

Biological Resources
Department

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MANUAL FOR THE INTERNATIONAL BOTTOM TRAWL SURVEYS

REVISION V

Agreed during the meeting of the International Bottom Trawl Survey Working Group
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Conseil International pour l'Exploration de la Mer

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1. INTRODUCTION

The International Bottom Trawl Survey Working Group, formerly known as the International Young Fish Survey Working Group, has the responsibility of coordinating various research vessel surveys conducted within certain ICES areas. The first survey to be coordinated was the International Young Fish Survey (IYFS) that was conducted in the North Sea and Skagerrak/Kattegat in February of each year starting in the late 1960's. A procedural manual was produced for the use of scientists involved in this survey and subsequently two revised editions were produced as international co-operation developed. In 1991 this co-operative programme was expanded to include the three other quarters in the North Sea and Skagerrak/Kattegat. This necessitated major alterations to the manual and the revised edition was published as ICES C.M. 1992/H:3.

During the Annual Science Conference in St. John's, Newfoundland in 1994 the recommendation was made that the International Bottom Trawl Survey Working Group should also incorporate the coordination of bottom trawl surveys in ICES Sub-Areas VI, VII and VIII and Division IXa (within this document these areas are designated as the western and southern areas).

In 1995 the manual was revised for a fifth time in order to clarify certain aspects of the surveys in the North Sea and Skagerrak/Kattegat. At the same time the opportunity was taken to review the manual to establish whether the same procedures could be applied to Sub-Areas VI, VII and VIII and Division IXa. It was decided that some aspects of the manual applied equally to all areas but some procedures required dedicated text. At the same time it was decided that a manual for the western and southern areas required further discussion and input from countries closely associated with these areas but who were unable to attend the meeting. Consequently procedures unique to the western and southern areas are provided in Appendix XI as a draft; if approved by all participants these draft proposals may be incorporated into the manual at a later date.

The objective of the IBTS Working Group is to standardise fishing gear and methods for all surveys but it is appreciated that the change from national gears to the GOV (the preferred gear) cannot be achieved immediately so although other types of gear are not described in this manual provision is made in the Exchange Data Format for information obtained by non-standard gear to be exchanged internationally.

Provisional data obtained from the North Sea and Skagerrak/Kattegat should be submitted to the quarterly coordinator as soon as possible after completion of the cruise. Appendix X lists the length splits for the various target species. Final data should be submitted to the ICES Secretariat in the format as listed in section 6 of this manual. The files can be transmitted via a floppy disk or by e-mail.

2. THE GOV-TRAWL

2.1 Construction

The construction of the 36/47 GOV-trawl is shown in Figure 2.1.

Special attention is drawn to the lining of the cod-end. This lining should consist of 400 stretched meshes of 20 mm each, giving a total length of 8 m. The total circumference of the lining should be 600 meshes.

Details of the "Exocet" kite and suggestions how to attach the kite to the trawl are shown in Figure 2.2. Five floats with a buoyancy of 2.9 kg each should be attached to the kite. If another kite than the recommended one is used then the lift of this kite should be the same as of the Exocet kite so that the configuration of the net conforms to expected parameters. Figures 2.6 and 2.7 illustrate the expected warp out / headline height ratio and the warp out / door spread ratio.

Total buoyancy of the floats on the net should be 172 kg. The floats should be spread as evenly as possible over the wings and the square.

2.2 Rigging

The rigging is given in Figure 2.3.

During the first quarter survey the length of the sweeps should depend on the bottom depth:

- m sweeps (including backstrops) are used in water depths less than 70 m,
- m sweeps (including backstrops) are used in deeper waters.

In the other quarters a sweep length of 60 m (including backstrops) is used throughout the survey area.

The standard groundrope with 10-20 cm rubber discs as shown in Figure 2.4 should be used throughout the survey area. The extra weights in the groundrope are 70 kg in the square, 35 kg in each wing and 35 kg in each wing-end. These weights should be evenly spread over the appropriate length of groundrope and this can be achieved by wrapping chain externally around the groundrope or, preferably, by interspersing the groundrope rubber discs with steel discs of the same diameter.

It is very important to achieve good bottom contact over the whole groundrope and this should be checked regularly. A proper contact of the net could be indicated by acoustic devices, wearing on chains and presence of benthic organisms and flatfish in the catch. The contact of the net with the bottom can also be greatly influenced by changing the length of the adjustment chain between the lower leg and the bumper bobbin. The normal length of this chain is 2 metres but on rough ground it can be shortened to 1.7 metres; if the gear is fishing too light it can be lengthened to 2.2 metres.

For a proper performance of the net it is essential that the four upper bridles are of identical length, and regular checks should be made to ensure this. It is also recommended that a total check of the trawl is carried out prior to the survey.

2.3 Standard Fishing Method

Standard fishing speed is 4 knots measured as trawl speed over the ground. The recommended speed is set as a target and actual (ground) speed and distance towed should be monitored and reported. It is also recommended that the speed of the trawl through the water should be monitored and reported.

Each haul lasts 30 minutes. Start time is defined as the moment when the vertical net-opening and doorspread are stable at a trawl speed of 4 knots. Stop time is defined as the start of pull back.

Vertical net opening and doorspread should be monitored at 30 second intervals and mean values should be reported. It is recommended that also wing spread is measured.

The recommended warp/depth ratio for the GOV trawl is shown in Figure 2.5. A minimum warp length of 150 m should be used as below this length the gear becomes unstable and insufficient spread is achieved. Maximum fishing depth in the North Sea is 200 m and in Division IIIa 250 m.

It is preferable to only conduct trawling operations during daylight hours although it is recognised that some institutes may wish to trawl both during the day and night. It is however strongly recommended that during the February survey the trawling in the old herring standard area (see Figure 6.4) is carried out during daytime only. The daylight period is defined as the time between 15 minutes before sunrise until 15 minutes past sunset. Daylight hours for various periods and latitudes are given in the text table below:

Daylight period in UTC at 0 degrees longitude:

Dates		South of 57° 30' N		North of 57° 30' N	
01-10	Jan	08.09	- 15.58	08.45	- 15.25
10-20	Jan	08.01	- 16.17	08.31	- 15.45
21-31	Jan	07.47	- 16.35	08.15	- 16.07
01-10	Feb	07.29	- 16.58	07.49	- 16.36
11-20	Feb	07.08	- 17.20	07.23	- 17.05
21-28	Feb	06.47	- 17.41	06.55	- 17.30
01-10	Mar	06.27	- 17.57	06.32	- 17.50
11-20	Mar	06.03	- 18.18	06.05	- 18.15
21-31	Mar	05.35	- 18.38	05.32	- 18.39
01-10	Jul	03.15	- 20.55	02.28	- 21.40
11-20	Jul	03.26	- 20.47	02.49	- 21.24
21-31	Jul	03.41	- 20.33	03.08	- 21.03
01-10	Aug	04.00	- 20.12	03.34	- 20.38
11-20	Aug	04.19	- 19.50	03.59	- 20.09
21-31	Aug	04.37	- 19.26	04.23	- 19.42
01-10	Sep	04.57	- 19.00	04.48	- 19.09
11-20	Sep	05.16	- 18.34	05.12	- 18.38
21-30	Sep	05.35	- 18.08	05.35	- 18.08

Source: *'The Times Atlas' 1972, p 33.*

For each degree longitude west, 4 minutes should be added and for each degree longitude east, 4 minutes should be subtracted.

2.4 Fishing Positions

Most statistical rectangles contain a number of possible tows that are deemed to be free of obstruction and vessels are free to choose any of these positions in the rectangles that they are surveying. In some rectangles sampling may be further stratified due to significant changes in sea bed depth which may, in turn, cause variations in the fish population. In such cases it is extremely important that the same depths are sampled in each survey year.

In rectangles or strata that are to be sampled more than once by the same vessel it is recommended that valid hauls are separated by at least one day or by at least 10 miles wherever this is possible. Tows in adjacent rectangles should also be separated by at least 10 miles.

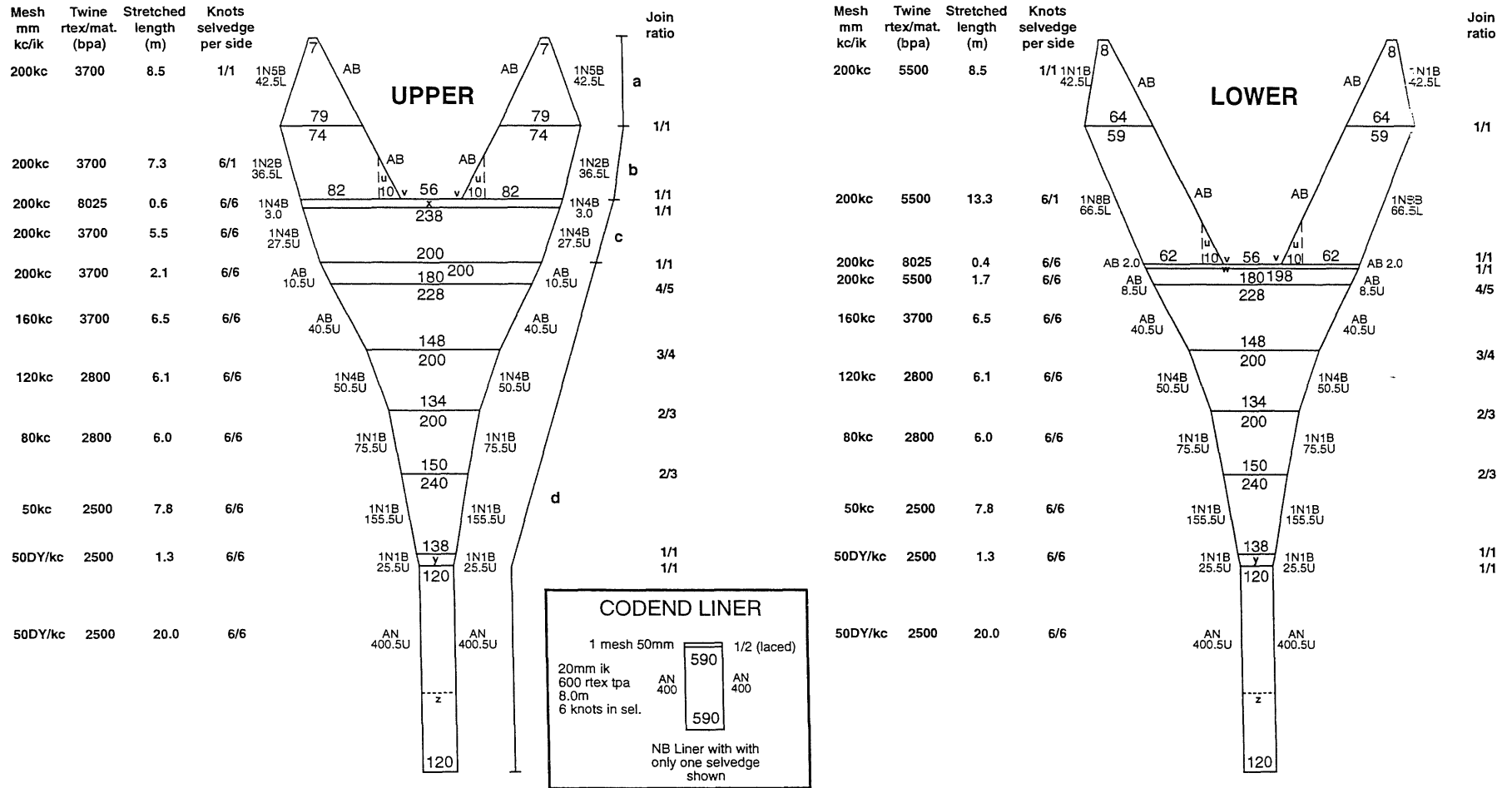
Fishing should not be influenced by fish shoals located by sonar or echo sounder.

