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INTERNATIONAL COUNCIL FOR THE
EXPLORATION OF THE SEA

C.M. 1977/F : 19
Demersal Fish
(Northern) Committee

REPORT OF THE GADOID I-GROUP WORKING GROUP.

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 an 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.

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1. Terms of reference.

At the 1976 Statutory Meeting of ICES in Copenhagen a Gadoid I-Group Working Group was established (C.Res 1976/2:9), which was asked to:

a. discuss the planning of surveys in relation to gadoid matters;

b. discuss the problems of minimising the differences between the gears;

c. evaluate the gadoid data collected during these surveys with particular reference to their value in recruitment studies.

The meeting was held in Ymuiden from 24-26 May 1977 and coincided with the meeting of the Working Group on North Sea Young Herring Surveys. Aspects of mutual interest were discussed in joint sessions of the two groups.

2. Participation.

The meeting was attended by:

Mr. J. Carruthers	- Canada
Dr. N. Daan (Chairman)	- The Netherlands
Mr. O. Hagstrøm	- Sweden
Dr. J.R.G. Hislop	- U.K. (Scotland)
Mr. J. Lahn-Johannessen	- Norway
Mr. G. Lefranc	- France
Mr. P.F. Lett	- Canada
Mr. C.T. Macer	- U.K. (England)
Mr. K. Popp Madsen	- Denmark
Mr. G. Wagner	- Federal Republic of Germany

The Group regretted the absence of a representative from U.S.S.R. However, U.S.S.R. data from the 1977 survey had been made available to the Group.

3. Data base

According to the wish expressed by the participants of the 1976 Meeting on Abundance Estimates of Juvenile Cod, Haddock and Whiting from the "International Young Herring Surveys" in the North Sea in Copenhagen (C.M. 1976/F : 5) sets of summary tables of catches per year class per haul by countries for the period 1965-1974 were distributed during the meeting. Copies of this data base are available upon request from the Netherlands Institute for Fishery Investigations.
Both in Aberdeen and Ymuiden progress had been made in computerizing the gadoid data collected during the 1977 survey, which is a necessity if detailed analyses of survey results are to be made during the limited time-spans available to Working Groups. Also the amount of work involved in the annual analysis of the survey could be considerably relieved by

computerization. This does not only apply to roundfish data, but is equally relevant for herring and mackerel data derived from the survey.
It was agreed to centralize the computer analysis and that the Ymuiden laboratory continues its efforts to get the system ready to cope with the data of the 1978 survey. Still, it was noted that the computing capacity presently available in that institute is not large enough and the filing system for data not appropriate to have it operating adequately upon more than one year's set of data. Therefore close contact should be maintained with other laboratories to ensure the possibility of exchange of both programs and data tapes for more extensive analyses.
To make centralization at all possible it is of ultimate importance that countries provide conscientiously checked input data in a format which can only bear one construction. The input data required will involve length distributions by age groups in individual hauls and consequently countries should continue to collect and work up their own length age distributions. In case a laboratory has no appropriate age length keys for a particular group of rectangles at its disposal it should not submit the raw data but ask for the appropriate ALK's from other countries.
Data for all species together should be submitted to the Ymuiden laboratory as soon as possible after completing the 1978 survey.

4. Survey design.

4.1. Sources of error.

General

In order to arrive at a statistically valid survey design an analysis of the different sources of error involved is required. However, the problems with such an analysis are considerable. The basic statistical unit for analyzing roundfish data has sofar been the ICES rectangle As a first step in the preparation of estimates of abundance the arithmetic mean catch per hour is calculated for each square.
On a total North Sea basis the mean catch per square fits a negative binominal distribution and consequently the geometric mean of the catch-rates in each square is calculated as an index of total abundance. In this situation the confidence limits around the calculated index of abundance are limited by the number of squares fished, which is at the maximum level. Additional hauls in individual squares do not directly affect these confidence limits. Thus increasing the number of hauls per square does not lead to a narrowing of these limits, although it should give better indices of abundance in individual squares and therefore, intuitively, should

offer better survey results. There is no way of using this extra information in a statistically sound manner, because, due to the requirements of the survey for herring, large numbers of hauls are made in some squares whereas in others only one or two are made. Making use of the total number of hauls would result in a bias, positive or negative depending upon whether these "herring" squares happen to be in a region of high or low abundance for the gadoid species concerned. The effective use of all hauls in the analysis depends upon an even distribution of fishing effort over the whole area, because then the individual haul, rather than the ICES rectangle, could be used as the basic statistical unit. In this way the requirements for herring versus roundfish lead to conflicting views in relation to the survey design. A second problem arises with the analysis of within-square variance. More often than not these do not fit any particular distribution pattern except that they appear to be bi- or multimodal due to between-ship variation in catch rates. In fact this serves as a rationale for taking arithmetic mean of the catches per square rather than geometric means. Hauls made within a particular square by individual ships often result in fairly constant catches of roundfish and suggest a normal rather than a negative binominal distribution at this small scale. However, when data from several countries are combined standard deviations increase beyond the mean and only multi-variate techniques could solve the statistical problems. The Working Group was not in a position to apply these techniques, because for that purpose the basic data would have to be on tape.

Depth.

A two way analysis of variance was carried out on the 1976 survey data to test the significance of depth and vessel type in determining the catch of one group cod, haddock and whiting. The statistical unit was the mean catch within a unit depth for a specified vessel. The distribution of the mean within the statistical unit was unknown.
Due to missing data within many of the statistical units it was difficult to calculate the correct degrees of freedom and make statistically valid comparison. However, inference could be drawn from the data in a number of instances.

4

The following table presents the average I-group catches of the different species by depth zones:

Depth zone	0-20	20-40	40-60	60-80	80-100	100-120	120-140	140-160	>160
Cod	30.5	12.1	15.0	17.6	1.7	13.0	0.2	0.6	0.0
Haddock	0.0	1.7	37.3	68.5	76.1	502.2	262.3	465.8	30.7
Whiting	60.0	331.6	1.364.4	1.508.6	580.3	68.3	25.1	27.5	1.5

Cod is concentrated in shallow waters up to 80 m of depth, whiting between 20 and 100 m and haddock between 100 and 160 m. Since these surveys are for roundfish in general, no squares can be relinguished due to depth, except that areas deeper than 200 meters can be safely omitted.

The following table indicates the amount of the total variation among statistical units that is explained by vessel type and depth for each species.

	Cod	Haddock	Whiting
vessel	47 %	31 %	37 %
depth	14 %	58 %	22 %

Although nothing can be said about the statistical significance of these results, they suggest that vessel type is more important in explaining the catches of roundfish than depth, except for haddock. But that exception only illustrates the well established fact that haddock is restricted in its distribution to the deeper waters north of the Doggerbank.

Diurnal variation.

Similar statistical problems arise when investigating the possibility that catch rates of gadoids might vary with time of day. An analysis was made on catches of haddock and whiting made in 1974, 1975 and 1976 within a reasonably homogeneous part of the northern North Sea (between lats. 57°30'N and 60°30'N, longs. 01°W to 03°E). It was not possible to carry out a similar analysis of cod because they were scarce in this area and the region where cod are abundant corresponds closely with the area of high herring abundance, where fishing is only carried out during the hours of daylight.

Hauls made during the hours of darkness (before 08.00 hours and after 16.30 hours) were compared with those made in daylight (Table I).
No consistent statistically significant differences were observed between either the geometric or the arithmetic mean catch rates.

Conclusions.

Considering the results in general, it is of extreme importance to decrease the amongship variation, and an important step towards this aim would be standardization of gear. It is obvious that the gear ultimately selected for this purpose should reflect the average performance of the gears applied so far in the surveys in order to get results comparable with those from former surveys. There is no real merit in trying to select the most effective gear for roundfish. Secondly, the point is stressed that from the gadoid point of view effort should be evenly spread out over the North Sea rather than concentrated in restricted areas. It seems doubtful that without a proper experimental set up any clue can be derived from survey results about diurnal variation in catch rates, because generally a very limited number of hauls is made before or after daylight hours anyway. But it is only after standardization of the gears that this might become a serious factor. Faced with these problems Mr. Lett accepted the responsibility for conducting a multivariate analysis of the available data base for the first 10 years of the surveys to be done at the Bedford Institute of Oceanography. This will allow for an analysis of the proportional contribution of the different "environmental" factors contributing to the overall variation. The Group would like to see the results on these important matters reported to the Statutory meeting of ICES in Reykjavik.

4.2. Sampling.

The Group noted that there are still considerable differences in the amount of length-age sampling carried out by the different countries and that as a result the coverage of the North Sea by these samples is still not adequate. In order to improve the data the need was stressed of including a paragraph on minimum sampling requirements in the programs, which are annually circulated before the surveys among the participating countries. The area west of Shetlands covered in 1977 has yielded very small catches of roundfish and there seems to be no need to continue to cover this area during future surveys.

5. Abundance estimates.

5.1. 1977 survey.

Tables II a - i present the numbers of I-group, II-group and older cod, haddock, whiting and Norway pout caught per hour fishing in individual hauls by each of the different countries.
Figures 1 - 8 present the average catches of I-group and II-group per statistical square for each of the four species. Figure 9 indicates the number of valid trawl hauls for haddock on which the averages are based. Deviations from these numbers for cod and whiting are indicated. For Norway Pout the number of valid trawl hauls is included in figure 7.

Cod : I-group cod was abundant along the continental coast and a minor concentration stretched along the north-western edge of the Doggerbank. Large catches of young cod were also made in the Kattegat.
Abundance of II-group cod was very low, except for the Kattegat area. Particularly in the southern North Sea this age group was virtually absent.

Haddock : Both I- and II-group haddock were poorly represented in the catches.

Whiting : In the eastern part of the North Sea the catches of I-group whiting were above average but in the western part they were poor.
II-group whiting was more abundant along the English and Scottish coast.

Norway pout : I- and II-group Norway Pout were abundant in the northern North Sea with minor concentrations stretching south along the British coast and towards the Danish coast.

Tables IIIa and b summarize the length data for I-group and II-group gadoids respectively.

5.2. Long-term averages.

Fig. 10-17 present the updated long-term average catches of I- and II-group per statistical rectangle for the four species. The area's from which the abundance indices for individual year classes were calculated are indicated in the figures.

5.3. Abundance indices 1965-1977.

Cod : Table IV provides arithmetic and geometric mean catches per square for each year class both as I- and II-group. Also the number of squares on which these indices are based are indicated and in the column heading promille coverage the average proportion of the total North Sea catch is indicated that the squares fished in that year should have yielded according to the long-term averages given in figure 10 and 11. These figures give some indication of the adequacy of each survey for each species and age group and might even be used to correct the indices derived.
VPA estimates of year class size (ICES C.M. 1977/F : 8) are also included.
There is generally little difference between arithmetic and geometric means except that the latter are somewhat smaller. However, regression analysis yielded higher correlation coefficients between geometric means and VPA estimates.

From the geometric mean regressions of VPA on the geometric mean abundance of I-year old cod the number of II-year old recruits for year classes 1975 and 1976 is estimated at 130 and 330 million fish respectively. For year class 1975 a corresponding figure of 116 million cod is estimated from the abundance as II-group fish.

Haddock : Table V provides similar date for haddock. In this case the geometric means are higher than the arithmetic means, which indicates that in the area, for which the indices are calculated, the catches are not characterized by a negative binominal distribution. Also in this case the correlation coefficients are higher for the arithmetic means than for the geometric means and estimates of incoming year classes based on the former are probably more reliable.
The estimated number of II-year old recruits for year classes 1975 and 1976 is 479 and 460 million haddock respectively from the index of abundance as I-year old fish and for 1975 535 million haddock from the index as II-year old fish.

Whiting : As for haddock the average catches per square do not seem to fit a negative binominal distribution and also correlation coefficients are higher for the abundance indices based on arithmetic means than those based on geometric means.
The estimated number of II-year old recruits for year classes 1975 and 1976 is 1696 and 1201 million whiting respectively, from the index for I-group fish and for 1975 1044 million whiting from the index for II-group fish.

Norway pout : Information on Norway pout catches from former surveys has recently been brought together by Mr. Lahn-Johannessen. The basic information on individual years will be reported at a later date, but a summary table giving arithmetic mean catches of this species during consecutive surveys has been included here (table VII). The 1973 year class has been extremely abundant both as I-group in 1975 and as II-group in 1976. For the other recent year classes variations in abundance are comparatively small. The older data are likely to be biased by inadequate sampling of the Norway pout area.

General remarks.

Assuming that the catchability of the two age groups are comparable it is possible to calculate the total mortality rate during the second year of life:

	Average abundance I-Group	1965 - 1977 II-Group	Estimated Z.
Cod	37.3	13.8	0.99
Haddock	931	592	0.45
Whiting	551	338	0.49
Norway pout	6830	1087	1.84

These values, which for the protected species probably include a significant amount of discard mortality, are considered as preliminary estimates, because several refinements in the abundance estimates are still to be included.
First of all, the %o coverage during each survey for each species, which is a measure of bias resulting from fishing inside or outside the main distribution area of each species and age group, can be used to correct the individual mean abundance estimates for such bias.
Secondly, there are still problems to be solved related to the methods of calculation of the indices because the distribution function of the catches per square is not known. Apparently the negative binomial distribution does not apply to all species, but more research is required to decide upon the best method of transformation of the data.

In comparison with the long term averages over the survey period the 1976 year class of cod is slightly above average, the haddock year class is very poor and the whiting year class is well below average,

6. Conclusions and recommendations from the joint sessions with the Young Herring Survey Working Group.

The Working Groups decided to choose the French GOV (Grande Ouverture Verticale) trawl as standard gear for future surveys. This net is similar to the majority of nets that have been used during previous surveys.
During the survey in 1978, at least 4 countries will utilise the new GOV-trawl. The remaining countries should make the change to the new gear at the earliest possible occasion.
A detailed specification of the construction of the net and its rigging will be circulated well before the start of the next survey.

It was decided to change the recommended duration of the hauls from 1 hour to ½ hour. This will cause some reduction in actual fishing time, but it will enable a larger number of hauls to be made. It will also facilitate the sampling of the catch and reduce the risk of severe net damage.

Fishing speed should be standardized at 4 knots. It was thought advisable that more detailed instructions should be given for the procedure of taking subsamples, and the minimum amount of fish to be sampled for length and age. These instructions will be included in the 1978 survey programme.

A proposal was accepted that the primary data sheets from the survey will all be sent to one laboratory for automatic processing. The processed data will then be sent to the various authors who will write up the relevant reports. The Ymuiden laboratory offered to take on this task for the 1978 survey.

In view of the fact that the Danish research vessel "Dana" will be out of commission in 1978, the Danish authorities are urged to provide a replacement for the "Dana" during the 1978 survey. The WG considers it essential that sampling effort in this programme is at least maintained at the present level, especially in view of the present situation in the herring stock. Even this level does not permit an intensity of sampling which fully satisfies the somewhat conflicting requirements of both the herring and gadoid groups.

TABLE I - Catch rates of haddock and whiting at different times of day.

		0000-0800 GMT $\bar{x}$	s.d.	se	Number of hauls	0800-1630 GMT $\bar{x}$	s.d.	se	Number of hauls	1630-2400 GMT $\bar{x}$	s.d.	se	Number of hauls
HADDOCK													
1974	Arithmetic	2.403.2	2.434.1	1.088.56	5	3.055.5	2.717.7	496.2	29	997.6	1.336.8	509.3	7
	Geometric	7.16	1.52	0.68	5	7.08	2.34	0.43	29	5.36	2.73	1.03	7
1975	Arithmetic	663.8	769.8	344.3	5	1.274.6	1.086.1	343.5	10	1.681.0	1.236.3	618.1	4
	Geometric	5.96	1.14	0.51	5	6.68	1.18	0.37	10	7.18	0.85	0.43	4
1976	Arithmetic	449.8	977.4	325.8	9	184.9	391.5	85.4	21	444.5	552.1	276.1	4
	Geometric	3.63	2.57	0.86	9	3.07	2.40	0.52	21	4.78	2.34	1.17	4
WHITING													
1974	Arithmetic	150.8	142.1	63.6	5	69.2	107.7	20.0	29	127.7	236.4	89.3	7
	Geometric	3.79	2.49	1.11	5	2.68	2.25	0.42	29	2.60	2.72	1.03	7
1975	Arithmetic	208.8	276.7	123.8	5	265.5	332.4	105.1	10	394.8	345.7	172.8	4
	Geometric	3.59	2.67	1.19	5	4.89	1.34	0.42	10	5.55	1.14	0.57	4
1976	Arithmetic	56.0	59.8	18.0	9	86.5	186.5	41.7	21	24.0	28.1	14.0	4
	Geometric	3.28	1.55	0.47	9	2.97	1.82	0.41	21	2.57	1.31	0.66	4

Table IIa

COUNTRY: DENMARK
SHIP: "DANA"

YEAR: 1977

IYHS

CATCHES IN NUMBERS PER HOUR FISHING BY AGE GROUPS

AREA	DATE	STATION	SQUARE	DEPTH M	TIME SHOT	POSITION N	COD I 1976	COD II 1975	COD older	HADDOCK I 1976	HADDOCK II 1975	HADDOCK older	WHITING I 1976	WHITING II 1975	WHITING older	NORWAY POUT I 1976	NORWAY POUT II 1975	NORWAY POUT older
EF 5330	14/2	25	36F1	41	1623	53°54' 1°09'E	16	-	2	-	-	-	728	10	-	-	-	-
GH 5330	12/2	16	36F3	46	0707	53 58 3 55	22	-	-	-	-	-	468	6	-	-	-	-
	"	17	36F3	46	1006	53 57 3 49	116	-	-	1	-	-	1411	6	-	-	-	-
	"	18	36F3	45	1224	53 56 3 45	61	-	2	1	-	-	1264	4	1	-	-	-
	"	19	36F3	43	1455	53 56 3 36	144	-	1	2	-	-	1746	7	1	-	-	-
	13/2	20	36F3	39	0710	53 51 3 46	133	-	1	-	-	-	686	5	1	-	-	-
	"	21	36F3	38	1030	53 44 3 31	49	-	3	1	-	-	239	7	1	-	-	-
	"	22	36F2	42	1530	53 40 2 56	501	-	3	-	4	-	7198	40	4	-	-	-
	"	23	35F3	33	1934	53 28 3 03	2	-	-	-	-	-	550	1	1	-	-	-
	14/2	24	35F2	32	0657	53 26 2 52	12	-	6	2	-	-	1810	-	-	-	-	-
LM 5430	7/2	10	38F7	26	0742	54 56 7 27	110	-	-	-	-	-	1221	-	-	-	-	-
	"	11	38F7	26	1008	54 47 7 26	36	-	6	-	-	-	630	-	-	-	-	-
	8/2	12	37F7	25	0752	54 22 7 49	1914	-	-	-	-	-	909	1	-	-	-	-
	"	13	37F7	44	1228	54 18 7 26	539	-	-	-	-	-	6608	7	-	-	-	-
	9/2	14	38F7	21	1014	54 37 7 48	156	-	-	-	-	-	384	2	-	-	-	-
CD 5530	15/2	26	39E9	65	0733	55 25 0 31'W	23	-	-	13	40	2	-	-	-	-	-	-
	"	27	40E9	80	1223	55 54 0 17	4	5	3	6	325	56	-	-	-	1104	72	-
	19/2	28	40E8	80	0952	56 00 1 26	73	5	4	334	558	538	-	-	-	15192	331	-
	"	29	40E8	79	1232	55 56 1 35	249	8	1	33	233	345	-	-	-	5612	48	
	"	30	40E8	71	1545	55 53 1 38	Not	valid										
	20/2	31	40E8	67	0906	55 54 1 41	99	1	6	25	189	113	-	-	-	1764	9	-
	"	32	40E8	67	1215	55 51 1 47	Not	valid										
	"	33	40E8	68	1632	55 56 1 09	26	32	4	36	253	561	-	-	-	494	231	33
EF 5630	21/2	34	41F0	87	0816	56 18 0 41'E	Not	valid										
	"	35	41F1	81	1315	56 05 1 10	61	-	2	48	90	52	2324	424	-	12	-	-
	22/2	36	42F0	85	0834	56 44 0 30	42	9	-	191	340	812	1422	822	42	87	5	-
	"	37	42F1	97	1503	56 50 1 21	209	1	9	15	95	56	432	34	2	4604	18	-
GH 5630	23/2	38	41F2	83	0810	56 12 2 06	247	35	21	82	185	87	185	72	13	4	3	-
	"	39	41F3	75	1615	56 18 3 45	358	6	-	50	66	10	1442	10	4	8	-	-
	24/2	40	42F2	68	0655	56 47 2 32	27	-	2	35	79	32	299	15	7	-	-	-
	"	41	42F3	62	1335	56 56 3 30	21	-	-	44	10	34	39	3	1	-	-	-
LM 5630	4/2	1	42F7	26	1223	56 38 7 50	340	-	2	-	-	-	273	-	1	-	-	-
	5/2	2	41F7	29	0708	56 09 7 42	141	-	-	-	-	-	996	-	-	-	-	(6)
	"	3	41F7	30	0940	56 09 7 38	200	-	2	-	-	-	2184	-	-	-	-	(6)
	"	4	41F7	30	1315	56 06 7 15	404	1	3	-	-	-	279	-	-	-	-	-
	"	5	41F7	34	1513	56 10 7 21	534	-	1	-	-	-	1609	-	-	-	-	-
	6/2	6	41F7	35	0702	56 21 7 30	3036	12	16	83	1	3	20944	1	4	308	-	-
	"	7	41F7	43	1020	56 24 7 09	1760	135	15	10	-	-	11195	45	70	-	-	(130)
	"	8	42F6	37	1504	56 33 6 49	1003	33	16	670	113	16	2014	83	52	-	-	(165)
	"	9	41F6	26	1857	56 25 6 57	411	15	40	154	1	-	1443	3	-	-	-	(40)

GEAR SPECIFICATIONS:

NOTES: Figures in brackets: No length measurements available.

