

LING Division VIa												
Country	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993 <sup>1</sup>
Belgium	4	-	1	4	-	4	4	6	-	3	-	-
Denmark	1	-	-	-	-	1	+	1	+	+	1	+
Faroe Islands	20	-	-	-	-	-	-	6	8	3	-	-
France	5,049	5,362	5,757	6,061	4,620	4,338	5,118	3,170 <sup>1</sup>	2,456 <sup>1</sup>	1,685 <sup>1</sup>	1,416 <sup>1</sup>	1,491
Germany, Fed.Rep.	-	-	14	8	6	2	6	11	1	2	2	93
Ireland	34	62	49	81	255	287	196	138	41	57	38	171
Norway	4,499	5,943	4,667	4,779	5,426	3,842	3,392	3,858	3,263	2,029 <sup>1</sup>	2,292 <sup>1</sup>	1,937
Spain	461	604	720	388	620	975	580	n/a	n/a	n/a	n/a	n/a
UK	389	314	442	640	435	1,087	2,002	1,252	911	982	975	1,016
Total	10,457	12,285	11,650	11,961	11,362	10,536	11,298	n/a	n/a	n/a	n/a	n/a
Total figures as used by Working Group	10,457	12,285	11,650	11,961	11,362	10,536	11,298	8,442	6,680	4,761	4,724	4,708

<sup>1</sup>Preliminary.<sup>2</sup>Includes catches reported by IFREMER.

LING Division VIIb												
Country	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993 <sup>1</sup>
Faroe Islands	123	204	153	24	6	-	196	17	3	-	35	4
France	13	8	34	140	24	4	8	2 <sup>1</sup>	- <sup>1</sup>	2 <sup>1</sup>	690 <sup>1</sup>	1
Germany, Fed.Rep.	-	-	-	-	-	2	-	-	-	-	+	-
Ireland	-	-	-	-	-	-	-	-	26	31	23	60
Norway	1,711	2,315	2,345	1,973	2,157	1,933	1,253	3,616	1,315	2,489 <sup>1</sup>	1,713	1,179
Spain	1,911	1,889	986	2,381	2,762	4,036	2,995	n/a	n/a	n/a	n/a	n/a
UK	84	30	57	202	236	315	317	125	174	147	134	181
Total	3,842	4,446	3,575	4,720	5,185	6,290	4,769	n/a	n/a	n/a	n/a	n/a

<sup>1</sup>Preliminary.<sup>2</sup>Includes catches reported by IFREMER.**Table 3.7.22** Nominal catch (tonnes) of LING in Sub-area XIV, 1982-1993, as officially reported to ICES.

LING XIV												
Country	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993 <sup>1</sup>
Faroe Islands	-	-	-	-	17	-	-	-	-	-	-	-
Germany, Fed.Rep.	8	1	6	1	2	1	3	1	1	+	9	-
Norway	-	-	-	-	-	-	-	-	2	+	7 <sup>1</sup>	1
UK (England & Wales)	-	-	-	-	-	-	-	-	6	1	1	5
Total	8	1	6	1	19	1	3	1	9	1	17	6

<sup>1</sup>Preliminary.

**Table 3.7.23** Nominal catch (tonnes) of TUSK (Cusk) in Division Va, 1982-1993, as officially reported to ICES.

TUSK Va												
Country	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993 <sup>1</sup>
Faroe Islands	2,410	4,046	2,008	1,885	2,811	2,638	3,757	3,908	2,475	2,286	1,567	1,274
Iceland	2,804	3,469	3,430	3,068	2,549	2,984	3,078	3,131	4,813	6,439	6,436	4,400
Norway	666	772	254	111	21	19	20	10	-	-	- <sup>1</sup>	-
Total	5,880	8,287	5,692	5,064	5,381	5,641	6,855	7,049	7,288	8,725	8,003	5,674

<sup>1</sup>Preliminary.**Table 3.7.24** Nominal catch (tonnes) of TUSK (Cusk) in Division Vb, 1982-1993, as officially reported to ICES.

TUSK Vb												
Country	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993 <sup>1</sup>
Denmark	-	-	-	-	+	2	+	-	-	-	-	-
Faroe Islands	4,148	3,450	4,394	5,288	3,625	4,262	3,372	1,991	3,193	4,204	3,337	1,939
France	14	15	25	34	24	54	81	52 <sup>1</sup>	63 <sup>1</sup>	16 <sup>1</sup>	10 <sup>1</sup>	10
Germany, Fed. Rep.	12	11	16	10	15	13	8	2	26	1	2	2
Norway	2,092	1,935	1,537	1,975	1,566	2,198	2,204	3,065	2,896	2,042	2,040 <sup>1</sup>	1,487
UK	125	73	2	+	+	+	+	+	+	+	2	1
Total	6,391	5,484	5,974	7,307	5,220	6,529	5,665	5,110	6,178	6,263	5,391	3,439
unallocated	-	-	-	-	-	-	67 <sup>2</sup>	75 <sup>2</sup>	153 <sup>2</sup>	38 <sup>2</sup>	35 <sup>2,3</sup>	-
Total Figures as used by Working Group	6,391	5,484	5,974	7,307	5,220	6,529	5,732 <sup>2</sup>	5,185 <sup>2</sup>	6,331 <sup>2</sup>	6,301 <sup>2</sup>	5,423 <sup>2,3</sup>	3,439

<sup>1</sup>Preliminary.<sup>2</sup>Includes Faroese catches in Sub-Division IIa4.<sup>3</sup>Includes French catches, reported by the Faroese Coastal Guard Service.

**Table 3.7.25** Nominal catch (tonnes) of TUSK (Cusk) in Sub-area VI, 1982-1993, as officially reported to ICES.

TUSK Division VIa												
Country	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993 <sup>1</sup>
Denmark	-	-	-	-	-	-	-	+	-	-	-	-
Faroe Islands	-	-	-	-	-	-	-	6	9	5	-	-
France	355	418	514	767	608	627	724	661 <sup>1</sup>	705 <sup>1</sup>	483 <sup>1</sup>	590	383
Germany, Fed.Rep.	-	-	1	1	+	+	1	3	+	+	+	4
Ireland	-	-	-	-	-	1	-	2	-	-	-	3
Norway	1,052	1,733	1,305	1,609	1,873	1,238	1,310	1,583	1,506	998	1,121 <sup>1</sup>	783
Spain	414	250	-	-	-	-	-	n/a	n/a	n/a	n/a	n/a
Sweden	2	-	-	-	-	-	-	-	-	-	-	-
UK	7	3	6	2	6	16	43	10	20	27	26	23
Total	1,830	2,404	1,826	2,379	2,487	1,882	2,078	2,265 <sup>1</sup>	2,240 <sup>1</sup>	1,513 <sup>1</sup>	1,737 <sup>1</sup>	1,196

<sup>1</sup>Preliminary.

