

This Report not to be cited without prior reference to the Council^{*)}

International Council for the
Exploration of the Sea

C.M.1977/F:4 - APPENDIX
Demersal Fish (Northern) Committee

<https://doi.org/10.17895/ices.pub.9418>



REVIEW OF SOME FISH STOCKS WITHIN THE NEAFC CONVENTION

AREA

This Report has not yet been approved by the International Council for the Exploration of the Sea; it has therefore at present the status of an internal document and does not represent advice given on behalf of the Council. The proviso that it shall not be cited without the consent of the Council should be strictly observed.

^{*)}

General Secretary,
ICES,
Charlottenlund Slot,
2920 Charlottenlund,
DENMARK

CONTENTS

	<u>Page</u>
1. GREENLAND HALIBUT	1
1.1 Greenland Halibut in Sub-areas I and II	1
1.1.1 Life history	1
1.1.2 Fisheries	2
1.2 Greenland Halibut in Sub-areas V and XIV	2
1.2.1 Life history	2
1.2.2 Fisheries	3
2. HALIBUT (<u>Hippoglossus hippoglossus</u>)	4
2.1 Halibut in Division Va	4
2.1.1 Life history	4
2.1.2 Fisheries	4
2.2 Halibut in Sub-area XIV	4
2.2.1 Life history	4
2.2.2 Fisheries	4
3. PLAICE	4
3.1 Plaice in Division Va	4
3.1.1 Life history	4
3.1.2 Fisheries	5
4. LEMON SOLE	5
4.1 Lemon Sole in Division Va	5
4.1.1 Life history	5
4.1.2 Fisheries	5
5. COMMON DAB	6
5.1 Common Dab in Division Va	6
5.1.1 Life history	6
5.1.2 Fisheries	6
6. WITCH	6
6.1 Witch in Division Va	6
6.1.1 Life history	6
6.1.2 Fisheries	6
7. MEGRIM	7
7.1 Megrim in Division Va	7
7.1.1 Life history	7
7.1.2 Fisheries	7

ctd.

<u>Contents</u> (ctd)	<u>Page</u>
8. LONG ROUGH DAB	7
8.1 Long Rough Dab in Division Va	7
8.1.1 Life history	7
8.1.2 Fisheries	7
REFERENCES	8
APPENDIX TABLES 1 - 13	9
APPENDIX FIGURES 1 - 6	19

-o-o-o-

1. GREENLAND HALIBUT

1.1. Greenland Halibut in Sub-Areas I and II

1.1.1. Life history

Very little is known about the distribution and development of Greenland halibut, Reinhardtius hippoglossoides, Waldbaum 1972, in the Norwegian Sea and the Barents Sea (Hognestad, 1969).

Spawning

According to Hognestad (1969) the distribution of 0- and I-group fish together with hydrographical conditions along the slope of the continental shelf between Norway and Spitzbergen lead to the conclusion that the main spawning area of Greenland halibut must be along the slope between 70°N and 75°N at depths between 400 and 800m. Nizovtsev (1969) found the greatest accumulations of spawners at 600-800m between 71°30'N and 73°30'N in this area.

It is supposed that spawning takes place from March or April to July (Milinsky, 1944 and Andriashev, 1954). However, Nizovtsev (1969) writes that the main spawning period is from October to January. It might be concluded that spawning takes place over a long period.

Eggs drift in the pelagic layer; the larvae move to the upper layers as they grow. The metamorphosis is complete at about 60mm length, before the larvae seeks the bottom (Hognestad, 1969). In the 0-group surveys, few Greenland halibut larvae longer than 80mm have been found.

0- and I-groups

Figure 1 shows the distribution of 0-group Greenland halibut in August/September 1976, which corresponds to the findings of previous 0-group surveys. Hognestad (1969) reports finds of 0- and I-group only from the Spitzbergen area, and he concludes that the nursery grounds seem to be confined to the inshore Spitzbergen waters, with a southward migration taking place later on.

Juveniles

According to Figure 2 and Sorokin (1967), the juveniles (≤ 30 cm) occur mostly in the more shallow regions of the Barents Sea in waters with negative temperatures, i.e., in the northern and eastern parts of the stocks' range. With increasing size, the fish are found in deeper waters and in the more western part of the range.

Adults

In the eastern Norwegian Sea, the mature stock is distributed from the Norwegian coast along the slope of the continental shelf northwards to the west of Bear Island and Spitzbergen. Lower abundances are found off the coast of southern Norway and in the southern part of the Barents Sea, eastwards to the Kanin Peninsula, and the southwest coasts of Novaja Zemlya, and also off the southern coast of Spitzbergen (Hognestad, 1969). (See Figure 3.)

Adults are found almost exclusively from 100-150m depth to the 600-900m depth.

Judging from the seasonal distribution of the fishery, it seems that mature Greenland halibut migrate slowly from the area off northern Norway to the waters west of Bear Island and Spitzbergen, from February to July. From the same area, some migration also takes place eastward to the southern Barents Sea during the

the same period (Sorokin, 1967), but this is probably mainly the immature part of the stock (Hognestad, 1969). Milinsky (1944) found males to become mature at 9-10 years old and females 11-12 years old. Lahn-Johannessen (1965) found most mature males to be 8-9 years old, and most mature females to be 9-11 years old. Nizovtsev (1969, Figure 152) found about 50% of the 9-year-old females and 50% of the 7-year-old males to be mature. The corresponding lengths for this age group was 40-45cm for 7-year-old males, and 55-60cm for 9-year-old females.

The age groups become partially recruited to the fishery at age 4-5, and fully recruited with the onset of maturity. Males dominate all the age groups up to 9 in the catches, whereas in the older age groups females dominate. It seems that females have a longer lifespan than males (see Appendix Figure 4).

1.1.2. Fisheries

Catches of Greenland halibut by major fishing areas are given in Appendix Table 1. Greenland halibut have been caught with long-line by Russian and Norwegian fishermen for many decades, mainly in deeper coastal waters off Northern Norway. Some were also caught as by-catch in the trawl fisheries for cod and redfish.

The Norwegian longline fishery increased around 1960 when concentrations of Greenland halibut were discovered along the continental shelf from Norway towards Bear Island. The following decade was the main period for the Norwegian longline fishery, when, on average, about 15 000 tons were caught annually. The fishing was also extended to the Spitzbergen area (Lahn-Johannessen, 1972). In recent years, this fishery has decreased due to a smaller stock and competition with trawlers on the best fishing grounds.

In 1964 a Soviet trawler obtained good catches of Greenland halibut west of Bear Island. This initiated a directed trawl fishery for this species. This trawl fishery increased greatly after 1968, mainly because of USSR trawlers, but also because of increased participation of trawlers from the German Democratic Republic and to some extent trawlers from Norway and Poland (Appendix Table 2). The peak of the total fishery was in 1970, when nearly 50 000 tons were caught (Appendix Figure 5).