Table IIb.

COUNTRY: ENGLAND
SHIP: "CIROLANA"

YEAR: 1977

IYHS

CATCHES IN NUMBERS PER HOUR FISHING BY AGE GROUPS

AREA	DATE	STATION	SQUARE	DEPTH M	TIME SHOT	POSITION N	COD I 1976	COD II 1975	COD older	HADDOCK I 1976	HADDOCK II 1975	HADDOCK older	WHITING I 1976	WHITING II 1975	WHITING older	NORWAY POUT I 1976	NORWAY POUT II 1975	NORWAY POUT older
EF	25/2	68	F135	23	1823	53°30' 01°43'E	-	-	1	-	-	-	-	-	1	-	-	-
5330	26/2	69	F135	22	0734	53 30 01 41	-	-		-	-	-	5	-	4	-	-	-
	"	70	F136	28	1031	53 43 01 31	2	-	1	-	-	-	2	3	6	-	-	-
	"	71	F036	43	1448	53 54 00 42	4	2	-	-	-	-	144	29	13	115	-	-
	"	72	F036	47	1614	53 58 00 47	-	-	-	-	-	-	48	2	3	9	-	-
GH	23/2	55	F336	41	0836	53 58 03 41	-	-	1	3	-	-	57	1	1	-	-	-
5330	"	56	F336	35	1056	53 47 03 41	1	-	-	-	-	-	97	2	1	-	-	-
	"	58	F336	37	1538	53 42 03 12	2	-	6	1	-	-	221	6	11	-	-	-
	24/2	60	F336	40	0733	53 41 03 18	4	11	11	2	-	-	103	5	2	-	-	-
	"	61	F336	35	1000	53 34 03 13	33	-	7	-	-	-	923	14	6	-	-	-
	"	62	F236	28	1400	53 47 02 35	13	-	1	-	-	-	11	3	10	-	-	-
	"	63	F236	60	1615	53 51 02 35	5	-	48	3	1	2	1251	227	244	3	-	-
	25/2	65	F335	24	0734	53 13 03 36	44	-	2	-	-	-	-	-	-	-	-	-
	"	66	F335	24	0913	53 12 03 43	114	-	1	-	-	-	876	207	75	-	-	-
	"	67	F235	29	1354	53 20 02 43	12	-	11	-	-	-	227	4	4	-	-	-
LM	18/2	38	F738	14	0737	54 56 07 58	96	-	-	-	-	-	9	1	-	-	-	-
5430	"	39	F738	17	0940	54 51 07 48	46	-	-	-	-	-	56	-	-	-	-	-
	"	40	F738	26	1250	54 34 07 24	64	-	-	-	-	-	40	-	-	-	-	-
	"	41	F738	32	1419	54 32 07 13	112	7	1	-	-	-	19	1	-	-	-	-
	20/2	43	F638	38	0736	54 49 06 35	57	1	3	1	2	1	591	28	8	-	-	-
	"	44	F637	44	1156	54 20 06 11	6	-	3	-	-	-	249	14	-	-	-	-
	"	45	F637	35	1501	54 16 06 45	274	1	1	-	-	-	345	28	3	-	-	-
	21/2	47	F737	33	0734	54 28 07 09	400	2	2	-	1	-	74	66	80	-	-	-
	"	48	F737	35	0940	54 21 07 22	397	6	-	-	-	-	544	75	40	-	-	-
	"	49	F737	35	1131	54 16 07 21	276	6	1	-	-	-	1064	148	39	-	-	-
	"	50	F737	22	1400	54 27 07 42	29	-	-	-	-	-	168	-	-	-	-	-
CD	5/2	1	E839	78	0847	55°20' 01°07'W	3	-	3	-	-	-	313	29	16	26	-	-
5530	"	2	E839	91	1131	55 08 00 59	2	-	1	-	-	-	242	166	64	51	6	1
	6/2	6	E840	77	0848	55 45 01 41	26	9	8	3	1	8	24	467	371	45	31	1
	"	7	E840	72	1154	55 50 01 46	-	-	3	-	-	1	6	4	2	12	5	-
	"	8	E840	74	1434	55 54 01 45	19	2	3	4	9	52	39	251	115	217	54	6
	"	9	E939	69	1947	55 25 00 35	33	3	2	10	1	15	1014	705	204	27	24	7
	7/2	11	E840	73	0839	55 53 01 38	72	3	-	8	3	16	150	557	159	300	128	-
	"	12	E940	68	1328	55 49 00 30	1	1	1	1	41	151	25	429	204	-	-	-
EF	8/2	14	F041	78	0845	56°11' 00°21'E	-	2	-	4	9	8	36	73	12	-	-	-
5630	"	15	F042	85	1311	56 45 00 26	11	-	1	2	16	44	22	14	25	13	1	-
	"	16	F142	96	1743	56 45 01 28	10	-	1	-	-	-	13	2	1	1725	-	-
	"	18	F141	92	2144	56 24 01 29	29	4	31	-	2	100	8	11	28	114	11	-
GH	9/2	20	F241	76	0842	56 15 02 15	41	8	5	40	24	20	14	1	-	-	-	-
5630	"	21	F341	63	1322	56 09 03 22	10	1	2	4	2	3	98	1	-	-	-	-
	"	22	F342	60	1753	56 45 03 28	3	-	1	1	1	3	32	2	-	-	-	-
	"	24	F242	66	2154	56 45 02 31	5	-	1	1	2	1	93	-	-	-	-	-
LM	10/2	26	F642	45	1057	56 46 06 17	4	3	5	1	1	-	2	-	-	-	-	-
5630	15/2	28	F641	38	2012	56 12 06 33	59	2	1	18	3	5	689	53	5	3	1	-
	16/2	30	F642	34	0837	56 32 06 48	114	26	7	93	26	20	140	70	29	8	1	-
	"	31	F742	23	1254	56 38 07 50	89	2	2	-	-	-	115	-	-	-	-	-
	"	32	F741	23	1542	56 26 07 39	106	2	7	-	-	-	95	3	-	-	-	-
	17/2	33	F741	30	0838	56 20 07 05	128	6	6	30	1	1	976	57	2	13	-	-
	"	34	F741	28	1052	56 15 07 09	78	4	-	-	-	-	141	1	-	-	-	-
	"	35	F741	24	1246	56 09 07 21	36	-	-	-	-	-	848	3	-	-	-	-
	"	36	F741	24	1507	56 03 07 41	39	-	-	-	-	-	416	2	-	-	-	-
JK	22/2	52	F442	58	0842	56 45 04 40	6	-	-	4	13	11	86	-	-	-	-	-
5630	"	53	F542	50	1330	56 45 05 30	49	35	13	30	15	14	63	7	5	-	-	-
	"	54	F542	51	1631	56 44 05 37	34	-	-	36	3	1	644	2	-	6	-	-
CD 5730	27/2	73	E944	116	1246	57 46 00 33 W	-	-	5	511	49	448			(616)			(8625)
CD	27/2	74	E945	118	1542	58 04 00 29	-	-	3	457	88	492			(750)			(5323)
5830	"	75	E945	121	1840	58 09 00 25	-	-	-	112	24	206			(418)	-	-	-
EF	28/2	76	F045	147	0741	58 23 00 46 E	-	12	28	14	154	509			(561)			(11734)
5830	"	77	F046	133	1059	58 44 00 29	-	8	11	727	51	731			(222)			(7952)

GEAR SPECIFICATIONS: 63' Dutch Herring Trawl, with codend liner.
2 Headline kites

NOTES: Stations Nos. 26, 65, 69, 70, with gear damage.

Table II c.

COUNTRY: FRANCE
SHIP: "LA PERLE"

YEAR: 1977

IYHS

CATCHES IN NUMBERS PER HOUR FISHING BY AGE GROUPS

AREA	DATE	STATION	SQUARE	DEPTH M	TIME SHOT	POSITION N	POSITION E	COD I 1976	COD II 1975	COD older	HADDOCK I 1976	HADDOCK II 1975	HADDOCK older	WHITING I 1976	WHITING II 1975	WHITING older	NORWAY POUT I 1976	NORWAY POUT II 1975	NORWAY POUT older
GHJ 5230	6/2	1	33F3	30	1125	52°21'	03°31'	58	2	4	-	-	-	189	218	143	-	-	-
	7/2	2	34F4	20	1120	52 35	04 18	207	5	2	-	-	-	277	193	34	-	-	-
	"	3	34F4	25	1540	52 42	04 10	39	1	-	-	-	-	49	23	4	-	-	-
	"	4	34F4	25	1650	52 45	04 14	67	1	-	-	-	-	96	74	10	-	-	-
	8/2	5	34F4	26	0825	52 33	04 10	653	13	2	-	-	-	370	465	87	-	-	-
	"	6	34F4	25	1015	52 35	04 13	173	9	-	-	-	-	60	82	28	-	-	-
	"	7	34F4	24	1120	52 36	04 08	-	-	-	-	-	-	30	40	14	-	-	-
JK 5330	8/2	8	35F4	27	1700	53 02	04 03	60	-	10	-	-	-	1237	772	91	-	-	-
	9/2	9	35F4	28	0826	53 22	04 04	40	-	-	-	-	-	734	101	11	-	-	-
	"	10	35F4	28	0900	53 26	04 05	28	-	-	-	-	-	679	40	5	-	-	-
	"	11	36F4	32	1115	53 35	04 23	-	-	1	-	-	-	1146	66	-	-	-	-
	"	12	36F4	42	1345	53 50	04 20	46	-	-	-	-	-	1975	105	4	-	-	-
	"	13	36F4	42	1446	53 52	04 25	-	-	-	-	-	-	951	79	-	-	-	-
JK 5430	9/2	14	37F4	44	1635	54 00	04 37	-	-	-	-	-	-	700	24	6	-	-	-
	10/2	15	38F4	47	0837	54 41	04 33	30	-	6	-	-	-	546	-	-	-	-	-
LMN 5430	11/2	16	37F7	20	0834	54 26	07 55	72	-	-	-	-	-	376	-	-	-	-	-
	"	17	37F8	18	0956	54 28	08 04	156	-	-	-	-	-	450	-	-	-	-	-
	"	18	38F8	15	1340	54 54	08 04	124	-	-	-	-	-	128	-	-	-	-	-
LMN 5530	11/2	19	39F7	21	1622	55 16	07 56	136	-	-	-	-	-	114	-	-	-	-	-
	"	20	39F8	17	1750	55 18	08 03	220	-	-	-	-	-	226	-	-	-	-	-
	14/2	21	39F8	19	1139	55 21	08 04	170	2	-	-	-	-	1214	-	-	-	-	-
	"	22	39F7	22	1420	55 18	07 53	70	-	-	-	-	-	222	-	-	-	-	-
JK 5630	15/2	23	41F5	53	0823	56 13	05 44	93	13	10	178	8	36	902	77	25	222	6	-
	"	24	41F5	58	0950	56 13	05 34	138	24	10	-	-	-	535	63	16	546	-	-
	"	25	41F5	54	1120	56 13	05 19	294	-	2	384	29	19	7822	138	-	-	-	-
	"	26	41F4	56	1350	56 10	04 47	4	-	2	34	-	-	748	8	-	-	-	-
	"	27	41F4	54	1452	56 09	04 40	4	-	-	34	-	6	463	4	1	-	-	-
	"	28	41F4	62	1652	56 09	04 14	2	-	-	16	6	-	322	7	7	-	-	-
	16/2	29	42F5	58	0827	56 32	05 10	78	2	10	152	1	1	1287	27	-	28	-	-
	"	30	42F4	65	0927	56 32	04 59	35	35	28	56	5	11	444	14	-	-	-	-
EF 5730	17/2	35	44F1		1040	57 31	01 59	-	-	2	637	708	595	514	4	4	92	-	-
	"	36	43F1		1335	57 28	01 59	-	16	404	136	603	585	12	20	10	-	-	-
	"	37	43F0		1600	57 27	00 56	8	53	29	44	943	815	50	293	103	642	333	39
	"	38	44F0		1708	57 31	00 50	-	68	79	20	1209	1075	99	217	10	950	40	20
GH 5730	16/2	31	43F3	65	1532	57 06	03 33	22	3	3	55	15	48	90	-	-	-	-	-
	"	32	44F3	66	1820	57 30	03 23	24	-	2	50	1	3	86	2	-	-	-	-
	17/2	33	43F2		0826	57 27	02 13	10	25	53	667	323	268	320	2	18	-	-	-
	"	34	44F2		0934	57 30	02 06	4	-	4	1203	1125	546	1312	-	10	32	-	-

GEAR SPECIFICATIONS:

NOTES:

COUNTRY: GERMANY, FED. REP., OF
SHIP: "ANTON DOHRN"

YEAR: 1977

IYHS

CATCHES IN NUMBERS PER HOUR FISHING BY AGE GROUPS

AREA	DATE	STATION	SQUARE	DEPTH M	TIME SHOT	POSITION N		COD I 1976	COD II 1975	COD older	HADDOCK I 1976	HADDOCK II 1975	HADDOCK older	WHITING I 1976	WHITING II 1975	WHITING older	NORWAY POUT I 1976	NORWAY POUT II 1975	NORWAY POUT older
JK 5330	15/2	160	36F5	36	1430	53°57'	5°45'E	539	40	4	-	-	-	5294	719	64	-	-	-
LM 5330	15/2	161	36F6	35	1705	53 55	6 10	62	11	6	-	-	-	9	7	31	-	-	-
CD 5430	26/1	46	38E9	74	0610	54 36	0 08'W	1	4	8	2	8	34	406	232	366	323	-	3
JK 5430	15/2	157	38F5	44	0600	54 41	5 57	9	1	-	1	2	1	908	7	-	-	-	-
	"	159	37F5	44	1110	54 24	5 57	43	-	-		-	-	461	4	-			
LM 5430	21/1	1	37F7	24	0720	54 22	7 49	11	-	-	-	-	-	26	2	-	-	-	-
	"	2	37F7	26	0905	54 22	7 38	10	-	-	-	-	-	81	3	-	-	-	-
	"	3	37F7	30	1110	54 23	7 23	-	1	-	-	-	-	19	-	-	-	-	-
	"	4	37F6	40	1400	54 28	6 56	8	-	6	-	-	-	189	22	-	-	-	-
	"	5	37F6	40	1625	54 27	6 24	1	-	2	-	-	-	179	13	1	-	-	-
	22/1	7	38F7	18	0725	54 36	7 45	36	-	-	-	-	-	94	1	-	-	-	-
	"	8	38F7	20	0855	54 43	7 45	16	-	-	-	-	-	99	1	-	-	-	-
	"	9	38F7	22	1135	54 45	7 36	-	-	-	-	-	-	4	-	-	-	-	-
	"	10	38F6	44	1450	54 46	6 52	5	3	17	1	5	8	103	2	9	-	-	-
	15/2	158	37F6	42	0830	54 28	6 10	51	-	6	-	-	-			(1283)	-	-	-
CD 5530	26/1	47+	39F9	82	1230	55 07	0 27W	Not valid											
	"	47	39E9	84	1020	55 04	0 28	8	7	26	14	43	253	88	105	53	200	142	67
	"	48	39E9	80	1510	55 20	0 30	-	-	-	140	36	114	1848	9735	3757	380	175	35
	"	49	40E9	100	1805	55 31	0 44	-	-	1	19	56	62	318	5572	2215	1131	652	425
	27/1	50	40E8	72	0600	55 54	1 24	-	-	-	-	36	1251	35	2821	2467	675	531	441
	"	51	40E8	84	0735	55 55	1 18	-	-	2	-	133	907	20	1640	2920	320	470	930
EF 5530	24/1	32	39F1	72	1720	55 25	1 37E	53	23	43	17	5	67	633	8	19	-	-	-
	25/1	35	40F1	80	0745	55 49	1 11	5	-	-	6	3	1	319	2	1	-	-	-
	"	37	40F1	84	1055	55 40	0 27	1	1	15	10	81	508	46	8	198	295	-	-
	"	39	39F0	80	1400	55 15	0 24	3	-	-	10	-	10	938	103	16	70	1	-
GH 5530	23/1	21	39F3	32	0735	55 18	3 42	-	-		-	-	-	1	-	-	-	-	-
	"	23	39F2	33	1130	55 15	2 52	-	-	1	-		1	1	-	-	-	-	-
	"	24	39F2	33	1405	55 13	2 35	4	2	6	4	14	73	8	32	51	-	-	-
	"	25	39F2	36	1535	55 12	2 16	-	-	1	-	-	1	13	-	-	-	-	-
	24/1	26	40F3	68	0735	55 52	3 27	3	-	1	5	4	-	41	-	1	-	-	-
	"	29	40F2	84	1225	55 51	2 16	24	-	1	42	7	14	569	3	-	-	-	-
CD 5630	27/1	53	41E9	80	1250	56 05	0 46W	-	-	1	-	136	1351	32	630	393	-	-	-
	"	55	41E9	92	1640	56 16	0 08	-	-	1	-	24	250	164	717	154	418	-	-
GH 5630	28/1	60	42F2	76	0610	56 52	2 46E	1	-	2	3	2	2	12	3	-	1	-	-
GH 5730	28/1	62	43F3	68	0930	57 20	3 32	2	1	4	43	40	14	12	-	-	1	-	-
JK 5730	28/1	64	43F4	74	1350	57 21	4 10	-	-	1	85	16	5	27	4	2	4544	-	-
	"	65	44F4	80	1710	57 39	4 21	7	1		265	62	64	133	5	-	129	-	-
	29/1	70	43F5	84	1340	57 23	5 48	2	12	-	187	117	42	28	3	3	11	-	-
	"	72	44F5	120	1715	57 39	5 40	2	-	10	127	33	31	6	2	14	571	-	-
LM 5730	29/1	66	43F7	60	0610	57 12	7 24	17	6	3	34	50	43	56	7	3	16	-	-
	"	67	43F6	84	0920	57 19	6 52	1	8	13	26	40	141	7	12	35	33	2	-
EF 5830	8/2	127	46F1	112	0620	58 45	1 35	1	4	2	150	91	661	21	23	9	482	16	-
	"	128	46F0	136	1010	58 45	0 32	1	1	15	237	38	720	49	141	503	10220	-	-
	"	129	45F0	152	1435	58 15	0 40	-	3	21	27	86	274	30	213	633	11616	-	-
	9/2	130	45F1	108	0610	58 14	1 33	2	1	5	157	111	242	60	16	8	147	10	1

GEAR SPECIFICATIONS: 180' - Herring - Bottom - Trawl with inserted small meshed cod end.