TUSK Division VIb												
Country	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993 <sup>1</sup>
Faroe Islands	159	188	53	48	106	-	217	41	6	-	63	4
France	3	3	4	3	9	2	4	1 <sup>1</sup>	3 <sup>1</sup>	6 <sup>1</sup>	1 <sup>1</sup>	+
Germany, Fed.Rep.	+	-	-	-	-	-	-	-	-	+	+	-
Ireland	-	-	-	-	-	-	-	-	-	5	5	32
Norway	468	1,080	960	944	952	1,385	601	1,537	738	1,068 <sup>1</sup>	763 <sup>1</sup>	899
Spain	2,098	1,902	-	-	-	-	-	n/a	n/a	n/a	n/a	-
UK (Scotland)	101	25	+	20	24	21	42	17	24	31	39	55
Total	2,829	3,198	1,017	1,015	1,091	1,408	864	1,596	771	1,110	871	990

<sup>1</sup>Preliminary.

**Table 3.7.26** Nominal catch (tonnes) of TUSK (Cusk) in Sub-area XIV, 1982-1993, as officially reported to ICES.

TUSK XIV												
Country	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993 <sup>1</sup>
Faroe Islands	-	74	-	-	33	13	19	13	-	-	-	-
Germany, Fed.Rep.	10	11	5	4	2	2	2	1	2	2	+	-
Iceland	-	-	-	-	-	-	-	-	-	-	4	-
Norway	-	-	-	-	-	-	-	-	7	68	120 <sup>1</sup>	53
UK (England & Wales)	-	-	-	-	-	-	-	-	-	1	+	-
Total	10	85	5	4	35	15	21	14	9	71	124	53

<sup>1</sup>Preliminary.



**Table 3.8.1** No mininal catch (tonnes) of COD in Division VIIa, 1982-1993, 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 <sup>1</sup>
Belgium	269	139	135	185	222	344	269	467	310	78	174	162
Denmark	6	-	-	-	-	-	-	-	-	-	-	-
France	1,066	815	912	1,782	1,480	1,717	2,406	352 <sup>1</sup>	201 <sup>1</sup>	320 <sup>1</sup>	927 <sup>1</sup>	505
Ireland	4,758	4,032	2,885	4,121	3,991	5,017	5,821	3,656	2,800	2,364	2,260	1,388
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	827
UK (Isle of Man)	161	103	98	119	80	44	118	39	48	175	129	57
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
UK (Scotland)	583	336	669	1,038	446	574	472	351	1,700	485	335	447
Total	13,281	10,327	8,648	11,090	10,058	13,183	15,833	11,283	9,855	6,941	7,379	5,790
Unallocated	-	-312	-265	-607	-206	-289	-1,665	1,468	-2,476	670	151	1,788
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 <sup>2</sup>	7,530 <sup>2</sup>	7,578

<sup>1</sup>Preliminary

<sup>2</sup>Revised

**Table 3.8.2** Irish Sea Cod (Division VIIa).

Weights in '000 t and numbers in millions.

Year	Recruitment	Spawning Stock		Fishing Mortality
	Age 0	Biomass	Landings	Age 2-5
1968	7	9	9	0.75
1969	9	8	8	0.88
1970	15	6	6	0.67
1971	5	7	9	0.59
1972	14	10	9	0.53
1973	3	11	12	0.77
1974	11	10	10	0.65
1975	4	10	10	0.81
1976	5	8	10	0.71
1977	6	7	8	0.78
1978	12	6	6	0.56
1979	14	6	8	0.70
1980	8	7	11	0.69
1981	4	10	15	0.75
1982	5	11	13	0.93
1983	8	9	10	0.81
1984	8	7	8	0.78
1985	7	6	10	0.86
1986	19	6	10	0.91
1987	9	6	13	0.95
1988	4	6	14	0.99
1989	5	6	13	1.16
1990	6	5	7	1.04
1991	11	3	8	1.05
1992	1	3	8	1.39
1993	6	3	8	1.04
Average	8	7	10	0.84

**Table 3.8.3** Nominal catch (tonnes) of WHITING in Division VIIa, 1982-1993, as officially reported to ICES and Working Group estimates of human consumption and discards.

Country	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993 <sup>1</sup>
Belgium	45	78	99	100	70	109	90	92	142	53	78	45
France	1,333	1,021	930	956	770	826	1,063	533 <sup>1</sup>	528 <sup>1</sup>	611 <sup>1</sup>	512 <sup>1</sup>	462
Ireland	4,710	3,047	4,276	5,521	3,101	4,067	4,394	3,871	2,000	2,200	2,100	1,459
Netherlands	14	18	5	30	-	-	-	-	-	-	-	-
UK (Engl. & Wales)	1,195	1,200	1,224	1,379	1,004	1,529	1,202	946	1,106	934	822	549
UK (Isle of Man)	268	127	68	57	25	14	15	26	75	74	53	55
UK (N. Ireland)	9,927	5,218	5,660	8,382	4,940	4,858	4,621	5,651	4,029	3,260	3,269	3,300
UK (Scotland)	189	120	275	368	129	281	107	184	280	272	258	317
<b>Total human consumption</b>	<b>17,681</b>	<b>10,829</b>	<b>12,537</b>	<b>16,793</b>	<b>10,039</b>	<b>11,684</b>	<b>11,492</b>	<b>11,303</b>	<b>8,160</b>	<b>7,404</b>	<b>7,092</b>	<b>6,187</b>
<b>Total human consumption figures used by the Working Group for stock assessment</b>	<b>17,219</b>	<b>10,508</b>	<b>11,561</b>	<b>15,952</b>	<b>10,086</b>	<b>10,697</b>	<b>9,955</b>	<b>11,208</b>	<b>7,973</b>	<b>7,434<sup>2</sup></b>	<b>8,985<sup>2</sup></b>	<b>6,496</b>
Unallocated	-462	-321	-976	-841	47	-987	-1,537	-95	-187	30	1,893	309
<b>Estimated discards from <i>Nephrops</i> fishery<sup>3</sup></b>	<b>893</b>	<b>1,837</b>	<b>3,674</b>	<b>2,284</b>	<b>2,329</b>	<b>3,721</b>	<b>1,901</b>	<b>2,014</b>	<b>2,683</b>	<b>2,679</b>	<b>4,149</b>	<b>2,708</b>

<sup>1</sup>Preliminary.

