

FAROESE WATERS: ENVIRONMENT, BIOLOGY, FISHERIES AND MANAGEMENT

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ABSTRACT

The annual marine resources status report produced by the Faroese Fisheries Laboratory (available at www.frs.fo under the title 'Fiskastovnar og Umhvørvi 1998') contains a useful overview of the environment and fish stocks of Faroese waters. Unfortunately, the text is in Faroese, which makes it difficult to read by non-Faroese speaking people. This presents a summary of said report, including legends for

those of its tables and figures not reproduced here. This account thus presents an overview of the marine environment, and fisheries and fisheries management measures, including allocated effort quotas and spatial management patterns.

INTRODUCTION

The report presented here is an extracted and translated summary of the Faroese fisheries status report 'Fiskastovnar og Umhvørvi 1998' (Anon., 1998), which is only available in the Faroese language. In the present document the figures and tables from this status report will be the 'Status Report' or Anon. (1998), and consist of multi-level numbers (e.g., Figure 1.2.3), whereas Tables and Figures explicitly included in the present report are labeled with single-level numbers (e.g., Figure 1).

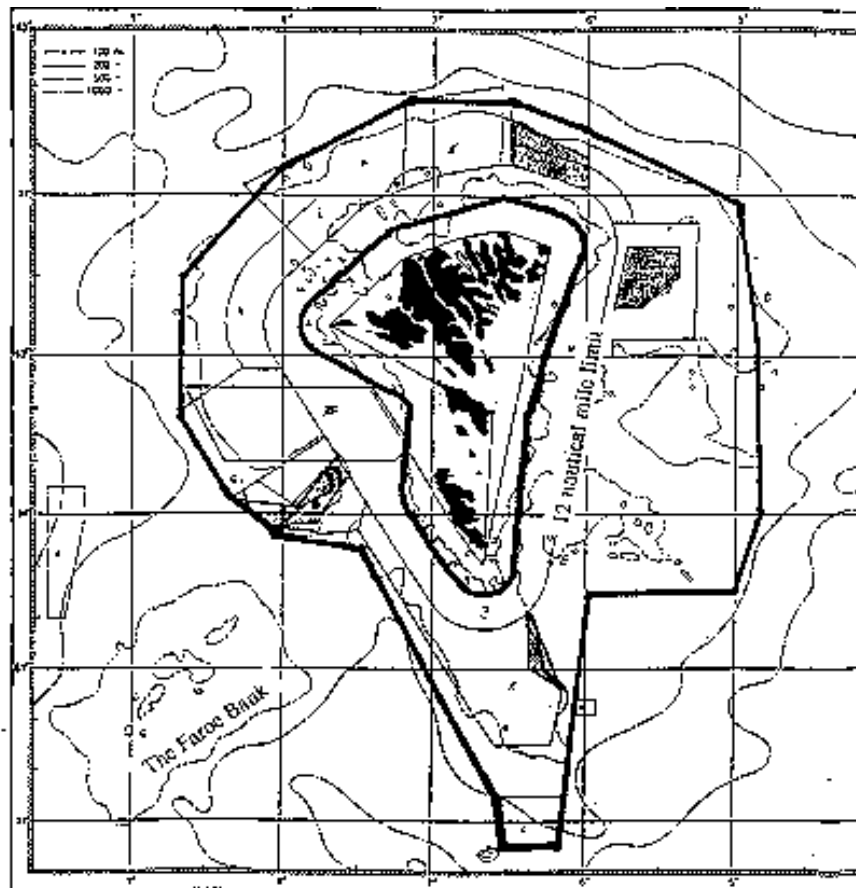


Figure 1. Fishing area regulations in ICES area Vb (Faroe Plateau). Allocation of fishing days applies to the area inside the outer thick line. Holders of effort quotas who fish outside this line can triple their numbers of days. Trawlers are generally not allowed to fish inside the 12 nautical mile limit and only longliners < 100 GRT and jiggers < 100 GRT are allowed to fish inside the innermost thick line. Several areas are closed for parts of the year, to protect spawning areas, exclude separate gears etc.

THE MARINE ENVIRONMENT

The waters around the Faroe Islands are dominated by the North Atlantic Current in the upper 500 m, which to the north of the islands meets the East Icelandic Current (Figure 2.2.2 in Anon., 1998). Clockwise current systems create retention areas on the Faroe Plateau and on the Faroe Bank. The deeper waters to the north and east consist of deep Norwegian Sea water and to the south and west of Atlantic water (Figure 2.2.3 in Anon., 1998). From the late 1980s the intensity of the North Atlantic current passing the Faroe area was found to be decreasing. The productivity of the Faroese waters was very low and recruitment and growth of many fish stocks was very poor during this time. However, in recent years productivity has increased again. Measurements of phytoplankton production show that the situation has gradually improved since 1991. This is illustrated in Figure 2.3.2 in Anon. (1998) which shows the reduction of the nitrate content from winter to late June from 1990-1997. In Figure 2.3.2 of the same report, the phytoplankton biomass per month for 1997 is shown as $\mu\text{g}\cdot\text{l}^{-1}$ of Chlorophyll *a*, illustrating a typical year sequence. The biomass of zooplankton in June 1991-1997 on the Faroe Plateau shallower than 200 m is also shown in Figure 2.3.7 (Anon., 1998) measured as $\text{mg}\cdot\text{m}^{-3}$ dry weight. Since 1992, the recruitment of important prey fish species, such as sandeel (*Ammodytes* spp.) and Norway pout (*Trisopterus esmarki*), has been good, and the growth of fish such as cod (*Gadus morhua*), haddock (*Melanogrammus aeglefinus*) and saithe (*Pollachius virens*) has improved considerably. As well, the productivity of important seabirds has also improved.

TOPOGRAPHY

The topography of Faroese waters is shown in status report Figure 2.2.1 in Anon. (1998), and Table 1 gives the sizes of different areas.

THE FISHERIES AND ASSOCIATED MANAGEMENT MEASURES

For centuries the fishing grounds around the Faroe Islands have been open to international fisheries, involving several countries. Apart from a local fishery with small wooden boats, the Faroese offshore fishery started in the late 19th century. In order to compete with international fisheries, particularly British vessels, a large part of the Faroese fishing fleet specialized as a long-

distance fleet and fishing in other areas. Thus, most of the Faroese fleet fished around Iceland, at Rockall, in the North Sea and in more distant waters like Grand Bank, Flemish Cap, Greenland, the Barents Sea and Spitzbergen (Svalbard).

Table 1. Surface areas of different regions within the Faroese 200 nm Exclusive Economic Zone. When a particular area includes the Faroe Islands, the land area of the Islands (1,400 km²) is included. To obtain sea areas only for those cases, the 1,400 km² must be subtracted.

Area	Size (km ²)
Faroe Islands (land)	1,400
200 nm zone (includes land)	273,800
ICES Sub-division Vb1 (includes land)	174,600
ICES Sub-Division Vb2	20,750
Faroe Plateau < 200 m (includes land)	21,400
Faroe Plateau 200-500 m	14,900
Faroe Bank < 200 m	4,900
Faroe Bank 200-500 m	3,000
Bill Bailey < 200 m	600
Bill Bailey 200-500 m	2,500
Lousy Bank < 500 m	2,700
Faroe-Iceland Ridge	17,500

Up to 1959, all international vessels were allowed to fish around the Faroe Islands outside the 3 nm fisheries zone. During the 1960s, the fisheries zone was gradually expanded, and in 1977 an EEZ of 200 nm was introduced in the Faroe area. The demersal fishery by foreign countries has since decreased and Faroese vessels now take most of the catches. The fishery may be considered a multi-fleet and multi-species fishery, and is described in Appendix 2.