In the period 1973 to 1976, the yearly catches have been fairly constant, on the average 35 000 tons. The catches of the Norwegian longline fishery have decreased from 13% to about 5% in the same period.

The Norwegian longline fishery is a seasonal one which usually starts in April/May and ends in August/September (Lahn-Johannessen, 1972). At the start of the directed trawl fishery, it was conducted mainly in the autumn and winter. At present, it is a year-round fishery (Ponomarenko, 1977, personal communication). The main catches are taken in Sub-Area II, and a minor part is taken in Sub-Area I (Appendix Table 1). The largest concentrations are found on the slope of the continental shelf in the western Barents Sea at the depth of 350 to 700m.

1.2. Greenland Halibut in Sub-Areas V and XIV

1.2.1. Life history

There is apparently only one stock of Greenland halibut in these two areas. The main spawning grounds are probably in deep waters on the slopes off Iceland and Greenland, south of the Iceland-Greenland ridge. Some spawning, probably of minor importance, takes place on the south slope of the Faroe-Iceland ridge. The spawning time appears to be in the first months of the year. The eggs are large (3.7 - 4.9mm in diameter (Smidt, 1969)), and therefore the fecundity is low.

Some scattered eggs and larvae have been found in the ocean between Iceland and Greenland (Smidt, 1969, and the ICES O-Group Survey in recent years). From the larval stages to 3-year-old fish, there is a gap in the knowledge of the life history of the species in these areas.

Nursery grounds for the immature fish, and feeding grounds for the mature part of the stock, are in deep waters off the northwest, north and east coasts of Iceland.

The youngest mature males are about 7 years old, and the youngest females about 8 years, but the majority of both sexes become mature at an older age.

The growth is slow, and the growth of males is retarded earlier than that of females. The males are also younger than the females when they disappear from the catch.

The main migration is between the feeding grounds at Iceland and the spawning grounds between Iceland and Greenland, and probably fish partly pass the fishery limits between Iceland and Greenland. Occasional migrations are known from the Icelandic area to the Faroe Islands, Barents Sea and East Greenland.

1.2.2. Fisheries

The nominal catches are given in Appendix Tables 3, 4, 5 and 6.

The Icelandic and Norwegian catches in Division Va are mostly from longline fisheries. Other countries' catches from that Division are mainly taken by trawl.

All catches from Sub-Area XIV are from the trawl fisheries, except the Greenlandic catch.

The fishing grounds in Division Va are off the northwest, north and east coasts of Iceland, whereas those in Sub-Area XIV are mainly rather close to Division Va and are, therefore now inside the Icelandic fishery limits.

The Icelandic longline fishery for Greenland halibut started in 1969, being very profitable at the beginning, with a catch of 718 kg per 1 000 hooks. In 1972 the catch per 1 000 hooks had declined to 390 kg. This decline was not due to competition with the trawlers, the extent of which was very insignificant. Since then, the longliners fished for Greenland halibut more occasionally than directly.

The total catch of Greenland halibut in Division Va and Sub-Area XIV was rather small until the sixties. In 1969 the nominal catch was 23 000 metric tons, of which about 17 000 tons were taken by trawl, mostly in Icelandic waters. In the following years, the trawl fishery in Sub-Area XIV increased rapidly, while the trawl catches in the Icelandic waters decreased. The catch of Greenland halibut in Sub-Area XIV was mainly taken in late April, May and early June when the fish migrate from the spawning grounds to the feeding grounds. This fishery practically ceased when the Icelandic fishery limits were extended to 200 nautical miles in 1975.

2. HALIBUT (*Hippoglossus hippoglossus*)

2.1 Halibut in Division Va

2.1.1 Life history

Halibut are common around Iceland especially off the southwest, west and northwest coasts.

Halibut spawn at a depth of about 1 000 m and at temperatures of 5-7°C off the south and west coasts. Spawning takes place at the bottom in March-May with a peak in April; the eggs are bathypelagic. It is not yet known where or when halibut adopt the demersal way of life, because only few individuals of the 0-group have been found, all in shallow waters near the coast.

Halibut appear in shallow waters, having reached an age of 1 year. The fish stay there until 3-5 years old, and then migrate into deeper waters. Though older fish usually stay at greater depths, the adults were frequently caught in shallow waters during summer. Summer distribution of Greenland halibut is shown in Appendix Figure 6. The halibut reach maturity as 9-10 year old fish and older.

Tagging experiments show migrations between Iceland and the Faroes but there are no indications of any migration between Iceland and Greenland, although this is possible. Pelagic larvae might be transported to Greenland.

2.1.2 Fisheries

The nominal catches are given in Table 7. The stock of halibut is small and has been such for a long period due to the high degree of exploitation. In recent years the species have mostly been caught as by-catches in the trawl, Danish seine, long-line and hand-line fisheries. The total annual catch varied from 1 761 - 3 212 metric tons in 1966-75, averaging 2 392 tons.

The greater part of the catch consisted of young halibut caught in mixed fisheries for cod, haddock and plaice. Regulatory measures for halibut are, therefore, impracticable, and the stock is likely to be kept at the same low level in the years to come. The stock will consequently not be of great commercial value.

2.2 Halibut in Sub-area XIV

2.2.1 Life history

No biological data are available on halibut in Sub-area XIV. However, the life history is probably of a similar nature as in Division Va, since halibut in these two areas most likely belong to a single stock.

2.2.2 Fisheries

The nominal catches are given in Table 8. The total catch is very small and, therefore, of little commercial interest. It is not known whether halibut in Sub-area XIV were caught on the Icelandic or the Greenlandic sides of the medium line.

3. PLAICE

3.1 Plaice in Division Va

3.1.1 Life history

Plaice inhabit shallow waters around Iceland and do not, therefore, migrate outside the Icelandic fishery limit.

The main spawning grounds are off the south and west coasts at depths of 50-100 m, where the water temperature is relatively high.

Insignificant spawning also occurs in the cold waters off the north and east coasts. The peak of the spawning season is in March and April.

The nursery areas and the feeding grounds around Iceland occur in shallower waters than the spawning grounds.

It is apparent from extensive tagging experiments that the migration of plaice is limited to shallow waters. The main migrations are back and forth between feeding grounds and nursery grounds, for instance from the northeast coast to the southwest coast. Some of the pelagic larvae from the southwest and west coasts are seemingly transported by currents to the north and east coasts. The nursery grounds are in coastal waters around the whole island.

As migrations from the north and east coasts to the principal spawning grounds are known, as well as drifting of pelagic larvae back to the nursery grounds at the north and east coasts, it seems clear that there is only one stock of plaice in Division Va.