<sup>2</sup>Revised.

<sup>3</sup>Based on UK (N. Ireland) data.

**Table 3.8.4** Irish Sea Whiting (Division VIIa).  
Weights in '000 t and numbers in millions.

Year	Recruitment	Spawning Stock	Landings	Fishing Mortality
	Age 0	Biomass		Age 2-5
1980	121	13	13	0.81
1981	64	17	17	0.91
1982	68	13	17	1.10
1983	186	8	11	1.07
1984	136	7	12	1.07
1985	114	9	16	1.23
1986	177	7	10	1.33
1987	93	8	11	1.04
1988	102	9	10	1.01
1989	132	6	11	1.64
1990	130	6	8	1.32
1991	208	6	7	1.28
1992	69	7	9	1.99
1993		8	6	1.45
<b>Average</b>	<b>123</b>	<b>9</b>	<b>11</b>	<b>1.23</b>

Table 3.8.5 Nominal landings (t) of PLAICE in Division VIIa, 1981-1993, as officially reported to ICES.

Country	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Belgium	231	130	195	118	285	384	403	243	265	301	138	321	127
France	51	60	99	38	110	165	87	58	11	105	20	42	13
Ireland	1,243	923	1,384	1,420	2,000	1,858	2,132	2,009	1,406	1,350	900	1,355	655
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	1,004
UK (Isle of Man)	27	12	11	11	26	12	9	12	18	27	51	24	13
UK (N. Ireland)	132	159	183	203	198	272	332	286	370	325	334	226	104
UK (Scotland)	64	47	42	86	118	119	243	127	94	204	95	67	58
Others	1	0	0	0	0	0	0	0	0	0	0	0	0
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	1,974
Discards	-	-	-	-	-	250	270	220	0	0	0	0	0
Unallocated	0	9	-14	34	-1,048	-28	378	420	191	-681	-218	85	40
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	2,014

**Table 3.8.6** Irish Sea Plaice (Division VIIa).  
Weights in '000 t and numbers in millions.

Year	Recruitment	Spawning Stock	Landings	Fishing Mortality
	Age 1	Biomass		Age 3-6
1964	33	7	3	0.30
1965	17	8	4	0.36
1966	15	10	4	0.42
1967	12	12	5	0.50
1968	14	11	5	0.47
1969	21	10	4	0.45
1970	20	9	4	0.40
1971	13	9	4	0.63
1972	10	9	5	0.60
1973	13	7	5	0.75
1974	13	5	4	0.76
1975	11	5	4	0.76
1976	17	4	3	0.90
1977	19	3	3	0.81
1978	23	3	3	0.71
1979	21	3	3	0.59
1980	15	4	4	0.67
1981	8	5	4	0.55
1982	21	5	3	0.53
1983	21	5	4	0.68
1984	23	5	4	0.55
1985	16	6	5	0.58
1986	20	7	5	0.58
1987	22	7	6	0.80
1988	13	7	5	0.75
1989	7	6	4	0.58
1990	12	6	3	0.56
1991	9	5	3	0.46
1992	7	4	3	0.73
1993		3	2	0.61
<b>Average</b>	<b>16</b>	<b>6</b>	<b>4</b>	<b>0.60</b>

**Table 3.8.7** Irish Sea SOLE. Nominal catches (t), 1981-1993, as officially reported to ICES.

Country	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Belgium	884	669	544	425	589	930	987	915	1,010	786	371	531	508
Denmark	15	-	-	-	-	-	-	-	-	-	-	-	-
France	13	9	3	10	9	17	5	11	5	2	3	11	10
Ireland	167	161	203	187	180	235	312	366	155	170	198	164	136
Netherlands	186	138	224	113	546	-	-	-	-	-	-	-	-
UK (Engl. & Wales)	311	277	219	230	269	637	599	507	527	493	488	408	298
UK (Isle of Man)	7	10	10	6	12	1	3	1	2	10	44	11	4
UK (N. Ireland)	41	31	33	38	36	50	72	47	83	73	71	65	40
UK (Scotland)	45	44	29	17	28	46	63	38	40	41	27	27	17
<b>Total</b>	<b>1,669</b>	<b>1,339</b>	<b>1,265</b>	<b>1,026</b>	<b>1,669</b>	<b>1,916</b>	<b>2,041</b>	<b>1,885</b>	<b>1,822</b>	<b>1,575</b>	<b>1,202</b>	<b>1,217</b>	<b>1,013</b>
Unallocated	-2	-1	-96	32	-523	79	767	114	11	8	12	42	1
Total figures used by Working Group for stock assessment	1,667	1,338	1,169	1,058	1,146	1,995	2,808	1,999	1,833	1,583	1,214	1,259	1,014

**Table 3.8.8** Irish Sea Sole (Division VIIa).

Weights in '000 t and numbers in millions.