During the 1980s and 1990s, the Faroese authorities began to regulate the fishery and investment in fishing vessels. Since 1987 a system of fishing licenses has been introduced, and the demersal fishery of the Faroe Islands has been regulated using technical measures including minimum mesh sizes and closed areas. Closed areas are used in order to protect juveniles and young fish. Fishing is temporarily prohibited (for 1-2 weeks) in areas where the number of small cod, haddock and saithe exceeds 30% of the total catch. After 1-2 weeks of closure the areas are again opened for fishing. A reduction of effort has also been attempted through banning of new licenses and buy back of licenses.

A new quota system, based on Individual Transferable Quotas (ITQ), was introduced in 1994. The fishing year started on September 1 and ended on August 31 the following year. The aim of

the quota system was, to restrict Total Allowable Catches (TACs) for the period 1994–1998, in order to increase the Spawning Stock Biomass (SSB) of Faroe Plateau cod and haddock to 52,000 t and 40,000 t, respectively. The TAC for saithe was set higher than recommended by scientists. It should be noted that cod, haddock and saithe are caught in a mixed fishery and any management measure should account for this. Species under the quota system were Faroe Plateau cod, haddock, saithe, redfish and Faroe Bank cod.

The catch quota management system introduced in the Faroese fisheries in 1994 was met with considerable criticism by the industry, and resulted in substantial discarding and mis-reporting of catches. Reorganization of enforcement and control did not solve the problems. As a result of the dissatisfaction with the catch quota management system, the Faroese Parliament discontinued the system from May 31 1996. In close co-operation with the fishing industry, the Faroese government has developed a new system based on ‘fleet category individual transferable effort quotas’, measured in days. The new system was put into place June 1, 1996 and the fishing year from September 1 to August 31, as introduced under the catch quota system, has been maintained.

The individual transferable effort quotas apply to:

- longliners less than 100 GRT;
- longliners greater than 100 GRT;
- jiggers;
- single trawlers less than 400 HP; and
- pair trawlers.

The single trawlers greater than 400 HP do not have effort limitations, but they are not allowed to fish within the 12 nautical mile limit. The areas closed to them, as well as to the pair trawlers, have increased in area and time. Their catch of cod and haddock is limited by maximum bycatch allocation. The single trawlers less than 400 HP are given special licenses to fish in certain areas inside 12 nautical miles with a bycatch allocation of 30% cod and 10% haddock. In addition, they must use sorting devices in their trawls.

One fishing day by longliners less than 100 GRT is considered equivalent to two fishing days for jiggers in the same gear category. Longliners less than 100 GRT could therefore double their allocation by converting to jigging. Table 2 shows the number of fishing days used by this fleet category for 1985–1995 and 1998–1999 and Table 3 shows the number of allocated days inside the outer thick line in Figure 1. Holders of individual transferable effort quotas who fish outside this line can fish for 3 days for each day allocated inside the line.

Table 2. Number of fishing days^{a)} used by various fleet groups in ICES area Vb1 1985–99. For other fleets there are no effort limitations. Catches of cod (*Gadus morhua*), haddock (*Melanogrammus aeglefinus*), saithe (*Pollachius virens*) and redfish (*Sebastes* spp.) are regulated by the by-catch percentages given in section 2.1.1. In addition there are special fisheries regulated by licenses and gear restrictions.

Year	Longliner 0-110 GRT, jigger, trawlers < 400 HP	Longliner > 110 GRT	Pairtrawlers > 400 HP
1985	13,449	2,973	8,582
86	11,399	2,176	11,006
87	11,554	2,915	11,860
88	20,736	3,203	12,060
89	28,750	3,369	10,302
90	28,373	3,521	12,935
91	29,420	3,573	13,703
92	23,762	2,892	11,228
93	19,170	2,046	9,186
94	25,291	2,925	8,347
95	33,760	3,695	9,346
mean (85-95)	(22,333)	3,023	10,778
98	23,971	2,519	6,209
99	21,040	2,428	7,135
mean (98-99)	(22,506)	2,474	6,672

^{a)} This is the real number of days fishing not affected by doubling or tripling of days by changing areas/gears.

The effort quotas are transferable within gear categories. The allocations of number of fishing days by fleet categories was arranged in such a manner that, together with other regulations of the fishery, they should result in average fishing mortalities of 0.45 year⁻¹ on each of the three stocks, corresponding to average annual catches of 33% of the exploitable stocks in numbers. Built into the system is also an assumption that the day system is self-regulatory, because the fishery will

move between stocks according to the relative availability of each of them and no stock will be overexploited.

In addition to the number of days allocated, it is also stated in the legislation what percentage of total catches of cod, haddock, saithe and redfish, each fleet category on average are allowed to fish (Table 4).

Table 3. Number of allocated days for each fleet group since the new management scheme was adopted and number of licenses per fleet.

Fleets		1996/97	1997/98	1998/99	1999/2000	No. of licenses
Group 1	Single trawlers > 400 HP	- Regulated by area and by-catch limitations -				13
Group 2	Pair trawlers > 400 HP	8,225	7,199	6,839	6,839	31
Group 3	Longliners > 110 GRT	3,040	2,660	2,527	2,527	19
Group 4	Longliners and jiggers 15-110 GRT, single trawlers < 400 HP	9,320	9,328	8,861	8,861	106
Group 5	Longliners and jiggers < 15 GRT	22,000	23,625	22,444	22,444	696

Table 4. Legally defined average percentage of total annual catch of cod (*Gadus morhua*), haddock (*Melanogrammus aeglefinus*), saithe (*Pollachius virens*) and redfish (*Sebastes* spp.) allocated to gear category for Faroese vessels.

Fleet category	Percentage catch			
	Cod	Haddock	Saithe	Redfish
Longliners < 110 GRT, Jiggers, Single trawl.<400HP	51.0	58.00	17.5	1.0
Longliners > 110GRT	23.0	28.00	0.0	0.0
Pairtrawlers	21.0	10.25	69.0	8.5
Single trawlers > 400 HP	4.0	1.75	13.0	90.5
Others	1.0	2.00	0.5	0.5

Technical measures such as area closures during the spawning periods to protect juveniles and young fish, and mesh size regulations as mentioned above are still in effect. Overviews of spawning area closures and areas closed to trawling, together with the periods when the areas are closed, are given in Figure 2 and 3, respectively. In addition to these trawl ban areas, no trawling is allowed within twelve nautical miles of the Faroese territorial baseline. However, during summer, 10-15 small trawlers (<500 Hp) are allowed to fish in specified areas within this limit, targeting mainly lemon sole and plaice.

200 m are permanently closed to all trawl gear, and the longline fishery is regulated by individual day quotas.

ACKNOWLEDGEMENTS

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REFERENCES

Anon. 1998. Fiskastovnar og Umhvørvi. Lagt til rættis: Fiskirannsóknarstovan. Available at: www.frs.fo

The Faroe Bank (ICES area Vb2) is managed separately from the Faroe Plateau (ICES area Vb1). Areas on the Faroe Bank shallower than

Closed spawning areas.