The exchange of clear tow positions is to be encouraged and this may be in the form of data formatted for immediate entry into a ship's navigational system or, alternatively, as an ASCII file as specified in Appendix I.

Construction of the 36/47 GOV trawl (adapted from drawings of the Institute des Peches Maritimes, Boulogne/Mer)

4

Figure 2.1 Construction of the 36/47 GOV Trawl



Headline : 36m (15.50 + 5.00 + 15.50) x 14mm ϕ wire (t/c) served (6/19 - 12/6/1 65.8kg/100m).
Fishingline : 47.20m (21.10 + 5.00 + 21.10) x 22mm ϕ combination wire 6 strand/steel core 54.6kg/100m).
Winglines : Upper 8.2m, Lower 8.2m x 20mm ϕ combination wire (6 strand/steel core 54.6kg /100m)

a - 7.1m x 14mm ϕ wire (6/19 - 12/6/1 - 65.8kg/100m)
b - 6.7m x 20mm ϕ combination wire (6 strand/steel core - 54.4kg/100m)
c - 5.55m x 20mm ϕ combination wire (6 strand/steel core - 54.4kg/100m)
d - length for length x 22mm ϕ nylon (3 strand - 26kg/100m)

u - Gussets 8025rtex
v - 4 meshes gathered at quarters

w - 200 198
x - 240 238
y - 138 120

z - Joining position for Liner

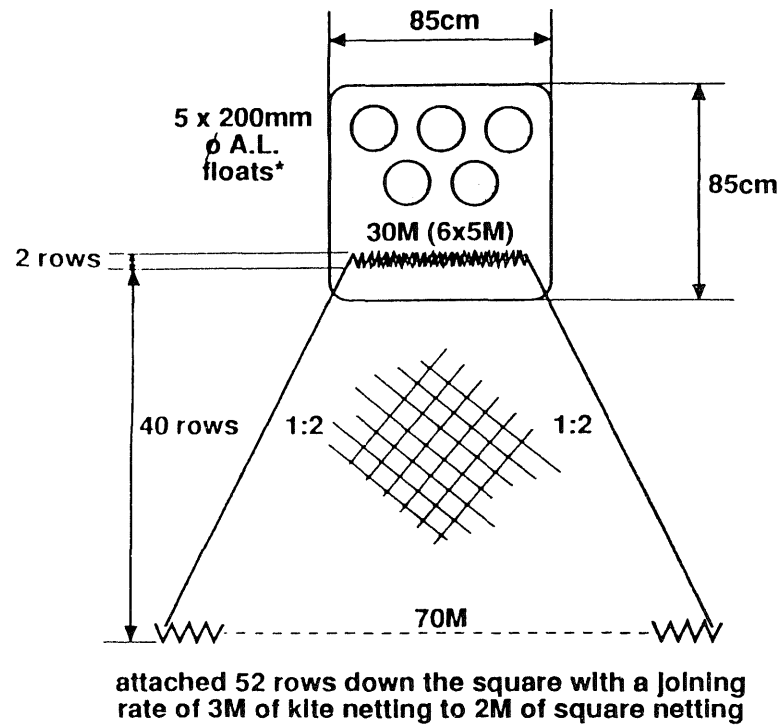
kc = knot centre to knot centre
ik = inside knot measurement
tpa = polyamide twine/twisted
bpa = polyamide twine/braided
dy = double yarn

Method of join used, sewing.
 Type of knot, weavers knot.

NOTE TO NETMAKERS

The numbers of meshes shown for netting panel widths do NOT include selvedge meshes. Five meshes (six knots) per selvedge must be added where indicated. Conversely to obtain panel depths one row (1/2 mesh) must be subtracted from each panel as the joining row is included in the number of meshes deep. The total numbers of meshes (width and depth) for each individual panel are set out in GOV 36/47 Groundfish Survey Trawl Checklist (Page 2 of 5)

GOV 36/47 GROUND FISH SURVEY TRAWL : "Exocet" kite rigging



* total buoyancy 14 kg.

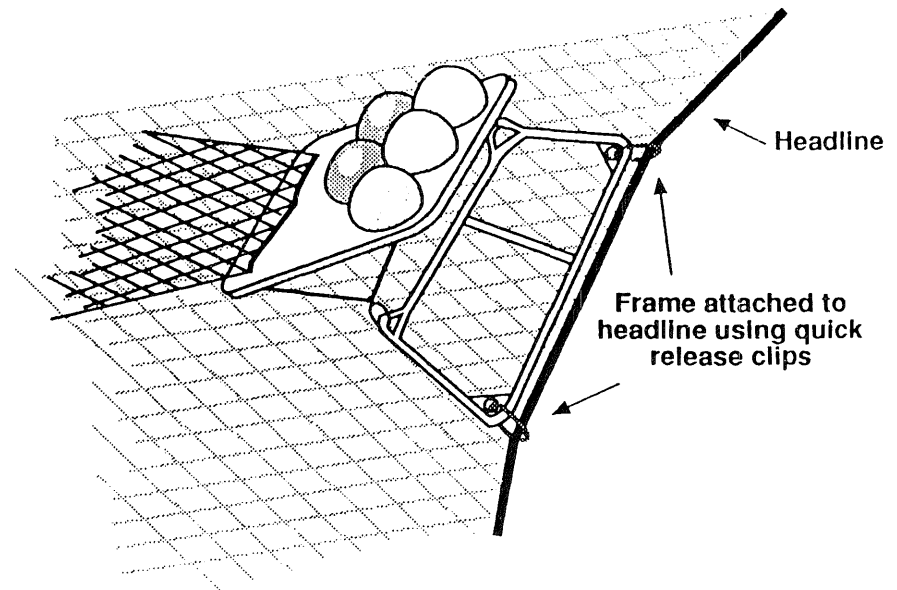
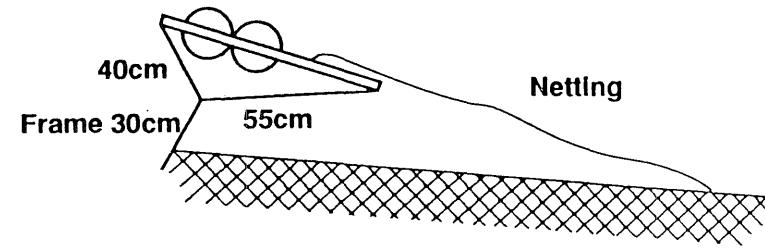


Figure 2.2 Exocet Kite for 36/47 GOV Trawl

GOV 36/47 GROUND FISH SURVEY TRAWL : Overall rigging diagram

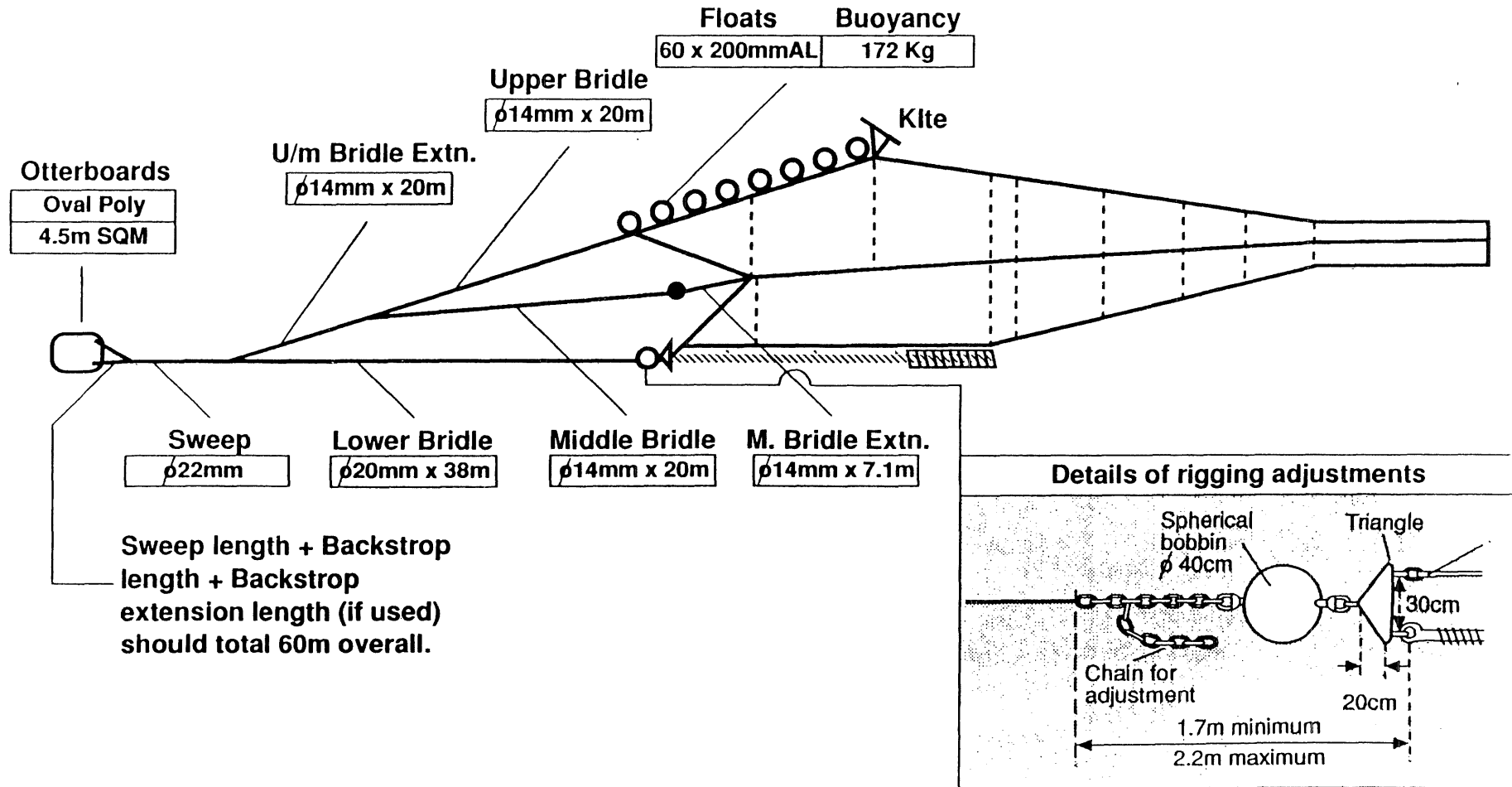
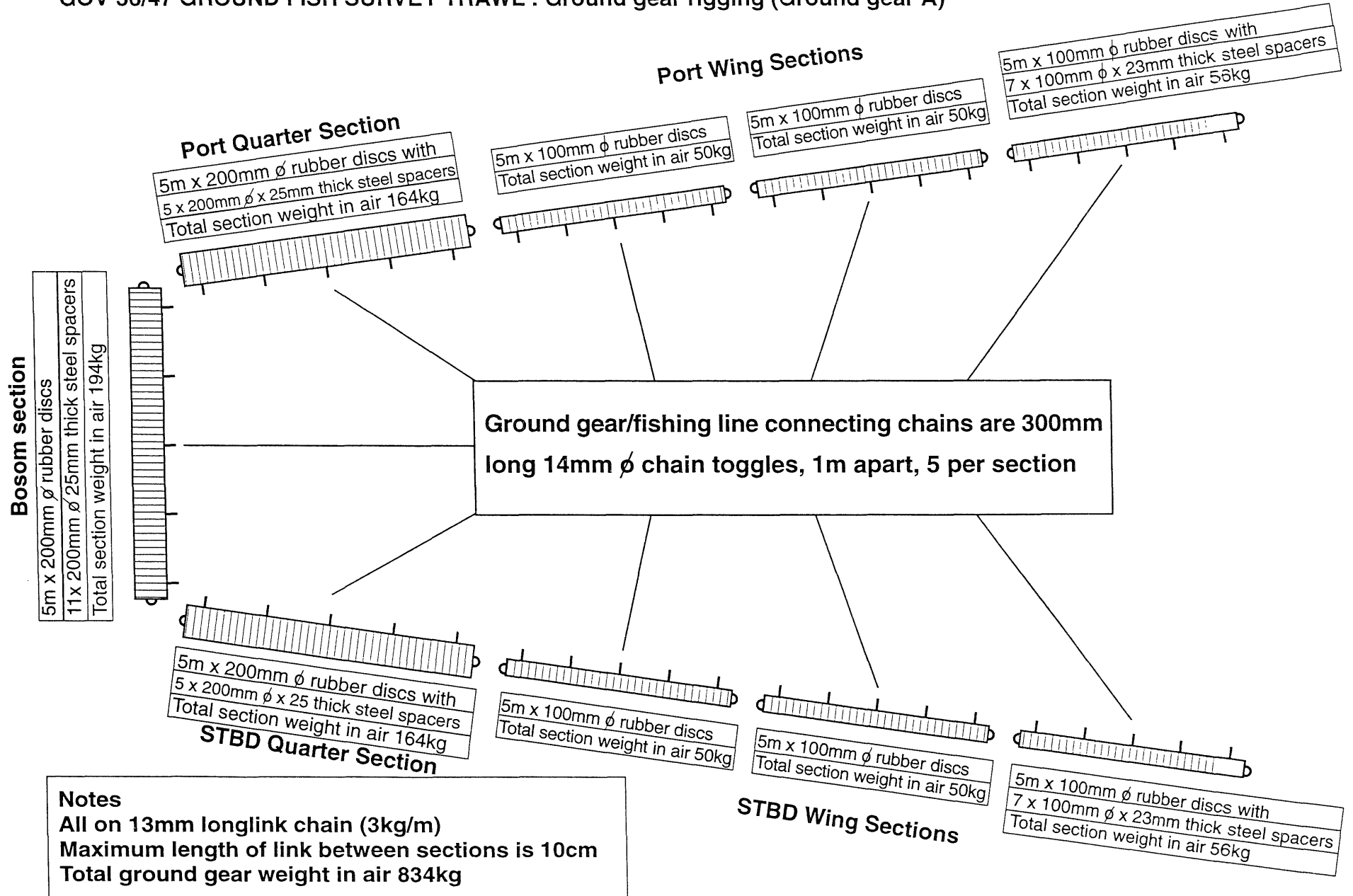