Year	Recruitment	Spawning Stock	Fishing Mortality	
	Age 1	Biomass	Landings	Age 4-7
1970	11	6.40	1.79	0.38
1971	4	5.88	1.88	0.39
1972	15	5.42	1.45	0.38
1973	7	4.36	1.43	0.35
1974	7	5.18	1.31	0.38
1975	5	5.22	1.44	0.34
1976	18	4.90	1.46	0.40
1977	10	4.45	1.15	0.34
1978	9	5.11	1.11	0.33
1979	6	5.70	1.61	0.42
1980	5	5.34	1.94	0.56
1981	3	5.06	1.67	0.42
1982	6	4.29	1.34	0.42
1983	18	3.45	1.17	0.44
1984	19	3.45	1.06	0.36
1985	27	4.89	1.15	0.33
1986	4	6.22	2.00	0.44
1987	4	7.39	2.81	0.81
1988	5	6.00	2.00	0.51
1989	7	4.49	1.83	0.47
1990	15	3.60	1.58	0.52
1991	4	3.02	1.21	0.40
1992	5	4.00	1.26	0.39
1993	4	3.43	1.01	0.42
<b>Average</b>	<b>9</b>	<b>4.89</b>	<b>1.53</b>	<b>0.42</b>

Table 3.9.1a

Nominal catches of COD in Divisions VII<sup>a</sup> and VII<sup>b</sup>  
as used by Working Group in 1994

Year	Belgium	France	Ireland	UK(England and Wales)	Others	Total
1973	524	2229	64	196	30	3043
1974	197	1770	24	153		2144
1975	377	2472	15	127	30	3021
1976	226	3351	13	92	1	3683
1977	107	2088	17	59		2271
1978	88	2567	30	67		2752
1979	110	3244	72	81		3507
1980	172	5036	246	199	7	5660
1981	285	7473	108	299		8165
1982	172	5984	142	302		6600
1983	244	4602	274	188		5308
1984	229	4900	204	287		5620
1985	451	5237	198	307		6193
1986	372	7050	226	302		7950
1987	216	6998	380	355		7949
1988	542	10535	612	351		12040
1989	888	12981	1003	379		15251
1990	612	7334	177	554		8677
1991	294	4944	246	507		5991
1992	190	5287	340	565		6382
1993*	380	6598	331	518		7827

\* = Provisional

Table 3.9.1b

Nominal catches of COD in Divisions VII<sup>a</sup>,g,h  
as used by Working Group in 1994

Year	Belgium	France	Ireland	UK(England and Wales)	Others	Total
1973	524	2413	64	196	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	86		3737
1980	172	5187	246	209	7	5821
1981	285	7806	108	317		8516
1982	174	6391	142	338		7045
1983	262	4915	274	199		5650
1984	240	5256	204	316		6016
1985	456	5709	198	398		6761
1986	374	7487	226	345		8432
1987	216	7419	380	437		8452
1988	542	12243	612	400		13797
1989	891	14622	1003	482		16998
1990	615	8378	177	689		9859
1991	297	5434	246	590		6567
1992	193	6184	340	655		7372
1993*	386	7318	331	604		8639

\* = Provisional

**Table 3.9.2** Celtic Sea Cod (Divisions VII f,g,h). Weights in t and numbers in thousands

Year	Recruitment	Spawning Stock	Fishing Mortality	
	Age 1	Biomass	Landings	Age 2-5
1971	2.70	7.90	4.65	0.60
1972	0.51	6.26	3.81	0.52
1973	1.49	6.92	3.23	0.56
1974	0.46	6.23	2.33	0.39
1975	3.31	5.76	3.21	0.78
1976	1.03	3.85	3.87	0.56
1977	1.47	6.23	2.46	0.38
1978	1.43	6.49	2.93	0.38
1979	3.45	7.12	3.74	0.52
1980	6.13	6.20	5.82	0.76
1981	2.47	6.15	8.52	0.88
1982	0.91	9.45	7.05	0.72
1983	3.81	8.98	5.65	0.66
1984	3.95	5.57	6.02	0.58
1985	2.73	9.77	6.76	0.55
1986	2.29	11.12	8.43	0.83
1987	14.60	8.51	8.45	0.85
1988	6.33	7.65	13.80	0.78
1989	1.98	19.58	17.00	0.91
1990	2.16	14.00	9.86	0.99
1991	5.54	6.95	6.57	0.99
1992	5.32	5.15	7.37	0.89
1993	1.29	8.17	8.64	0.93
<b>Average</b>	<b>3.28</b>	<b>8.00</b>	<b>6.53</b>	<b>0.70</b>



Table 3.9.3 Nominal catches of Celtic Sea Whiting as used by the Working Group in 1994.

Divisions VIIIf and VIIg

Year	Belgium	France	Ireland	UK (England and Wales)	Total
1982	70	7172	62	187	7491
1983	120	808	124	162	8488
1984	154	6552	299	224	7229
1985	164	6798	138	175	7275
1986	104	6488	138	117	6845
1987	109	8123	198	258	8688
1988	155	9013	189	322	9679
1989	293	10530	1334	285	12442
1990	303	9285	174	322	10132
1991	284	8584	190	450	9509
1992	105	8075	238	282	8698
1993 *	142	9650	654	305	10751

\* = provisional

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	8402	198	289	8998
1988	155	9607	189	354	10305
1989	293	10934	1334	309	12870
1990	304	9569	174	344	10391
1991	290	8775	190	481	9736
1992	106	8220	238	305	8867
1993 *	143	9782	654	341	10920

\* = provisional

Table 3.9.4 Celtic Sea Whiting (Divisions VIIIf,g,h).Weights in '000 t and numbers in millions.

Year	Recruitment	Spawning Stock	Fishing Mortality	
	Age 1	Biomass	Landings	Age 2-5
1982	17	13	8	1.01
1983	30	11	9	1.41
1984	24	11	7	1.24
1985	26	12	8	1.16
1986	35	13	7	1.10
1987	67	14	9	1.34
1988	56	22	10	1.07
1989	17	28	13	1.07
1990	25	18	10	0.99
1991	45	13	10	1.27
1992	51	15	9	1.07
1993	29	20	11	1.05
Average	35	16	9	1.15

**Table 3.9.5** Celtic Sea PLAICE. Nominal landings (tonnes) in Divisions VIIIf+g, 1977-1993, as officially reported to ICES, and 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	335	87	290	0	1,108	0	1,108

N.B.: ICES receives statistics from some countries only for Divisions VIIg-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 3.9.6** Celtic Sea Plaice (Divisions VIIIf,g). Weights in tonnes and numbers in thousands.

