INTERNATIONAL COUNCIL FOR THE
EXPLORATION OF THE SEA

C.M. 1980/H : 35
Pelagic Fish Committee

REPORT OF THE ICES YOUNG FISH SURVEY 1980: HERRING DATA

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A. Corten

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Fishery Investigations
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General

This paper is one in a series of yearly reports on the ICES Young Fish Surveys (formerly called Young Herring Surveys). These surveys, which are conducted each year during the month of February, are designed to obtain recruitment estimates for a number of fish species. The area covered by the survey includes the North Sea, Skagerrak and Kattegat. Details on the methodology of the surveys are given in the latest report of the Working Group on North Sea Young Herring Surveys (Anon., 1978).

Most vessels nowadays are equipped with the standard GOV bottom trawl for sampling both herring and gadoids of 1 year and older. In addition to the GOV bottom trawl, several ships carry an Isaacs-Kidd Midwater Trawl (IKMT) which is used for sampling 0-group herring (still larvae in February). Fishing with the IKMT is done at night in all areas that are also sampled by bottom trawl.

Participants in the 1980 survey are listed below:

Country:	Vessel:	Period:	Project supervisor:
France	Thalassa	10/02 - 19/02	G. Lefranc
Fed. Rep. of Germany	A. Dohrn	02/02 - 19/02	G. Wagner
Norway	M. Sars	22/01 - 10/02	J. Lahn-Johannessen
The Netherlands	Tridens	24/02 - 07/03	A. Corten
Sweden	Argos	04/02 - 21/02	O. Hagström
U.K. (England)	Cirolana	01/02 - 17/02	W. Parnell
U.K. (Scotland)	Explorer	01/02 - 05/03	A. Saville

Both Denmark and the U.S.S.R. had to cancel their participation in the 1980 survey at the last moment for technical reasons.

0-group herring (year class 1979 autumn spawners)

During the 1980 survey, the number of herring larvae caught were much higher than in any of the previous years. Figure 1 compares the results of the IKMT sampling in the four years for which data are now available. It is seen that in 1980 also the distribution area of the larvae was considerably larger than in previous years.

Of particular interest was the high abundance of larvae in the eastern North Sea, an area which is the traditional nursery ground for most of the North Sea herring, but which had shown an absence of herring larvae in the previous three years. The increased abundance of larvae in the eastern North Sea is illustrated in the text table below:

Year class	Number of squares fished	Mean No/square total N. Sea	Mean No/square eastern N. Sea')	Mean No/square Div. IIIa.
1976	77	5.8	0.0	0.2
1977	122	3.9	1.5	0.9
1978	101	10.5	0.9	7.9
1979	133	28.9	63.3	9.5

') east of 5°E.

The coverage of the North Sea in 1980 was the best one obtained so far. A total of 280 hauls was made in 133 different squares. Out of 7 vessels participating in the Young Fish Survey, 5 were equipped with an IKMT.

1-Ringed herring (mainly year class 1978 autumn spawners)

Sampling of 1-ringed herring was concentrated mainly in the "herring standard area", which covers most of the central and southern North Sea (fig. 2).

Mean densities of 1-ringed herring for all squares sampled are shown in figure 3.
As mentioned in last year's report (Corten, 1979), considerable difficulties still exist in separating 1-ringed herring into autumn and spring spawners. To avoid errors caused by a subjective classification, no such split has been attempted and the numbers per square shown in figure 3 are the total quantities of both autumn and spring spawners with one growth zone. It is assumed that the great majority of these fish in the North Sea and Skagerrak are autumn spawners born in 1978, while the 1-ringed herring in Kattegat may contain a considerable proportion of 1979 spring spawners.

The numbers of 1-ringed herring caught in the central and southern North Sea were considerably higher than those caught in 1979, but they were still low in comparison to years with normal recruitment. The mean density of fish for the herring standard area was 535/hour, which is only 37% of the average for a period of normal year classes, such as 1968 - 73 (table I).

A high abundance of 1-ringers was found in the German Bight, which is a normal distribution area for juvenile herring. Large catches were also taken near the Silver Pit, which gave square 36F2 the highest mean density for the whole North Sea. Good catches were also reported from the Kattegat, an area which had shown a rather low abundance in 1979. As was mentioned above, catches in this area probably contain a certain amount of spring spawners.

The mean length of 1-ringed herring was abnormally low in all parts of the central and southern North Sea (fig. 4). In the German Bight and along the Danish west coast, individual catches with a modal length of 9 cm were no exception. Even the mean length of 9 hauls in block 39, 40/F6, F7 was as low as 11.8 cm.

The low mean length of herring in the North Sea may have been caused either by unfavourable growth conditions during the preceeding year, or by the presence of a high proportion Eastern Channel recruits among the 1-ringers. The first explanation seems to be most plausible at this moment. It should be remembered that year class 1978 has encountered very low water temperatures during the spring of 1979; a factor which may have retarded the growth of this year class considerably.

2-Ringed herring (mainly year class 1977 autumn spawners)

Mean catches per square of 2-ringed herring are shown in fig. 5. The abundance of this age group in most parts of the North Sea was very low, and there is no reason therefore, to revise our present view that year class 1977 is an extremely poor one in the North Sea.

In the Kattegat somewhat higher numbers of 2-ringed herring were found, which presumably consist mainly of year class 1978 spring spawners. The numbers caught were low in comparison with the numbers of 2-ringers found last year, but they were still a little bit higher than the numbers of 1-ringers (the same year class) found in that area in 1979.