Figure 2.3 Rigging of the 36/47 GOV Trawl

GOV 36/47 GROUND FISH SURVEY TRAWL : Ground gear rigging (Ground gear A)

Figure 2.4 Standard groundrope for the 36/47 GOV Trawl



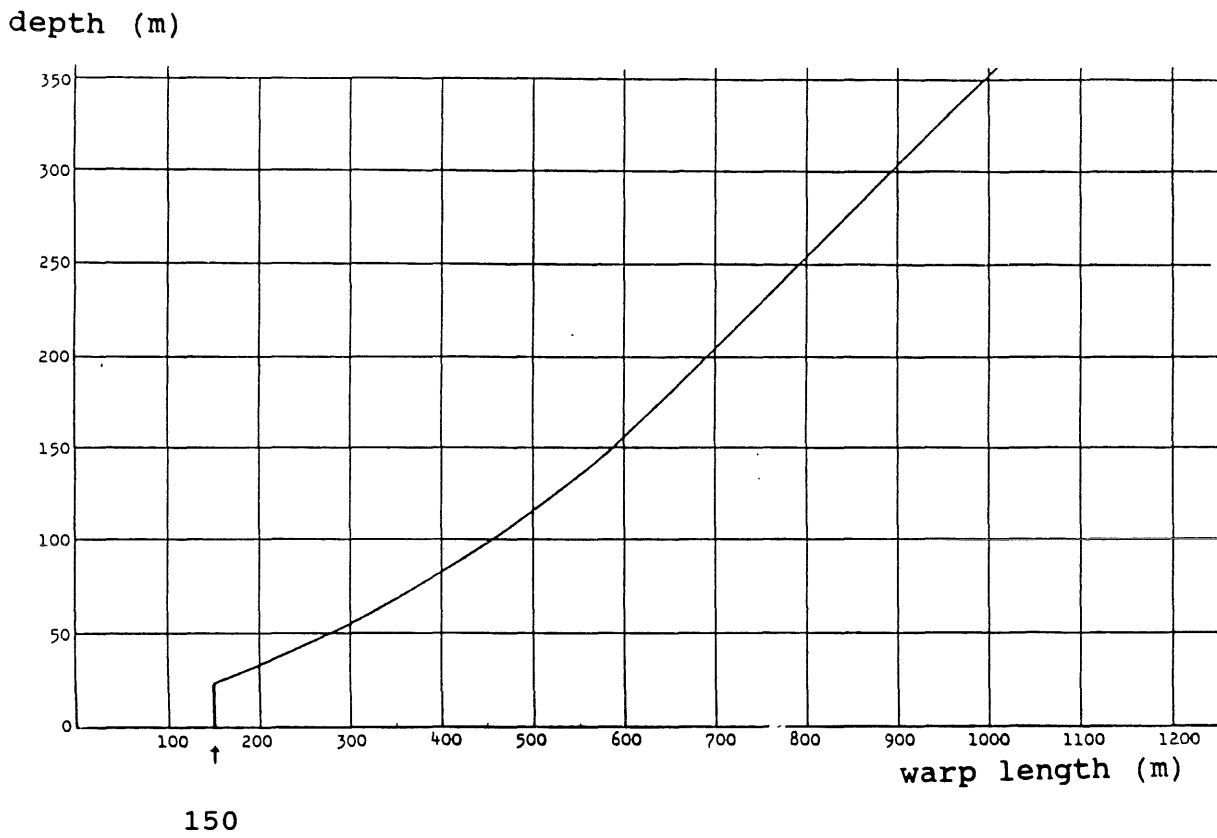


Figure 2.5 Warp/Depth ratio for the 36/47 GOV Trawl.

warp out/headline height
with range set at +/- standard error

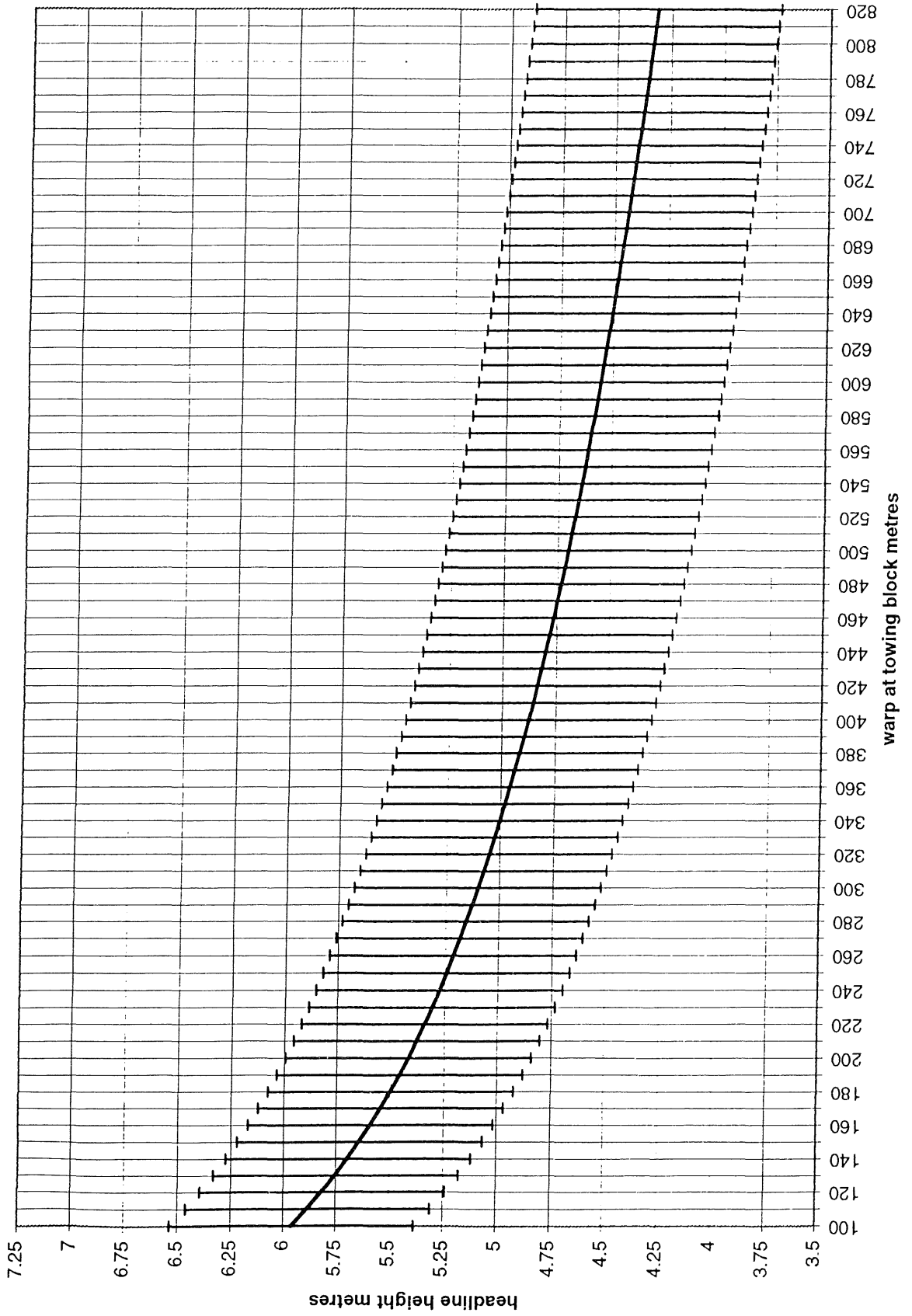


Figure 2.6 Expected warp out / headline height ratio.

