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International Council for the Exploration of the Sea

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Demersal Fish Committee



**REPORT OF THE STUDY GROUP ON BOTTOM TRAWL SURVEYS
IN SUB-AREAS VI, VII AND VIII AND DIVISION IXa**

This document is a report of a Study Group of the International Council for the Exploration of the Sea and does not necessarily represent the views of the Council. Therefore, it should not be quoted without consultation with the General Secretary.

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TABLE OF CONTENTS

Section	Page
1. INTRODUCTION	1
1.1 Terms of Reference	1
1.2 Members of Study Group	1
2. COMMON DATA BASE	1
3. SPECIES DISTRIBUTION	1
3.1 Data Used and Methods	1
3.2 Hake	2
3.3 Horse Mackerel	2
3.4 Mackerel	3
3.5 <i>Lepidorhombus whiffiagonis</i>	3
3.6 <i>Lepidorhombus boscii</i>	3
3.7 <i>Lophius piscatorius</i>	3
3.8 <i>Lophius budegassa</i>	3
4. GEAR COMPARISON	3
5. CO-ORDINATION OF BOTTOM TRAWL SURVEYS	4
6. REFERENCES	4
TABLES 2-4	5
FIGURES 2-3.30	6

1 INTRODUCTION

1.1 TERMS OF REFERENCE

At the 1993 ICES Statutory Meeting the Council decided (C.Res. 1993/2:32), that the Study Group on Bottom Trawl Surveys in Sub-areas VI, VII and VIII and Division IXa (Chairman : Mr J.C. POULARD, France) will work by correspondence in 1994 to :

- a) assemble data from different national research vessel surveys in a common data base;
- b) describe, on the basis of survey results, the seasonal distribution and relative abundance of hake, mackerel, horse mackerel, anglerfish (*Lophius budegassa* and *L. piscatorius*), and megrim (*Lepidorhombus whiffiagonis* and *L. boscii*) in the area;
- c) promote collaboration between national laboratories in co-ordinating bottom trawl surveys in the area.

1.2 MEMBERS OF THE STUDY GROUP

M. Azevedo	Portugal
F. Borges	Portugal
M de F. Cardador	Portugal
A. Cascalho	Portugal
J. Casey	United Kingdom
P. Connolly	Ireland
H. Dornheim	Germany
S. Ehrich	Germany
A. Eltink	Netherlands
M.J. de Figueiredo	Portugal
B.W. Jones	United Kingdom
M. Martins	Portugal
F.J. Pereiro	Spain
G. Pestana	Portugal
J.C. Poulard (Chairman)	France
F. Sanchez	Spain
M. Walsh	United Kingdom

2 COMMON DATA BASE

No progress has been made in the definition and location of the data base. However, collating survey data using the IBTS data format exchange was undertaken. The table 2 gives the inventory of data collated up to now.

3 SPECIES DISTRIBUTION

3.1 DATA USED AND METHODS

Three sets of surveys results were extracted from the available data to describe the distribution of species during quarters, they are as follows :

- the first quarter of 1990 : distribution of hake, horse mackerel, mackerel and megrim (*Lepidorhombus whiffiagonis*), in ICES divisions VIa, VIIb and VIIj, from data provided by the German survey (table 3);
- the fourth quarter of 1990 : distribution of hake, megrim (*Lepidorhombus whiffiagonis* and *L. boscii*), anglerfish (*Lophius piscatorius* and *L. budegassa*), to the south of 51° N, from data provided by the French, Spanish and Portuguese surveys;
- the fourth quarter of 1992 : distribution of hake, horse mackerel, mackerel, megrim (*Lepidorhombus whiffiagonis*) and anglerfish (*Lophius piscatorius* and *L. budegassa*), to the north of 43° N, from data provided by Scottish and French surveys.

A detailed description of the survey design and methods has been given previously (ICES CM 1991/G :13). The main features of the surveys used are given in table 3. It must be noticed that several different gears were used according to the country during these surveys. Although a gear comparison was carried out in autumn 1992 (see § 4) between the bottom trawl type BAKA 44/60 used during Spanish surveys and the GOV 36/47 trawl used during French surveys, no attempt was made to standardize the gear in the absence of information about the performances of other gears. It must be noted that for hake (table 4) there is almost no difference between the fishing power of BAKA and GOV trawls, on the contrary BAKA trawl catches about three times as much megrim than GOV.

The distribution of the hauls through the surveyed area is showed on figure 3.1. There is no overlapping area between the different surveys, except a small one in 1992 between French and Scottish surveys around the 51° N (figure 3.1 C). Trawl stations completed in September 1990 by Spain and France and in September 1992 by France were incorporated into the data sets used.

Seven categories have been defined for the numbers of fish caught per hour fishing. Several scales were used, each of them was fitted to the abundance level of individual species to get the best description of its distribution.

The length frequency distributions are given when length data were available or the total number caught were large enough. They were obtained by pooling tow length compositions without applying any depth stratified weighting factors.

3.2 HAKE (FIGURES 3.2-3.7)

South of 51° N, the hake distribution shows a patchy pattern in autumn. Higher densities corresponded to 0-group (i.e. fish approximately less than 15 cm in length) which was generally caught at a depth comprised between 50 and 200 meters. The overall distribution of hake during the fourth quarter shows in fact the position of its major nursery grounds. The highest densities were recorded in VIIIa in 1990 and in VIIg,h in 1992.

3.3 HORSE MACKEREL (FIGURES 3.8-3.11)

North of 49° N, horse mackerel seems more abundant along the shelf edge during the first quarter than during the fourth one. In both quarters the 2+ group made up the bulk of the catches.

In the Bay of Biscay, higher densities were recorded at depth less than 100 m during the fourth quarter. The total catch can be split into four age groups (0 to 3⁺), the younger one being mainly found in shallow waters.

3.4 MACKEREL (FIGURES 3.12-3.15)

The highest catch numbers (more than ten thousands per hour) were found predominantly off the western coast of Ireland and south of Cornwall during the first quarter. High number distribution seems more even during the first quarter than during the fourth one along the shelf edge in the northern part of the area.

Densities were low in the Bay of Biscay compared to those recorded in the north.

3.5 *Lepidorhombus whiffiagonis* (FIGURES 3.16-3.20)

This species occurred mainly in two areas. The main one is centered on divisions VIIg,h,j and extended northwards to divisions VIIb and VIa. In sub-area VIII densities were generally lower. The second area was confined to division VIIIc with higher densities occurring mainly at a depth comprised between 100 and 200 meters. The length frequency distributions show no large difference over the surveyed area.

3.6 *Lepidorhombus boscii* (FIGURES 3.21-3.22)

The distribution area of *L. boscii* was limited to divisions VIIIc and north of division IXa. There was an increasing trend in abundance from east to west in division VIIIc. The species occurred mainly in the 200-400 meters depth range. Outside of this area the abundance of *L. boscii* was very low and the species was not reported from surveys carried out north of 51° N.

There is some indication that BAKA trawl used by Spain is more efficient at catching both megrim species than the other gears used. This can affect their distribution pictures.

3.7 *Lophius piscatorius* (FIGURES 3.23-3.27)

The species was rather evenly distributed in northern area (divisions VIa and VIIbj) during the fourth quarter of 1992. *L. piscatorius* was on the contrary scattered in division VIIh and sub-area VIII during the fourth quarter of 1990 and 1992. The species was found fairly abundant in the eastern part of division VIIIc during the fourth quarter of 1990.

3.8 *Lophius budegassa* (FIGURES 3.28-3.30)

L. budegassa abundance distribution showed high catch values in the southern part of division VIIIb and also in division VIIIc. The species was scattered through the northern part of the surveyed area and was almost not found north of 55° N.

4 GEAR COMPARISON

A comparison between the bottom trawl type BAKA 44/60 used by the R.V Cornide de Saavedra (Spain) and the GOV 36/47 used by the R.V Thalassa (France) during surveys (Anon., 1991)

was carried out in the south of the Bay of Biscay between the 26 September and the 4 October 1992. Nineteen pairs of simultaneous tows lasting 30 minutes each were completed.

Preliminary results showed that for hake both gears have almost the same catch efficiency (table 4), the length compositions being similar. However, Baka trawl caught somewhat three times as many megrim as the GOV trawl and less than twice as many anglerfish. The length distributions of these species were similar although there was some indication that the Baka trawl caught a higher proportion of small anglerfish and a smaller proportion of *L. boscii*.

5 CO-ORDINATION OF BOTTOM TRAWL SURVEYS

Not enough progress has been made in the co-ordination of bottom trawl surveys in the area. However, it should be possible to get a good coverage of the northern part of the area (i.e. from VIa to VIIIa) during the first quarter by co-ordinating surveys carried out by Scotland, Ireland, England and Germany. The whole area is already covered during the fourth quarter because many national surveys are conducted by Scotland, Ireland, Netherlands, France, Spain and Portugal.

6 REFERENCES

Anon. 1991. Report of the study group on the co-ordination of bottom trawl surveys in Sub-areas VI, VII and VIII and Division IXa. ICES, Doc. C.M. 1991/G : 13.

Table 2 Bottom trawl surveys in ICES Sub-areas VI, VII, VIII and division IXa : summary of survey data collated.

Country	Year	Quarter			
		I	II	III	IV
France	1987				VIIIa-d
	1988		VIIIa-d		VIIIa-d
	1989				VIIIa-d
	1990				VIIe-j, VIIIa-d
	1991		VIIe-j, VIIIa-d		
	1992				VIIe-j, VIIIa-d
Germany	1987	VIa, VIIb,j,e, VIIIa			
	1989	VIa, VIIb,j,e, VIIIa			
	1990	VIa, VIIb,j,e			
	1991	VIa, VIIb,j,e			
Portugal*	1990			IXa	IXa
	1991			IXa	IXa
Scotland	1992	VIa			VIa, VIIb,j
	1993	VIa			VIa, VIIb,j
	1994	VIa			
Spain*	1990				VIIIc, IXa
	1991				VIIIc, IXa

* only selected species available

Table 3 Main characteristics of the surveys used to describe the species distribution.

Year /Quarter	Country	Gear	Survey dates	Depth range (m)	Number of hauls
1990 I st	Germany	HGS180 P	1/03 - 18/03	65 - 450	71
1990 IV th	Portugal	Norwegian Campell trawl	27/10 - 6/12	15 - 708	123
	Spain	Baka 44/60	10/09 - 14/10	37 - 444	120
	France	GOV 36/47	25/09 - 10/11	16 - 568	193
1992 IV th	France	GOV 36/47	18/09 - 30/10	17 - 576	171
	Scotland	GOV 36/47	18/11 - 5/12	50 - 205	38

Table 4 Conversion coefficients for number/hour from BAKA to GOV trawls.

SPECIES	GOV/BAKA
Merluccius merluccius	1.06
Micromesistius poutassou	0.51
Lepidorhombus boscii	0.34
Lepidorhombus whiffiagonis	0.26
Anglerfish	0.69
Trachurus trachurus	2.18

Figure 2. ICES Sub-areas and Divisions in the area surveyed by the Study Group.

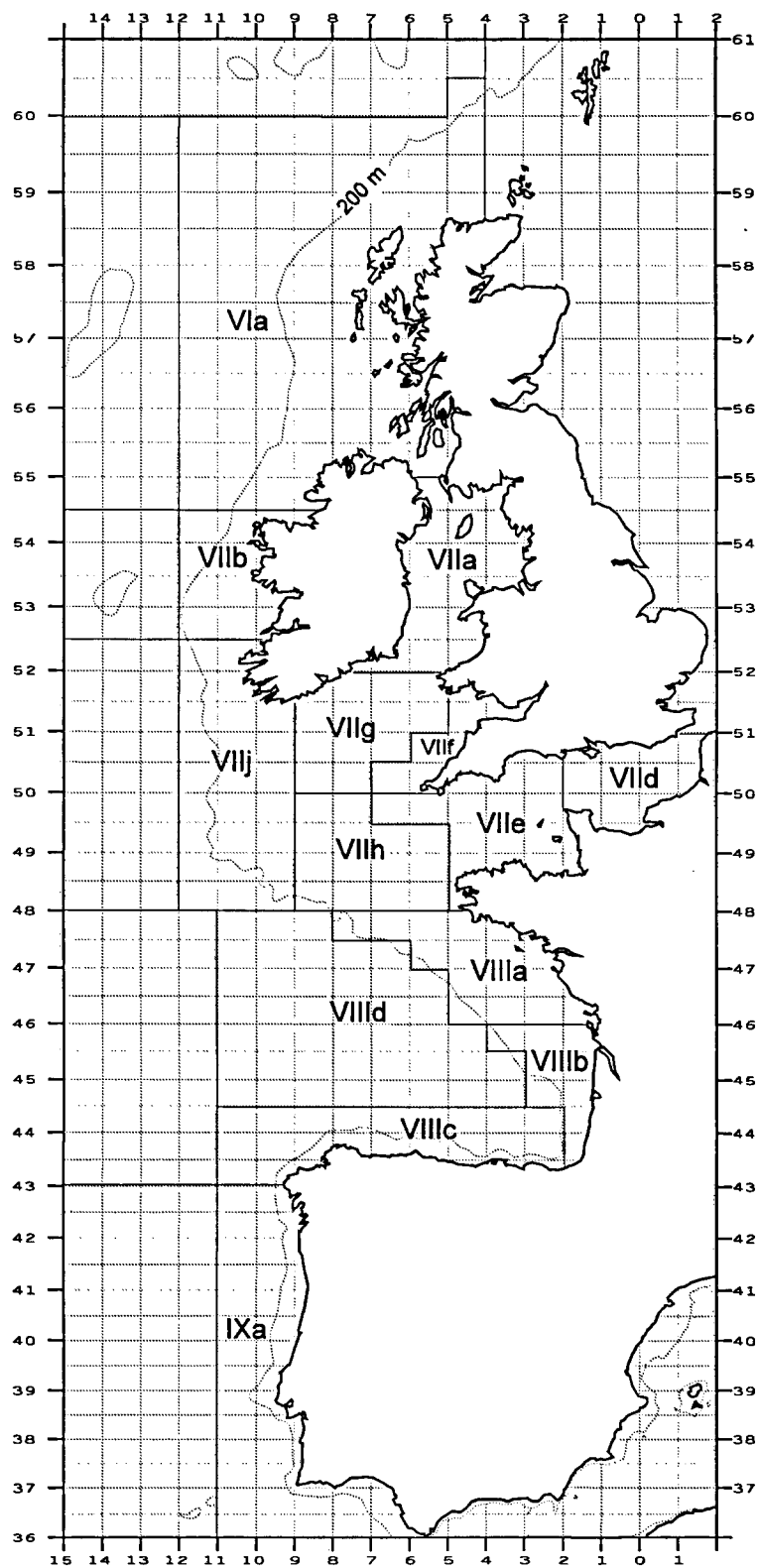


Figure 3.1 Survey areas and location of the trawl stations used to describe species distribution during : A the first quarter of 1990; B the fourth quarter of 1990; C the fourth quarter of 1992.