Acknowledgements

Thanks are due to Dr. N. Daan who wrote a computer programme for analysing the herring data from the IYHS, and for drawing the charts in fig. 2 - 6.

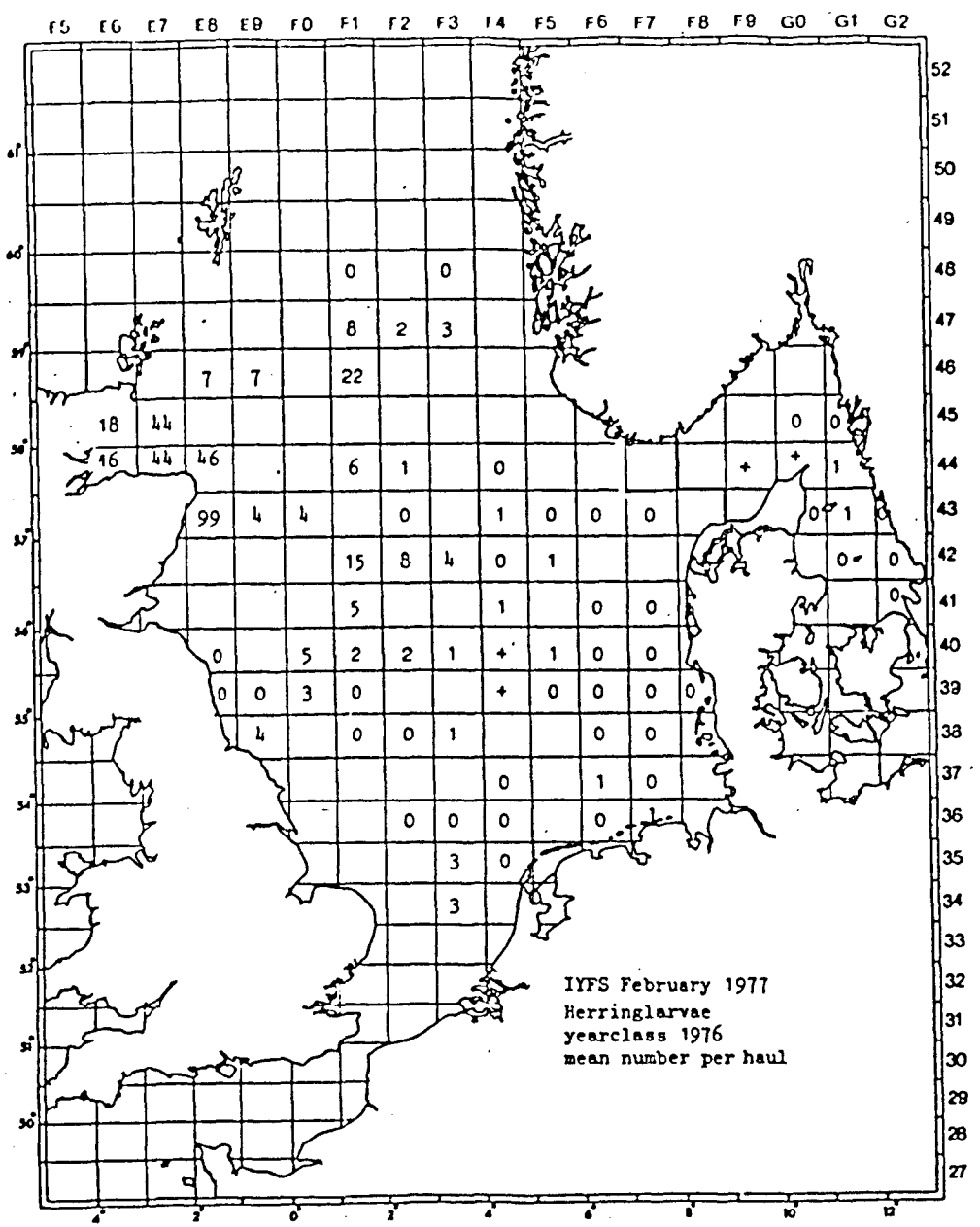
References

Anon., 1978 - Report of the Working Group on North Sea Young Herring Surveys, 1977. ICES Coop. Res. Rep., 81.

Corten, A., 1979 - Report on the ICES Young Fish Survey 1979: Herring data. ICES C.M. 1979/H : 25

TABLE I - Mean abundance of 1-ringed herring for the herring standard area.

Survey year	Year class (assuming all fish are autumn spawners)	No/hour
1970	1968	822
1971	1969	2647
1972	1970	1629
1973	1971	827
1974	1972	1195
1975	1973	1529
1976	1974	452
1977	1975	342
1978	1976	575
1979	1977	139
1980	1978	535