NOTES: + Station no. 47 repeated

Table II d.

COUNTRY: GERMANY, FED. REP. OF
SHIP: "ANTON DOHRN"

YEAR: 1977

IYHS

CATCHES IN NUMBERS PER HOUR FISHING BY AGE GROUPS

AREA	DATE	STATION	SQUARE	DEPTH M	TIME SHOT	POSITION N		COD I 1976	COD II 1975	COD older	HADDOCK I 1976	HADDOCK II 1975	HADDOCK older	WHITING I 1976	WHITING II 1975	WHITING older	NORWAY POUT I 1976	NORWAY POUT II 1975	NORWAY POUT older
GH 5830	9/2	132	45F2	77	1005	58°15'	2°29'E	-	1	-	125	2	3	13	1	-	9	1	-
	"	134	46F2	116	1400	58 43	2 30	-	-	-	938	176	529	67	4	-	2343	55	-
	10/2	136	46F3	128	0615	58 50	3 30	-	3	3	363	45	73	2	17	41	1386	126	-
	"	138	45F3	118	1020	58 22	3 30	-	2	15	218	33	213	-	-	2	6930	-	-
AB 5930	3/2	90	47E6	148	0735	59 16	3 50W	-	-	4	14	14	740	4	11	311	240	922	76
	"	93	48E7	80	1220	59 46	2 59	-	2	-	-	-	31	-	-	1	-	-	-
	4/2	99	47E7	85	0613	59 02	2 12	-	4	-	43	20	767	47	71	180	2	24	6
CD 5930	3/2	95	48E8	112	1715	59 54	1 50	-	-	1	247	130	4219	13	68	693	-	1960	442
	4/2	100	47E8	114	1035	59 07	1 19	-	-	1	1157	50	1132	-	352	1015	145	651	16
	"	101	47E9	140	1340	59 17	0 41	-	-	3	937	156	694	12	45	450	1057	308	21
	"	102	48E9	140	1715	59 35	0 38	-	-	6	296	191	861	-	31	405	385	185	15
EF 6030	5/2	103	49F0	115	0605	60 22	0 34E	-	1	6	177	194	499	-	-	2227	642	613	103
	"	104	49E1	144	0850	60 24	1 18	-	1	13	61	44	77	-	-	1182	287	428	93
	"	105	50F1	152	1400	60 41	1 25	-	-	18	1491	180	50	-	-	56	17874	9958	399
	"	106	50F0	146	1710	60 42	0 41	-	1	5	521	325	298	4	-	74	3038	3300	550
GH 6030	7/2	122	50F2	126	0625	60 45	2 30	3	-	2	646	61	97	3	-	16	2356	171	-
	"	124	49F2	100	1010	60 17	2 33	-	-	1	127	-	-	4	-	-	996	74	6
	"	126	49F3	180	1340	60 13	3 15	-	-	-	98	4	3	3	2	39	1535	435	40
EF 6130	6/2	109	51F0	172	0620	61 14	0 33	-	-	1	87	7	43	-	-	-	862	553	73
	"	111	51F1	152	1035	61 13	1 39	-	-	3	1839	58	144	-	3	39	7876	2772	77
GH 6130	6/2	113	51F2	144	1400	61 13	2 20	-	-	-	170	-	-	-	-	-	256	29	3

GEAR SPECIFICATIONS: 180' - Herring - Bottom - Trawl with inserted small meshed cod end.

NOTES:

COUNTRY: THE NETHERLANDS
SHIP: "TRIDENS"

YEAR: 1977

IYHS

CATCHES IN NUMBERS PER HOUR FISHING BY AGE GROUPS

AREA	DATE	STATION	SQUARE	DEPTH M	TIME SHOT	POSITION N	POSITION E	COD I 1976	COD II 1975	COD older	HADDOCK I 1976	HADDOCK II 1975	HADDOCK older	WHITING I 1976	WHITING II 1975	WHITING older	NORWAY POUT I 1976	NORWAY POUT II 1975	NORWAY POUT older
GH	7/2	2	34F3	25	2110	52°43'	3°38'	NOT VALID											
5230	7/3	60	34F3	22	1721	52 49	3 52	4	-	-	-	-	-	492	628	392	-	-	-
JK	3/3	58	33F4	20	0820	52 26	4 01	244	5	8	-	-	-	268	60	108	-	-	-
5230	7/2	1	34F4	20	1650	52 47	4 17	50	2	2	-	-	-	158	10	8	-	-	-
	8/2	3	34F4	10	0830	52 35	4 15	656	-	-	-	-	-	476	19	25	-	-	-
	"	4	34F4	20	1010	52 37	4 10	170	1	3	-	-	-	164	12	24	-	-	-
	"	5	34F4	19	1120	52 37	4 05	20	1	5	-	-	-	72	2	2	-	-	-
	17/2	33	34F4	23	0820	52 49	4 16	NOT VALID											
	"	34	34F4	21	1000	52 36	4 16	336	-	2	-	-	-	1020	51	29	-	-	-
	7/3	59	34F4	20	1535	52 42	4 11	20	-	-	-	-	-	122	22	22	-	-	-
GH	8/3	61	36F3	33	0815	53 43	3 30	66	-	-	2	-	-	704	9	5	-	-	-
5330																			
JK	8/2	6	35F4	23	1702	53 02	4 03	196	-	16	-	-	-	2280	204	84	-	-	-
5330	9/2	7	35F4	23	0825	53 25	4 05	48	-	2	-	-	-	723	13	-	-	-	-
	"	8	35F4	23	0930	53 29	4 06	44	-	2	-	-	-	581	19	-	-	-	-
	"	9	36F4	26	1115	53 36	4 26	26	-	8	-	-	-	736	16	-	-	-	-
	"	10	36F4	38	1342	53 52	4 23	26	-	-	6	-	-	720	10	-	-	-	-
	"	11	36F4	38	1444	53 53	4 29	20	-	-	2	2	-	981	11	-	-	-	-
	16/2	27	36F5	26	0837	53 44	5 21	NOT VALID											
	"	28	36F5	26	0930	53 46	5 19	584	-	4	-	-	-	1643	53	32	-	-	-
	"	29	36F5	26	1040	53 46	5 24	368	-	4	-	-	-	800	16	16	-	-	-
	"	30	36F5	26	1130	53 45	5 28	118	2	-	-	-	-	275	9	-	-	-	-
LM	16/2	31	36F6	25	1650	53 57	6 49	154	2	2	-	-	-	266	2	2	-	-	-
5330	10/3	69	36F6	26	1120	53 49	6 15	20	-	6	-	-	-	28	4	2	-	-	-
	16/2	32	36F7	25	1840	53 58	7 06	136	6	-	-	-	-	36	-	-	-	-	-
EF	8/3	63	37F1	40	1612	54 17	1 49	56	-	-	6	-	-	214	200	146	-	-	-
5430	"	64	38F1	20	1830	54 37	1 47	6	-	-	-	-	-	3	6	3	-	-	-
GH	8/3	62	37F2	53	1235	54 03	2 45	18	2	2	14	10	10	1728	64	-	-	-	-
5430	9/3	65	37F3	40	0820	54 24	3 31	10	-	-	-	2	2	332	4	-	-	-	-
	"	66	38F3	40	1045	54 44	3 29	4	-	-	2	2	-	28	-	2	2	-	-
JK	9/2	12	37F4	38	1632	54 01	4 41	36	-	2	-	-	-	1414	33	9	-	-	-
5430	2/3	55	37F5	38	1050	54 23	5 32	38	-	-	2	-	-	722	2	4	-	-	-
	"	56	37F5	36	1320	54 11	5 24	74	-	-	3	-	-	1744	3	7	-	-	-
	"	57	37F5	37	1455	54 03	5 16	146	-	4	2	-	-	8096	17	75	-	-	-
	10/2	13	38F4	42	0840	54 42	4 38	78	-	2	-	2	-	1024	16	16	-	-	-
	2/3	54	38F5	40	0820	54 40	5 33	60	-	8	2	-	-	1696	21	13	-	-	-
	9/3	67	38F5	40	1710	54 46	5 19	28	-	4	2	2	2	240	5	15	-	-	-
LMNO	10/3	68	37F6	30	0820	54 11	6 24	76	-	-	-	-	-	488	-	-	-	-	-
5430	11/2	14	37F7	18	0830	54 26	7 59	110	-	-	-	-	-	300	-	-	-	-	-
	"	15	37F8	13	0955	54 28	8 04	130	-	-	-	-	-	328	-	-	-	-	-
	"	16	38F8	11	1337	54 58	8 04	404	-	-	-	-	-	364	-	-	-	-	-
LMNO	11/2	17	39F7	17	1615	55 17	7 52	280	-	-	-	-	-	102	-	-	-	-	-
5530	"	18	39F8	11	1745	55 19	8 05	156	-	-	-	-	-	128	-	-	-	-	-
	14/2	19	39F8	13	1135	55 21	8 04	30	-	-	-	-	-	472	-	-	-	-	-
	"	20	39F7	15	1415	55 18	7 49	26	-	-	-	-	-	50	-	-	-	-	-
JK	15/2	21	41F5	47	0823	56 14	5 39	84	2	14	174	22	40	949	107	-	148	4	16
5630	"	22	41F5	51	0948	56 14	5 29	64	14	2	720	69	45	487	25	8	960	-	-
	"	23	41F5	49	1115	56 14	5 12	74	-	-	288	-	-	1781	11	-	-	-	-
	"	24	41F4	51	1345	56 10	4 42	8	-	-	4	2	-	551	5	-	-	-	-
	"	25	41F4	50	1450	56 09	4 36	4	-	-	22	4	2	262	-	-	-	-	-
	"	26	41F4	56	1647	56 09	4 12	10	-	2	2	2	-	381	1	2	-	-	-
	22/2	35	42F4	55	0945	56 45	4 43	38	-	2	-	24	6	294	-	-	-	-	-
	"	36	42F5	49	1430	56 45	5 39	NOT VALID											
	"	37	42F5	49	1742	56 45	5 40	46	-	2	70	4	2	1024	-	-	-	-	-

GEAR SPECIFICATIONS:

NOTES:

Table II e.

COUNTRY: THE NETHERLANDS
SHIP: "TRIDENS"

YEAR: 1977

IYHS

CATCHES IN NUMBERS PER HOUR FISHING BY AGE GROUPS

AREA	DATE	STATION	SQUARE	DEPTH M	TIME SHOT	POSITION N	POSITION E	COD I 1976	COD II 1975	COD older	HADDOCK I 1976	HADDOCK II 1975	HADDOCK older	WHITING I 1976	WHITING II 1975	WHITING older	NORWAY POUT I 1976	NORWAY POUT II 1975	NORWAY POUT older
EF 5730	25/2	46	43F1	84	0855	57°15'	1°12'	-	2	2	192	690	1512	3564	804	132	-	-	-
	"	47	43F0	80	1125	57 15	0 30	-	-	2	444	709	271	102	52	8	16	-	-
	28/2	48	44F0	103	0835	57 45	0 37	-	2	2	453	361	402	226	504	66	7360	320	2
	"	49	44F1	80	1128	57 45	1 21	-	-	-	116	36	140	102	23	1	42	2	-
GH 5730	28/2	50	44F2	78	1505	57 45	2 24	-	-	-	213	102	67	362	2	-	2	-	-
	"	51	43F2	80	1845	57 18	2 38	8	-	2	164	166	170	180	-	24	-	-	-
	1/3	52	44F3	60	0825	57 41	3 28	8	-	-	16	-	--	36	-	-	-	-	-
	"	53	43F3	60	1059	57 19	3 29	154	-	-	47	3	2	40	-	-	-	-	-
EF 5930	24/2	42	47F1	102	0830	59 20	1 24	-	2	2	24	23	717	5	5	6	400	75	5
	"	43	47F0	122	1125	59 21	0 45	-	2	36	432	80	490	58	6	4	79360	2048	-
	"	44	48F0	125	1450	59 45	0 36	2	24	10	908	208	344	206	18	6	96288	6363	21
	"	45	48F1	106	1735	59 44	1 25	4	18	22	720	219	273	16	2	2	5640	37	3
GH 5930	23/2	38	47F3	152	1035	59 19	3 20	-	2	-	88	-	-	4	12	34	10880	166	2
	"	39	48F3	158	1335	59 42	3 14	-	14	8	864	495	61	136	698	3042	9520	544	-
	"	40	48F2	113	1627	59 41	2 30	2	8	10	408	197	229	-	184	710	3264	40	-
	"	41	47F2	105	1922	59 19	2 52	-	8	64	288	200	338	20	13	61	9984	40	-

GEAR SPECIFICATIONS:

NOTES:

Table IIf.

COUNTRY: NORWAY
SHIP: "JOHAN HJORT"

YEAR: 1977

IYHS

CATCHES IN NUMBERS PER HOUR FISHING BY AGE GROUPS

AREA	DATE	STATION	SQUARE	DEPTH M	TIME SHOT	POSITION N	COD I 1976	COD II 1975	COD older	HADDOCK I 1976	HADDOCK II 1975	HADDOCK older	WHITING I 1976	WHITING II 1975	WHITING older	NORWAY POUT I 1976	NORWAY POUT II 1975	NORWAY POUT older
LM 5430	14/2	2	38F7	17	1213	54°55' 07°50'E	6	-	-	-	-	-	28	-	-	-	-	-
	"	3	38F7	18	1425	54 45 07 35	4	-	-	-	-	-	14	-	-	-	-	-
	"	4	38F7	16	1643	54 40 07 45	45	-	-	-	-	-	225	-	-	-	-	-
	15/2	5	37F7	19	0733	54 25 07 50	4	-	-	-	-	-	12	-	-	-	-	-
	"	6	37F7	27	0957	54 20 07 28	2	-	-	-	-	-	8	-	-	-	-	-
	"	7	37F7	37	1205	54 18 07 09	10	2	4	-	-	-	136	88	96	-	-	-
	"	8	37F6	34	1357	54 19 06 52	54	-	-	-	-	2	775	-	-	-	-	-
	"	9	38F6	36	1630	54 33 06 32	5	-	3	-	-	-	884	3	-	-	-	-
EF 5530	17/2	14	39F1	51	0720	55 16 01 26	4	-	-	-	2	4	681	6	-	-	-	-
	"	15	39F0	84	1315	55 18 00 30	4	8	16	4	7	39	155	11	2	474	24	8
	"	16	40F0	81	1605	55 36 00 24	-	-	-	4	13	67	69	23	2	104	2	-
	18/2	17	40F1	74	0655	55 39 01 36	4	-	-	-	2	14	584	11	10	-	-	
GH 5530	"	18	40F2	77	1147	55 42 02 34	16	2	2	6	9	35	288	4	-	-	-	-
	"	19	40F3	43	1547	55 38 03 21	-	-	-	-	-	-	2	-	-	-	-	-
	16/2	10	39F3	37	0720	55 10 03 40	4	-	-	-	-	4	18	-	-	-	-	-
	"	11	39F2	23	1220	55 06 02 50	-	-	-	-	-	-	4	-	-	-	-	-
	"	12	39F2	34	1328	55 15 02 32	6	-	-	-	-	2	50	2	-	-	-	-
	"	13	39F2	38	1517	55 20 02 10	4	-	-	2	-	-	154	2	-	-	-	-
JK 5730	20/2	22	43F5	66	1255	57 15 05 44	10	-	4	223	46	23	351	24	3	10	-	-
	"	23	43F4	66	1649	57 20 04 52	24	-	-	106	2	-	267	3	2	38	6	-
	21/2	24	44F4	98	0530	57 52 04 33	2	4	4	110	105	53	55	43	80	58	-	-
	10/2	1	44F5	115	0710	57 45 05 35	-	16	68	98	-	2	-	-	6	112364	-	-
LM 5730	20/2	20	43F7	63	0535	57 11 07 16	4	5	6	39	31	52	60	2	-	6	-	-
	"	21	43F6	63	0925	57 08 06 26	8	6	16	257	185	128	163	12	5	260	12	-
EF 5830	22/2	30	45F1	109	0810	58 20 01 36	-	-	2	1204	252	840	258	163	67	48720	464	-
	"	31	45F0	142	1125	58 27 00 49	-	2	26	24	56	262	71	115	306	9029	-	-
	"	32	46F0	143	1332	58 37 00 46	6	6	20	114	41	385	133	103	262	10692	-	-
	"	33	46F1	108	1625	58 47 01 13	-	2	2	780	237	285	236	87	37	13986	252	-
GH 5830	21/2	26	45F3	119	1220	58 22 03 35	-	2	16	64	8	18	20	8	4	6550	-	-
	"	27	46F3	114	1435	58 35 03 27	-	4	28	108	45	215	4	20	48	22693	197	-
	"	28	46F2	114	1735	58 40 02 50	-	-	10	58	10	42	18	6	4	2457	33	-
	22/2	29	45F2	80	0520	58 20 02 19	4	-	-	166	14	8	236	-	-	62	-	-
JK 5830	21/2	25	45F4	139	0823	58 08 04 16	-	-	4	68	1	7	8	20	48	17062	142	-
AB 5930	26/2	37	47E7	72	1622	59°04' 02°02'W	-	-	-	20	44	152	20	58	90	-	-	-
	27/2	38	47E6	144	0520	59 25 03 50'	-	-	-	-	8	112	8	9	31	40	9	3
	"	39	48E6	125	0840	59 43 03 42'	Not	valid										
	"	40	48E7	86	1435	59 46 02 40'	-	-	4	20	52	40	-	-	-	-	-	-
CD 5930	26/2	34	48E9	133	0525	59 37 00 20'	-	-	2	175	65	222	4	6	132	935	35	-
	"	35	47E9	139	0945	59 16 00 26'	-	8	4	128	54	194	18	12	54	6262	124	-
	"	36	47E8	106	1240	59 14 01 20'	-	-	6	278	32	100	2	-	-	6685	1389	-
	27/2	41	48E8	108	1735	59 46 01 55'	-	-	-	96	307	829	-	118	1210		745	130
EF 6030	1/3	42	49F0	139	1452	60 17 00°21'E	-	-	12	596	115	159	12	6	54	456	-	-
	"	43	49F1	141	1840	60 22 01 15	-	-	-	59	74	39	6	14	36	450	34	-
	2/3	44	50F1	144	0525	60 40 01 06	2	-	2	578	185	77	15	9	390	480	-	-
	3/3	45	50F0	151	0800	60 45 00 44	-	-	4	109	80	54	2	1	237	956	508	37
GH 6030	12/3	49	49F2	110	0630	60 09 02 23	2	-	2	59	3	-	-	-	-	6627	233	-
	"	50	49F3	152	1020	60 08 03 08	-	-	-	46	16	21	-	-	6	-	-	-
EF 6130	3/3	46	51F0	163	1243	61 14 00 50	-	-	-	5	5	48	-	-	126	20188	3152	-
	"	47	51F1	170	1637	61 22 01 17	-	-	4	30	29	196	-	-	300	8325	7691	1824
GH 6130	"	48	51F2	168	2155	61 14 02 08	-	-	-	45	2	9	-	-	54	2212	1570	186

GEAR SPECIFICATIONS:

NOTES:

Table II g.