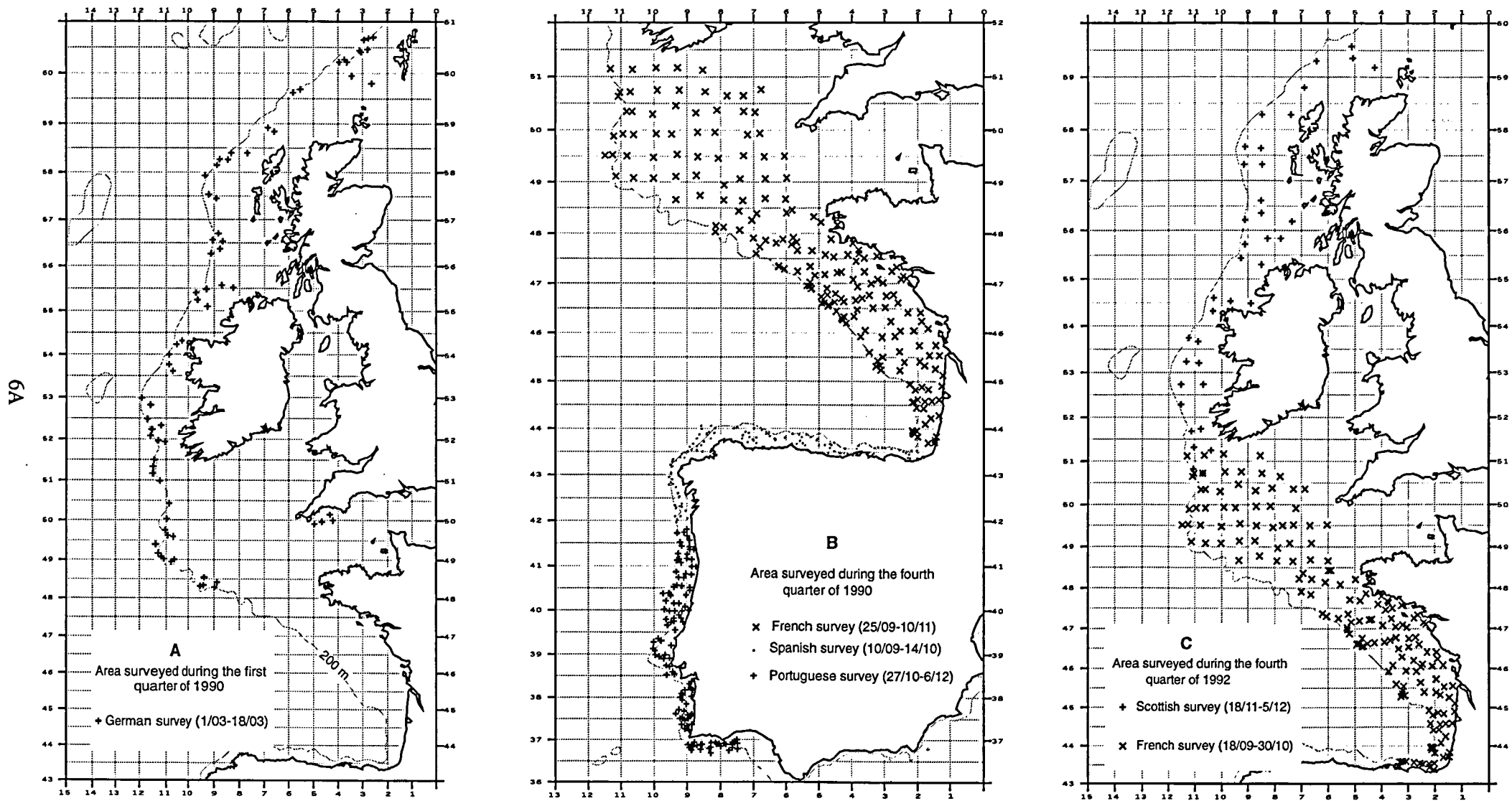


Figure 3.2 Hake distribution observed during the first quarter of 1990.

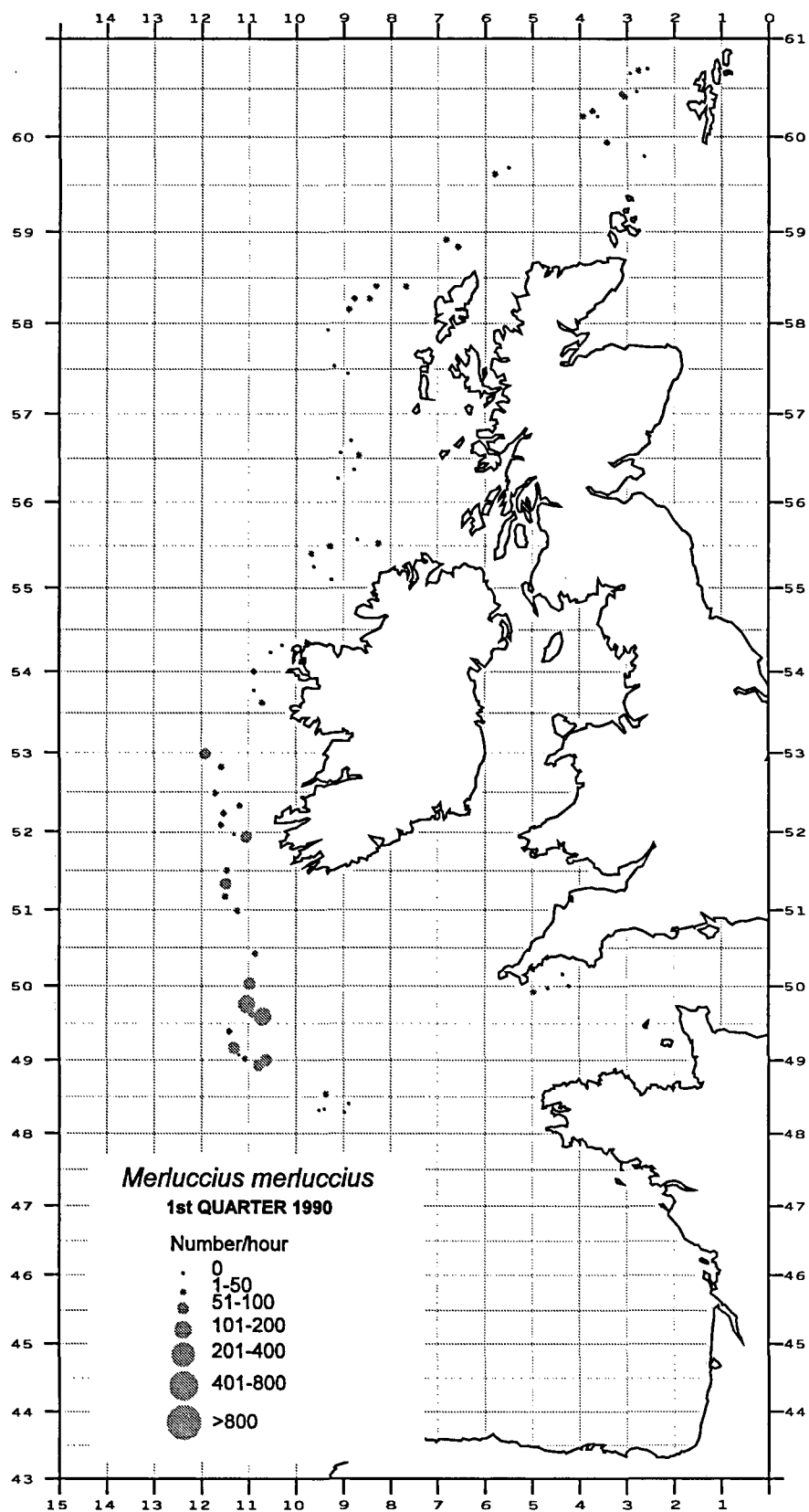


Figure 3.3 Hake distribution observed during the fourth quarter of 1992.

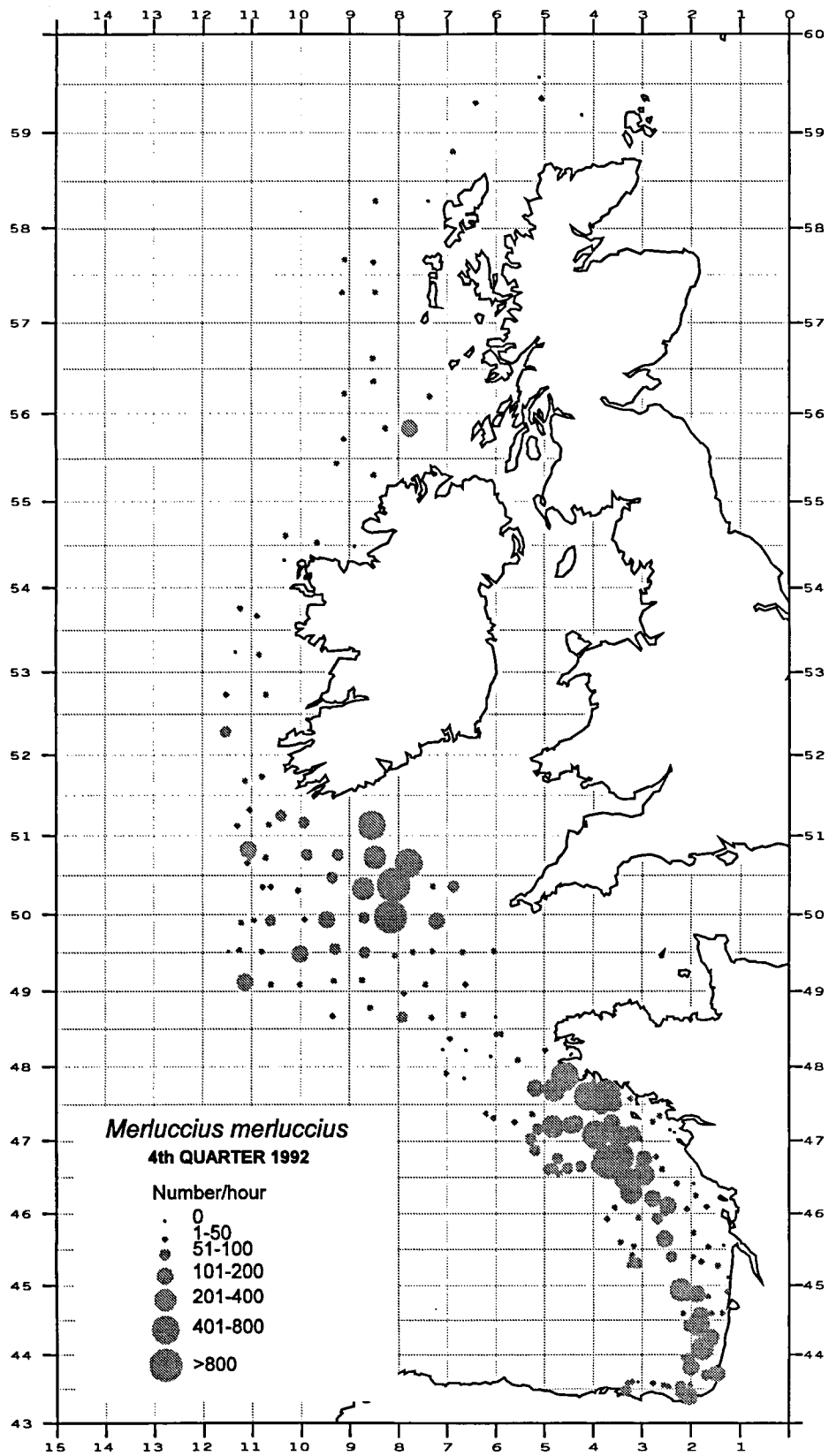


Figure 3.4 Hake distribution observed during the fourth quarter of 1990.

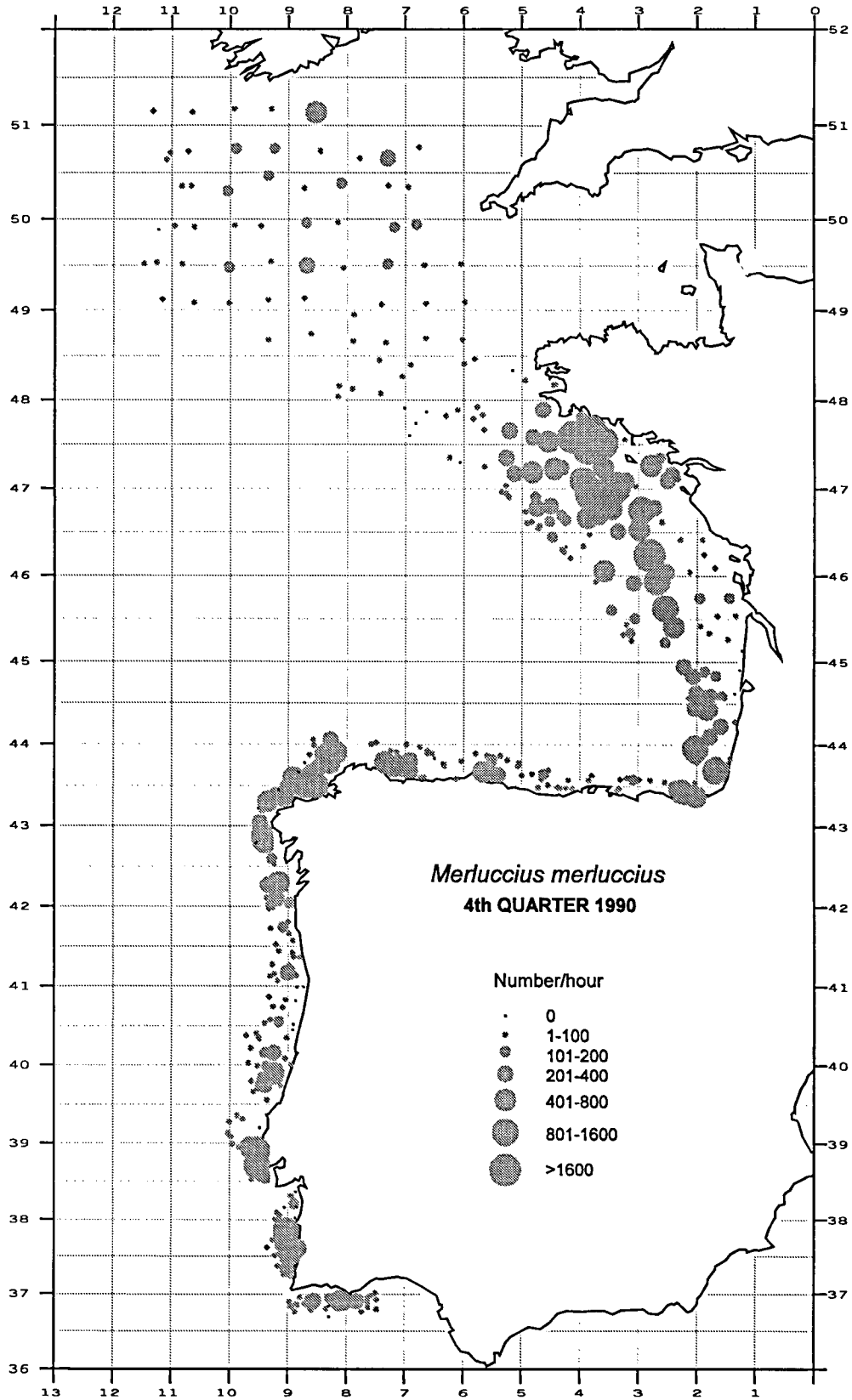


Figure 3.5 Length frequency distribution of hake during the first quarter of 1990.