Nr	From	To
1	15-Feb	31-Mar
2	15-Feb	15-Apr
3	15-Feb	15-Apr
4	01-Feb	01-Apr
5	15-Jan	15-May
6	15-Feb	15-Apr
7	15-Feb	15-Apr
8	15-Jan	01-Apr

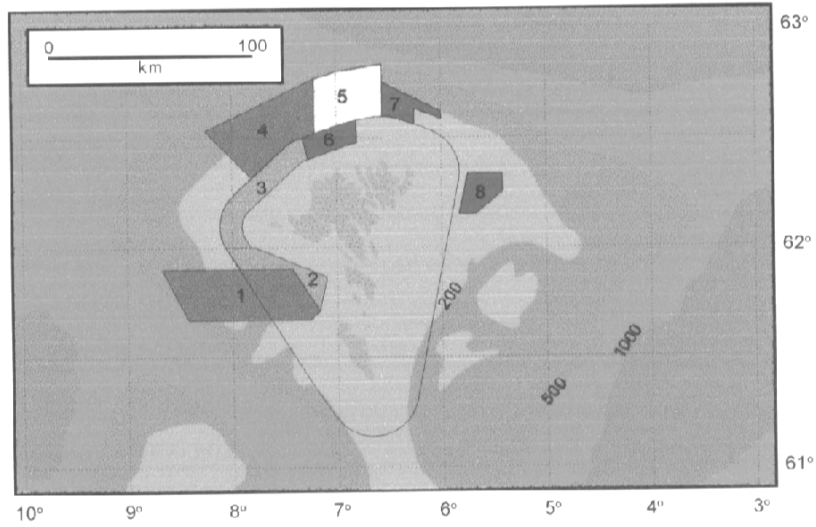


Figure 2. Spawning area closures (all gears) in ICES area Vb1 (Faroe Plateau) and the time periods of closure.

Areas closed for trawl fishery.

Nr.	From	To	> 500 hk
A	01-Jan	31-Dec	
a	01-Jun	31-Aug	
B	20-Jan	01-Mar	
C	01-Jan	31-Dec	
D	01-Jan	31-Dec	
E	01-Apr	31-Jan	
F	01-Jan	31-Dec	
G	01-Jan	31-Dec	
H	01-Jan	31-Dec	
I	01-Jan	31-Dec	500
J	01-Jan	31-Dec	500
K	01-Jan	31-Dec	
L	01-Jan	31-Dec	
M	01-Feb	01-Jun	
O	01-Jan	31-Dec	
P	01-Jan	31-Dec	
R	01-Jan	31-Dec	500
S	01-Jan	31-Dec	500

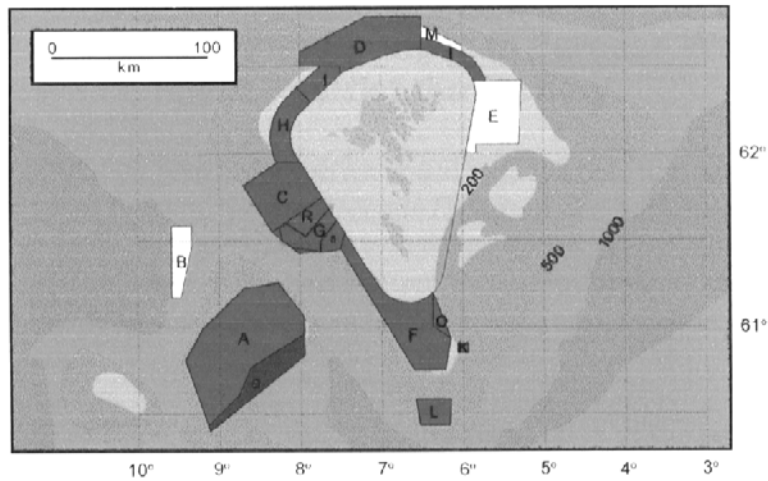


Figure 3. Areas in ICES Vb1 outside the 12 nm zone around the Faroe Islands that are closed for trawl fishery and the periods when they are closed.

APPENDIX 1: LEGENDS TO FIGURES AND TABLES IN 'FISKASTOVNAR OG UMHVØRVI 1998' (ANON., 1998)

Text in Faroese only (*www.frs.fo*)

2.2 The ocean surrounding the Faroe Islands

2.2.1 Bottom topography in the ocean surrounding the Faroe Islands.

Table 2.2.1. Standard values for temperature and salinity in the various watermasses in Faroese waters.

Water mass	Temp. (°C)	Salinity
Atlantic water	7-9	35.14-35.35
East Icelandic water	2-4	34.7-34.9
Norwegian Atlantic water	~5	~ 35.0
Scottish Atlantic water	9-11	35.25-35.45
Deep Norwegian Sea water	-1-0	34.9
Faroe Plateau water	6-10	35.0-35.25

2.2.2 Mean features of the upper-layer circulation in the eastern North Atlantic. NAS = North Atlantic Current, EIS = East Icelandic Current; SSS = Scottish Slope Current; JMF = Jan Mayen Front; ÍF = Iceland Front; FS = Faroe Current; IS = Irminger Current; EGS = East Greenland Current.

2.2.3 At depths of approximately 500 m and deeper, very cold sea water is found to the east of the East Greenland - Scotland ridge as opposed to the area west of the ridge with much warmer sea water at all depths. Occasionally, cold water flows over the ridge into the Atlantic, and a steady flow through the Faroe Bank Channel is to the west (the white arrows).

2.2.4 Three cross-sections of the Faroe plateau (location indicated on the map). Each shows the average depth of the various water masses.

2.2.5 Average direction (arrows) and strength (length of arrow) of the current around the Faroe Plateau. Release points of drifters at black dots.

2.3 Plankton in Faroese Waters

2.3.1 Schematic representation of the first three trophic levels in the ocean. In the first level are the primary producers (phytoplankton), in the second level are the grazers (herbivorous zooplankton) and in the third are the larger zooplankton feeding on smaller zooplankton. In the figure, only fish larvae are shown in the third trophic level. Many other organisms, however, may be in that level as well. The organisms representing each trophic level are only selected examples of the many marine species that could be present in that level.

2.3.2 Phytoplankton biomass ($\mu\text{g chl. } a \text{ l}^{-1}$) and nitrate concentrations (μM) on the central Faroe shelf (northeast of Nólsoy) during 1997.

2.3.3 Nitrate concentrations on the central Faroe shelf between 3 May 1995 and 4 June 1998. The samples were collected to the north of Skopun.

2.3.4 Reduction in nitrate concentrations on the Faroe shelf from winter concentrations to 26 June each year during the period 1990-1997.

2.3.5 Abundance of copepods and barnacle larvae on the central Faroe shelf during 1997. Copepod larvae are not included in the figure although they were found in significant numbers. No other zooplankton occurred in significant amounts.

2.3.6 Egg production of the copepod *Calanus finmarchicus* (eggs female⁻¹ day⁻¹) on the Faroe shelf during 17-25 April 1998.

2.3.7 Mean zooplankton biomass (mg dry weight m⁻³) in the upper 50 meters of the water column on and off the Faroe shelf, respectively, in June 1990-1997.

2.3.8 Absolute and relative abundance of neritic and oceanic copepods on the Faroe shelf during June from 1989 to 1997.

2.3.9 Mean abundance of barnacle larvae (upper figure) and relative abundance of barnacle larvae and copepods (lower figure) on the Faroe shelf during May from 1989 to 1997.

3.1 Fish and Fisheries Biology

3.1.1 Elements that affect the size of the fish stock.

3.1.2 The graph depicts the decrease in number of an average year class of cod and Norway pout on the Faroe Plateau. This graph only takes into account the effects of natural mortality.

3.1.3 The graph depicts the decrease in numbers of cod for an average year on the Faroe Plateau for three different fishing mortality rates. Calculations are based on a natural mortality rate of 0.2 and a recruitment age of two years.

3.1.4 Relationship between natural mortality rates and percentage of total fish population on the Faroe Plateau.

3.1.5 Mean length and mean weight at age for cod on the Faroe Plateau.

3.1.6 The graph depicts the biomass with age for an average year class of cod under normal growth conditions at different fisheries mortality rates.