COUNTRY: SCOTLAND
SHIP: "EXPLORER"

YEAR: 1977

IYHS

CATCHES IN NUMBERS PER HOUR FISHING BY AGE GROUPS

AREA	DATE	STATION	SQUARE	DEPTH M	TIME SHOT	POSITION N	COD I 1976	COD II 1975	COD older	HADDOCK I 1976	HADDOCK II 1975	HADDOCK older	WHITING I 1976	WHITING II 1975	WHITING older	NORWAY POUT I 1976	NORWAY POUT II 1975	NORWAY POUT older
CD 5430	18/2	23	38E9	69	1700	54°31' 00°02'W	27	2	2	9	6	2	1833	700	20	321	-	-
EF 5430	18/2	21	37F0	66	1330	54 28 00 08'E	31	2	1	4	-	-	5296	747	-	1003	-	-
	"	22	38F0	68	0920	54 39 00 29'W	29	1	-	21	3	-	8455	511	1	-	-	-
GH 5430	17/2	15	38F3	46	1455	54 42 03 41'E	4	-	1	1	1	-	60	-	-	-	-	-
	"	18	38F2	18	2122	54 54 02 38	2	-	-	-	-	-	3	-	-	-	-	-
JK 5530	9/2	1	40F4	48	1450	55 45 04 38	2	-	-	1	2	1	57	-	-	-	-	-
	10/2	2	40F5	42	0735	55 44 05 08	30	-	-	3	-	-	113	-	-	-	-	-
	16/2	9	39F5	46	0720	55 20 05 43	36	-	-	4	1	5	412	1	-	-	-	-
	"	10	39F5	40	1300	55 13 05 15	3	-	-	5	3	-	27	1	1	-	-	-
	"	11	39F5	44	1010	55 23 05 12	49	-	-	14	9	9	144	2	2	-	-	-
	"	12	39F4	48	1555	55 15 04 52	44	-	-	3	2	1	693	-	-	-	-	-
	17/2	12	39F4	48	0715	55 16 04 19	58	-	-	1	-	1	186	-	-	-	-	-
	"	14	39F4	46	0945	55 10 04 15	43	-	-	-	-	-	232	-	-	-	-	-
LM 5530	15/2	3	40F6	40	1445	55 36 06 17	24	2	1	9	-	-	636	4	8	-	-	-
	14/2	4	40F7	26	1945	55 36 07 14	110	-	1	2	-	-	95	1209	2843	-	-	-
	"	5	39F7	24	1605	55 23 07 22	1	-	-	-	-	-	8	-	-	-	-	-
	"	6	39F7	22	1320	55 14 07 35	2	-	-	-	-	-	4	-	-	-	-	-
	15/2	7	39F7	26	0715	55 10 07 09	104	45	23	-	-	-	12	10	34	-	-	-
	"	8	39F6	42	1225	55 26 06 18	32	-	3	1	1	4	687	6	12	-	-	-
AB 5630	20/2	26	41E7	59	1515	56 16 02 16'W	51	10	12	5	2	26	662	398	76	291	2	-
	"	27	42E7	55	1055	56 31 02 15	20	8	3	2	-	8	6955	466	155	298	-	-
CD 5630	19/2	24	41E9	73	0800	56 18 00 36	3	-	1	12	15	126	252	419	1	18	-	-
	"	25	41E8	64	1130	56 16 01 10	2	-	-	37	56	218	905	536	5	4	-	-
	20/2	28	42E8	69	0610	56 33 01 22	3	-	-	6	17	199	259	230	35	50	1	-
	19/2	29	42E9	90	1730	56 42 00 45	2	-	3	16	18	133	12	259	25	1572	30	-
CD 5730	19/2	30	43E9	69	2130	57 04 00 45	2	13	14	1	2	290	23	319	299	29	-	-
	14/2	31	43E8	124	2300	57 24 01 20	9	4	2	31	4	76	328	393	41	714	2	-
	25/2	32	44E9	115	0715	57 44 00 33	-	1	4	667	62	559	158	483	82	3366	309	13
	1/3	33	44E8	119	1600	57 48 01 50	-	-	1	-	-	7	1	-	-	-	-	-
AB 5830	1/3	34	44E7	93	1105	57 51 02 53	-	-	1	61	2	19	1587	5	2	2290	-	-
	"	35	44E6	69	0730	57 54 03 26	-	-	-	-	-	-	-	-	-	-	-	-
	28/2	36	45E6	69	2120	58 15 03 08	-	-	-	2	--	4	28	-	1	143	115	37
	"	37	45E7	55	1750	58 18 02 40	-	-	-	--	-	3	-	-	-	-	-	-
	"	42	46E7	82	1445	58 34 02 26	-	-	-	-	-	11	-	-	-	-	-	-
CD 5830	25/2	38	45E8	110	1545	58 23 01 13'	-	-	-	423	67	242	270	66	5	466	-	-
	"	39	45E9	117	1130	58 13 00 28'	-	1	1	178	89	508	140	225	15	1758	28	7
	"	40	46E9	128	2045	58 45 00 52	-	1	1	61	35	477	15	1811	728	934	10	-
	28/2	41	46E8	124	1005	58 41 01 34	-	-	-	11	5	17	1	1	-	9	2	-
AB 6030	27/2	45	49E7	99	1905	60 16 02 28	-	-	-	2	1	36	1	3	31	-	-	-
	"	48	50E7	146	1409	60 43 02 20	-	-	-	-	-	100	-	-	-	6	17	6
CD 6030	27/2	46	49E8	73	2340	60 12 01 53	-	-	-	-	1	15	-	2	1	3	-	-
	26/2	51	50E9	106	1400	60 42 00 40	1	-	-	16	1	1	-	-	-	-	-	-
	"	52	49E9	150	0850	60 07 00 02	-	5	22	366	211	178	-	3	21	1696	348	21
CD 6130	26/2	49	51E8	165	2230	61 08 01 15	-	-	4	5	2	15	-	-	-	589	860	81
	"	50	51E9	150	1850	61 09 00 33	-	-	4	8	5	33	-	-	-	10023	8406	381

GEAR SPECIFICATIONS:
French Herring Trawl

NOTES: St. 47 came fast after 50 min. Catch raised to 1 hr.

Table IIh.

COUNTRY: SWEDEN
SHIP: "ARGOS"

YEAR: 1977

IYHS

CATCHES IN NUMBERS PER HOUR FISHING BY AGE GROUPS

AREA	DATE	STATION	SQUARE	DEPTH M	TIME SHOT	POSITION	COD			HADDOCK			WHITING			NORWAY POUT		
							I 1976	II 1975	older	I 1976	II 1975	older	I 1976	II 1975	older	I 1976	II 1975	older
43-44																		
F8-9	8/2	7	44F9	56	1530	57°52' 09°46'E	4	33	5	45	31	55	249	24	5			
45-46	9/2	10	45G0	235	1445	58 08 10 44	2	1	-	2	1	1	22	7	1			
G0-1	10/2	11	46G0	94	0620	58 34 10 51	4	-	7	20	14	14	88	14	1			
	"	12	45G1	63	0955	58 27 11 04	4	-	5	34	14	8	17	3	3			
43-44	7/2	4	44G1	70	1400	57 34 11 32	-	2	7	57	11	12	85	6	2			
G0-1-2	8/2	5	44G0	105	0630	57 50 10 30	4	-	4	11	1	5	108	3	1			
	"	6	44G0	65	1115	57 45 10 10	-	-	3	-	1	3	11	-	-			
	9/2	8	44G0	98	0635	57 54 10 16	3	9	6	3	4	1	44	2	1			
	"	9	44G0	75	1045	57 51 10 56	1	2	2	9	13	16	275	5	1			
	11/2	15	44G1	57	0625	57 54 11 10	8	1	4	4	1	1	116	2	-			
	14/2	16	44G0	27	1415	57 42 10 54	11	1	2	1	-	-	53	-	-			
	15/2	17	43G1	67	0635	57 21 11 35	16	10	18	28	8	5	494	31	3			
	"	18	43G2	34	1310	57 03 12 12	238	32	45	10	-	-	93	3	1			
	18/2	25	43G0	36	0610	57 26 10 49	28	-	4	1	-	-	32	-	-			
41-42	16/2	19	41G1	30	0725	56 21 11 53	600	113	30	2	-	-	302	1	-			
G1-2	"	20	41G2	30	1045	56 22 12 15	7	7	104	3	-	-	98	2	-			
	"	21	41G2	22	1535	56 20 12 37	-	46	654	-	-	-	-	-	-			
	17/2	22	42G2	21	0620	56 33 12 34	6	7	45	-	-	-	1	-	-			
	"	23	42G2	40	0940	56 38 12 14	3	1	19	4	-	-	88	9	4			
	"	24	42G1	31	1445	56 51 11 44	169	2	2	-	-	-	37	2	-			

GEAR SPECIFICATIONS:

NOTES:

COUNTRY: USSR
SHIP: "ALIOT"

YEAR: 1977

IYHS

CATCHES IN NUMBERS PER HOUR FISHING BY AGE GROUPS

AREA	DATE	STATION	SQUARE	DEPTH M	TIME SHOT	POSITION N	COD I 1976	COD II 1975	COD older	HADDOCK I 1976	HADDOCK II 1975	HADDOCK older	WHITING I 1976	WHITING II 1975	WHITING older	NORWAY POUT I 1976	NORWAY POUT II 1975	NORWAY POUT older
CD 5430	30/1	28	38E9	64	0625	54°45' 0°21'W	-	-	-	1	-	-	59	71	3	14	1	-
EF 5430	30/1	29	38F0	71	1147	54 41 0 38'E	3	-	4	4	-	-	528	112	6	104	9	-
	"	30	37F0	66	1550	54 19 0 32	-	-	-	1	-	-	38	4	2	-	-	-
	4/2	32	38F1	23	0937	54 42 1 42	-	-	-	-	-	-	-	-	-	-	-	-
	"	33	37F1	50	1430	54 12 1 30	-	-	-	-	-	-	16	-	1	-	-	-
GH 5430	4/2	31	38F2	20	0450	54 40 2 22	-	-	2	-	-	-	4	-	-	-	-	-
	5/2	34	37F2	50	0700	54 11 2 30	-	-	-	-	-	-	174	9	-	-	-	-
	"	35	37F3	40	1052	54 16 3 14	-	-	3	11	1	-	10	4	-	-	-	-
	"	36	38F3	41	1420	54 40 3 30	-	-	6	-	-	-	-	-	-	-	-	-
JK 5530	7/2	37	40F4	32	1442	55 39 4 30	-	-	-	-	-	1	-	-	-	-	-	-
	8/2	38	39F4	46	0720	55 10 4 16	-	-	-	-	-	1	1	-	-	-	-	-
	"	39	39F4	46	0900	55 09 4 24	-	-	2	-	-	1	3	-	-	-	-	-
	"	40	39F4	47	1220	55 09 4 34	-	-	1	-	-	-	6	-	-	-	-	-
	"	41	39F5	44	1545	55 12 5 03	-	-	-	-	-	-	3	-	1	-	-	-
	9/2	42	40F5	54	0700	55 36 5 30	-	-	3	44	-	-	30	3	-	-	-	-
	"	43	39F5	46	1017	55 19 5 31	-	-	2	-	-	-	-	-	-	-	-	-
	"	44	39F5	45	1200	55 17 5 37	-	-	1	-	-	-	1	-	-	-	-	-
LM 5530	9/2	45	39F6	47	1535	55 12 6 16	-	-	10	1	5	19	9	-	3	-	-	-
	"	46	40F7	27	2100	55 43 7 12	-	-	-	-	-	-	1	-	-	-	-	-
	15/2	52	39F7	21	0650	55 15 7 48	1	-	-	-	-	-	-	-	-	-	-	-
	"	54	39F7	23	1105	55 13 7 29	-	-	6	-	-	-	-	-	-	-	-	-
	"	55	40F6	34	1524	55 35 6 47	-	-	3	-	-	-	-	-	-	-	-	-
CD 5630	28/1	22	42E9	73	2400	56 54 0 23W	-	-	-	1	4	-	2	1	-	3	-	-
	29/1	23	42E8	60	0550	56 37 1 21	-	1	1	1	19	60	1	52	8	5	-	-
	"	24	42E7	52	1000	56 34 2 07	-	-	-	-	-	55	15	1445	202	-	-	-
	"	25	42E7	54	1210	56 25 2 11	-	5	1	160	192	188	160	4502	296	20	20	-
	"	26	41E8	47	1500	56 18 1 51	-	4	5	4	24	63	3	193	35	-	-	2
	"	27	41E9	72	2020	56 07 0 42	-	-	1	3	4	93	-	7	14	-	-	-
AB 5730	22/1	3	44E7	83	1200	57 56 2 31	-	-	-	5	6	32	14	4	-	-	-	-
	"	4	44E6	56	1620	57 57 3 15	-	-	1	10	20	247	146	1	1	20	-	-
CD 5730	21/1	1	43E8	88	1745	57 14 1 26	-	-	2	4	42	680	121	1801	396	62	4	-
	22/1	2	44E8	96	0617	57 47 1 28	-	-	1	-	4	48	402	59	-	257	4	-
	28/1	20	44E9	110	1510	57 44 0 30	-	-	5	66	411	614	71	763	68	22	-	-
	"	21	43E9	83	2015	57 12 0 28	-	-	-	-	-	-	-	-	-	-	-	-
NO 5730	10/2	47	43F8	60	0829	57 23 8 03'E	-	-	1	--	5	4	-	-	-	-	-	-
	"	48	43F8	65	1020	57 23 8 10	-	-	-	-	-	-	-	-	-	-	-	-
	"	49	43F8	70	1230	57 27 8 29	-	-	4	2	1	11	9	4	-	-	-	-
	"	50	43F9	20	1620	57 28 9 03	-	-	3	-	-	-	-	-	-	-	-	-
	"	51	44F9	100	2000	57 48 9 18	1	-	-	9	-	2	9	6	12	-	-	-
AB 5830	22/1	5	45E6	67	1940	58 11 3 05'W	-	-	-	-	24	98	291	5	1	33	10	2
	23/1	6	45E7	70	0640	58 26 2 30	-	-	-	9	147	179	46	25	9	4	-	-
CD 5830	23/1	8	46E8	105	1610	58 47 1 34	-	-	-	34	48	310	10	235	201	12	10	1
	28/1	18	46E9	120	0605	58 44 0 30	-	-	-	3	5	59	4	32	30	17	1	-
	"	19	45E9	110	1035	58 13 0 34	-	-	-	13	6	18	6	17	8	3	-	-
AB 6030	24/1	11	49E7	143	1225	60 20 2 25	-	-	-	-	-	7	-	-	-	176	178	75
	"	12	50E7	135	1620	60 44 2 29	-	-	-	-	-	1	-	-	-	7	57	39
CD 6030	24/1	13	50E8	125	2045	60 51 1 43	-	-	-	-	-	-	-	-	16	10	138	27
	27/1	16	50E9	95	1016	60 45 0 14	-	-	-	-	-	16	-	-	-	-	5	-
	"	17	49E9	118	1450	60 16 0 18	-	-	-	-	-	-	-	-	-	-	-	-
CD 6130	25/1	14	51E8	177	0620	61 05 1 36	-	-	-	-	-	1	-	-	-	55	1012	159

GEAR SPECIFICATIONS:

NOTES:

Table III a

COUNTRIES COMBINED. | YEAR: 1977 | IYHS

SUMMARY ABUNDANCE AND LENGHT DATA BY AREA; AGE GROUP:

AREA	COD				HADDOCK				WHITING				NORWAY POUT			
	YEARCLASS 1976				1976				1976 *				1976			
	N̄/Hr	L̄	S	Range	N̄/Hr	L̄	S	Range	N̄/Hr	L̄	S	Range	N̄/Hr	L̄	S	Range
GH 5130																
GH 5230	31	23.7	4.03	14-31	-				} 104	19.49	2.52		-			
JK 5230	220	23.7	3.88	12-34												
EF 5330	4	16.8	4.86	11-26	-				232	12.82	3.04		21	11.4	1.01	9-13
GH 5330	70	17.8	3.48	9-30	1	21.2	1.41	16-23	1044	14.37	3.15		-			
JK 5330	153	19.5	3.19	12-32	1	21.8	2.66	17-24	1297	18.39	2.29		-			
LM 5330	93	20.8	4.63	10-31	-				85	16.10	2.76		-			
CD 5430	9	17.1	2.75	13-22	4	21.6	1.24	18-24	766	18.58	2.33		219	11.4	1.05	7-14
EF 5430	16	18.4	2.90	11-25	5	21.2	2.06	17-26	1819	16.09	1.93		138	12.7	1.13	9-16
GH 5430	4	19.1	3.95	11-25	3	22.3	1.88	18-26	260	16.81	2.41		-			
JK 5430	52	18.0	11.29	9-31	1	22.0	1.69	20-25	1596	15.27	2.30		-			
LM 5430	} 145	16.4	4.01	8-29	-								-			
NO 5430									} 523	14.86	2.48					
CD 5530	32	17.6	2.80	10-26	36	20.2	1.82	14-25	614	16.27	2.00		1396	13.7	0.97	9-16
EF 5530	9	16.9	3.91	11-26	6	21.2	1.60	12-27	428	14.34	2.89		118	12.6	0.92	7-15
GH 5530	4	14.4	3.29	9-25	5	19.5	1.49	17-23	96	12.91	2.00		-			
JK 5530	18	14.8	3.25	9-24	5	20.6	1.79	16-28	119	12.88	2.27		-			
LM 5530	} 65	13.7	3.78	7-28	1	21.7	1.46	19-25	} 199	13.31	2.50		-			
NO 5530																
AB 5630	18	16.6	3.05	10-23	42	21.2	1.24	16-24	} 673	15.52	1.50		-			
CD 5630	1	15.1	2.17	11-18	8	18.8	2.47	14-27					206	13.5	1.12	9-15
EF 5630	52	13.2	2.37	9-27	37	17.5	1.89	14-23	532	15.33	2.13		936	11.8	0.76	10-14
GH 5630	79	15.5	2.67	9-27	29	19.6	1.87	12-25	246	12.80	2.34		1	12.0	0.88	10-13
JK 5630	56	15.8	3.66	8-26	116	20.4	1.74	14-26	1052	13.34	2.81		119	12.4	0.83	9-14
LM 5630	471	14.0	3.04	6-26	62	20.5	1.85	15-25	2609	14.43	2.16		25	11.3	1.03	8-13
PQ 5630	131	16.3	2.24	9-22	2	21.6	1.96	18-24					-			
AB 5730	-	-	-	-	-								578	11.5	0.66	9-13
CD 5730	1	17.3	2.27	13-21	142	15.7	1.56	12-22	177	15.93	2.20		556	12.0	0.99	8-16
EF 5730	1	18.5	-	-	255	16.8	2.10	12-23	584	16.05	1.68		1138	11.8	0.99	9-14
GH 5730	26	14.6	2.73	8-22	273	17.4	1.68	13-25	271	14.84	1.73		7	11.5	0.61	10-12
JK 5730	6	12.4	4.47	9-23	170	16.9	2.39	11-25	} 96	16.13	2.90		14716	9.9	0.76	8-13
LM 5730	7	15.3	4.49	8-25	49	16.0	3.76	11-28					79	11.5	0.13	9-13
NO 5730	1	17.5	6.78	9-27	11	20.3	2.56	15-26	} 4	19.00	3.99		-			
PQ 5730	31	14.7	2.84	9-26	12	18.8	2.41	13-26					-			
AB 5830	-	-	-	-	10	18.4	1.65	14-23	236	15.62	1.91		36	12.3	0.99	9-14
CD 5830	-	-	-	-	144	15.8	1.64	11-21	74	16.94	2.02		457	12.0	0.97	8-14
EF 5830	1	22.5	-	-	343	14.7	3.01	10-22	98	16.99	3.14		13325	11.2	1.02	7-14
GH 5830	0.4	21.5	3.46	18-24	255	14.5	1.94	10-23	} 41	17.26	2.67		5304	10.8	0.88	8-14
JK 5830					68	15.7	1.84	12-20					17062	10.6	0.81	9-13
NO 5830	3	17.1	3.10	12-21												
PQ 5830					19	16.1	1.90	12-22					-			
AB 5930	-	-	-	-	16	16.9	1.62	13-21	13	18.86	1.45		47	12.3	1.29	10-13
CD 5930	-	-	-	-	414	16.5	1.87	11-21	6	17.55	2.75		1934	11.7	0.91	8-13
EF 5930	2	16.5	4.98	10-22	521	13.8	2.08	11-21	71	18.37	2.79		45422	11.0	0.90	8-13
GH 5930	1	17.5	-	-	412	16.1	2.41	10-22	40	20.73	1.72		8412	10.5	0.95	8-13
AB 6030	-	-	-	-	1	22.0	2.12	20-24	1	23.5	0		47	12.1	0.60	10-13
CD 6030	0.1	17.5	-	-	64	14.5	1.42	11-19	0	-			342	11.3	0.80	9-13
EF 6030	0.2	11.5	-	-	449	14.1	1.80	9-20	7	21.10	1.75		3023	10.7	0.83	8-13
GH 6030	0.3	10.5	-	-	195	15.5	1.89	10-24	2	18.50	2.12		2303	10.2	0.86	7-13
CD 6130	-	-	-	-	4	16.6	1.50	14-20	0				3556	11.1	0.75	9-13
EF 6130	-	-	-	-	490	14.6	1.24	11-20	0				9313	10.4	0.84	8-13
GH 6130	-	-	-	-	108	14.3	1.47	10-21	0				1234	10.8	0.89	7-13
TOTAL	38.6	16.8	3.00	8-34												