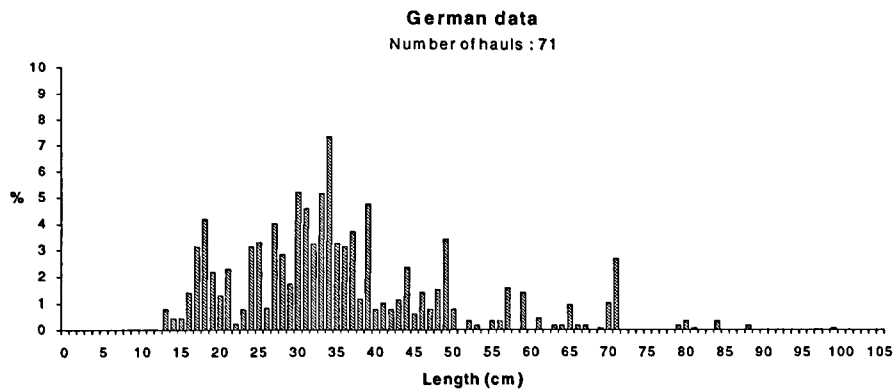


Figure 3.6 Length frequency distribution of hake during the fourth quarter of 1992.

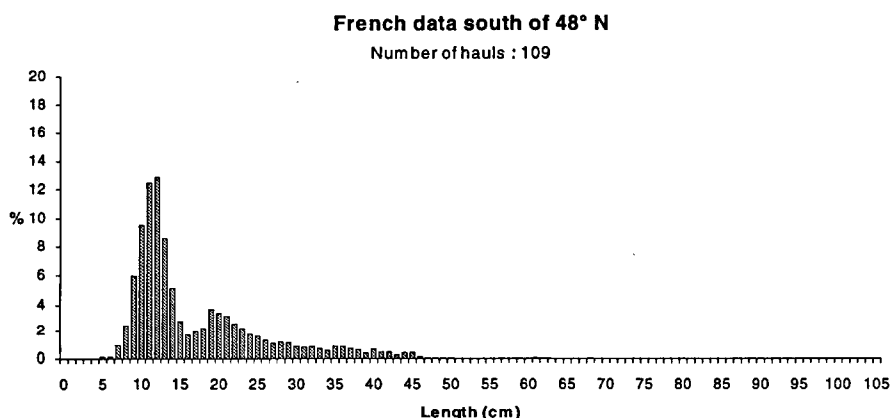
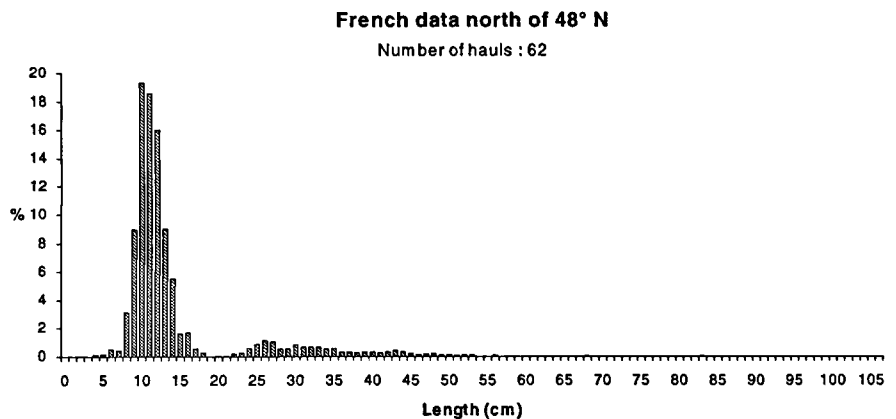
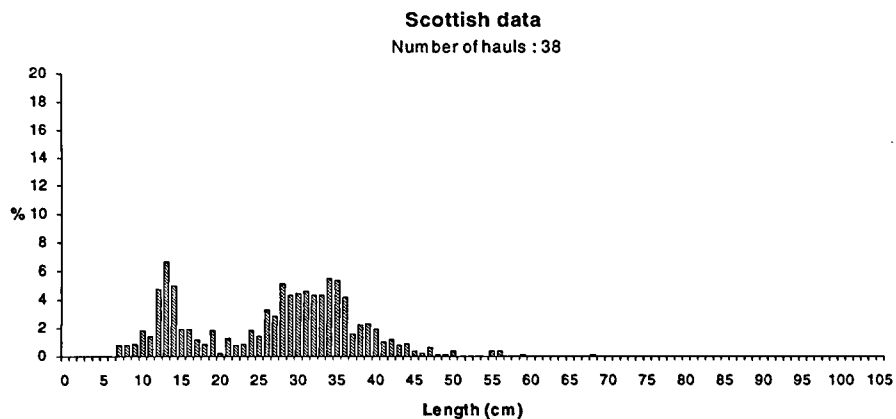


Figure 3.7 Length frequency distribution of hake during the fourth quarter of 1990.

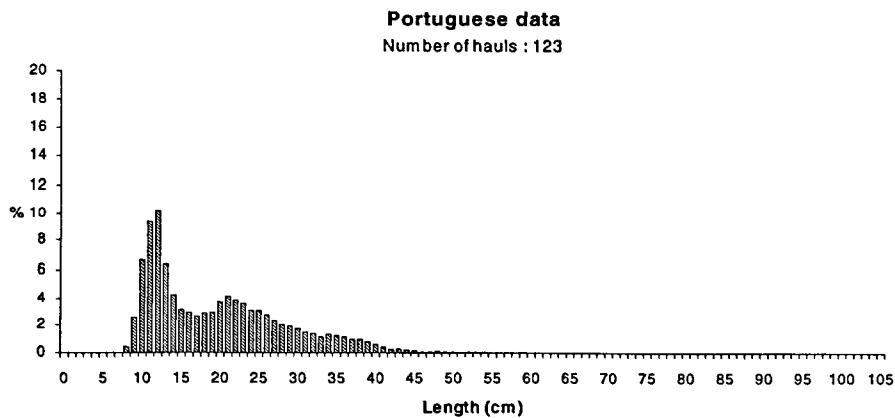
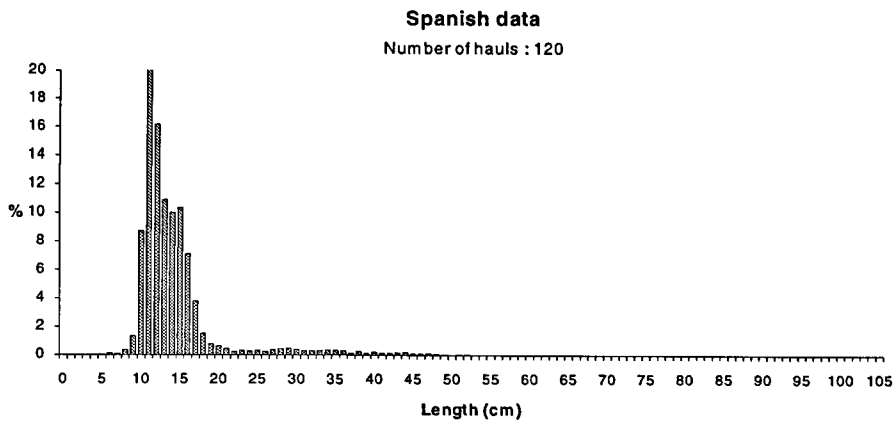
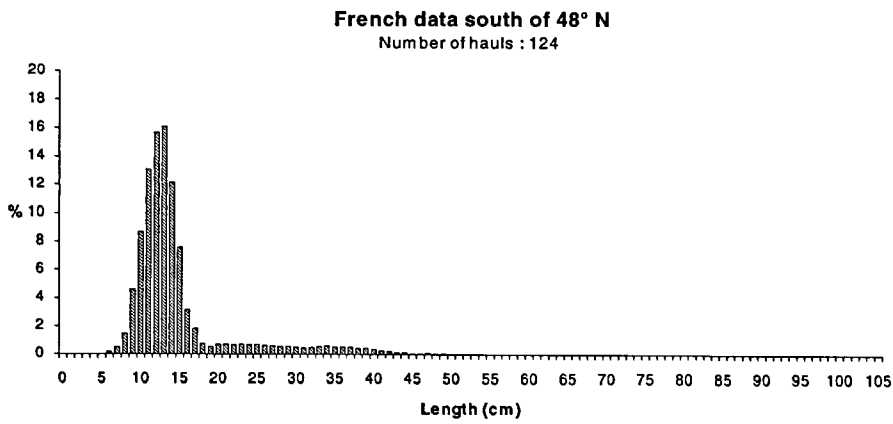
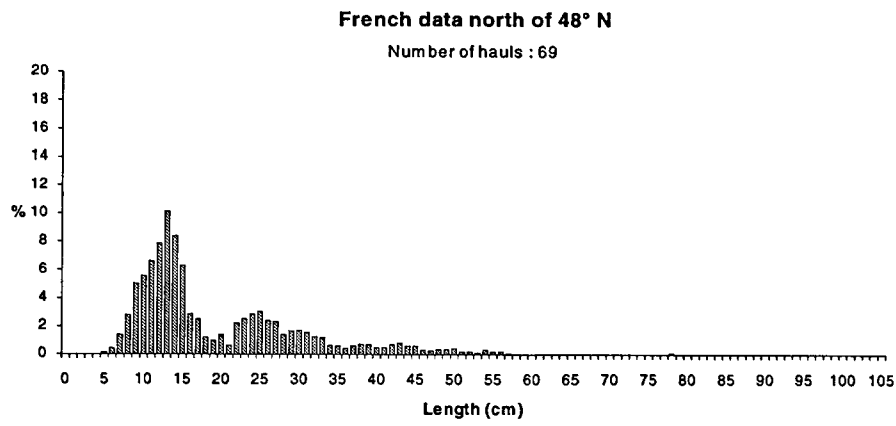


Figure 3.8 Horse mackerel distribution observed during the first quarter of 1990.

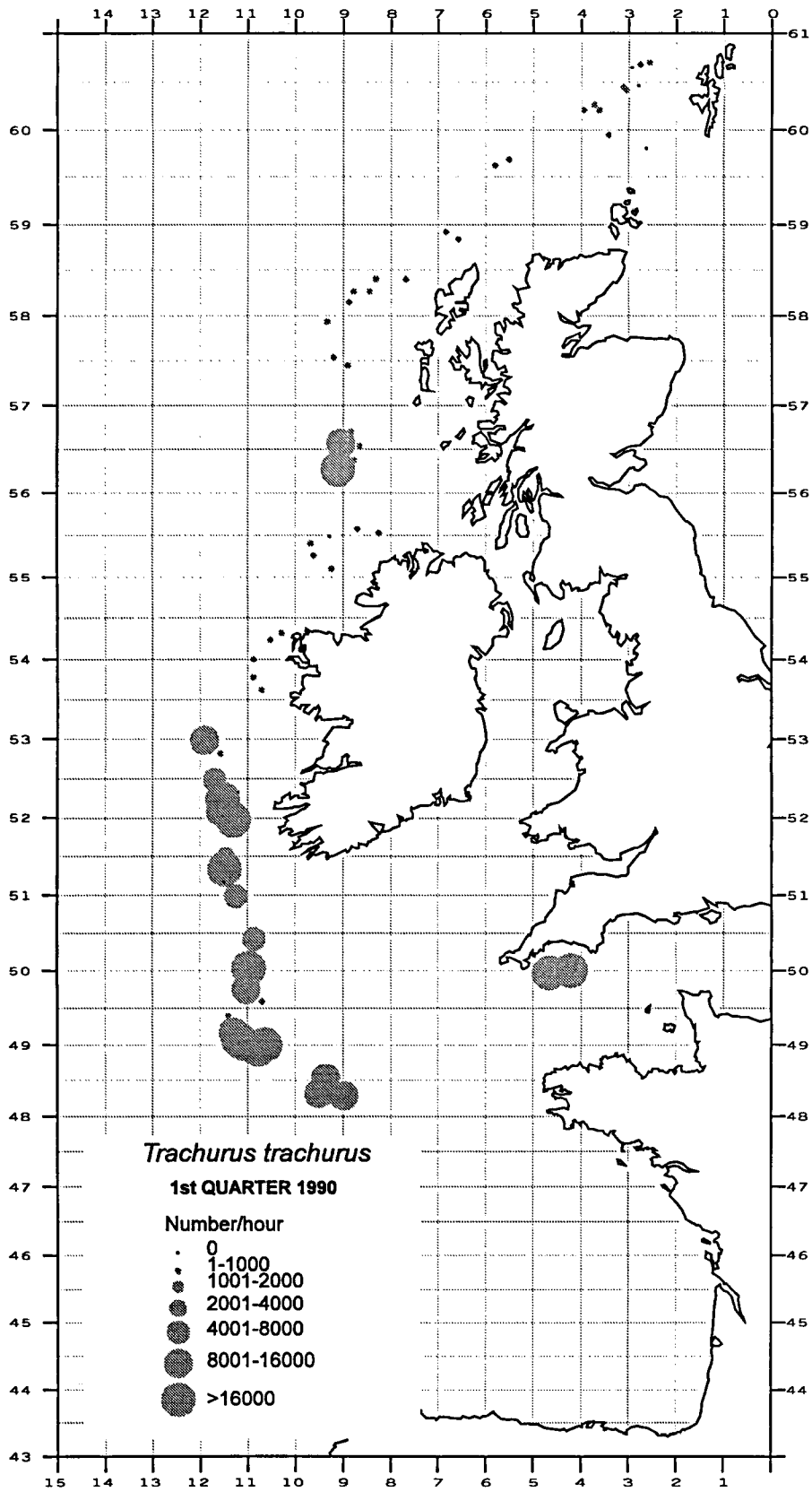


Figure 3.9 Horse mackerel distribution observed during the fourth quarter of 1992.