Year	Recruitment	Spawning Stock	Fishing Mortality	
	Age 1	Biomass	Landings	Age 3-6
1977	3,661	1,021	757	0.60
1978	5,015	901	875	0.64
1979	8,228	1,184	863	0.63
1980	5,585	1,506	1,373	0.53
1981	2,123	1,571	1,377	0.49
1982	3,334	1,821	1,303	0.66
1983	8,688	1,665	1,146	0.59
1984	9,234	1,480	1,210	0.65
1985	8,420	2,218	1,752	0.61
1986	8,684	2,789	1,691	0.56
1987	11,439	2,832	1,901	0.57
1988	7,155	2,845	2,116	0.78
1989	2,664	2,476	2,151	0.74
1990	1,700	2,504	2,082	0.86
1991	4,361	1,889	1,501	0.73
1992	4,903	1,557	1,188	0.74
1993	4,955	1,177	1,108	0.77
<b>Average</b>	<b>5,891</b>	<b>1,849</b>	<b>1,435</b>	<b>0.66</b>

**Table 3.9.7** Celtic Sea SOLE. Divisions VIIIf and VIIg. Nominal landings (tonnes), 1981-1992. Data used by the Working Group.

Country	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993 <sup>1</sup>
Belgium	819	871	786	786	1,092	704	725	660	689	839	516	511
France	100	124	115	126	92	72	89	97	100	80	136	102
Ireland	3	48	4	13	12	9	15	32	41	N/A	4	28
UK (Engl. & Wales)	206	330	361	403	404	437	317	203	359	395	325	285
Others	-	-	-	-	-	-	-	-	-	10	-	-
Total	1,128	1,373	1,266	1,328	1,600	1,222	1,146	992	1,189	1,324	981	926
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	926

<sup>1</sup>Preliminary

**Table 3.9.8** Celtic Sea Sole (Divisions VIIIf,g). Weights in tonnes and numbers in thousands.

Year	Recruitment	Spawning Stock	Fishing Mortality	
	Age 1	Biomass	Landings	Age 4-8
1971	9,217	5,243	1,861	0.43
1972	4,262	4,549	1,278	0.31
1973	3,418	4,350	1,391	0.26
1974	3,475	4,579	1,105	0.27
1975	2,915	4,090	919	0.23
1976	5,171	3,513	1,350	0.41
1977	4,673	3,624	961	0.26
1978	5,565	3,483	780	0.20
1979	3,590	3,509	954	0.28
1980	5,190	3,811	1,314	0.30
1981	4,902	3,140	1,212	0.36
1982	4,958	3,410	1,128	0.35
1983	6,906	3,274	1,373	0.45
1984	4,812	3,498	1,266	0.39
1985	5,814	3,272	1,328	0.42
1986	3,149	3,170	1,600	0.52
1987	5,816	2,493	1,222	0.56
1988	4,262	2,480	1,146	0.56
1989	3,673	2,038	992	0.54
1990	8,489	2,107	1,189	0.68
1991	4,288	1,900	1,107	0.43
1992	4,636	2,428	981	0.40
1993	4,673	2,283	926	0.50
Average	4,950	3,315	1,191	0.40

**Table 3.9.9** Western Channel Cod. Nominal catches (t) of cod in Division VIIe as used by the Working Group.

Country	1987	1988	1989	1990	1991	1992 <sup>1</sup>	1993
Belgium	10	12	19	6	6	2	5
Denmark	-	-	-	5	-	-	1
France	1,119	1,899	1,453	654	341	331	247
UK (England and Wales)	497	832	724	605	402	364	274
UK (Scotland)	-	-	2	4	-	-	1
Total	1,626	2,743	2,198	1,274	749	697	528

<sup>1</sup>Preliminary.

**Table 3.9.10** Western Channel Whiting. Nominal catches (t) of whiting in Division VIIe as used by the Working Group.

Country	1987	1988	1989	1990	1991	1992 <sup>1</sup>	1993
Belgium	2	4	3	4	2	1	2
France	1,510	1,485	915	479	667	543	522
UK (England and Wales)	746	1,167	911	1,352	1,431	931	1,240
UK (Scotland)	-	-	5	41	21	-	5
Total	2,258	2,656	1,834	1,876	2,121	1,475	1,769

<sup>1</sup>Preliminary.

**Table 3.9.11** English Channel PLAICE. Nominal landings (tonnes) in Division VIIe, 1976-1993, as officially reported to ICES, and as used by the Working Group.

Year	Belgium	Denmark	France	UK (Engl. & Wales)	Others	Total reported	Unallocated <sup>2</sup>	Total as used by WG
1976	5	- <sup>1</sup>	323	312	-	640	-	640
1977	3	- <sup>1</sup>	336	363	-	702	-	702
1978	3	- <sup>1</sup>	314	467	-	78	-	784
1979	2	- <sup>1</sup>	458	515	-	975	2	977
1980	23	- <sup>1</sup>	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	- <sup>1</sup>	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 <sup>2</sup>	1,708	2	2,247	111	2,358
1990	82	2	N/A <sup>3</sup>	1,873	18	1,975	618	2,593
1991	57	-	251 <sup>2</sup>	1,314	16	1,638	210	1,848
1992	25	-	277 <sup>2</sup>	1,110	19	1,431	193	1,624
1993	56	-	279 <sup>2</sup>	1,063	-	1,398	19	1,417

<sup>1</sup>Included in Division VIId.

<sup>2</sup>Estimated by the Working Group.

<sup>3</sup>Divisions VIId,e = 14,739 t.

**Table 3.9.12** Western English Channel Plaice (Divisions VIIe). Weights in t and numbers in thousands.

Year	Recruitment	Spawning Stock		Fishing Mortality
	Age 1	Biomass	Landings	Age 3-7
1976	3.77	1.55	0.64	0.44
1977	2.00	1.49	0.70	0.43
1978	3.10	1.65	0.78	0.41
1979	6.97	1.80	0.98	0.54
1980	6.39	2.01	1.08	0.55
1981	2.65	2.80	1.50	0.49
1982	5.91	3.01	1.69	0.55
1983	5.41	3.23	1.50	0.59
1984	6.83	2.69	1.55	0.53
1985	6.63	3.29	1.44	0.54
1986	13.56	3.06	1.81	0.53
1987	12.09	2.67	1.96	0.62
1988	8.58	3.80	2.46	0.45
1989	3.46	4.24	2.36	0.60
1990	3.78	4.20	2.59	0.65
1991	4.21	3.37	1.85	0.56
1992	6.32	2.75	1.62	0.62
1993	4.09	2.36	1.42	0.64
<b>Average</b>	<b>5.88</b>	<b>2.78</b>	<b>1.55</b>	<b>0.54</b>

**Table 3.9.13** Division VIIe SOLE. Nominal landings (tonnes), 1972-1993 as officially reported to ICES and as used by the Working Group.