Occasionally males become sexually mature at the age of 4 and females at the age of 5, but usually plaice are older at first spawning (males 6-7 years and females 7-8 years). Once sexually mature, males grow more slowly than females and have a shorter life span.

3.1.2 Fisheries

The nominal catches are given in Table 9. Most of the Icelandic catch was taken by Danish seine during the summer season, the rest by trawl. The fishing grounds are in shallow waters, at less than 100 m depth, and solely inside the Icelandic fishery limit.

The total catch in 1966-68 and 1970-71 appears to be near the estimated MSY or between 10 and 12 thousand metric tons. Between 1966 and 1975 non-Icelandic catches have decreased due to changes of the Icelandic fishery limit. After 1971 the Icelandic catch decreased on account of limitations imposed on the use of Danish seine and trawl in shallow waters as a preservation measure for other demersal species.

The Icelanders have now introduced Danish seine with 170 mm mesh size thus hoping to increase the Icelandic catch of plaice without endangering other species.

4. LEMON SOLE

4.1 Lemon Sole in Division Va

4.1.1 Life history

The biology of lemon sole in Icelandic waters has received little attention and is, therefore, poorly known.

Lemon sole occur all around Iceland, but are primarily found along the southeast, south and west coasts. The favourite depth range is within 40-150 m. Spawning occurs in warm waters south and southwest of Iceland at depths of 50-70 m. It begins in late May, reaches the peak in June-July, and ends in late August. The juveniles, when about 3 cm long, descend to the bottom in late autumn and live in fairly deep water until they are about 13 cm long. No fish between 3-13 cm have been caught. The growth rate is rather slow (20-25 cm at the age 4-5). Little is known about the age composition of the stock and its migratory movements.

4.1.2 Fisheries

The nominal catches are given in Table 10. Lemon sole were caught by trawl and Danish seine as by-catches, as the stock is small and mixed with other demersal species.

The decrease in catches in recent years is probably due to the change of the Icelandic fishery limit and restricted use of Danish seine and

trawl inside the limits introduced as conservation measures for other demersal species.

5. COMMON DAB

5.1 Common Dab in Division Va

5.1.1 Life history

Common dab (Limanda limanda (L.)) are very common around Iceland within the depth range of 0-120 m and most frequently at 20-40 m.

Dab spawn both in the warm water area off the south and west coasts of Iceland and in the cold water area off the north and east coasts at 20-40 m. Spawning begins off the south coast around the middle of April, reaches its peak in the middle of May and is mostly finished by the end of June. It slowly progresses westward and to the north. Off the north coast spawning begins in early May and off the east coast around mid-June.

The larvae and the post-larvae are distributed around the coast from the end of April, off the southwest coast, through the middle of September off the east coast.

At a length of 12-17 mm dab become demersal and the juvenile fish are distributed all around the country at 0-100 m. The growth rate of dab is rather slow. The maximum length of 42 cm is attained at 13-14 years. Females grow faster than males and the fish in the cold water area grow faster than dab in the warm area. Males reach maturity at 2-3 years and at a length of 10-15 cm, females at 3-4 years and at a length of 14-20 cm. The stock of dab around Iceland is characterised by medium size, medium growth rate and a relatively large number of old fish.

Dab do not migrate over long distances, only from the inshore to deeper waters during winter and back towards the coast during summer.

5.1.2 Fisheries

The nominal catches are given in Table 11. Dab are only caught as by-catches in the trawl and Danish seine fisheries at Iceland and are of minor commercial value.

6. WITCH

6.1 Witch in Division Va

6.1.1 Life history

Very little is known about the biology of witch in Icelandic waters due to the few investigations conducted.

Witch inhabit mainly warm waters off the southeast, south and west coasts of Iceland, at depths of 40-200 m. Spawning in the warm waters probably occurs during summer at depths of 40-200 m. The young fish descend to the bottom at the same depths and stay there. Specimens less than 19 cm in length were never caught. Little is known about the growth rate and age composition of the stock. Migrations have not been studied.

6.1.2 Fisheries

The nominal catches are given in Table 12. The stock of witch in Division Va is very small and is, therefore, of insignificant commercial value. Witch are only caught as by-catches.

7. MEGRIM

7.1 Megrim in Division Va

7.1.1 Life history

The biology of megrim in Icelandic waters has been only slightly investigated and few data were collected on the species. Megrim occur mainly in warm waters off the south and southwest coasts, although individual specimens have been caught all around Iceland. Though the favourite habitat is within 100-150 m depth, the species were found at depths of 40-390 m. Spawning is believed to occur off the south and southwest coasts in spring. Pelagic larvae have been found in July and August off the south and west coasts and some individuals of the 0-group were found at the bottom at depths of 300-390 m. The young fish probably keep to deep waters and fish smaller than 20 cm are rarely observed.

Nothing is known about the growth rate and age composition. Migrations have not been investigated.

7.1.2 Fisheries

The nominal catches are given in Table 13. The stock of megrim in Division Va is very small and of little commercial interest. Megrim are only caught as by-catches in Icelandic waters and the stock is not likely to withstand an expanded exploitation.

8. LONG ROUGH DAB

8.1 Long Rough Dab in Division Va

8.1.1 Life history

Long rough dab is common around Iceland at 40-130 m depth. As the biology of long rough dab in Icelandic waters has not been studied very intensively, not much is known about it. It is known, however, that long rough dab spawn all around Iceland during March through June, presumably at depths of 60-100 m. Growth seems to be rather slow. Long rough dab attain a maximum length of 40-43 cm and an of 18-20 years. Females grow faster than males, and growth seems to be faster in the warm water area off the south and west coasts than off the north and east coasts.

8.1.2 Fisheries

Long rough dab are only caught as by-catches in the trawl and Danish seine fisheries and are of very limited commercial value in Iceland.