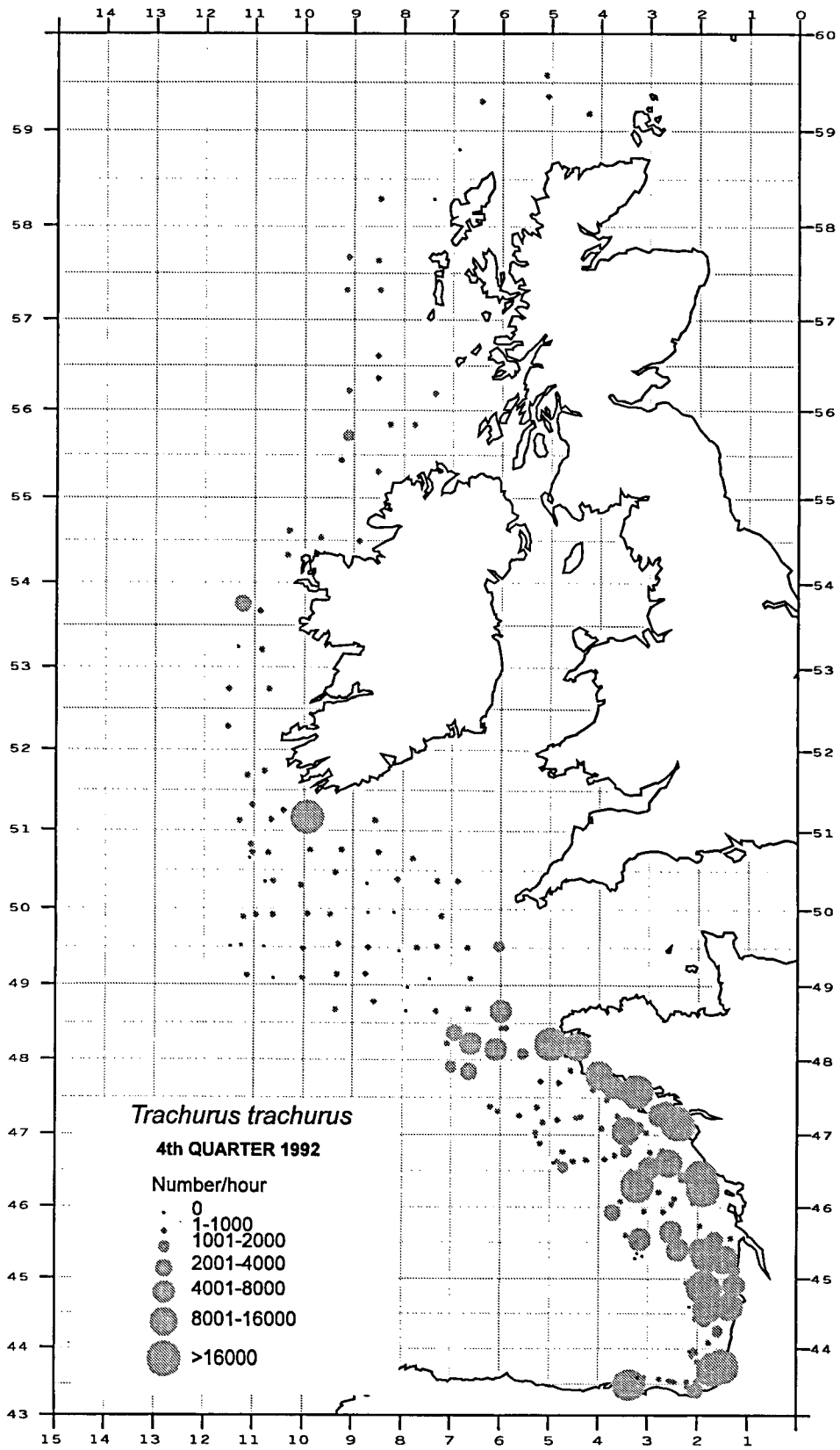


Figure 3.10 Length frequency distribution of horse mackerel during the first quarter of 1990.

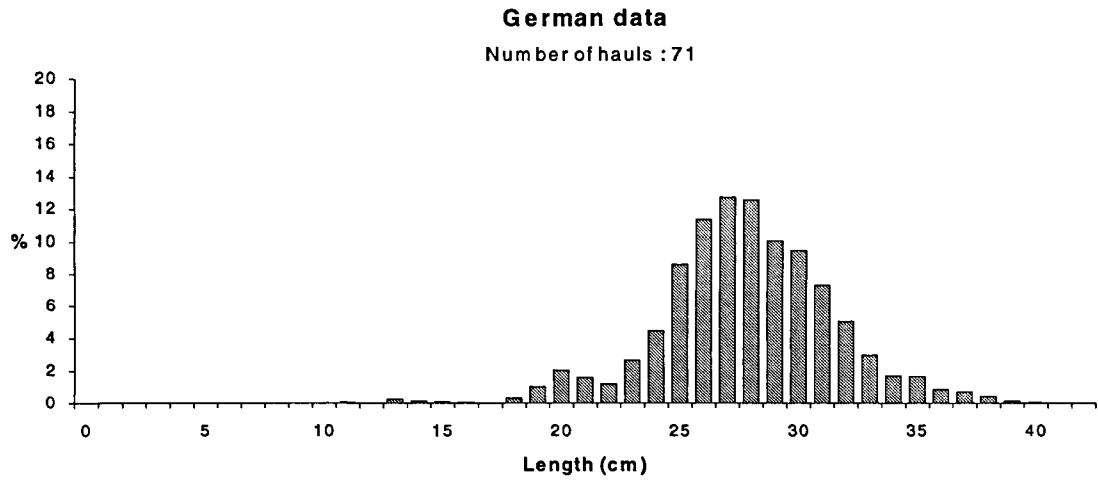


Figure 3.11 Length frequency distribution of horse mackerel during the fourth quarter of 1992.

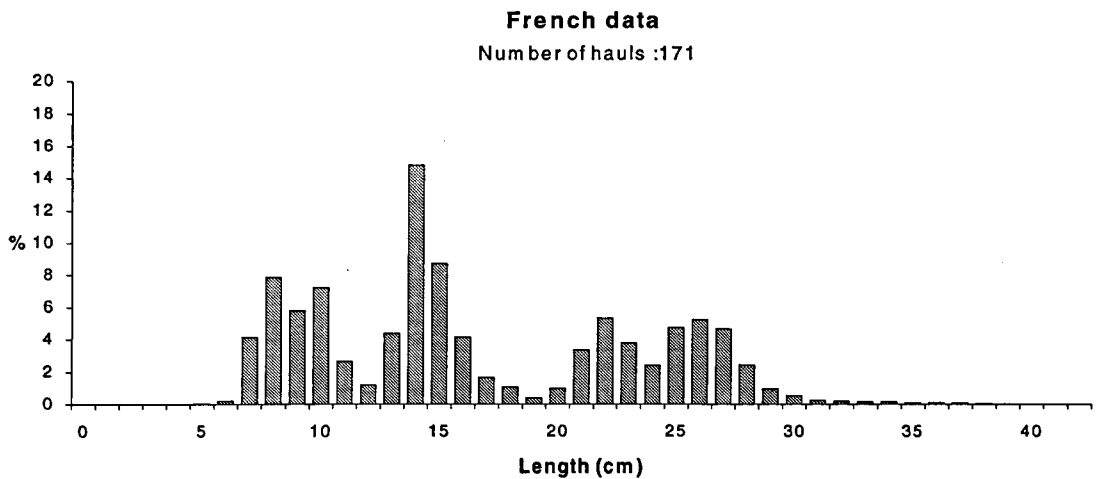
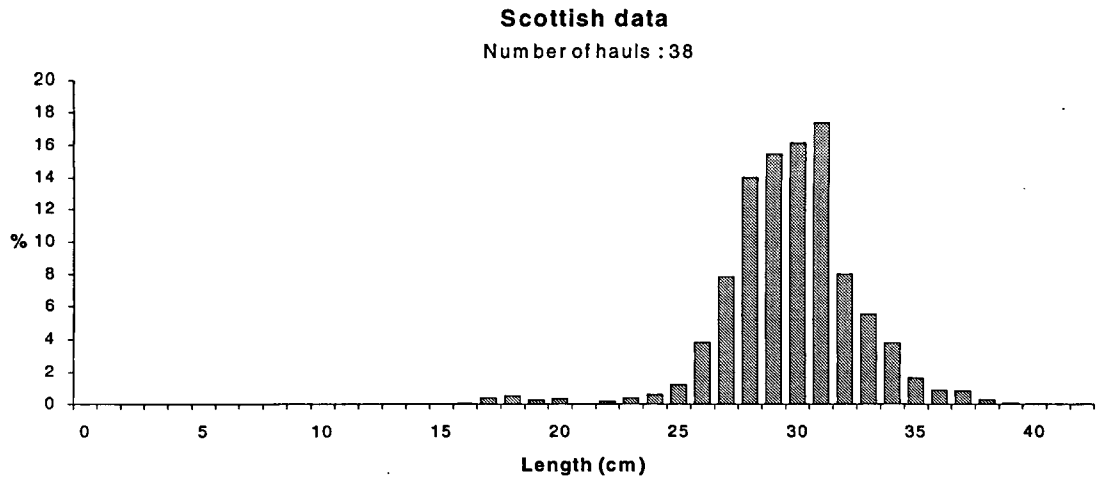


Figure 3.12 Mackerel distribution observed during the first quarter of 1990.

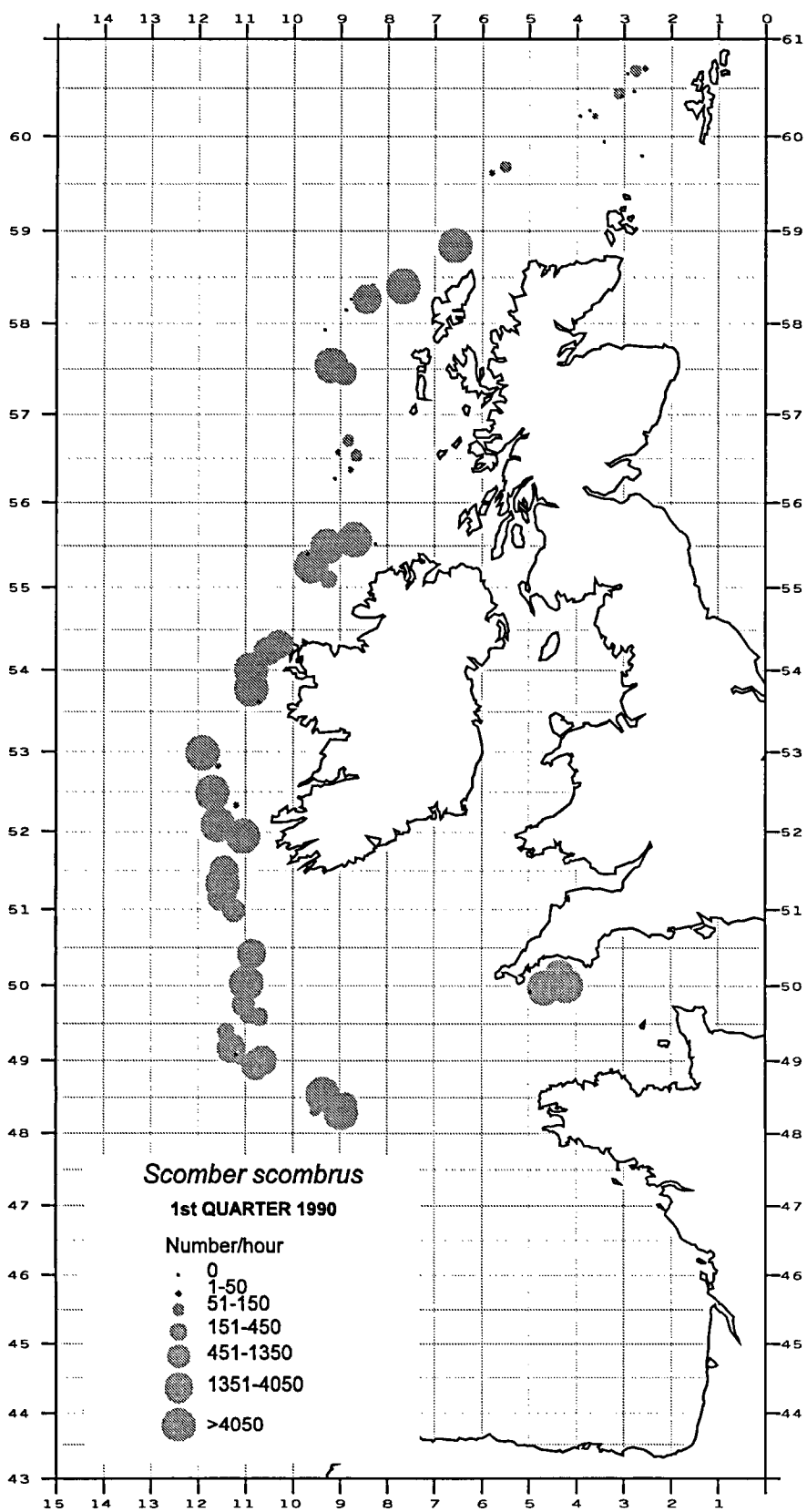


Figure 3.13 Mackerel distribution observed during the fourth quarter of 1992.

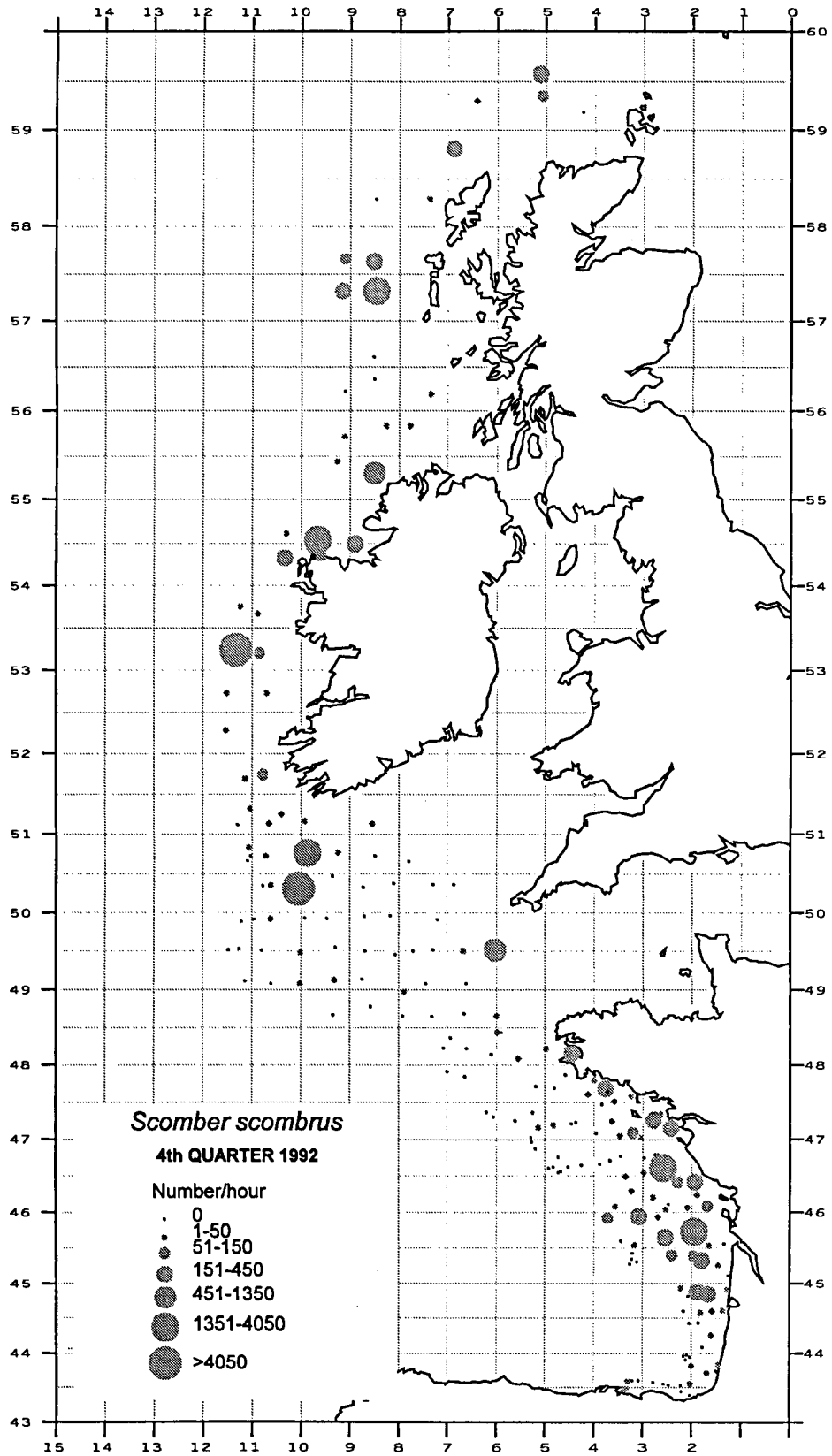


Figure 3.14 Length frequency distribution of mackerel during the first quarter of 1990.