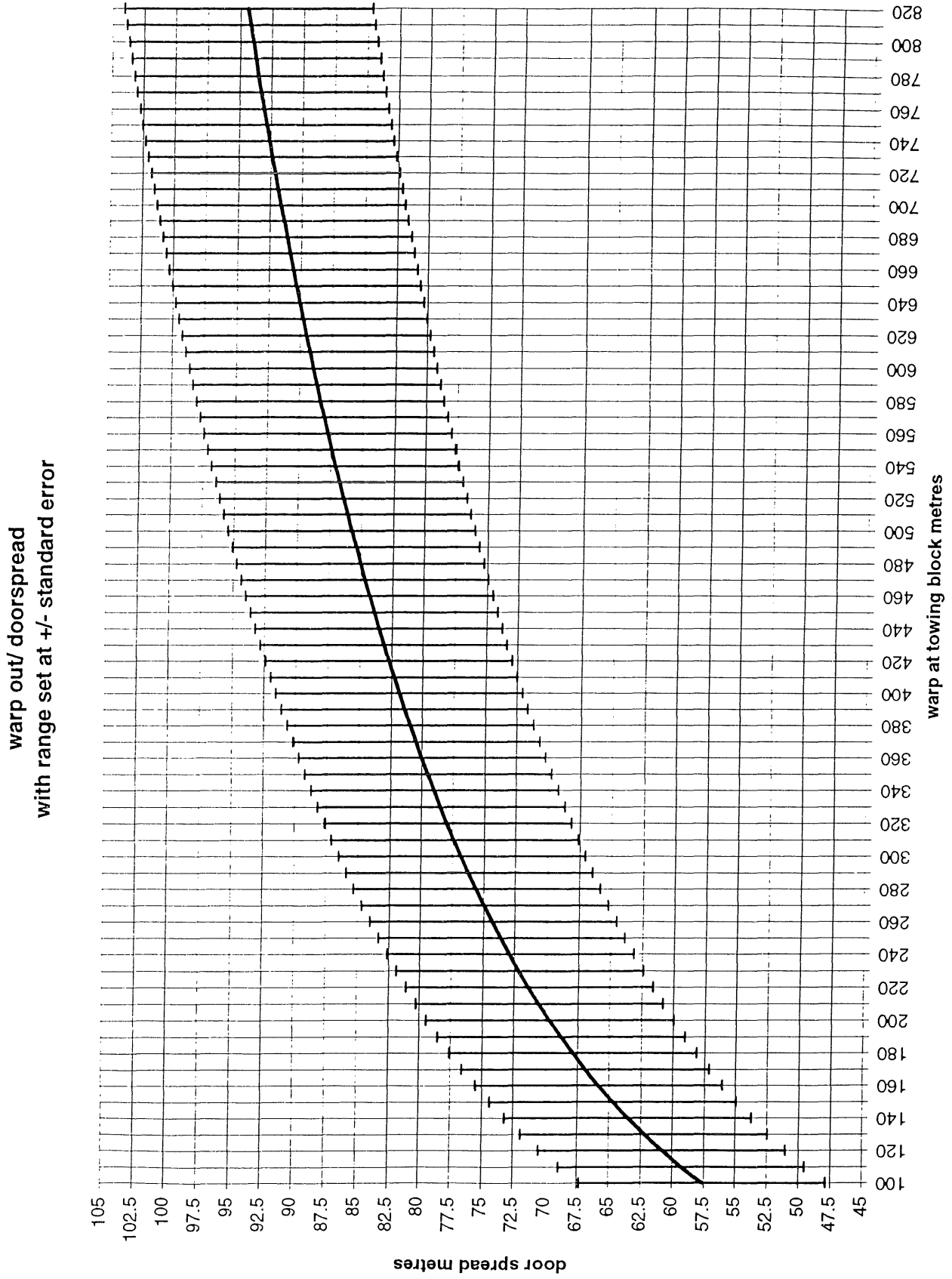


Figure 2.7 Expected warp out / door spread ratio.

3. SAMPLING OF GOV-TRAWL CATCHES

3.1 Length composition

Length distributions are recorded for all fish species caught. Length is defined as total length (measured from tip of snout to tip of caudal fin). Length is measured to 0.5 cm below for herring and sprat, and to 1 cm below for all other species.

In case the catch of a certain species is too large to measure all individuals, a sub-sample may be taken which should contain at least 50 specimens.

If a certain species (notably cod or haddock) is caught in two clearly distinct size groups, each of these size groups should be sampled separately by measuring at least 50 fish from each of them.

In case of large catches ($n > 1000$) of any species, the minimum sample size given above should be doubled.

Certain related species that are hard to distinguish from one another may be grouped by genus or larger taxonomic unit.

3.2 Sampling for Age, Sex and Maturity

Otolith samples are collected within 9 specified sampling areas as illustrated in Figure 6.2. For all species the same areas are used but care should be taken not to extract otoliths from fish that exhibit length deformities.

For the target species the following minimum sampling levels should be maintained for each sampling area:

herring	:	8 otoliths per 1/2 cm group
sprat	:	8 otoliths per 1/2 cm group
mackerel	:	8 otoliths per 1 cm group
cod	:	8 otoliths per 1 cm group
haddock	:	8 otoliths per 1 cm group
whiting	:	8 otoliths per 1 cm group
Norway pout	:	8 otoliths per 1 cm group
saithe	:	8 otoliths per 1 cm group

For the smallest size groups, that presumably contain only one age group, the number of otoliths per length class may be reduced. Conversely more otoliths per length are required for the larger length classes.

Participants are encouraged to collect age samples also from other commercially important species such as saithe, plaice and IIIa sole.

Sex and maturity data may be reported for each species for which age data are collected. Maturity stages should be reported according to the simplified maturity scale given in Appendix II.

4. METHOT ISAAC KIDD NET

4.1 Construction and Rigging

The Methot Isaac Kidd (MIK) net is a midwater ring trawl and is the standard gear for the sampling of fish larvae during the International Bottom Trawl Survey in the first quarter.

The parts of the gear, as shown in Figures 4.1 and 4.2 are:

- a) ring of 2 meter diameter
- b) black net of 1.6 mm pore, 13 meter long, strengthened by nylon straps. In the last meter of the net a 500 mm net is inserted (b1)
- c) bolts for mounting the net on the ring
- d) dihedral depressor which is 2 meter long and 0.5 meter wide
- e) pair of 10 meter long bridles to the gear
- f) pairs of 1.5 meter long bridles to the depressor
- g) pair of 1.5 meter long wires between gear and depressor-bridles
- h) bucket (\emptyset 11 cm) for collection of the plankton sample
- i) flow meter mounted on a string crossing the ring, positioned in the centre of the ring

4.2 Fishing Method

Because of the length of the bridles it is necessary to haul them through the block; thus a strong block is necessary, and the connection between bridle and hauling wire ought to be relatively small.

In order to monitor the distance of the gear to the bottom an echo sounder should be mounted, optionally a wireless echo sounder (e.g. SCANMAR) should be used. This should be placed in the lower part of the ring.

If no wireless sounder is available the transmitting cable could be relieved by use of a second, 9-10 meter long, pair of bridles as shown in Figure 4.3.

When the gear is put out the net should float freely, and the depressor should be under water before the ring is lowered under water.

4.3 Sampling Procedure

Hauls should only be made during the period between 30 minutes past sunset to 30 minutes before sunrise (see table in section 2.3 for the definition of sunrise and sunset). If there is no cloud cover, i.e. the daylight period has been extended, then fishing should not begin until 60 minutes after sunset and cease 60 minutes before sunrise.

Fishing speed is 3 knots.

The haul profile is oblique to 5 meter above the bottom (i.e. measured from the lower part of the ring). Maximum depth of tow should, however, be 100 meter. If the haul duration of a single oblique haul is less than 10 minutes a double oblique haul must be made.

The wire is paid out at a speed of 25 meter per minute and retrieved at 15 m/min.

The flowmeter is read before and after each haul.

The duration and distance towed must be recorded.

The position of sampling is the shooting position.

On deck the hindmost part of the net (the 500 mm netting) is washed into the bucket.

4.4 Sample and Data Treatment

The samples should be preserved in 4% formalin in fresh water.

It is recommended that lengths of larvae are measured after preservation. If measurements are made before preservation this should be indicated on the standard form (Figure 4.4).

Herring and sprat larvae should be identified, and their standard length (see Figure 4.5) measured to the millimetre below.

Catches of eel should also be indicated on the standard form. Optionally other species may be reported.

Preferably samples are processed and reported within one month after termination of the survey.

The standard forms (Figure 4.4) should be mailed to Peter Munk, Danish Institute for Fisheries and Marine Research, Charlottenlund Castle, DK-2920 Charlottenlund, Denmark.

The data will be included in a data base on DIFMAR. A revised copy of data will be available at ICES Secretariat.

The standard areas for which the abundance of herring larvae is calculated is shown in Figure 6.5.

4.5 Calibration of the Flowmeter

The flowmeter used in the survey should be calibrated to revolutions per meter. One method is to tow the MIK (without the bucket) at a depth of about 10 meter for a known distance and make at least two measurements in opposite directions.

4.6 Allocation of Rectangles

At least 2 hauls are made within each standard rectangle and the distance between hauls in a rectangle is at least 10 nm.

Each year, the chairman of the IBTS WG announces the allocation of rectangles to all participants.

During the survey the status of MIK-sampling should be reported to the coordinating vessel. If there is any risk that rectangles will be left unsampled then initiatives should be taken to reallocate sampling between participants.