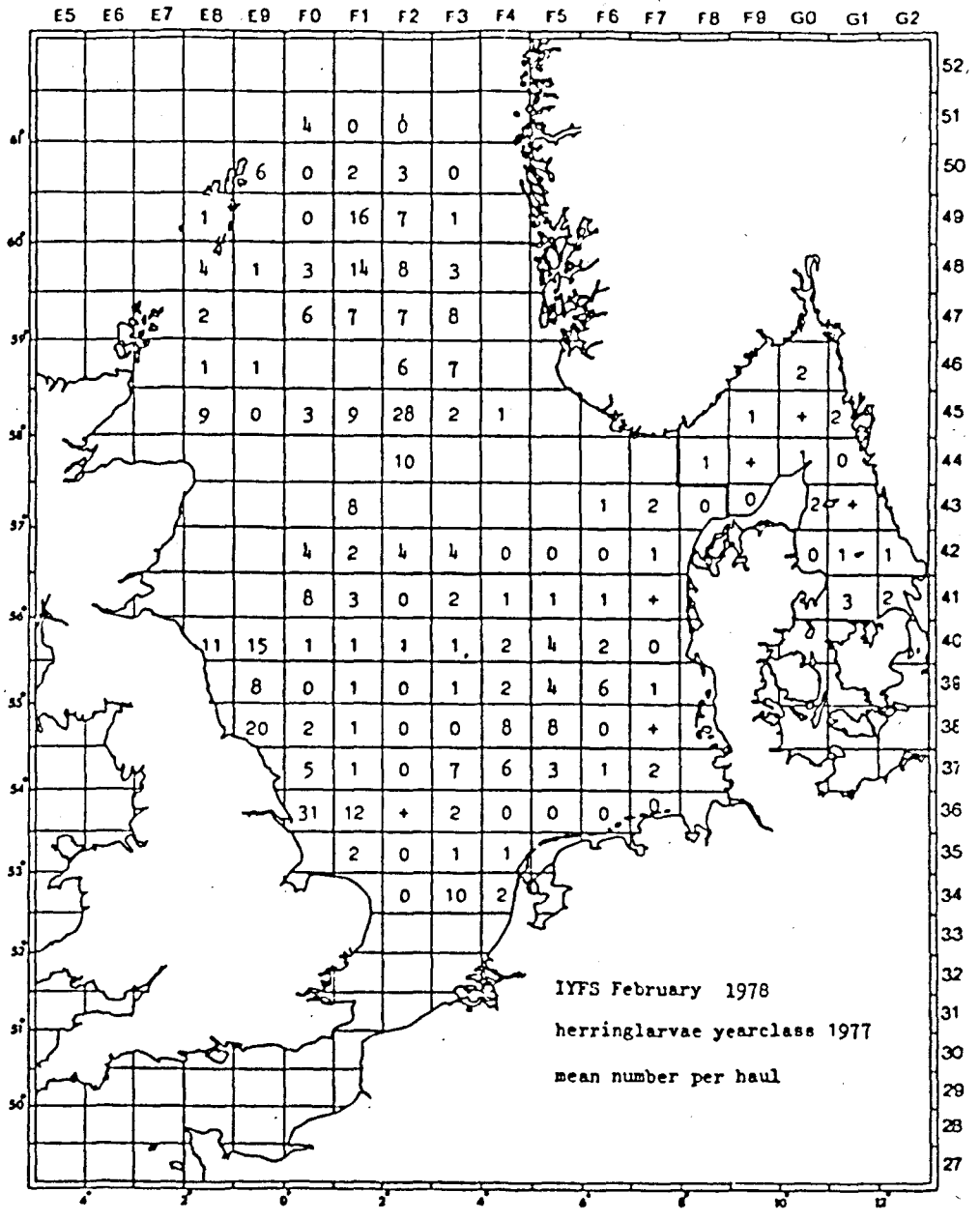
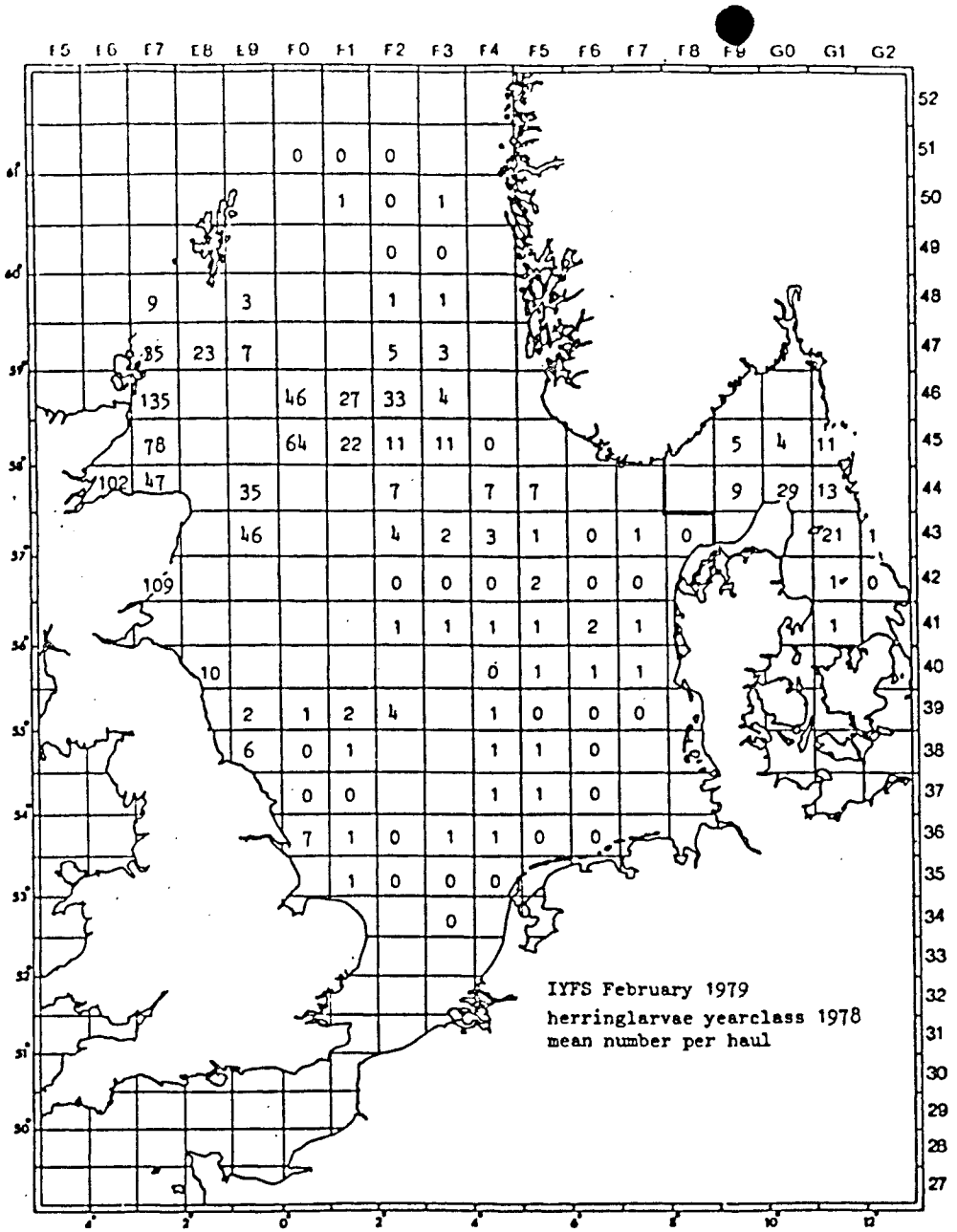