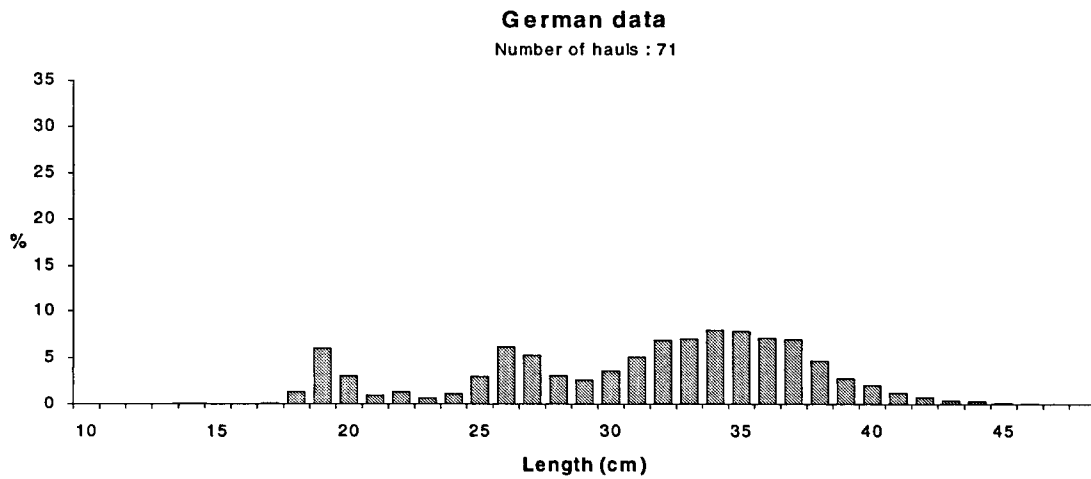


Figure 3.15 Length frequency distributions of mackerel during the fourth quarter of 1992.

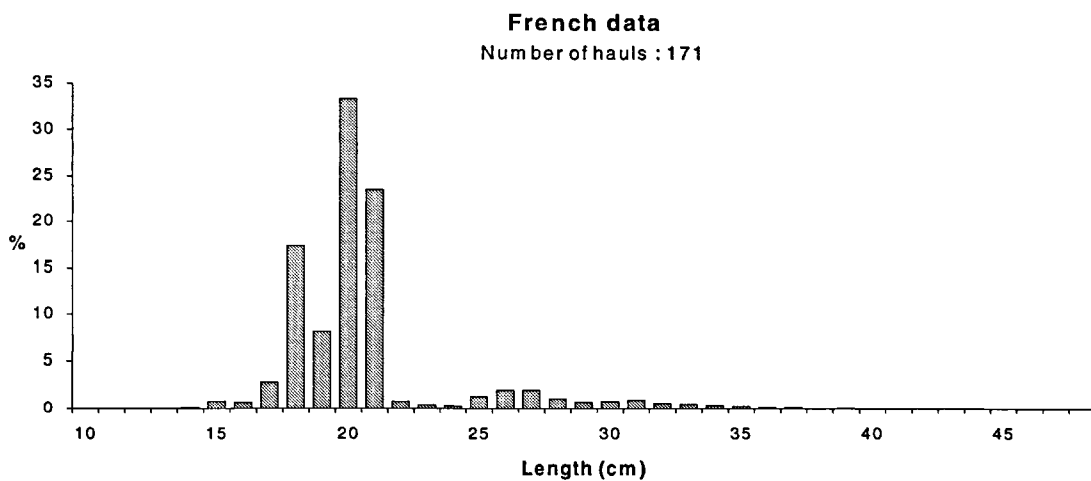
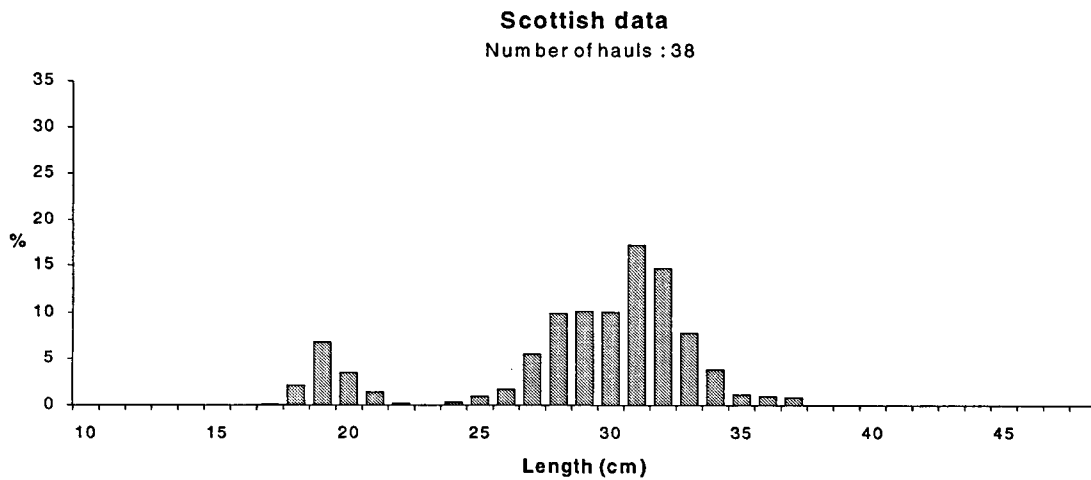


Figure 3.16 *Lepidorhombus whiffiagonis* distribution observed during the first quarter of 1990.

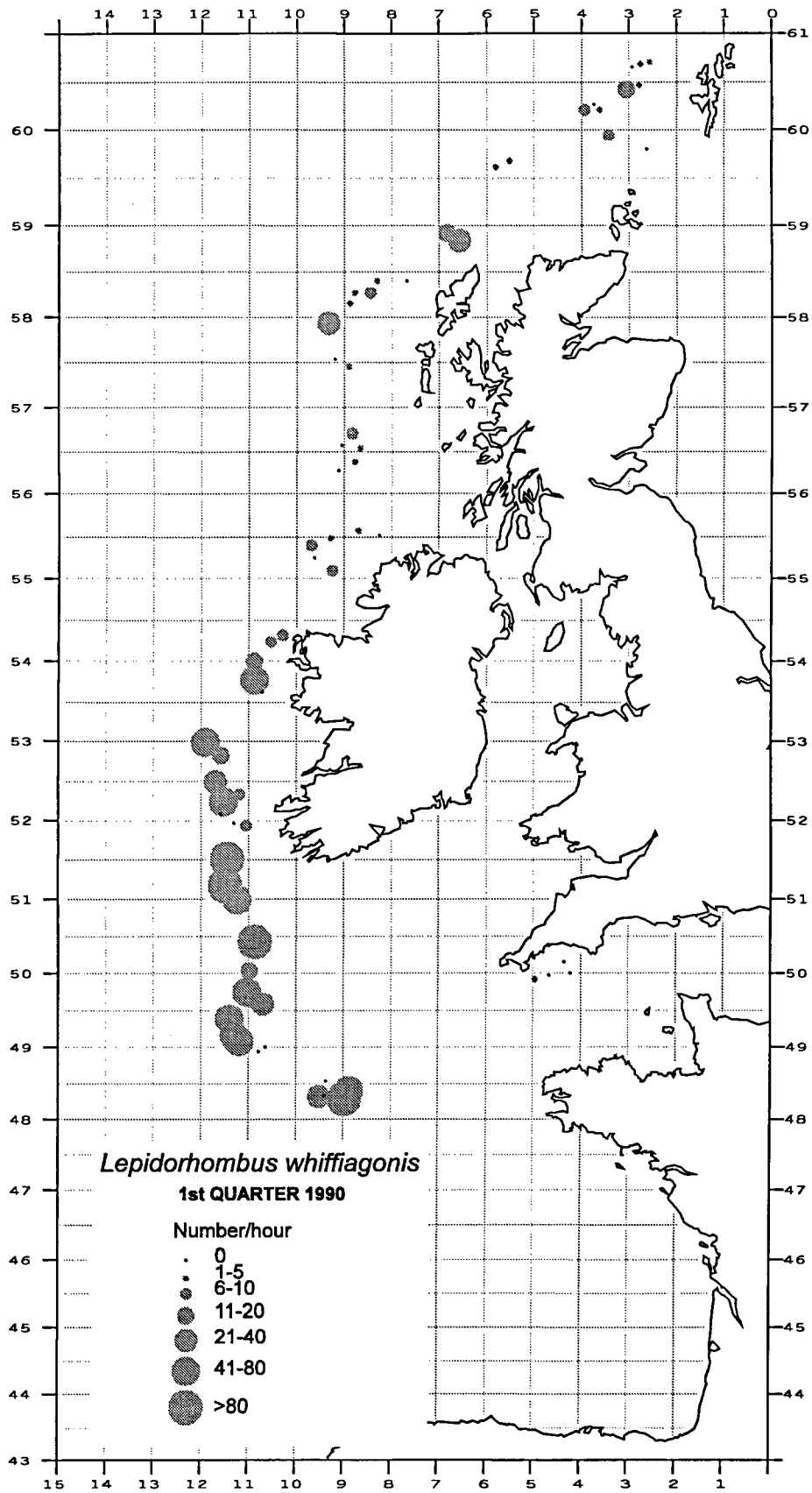


Figure 3.17 *Lepidorhombus whiffiagonis* distribution observed during the fourth quarter of 1992.

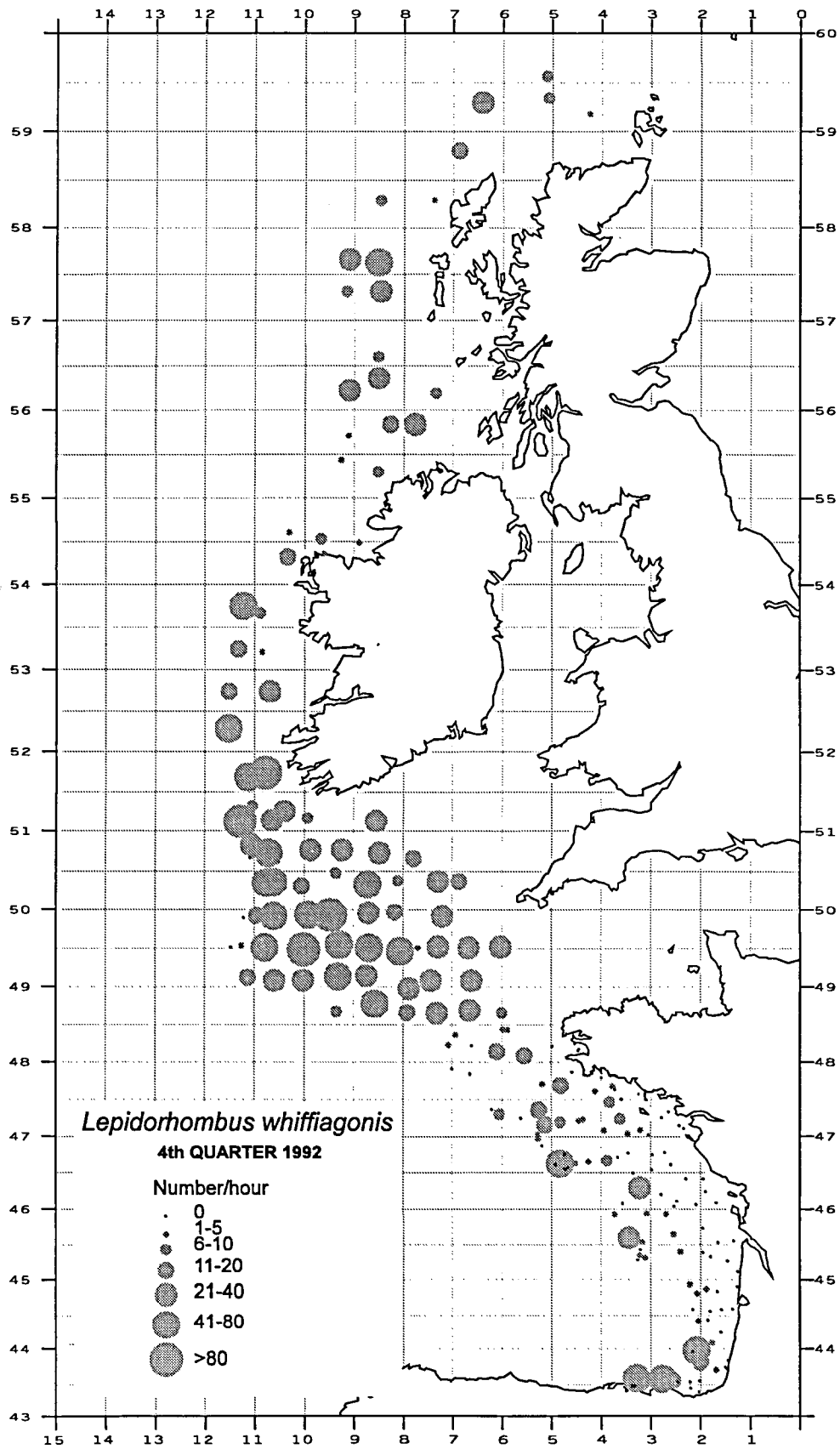


Figure 3.18 *Lepidorhombus whiffiagonis* distribution observed during the fourth quarter of 1990.