NOTES:

*Whiting length ranges not yet available.

/AB 5730 included.

Table IIIb

COUNTRIES COMBINED. | YEAR: 1977 | IYHS

SUMMARY ABUNDANCE AND LENGHT DATA BY AREA; AGE GROUP:

AREA	COD				HADDOCK				WHITING				NORWAY POUT			
	YEARCLASS 1975				1975				1975			*	1975			
	N̄/Hr	L̄	S	Range	N̄/Hr	L̄	S	Range	N̄/Hr	L̄	S	Range	N̄/Hr	L̄	S	Range
GH 5130																
GH 5230	1	59.5	-	-	-				115	23.89	2.50		-			
JK 5230	3	39.2	8.85	30-54												
EF 5330	0.3	38.5	-	-	-				11	22.73	3.97		-			
GH 5330	-	-	-	-	-				29	22.96	2.75		-			
JK 5330	3	29.3	3.83	26-46	-				140	22.32	2.05		-			
LM 5330	5	35.8	10.03	26-54	-				3	25.46	3.31		-			
CD 5430	1	18.5	-	-	5	30.9	1.74	28-34	334	21.11	2.41		-			
EF 5430	0.4	37.2	4.51	32-41	-				198	20.78	2.14		1	13.8	0.50	13-14
GH 5430	0.2	46.5	-	46-47	2	34.0	2.53	27-36	9	24.21	2.55		-			
JK 5430	-	-	-	-	1	30.3	4.88	20-34	12	26.53	3.27		-			
LM 5430	1	40.9	8.05	26-49	-				13	23.03	5.04		-			
NO 5430																
CD 5530	3	33.7	2.16	24-41	104	28.7	3.88	18-36	3358	22.84	1.85		153	18.3	1.67	14-21
EF 5530	4	32.3	3.69	27-41	14	27.8	2.48	20-34	22	22.58	1.39		3	17.6	0.96	16-19
GH 5530	0.2	31.5	-	-	3	31.1	3.90	20-36	4	24.81	1.37		-			
JK 5530	-	-	-	-	1	34.8	3.04	27-39	+	25.43	3.15		-			
LM 5530	2	39.5	5.00	22-46	-				61	27.98	1.77		-			
NO 5530																
AB 5630	6	35.8	3.80	29-42	49	27.3	1.75	24-31	704	22.43	1.69		-			
CD 5630	1	36.1	4.22	31-42	32	25.7	2.35	21-31					4	17.0	2.34	14-21
EF 5630	2	30.2	2.36	26-34	79	25.4	2.73	20-32	172	23.87	1.92		5	16.8	1.01	14-19
GH 5630	5	31.6	3.95	26-43	41	29.1	2.53	21-35	12	23.80	2.71		-			
JK 5630	7	30.8	3.36	24-40	11	33.2	2.32	26-39	28	20.91	2.61		1	17.9	0.84	16-18
LM 5630	13	35.2	3.45	27-45	9	33.9	2.27	27-40	19	21.96	4.39		-			
PQ 5630	29	30.8	5.87	23-44	-								142	17.5	-	17
AB 5730	-	-	-	-	-								-			
CD 5730	2	35.2	3.69	27-44	64	24.2	1.74	19-28	44	23.30	1.55		40	17.2	1.28	15-20
EF 5730	20	31.2	3.65	24-37	658	27.7	2.79	20-35	240	23.40	1.57		87	17.3	1.11	15-19
GH 5730	3	34.6	4.04	26-41	197	27.7	2.70	20-36	1	24.00	0.89		-			
JK 5730	2	32.0	9.06	28-42	48	30.7	2.79	21-38	10	23.9	2.46		1	18.2	0.52	17-18
LM 5730	3	32.1	2.46	27-34	77	32.9	2.58	23-40					4	17.6	0.83	15-18
NO 5730	6	41.4	4.93	25-48	7	33.9	2.81	27-38	2	23.00	2.55		-			
PQ 5730	6	37.0	4.13	28-43	4	35.2	2.93	28-46					-			
AB 5830	-	-	-	-	22	25.0	1.51	20-31	4	23.40	1.58/		25	16.6	0.78	14-18
CD 5830	0.2	31.5	-	-	41	23.9	1.66	19-28	349	24.18	1.76		7	17.4	1.29	15-19
EF 5830	3	32.7	2.23	29-37	112	25.8	2.72	20-34	108	23.48	1.33		106	17.4	1.43	15-18
GH 5830	1	31.2	1.03	30-32	42	25.4	1.93	20-33	8	27.13	1.61		52	15.9	0.68	15-18
JK 5830					1	25.5	-	20-33					142	17.5	-	17
NO 5830	0.3	37.5	-	-	-								-			
PQ 5830					9	32.4	2.55	23-36					-			
AB 5930	-	-	-	-	23	20.7	2.74	17-25	25	22.44	1.12		159	16.7	1.29	14-19
CD 5930	1	33.0	0.53	32-33	124	24.7	2.28	20-31	79	22.99	1.01		675	17.0	1.18	14-19
EF 5930	12	35.4	4.00	29-42	133	24.6	1.98	21-29	8	25.87	1.71		2131	12.7	0.81	12-17
GH 5930	8	31.9	2.41	27-36	223	26.2	1.96	22-30	227	30.27	2.60		198	16.7	1.41	14-18
AB 6030	-	-	-	-	-				3	27.17	3.05		63	16.3	1.18	13-20
CD 6030	1	34.1	3.85	30-40	36	22.1	1.74	18-31	1	26.9	2.41		98	16.0	1.17	13-20
EF 6030	-	-	-	-	150	22.7	1.81	18-27	4	22.8	1.10		1855	15.6	1.00	13-17
GH 6030	-	-	-	-	17	24.4	3.15	18-31	+	25.0	0.71		183	15.3	0.98	12-17
CD 6130	-	-	-	-	2	25.1	1.27	23-27	0				3426	15.8	0.97	13-19
EF 6130	-	-	-	-	25	24.3	1.47	21-29	1	24.5	0		3542	15.4	0.95	13-17
GH 6130	-	-	-	-	1	22.5	5.66	18-27	0				800	15.4	0.81	13-17
TOTAL	3.3	35.0	6.30	22-54												

NOTES:

*Whiting length ranges not yet available.

/AB 5730 included.

TABLE IVa - Year class abundance indices cod.

A	B	C	D	E	F	G	H	I	J
	I-GROUP				II-GROUP				VPA
Year class	N squares fished	%o coverage	Arithmetic mean	Geometric mean	N squares fished	%o coverage	Arithmetic mean	Geometric mean	Number of II-year old recruits (millions)
1963					23	96	1.9	1.8	234
1964	23	131	16.0	17.1	30	184	18.6	5.3	222
1965	30	208	20.2	12.8	57	458	23.4	13.5	315
1966	57	241	28.5	30.5	45	375	17.0	15.2	283
1967	45	181	5.4	5.5	68	471	5.6	4.9	92
1968	68	278	6.4	6.3	82	571	5.5	4.9	86
1969	82	703	71.5	59.9	98	697	25.5	17.0	371
1970	98	501	84.5	89.4	107	700	37.2	31.5	549
1971	107	520	3.4	2.8	100	591	9.6	7.0	86
1972	100	528	41.4	31.5	132	950	8.9	8.7	193
1973	132	634	14.8	11.2	126	754	5.4	4.8	184
1974	126	953	98.2	54.5	126	871	20.7	17.1	385
1975	126	950	8.8	6.1	135	915	3.4	3.0	
1976	135	990	42.3	44.2					
Long term average	139	992	45.1	37.3	139	994	14.3	13.8	250

TABLE IVb - Correlations. (Letters refer to columns in table IVa).

	VPA/I-GROUP		VPA/II-GROUP		II-GROUP/I-GROUP	
	Arithmetic (J/D)	Geometric (J/E)	Arithmetic (J/H)	Geometric (J/I)	Arithmetic (H/D)	Geometric (I/E)
Correlation : N	11	11	12	12	12	12
r	0.86	0.92	0.88	0.89	0.74	0.92
Geometric mean regression: U_0	(99.24)	97.99	(52.72)	66.09		
$Y = U_0 + U_1 X$ U_1	(4.29)	5.25	(13.20)	16.75		
Estimated nr of recruits: 1975	(137)	130	(98)	116		
1976	(281)	330				

TABLE Va - Year class abundance indices haddock.

A	B	C	D	E	F	G	H	I	J
	I-GROUP				II-GROUP				VPA
Year class	N squares fished	%o coverage	Arithmetic mean	Geometric mean	N squares fished	%o coverage	Arithmetic mean	Geometric mean	Number of II-year old recruits (millions)
1964					8	97	(1.1)	(1.1)	(115)
1965	8	81	24.5	31.0	21	272	19.9	21.0	147
1966	21	216	90.5	151.1	22	224	65.9	84.5	767
1967	22	259	7.627.6	8.911.4	27	429	6.411.1	7.287.8	6.296
1968	27	230	118.6	424.8	35	416	63.2	91.9	385
1969	35	326	35.4	42.3	62	715	39.4	57.2	109
1970	62	613	1.545.0	2.363.7	60	688	374.7	669.0	974
1971	60	616	957.1	2.766.7	62	732	1.221.1	3.645.9	1.510
1972	62	642	229.6	469.5	83	940	152.5	264.6	273
1973	83	943	1.313.7	3.620.9	80	846	462.0	693.9	1.338
1974	80	928	1.370.0	1.616.2	77	834	787.3	1.472.1	2.050
1975	77	848	211.5	326.4	88	954	100.0	144.4	
1976	88	952	188.7	315.5					
Long term average	89	979	930.8	1.130.3	89	954	591.9	722.0	1.385

Baserad på alla hål

TABLE Vb - Correlations. (Letters refer to columns in table Va).

	VPA/I-GROUP		VPA/II-GROUP		II-GROUP/I-GROUP	
	Arithmetic (J/D)	Geometric (J/E)	Arithmetic (J/H)	Geometric (J/I)	Arithmetic (H/D)	Geometric (I/E)
Correlation: N	10	10	10	10	11	11
r	0.98	0.95	0.98	0.94	0.98	0.92
Geometric mean regression: U_0	307.45	(10.72)	440.4	(260.10)		
$Y = U_0 + U_1X$ U_1	0.81	(0.67)	0.95	(0.79)		
Estimated nr of recruits: 1975	479	(229)	535	(374)		
,6	460	(222)				

TABLE VIa - Year class abundance indices whiting.

A	B	C	D	E	F	G	H	I	J
	I-GROUP				II-GROUP				VPA
Year class	N squares fished	%o coverage	Arithmetic mean	Geometric mean	N squares fished	%o coverage	Arithmetic mean	Geometric mean	Number of II-year old recruits (millions)
1963					23	117	92.1	156.1	387
1964	23	217	417.9	542.8	35	241	300.3	528.7	682
1965	35	371	600.2	602.1	54	411	115.5	171.3	777
1966	54	572	519.4	820.5	41	408	194.1	305.1	977
1967	41	454	2065.6	1725.9	46	452	1074.6	2096.2	2614
1968	46	352	18.1	17.9	73	543	73.9	53.1	858
1969	73	614	71.1	82.4	79	589	30.3	24.9	778
1970	79	611	225.4	308.5	85	627	193.0	178.0	829
1971	85	728	356.3	669.3	109	810	757.2	897.0	1784
1972	109	916	1160.7	4251.4	133	972	489.7	661.1	2343
1973	133	938	324.9	733.7	129	892	159.5	224.2	1667
1974	129	905	942.9	1203.0	126	898	549.0	1108.1	2304
1975	126	865	831.9	1177.8	137	983	215.6	199.0	
1976	137	968	436.1	938.9					
Long term average	140	987	550.9	703.8	140	987	338.0	406.9	1333

TABLE VIb - Correlations (Letters refer to columns in table IVa).

	VPA/I-GROUP		VPA/II-GROUP		II-GROUP/I-GROUP	
	Arithmetic (J/D)	Geometric (J/E)	Arithmetic (J/H)	Geometric (J/I)	Arithmetic (H/D)	Geometric (I/E)
Correlation: N	11	11	12	12	12	12
r	0.79	0.69	0.82	0.81	0.78	0.40
Geometric mean regression: U_0	655.74	(423.22)	526.66	(654.74)		
$Y = U_0 + U_1X$ U_1	1.25	(1.00)	2.40	(1.27)		
Estimated nr of recruits: 1975	1696	(1601)	1044	(929)		
1976	1201	(1362)				

TABLE VII - Year class abundance indices Norway pout.

	I-GROUP		II-GROUP	
Year class	N squares fished	Arithmetic mean	N squares fished	Arithmetic mean
1965			7	1
1966	7	1	10	34
1967	10	385	25	1
1968	25	24	13	7
1969	23	1088	27	19
1970	27	1050	38	526
1971	38	3460	25	649
1972	25	5426	38	453
1973	58	26665	82	2434
1974	82	4143	83	276
1975	83	3392	94	409
1976	94	4684		
Long term average	96	6830	96	1087