3.1.7 Projection of yield per recruit on the Faroe Plateau at different fishing mortality rates.

3.1.8 Age distribution of herring in landings from the North Sea in the years 1952, 1962 and 1972. Fishing mortality rates for these years are also indicated.

3.1.9 Projection of the number of cod on the Faroe Plateau over a ten year period assuming 1) a natural mortality rate of 0.2 for all ages; 2) a fishing mortality rate of 0.0 for ages 1-2, 0.3 for age 3, and 0.7 for age 4 and older; 3) an average fishing pattern over the last ten years; and 4) a recruitment of 16 million fish at age two. The graph shows that under current fishing patterns only a few age groups will be represented in the fishery.

Table 3.1.1 Overview over samples from landings at Faroe Islands in 1997. Numbers of samples measured and weighed are presented as numbers of fishes which are length measured or weighed respectively. Number of samples age measured are those which, in addition to being length measured, had their otoliths taken for aging. Species of fish listed: Cod (*Gadus morhua*), Faroe Plateau, cod, Faroe Bank, haddock (*Melanogrammus aeglefinus*), saithe (*Pollachius virens*), redfish (*Sebastes* spp.), tusk (*Brosme brosme*), ling (*Molva molva*), blue ling (*Molva dypterygia*), Greenland halibut (*Reinhardtius hippoglossoides*), whiting (*Merlangius merlangus*), blue whiting (*Micromesistius poutassou*), greater silver smelt (*Argentina silus*), angler fish (*Lophius* sp.), plaice (*Pleuronectes platessus*), Norway lobster (*Nephrops norvegicus*), queen scallop (*Chlamys islandica*).

3.1.1. Elements affecting fish stocks

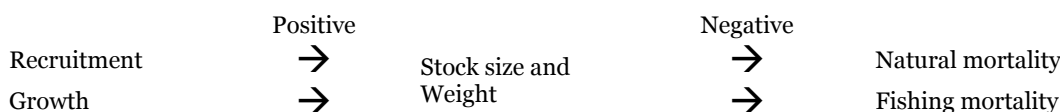


Table 3.1.2. Sample of short-term predictions for catches and stocks, in this case of haddock in the Faroes region. (See chart).

Fisheries policy	Fishing mortality (year ⁻¹)	Fishery catch (tonnes)	Spawning stock (tonnes)
No fishery	0.00	0	74,000
Fishing mortality < 30% of 1996 level	0.21	12,000	59,000
Fishing mortality equal to 1996 level	0.31	16,000	54,000
Fishing mortality > 30% of 1996 level	0.40	20,000	49,000

3.2 Catches and Fishing Fleet

3.2.1 Landings by Faroese vessels of demersal fish from Faroese waters.

3.2.2 Landings of demersal fish from Faroese waters by gear type.

Y-axis: Landings (tonnes)
 X-axis: Year
 Black circles: Trawling and Gill-netting
 Clear squares: Hook and line

Table 3.2.1 Number of fishing days by vessel type in Faroese waters, 1985-1996. Unfortunately, there are as yet no reliable numbers for 1997. It is anticipated, however, that levels will remain the same as the previous year. These are the vessels types used for stock assessments. For the purpose of this report, more vessel types are included than those defined in Faroese regulations. Gear types listed: Open boats, smaller vessels using hook and line, small trawlers, gill-netting vessels, jigging vessels, single trawlers < 1000 Hp, single trawlers > 1000 Hp, pair trawlers < 1000 Hp, pair trawlers > 1000 Hp, larger longline vessels.

3.2.3 Average landings of demersal fish per fishing day by three vessel types for the years 1985-1996. Listed from top to bottom: Single trawlers >1000 Hp, pair trawlers >1000 Hp, single trawlers < 1000 Hp.

3.2.4 Average landings of demersal fish per fishing day by three vessel types for the years 1985-1996. Listed from top to bottom: Larger longliners, small trawlers, smaller vessels using hook and line.

4.2 Cod (*Gadus morhua*) from the Faroe Plateau

Table 4.2.1 Faroese landings of cod taken from the Faroe Plateau 1985-1997, by gutted weight in tonnes (bottom row) and corresponding percentages taken by each commercial fleet. The column to the right shows in percentages how important Faroe Plateau cod as a fishing species has been for each fleet during this period.

4.2.1 Main spawning grounds of cod on the Faroe Plateau.

4.2.2 Growth rate of Faroe Plateau cod as shown by mean length (cm) as a function of age (years). Data are from the yearly spring survey. Length at 50 % maturity is also shown.

4.2.3 Total landings of cod (in round weight) from the Faroe Plateau 1903-1997. For the years 1903-1964, the landings from the Faroe Bank are also included.

4.2.4 Cod landings per unit of effort expressed as kg/day for selected commercial fleets (pair trawlers > 1000 HP and longliners > 100 GRT) and the survey vessel *Magnus Heinason* expressed as kg/two fishing-hours.

4.2.5 Total landings of cod for 1997 shown as percentage of fish in each age group.

4.2.6 Average weight of Faroe Plateau cod 1960-1997. The graph represents the mean year class strength of the weight of four, five, six and seven year old cod.

4.2.7 Year class strength of cod 1959-1996 as two-year olds. The number for 1996 is based on the spring survey, in contrast to the others, which are based on virtual population analysis (VPA).

4.2.8 Spawning biomass of Faroe Plateau cod 1961-1997 in tonnes at the beginning of each year.

4.2.9 Fishing mortality of Faroe Plateau cod as a mean for 3-7 year old cod.

4.2.10 Yield-per-recruit as a function of fishing mortality of Faroe Plateau cod. Arrows indicate the

fishing mortality giving the highest yield-per-recruit (F_{max}) and the fishing mortality in 1997 (F_{97}).

4.3 Cod from the Faroe Bank

Table 4.3.1 Faroese landings of cod taken from the Faroe Bank 1985-1997, by gutted weight in tonnes (bottom row) and corresponding percentages taken by each commercial fleet. The column to the right shows in percentages how important Faroe Bank cod as a fishing species has been for each fleet during this period.

4.3.1 Growth rate of Faroe Bank cod as shown by mean length (cm) as a function of age (years). Data are from the yearly spring survey. Length at 50 % maturity is also shown.

4.3.2 Total landings of Faroe Bank cod (round weight) 1965-1997.

4.3.3 Landings of Faroe Bank cod per unit of effort expressed as kg/day for the larger longliners (>100 GRT) and smaller longliners (<100 GRT) 1988-1997.

4.3.4 Landings of Faroe Bank cod per unit of effort expressed as kg/hour from the spring survey 1983-1998, based on hauls from depths < 200 m.

4.4 Haddock (*Melanogrammus aeglefinus*)

Table 4.4.1 Faroese landings of haddock taken from the Faroe area 1985-1997, by gutted weight in tonnes (bottom row) and corresponding percentages taken by each commercial fleet. The column to the right shows in percentages how important Faroe haddock as a fishing species has been for each fleet during this period.

4.4.1 Main spawning grounds of haddock on the Faroe Plateau.

4.4.2 Growth rate of Faroe haddock as shown by mean length (cm) as a function of age (years). Data are from the yearly spring surveys 1983-1997. As three years old, 60% have attained maturity.

Table 4.4.2 Short-term predictions for catches of Faroe haddock. Landings in 1998 are set at 14,000 tonnes, corresponding to a fishing mortality of 0.32 (equal to 1997). The spawning biomass at 1 January 1999 is estimated to be 42,000 tonnes.