Year	Belgium	France	UK (Engl. & Wales)	Other	Total Reported	Unreported <sup>2</sup>	Total as used by WG
1972	6	230 <sup>1</sup>	201	-	437	-	437
1973	2	263 <sup>1</sup>	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 <sup>3</sup>	611	7	799	362	1,161
1990	41	81 <sup>3</sup>	634	1	757	325	1,082
1991	35	111 <sup>2</sup>	480	1	627	104	731
1992	41	122 <sup>2</sup>	456	1	620	149	769
1993 <sup>3</sup>	59	220	468	-	747	17	764

<sup>1</sup>Estimated from Division VIIe total by the Working Group.

<sup>2</sup>Estimated by the Working Group.

<sup>3</sup>Provisional.

**Table 3.9.14** Western English Channel Sole (Division VIIe). Weights in tonnes and numbers in thousands.

<b>Year</b>	<b>Recruitment</b>	<b>Spawning Stock</b>	<b>Fishing Mortality</b>	
	<b>Age 1</b>	<b>Biomass</b>	<b>Landings</b>	<b>Age 3-7</b>
1969	1.17	2.04	0.35	0.19
1970	3.17	2.26	0.39	0.19
1971	2.84	2.08	0.43	0.24
1972	2.31	2.63	0.44	0.19
1973	3.47	2.07	0.46	0.25
1974	3.38	2.37	0.43	0.20
1975	3.09	3.15	0.49	0.17
1976	6.93	3.07	0.62	0.19
1977	4.87	3.62	0.61	0.16
1978	4.36	4.42	0.86	0.21
1979	4.92	5.08	1.18	0.25
1980	8.46	5.47	1.27	0.23
1981	4.74	4.70	1.22	0.28
1982	3.88	5.00	1.45	0.34
1983	6.05	4.37	1.50	0.41
1984	6.68	4.08	1.37	0.40
1985	3.56	3.68	1.41	0.44
1986	5.43	3.67	1.37	0.41
1987	3.38	3.58	1.16	0.36
1988	3.42	3.67	1.35	0.42
1989	2.75	2.72	1.16	0.47
1990	6.90	2.57	1.08	0.42
1991	4.04	2.37	0.73	0.29
1992	3.21	2.97	0.77	0.28
1993	3.71	2.58	0.76	0.34
<b>Average</b>	<b>4.27</b>	<b>3.37</b>	<b>0.91</b>	<b>0.29</b>

**Table 3.9.15 ICES Divisions VIIb,c. Landing Statistics as used by the Working Group.**

**COD Landings, Divisions VIIb,c.**

Country	1988	1989	1990	1991	1992	1993 <sup>1</sup>
France	591	474	206	112	36	116
Germany	-	1	-	-	-	-
Ireland	388	915	795	612	507	356
Norway	2	9	29	11	39	200
UK(England and Wales	23	9	12	35	64	1
UK (N. Ireland)	-	-	-	2	1	2
UK (Scotland)	5	33	300	173	146	67
Total	1009	1441	1342	945	793	742

<sup>1</sup>Preliminary

Norwegian catches, on Russian quotas are included for 1992 and 1993.

**WHITING Landings, Divisions VIIb,c**

Country	1988	1989	1990	1991	1992	1993 <sup>1</sup>
France	113	56	63	40	27	31
Germany, Fed. Rep	+	-	-	-	-	-
Ireland	922	1199	770	540	730	833
UK(England and Wales	12	1	-	15	7	18
UK (N. Ireland)	+	-	-	-	+	-
UK (Scotland)	+	32	38	79	150	146
Total	1047	1288	871	674	914	1028

<sup>1</sup>Preliminary.

**SOLE Landings, Divisions VIIb,c**

Country	1988	1989	1990	1991	1992	1993 <sup>1</sup>
France	2	+	-	5	1	2
Ireland	34	38	41	46	43	59
UK(England and Wales	2	2	-	+	6	+
UK (Scotland)	+	13	91	3	3	2
Total	38	53	132	54	53	63

<sup>1</sup>Preliminary

**PLAICE Landings, Divisions VIIb,c**

Country	1988	1989	1990	1991	1992	1993 <sup>1</sup>
France	9	1	11	9	3	3
Ireland	157	159	130	179	180	191
UK(England and Wales	2	2	-	+	6	-
UK (Scotland)	-	13	91	3	3	2
Total	168	175	232	191	192	196



**Table 3.9.16 ICES Divisions VIIh-k. Landing Statistics as used by the Working Group.**

**COD Landings, Divisions VIIh-k.**

Country	1988	1989	1990	1991	1992	1993 <sup>1</sup>
Belgium <sup>2</sup>	102	229	86	51	81	296
Denmark	+	-	-	+	-	-
France	1960	2137	1313	603	1056	838
Ireland	1593	1244	1285	1528	1002	925
Norway	-	13	20	-	-	-
UK(England and Wales)	104	128	191	189	276	154
UK (N. Ireland)	-	-	-	-	-	-
UK (Scotland)	-	-	2	-	-	-
	2	-	122	19	13	-
Total	3761	3751	3019	2390	2428	2213

<sup>1</sup>Preliminary <sup>2</sup>Includes VIIg

**WHITING Landings, Divisions VIIh-k.**

Country	1988	1989	1990	1991	1992	1993 <sup>1</sup>
Belgium	19	39	67	43	47	2
Denmark	-	-	-	-	-	-
France	777	753	529	367	306	282
Germany Fed. Rep.	-	-	-	-	14	-
Ireland	1771	1483	1304	1068	1455	3033
Norway	109	116	47	103	167	211
UK(England and Wales)	-	-	-	-	-	-
UK (N. Ireland)	-	-	-	-	-	-
UK (Scotland)	1	-	27	12	6	-
Total	2677	2391	1974	1593	1995	3528

<sup>1</sup>Preliminary.