Figure 1. Mean number of herring larvae per haul caught by the Isaacs-Kidd Midwater Trawl during the surveys in 1977 - 80



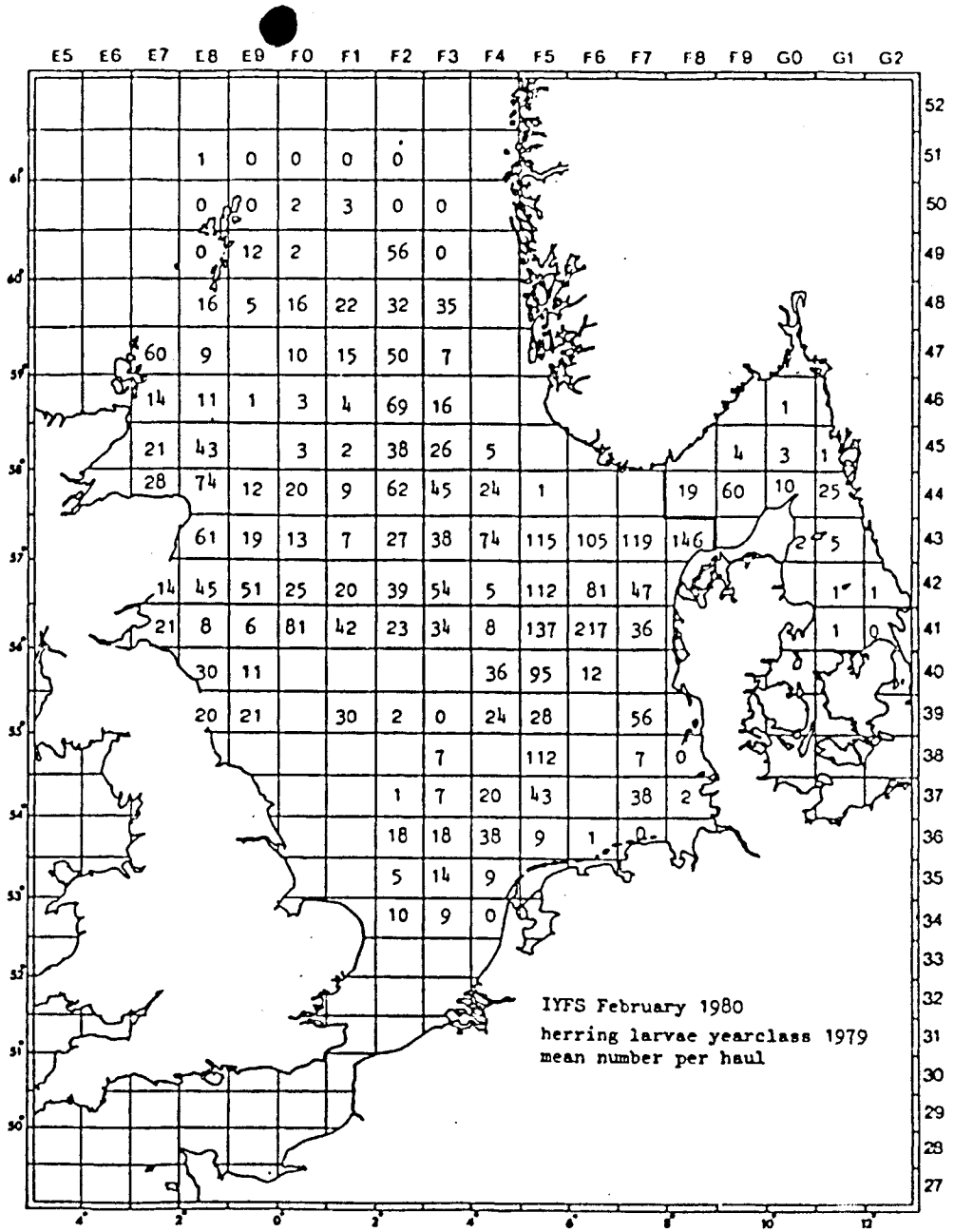


Figure 1. (Continued)