Fisheries policy	Fishing mortality (year ⁻¹)	Fishery catch (tonnes)	Spawning stock (tonnes)
No fishery	0.00	0	48,000
Fishing mortality < 20% of 1997 level	0.25	9,000	38,000
Fishing mortality equal to 1997 level	0.32	11,000	36,000
Fishing mortality > 20% of 1997 level	0.38	13,000	34,000

4.4.3 Total landings of haddock (in round weight) from the Faroe area 1903-1997.

4.4.4 Haddock landings per unit of effort expressed as kg/day for selected commercial fleets (pair trawlers > 1000 HP, longliners > 100 GRT and longliners < 100 GRT).

4.4.5 Total landings of haddock for 1997 shown as percentage of fish in each age group.

4.4.6 Average weight of Faroe haddock (age group 3-7) since 1976.

4.4.7 Yearly class-strength of haddock 1959-1996 as two-year olds. The numbers for 1996-97 are based on the spring survey in contrast to the others which are based on virtual population analysis (VPA).

4.4.8 Spawning biomass of Faroe haddock 1961-1997 in tonnes at the beginning of each year.

4.4.9 Fishing mortality of Faroe haddock as a mean for 3-7 year old haddock.

4.4.10 Yield-per-recruit as a function of fishing mortality of Faroe haddock. Arrows indicate the fishing mortality giving the highest yield-per-recruit (F_{max}) and the fishing mortality in 1997 (F_{97}).

4.5 Saithe (*Pollachius virens*)

Table 4.5.1 Faroese landings of saithe taken from the Faroe area 1987-1997, by gutted weight in tonnes (bottom row) and corresponding percentages taken by each commercial fleet. The column to the right shows in percentages how important Faroe saithe a fishing species has been for each fleet during this period.

Table 4.5.2 Short-range prediction of landings and spawning biomass of Faroe saithe. Landings in 1998 are set at 21,000 tonnes, corresponding to a fishing mortality of 0.44.

4.5.1 Main spawning grounds of saithe on the Faroe Plateau.

4.5.2 Growth rate of Faroe saithe as shown by mean length (cm) as a function of age (years). Data are from landings 1995-1997. As five year old 50% have attained maturity.

4.5.3 Total landings of saithe (in round weight) from the Faroe area in this century.

4.5.4 Saithe landings per unit of effort expressed as kg/day for selected commercial fleets (pair trawlers > 1000 HP, Single trawler >1000 HP and jiggers).

4.5.5 Total landings of saithe for 1997 shown as percentage of fish in each age group.

4.5.6 Average weight of Faroe saithe (age group 4-8) since 1960.

4.5.7 Yearly class-strength of saithe 1957-1996 as three-year old fish. The numbers for 1996-97 are preliminary estimates in contrast to the others which are based on virtual population analysis (VPA).

4.5.8 Spawning biomass of Faroe saithe 1960-1997 in tonnes at the beginning of each year.

4.5.9 Fishing mortality of Faroe saithe as a mean for 3-7 year old saithe.

4.5.10 Yield-per-recruit as a function of fishing mortality of Faroe saithe. Arrows indicate the fishing mortality giving the highest yield-per-recruit (F_{max}) and the fishing mortality in 1997 (F_{97}).

4.6 Redfish (*Sebastes* spp.)

4.6.1a Distribution of the western stock complex of ocean perch (*Sebastes marinus*).

4.6.2 Mean length at age for ocean perch and deep sea redfish. As redfish are difficult to age, especially at older ages (more than 25 years), the figure is tentative only.

4.6.1b Distribution of the western stock complex of deep sea redfish (*Sebastes mentella*).

4.6.3 Total landings of redfish from the western area (Faroes, Iceland, East Greenland, Rockall and Hatton Bank) during this century. Shown also are the landings from the Faroe area.

Table 4.6.1 Faroese landings of redfish taken from the Faroe Plateau 1985-1997, by gutted weight in tonnes (bottom row) and corresponding percentages taken by each commercial fleet. The column to the right shows in percentages how important redfish as a fishing species has been for each fleet during this period.

4.6.4 Landings per unit of effort expressed as tonnes/day of redfish by the larger, wet-fish trawlers in the Faroes, 1985-1997.

4.6.5 Total landings of ocean perch from the western area (Faroes, Iceland, East Greenland, Rockall and Hatton Bank) since 1978. Also shown are the landings from the Faroe area.

4.6.6 Length distribution of ocean perch in Faroese landings from the Faroe area in 1995.

4.6.7 Total landings of deep sea redfish from the western area (Faroes, Iceland, East Greenland, Rockall and Hatton Bank) since 1978. Also shown are the landings from the Faroe area.

4.6.8 Length distribution of deep sea redfish in Faroese landings from the Faroe area in 1997.

4.7 Blue Ling (*Molva dypterygia*)

Table 4.7.1 Faroese landings of blue ling taken from the Faroe Plateau 1985-1997, by gutted weight in tonnes (bottom row) and corresponding percentages taken by each commercial fleet. The column to the right shows in percentages how important blue ling as a fishing species has been for each fleet during this period.

4.7.1 The distribution of blue ling (*Molva dypterygia*) in the Northeast Atlantic.

4.7.2 Growth rate of blue ling based on investigations with 'R/V' *Magnus Heinason* 1987-1993. Also indicated is the age when 50% have attained sexual maturity. From the graph it can be seen that the males mature approximately one year earlier than the females. Blue ling are difficult to age and the values represent a best estimate.

4.7.3 Total landings of blue ling from the Faroe area since 1963.

4.7.4 Landings per unit of effort expressed as tonnes/day of blue ling by the larger, wet-fish trawlers (> 1000 HP) in the Faroe area during the period March-May 1985-1997.

4.7.5 Length distribution of blue ling in Faroese landings from the Faroe area in 1997.

4.8 Ling (*Molva molva*)

Table 4.8.1 Faroese landings of ling taken from the Faroe Plateau 1985-1997, by gutted weight in tonnes (bottom row) and corresponding percentages taken by each commercial fleet. The column to the right shows in percentages how important ling as a fishing species has been for each fleet during this period.

4.8.1 The distribution of ling (*Molva molva*) in the Northeast Atlantic.

4.8.2 Average growth rate of ling based on age readings taken of Faroese landings in January-June 1996 (five-year and older fish) and from Icelandic bottom trawl surveys (one to four-year old fish). As the growth rate might vary between the Faroes and Iceland, the results should be treated with caution.

4.8.3 Total landings of ling from the Faroe area since 1904.

4.8.4 Landings per unit of effort expressed as kg/day of ling by the larger, longline vessels in the Faroe area during the period 1985-1997.

4.8.5 Age distribution of ling in Faroese landings from the Faroe area in 1997.

4.9 Tusk (*Brosme brosme*)

Table 4.9.1 Faroese landings of tusk taken from the Faroe Plateau 1985-1997, by gutted weight in tonnes (bottom row) and corresponding percentages taken by each commercial fleet. The column to the right shows in percentages how important tusk as a fishing species has been for each fleet during this period.

4.9.1 Distribution of tusk (*Brosme brosme*) in the Northeast Atlantic.

4.9.2 Average growth rate of tusk based on age readings taken of Faroese landings in January-June 1996 (seven-year and older fish) and from Icelandic bottom trawl surveys (one to six-year old fish). As the growth rate might vary between the Faroes and Iceland, the results should be treated with caution.

4.9.3 Total landings of tusk from the Faroe area since 1906.

4.9.4 Landings per unit of effort expressed as kg/day of ling by the larger, longline vessels in the Faroe area in the period 1985-1997.