FIG 1:MEAN NUMBER PER HR FISHING

NORTH SEA

IYHS 1977

COD 1
YEAR CLASS 1976

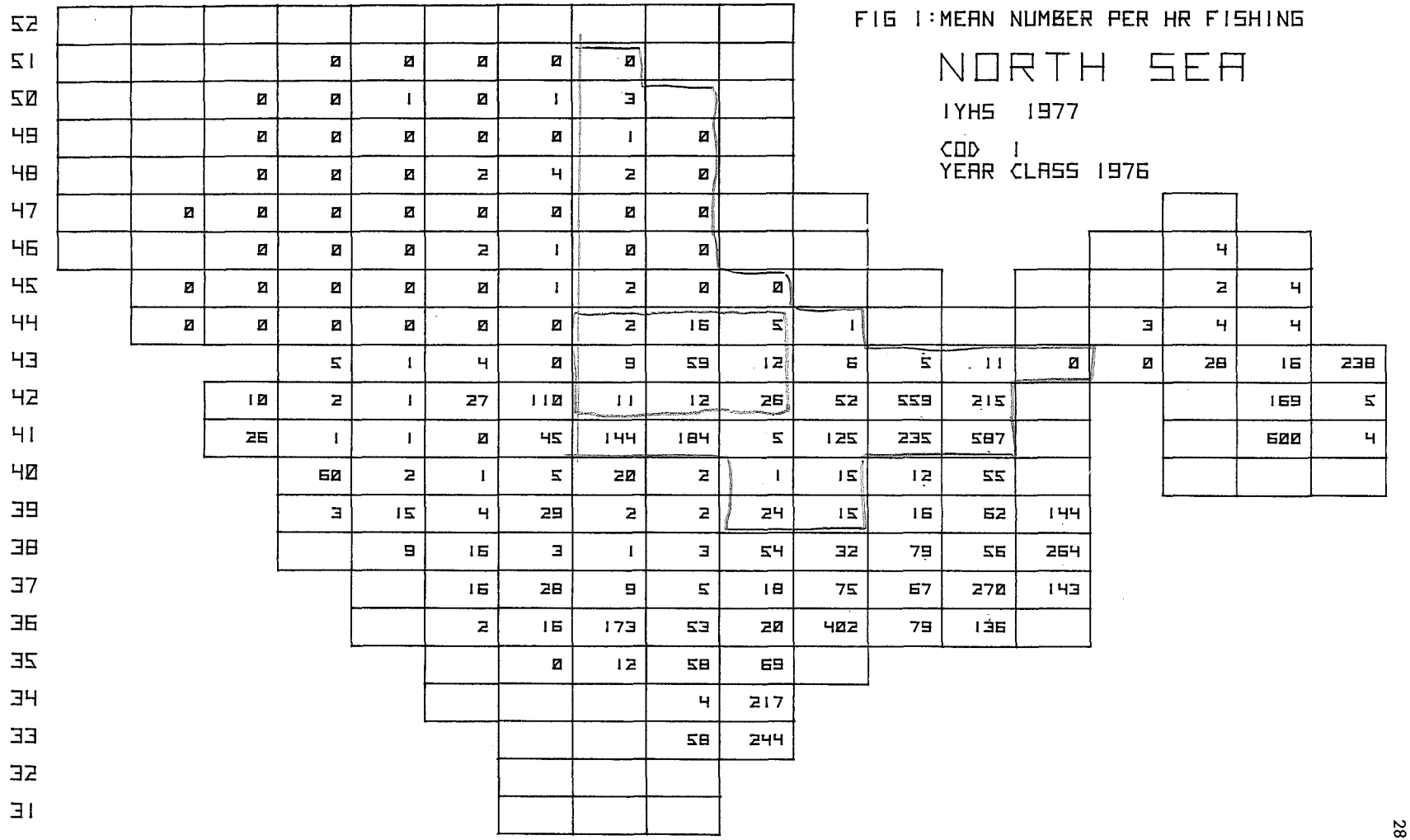


FIG 2: MEAN NUMBER PER HR FISHING

NORTH SEA

IYHS 1977

COD II
YEAR CLASS 1975

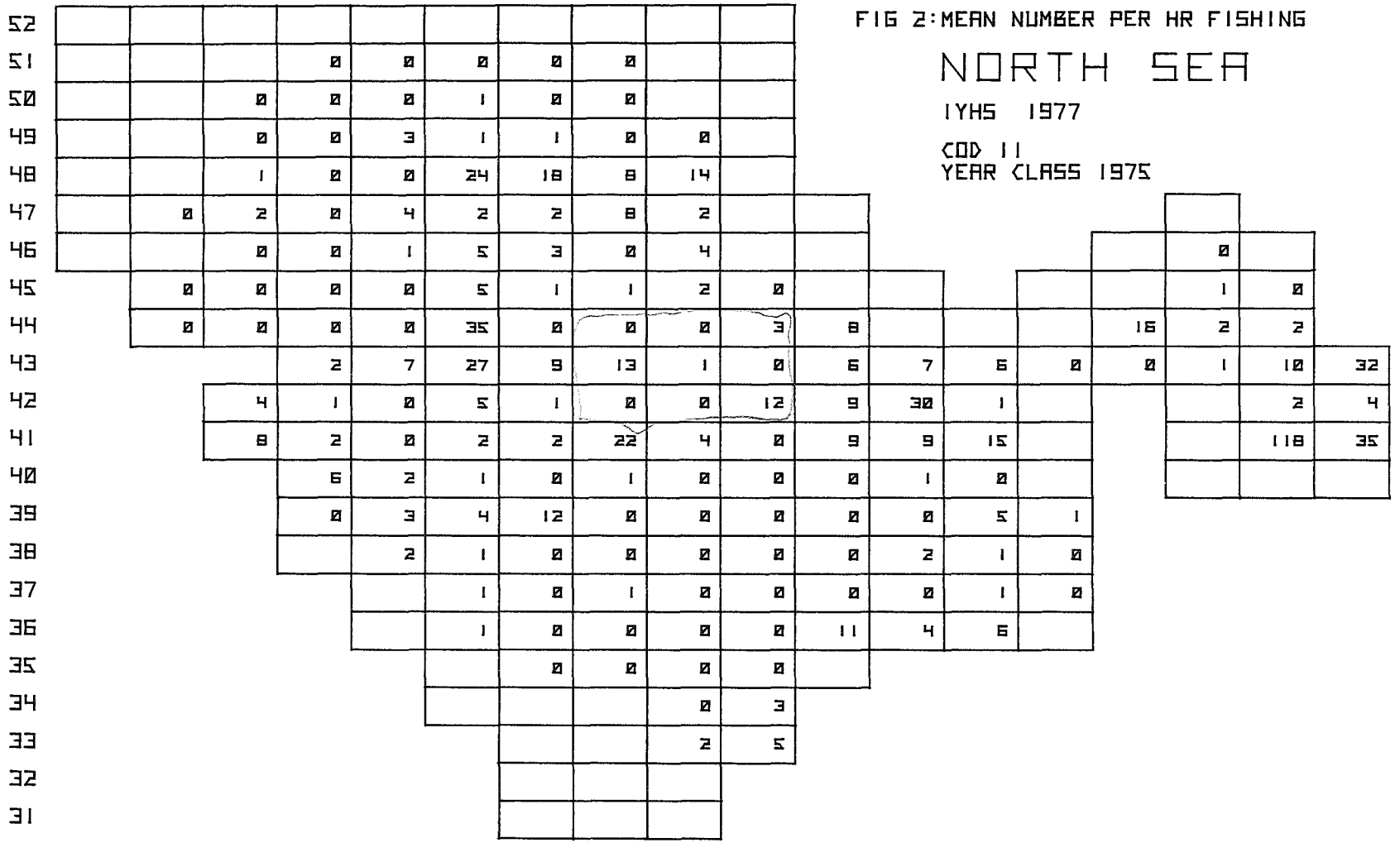


FIG 3: MEAN NUMBER PER HR FISHING.

NORTH SEA

IYHS 1977

HADDOCK 1
YEAR CLASS 1976

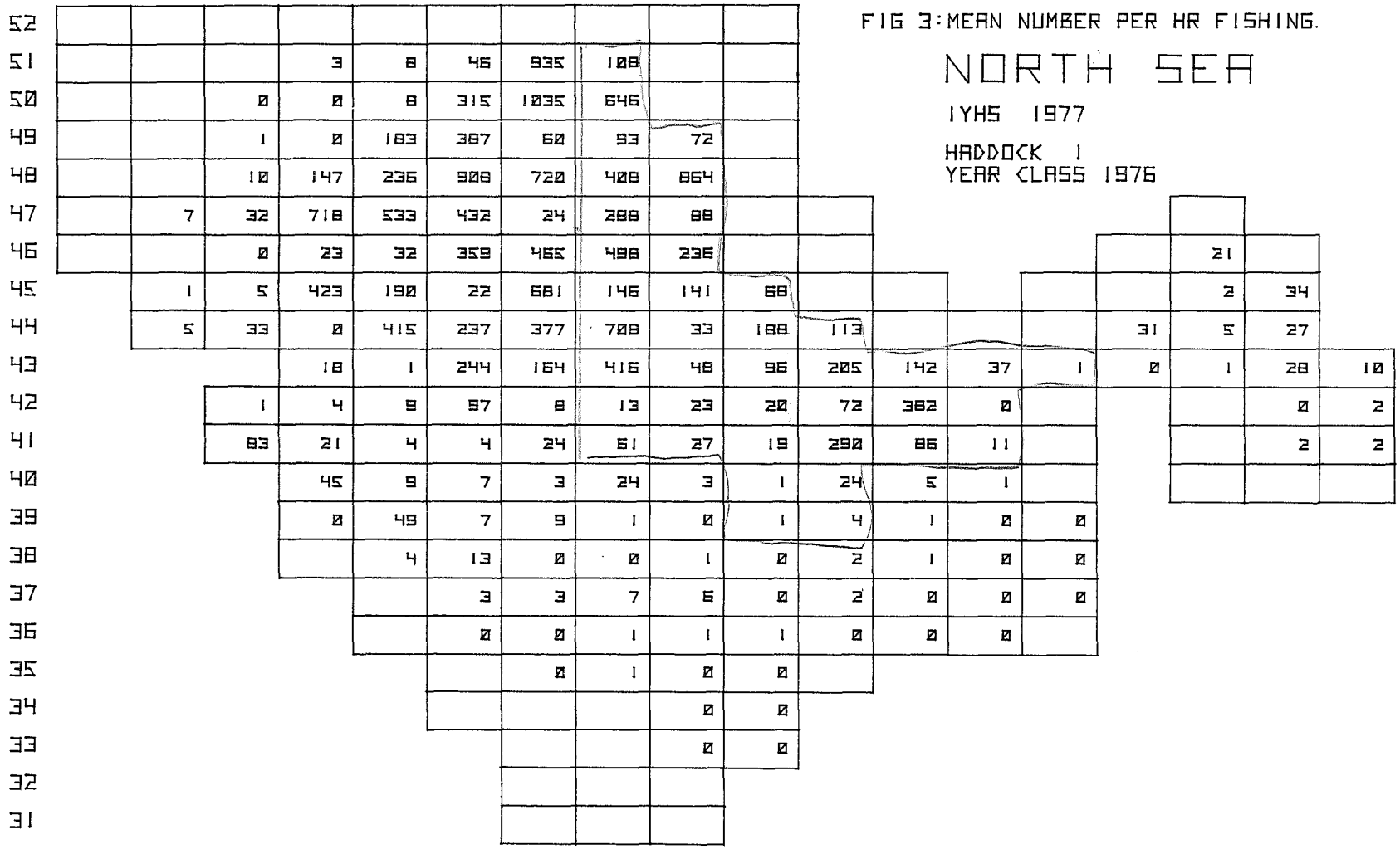


FIG 4: MEAN NUMBER PER HR FISHING

NORTH SEA

1YHS 1977

HADDOCK II
YEAR CLASS 1975

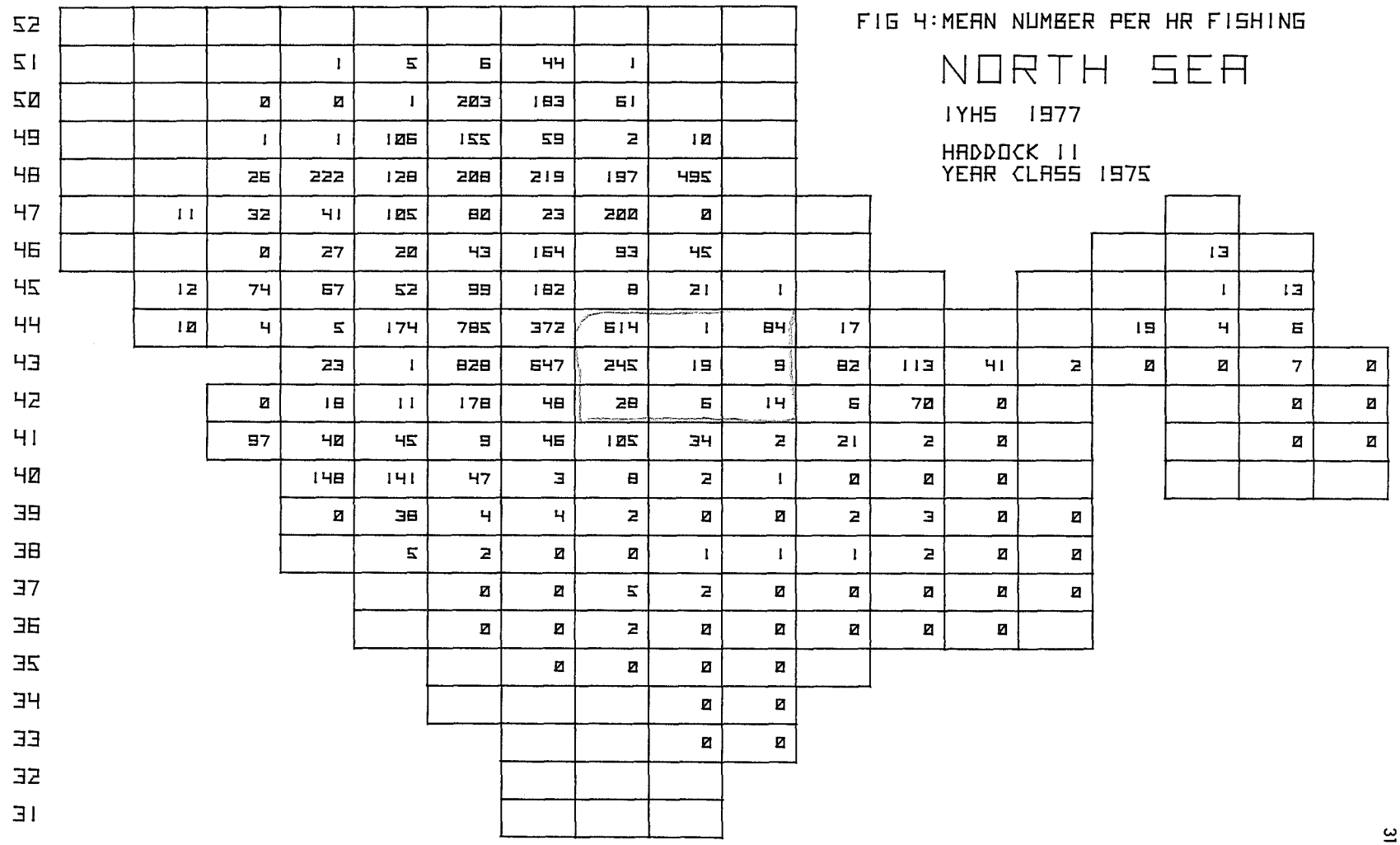


Figure 5 - Mean number per hour fishing of I-group whiting (year class 1976).

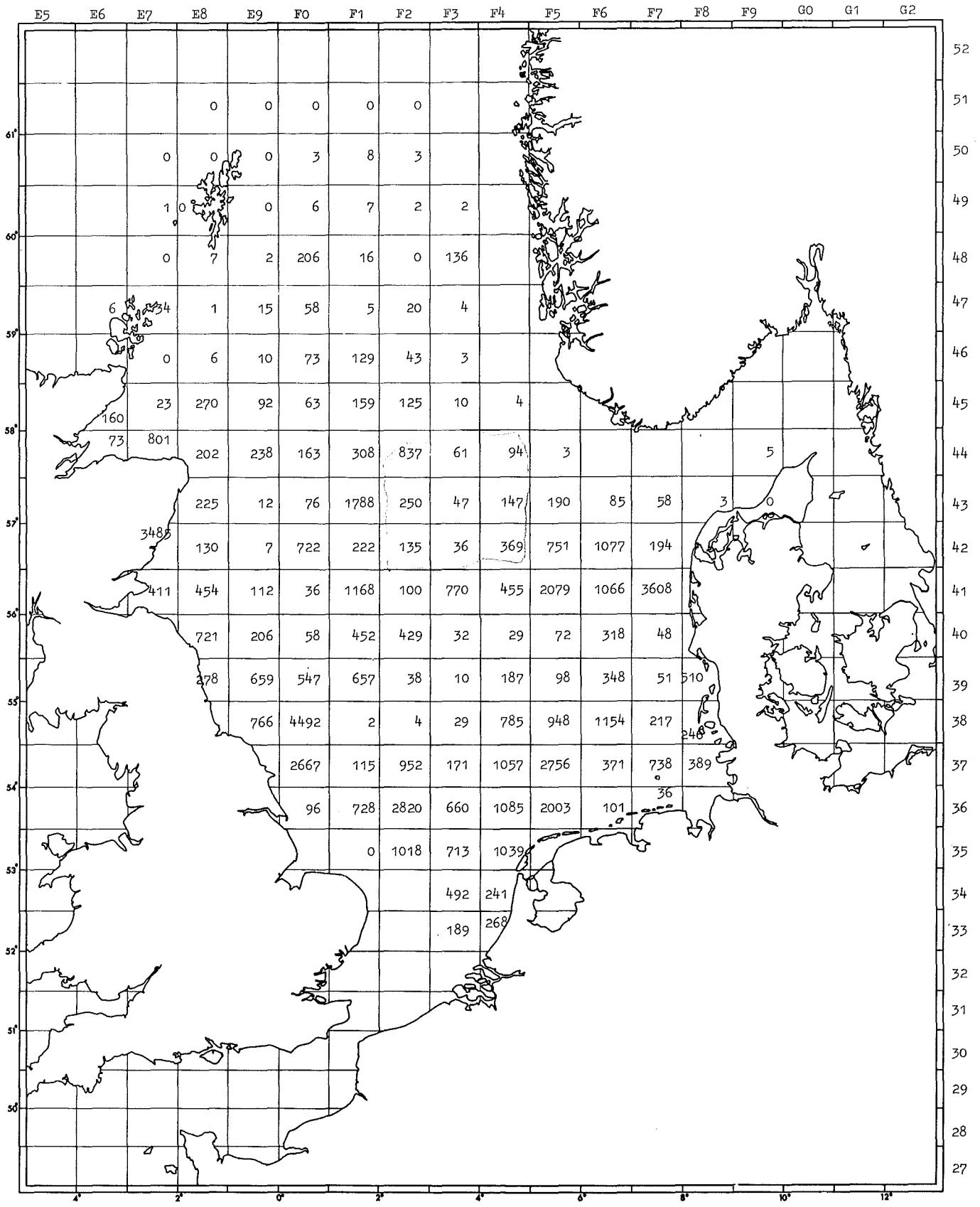


Figure 6 - Mean number per hour fishing of II-group whiting (year class 1975).

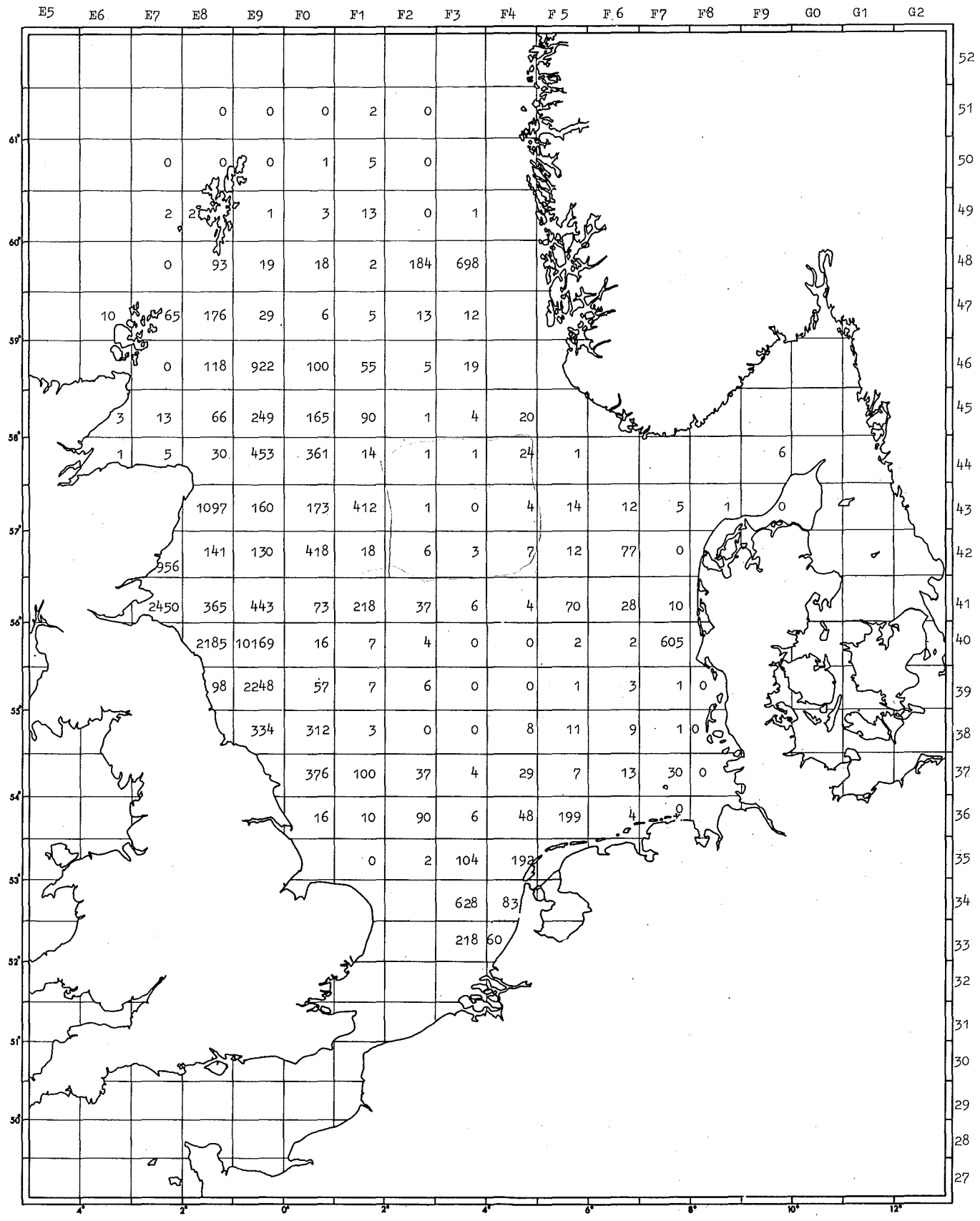


Fig. 7. Mean number per hour fishing of I-group Norway pout (year class 1976).