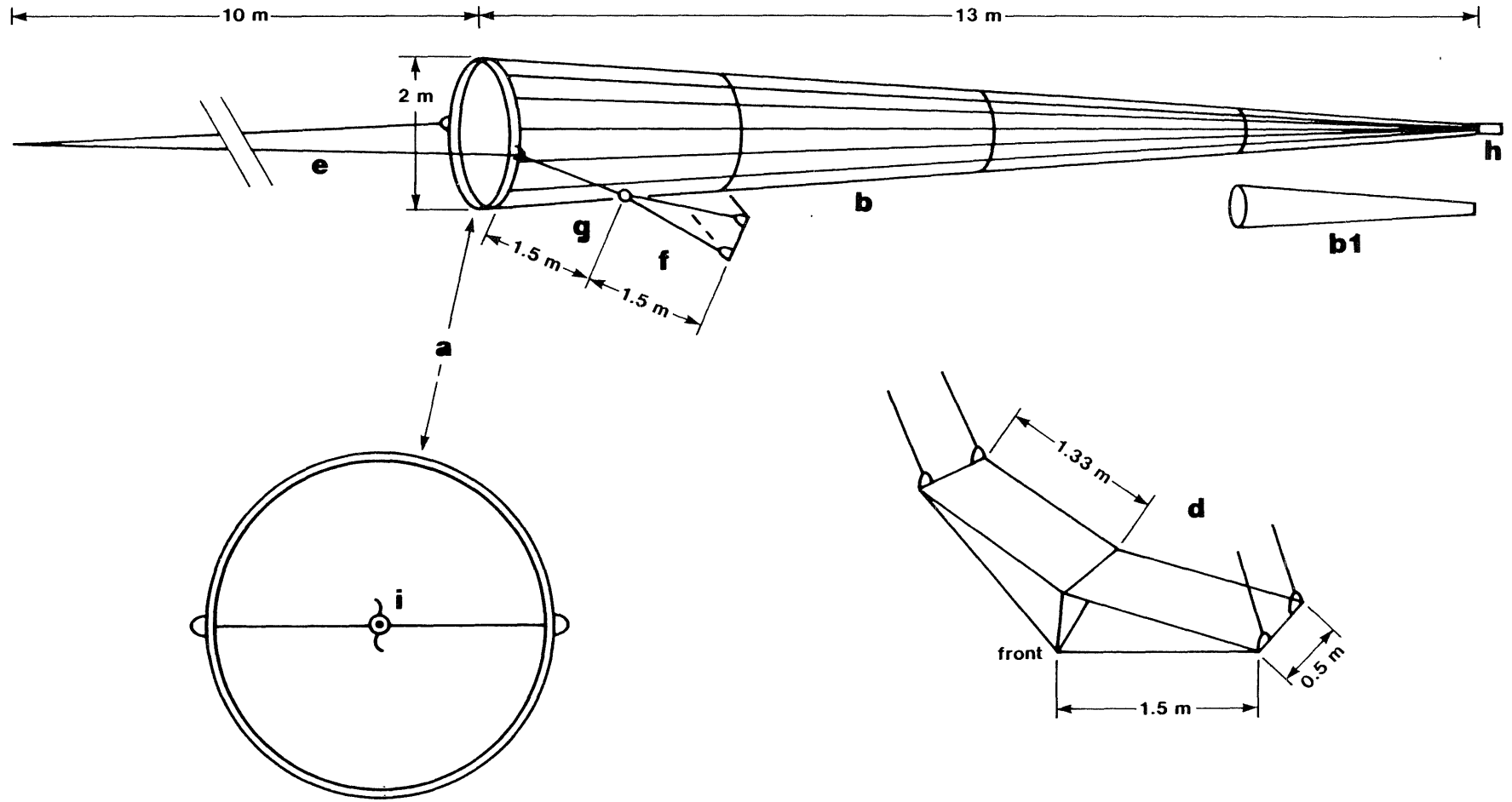


Figure 4.1 Construction and rigging of the MIK midwater trawl. Letters refer to description in the text

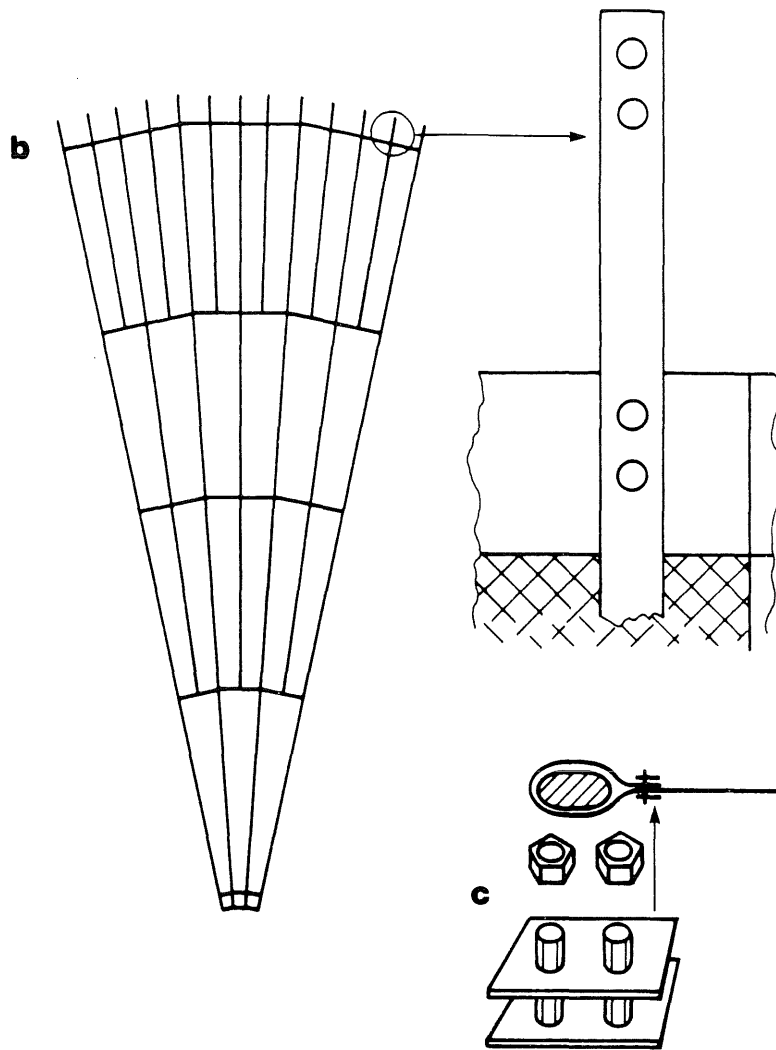


Figure 4.2 Unfolded net of the MIK midwater trawl and illustration of net attachment.

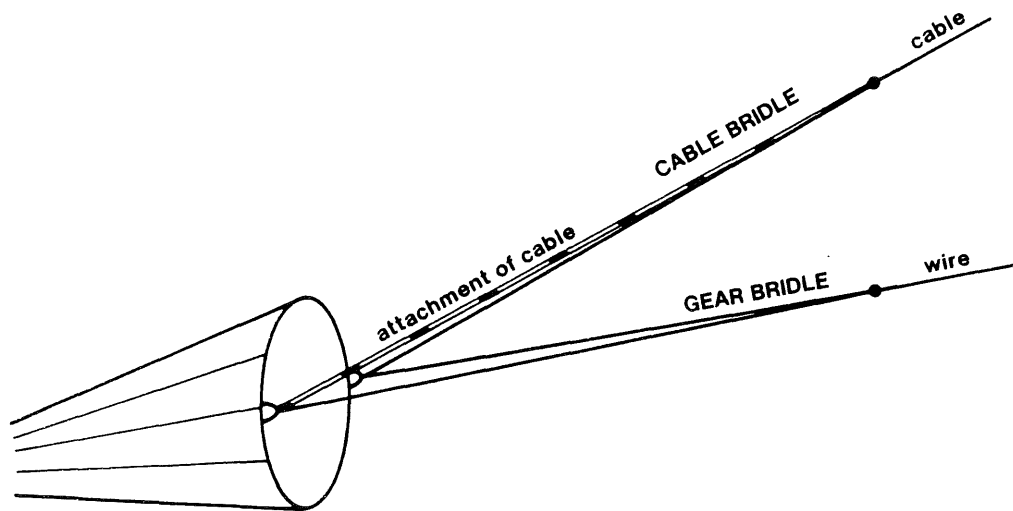


Figure 4.3 Proposed rigging of transmitting cable

Standard form for MIK haul data during the IBTS

haul no:

country		date	time (GMT)	
duration min	sec	latitude	longitude	rectangle
water depth (m)	max tow depth (m)	distance towed (m)	flowmeter revs	revs/metre constant
HERRING No/haul:	SPRAT No/haul:	EEL No/haul:	KRILL VOLUME (millimetre):	
length(mm) 15	length(mm) 15	length(mm) 55	all other fish species measured? yes/no	
16	16	56		
17	17	57		
18	18	58		
19	19	59		
20	20	60	species: length(cm)	
21	21	61		
22	22	62		
23	23	63		
24	24	64		
25	25	65		
26	26	66		
27	27	67		
28	28	68		
29	29	69		
30	30	70	species: length(cm)	
31	31	71		
32	32	72		
33	33	73		
34	34	74		
35	35	75		
36	36	76		
37	37	77		
38	38	78		
39	39	79		
40	40	80	species: length(cm)	
41	41	81		
42	42	82		
43	43	83		
44	44	84		
45	45	85		
46	46	86		
47	47	87		
48	48	88		
49	49	89		
50	50	90	species: length(cm)	
51	51	91		
52	52	92		
53	53	93		
54	54	94		
55	55	95		
56	56	96		
57	57	97		
58	58	98		
59	59	99		
60	60	100		

all measurements to the mm or cm below
see IBTS Manual for guidelines

sample analysed by:

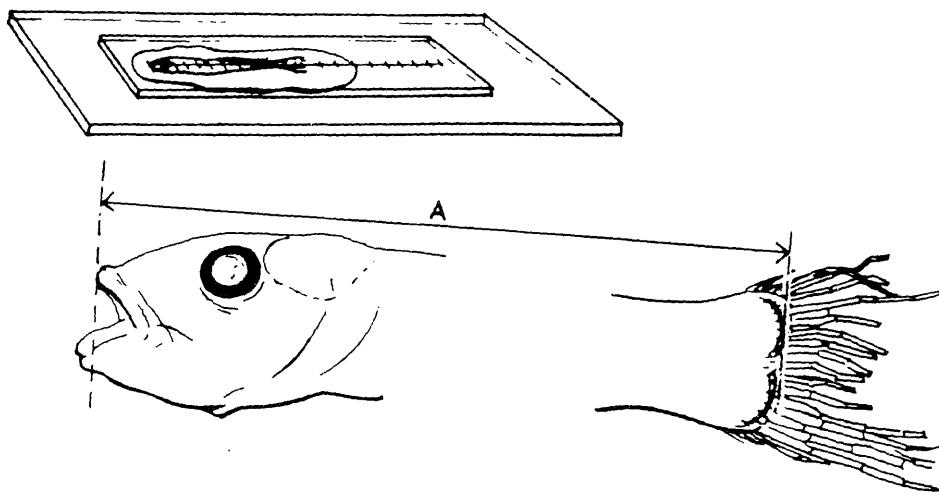


Figure 4.5 Measurement of standard length of herring and sprat larvae (to the millimetre below)

5. ENVIRONMENTAL DATA

After each haul with the GOV trawl, the following minimum hydrographical data are collected:

- surface temperature
- bottom temperature
- surface salinity
- bottom salinity

When using a CTD-probe for measuring temperature and salinity, the CTD should be calibrated against a sample collected by Nansen bottle at each station.

Participants are recommended to collect nutrient samples during the International Bottom Trawl Survey in the first quarter. For further specifications they should contact the ICES Hydrographer.

Since 1992 the following additional environmental data are sought:

- surface current direction
- surface current speed
- bottom current direction
- bottom current speed
- wind direction
- wind speed
- swell direction
- swell height

The above parameters should be reported in an additional file. The format of this file is specified in section 6.3.

6. EXCHANGE TAPE SPECIFICATIONS FOR IBTS DATA

Note: in force from 1 June 1992

6.1 General Information

When data are exchanged it is important to give details of the data, such as the number of records of each record type, and the number of CA-records per species.