4.9.5 Age distribution of tusk in Faroese landings from the Faroe area in 1997.

4.10 Greenland Halibut (*Reinhardtius hippoglossoides*)

Table 4.10.1 Faroese landings of Greenland halibut from the Faroese fishing area 1985-1997, as shown by the gutted weight in tonnes (bottom row) and corresponding percentages taken by each commercial fleet. The column to the right shows in percentages how important Greenland halibut as a fishing species has been for each fleet during this period.

4.10.1 Total landings of Greenland halibut (round weight) in the Faroese fishing area 1971-1997 and total landings in Faroese, Icelandic, and East Greenland fishing areas combined.

Table 4.10.2 Short-range prediction of landings and spawning biomass of Greenland halibut. Landings in 1998 are set at 23,000 tonnes, corresponding to a 20 % reduction in fishing mortality from 1997 to 1998. This yields a spawning biomass of 61,000 tonnes as of 1 January 1999.

4.10.2 Landings per unit of effort expressed as kg/day of Greenland halibut for Faroese gill-netters, single trawlers > 1000 HP, and longliners > 100 GRT.

4.10.3 Length distribution of 1997 landings of Greenland halibut for single trawlers and gill-netters.

4.10.4 Spawning stock biomass of Greenland halibut in Faroese, Icelandic, and East Greenland fishing areas combined.

4.10.5 Year class strength of Greenland halibut 1970-1992 as number of five-year olds.

4.10.6 Fishing mortality of Greenland halibut 1975-1997, averaged for age classes 8-12 years.

4.10.7 Yield-per-recruit of Greenland halibut as a function of fishing mortality.

4.11. Angler Fish (*Lophius* spp.)

Table 4.11.1 Faroese landings of anglerfish from the Faroese fishing area 1985-1997, as shown by the gutted weight in tonnes (bottom row) and corresponding percentages taken by each commercial fleet. The column to the right shows in percentages how important anglerfish as a fishing species has been for each fleet during this period.

4.11.1 Total landings of anglerfish (round weight) in the Faroese fishing area 1906-1997.

4.11.2 Landings per unit of effort expressed as kg/day of anglerfish for Faroese gill-netters, single trawlers < 400 HP, single trawlers 400-1000 HP, and single trawlers > 1000 HP.

4.11.3 Length distribution of anglerfish in the 1997 landings for gill-netters.

4.12 Lemon Sole (*Microstomus kitt*)

Table 4.12.1 Faroese landings of lemon sole from the Faroese fishing area 1985-1997, as shown by the gutted weight in tonnes (bottom row) and corresponding percentages taken by each commercial fleet. The column to the right shows in percentages how important lemon sole as a fishing species has been for each fleet during this period.

4.12.1 Growth rate of lemon sole in Faroese waters.

4.12.2 Total landings of lemon sole (round weight) 1903-1997 on the Faroe Plateau and the Faroe Bank combined.

4.12.3 Landings per unit of effort expressed as kg/day of lemon sole in Faroese waters 1988-1997 for single trawlers < 400 HP and single trawlers 400-1000 HP.

4.13 Plaice (*Pleuronectes platessus*)

Table 4.13.1 Faroese landings of plaice from the Faroese fishing area 1985-1997, as shown by the gutted weight in tonnes (bottom row) and corresponding percentages taken by each commercial fleet. The column to the right shows in percentages how important plaice as a fishing species has been for each fleet during this period.

4.13.1 Total landings of plaice in Faroese waters from 1903 to 1997.

4.13.2 Landings per unit of effort expressed as kg/day of plaice in Faroese waters 1988-1997 for single trawlers < 400 HP and single trawlers 400-1000 HP.

4.14 Halibut (*Hippoglossus hippoglossus*)

Table 4.14.1 Faroese landings of halibut from the Faroese fishing area 1985-1997, as shown by the gutted weight in tonnes (bottom row) and corresponding percentages taken by each commercial fleet. The column to the right shows in percentages how important halibut as a fishing species has been for each fleet during this period.

4.14.1 Spawning area of halibut northwest of the Faroe Bank.

4.14.2 Growth rate of halibut in Faroese waters. Note that male and female growth rates are different from age seven.

4.14.3 Total landings of halibut (round weight) 1903-1997 on the Faroe Plateau and the Faroe Bank combined.

4.14.4 Landings per unit of effort expressed as kg/day of halibut 1988-1997 for single trawlers > 1000 HP, longliners < 100 GRT and longliners > 100 GRT.

4.15 Whiting (*Merlangius merlangus*)

Table 4.15.1 The Faroese landings of whiting from the Faroese fishing area 1985-1997, as shown by the gutted weight in tonnes (bottom row) and corresponding percentages taken by each commercial fleet. The column to the right shows in percentages how important whiting as a fishing species has been for each fleet during this period.

4.15.1 Growth rate of whiting in Faroese waters.

4.15.2 Total landings of whiting (round weight) 1905-1997 on the Faroe Plateau and the Faroe Bank combined.

4.15.3 Landings per unit of effort expressed as kg/day of whiting 1988-1997 for pair trawlers > 1000 HP and longliners < 100 GRT.

4.15.4 Length distribution of 1997 Faroese landings of whiting for pair trawlers > 1000 HP.

4.16 Norway Pout (*Trisopterus esmarki*)

4.16.1 Area with highest biomass of Norway pout in the Faroes area.

4.16.2 Average length by age of Norway pout in the period 1985-1994.

4.16.3 The Faroese catch (in 1,000 tonnes) at Faroese of Norway pout in the period 1980-1994.

4.16.4 Average age of Norway pout by percent of catch in the period 1985-1994.

4.16.5 Average length of Norway pout in percentages of catch in the period 1985-1994.

4.17 Greater Silversmelt (*Argentina silus*)

4.17.1 Area with highest biomass of greater silversmelt in the Faroes area.

4.17.2 Average length by age of male and female greater silversmelt in the period 1987 to 1988

4.17.3 The Faroese catch (in tonnes) of greater silversmelt in Faroese waters in the period 1987-1997.

4.17.4 Age distribution of greater silversmelt by percent of catch in 1997.

4.18 Blue Whiting (*Micromesistius poutassou*)

4.18.1 Main distribution and migration of blue whiting between spawning (south) and feeding areas (north).

4.18.2 Average weight of blue whiting by age in the Northeast Atlantic.

4.18.3 Yearly international catch of blue whiting (in tonnes) as well as the Faroese catch from 1980 to 1997.

4.19 Herring (*Clupea harengus*)

4.19.1 Distribution and migration pattern of Norwegian Spring Spawning herring showing spawning and feeding areas since 1991.

4.19.2 Migration pattern of older Norwegian Spring Spawning herring in 1996. During March the main concentration were found west of the middle of Norway; in May they migrated to Faroese waters and in August they were found farther north off northern Norway.

4.19.3 Migration pattern of young Norwegian Spring Spawning herring in 1996. During March the main concentration were found west of the middle of Norway. In May-June they entered Faroese waters and later in August migrated farther north and then into Norwegian waters.

4.19.4 Migration pattern of Norwegian Spring Spawning herring in 1997. In April the herring moved from Norwegian into Faroese and international waters. In June they began to move northward until in August they were found in the northern reaches of the Norwegian waters.

4.19.5 Migration pattern of Atlanto Scandian herring during the period 1950-1962.

4.19.6 Migration pattern of Atlanto Scandian herring during the period 1963-1966.

4.19.7 Migration pattern of Atlanto Scandian herring during the period 1967-1968.

4.19.8 Average weight by age of Norwegian Spring Spawning herring in 1997.

4.19.9 Total international catch of Atlanto Scandian herring in millions of tonnes during the period 1950-1997.

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4.19.11 Spawning biomass by millions of tonnes of Atlanto Scandian herring during the period 1950-1997.