**SOLE Landings, Divisions VIIh-k.**

Country	1988	1989	1990	1991	1992	1993 <sup>1</sup>
Belgium <sup>2</sup>	254	252	353	358	312	345
Denmark	53	84	66	55	70	43
France	182	206	266	306	255	237
Ireland	166	177	144	232	214	203
UK(England and Wales)	-	-	+	-	-	-
UK (N. Ireland)	-	-	-	-	-	-
UK (Scotland)	-	-	-	-	3	-
Total	655	719	829	951	854	828

<sup>1</sup>Preliminary <sup>2</sup>Includes VIIg

**PLAICE Landings, Divisions VIIh-k**

Country	1988	1989	1990	1991	1992	1993 <sup>1</sup>
Belgium <sup>2</sup>	245	403	301	252	246	415
Denmark	+	+	-	+	-	-
France	135	229	77	173	185	64
Ireland	369	454	338	478	477	363
Norway	433	73	88	287	259	182
UK(England and Wales)	-	-	-	-	-	-
UK (N. Ireland)	-	-	-	-	+	+
UK (Scotland)	1	-	1	-	7	-
Total	1183	1159	805	1190	1174	1024

<sup>1</sup>Preliminary <sup>2</sup>Includes VIIg

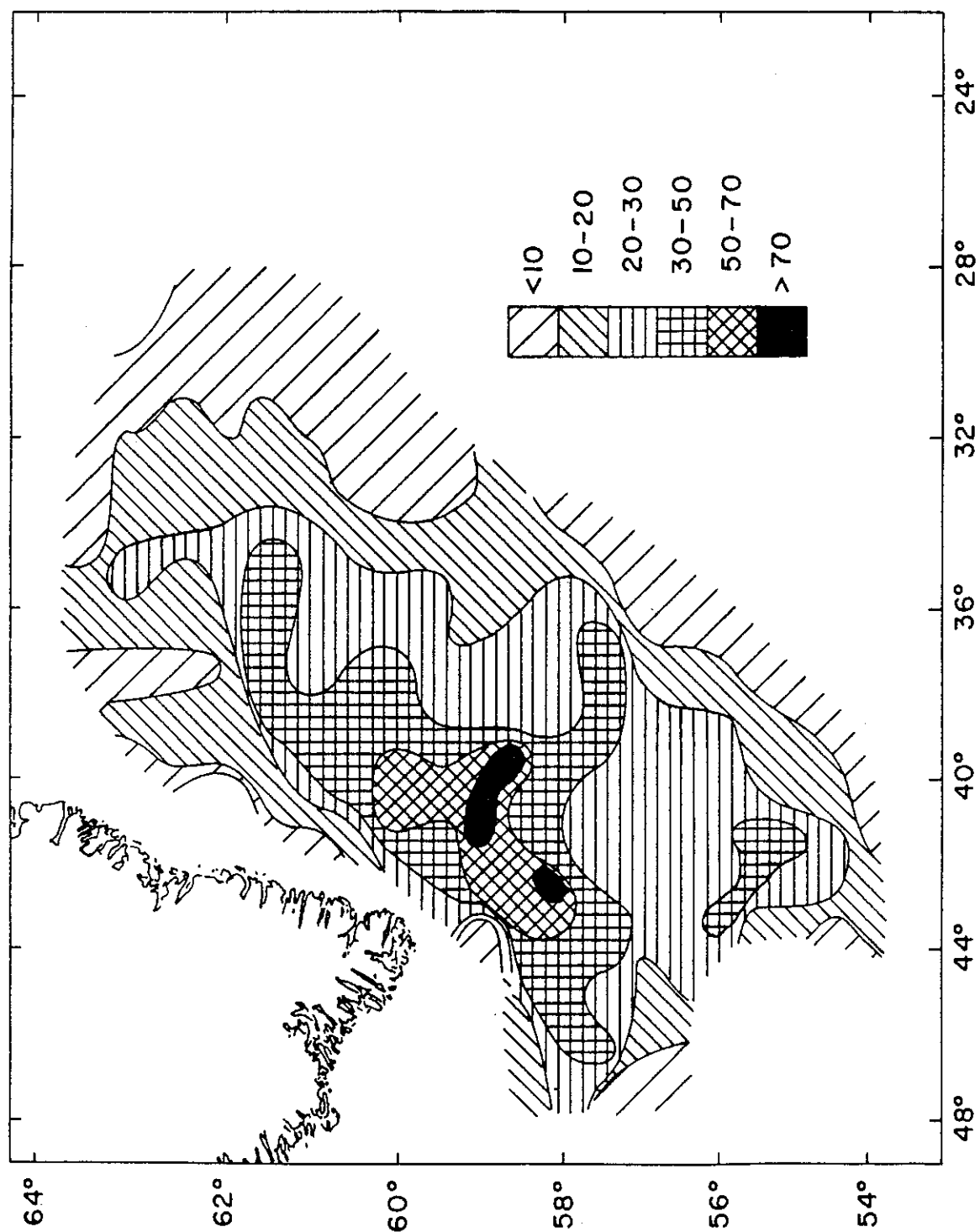
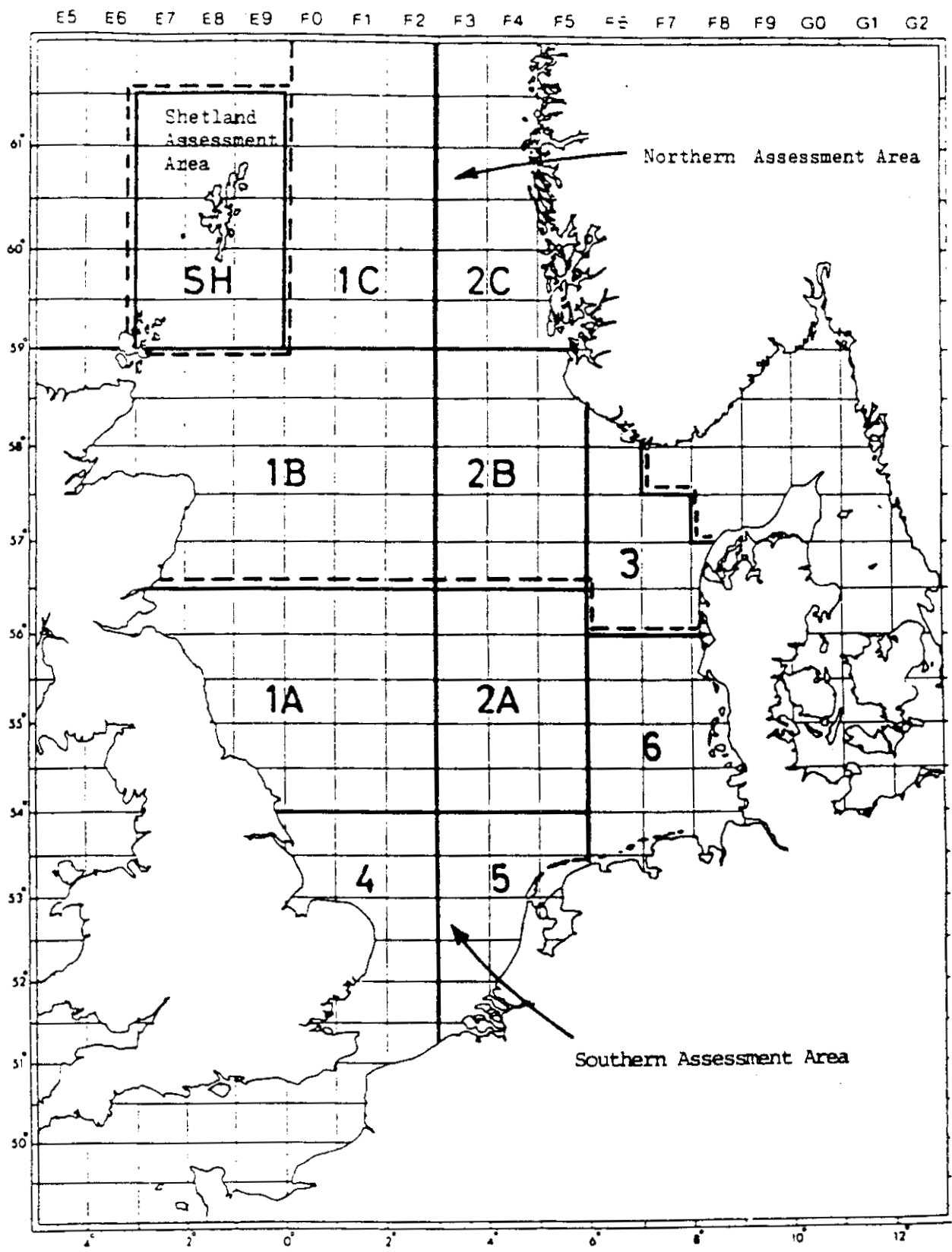