Figures in brackets represent number of valid hauls.

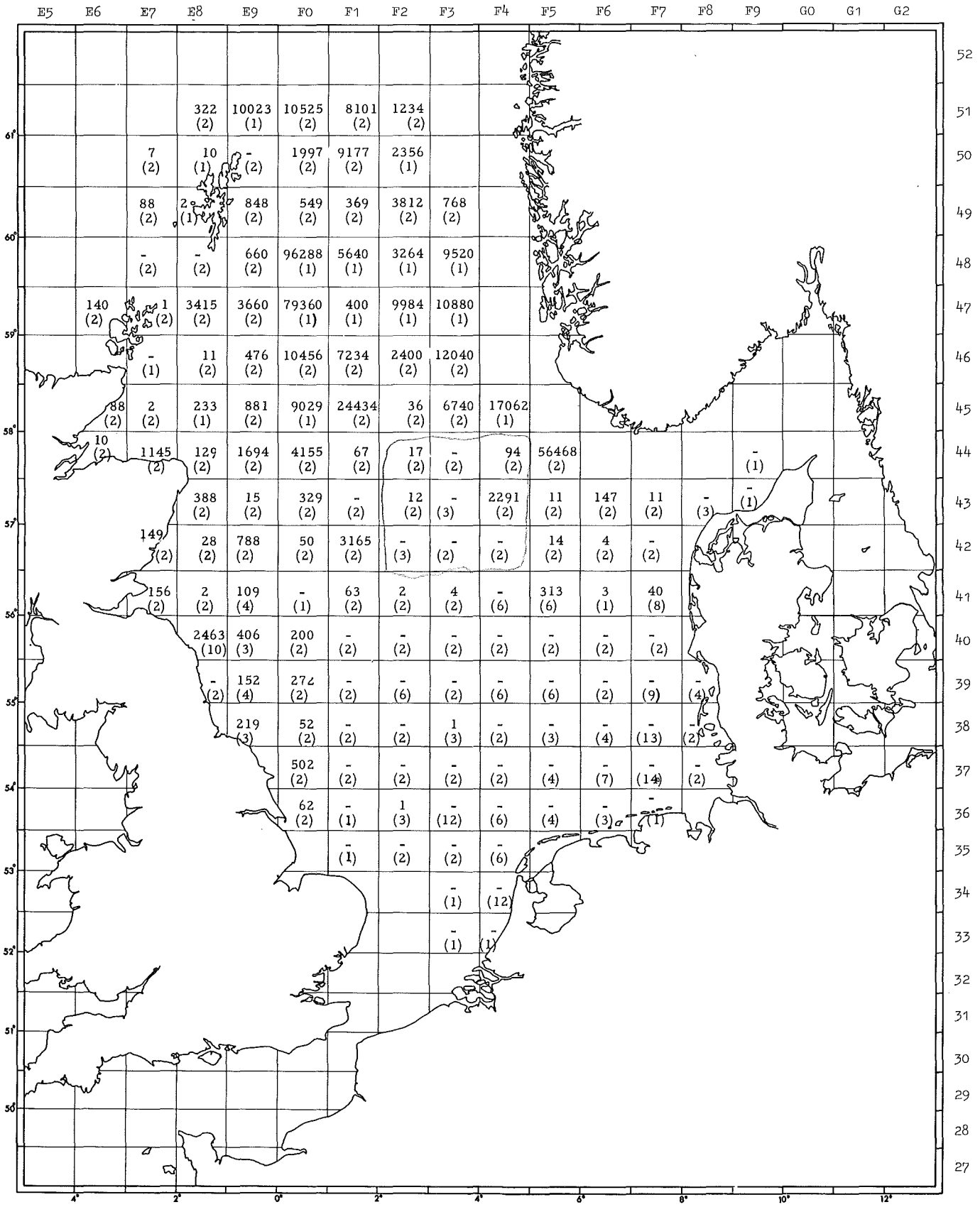


Fig. 8. Mean number per hour fishing of II-group Norway pout (year class 1975).

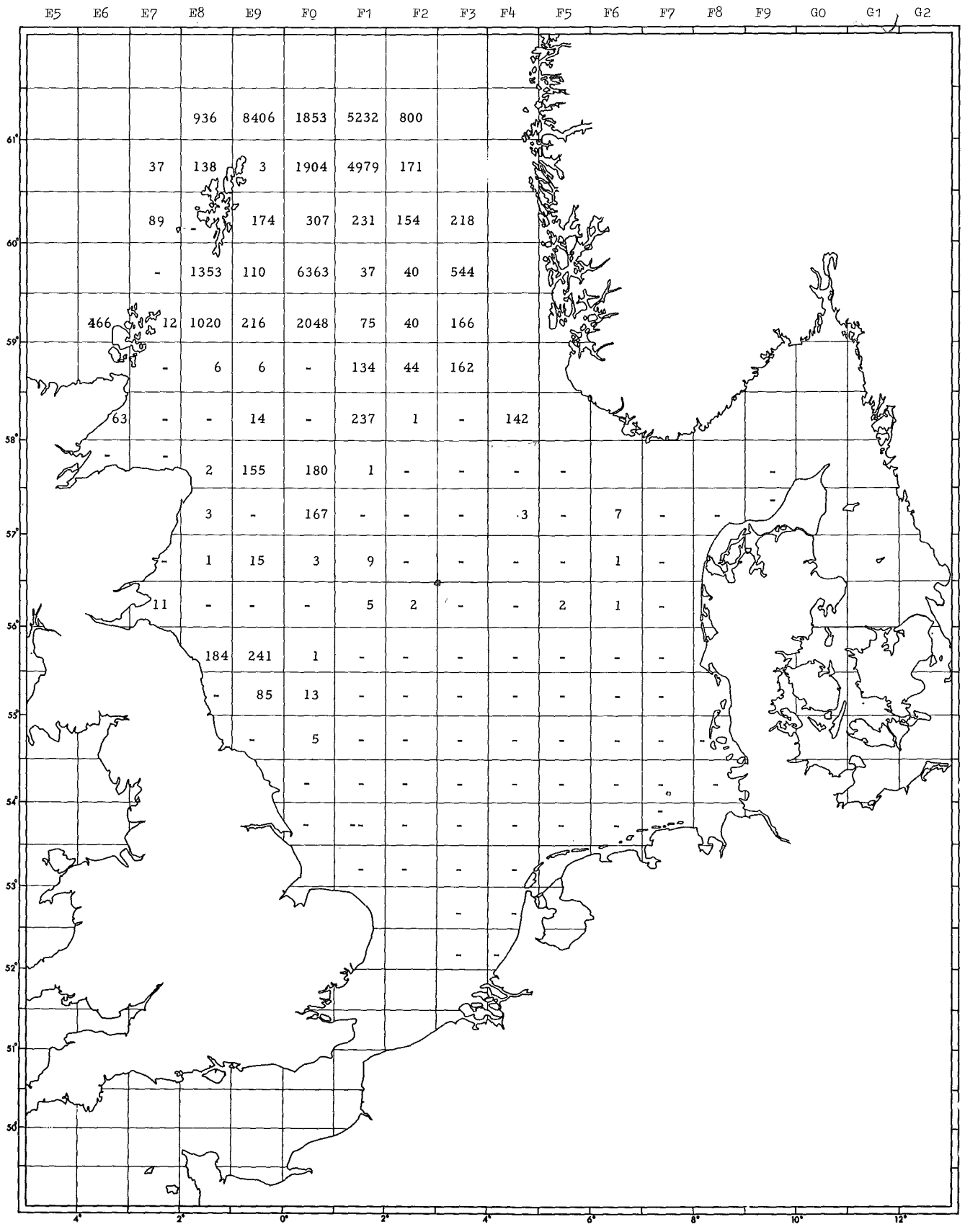
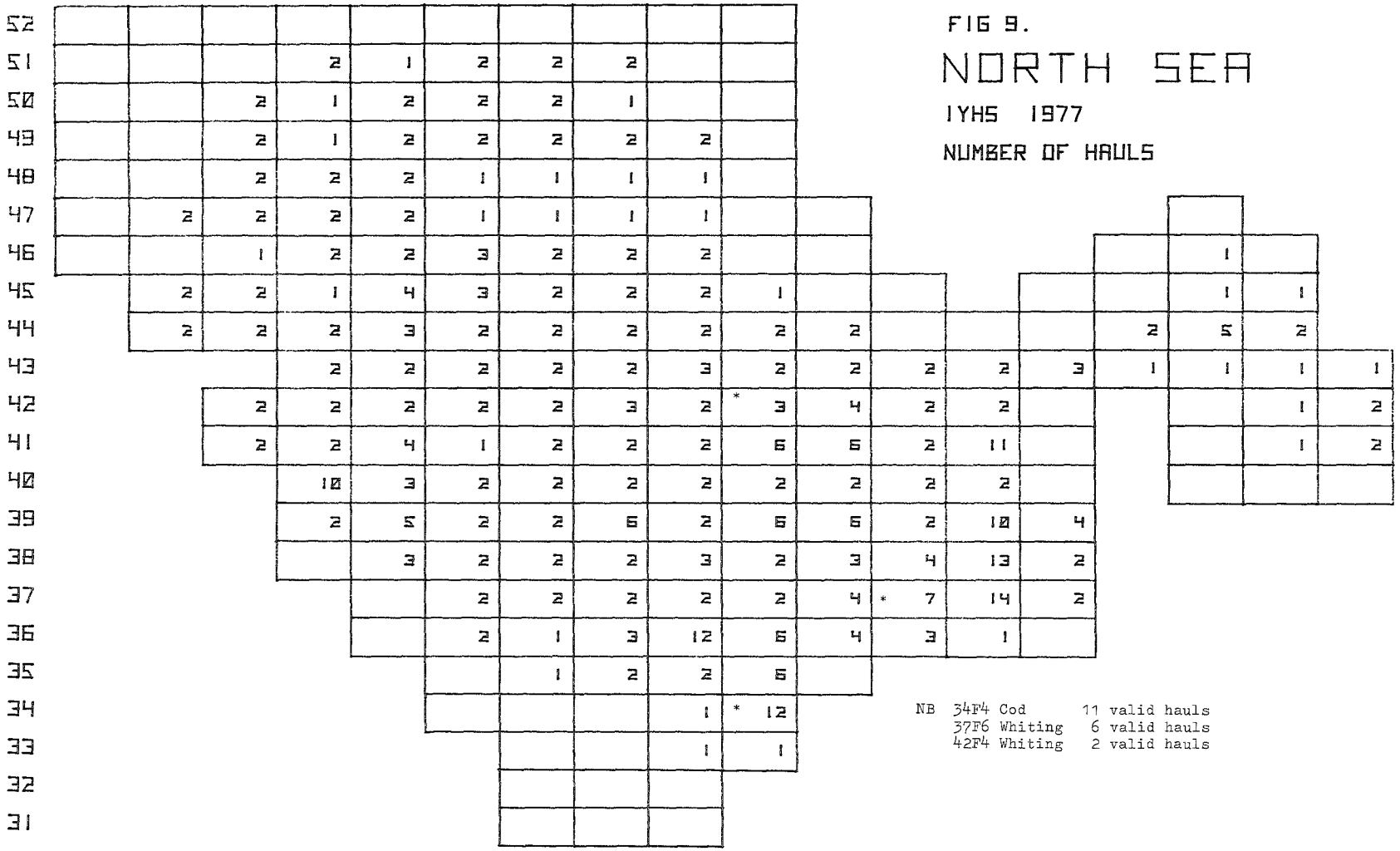


FIG 9.

NORTH SEA

1YHS 1977

NUMBER OF HAULS



NB 34F4 Cod 11 valid hauls
37F6 Whiting 6 valid hauls
42F4 Whiting 2 valid hauls

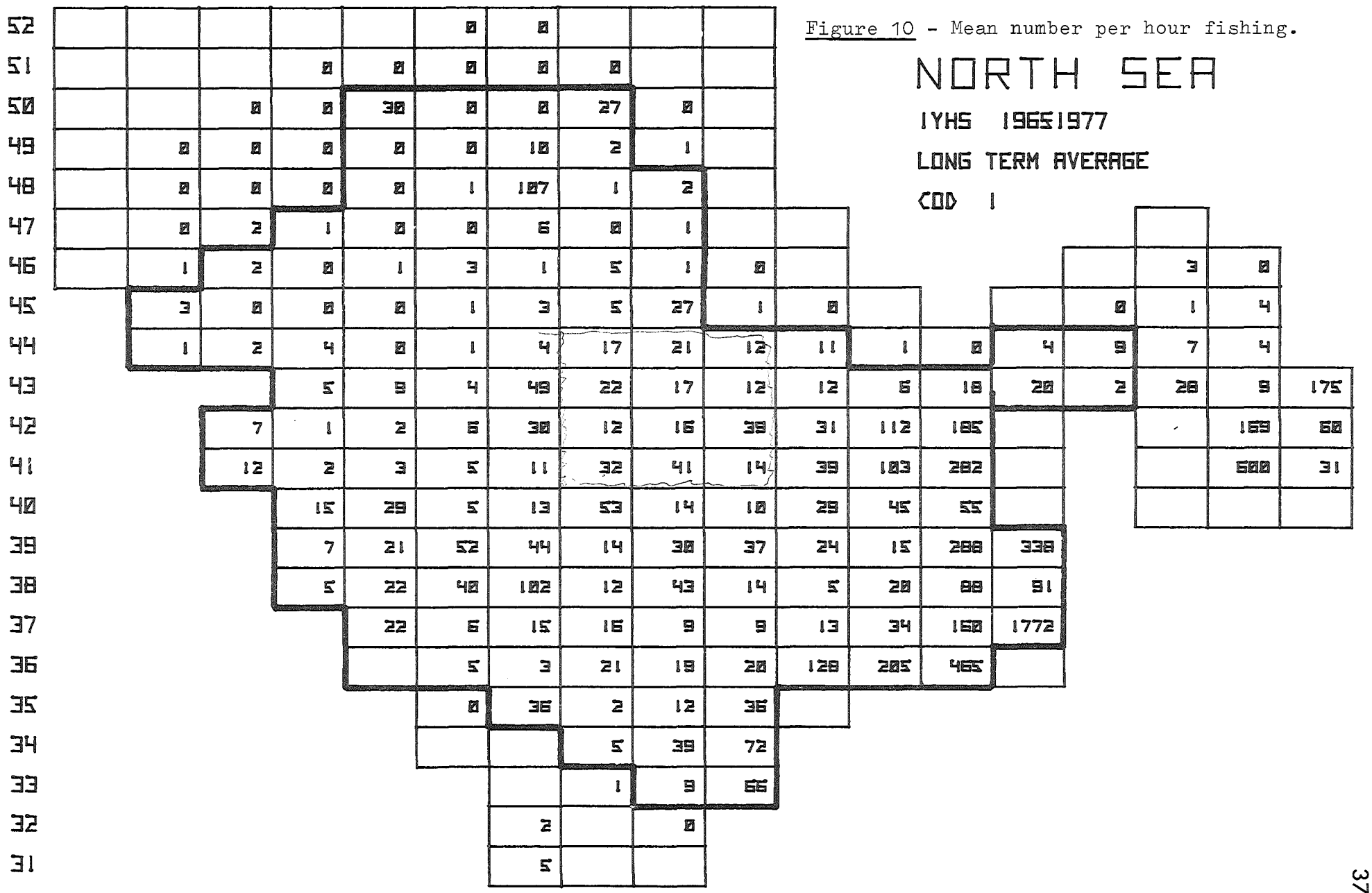


Figure 10 - Mean number per hour fishing.

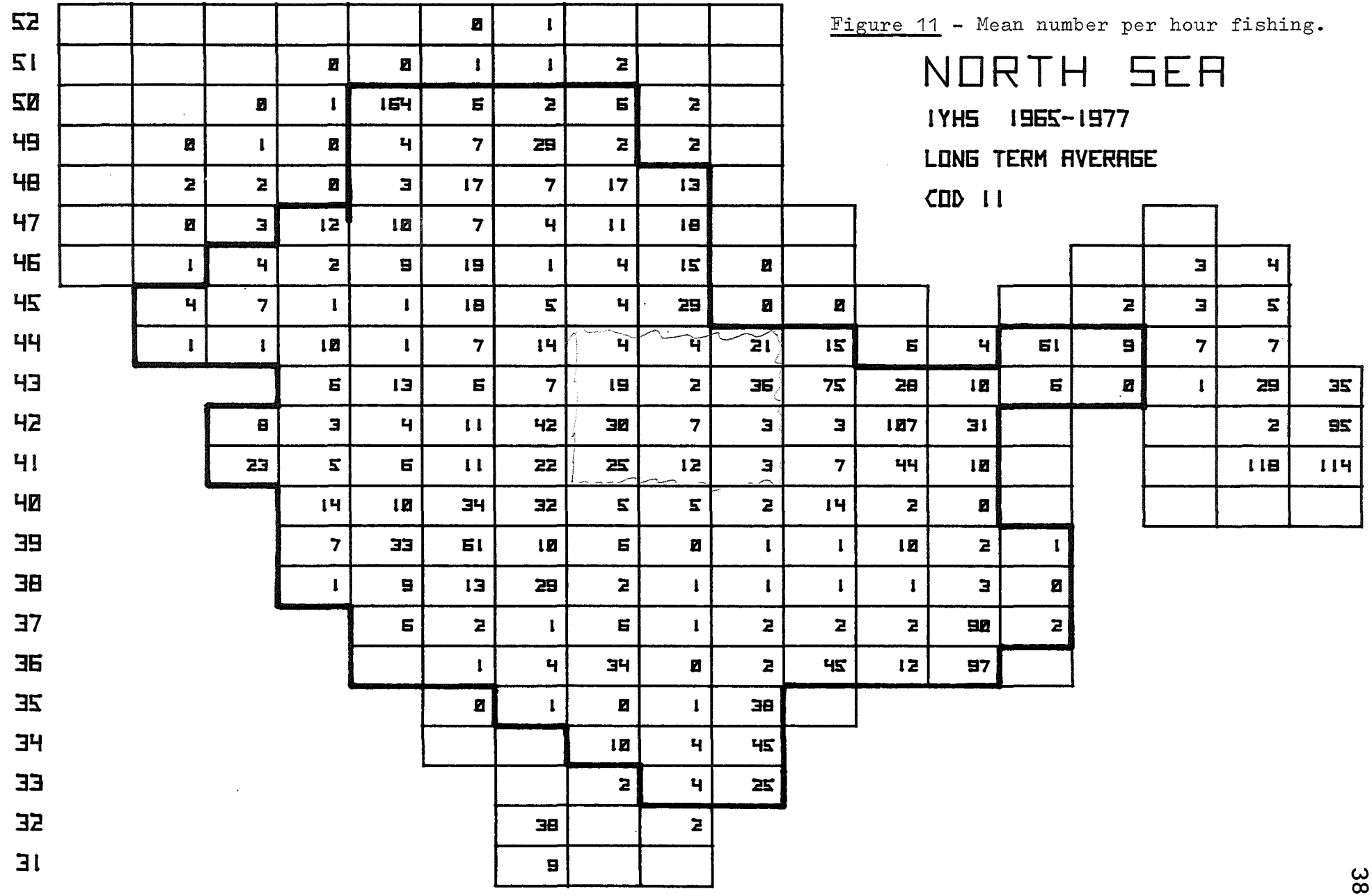


Figure 11 - Mean number per hour fishing.