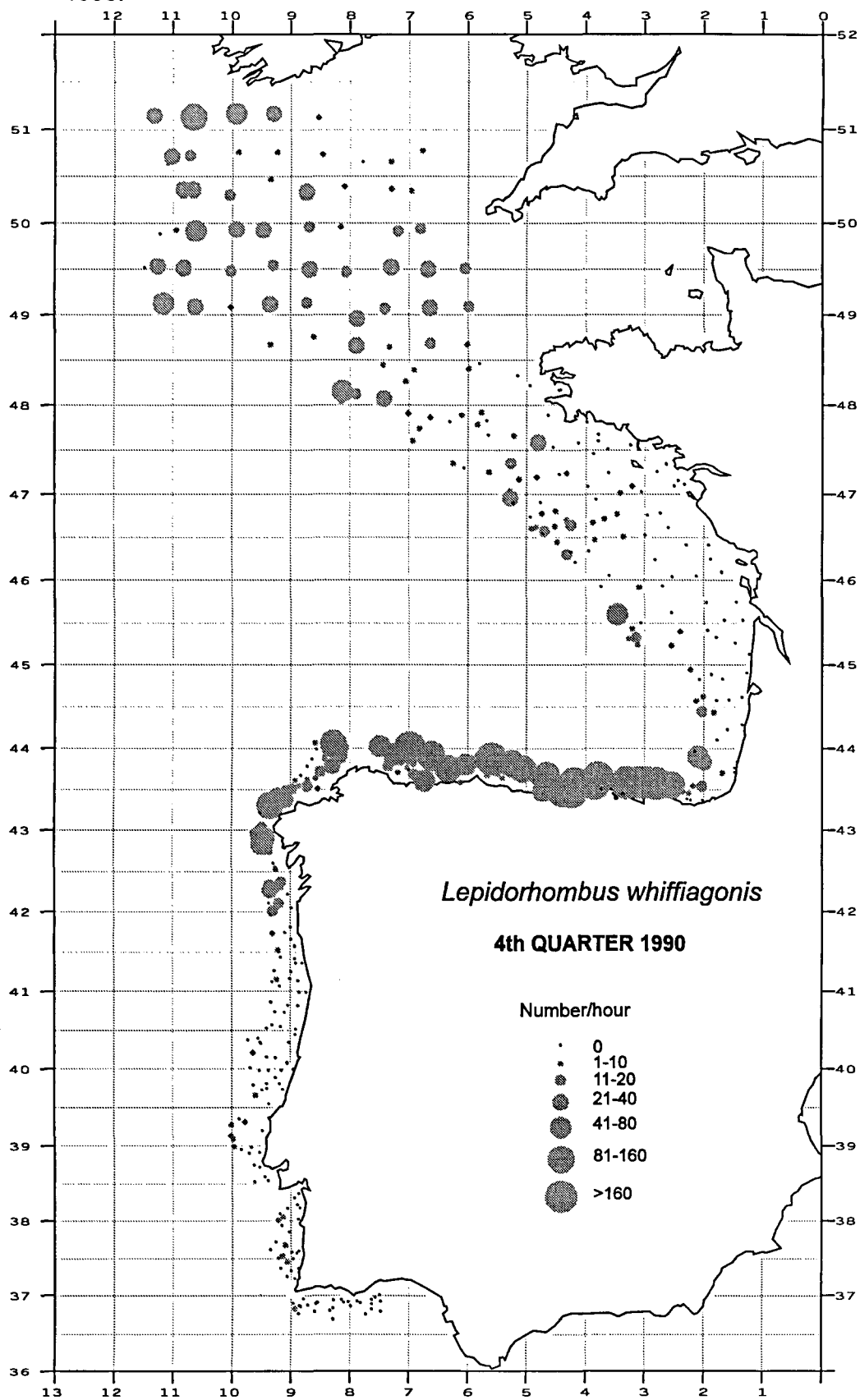


Figure 3.19 Length frequency distributions of *Lepidorhombus whiffiagonis* during the fourth quarter of 1992.

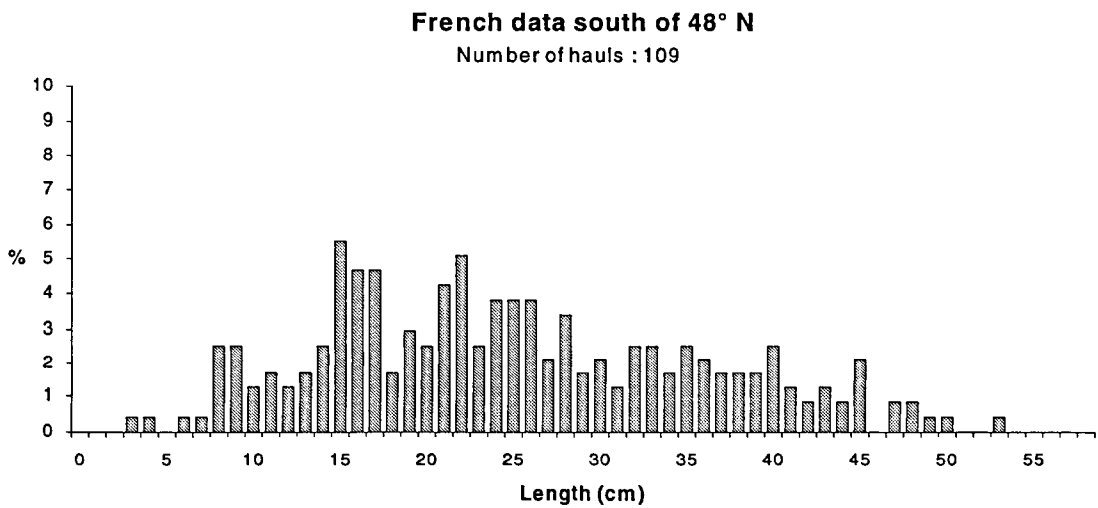
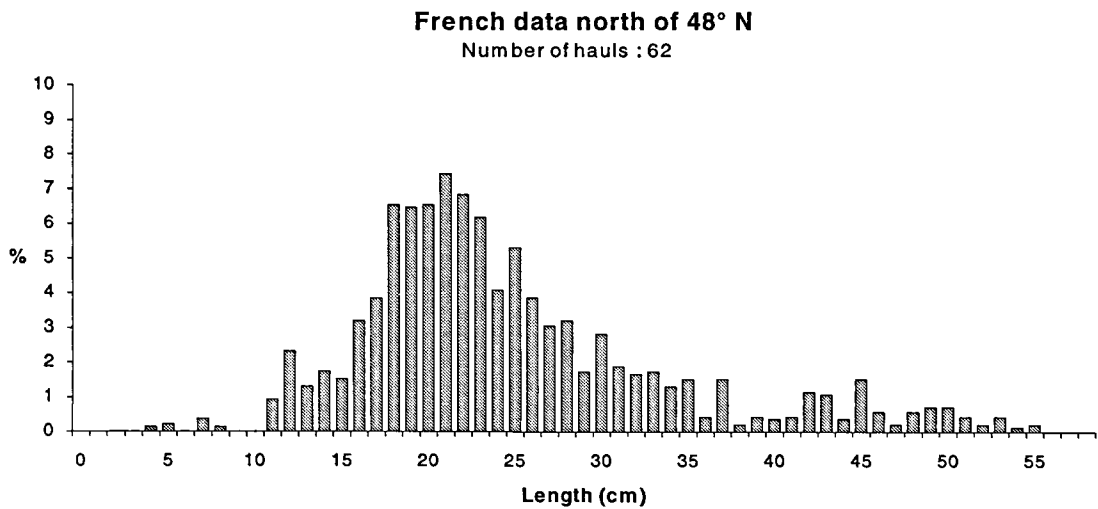
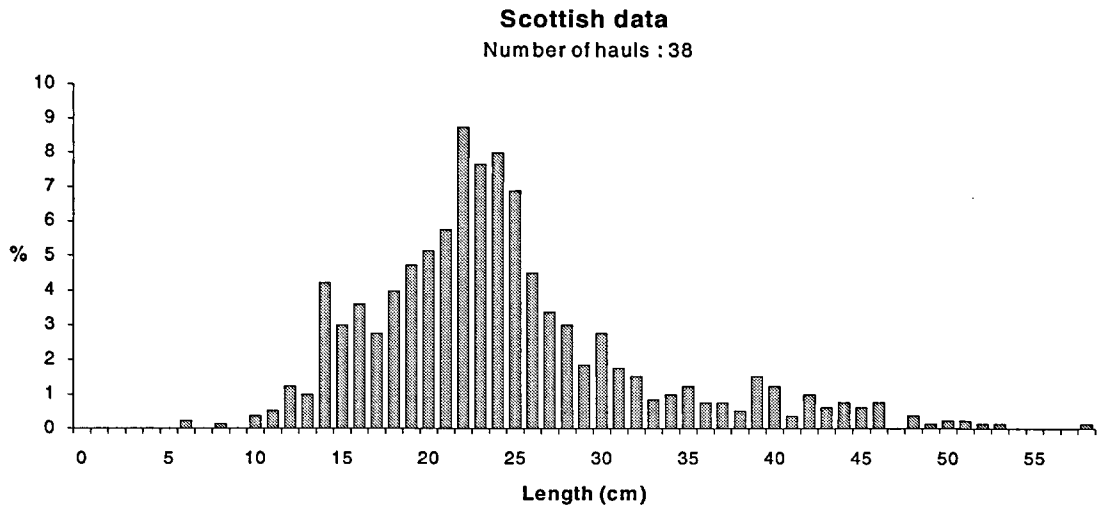


Figure 3.20 Length frequency distributions of *Lepidorhombus whiffiagonis* during the fourth quarter of 1990.

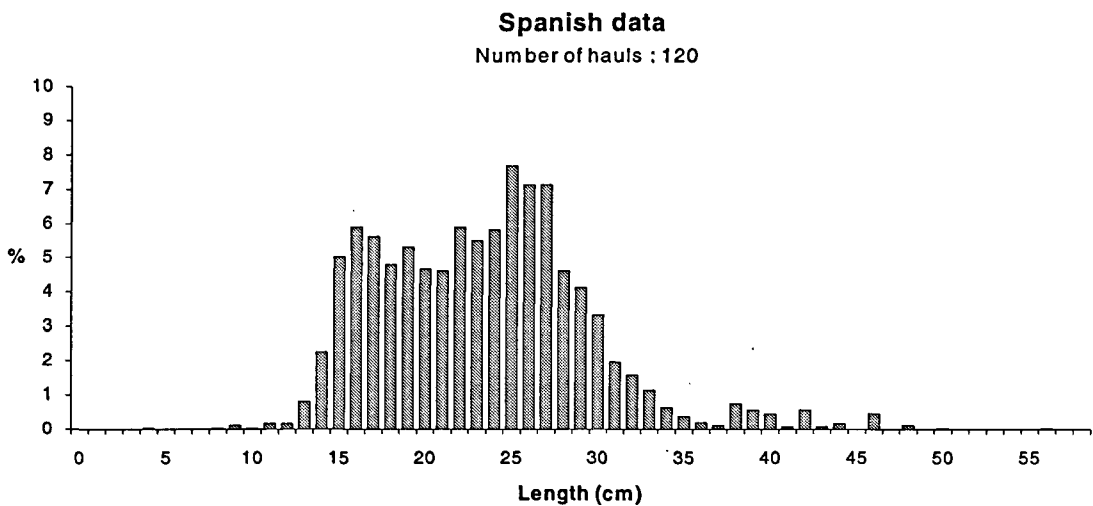
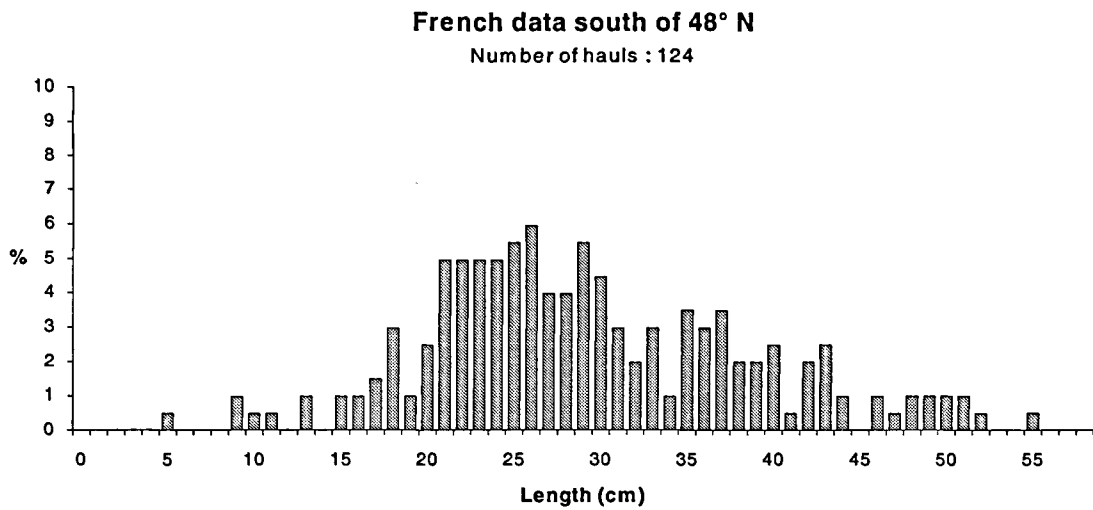
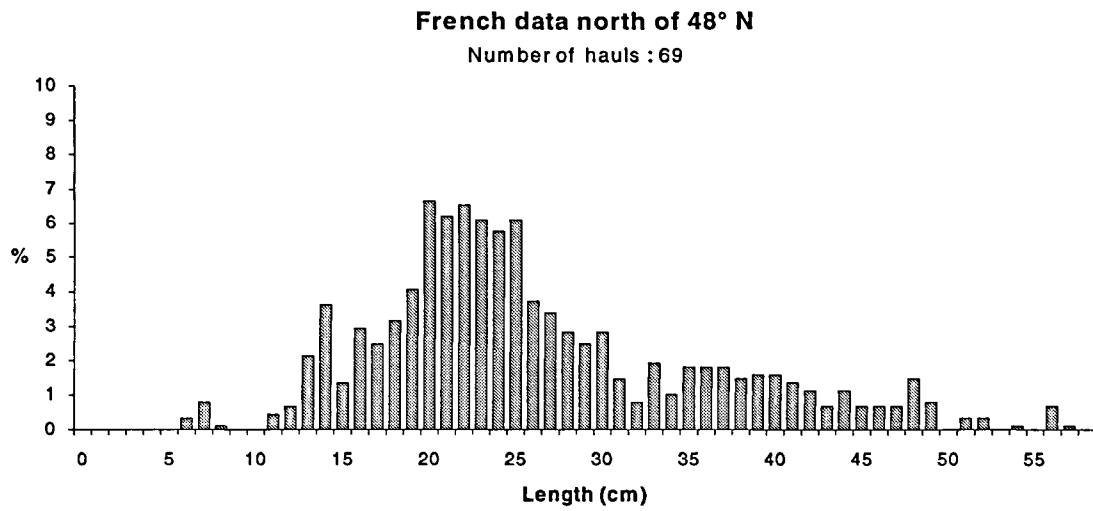


Figure 3.21 *Lepidorhombus boscii* distribution observed during the fourth quarter of 1990.