Figure 2.8.1 Distribution and relative density of Oceanic redfish in June/July 1994.

Figure 3.2.1 Danish sandeel areas and assessment areas used by ACFM.



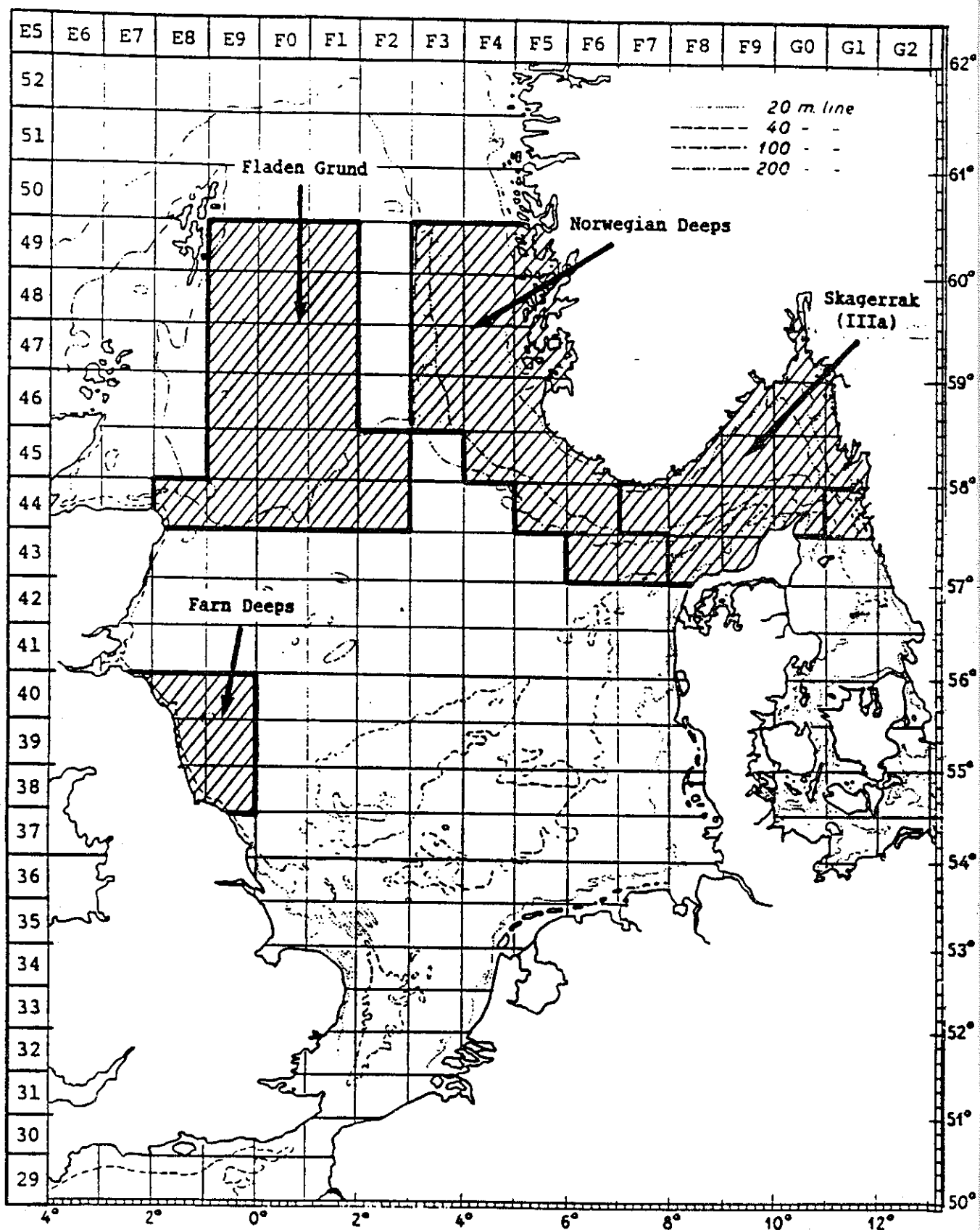


Figure 3.4.1. The Management units of *Pandalus* in ICES Sub-area IV and Division IIIa as defined by statistical squares according to the Working Group.