- ANDRIYASHEV, A.P., 1954. Ryby severnykh morei SSSR. Opred. Faune SSSR, 53: 1-556
[Engl. transl.: Fishes of the northern seas of the USSR. Israel Program
for Scientific Translations. Jerusalem 1964, 617p].
- BENKO, Ju.K., and PONOMARENKO, V.P. Main commercial fish from the Barents, Norwegian
and Greenland Seas (Biology and catches). PINRO, Murmansk, 1972, 143pp.
- HOGNESTAD, P.T., 1969. Notes on Greenland Halibut, Reinhardtius Hippoglossoides
(Walbaum), in the eastern Norwegian Sea. FiskDir. Skr. Ser. Havunders.,
15: 139-144.
- LAHN-JOHANNESSEN, J., 1965. Blåkveiten og blåkveite fisket på egga, 52p. [Thesis not
published].
- LAHN-JOHANNESSEN, J., 1972. Recent development of the fisheries for Greenland halibut
(Reinhardtius hippoglossoides, Walbaum) in northeast Atlantic waters
(C.M.1972/F:39).
- MILINSKY, G.I., 1944. Materialy po biologii i promyslu chernogo paltusa Barentsova
Morya. Trudy polyar. nauchno-issled. Inst. morsk. ryb. Khoz. Okeanogr., 8:
375-387 [Engl. transl.: The biology and fisheries of Greenland halibut
of the Barents Sea. Fish. Res. Bd. Can. Translation Series No. 1159].
- NIZOVITSEV, G.P., 1968. Distribution and age-size characteristics of catches of Greenland
halibut from the Barents Sea. Trudy, PINRO, Issue 23, Murmansk, 1968.
- NIZOVITSEV, G., 1969. Soviet investigations on Greenland halibut in the Barents Sea,
1964-1967. Annales Biologiques, 25: 239-242.
- SMIDT, E.L., 1969. The Greenland halibut, Reinhardtius hippoglossoides (Walbaum),
biology and exploitation in Greenland waters. Medd. fra Danmarks Fiskeri-
og Havundersøgelser, N.S. 6, No.4: 79-148.
- SOROKIN, V.P., 1967. Some features of biology of Greenland halibut Reinhardtius
hippoglossoides (Walbaum) in the Barents Sea. Materialy sessii uchenogo
soveta PINRO, 8: 44-67 [in Russ.].

Appendix Table 1. Greenland halibut.
Total nominal catch by main fishing gear (metric tons).

Year	Sub-Area I	Division IIb	Division IIa	Division Va	Division Vb	Sub-Area XIV	Total catch
1966	1 200	8 726	16 319	7 515	478	40	34 278
1967	2 198	6 712	15 357	8 955	442	200	33 864
1968	2 488	8 935	14 745	7 501	647	189	34 505
1969	8 393	25 010	10 386	23 135	906	280	68 110
1970	4 011	70 523	14 950	30 001	-	3 822	123 307
1971	5 413	62 764	10 857	15 049	11	13 913	108 007
1972	8 549	18 873	15 633	10 666	417	15 389	69 527
1973	5 667	16 081	8 190	7 386	358	12 719	50 401
1974	5 251	24 660	7 852	7 866	325	28 089	74 043
1975 ^{x)}	6 495	28 511	3 166	3 308	560	19 627	61 667
1976 ^{x)}	2 241	28 602	2 201	2 959	285	194	36 482

Appendix Table 2. Greenland halibut.
Nominal catch (metric tons) in Sub-Areas I and II, 1966-1976
(Data for 1966-75 from Bulletin Statistique).

Country	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976 ^{x)}
Faroe Islands	-	-	-	-	44 ¹⁾	-	-	-	-	-	-
German Dem.Rep.	112 ¹⁾	964 ¹⁾	257 ¹⁾	3 788 ¹⁾	18 729 ¹⁾	2 949 ¹⁾	1 633 ¹⁾	3 954	5 914	8 472	8 955
Germany, Fed.Rep.	7	38	-	71	-	3	3	59	88	94	20
Norway Trawl catch	-	-	-	-	1 638	2 309	9 656	10 217	4 656	1 686	2 000 ³⁾
Norway Longline catch	16 434	17 528	22 514	14 856	14 233	7 157	6 327	3 772	4 135	3 172	1 829 ³⁾
Poland	-	-	-	5 314	19 262	12 277	7 981	2 140	5 146	3 645	3 566 ²⁾
UK (Eng. & Wales)	-	-	-	-	-	-	1 262	1 235	866	731	731 ²⁾
USSR	9 692 ¹⁾	5 737 ¹⁾	3 397 ¹⁾	19 760	35 578	54 339	16 193	8 561	16 958	20 372	16 674
Total	26 245	24 267	26 168	43 789	89 484	79 034	43 055	29 938	37 763	38 172	33 775

^{x)} Preliminary.

²⁾ No data. Estimated landings set equal to the 1975 landings in the assessments.

¹⁾ From national statistics. ³⁾ Assumed split between gears.

Appendix Table 3. Greenland halibut.
Nominal catch (metric tons) in Division Va.

Country	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976 ^{*)}
Faroe Islands	- ¹⁾	- ¹⁾	- ¹⁾	-	4 122 ¹⁾	1 316 ¹⁾	1 180 ¹⁾	188	41	2	360
German Dem.Rep.	2 018 ¹⁾	5 064 ¹⁾	6 247 ¹⁾	7 768 ¹⁾	14 958 ¹⁾	3 317 ¹⁾	159 ¹⁾	320	388	-	-
Germany Fed.Rep.	5 491	3 890	1 253	1 488	-	882	1 119	826	1 786	887	915
Iceland	6	1	1	5 856	7 343	5 020	4 640	2 115	2 842	1 212	1 684
Norway	-	-	-	54	338	369	186	-	-	-	-
Poland	-	-	-	-	1 127	899	31	-	485	-	- ²⁾
UK (Eng. & Wales)	-	-	-	-	-	-	2 223	3 648	2 314	1 207	- ²⁾
USSR	-	-	-	7 969	2 113	3 246	1 128	289	10	-	- ²⁾
Total	7 515	8 955	7 501	23 135	30 001	15 049	10 666	7 386	7 866	3 308	2 959

Appendix Table 4. Greenland halibut.
Nominal catch (metric tons) in Division Vb.

Country	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976 ^{*)}
Faroe Islands	- ¹⁾	- ¹⁾	- ¹⁾	- ¹⁾	-	-	-	-	7	6	-
German Dem.Rep.	2 ¹⁾	218 ¹⁾	68 ¹⁾	855 ¹⁾	-	-	-	-	147	91	-
Germany, Fed.Rep.	476	224	579	51	-	11	405	287	163	437	285
Norway	-	-	-	-	-	-	-	-	-	7	-
Poland	-	-	-	-	-	-	-	9	-	18	- ²⁾
UK (Eng. & Wales)	-	-	-	-	-	-	12	61	8	+	- ²⁾
USSR	-	-	-	-	-	-	-	1	-	-	- ²⁾
Total	478	442	647	906	-	11	417	358	325	560	285

^{*)} Preliminary.

¹⁾ From national statistics. ²⁾ No information available.

Appendix Table 5. Greenland halibut.
Nominal catch (metric tons) in Sub-Area XIV.

Country	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976 [*])
German Dem.Rep.	-	-	-	42 ¹⁾	2 981 ¹⁾	3 491 ¹⁾	7 328 ¹⁾	8 806	25 266	16 872	-
Germany, Fed.Rep.	40	200	187	183	-	270	5	7	+	64	192
Greenland	-	-	2	+	-	2	3	4	2	1	+
Iceland	-	-	-	24	2	+	-	3	1	+	2
Poland	-	-	-	-	732	7 910	7 847	3 122	1 057	1 054	- ²⁾
UK (Eng. & Wales)	-	-	-	-	-	-	1	1	1	2	- ²⁾
USSR	-	-	-	31	107	2 240	205	776	1 762	1 634	- ²⁾
Total	40	200	189	280	3 822	13 913	15 389	12 719	28 089	19 627	194

Appendix Table 6. Greenland halibut.
Nominal catch (metric tons) in Sub-Areas V and XIV, 1966-76.
(Data for 1966-75 from Bulletin Statistique and from national statistical offices).