4.19.12 Recruitment of three-year old Atlanto Scandian herring (in 1,000 millions) during the period 1950-1997.

4.20 Mackerel (*Scomber scombrus*)

4.20.1 Migration pattern of mackerel which spawn in the area west of Ireland.

4.20.2 Growth in weight of mackerel by age.

4.20.3 The total international catch of mackerel (in tonnes) in the Northeast Atlantic.

4.20.4 The catch of mackerel (in tonnes) from Faroese waters.

4.20.5 Fishing mortality of mackerel (ages 4-8) for the period 1984-1996.

4.20.6 The total mackerel spawning biomass (in millions of tonnes) for the period 1984-1996 (all stocks combined).

4.20.7 Recruitment at age 0 for the western mackerel stock for the period 1984-1996.

4.21 Salmon (*Salmo salar*)

4.21.1 Distribution of salmon in the North Atlantic and the Faroese fishing area before and after 1984.

4.21.2 Average ratio (with 95% confidence limits) of salmon tagged at the Faroes and recaptured in countries of origin, corrected for fishing mortality in same.

4.21.3 Yearly catch of salmon (in tonnes) from the North Atlantic and the Faroese catch north of the islands for the period 1960-1997.

4.22 Norway Lobster (*Nephrops norvegicus*)

4.22.1 Distribution of Norway lobster in Faroese waters.

4.22.2 Length by age of male Norway lobster.

4.22.3 The Faroese catch of Norway lobster by year from the lobster trawlers.

4.22.4 Effort (thousand of trawl hours) by the lobster trawlers.

4.22.5 Landings per unit of effort expressed as kg/trawl hour by the lobster trawlers.

4.22.6 Seasonal landings in tonnes by the lobster pot fishers.

4.22.7 Effort in thousand of pot days by the lobster pot fishers.

4.22.8 Seasonal catch per unit of effort (g/pot days).

4.22.9 Length of male Norway lobster as measured by percent of catch during the season of 1997/1998.

4.23 Shrimp

4.23.1 Areas around the Faroes with most shrimp.

4.23.2 Length of shrimp as measured by percent of catch in May 1995.

4.23.3 Length of shrimp as measured by percent of catch taken from the Faroe Plateau in June 1996.

4.24 Queen Scallop (*Chlamys islandicus*)

4.24.1 Main areas of Queen scallop east and north of the Faroes.

4.24.2 Average size (height) in cm by age in the catches during the period 1990/91-1992/93 and 1994/95.

4.24.3 Average weight of muscles and milt/roe for the 6 cm group of Queen scallop during the year.

4.24.4 Faroese catch of Queen scallop during the period 1970-71 to 1997-98.

4.24.5 Effort expressed as thousands of dredge hours during the period 1970-71 to 1997-98.

4.24.6 Catch per unit of effort expressed as kg/dredge hour of Queen scallop during the period 1970-71 to 1997-98.

4.24.7 Age distribution expressed as a percent of the Queen scallop catch in the 1997-98 season.

APPENDIX 2 : FISHERIES AROUND THE FAROE ISLANDS

The fisheries in Faroese waters consist of single-species, pelagic fisheries and mixed-species, demersal fisheries (coastal and offshore). The demersal fisheries are mainly conducted by Faroese fishers, whereas the major part of the pelagic fisheries are conducted by foreign fishers licensed through bilateral and multilateral fisheries agreements.

PELAGIC FISHERIES

Three main species of pelagic fish are fished in Faroese waters: blue whiting, herring and mackerel. Several countries participate.

Pelagic species

Blue Whiting

The major spawning areas for blue whiting are along the shelf break to the west of the British Isles, from south of Ireland in the south, to the Wyville-Thomson Ridge in the north. The spawning period is from late February to mid-April.

Following spawning, the bulk of the spawning stock migrates north into the Norwegian Sea to feed. The migration route is, to a large extent, through Faroese waters on both sides of the Faroe Plateau, through the Faroe Bank Channel and the Faroe-Shetland Channel at a depth of approximately 300-400 m.

During summer and autumn, the stock is widely distributed in the Norwegian Sea on the southern and eastern side of the Atlantic Front. The migration south to the spawning areas commences in late November/early December through the Faroe-Shetland Channel.

Blue whiting eggs and larvae are pelagic and are carried to the north with the prevailing currents. The nursery areas are along the shelf break around the Faroe Plateau, west and north of Scotland, the Norwegian Deep and to the west of Norway.

Blue whiting are fished with pelagic trawls. In Faroese waters, the largest catches are taken by Russian factory trawlers, which process the catches for human consumption. Their fisheries take place almost every month of the year. The main area fished is around the southern tip of the Faroe Plateau.

The catches by Norwegian, EU and Faroese vessels, which are almost exclusively reduced to fishmeal and oil, are taken from late April through May around the southern tip of the Faroe Plateau.

Herring

Three herring stocks, Atlanto Scandian Spring-Spawning herring (also called Norwegian Spring-

Spawning herring); west of Scotland Autumn-Spawning herring; and local, Summer-Spawning herring are fished in Faroese waters. The Atlanto Scandian Spring-Spawning herring is by far the most important of these stocks.

Almost extinct in the early seventies, the spawning stock has rebuilt to the same level as it was in the late fifties and early sixties. The stock spawns on the banks off western Norway in March. Subsequently (in the most recent years), the spawning stock migrates to the west and south into the southern and central parts of the Norwegian Sea to feed. In late April, May and June, a significant part of the stock is distributed in the northern parts of Faroese waters. In late summer and during autumn, the stock migrates to the north and finally into a few northern, Norwegian fjords for overwintering (hibernating) prior to the southward migration to the spawning areas.

In some years, the west of Scotland Autumn-Spawning stock has, during its feeding migration, reached the eastern parts of the Faroe Plateau. Catches of several thousand tonnes have been fished on the eastern and southern banks.

In offshore Faroese waters, herring is almost exclusively fished by purse seine and the concentrations are found by sonar. The fishing vessels follow the shoals for long distances.

The local, Summer-Spawning stock of herring is very small compared to the two other herring stocks and is almost exclusively distributed inshore. The fishery occurs in the fjords and sounds with the use of gill-nets.

Mackerel

In order to feed, the western stock component of mackerel migrates to the north from the main spawning areas south of Ireland during May and June into the southern and central parts of the Norwegian Sea. The return migration takes place in the winter.

During the feeding period, a significant part of the stock is also distributed and fished in Faroese waters. Mackerel are difficult to detect by echo sounding systems unless in large concentrations. The main migration pattern, therefore, is almost exclusively deduced from the fisheries. Historically, the annual distribution of the fisheries has varied to a very large extent. In later years, the fisheries for mackerel spread into new areas in the Norwegian Sea. A complete picture of the distribution pattern for mackerel, therefore, has yet to be drawn. Mackerel are fished by purse seine and pelagic trawls.

Pelagic Fishing Fleet

The Faroese pelagic fisheries are almost exclusively conducted by purse seine vessels and larger purse seine vessels also equipped for pelagic trawling. Pelagic fishery by Russian vessels is conducted by large factory trawlers. Other countries use purse seine and factory trawlers.

COASTAL FISHERIES

Open boats and smaller vessels using hook and line can be categorized as coastal fisheries. Using longline and to some extent automatic, jigging engines, they operate mainly on a day-to-day basis, targeting cod, haddock and, to a lesser degree, saithe. The large number of open boats participating in the fisheries are often operated by non-professional fishers. In the fishing year 1996/1997, a total of 1,414 licenses were issued to these two groups, including 1,098 licenses to vessels fishing only part of the year. These fisheries are mainly conducted in the most central part of the Faroe Plateau.