6.1.1 Floppy disk requirements

- ASCII coding
- all standard disk formats are acceptable
- preferably 3.5 inch disks

6.1.2 Format of data

Four distinct types of computer records have been defined for standard storage of the IYFS data:

- Type 1 : Record with detailed haul information
- Type 1A: Record with additional haul information
- Type 2 : Length frequency data
- Type 3 : Length age frequency data
- Type 4 : Sex-maturity-age-length keys (SMALK's)

The detailed formats of these five record types are given on following pages.

NB:

- 1) Record Type 3 (Length frequency and age data) shall only be used for exchanging historic survey data.
- 2) Details of environmental data should be submitted to the Hydrographic Service of ICES according to established procedures. The national hydrographic station number must be reported in Record Type 1 to enable the link to be made between haul data and environmental data.

6.1.3 File structure

The records must be ordered in such a way that each record of Type 1 is followed by a variable number of records of Type 2 (or Type 3), ordered by species. The number and kinds of species recorded must agree with the species recording code as specified in record Type 1. For examples of the various codes see Appendix V.

Records of Type 4 should follow at the end of the file after the last species record of Type 2 for the last haul. Records of Type 1A should be submitted in a separate file.

6.2 Record type 1

SPECIFICATIONS FOR RECORD TYPE 1 (Haul information)

POSITION	NAME	TYPE*	M/O**	RANGE	COMMENTS
1 - 2	Record type	2A	M		Fixed value HH.
3	Quarter	1N	M	1 to 4	
4 - 6	Country	3A	M	See Appendix III	ICES alpha code for Countries.
7 - 10	Ship	4AN	M	See Appendix III	
11 - 20	Gear	10A	M	See Appendix IV	Preliminary code. 1)
21 - 26	Station no	6AN	O		National coding system.
27 - 29	Haul no	3N	M	1 to 999	Sequential numbering by cruise.
30 - 31	Year	2N	M	65 to 99	
32 - 33	Month	2N	M	1 to 12	
34 - 35	Day	2N	M	1 to 28/29/30/31	
36 - 39	Time shot	4N	M	1 to 2400, 9999	In UTC.
40 - 42	Haul duration	3N	M	5 to 90	In minutes.
43	Day/Night	1A	M	D, N, space	Not known=space filled.
44 - 45	Lat. degrees	2N	M	50 to 64	Shooting position: Degr. Latitude.
46 - 47	Lat. minutes	2N	M	0 to 59	Shooting position: Min. Latitude.
48 - 49	Lon. degrees	2N	M	0 to 15	Shooting position: Degr. Longitude.
50 - 51	Lon. minutes	2N	M	0 to 59	Shooting position: Min. Longitude.
52	East/West	1A	M	E, W	
53 - 55	Depth	3N	M	0, 10 to 300	Depth from surface in metres: not known=0.
56	Haul validity	1A	M	I, P, V	Invalid=I. Partly valid=P. Valid=V. 2)
57 - 64	Hydrographic station number	8AN	M		Station number as reported to the ICES hydrographer.
65 - 66	Species Recording Code	2N	M	See Appendix V	For examples see page 10.
67 - 69	Netopening	3N	O	25 to 100	In metres*10.
70 - 73	Distance	4N	O	1850 to 9999	Distance towed over ground in metres.
74 - 76	Warp length	3N	O	100 to 999	In metres.
77 - 78	Warp diameter	2N	O	10 to 60	In millimetres.
79 - 81	Door surface	3N	O	30 to 100	In square metres*10.
82 - 85	Door weight	4N	O	500 to 2000	In kilogrammes.
86 - 89	Buoyancy	4N	O	50 to 200	In kilogrammes.
90 - 91	Kite dimensions	2N	O	5 to 20	In square metres*10.
92 - 95	Weight ground rope	4N	O	0 to 300	In kilogrammes.
96 - 98	Door spread	3N	O	50 to 180	In metres.
99 - 100	Paddingfield	2A	M	Spaces	Filled up with spaces.

* All numeric fields (N) right justified, zero filled, except when spaces are used to indicate no information.
All alpha (A) and mixed alpha/numeric fields (AN) left justified, space filled.

** M=mandatory, O=optional. For all optional fields spaces are valid and indicate not known.

COMMENTS:

- 1) ICES is maintaining this code list. Laboratories should ask the Secretariat for new codes, if the gear they report is not included in the list. Numerical information on gear aspects is defined in position 67-98 and is only required for the GOV trawl.
- 2) Code P is reserved for situations, when no liner has been used, ultimately this should be evident from the gear code. For the time being it seems appropriate to include it here.

NB: FOR INVALID HAULS NO SPECIES INFORMATION NEED TO BE GIVEN

6.3 Record Type 1A

SPECIFICATIONS FOR RECORD TYPE 1A (Haul information)

POSITION NAME	TYPE*	M/O**	RANGE	COMMENTS
1 - 2 Record type	2A	M		Fixed value HE.
3 Quarter	1N	M	1 to 4	
4 - 6 Country	3A	M	See Appendix III	ICES alpha code for Countries.
7 - 10 Ship	4AN	M	See Appendix III	
11 - 20 Gear	10A	M	See Appendix IV	Preliminary code. 1)
21 - 26 Station no	6AN	O		National coding system.
27 - 29 Haul no	3N	M	1 to 999	Sequential numbering by cruise.
30 - 31 Year	2N	M	65 to 99	
32 - 33 Lat. degrees	2N	M	50 to 64	Hauling position: Degr. Latitude.
34 - 35 Lat. minutes	2N	M	0 to 59	Hauling position: Min. Latitude.
36 - 37 Lon. degrees	2N	M	0 to 15	Hauling position: Degr. Longitude.
38 - 39 Lon. minutes	2N	M	0 to 59	Hauling position: Min. Longitude.
40 East/West	1A	M	E, W	Hauling position:
41 - 43 Towing direction	3N	O	1 to 360	
44 - 45 Ground speed	2N	O	20 to 60	Ground speed of trawl. Knots*10
46 - 47 Speed through water	2N	O	10 to 99	Trawl speed through. Knots*10
48 - 49 Wing spread	2N	O	12 to 30	In metres.
50 - 52 Surface current direction	3N	O		0 to 360 0 slack water
53 - 55 Surface current speed	3N	O	0 to 100	Metres per sec*10
56 - 58 Bottom current direction	3N	O		0 to 360 0 slack water
59 - 61 Bottom current speed	3N	O	0 to 100	Metres per sec*10
62 - 64 Wind direction	3N	O	0 to 360	
65 - 67 Wind speed	3N	O	0 to 100	Metres per sec
68 - 70 Swell direction	3N	O	0 to 360	
71 - 73 Swell height	3N	O	0 to 1000	Metres*10
74 - 100 Paddingfield	27A	M	Spaces	Filled up with spaces.

* All numeric fields (N) right justified, zero filled, except when spaces are used to indicate no information.
All alpha (A) and mixed alpha/numeric fields (AN) left justified, space filled.

** M=mandatory, O=optional.
For all optional fields spaces are valid and indicate not known.

COMMENTS:

1) ICES is maintaining this code list. Laboratories should ask the Secretariat for new codes, if the gear they report is not included in the list. Numerical information on gear aspects is only required for the GOV trawl.

6.4 Record Type 2

SPECIFICATIONS FOR RECORD TYPE 2 (Length frequency distribution)

POSITION	NAME	TYPE*	M/O**	RANGE	COMMENTS
1 - 2	Record type	2A	M	Fixed value HL.	
3	Quarter	1N	M	1 to 4	Identical to Record Type 1.
4 - 6	Country	3A	M	See Appendix III	idem
7 - 10	Ship	4AN	M	See Appendix III	idem
11 - 20	Gear	10A	M	See Appendix IV	idem
21 - 26	Station no	6AN	O	idem	
27 - 29	Haul no	3N	M	1 to 999	idem
30 - 31	Year	2N	M	65 to 99	idem
32 - 41	Species code	10A	M	See Appendix VII	Official NODC-code.
42 - 43	Validity code	2N	M	See Appendix VIII	
44 - 50	No/hour	7N	M	0 to 9999999	No. of specimens caught per hour.
51 - 55	Catch Weight/Hour	5N	M	0 to 99999, spaces	In 100g. Not known= spaces. 1)
56 - 58	No measured	3N	M	0 to 999, spaces	Not known=spaces. 2)
59	Length code	1AN	M	., 0, 1, 5, 9, space	Class: 1mm=. 0.5cm=0 1cm=1 5cm=5 +group=9 no information=space. 3)
60 - 62	Length class	3N	M	1 to 999, spaces	Identifier: lower bound of size class, eg. 65-70cm=65. For 0.5 cm classes there will be an implied decimal point after the 2nd digit, eg. 30.5-31.0cm=305.
63 - 68	No at length	6N	M	1 to 999999, spaces	Length classes with zero catch should be excluded from the record (N/hour equals the sum of No at length).
69	Sex	1A	O	M,F	M=male, F=female
70 - 100	Paddingfield	32A	M	Spaces	Filled up with spaces

* All numeric fields (N) right justified, zero filled, except when spaces are used to indicate no information. All alpha (A) and mixed alpha/numeric fields (AN) left justified, space filled.

** M=mandatory, O=optional.

For all optional fields spaces are valid and indicate not known.

COMMENTS:

- 1) Total catch weights should be given per hour fishing.
- 2) If the number measured is zero then the remainder of the record should be filled with spaces.
- 3) Size classes smaller than those defined in the IYFS manual for reporting length distributions of the various species are allowed.

6.5 Record Type 3

SPECIFICATIONS FOR RECORD TYPE 3 (Length age frequency)

NB: This record has been designed for records of the earlier surveys, where in absence of ALK's subjective the length distributions have been split in age compositions on the basis of (subjective) inspection of the length distributions.

The record MUST NOT be used for present and future surveys!!

POSITION	NAME	TYPE*	M/O**	RANGE	COMMENTS
1 - 2	Record type	2A	M		Fixed value HA.
3	Quarter	1N	M	1 to 4	Identical to Record Type 1.
4 - 6	Country	3A	M	See Appendix III	idem
7 - 10	Ship	4AN	M	See Appendix III	idem
11 - 20	Gear	10A	M	See Appendix IV	idem
21 - 26	Station no	6AN	O		idem
27 - 29	Haul no	3N	M	1 to 999	idem
30 - 31	Year	2N	M	65 to 99	idem
32 - 41	Species code	10A	M	See Appendix VII	Official NODC-code.
42 - 43	Validity code	2N	M	See Appendix VIII	
44 - 50	No/hour	7N	M	0 to 9999999	No. of fish caught per hour of the species given.
51 - 55	Catch Weight/hour	5N	M	0 to 99999, spaces	In 100g. Not known=spaces 1)
56 - 58	No measured	3N	M	0 to 999, spaces	Not known=spaces 2)
59	Length code	1AN	M	., 0, 1, 5, 9	Class: 1mm=. 0.5cm=0 1cm=1 5cm=5 +group=9. 3)
60 - 62	Length class	3N	M	1 to 999	Identifier: lower bound of size class, eg. 65-70cm=65. For 0.5 cm classes there will be an implied decimal point after the 2nd digit, eg. 30.5-31.0cm=305.
63 - 68	No at length	6N	M	1 to 999999	Length classes with zero catch should be excluded from the record (N/hour equals the sum of No at length).
69	Plus group identifier	1A	M	+, space	Plus group=+ else space, refers to age/rings.
70 - 71	Age/rings	2N	M	0 to 99, spaces	Unknown age/rings=spaces.
72 - 100	Paddingfield	29A	M	Spaces	Filled up with spaces.