Country	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976 [*])
Faroe Islands	-	-	-	-	4 122	1 316	1 180	188	48	8	360
German Dem.Rep.	2 060 ¹⁾	5 282 ¹⁾	6 315 ¹⁾	8 665 ¹⁾	17 939 ¹⁾	6 808 ¹⁾	7 487 ¹⁾	9 126	25 801	16 963	-
Germany, Fed.Rep.	5 967	4 314	2 019	1 686	-	1 163	1 529	1 120	1 949	1 388	1 392
Greenland	-	-	2	+	-	2	3	4	2	1	-
Iceland	6	1	1	5 880	7 345	5 020	4 640	2 118	2 843	1 212	1 686
Norway	-	-	-	-	338	369	186	-	-	7	-
Poland	-	-	-	-	1 859	8 809	7 878	3 131	1 542	1 072	- ²⁾
UK (Eng. & Wales)	-	-	-	-	-	-	2 236	3 710	2 323	1 209	- ²⁾
USSR	-	-	-	8 000	2 220	5 486	1 333	1 066	1 772	1 634	- ²⁾
Total	8 033	9 597	8 337	24 231	33 823	28 973	26 473	20 463	36 280	23 494	3 438

*) Preliminary¹⁾ From national statistics. ²⁾ No information available.

Appendix Table 7 Nominal catch (metric tons) of halibut in Division Va, 1966-75.

(Data from Bulletin Statistique)

Country	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
Belgium	171	154	150	94	61	68	58	55	41	33
Faroe Islands	30	16	15	5	346	51	48	48	108	67
Germany ,Fed.Rep. of	488	588	343	426	374	346	302	257	226	179
Iceland	898	1018	940	842	1103	1284	1088	1032	976	1168
Norway	300	300	156	257	569	445	216	194	62	48
Poland	-	-	-	-	3	-	2	-	1	-
U.K. (Engl. & Wales)	582	611	442	426	411	896	600	411	341	388
U.K. (Scotland)	156	118	45	27	45	22	11	3	6	11
U.S.S.R.	22	-	-	-	300	-	-	-	-	-
Total	2647	2805	2091	2077	3212	3112	2325	2000	1761	1894

Appendix Table 8. Nominal catch (metric tons) of halibut in Subarea XIV, 1966-1975.

(Data from Bulletin Statistique)

Country	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
Faroe Islands	-	-	-	-	-	-	-	4	16	1
German Dem.Rep.	-	-	-	-	-	-	-	1	-	-
Germany , Fed.Rep.of	77	160	122	161	50	54	39	42	17	35
Iceland	22	15	112	54	21	17	17	11	37	22
Norway	-	-	-	-	-	-	-	-	-	52
Poland	-	-	-	-	3	6	10	7	1	-
U.K. (Engl. & Wales)	1	2	-	-	-	-	1	6	5	4
Total	100	177	234	215	74	77	67	71	76	114

Appendix Table 9. Nominal catch (metric tons) of plaice in Division Va, 1966- 75.

(Data from Bulletin Statistique)

Country	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
Belgium	14	6	3	1	-	1	20	+	+	+
Faroe Islands	-	-	-	-	92	44	20	-	1	31
France	-	54	-	-	-	-	-	-	-	-
Germany ,Fed.Rep.of	1	1	1	7	-	11	+	5	+	-
Iceland	7354	5644	6144	10764	8117	7179	5129	4137	4017	4399
U.K. (England & Wales)	4393	5652	4095	3242	1758	2440	1323	635	82	141
U.K. (Scotland)	113	23	27	17	51	13	4	1	2	4
Total	11875	11380	10270	14031	10018	9688	6496	4778	4102	4575

Appendix Table 10. Nominal catch (metric tons) of lemon sole in Division Va, 1966-1975.

(Data from Bulletin Statistique)

Country	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
Belgium	15	20	20	25	30	33	35	34	27	23
Faroe Islands	-	-	-	-	-	-	-	3	-	1
France	-	14	-	-	-	-	-	-	-	-
Germany, Fed. Rep. of	7	10	9	12	3	22	4	3	2	+
Iceland	564	347	497	453	328	283	255	175	84	67
U.K. (England & Wales)	881	975	771	527	337	433	455	254	184	174
U.K. (Scotland)	75	52	73	76	133	42	32	6	35	61
Total	1542	1418	1370	1093	831	813	781	475	332	326

Appendix Table 11. Nominal catch (metric tons) of Common Dab in Division Va, 1966-75.

(Data from Bulletin Statistique)

Country	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
Belgium	56	67	41	33	9	5	2	2	6	-
Faroe Islands	-	-	-	-	-	-	-	2	-	-
Germany , Fed.Rep.of	-	-	1	-	-	-	-	-	1	+
Iceland	58	30	37	76	11	11	12	3	3	5
U.K. (Engl. & Wales)	168	225	166	151	94	150	104	103	47	32
U.K. (Scotland)	47	31	17	29	49	63	41	22	18	19
Total	329	353	262	289	163	229	159	132	75	56

Appendix Table 12. Nominal catch (metric tons) of witch in Division Va, 1966-1975.