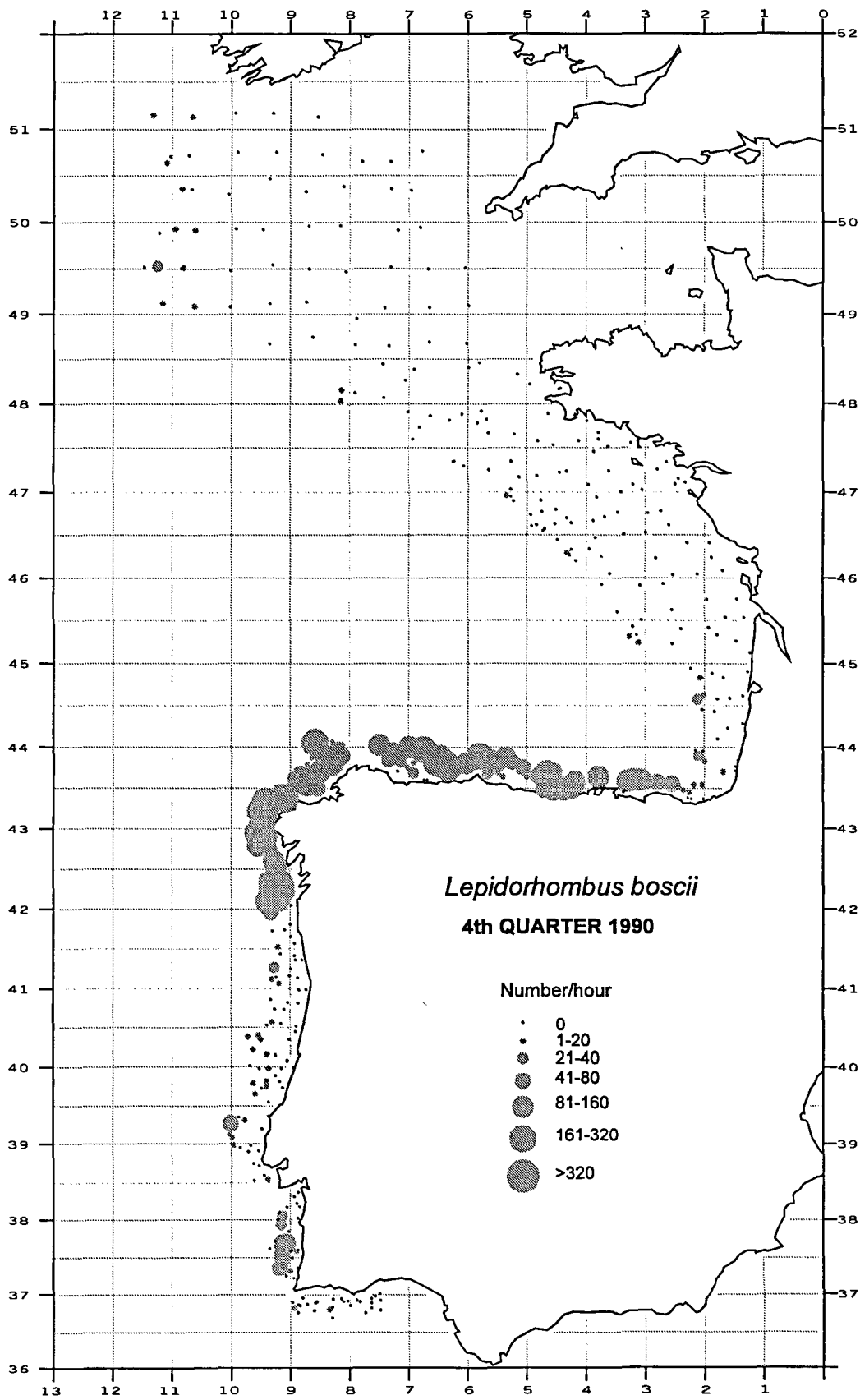


Figure 3.22 Length frequency distributions of *Lepidorhombus boscii* during the fourth quarter of 1990.

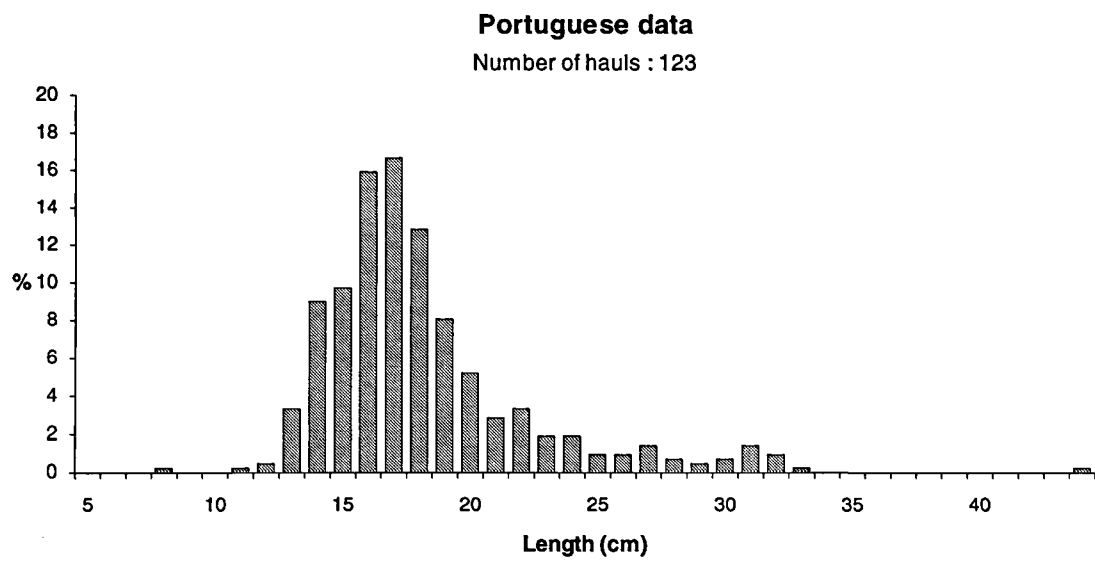
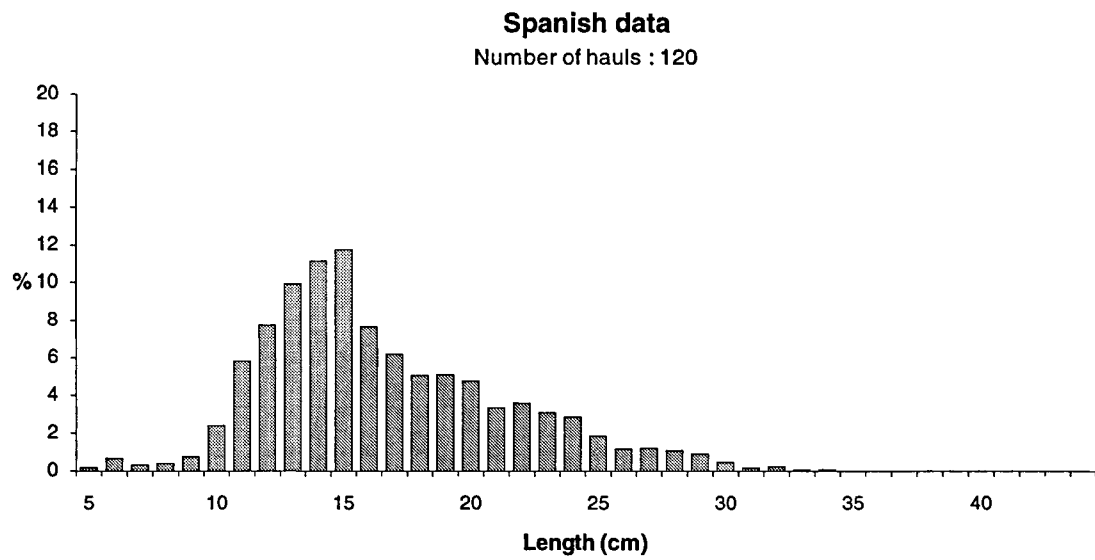


Figure 3.23 *Lophius piscatorius* distribution observed during the first quarter of 1990.

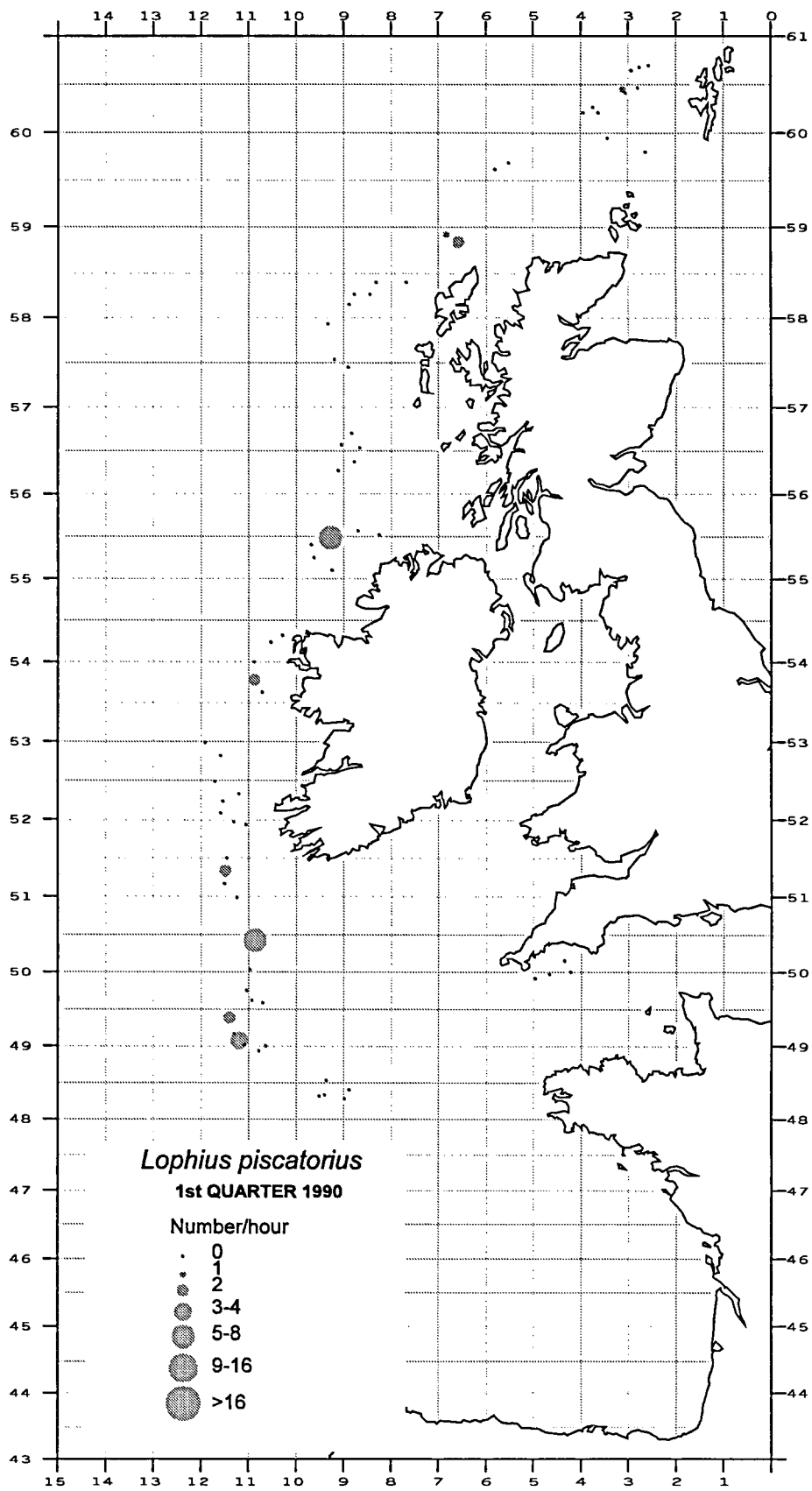


Figure 3.24 *Lophius piscatorius* distribution observed during the fourth quarter of 1992.

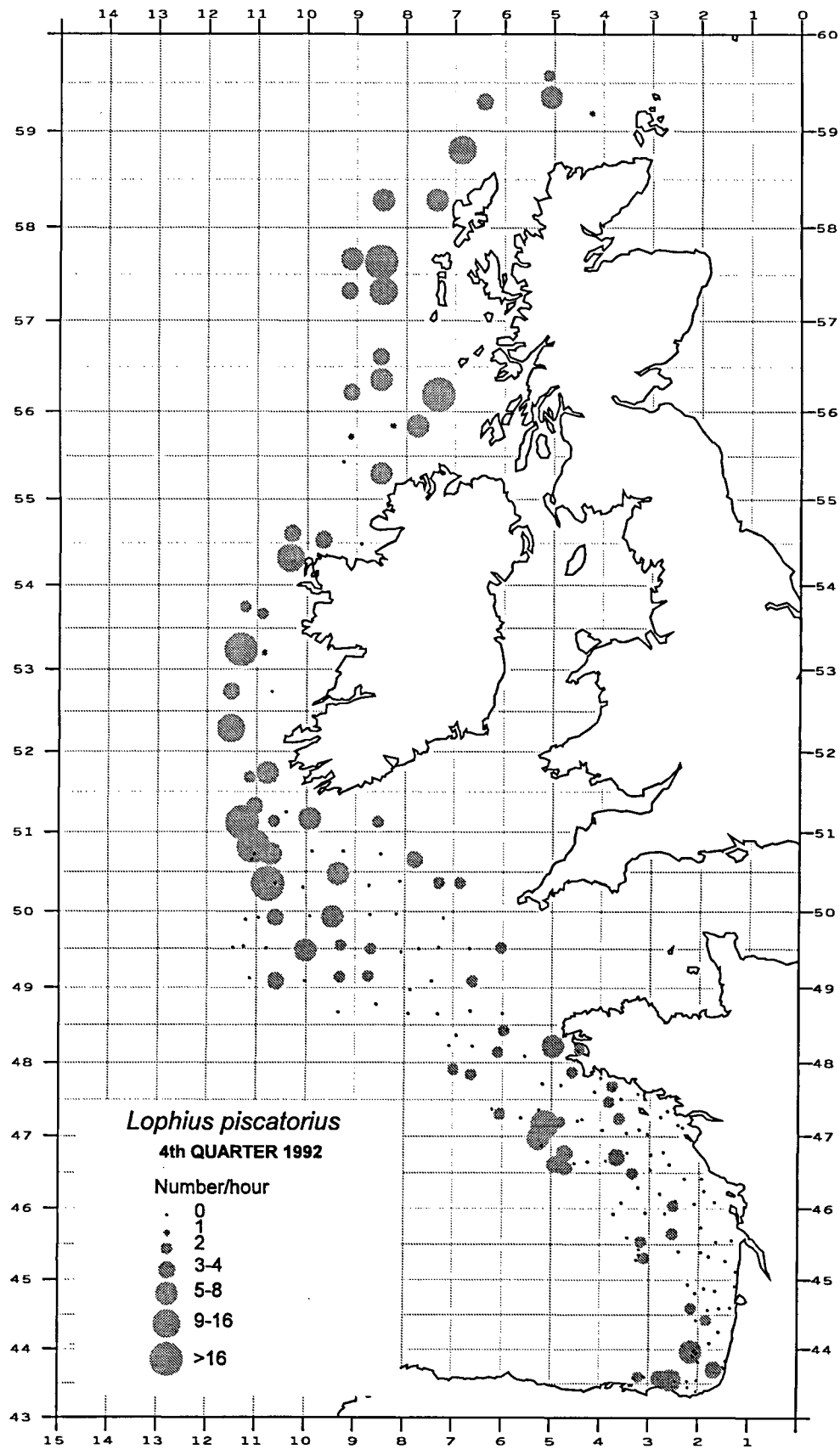


Figure 3.25 *Lophius piscatorius* distribution observed during the fourth quarter of 1990.