* All numeric fields (N) right justified, zero filled, except when spaces are used to indicate no information. All alpha (A) and mixed alpha/numeric fields (AN) left justified, space filled.

** M=mandatory, O=optional.

For all optional fields spaces are valid and indicate not known.

COMMENTS:

- 1) See note for Record Type 2.
- 2) See note for Record Type 2.
- 3) See note for Record Type 2.

6.6 Record Type 4

SPECIFICATION FOR RECORD TYPE 4 (SMALK's)

POSITION	NAME	TYPE*	M/O**	RANGE	COMMENTS
1 - 2	Record type	2A	M		Fixed value CA.
3	Quarter	1N	M	1 to 4	Identical to Record Type 1.
4 - 6	Country	3A	M	See Appendix III, ALL	idem
7 - 10	Ship	4AN	O	See Appendix III	idem 1)
11 - 20	Gear	10A	O	See Appendix IV	idem 1)
21 - 26	Station no	6AN	O		idem 1)
27 - 29	Haul no	3N	O	1 to 999	idem 1)
30 - 31	Year	2N	M	65 to 99	idem
32 - 41	Species code	10A	M	See Appendix VII	Official NODC-code.
42 - 43	Area type	2N	M	0 to 3	ICES Statistical rectangles=0 Four Statistical rectangles=1 Standard NS Roundfish areas=2 Herring Sampling areas=3.
44 - 47	Area code	4AN	M	See Appendix IX	
48 - 51	Paddingfield	4A	M	Spaces	Filled up with spaces.
52	Length code	1AN	M	., 0, 1, 5	Identical to Record Type 2 (+group not allowed). 2)
53 - 55	Length class	3N	M	1 to 999	idem
56	Sex	1A	M	M, F, space	Male=M, Female=F, Unknown=space
57	Maturity	1AN	M	1 to 4, space	See Appendix II 3)
58	+gr. ident.	1A	M	+, space	Plus group=+ else space. 4)
59 - 60	Age/rings	2N	M	0 to 99, spaces	Unknown age/rings=spaces. 5)
61 - 63	Number	3N	M	1 to 999	6)
64 - 100	Paddingfield	37A	M	Spaces	Filled up with spaces.

* All numeric fields (N) right justified, zero filled, except when spaces are used to indicate no information.
All alpha (A) and mixed alpha/numeric fields (AN) left justified, space filled, except Area code which is to be right justified, space filled.

** M=mandatory, O=optional.
For all optional fields spaces are valid and indicate not known.

COMMENTS:

- 1) Otolith samples may refer to an individual haul or to groups of hauls in the same rectangle or within one sampling area, depending on the procedures on board. If detailed information is available, it would seem appropriate to refer back to the haul no and/or rectangle; these data are optional rather than mandatory.
- 2) See Record Type 2.
- 3) Sex maturity data are explicitly demanded for roundfish.
- 4) A plus group refers to the age indicated AND older, respectively to a reading of more than or equal to the specified number of rings.
- 5) For herring and sprat the number of rings must be recorded. For all other species the age.
- 6) An additional field has been reserved for no of fish, which allows the information to be presented in a more aggregated form, rather than that identical information has to be recorded for all individual fish of the same size, sex, maturity and age group.

APPENDIX I

IBTS CLEAR TOW DATA

Required information: Country
Year
Shoot position
Haul position
Accuracy
Rectangle
Gear

Country: code as per standard 3 letter code (ICES exchange format)

Year: full format e.g. 1992

Shoot position: degrees decimal minutes if possible please

Haul position: idem

Accuracy: accuracy to which position data was recorded as decimal places, e.g.:

50 35.25	=	accuracy code 2
50 35.3	=	accuracy code 1
50 35	=	accuracy code 0 (data this coarse is not really any use)

Rectangle: ICES rectangle

Gear: as per code below

Description	Options
Gear type (3 characters)	GOV
Sweep length (metres)	60/110
Groundrope type (standard or bobbins)	S/B

Acceptable file formats are:

Format	Extension
Excel	.XLS
Lotus 1-2-3	.WK?
Dbase3	.DBF
Comma separated	.CSV

The data should be exchanged on high or double density 3.5" disks.

APPENDIX II
MATURITY KEY

1. VIRGIN

- Male Testes very thin translucent ribbon lying along an unbranched blood vessel.
No sign of development.
- Female Ovaries small, elongated, whitish, translucent. No sign of development.

2. MATURING

- Male Development has obviously started, colour is progressing towards creamy white and the testes are filling more and more of the body cavity but sperm cannot be extruded with only moderate pressure.
- Female Development has obviously started, eggs are becoming larger and the ovaries are filling more and more of the body cavity but eggs cannot be extruded with only moderate pressure.

3. SPAWNING

- Male Will extrude sperm under moderate pressure to advanced stage of extruding sperm freely with some sperm still in the gonad.
- Female Will extrude eggs under moderate pressure to advanced stage of extruding eggs freely with some eggs still in the gonad.

4. SPENT

- Male Testes shrunken with little sperm in the gonads but often some in the gonoducts which can be extruded under light pressure. Resting condition firm, not translucent, showing no development.
- Female Ovaries shrunken with few residual eggs and much slime. Resting condition, firm, not translucent, showing no development.

APPENDIX III

ALPHA CODES FOR COUNTRIES AND SHIPS

COUNTRY	ICES CODE	SHIP'S NAME	IYFS CODE
Denmark	DEN	Dana (old)	- DAN
		J.C.Svabo	- JCS
		Dana (new)	- DAN2
France	FRA	Thalassa	- THA
		Thalassa (new)	- THA2
		La Perle	- LAP
		Cryos	- CRY
		Gwen Drez	-.GWD
Germany	GFR	Anton Dohrn (old)	- AND
		Anton Dohrn (new)	- AND2
		Solea	- SOL
		Walther Herwig	- WAH
		Walther Herwig III	- WAH3
Ireland IRL		Lough Beltra	- LOB
		Commercial vessel	- COMI
Netherlands	NED	Willem Beukelsz	- WIL
		Tridens (old)	- TRI
		Tridens (new)	- TRI2
		Isis	- ISI
		Rose-Marie	- ROS
		Nicolaas Senior	-- KLA
Norway	NOR	G.O.Sars	- GOS
		Johan Hjort (old)	- JOH
		Feiebas	- FEI
		Michael Sars	- MIC
		Eldjarn	- ELD
		Johan Hjort (new)	- JHJ
Portugal	POR	Noruega	- NOR
Spain	SPA	Cornide de Saavedra	- CDS
United Kingdom (England and Wales)	ENG	Clione	- CLI
		Ernest Holt	- ERN
		Cirolana	- CIR
		Commercial vessel	- COME
United Kingdom (Scotland)	SCO	Explorer	- EXP
		Scotia (old)	- SCO
		Clupea	- CLU
		Scotia (new)	- SCO2

Sweden	SWE	Thesis	- THE
		Skagerak	- SKA
		Argos	- ARG
Union of Soviet Socialist Republics	USS	Viandra	- VIA
		Vaida	- VAI
		Aliot	- ALI
		Antares	- ANT
		Korifena	- KOR

APPENDIX IV

PRELIMINARY ALPHANUMERIC CODE FOR IYFS / IBTS GEARS

DHT	Dutch Herring Trawl	Scotia, Cirolana
DHT40	40 Feet	Clupea
DHT45	45 Feet	Willem Beukelsz
DHT48	48 Feet	Explorer
DHT63	63 Feet	Tridens
DHT73	73 Feet	Tridens
HT	Herring Bottom Trawl	Dana: 3 Winged trawl
HT120	120 Feet	Dana
HT180	180 Feet	Anton Dohrn
VIN	Vinge Trawl	Scotia
INT	Industrial Trawl	G.O.Sars, Feiebas
GRT	Granton Trawl	G.O.Sars, Feiebas, Cirolana
HOB	High Opening Bottom Trawl	Tridens, G.O.Sars
GOV	Grand Ouverture Verticale	Standard gear for all vessels
ABD	Aberdeen 48 ft Trawl	Scotia
COM	Commercial trawl with sprat bag	Irish commercial trawl
BOX	Boris 'Goshawk' Box Trawl	England
PHHT	Potuguese High Headline Trawl	Cirolana
GOVS	Small GOV 20/25	Gwen Drez
BAKA	Baka Trawl	Cornide de Saavedra
NCT	Norwegian Campelen Trawl	Noruega

Within the gear field the following positions have been reserved for recording various types of rigging:

Position 14-16 Sweep length in m. (Numeric, right justified, zero filled. Spaces for unknown.
Code 000 indicates the semi-pelagic rigging, this specification is associated with the GOV.)

Position 17: Exceptions (B=Bobbins used, D=Double sweeps, space=standard or not known).

Position 18: Door type (P=Polyvalent, V=Vee, F=Flat, K=Karm Waco, space=others or not known).

Further quantitative numeric information on rigging of gear is defined in positions 74-95, in Record Type 1.

NB: This code must still be considered as a preliminary one. More detailed information on the gears used in the past is required before a completely comprehensive coding system can be developed.

APPENDIX V

RECORDED SPECIES CODES

- NB: 1) Zero catches of a particular species in a haul may be included in or excluded from the file. However, any species deliberately excluded from a subset, or an invalid species for a particular haul, should be included for each haul with a species validity code 0 !!.
- 2) For species codes see Appendix VI and VII.

RECORDED STANDARD SPECIES LIST CODES (POSITION 65)

- 0 = No standard species recorded
- 1 = All (7) standard species recorded
- 2 = Pelagic (3) standard species recorded 1)
- 3 = Roundfish (4) standard species recorded 1)
- 4 = Individual (1) standard species recorded 2)

RECORDED BY-CATCH SPECIES LIST CODES (POSITION 66)

- 0 = No by-catch species recorded
- 1 = Open ended by-catch list - All species, even species complexes
- 2 = Closed by-catch list - All (27) species recorded
- 3 = Closed by-catch list - Gadoid (8) species recorded 1)
- 4 = Closed by-catch list - Flatfish (9) species recorded 1)
- 5 = Closed by-catch list - Various (10) species recorded 1)

- 1) For definition see Appendix VI.
- 2) If this code is applied, zero catches of the species recorded must be recorded in Record Type 2 format.

EXAMPLES OF APPLICATION OF THE SPECIES RECORDING CODE
AND CORRESPONDING TREATMENT IN THE ANALYSIS PHASE

1) All species are recorded.

Species recording code = 1 1

Comments: All fish species incorporated in Appendix VII are reported. Records for species having zero catches may be omitted, but for species which have deliberately not been counted must be included with validity code 0.

Analysis: Zeroes are generated for a species for which no record exists. Hauls with species validity code 0 are omitted for that species.

2) All standard pelagic species are recorded and no others.

Species recording code = 2 0

Comments: The catch of other species than herring sprat and mackerel is not available.

Analysis: Zeroes are generated for a standard pelagic species for which no record exists. For other species a validity code 0 is generated and the haul will thus be omitted.