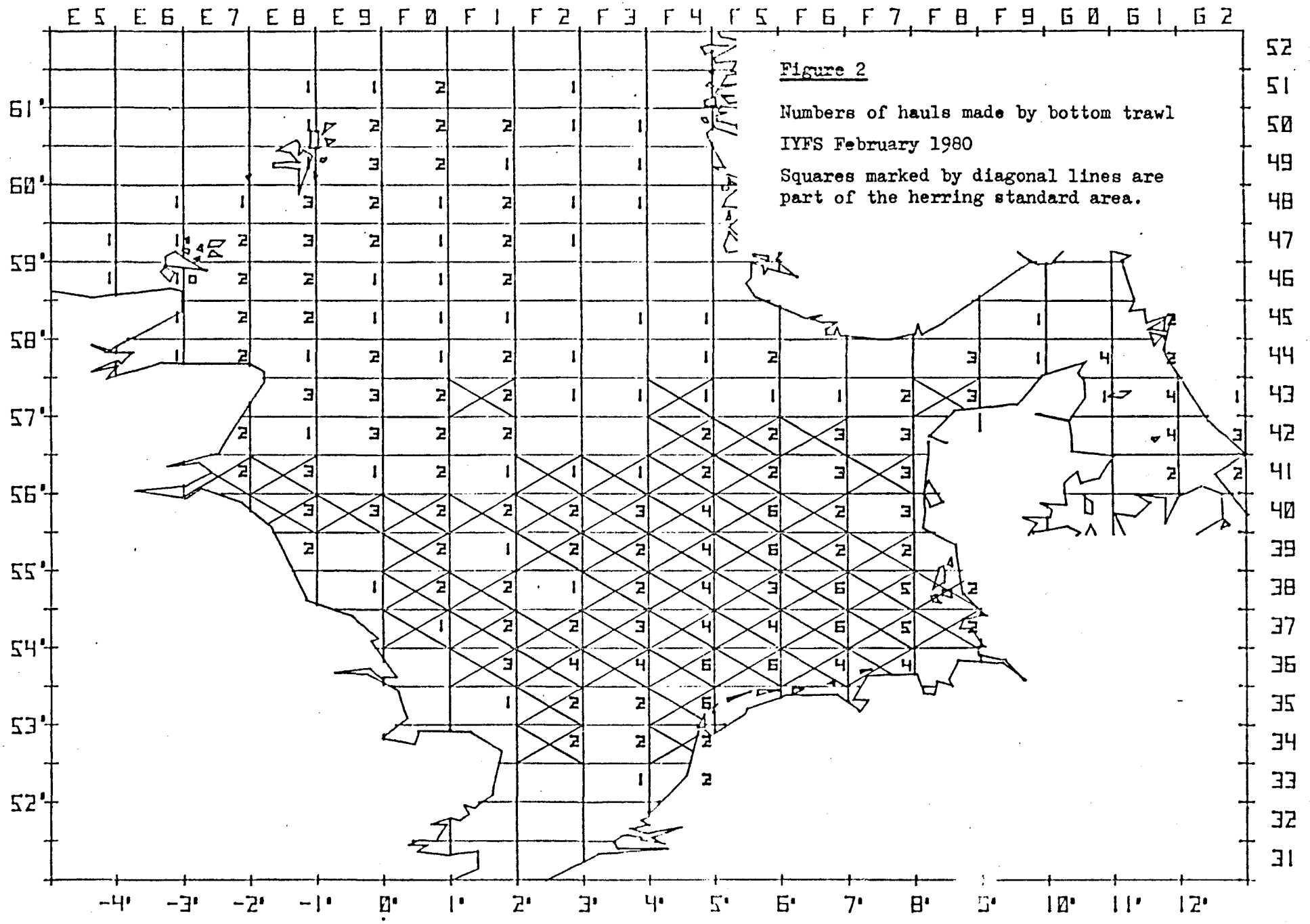
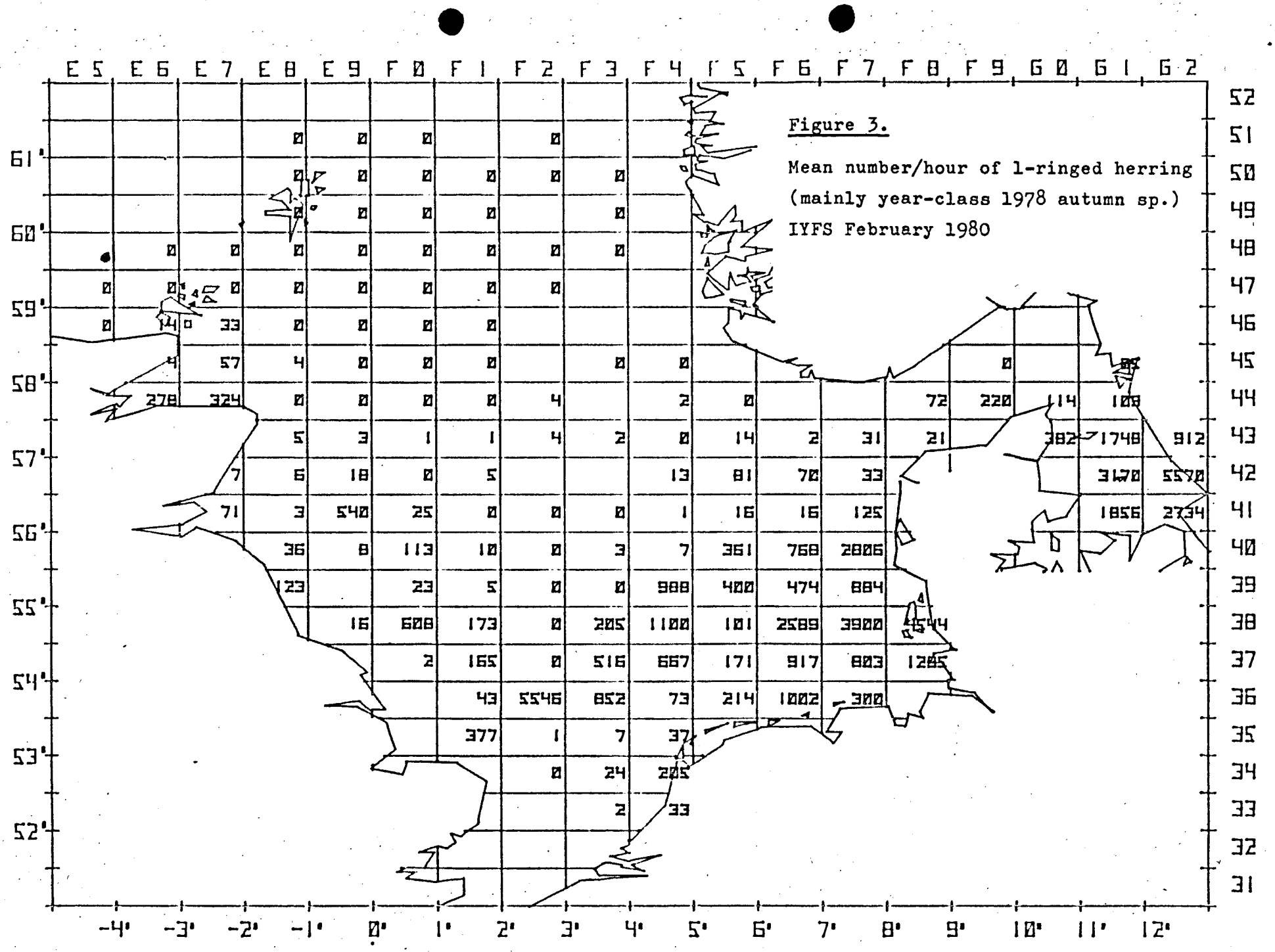