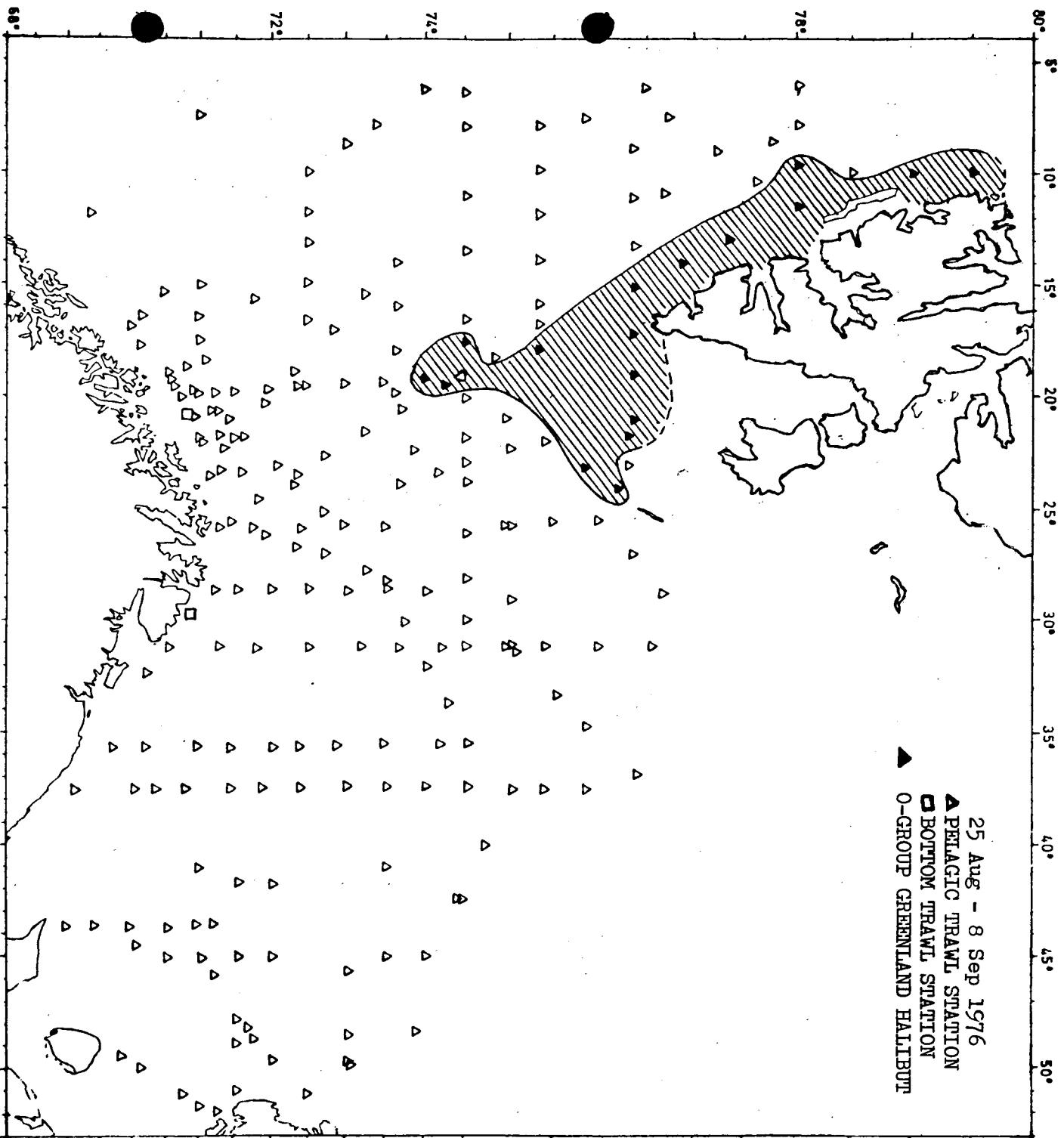
(Data from Bulletin Statistique)

Country	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
Belgium	229	178	181	189	157	169	-	-	-	-
France	-	3	-	-	-	-	-	-	-	-
Germany ,Fed.Rep.of	4	15	3	6	8	2	1	+	1	+
Iceland	122	162	132	166	169	125	138	22	52	69
U.K. (Engl. & Wales)	1	24	40	14	37	40	61	35	24	8
U.K. (Scotland)	3	4	2	4	10	10	3	2	1	2
Total	376	386	358	379	381	346	203	59	76	79

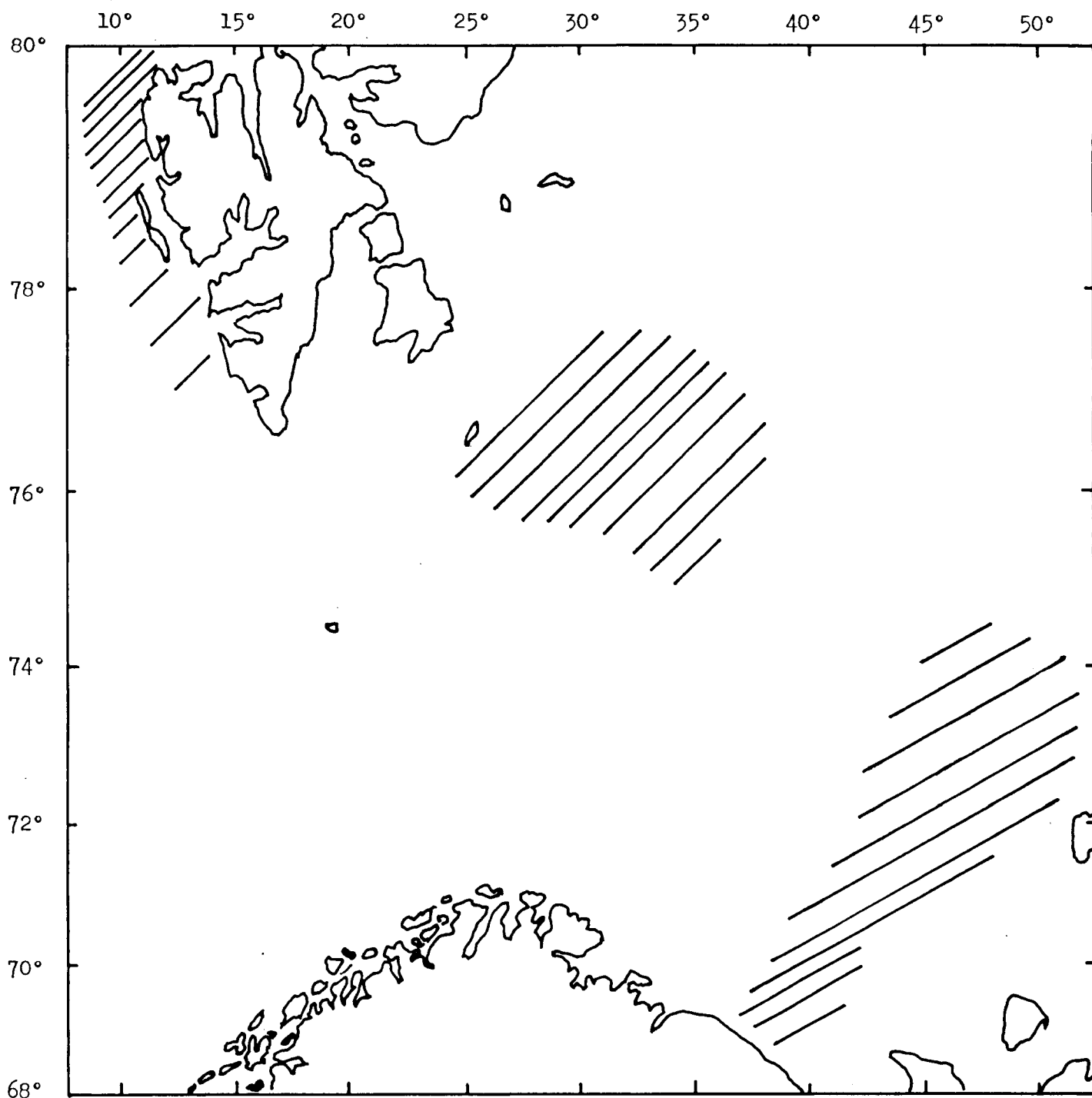
Appendix Table 13. Nominal catch (metric tons) of megrim in Division Va, 1966-1975.