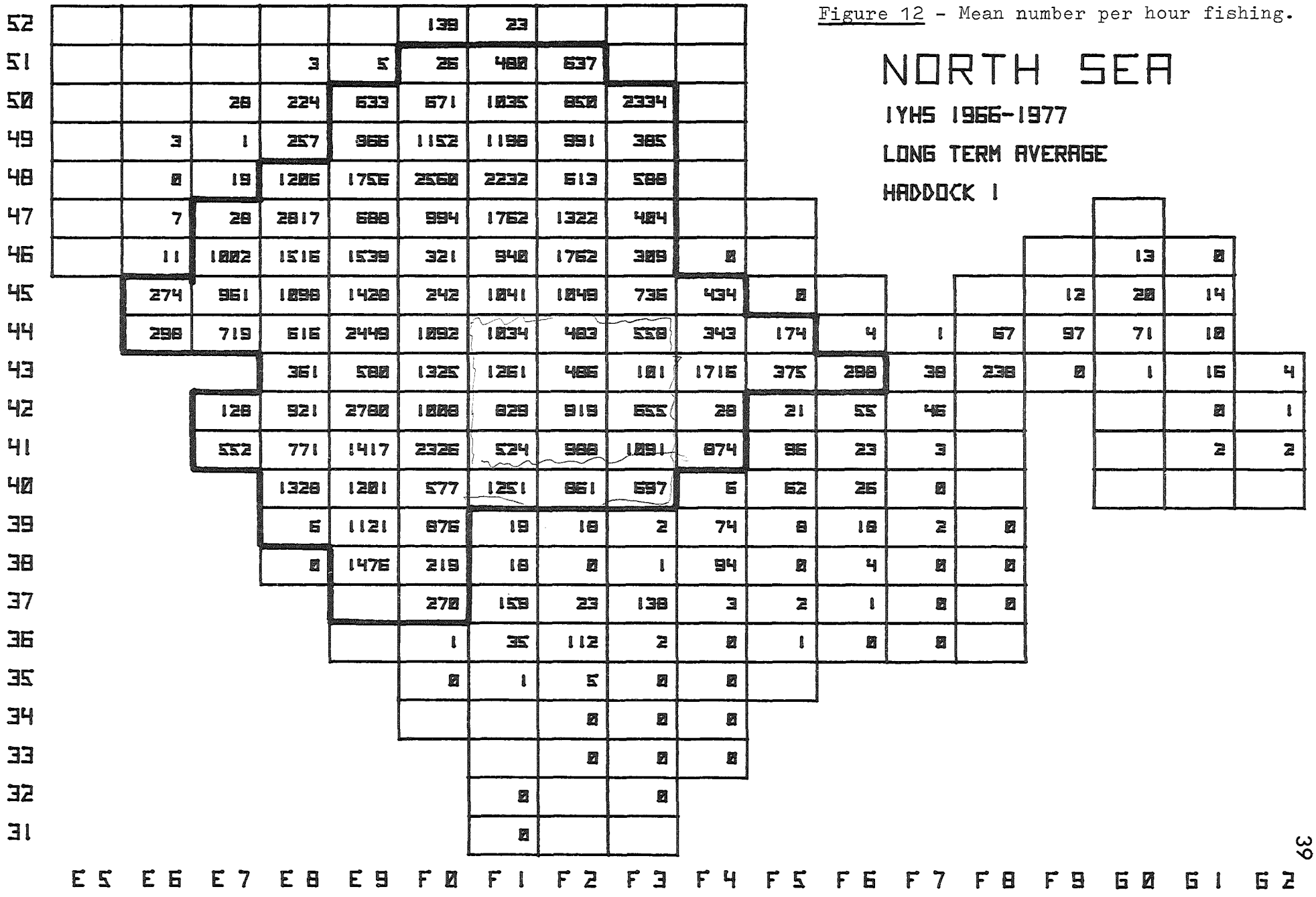
Figure 12 - Mean number per hour fishing.

NORTH SEA

IYHS 1966-1977

LONG TERM AVERAGE

HADDOCK 1



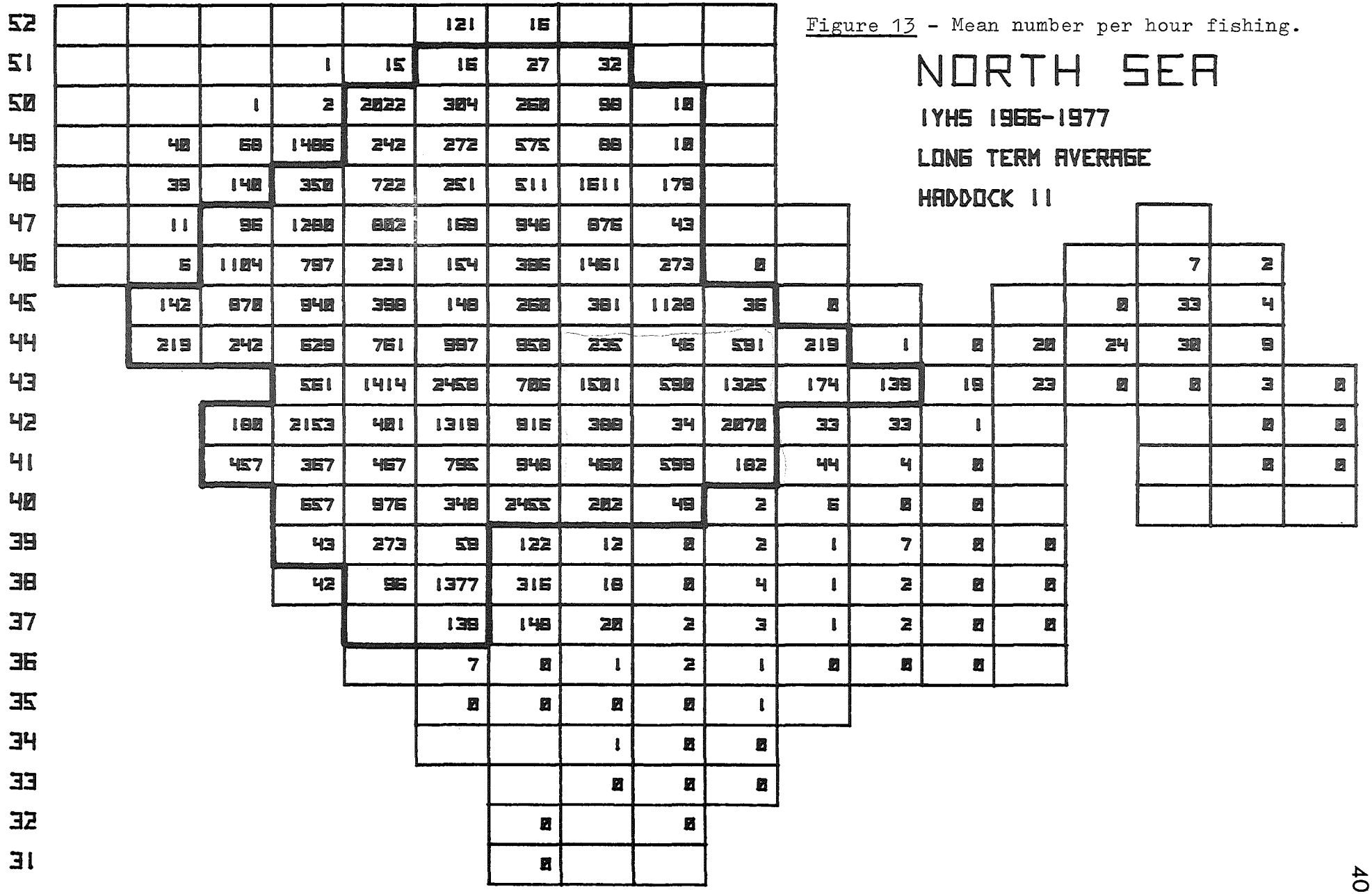


Figure 13 - Mean number per hour fishing.

NORTH SEA

IYHS 1966-1977

LONG TERM AVERAGE

HADDOCK II

FIG 14:MEAN NUMBER PER HR FISHING

NORTH SEA

IYHS 1965-1977

LONG TERM AVERAGE

WHITING I

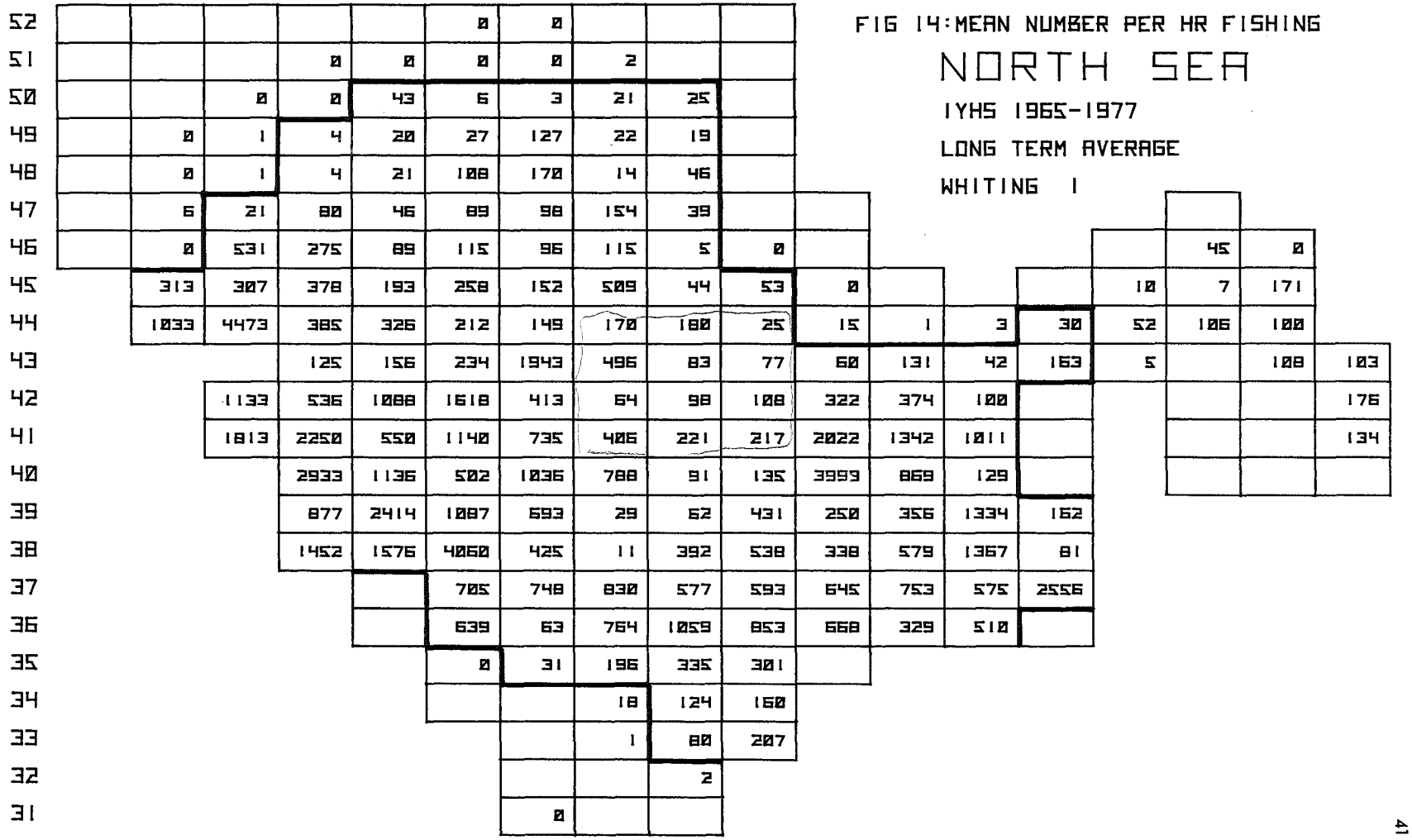


FIG 15: MEAN NUMBER PER HR FISHING

NORTH SEA

IYHS 1965-1977

LONG TERM AVERAGE

WHITING II

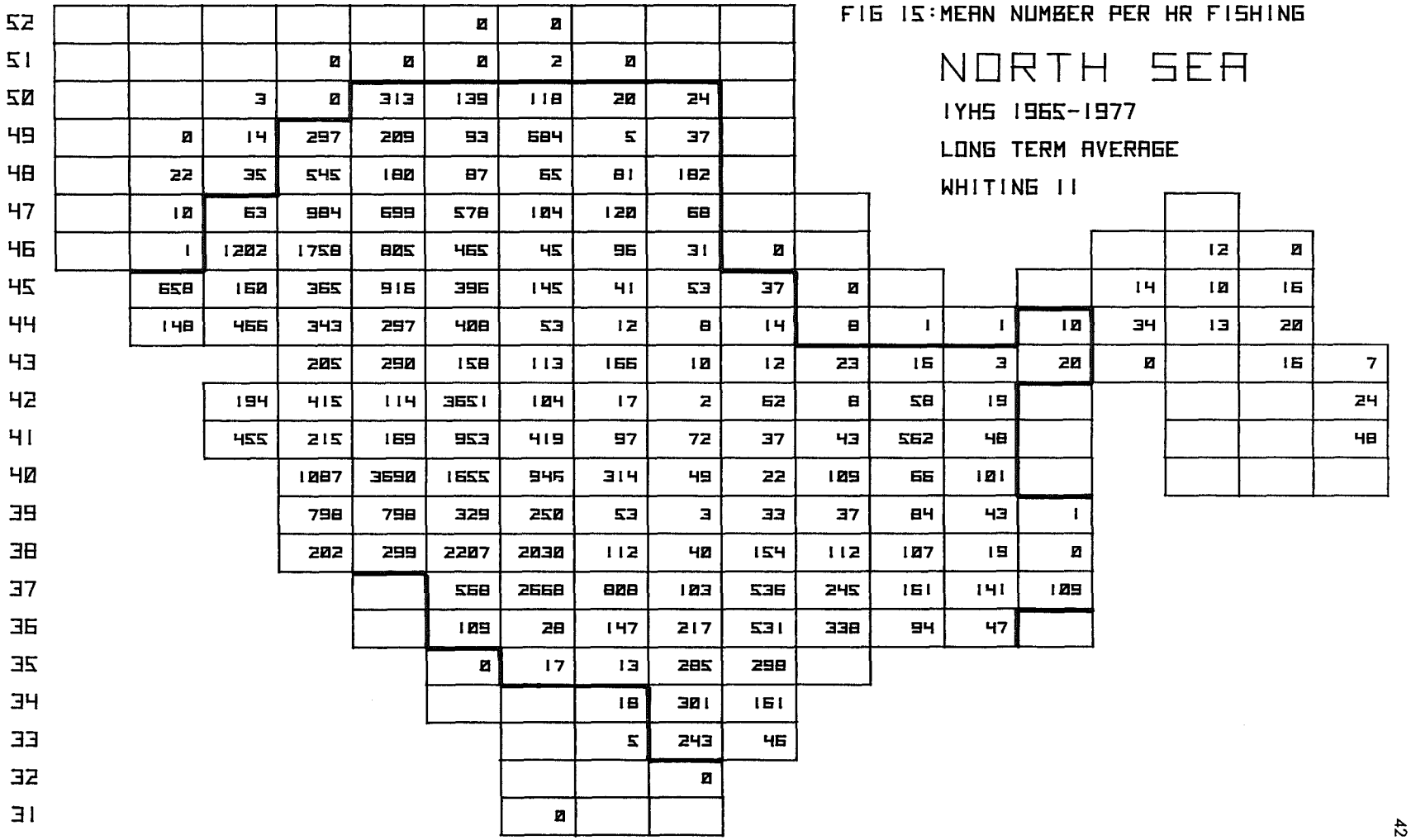


Fig. 16. Mean number of I-group Norway pout per hour fishing caught during the IYHS of 1967-1977. Figures in brackets represent number of years.

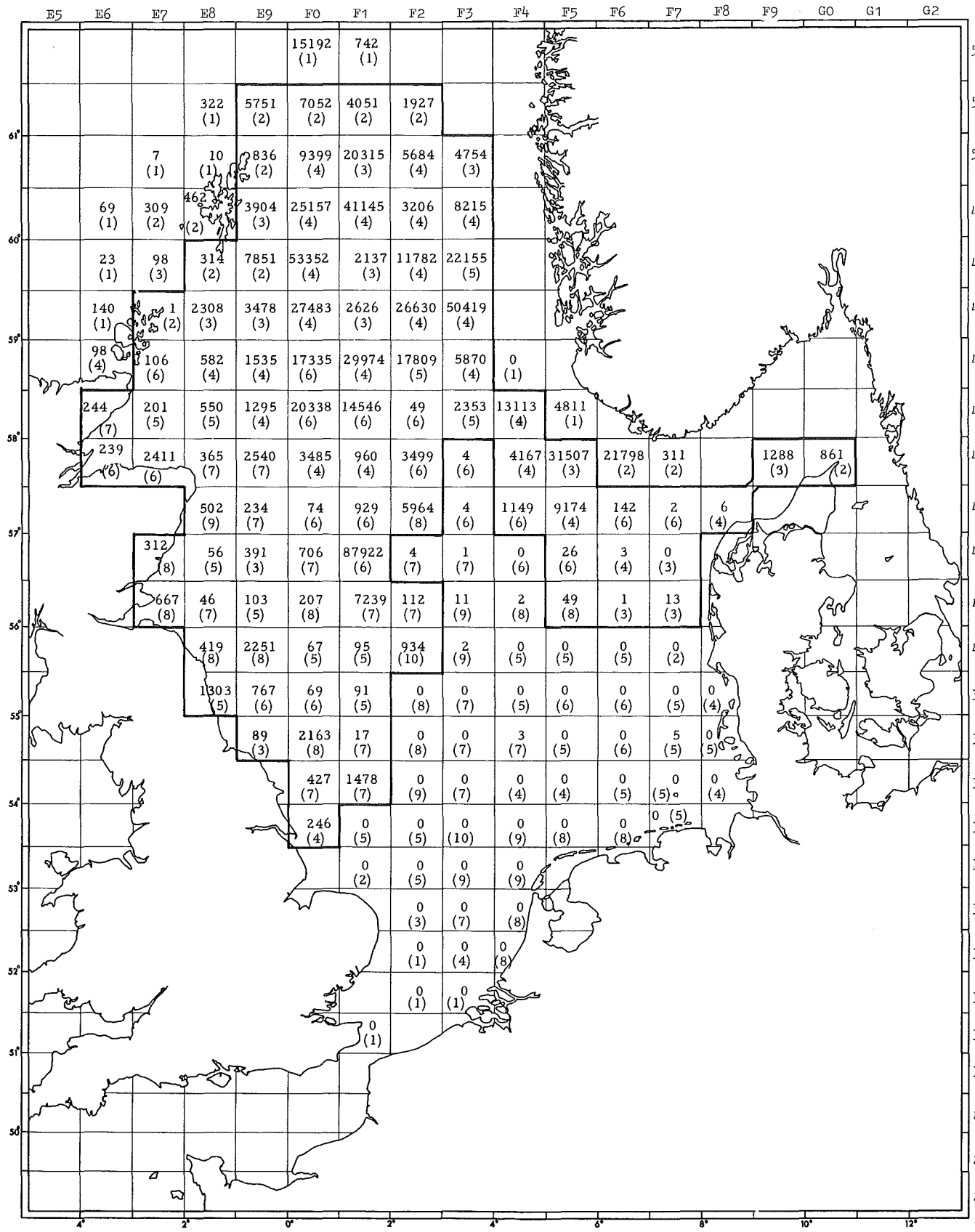


Fig. 17 Mean number of II-group Norway pout per hour fishing caught during the IYHS of 1967-1977.