Figure 2

Numbers of hauls made by bottom trawl

IYFS February 1980

Squares marked by diagonal lines are part of the herring standard area.


E5 E6 E7 E8 E9 F0 F1 F2 F3 F4 F5 F6 F7 F8 F9 G0 G1 G2
61° 60° 59° 58° 57° 56° 55° 54° 53° 52°
52 51 50 49 48 47 46 45 44 43 42 41 40 39 38 37 36 35 34 33 32 31
-4° -3° -2° -1° 0° 1° 2° 3° 4° 5° 6° 7° 8° 9° 10° 11° 12°
Figure 3.
Mean number/hour of 1-ringed herring
(mainly year-class 1978 autumn sp.)
IYFS February 1980

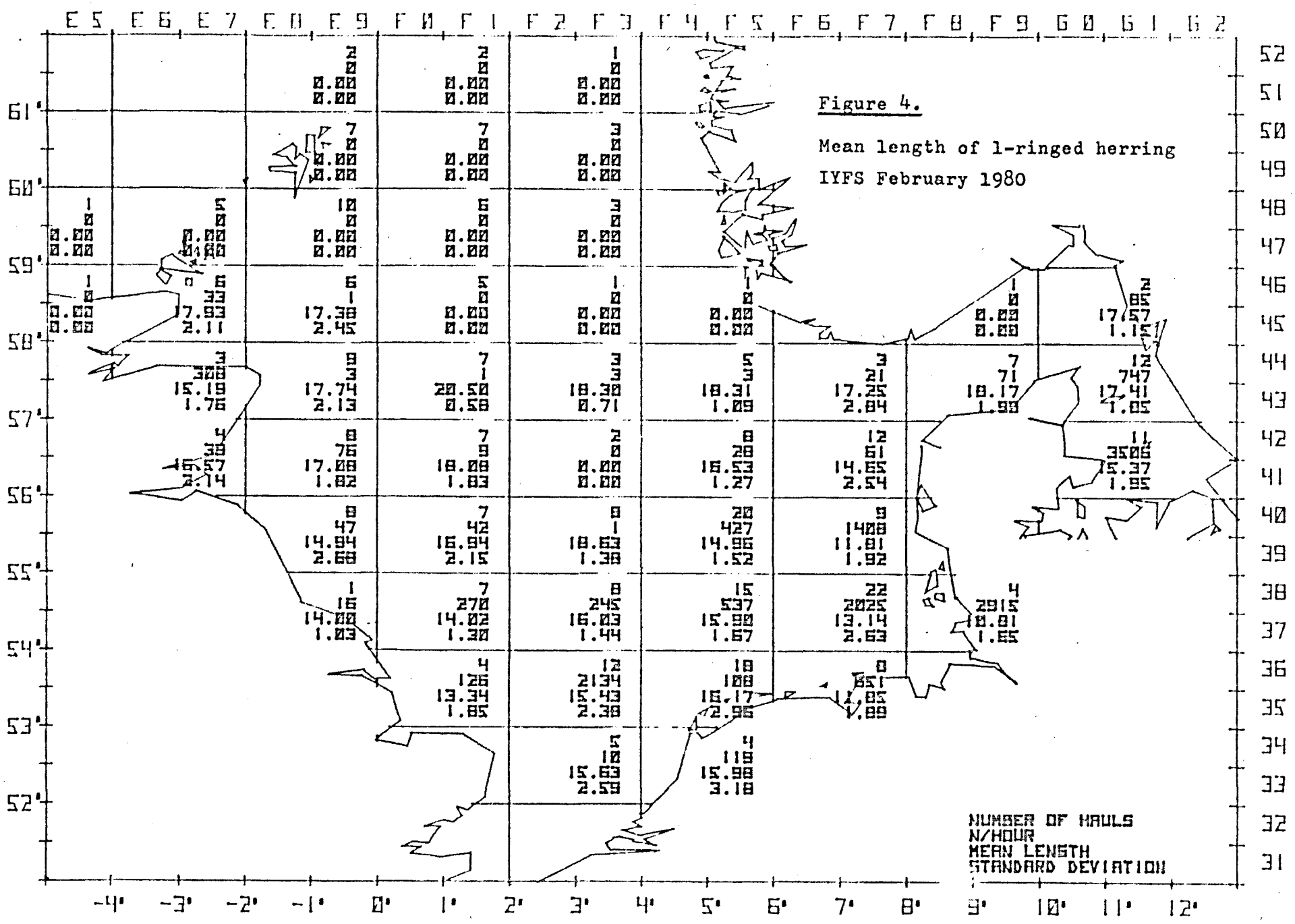


Figure 4.