(Data from Bulletin Statistique)

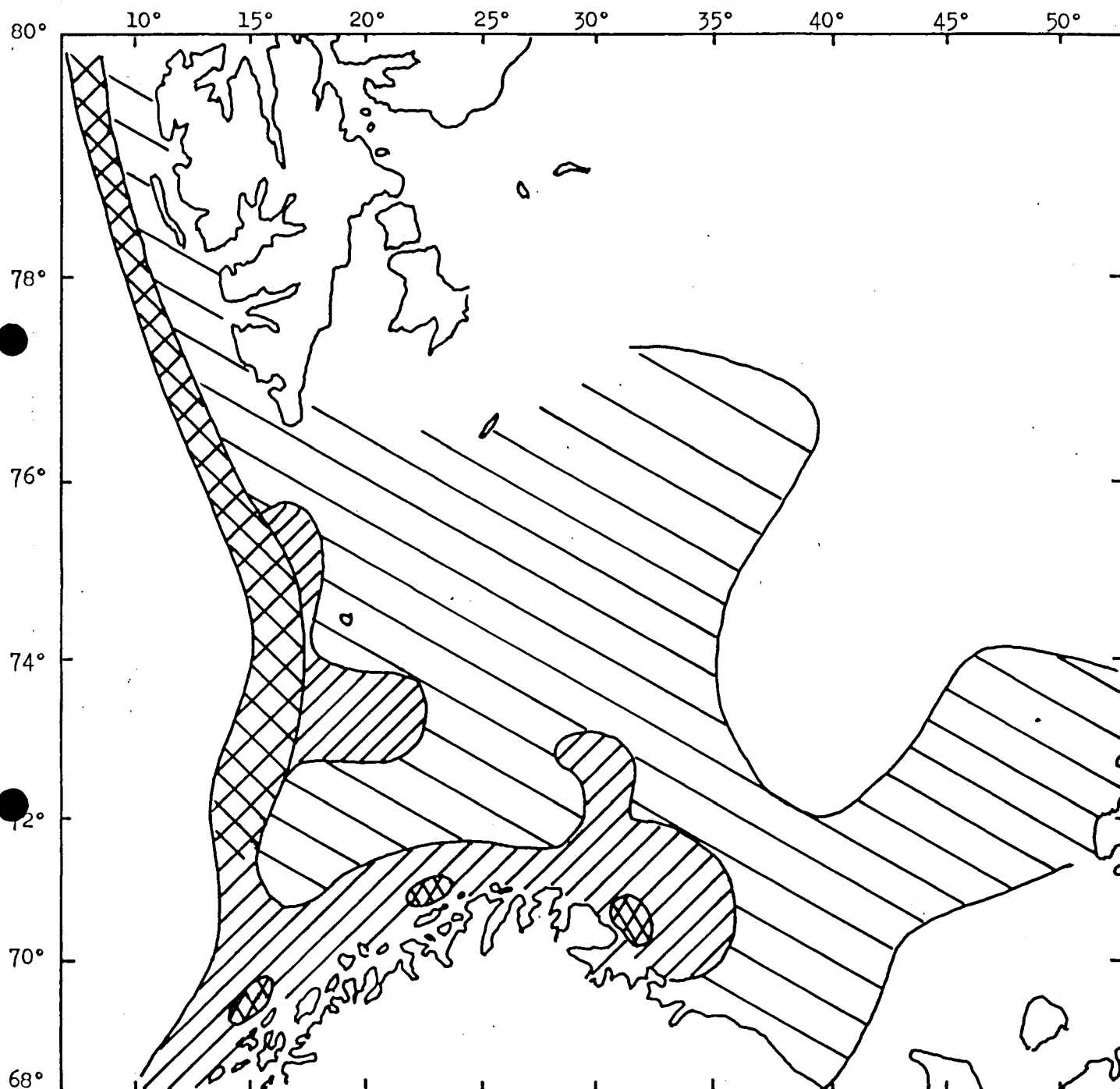
Country	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
Belgium	223	270	343	383	420	394	290	247	200	188
France	-	12	-	-	5	2	-	-	-	-
Germany ,Fed.Rep.of	38	45	60	53	39	39	29	17	16	8
Iceland	102	46	41	172	117	61	64	81	27	7
U.K. (Engl. & Wales)	10	23	28	28	18	64	43	58	58	20
U.K. (Scotland)	9	18	23	24	39	24	9	2	9	12
Total	382	414	495	660	638	584	435	405	310	235



Appendix Figure 1. Distribution of 0-group Greenland halibut.
(From C.M.1976/H:43, Fig. 17).



Appendix Figure 2. Distribution of juvenile (530cm) Greenland halibut. Based on Sorokin (1967, Fig.2) and Schultz (1977, personal communication).