Demersal species

Cod

There are two, self-contained stocks of cod in Faroese waters: one located on the Faroe Plateau and the other on the Faroe Bank.

The Faroe Plateau stock, by far the largest of these two, spawns from late February to early May in two distinct spawning areas to the north and west of the Islands. The pelagic eggs and larvae are to a large extent contained in the clockwise water circulation on the Plateau.

In June/July, at a length of 4-5 cm, the juveniles descend from the upper-water layers to the bottom, and migrate to the nursery areas, which are mainly found in the littoral zone and in shallow waters inshore. After spawning, the spawning stock is dispersed over the entire Plateau mainly at depths down to approximately 350 m.

The Faroe Bank cod stock spawns from March to May with the main spawning in the first-half of April in the shallow areas of the Bank. The eggs and larvae are contained in the clockwise water circulation on the Bank. The juveniles descend to the bottom of the Bank proper in July. No distinct nursery areas have been found on the Bank. It is anticipated that the juveniles are widely distributed on the Bank, finding shelter in areas difficult to access by fishing gear.

Haddock

Haddock are distributed throughout Faroese waters, from inshore waters to a depth of approximately 600 m. Apart from the Faroe Plateau and the Faroe Bank, they are also distributed on Bill Bailey's Bank and Lousy Bank.

The spawning takes place from March to May over a wide area on the Faroe Plateau. The location of the main spawning is normally between 50 and 200 m, and may geographically vary from one year to the next. Four main spawning areas, however, have been identified. During the summer, juveniles descend after the pelagic phase and are subsequently found widely distributed on the Plateau at depths between 50 and 200 m.

Saithe

Saithe are widely distributed around the Faroes, from the shallow, inshore waters to depths of 350 m. They are found both dispersed on the bottom, and in shoals on the bottom and in mid-water. For all practical purposes, the saithe in Faroese waters are regarded as belonging to a single stock. Tagging of live saithe, however, has demonstrated migrations between the Faroes, Iceland, Norway, west of Scotland and the North Sea.

The main spawning areas are found at 150-250 m depths east and north of the Islands. Spawning takes place from January to April, with the main spawning in the second-half of February. The pelagic eggs and larvae drift with the clockwise current around the islands until May/June, when the juveniles, at lengths of 2.5-3.5 cm, migrate inshore. During the first two years of life the nursery areas are in very shallow waters in the littoral zone.

During the subsequent two-year period, young saithe are also distributed in shallow depths near shore, but at increasing depths with increasing age. Saithe enter the adult stock at the age of three or four years. Although saithe are fished throughout the year, the highest catch-rates are obtained in the spawning areas at spawning time. During the summer, when the young fish recruit to the fishery, high catch-rates can also be obtained.

Tusk

Tusk are widely distributed in the Northeast Atlantic, but the precise stock structure is not known. In the Faroes, tusk are normally fished at depths between 200 and 500 m, but may be distributed over the entire depth range 50-1,500 m. Spawning in Faroese waters takes place from April to June at depths of about 200 m. No specific spawning area has been identified. The eggs and larvae are pelagic and the juveniles descend to the bottom at a length of about 6 cm. Nothing is known of the whereabouts of these young fish until they reach a length of about 20 cm.

Ling

Ling are also widely distributed in the Northeast Atlantic. It is not known whether this distribution is composed of one or more discrete stocks. In the Faroes, ling are generally fished at depths of 100- 400 m. They are found, however, in more shallow and deeper waters. Spawning mainly takes place at depths of 60-200 m in May/June.

Blue Ling

Blue ling is also widely distributed in the Northeast Atlantic, yet very little is known about the stock structure. There are, however, indications that blue ling concentrations found in Faroese waters are related to concentrations found farther south. Spawning in Faroese waters takes place in April/May at depths of 500-2,000 m (mainly at 1,000 m) in the Atlantic waters south of the western banks. The catch-rates in

the fishery for blue ling indicate that migration toward the spawning area commences in February.

Redfish

Two species of redfish are fished in Faroese waters, *Sebastes marinus* and *Sebastes mentella*. No distinction is made between the two species at landing. Figures given in the official catch statistics are, therefore, the combined catch of both species. The concentrations of *S. marinus* found around the Faroes, Iceland and East-Greenland are considered to belong to the same stock. The same applies to the *Sebastes mentella*, but in addition, this stock also is distributed in the Irminger Sea.

Sebastes marinus is commonly distributed in Faroese waters at depths of 200-400 m. The main spawning of *S. marinus* takes place at depths of 300-550 m in the southwest of Iceland from April to June. They mate in the feeding areas around the Faroes, Iceland and along East Greenland in late autumn and winter. In early spring, the females migrate to the spawning area. The nursery areas are in shallow waters along East Greenland, northwest and northeast of Iceland.

In Faroese waters, *S. mentella* is fished throughout the region at bottom depths of 300 to 650 m. They mate in the feeding areas in late autumn and winter. The main spawning takes place at 550 m or more southwest of Iceland from April to August. The nursery areas are in the shallow waters off East Greenland.

Demersal Fishing Fleets

Although they are conducted by a variety of different vessels, the demersal fisheries can be grouped into fleets of vessels operating in a similar manner.

Open boats

This is a huge group of smaller vessels often used by non-professional fishers (see 'coastal fisheries' above)

Smaller vessels using hook and line

This category includes all the smaller vessels operating mainly on a day-to-day basis. The area fished is mainly near shore, using longline and to some extent automatic jigging engines. The target species are cod and haddock. See 'coastal fisheries' above.

Longliners > 100 GRT

This group refers to vessels with automatic baiting systems. The main species fished are cod, haddock, ling and tusk. The target species at any one time are dependent on season and availability. In general, they fish mainly for cod and haddock from autumn to spring and for ling and tusk during the summer. During summer they also make a few trips to Icelandic waters.

Single trawlers < 500 HP

This refers to smaller fishing vessels with engine powers up to 500 Hp. The main areas fished are on the banks outside the areas closed for trawling. They mainly target cod and haddock. Some of the vessels are licensed during the summer to fish within the twelve nautical mile territorial fishing limit, targeting lemon sole and plaice.

Single trawlers 500-1000 HP

These vessels fish mainly for cod and haddock. They fish primarily in the deeper parts of the Faroe Plateau and the Banks.

Single trawlers >1000 HP

This category includes the deep-water trawlers. These trawlers target several deep-water fish species in Faroese waters, especially redfish, blue ling, saithe, Greenland halibut, grenadier and black scabbard fish.

Pair trawlers <1000 HP

These vessels fish mainly for saithe, however, they also have a significant by-catch of cod and haddock. The main areas fished are the deeper parts of the Faroe Plateau and the Banks.

Pair trawlers >1000 HP

This category targets mainly saithe, but their by-catch of cod and haddock is important to their profit margin. In addition, during summer some of these vessels have a special fishery in deep water for greater silver smelt. The areas fished by these vessels are the deeper parts of the Faroe Plateau and the Banks.

Gill netting vessels

This category refers to vessels fishing mainly Greenland halibut and monkfish. They operate in deep waters off the Faroe Plateau, Faroe Bank, Bill Bailey's Bank, Lousy Bank and the Faroe-Iceland Ridge. This fishery is only regulated by the number of licensed vessels.

Jiggers

This is a mixed group of smaller and larger vessels using automatic jigging equipment. The target species are saithe and cod. Depending on availability, weather, and the season, these vessels operate throughout the entire Faroese region.