Mean length of 1-ringed herring

IYFS February 1980

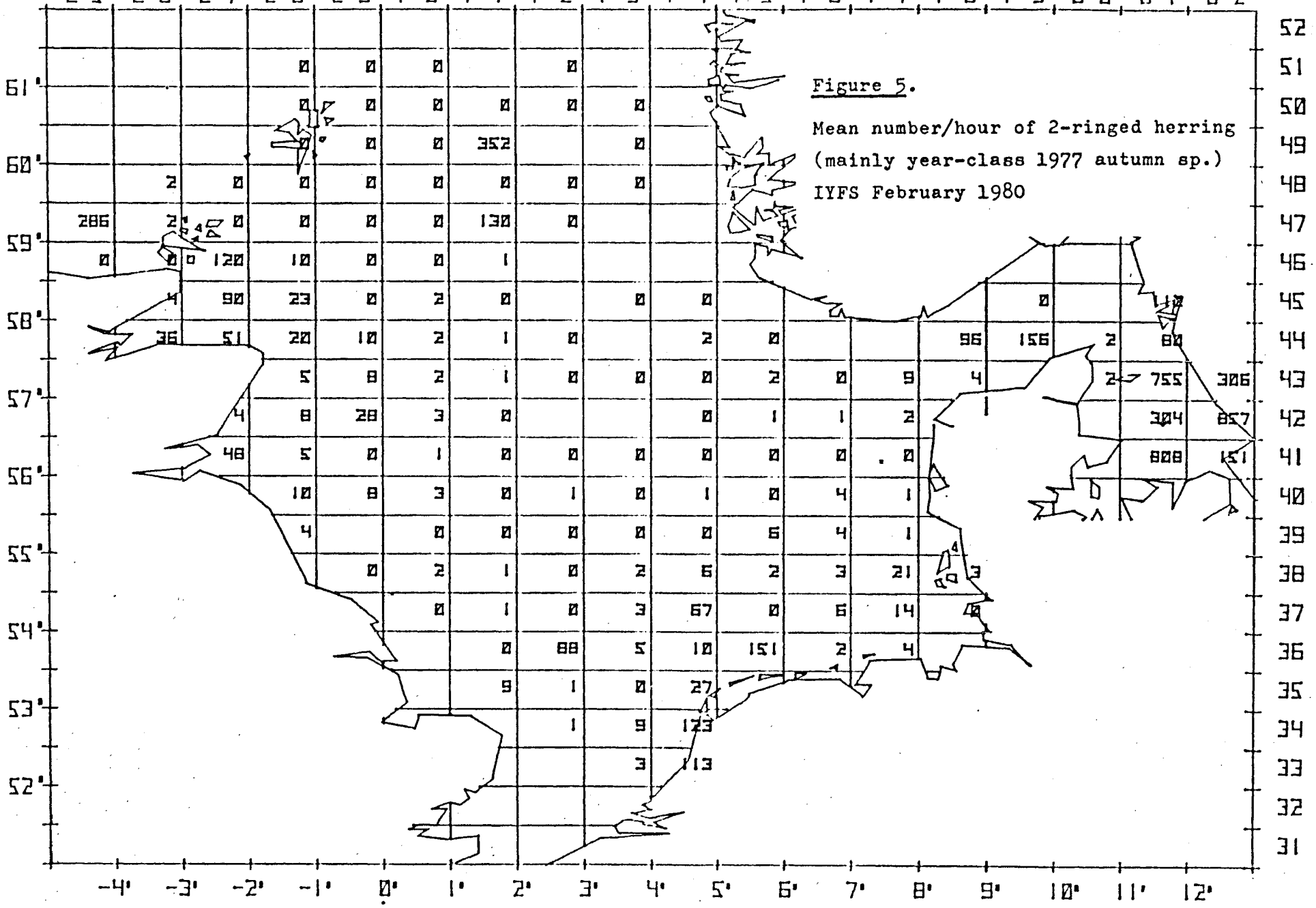
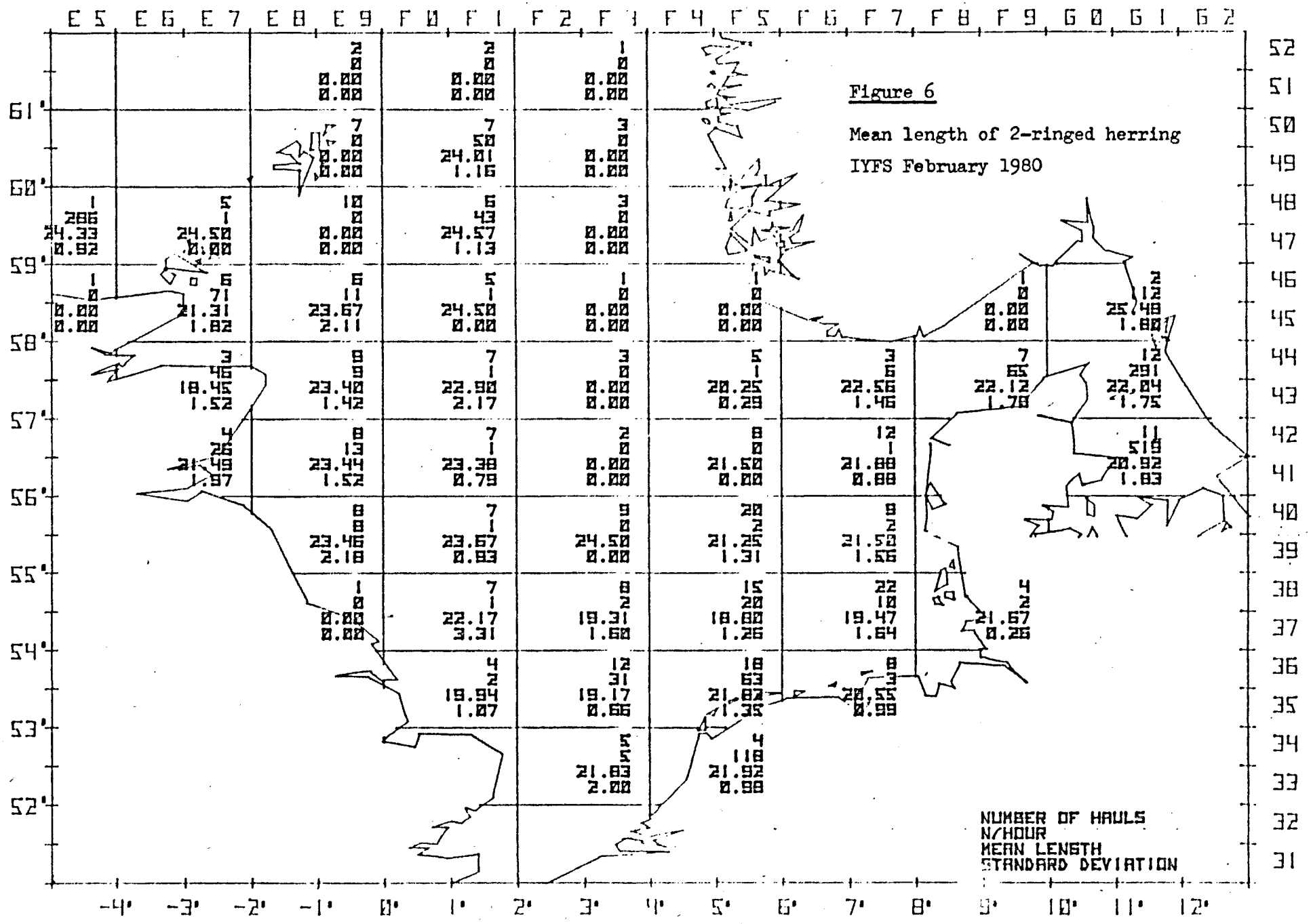


Figure 5.

Mean number/hour of 2-ringed herring (mainly year-class 1977 autumn sp.)
IYFS February 1980


E5 E6 E7 E8 E9 F0 F1 F2 F3 F4 F5 F6 F7 F8 F9 G0 G1 G2
61° 60° 59° 58° 57° 56° 55° 54° 53° 52°
52 51 50 49 48 47 46 45 44 43 42 41 40 39 38 37 36 35 34 33 32 31
-4° -3° -2° -1° 0° 1° 2° 3° 4° 5° 6° 7° 8° 9° 10° 11° 12°
Figure 6
Mean length of 2-ringed herring
IYFS February 1980
NUMBER OF HAULS
N/HOUR
MEAN LENGTH
STANDARD DEVIATION