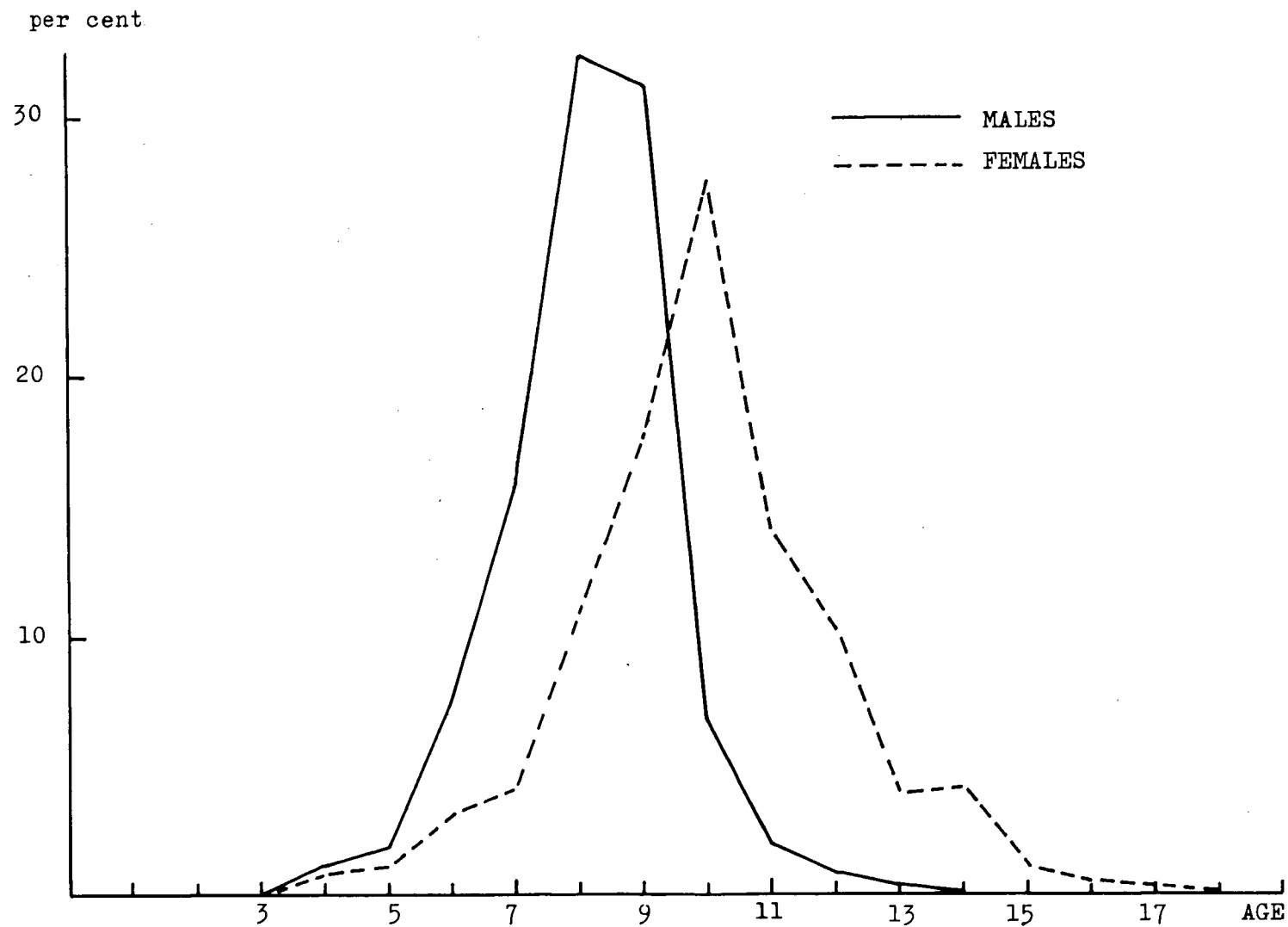


Appendix Figure 3. Distribution of adult Greenland halibut in the Barents Sea. The densist hatched areas are the fishing grounds. From Sorokin (1967), Hognestad (1969) and Schultz (1977, personal communication).

Appendix Figure 4.

Greenland Halibut in Sub-areas I and II.

The age distribution in the USSR trawl catches of
Greenland Halibut in 1966.



Appendix Figure 5. Greenland Halibut in Sub-areas I and II.

Catch per hour trawling (USSR fishery) and total catch.

Total catch
 $\times 10^{-3}$ (tons)

Catch (in tons)
per hour trawling
(USSR fishery)

----- Catch per hour trawling
——— Total catch

-23-

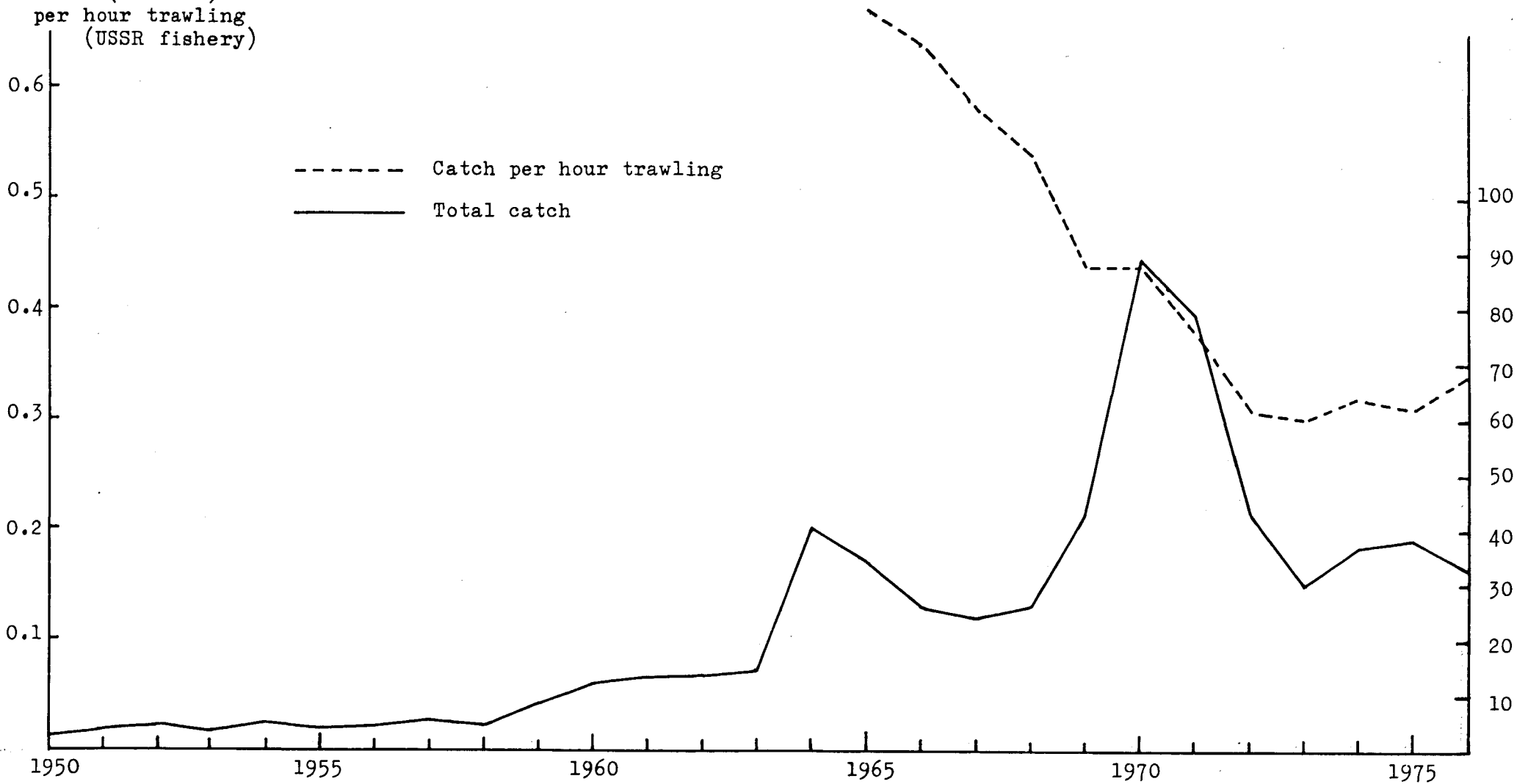


Fig.