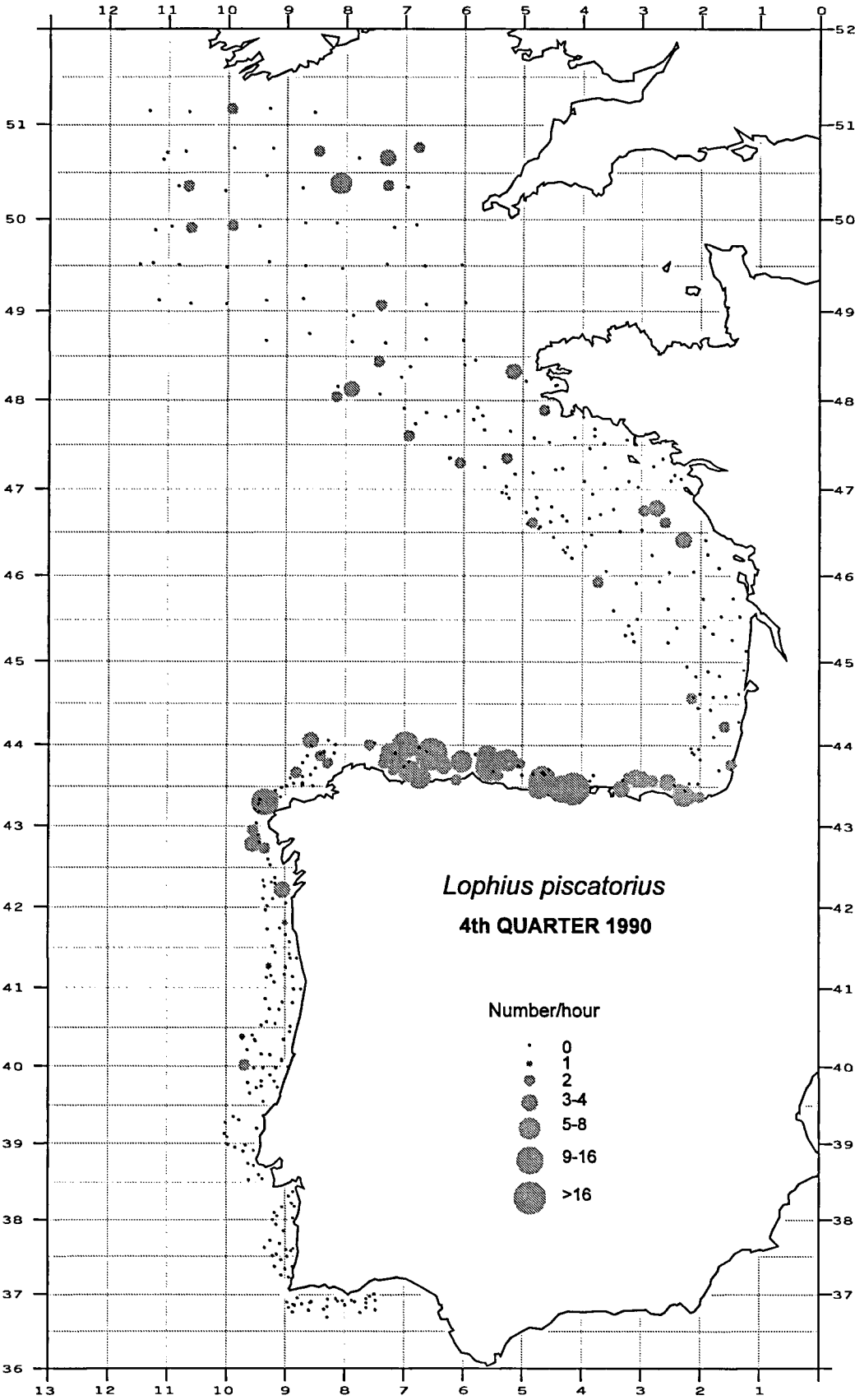


Figure 3.26 Length frequency distribution of *Lophius piscatorius* during the fourth quarter of 1992.

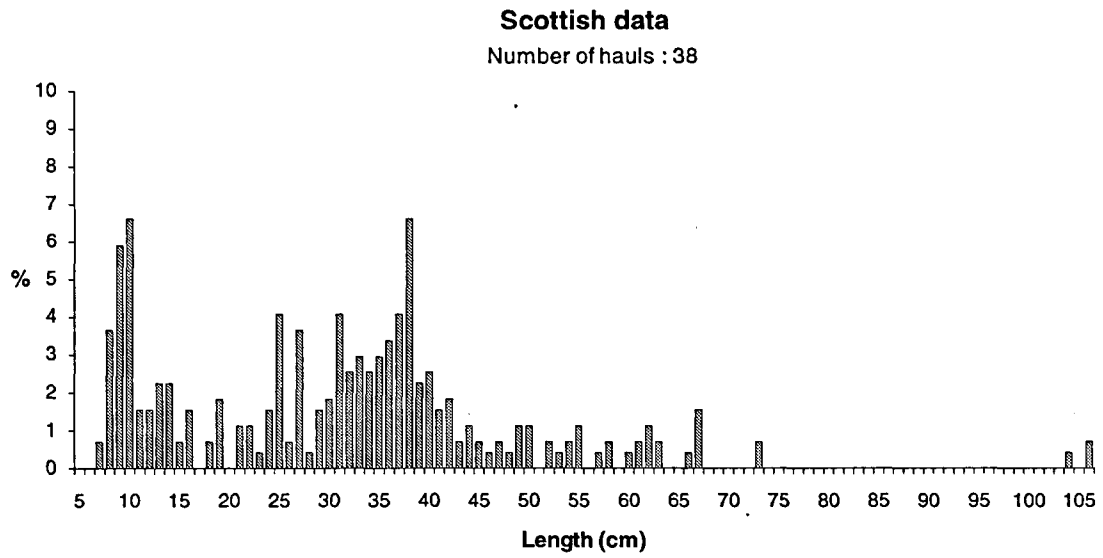


Figure 3.27 Length frequency distribution of *Lophius piscatorius* during the fourth quarter of 1990.

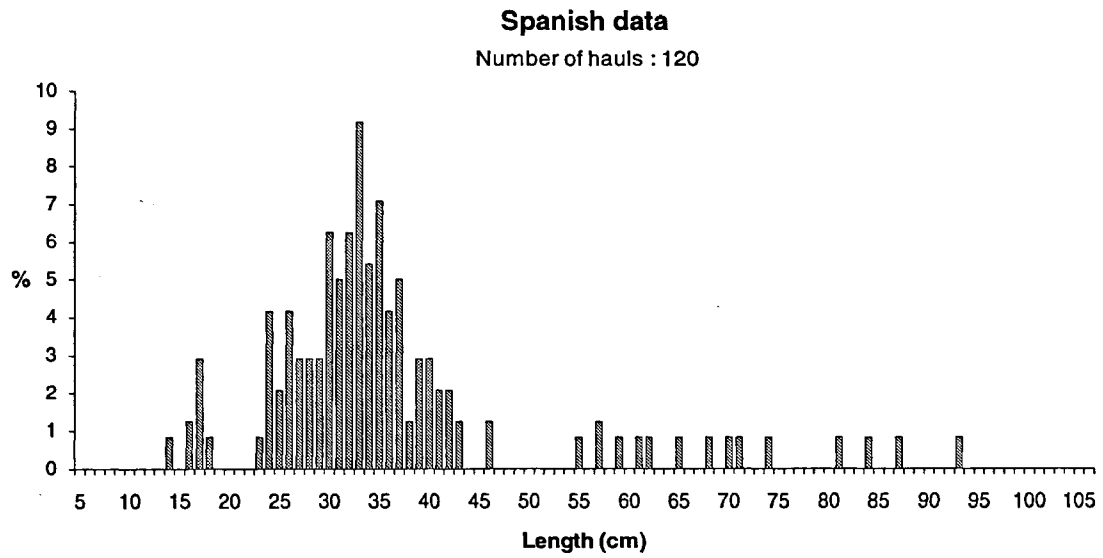


Figure 3.28 *Lophius budegassa* distribution observed during the fourth quarter of 1992.

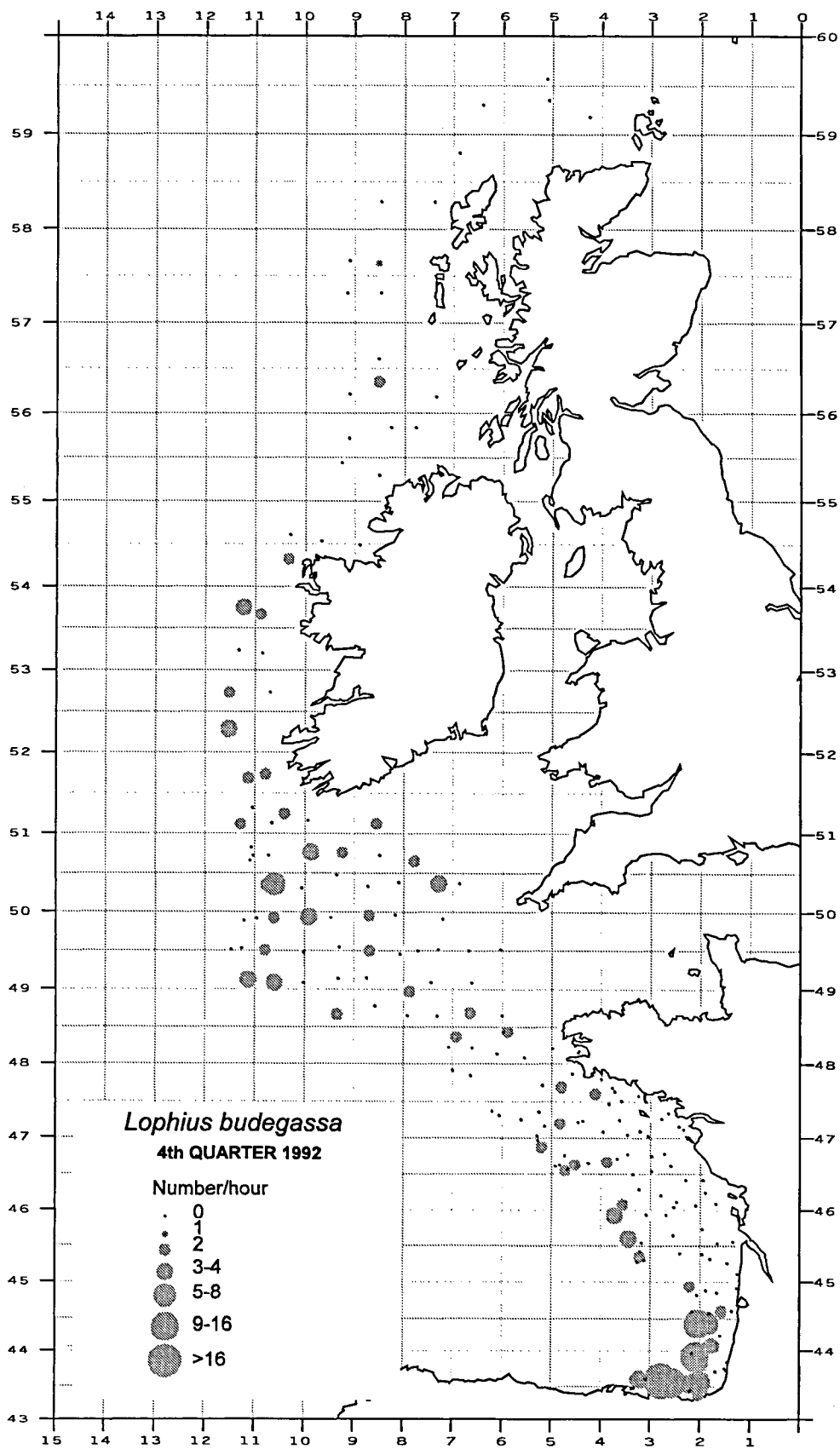


Figure 3.29 *Lophius budegassa* distribution observed during the fourth quarter of 1990.

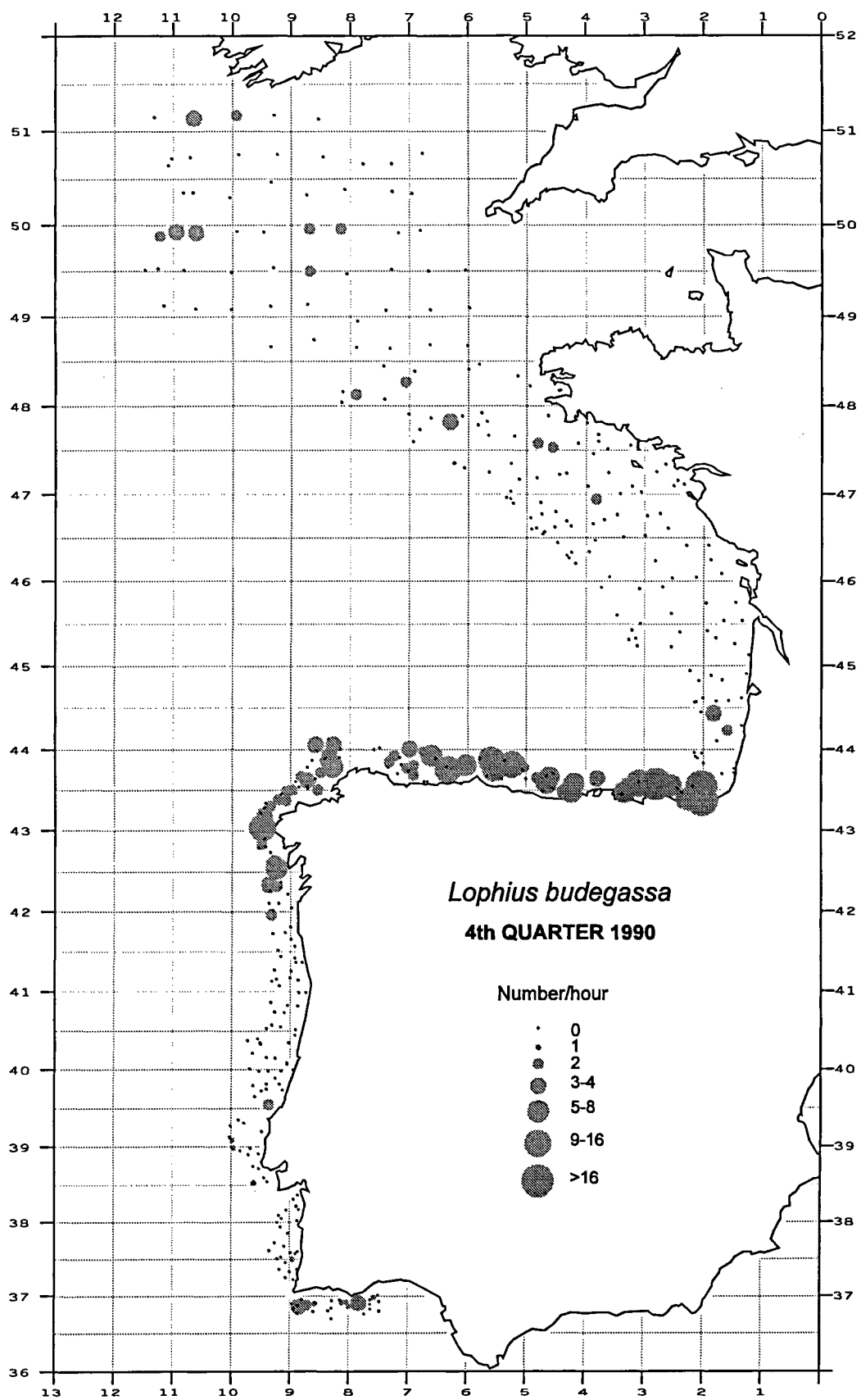


Figure 3.30 Length frequency distribution of *Lophius budegassa* during the fourth quarter of 1990.