3) All standard roundfish species and herring are recorded.

Species recording code = 1 0

Comments: The catch of other species than cod, haddock, whiting, Norway pout and herring is not available. The non-available standard species in the reference list for code 1 (sprat and mackerel) must be included in the file showing validity code 0. Standard species having zero catches may be omitted from the file.

Analysis: Zeroes are generated for a standard species for which no record exists. For other species a validity code is generated and the haul will thus be omitted.

4) Only one species recorded (e.g. herring).

Two options exist to cope with this example:

Option A.

Species recording code = 2 0

Comments: Sprat and mackerel must be recorded with validity code 0. Zero catches of herring may be omitted.

Analysis: As in example 3.

Option B.

Species recording code = 4 0

Comments: For each haul a record must be given showing the herring catch, even when it is zero.

Analysis: Species validity code 0 is generated for all other species than the one reported (i.e. herring) and the haul will thus be omitted from the analysis.

APPENDIX VI

SPECIES NAMES AND NODC CODES
FOR STANDARD AND CLOSED BY-CATCH LISTS

GROUP	SPECIES	NODC
Standard Pelagic	Herring	8747010201
	Sprat	8747011701
	Mackerel	8850030302
Standard Roundfish	Cod	8791030402
	Haddock	8791031301
	Whiting	8791031801
	Norway pout	8791031703
By-catch Gadoid	Saithe	8791030901
	Pollack	8791030902
	Pouting	8791031702
	Poor cod	8791031701
	Blue whiting	8791032201
	Hake	8791040105
	Ling	8791031901
	Tusk	8791031101
By-catch Flatfish	Plaice	8857041502
	Dab	8857040904
	Long rough dab	8857040603
	Lemon sole	8857041202
	Witch	8857040502
	Megrim	8857032302
	Turbot	8857030402
	Brill	8857030403
	Halibut	8857041902
	Flounder	8857041402
	Sole	8858010601
By-catch Various	Grey gurnard	8826020601
	Red gurnard	8826020801
	Spurdog	8710010201
	Horse mackerel	8835280103
	Red mullet	8835450202
	Lesser silversmelt	8756010209
	Greater silversmelt	8756010203
	Dragonet	8846010106
	Monkfish	8786010103
	Catfish	8842020103
	Sandeels	8845010000

APPENDIX VII

NODC CODES FOR FISH SPECIES (IN TAXONOMIC ORDER)

8603010000	Petromyzonidae		
8603010200	Lampetra	8603010217	Lampetra fluviatilis
		8603010218	Lampetra planeri
8603010300	Petromyzon	8603010301	Petromyzon marinus
8606010000	Myxinidae		
8606010200	Myxine	8606010201	Myxine glutinosa
8705010000	Chlamydoselachidae		
8705010100	Chlamydoselach	8705010101	Chlamydoselach anguineus
8705020000	Hexanchidae		
8705020100	Hexanchus	8705020101	Hexanchus Griseus
8707040000	Lamnidae		
8707040200	Cetorhinus	8707040201	Cetorhinus maximus
8707040300	Lamna	8707040302	Lamna nasus
8707040400	Alopias	8707040401	Alopias vulpinus
8707040500	Isurus	8707040501	Isurus oxyrinchus
8708010000	Scyliorhinidae		
8708010100	Apristurus	8708010103	Apristurus laurussoni
8708010200	Galeus	8708010203	Galeus melastomus
		8708010204	Galeus murinus
8708010300	Scyliorhinus	8708010306	Scyliorhinus caniculus
		8708010307	Scyliorhinus stellaris
8708010700	Pseudotriakis	8708010701	Pseudotriakis microdon
8708020000	Carcharinidae		
8708020100	Galeorhinus	8708020102	Galeorhinus galeus
8708020200	Galeocerdo	8708020201	Galeocerdo cuvier
8708020400	Mustelus	8708020408	Mustelus asterias
		8708020409	Mustelus mustelus
		8708020410	Mustelus punctulatus
8708020600	Prionace	8708020601	Prionace glauca
8708030000	Sphyrnidae		
8708030100	Sphyrna	8708030102	Sphyrna zygaena
		8708030103	Sphyrna lewini
		8708030105	Sphyrna tudes
8710010000	Squalidae		
8710010100	Somniosus	8710010102	Somniosus microcephalus
8710010200	Squalus	8710010201	Squalus acanthias
		8710010202	Squalus blainvillei
8710010300	Centrophorus	8710010301	Centrophorus granulosus
		8710010302	Centrophorus squamosus
		8710010303	Centrophorus uyato
8710010400	Dalatias	8710010401	Dalatias licha
8710010500	Etmopterus	8710010503	Etmopterus princeps
		8710010510	Etmopterus spinax

8710010700	Oxynotus	8710010702	Oxynotus centrina
		8710010703	Oxynotus paradoxus
8710010900	Centroscyllium	8710010901	Centroscyllium fabricii
8710011000	Echinorhinus	8710011001	Echinorhinus brucus
8710011200	Centroscyrnus	8710011201	Centroscyrnus coelolepis
		8710011202	Centroscyrnus crepidater
8710011400	Deania	8710011401	Deania calceus
8710011600	Scymnodon	8710011601	Scymnodon ringens
		8710011602	Scymnodon obscurus
8711010000	Squatinae		
8711010100	Squatina	8711010103	Squatina squatina
8713030000	Torpedinidae		
8713030100	Torpedo	8713030102	Torpedo nobiliana
		8713030104	Torpedo torpedo
		8713030105	Torpedo marmorata
8713040000	Rajidae		
8713040100	Raja	8713040134	Raja radiata
		8713040138	Raja brachyura
		8713040140	Raja microocellata
		8713040141	Raja montagui
		8713040142	Raja hyperborea
		8713040143	Raja batis
		8713040144	Raja nidarosiensis
		8713040145	Raja oxyrhynchus
		8713040146	Raja fullonica
		8713040147	Raja circularis
		8713040148	Raja naevus
		8713040150	Raja fyllae
		8713040151	Raja alba
		8713040153	Raja lintea
		8713040158	Raja undulata
		8713040159	Raja clavata
8713040800	Bathyraja	8713040801	Bathyraja pallida
		8713040803	Bathyraja spinicauda
8713050000	Dasyatidae		
8713050100	Dasyatis	8713050111	Dasyatis pastinacus
8713070000	Myliobatidae		
8713070200	Myliobatis	8713070204	Myliobatis aquila
8713080000	Mobulidae		
8713080200	Mobula	8713080205	Mobula mobular
8716020000	Chimaeridae		
8716020100	Hydrolagus	8716020103	Hydrolagus mirabilis
8716020200	Chimaera	8716020202	Chimaera monstrosa
8716030000	Rhinochimaeridae		
8716030200	Rhinochimaera	8716030201	Rhinochimaera atlantica
8729010000	Acipenseridae		

8729010100	Acipenser	8729010107	Acipenser sturio
8741010000	Anguillidae		
8741010100	Anguilla	8741010102	Anguilla anguilla
8741050000	Muraenidae		
8741050500	Muraena	8741050505	Muraena helena
8741120000	Congridae		
8741120100	Conger	8741120111	Conger conger
8741150000	Synaphobranchidae		
8741150100	Synaphobranchus	8741150104	Synaphobranchus kaupi
8741200000	Serrivomeridae		
8741200100	Serrivomer	8741200102	Serrivomer beani
		8741200104	Serrivomer parabeani
8741210000	Nemichthyidae		
8741210100	Avocettina	8741210102	Avocettina infans
8741210200	Nemichthys	8741210202	Nemichthys scolopaceus
8743030000	Notacanthidae		
8743030200	Polyacanthonotus	8743030204	Polyacanthonotus rissoanus
8743030300	Notocanthus	8743030301	Notocanthus chemnitzii
		8743030302	Notocanthus bonaparti
8747010000	Clupeidae		
8747010100	Alosa	8747010107	Alosa alosa
		8747010109	Alosa fallax
8747010200	Clupea	8747010201	Clupea harengus
8747011700	Sprattus	8747011701	Sprattus sprattus
8747012200	Sardina	8747012201	Sardina pilchardus
8747020000	Engraulidae		
8747020100	Engraulis	8747020104	Engraulis encrasicolus
8755010000	Salmonidae		
8755010100	Coregonus	8755010115	Coregonus lavaretus
		8755010116	Coregonus albula
8755010200	Oncorhynchus	8755010201	Oncorhynchus gorbuscha
		8755010202	Oncorhynchus keta
8755010300	Salmo	8755010302	Salmo gairdneri
		8755010305	Salmo salar
		8755010306	Salmo trutta
8755010400	Salvelinus	8755010402	Salvelinus alpinus
		8755010404	Salvelinus fontinalis
8755010700	Thymallus	8755010704	Thymallus thymallus
8755010800	Hucho	8755010801	Hucho hucho
8755030000	Osmeridae		
8755030200	Mallotus	8755030201	Mallotus villosus
8755030300	Osmerus	8755030301	Osmerus eperlanus

8756010000	Argentinidae		
8756010200	Argentina	8756010203	Argentina silus
		8756010209	Argentina sphyraena
8758010000	Esocidae		
8758010100	Esox	8758010101	Esox lucius
8758020000	Umbridae		
8758020100	Umbra	8758020101	Umbra pygmaea
		8758020103	Umbra krameri
8759010000	Gonostomatidae		
8759010500	Maurolicus	8759010501	Maurolicus muelleri
8759020000	Sternoptychidae		
8759020100	Argyropelecus	8759020107	Argyropelecus olfersii
8760010000	Alepocephalidae		
8760010300	Alepocephalus	8760010302	Alepocephalus rostratus
		8760010305	Alepocephalus bairdi
8760010700	Conocara	8760010704	Conocara salmonea
8762070000	Paralepididae		
8762070200	Notolepis	8762070201	Notolepis rissoi
8762070400	Paralepis	8762070402	Paralepis coregonoides
8762140000	Myctophidae		
8762140300	Lampanyctus	8762140317	Lampanyctus crocodilus
8784010000	Gobiesocidae		
8784010600	Lepadogaster	8784010601	Lepadogaster candollei
		8784010603	Lepadogaster lepadogaster
8784010700	Diplecogaster	8784010701	Diplecogaster bimaculata
8784010800	Apletodon	8784010801	Apletodon microcephalus
8786010000	Lophiidae		
8786010100	Lophius	8786010103	Lophius piscatorius
		8786010104	Lophius budegassa
8787020000	Antennariidae		
8787020100	Histrio	8787020101	Histrio histrio
8787020200	Antennarius	8787020203	Antennarius radiosus
8788030000	Himantolophiidae		
8788030200	Himantolophus	8788030201	Himantolophus groenlandicus
8788080000	Ceratiidae		
8788080100	Ceratias	8788080101	Ceratias holboelli
8788100000	Linophryniidae		
8788100100	Linophryne	8788100102	Linophryne lucifer
8791010000	Moridae		
8791010100	Antimora	8791010101	Antimora rostrata
8791010200	Laemonema	8791010203	Laemonema latifrons

8791010400	Mora	8791010401	Mora moro
8791010500	Lepidion	8791010501	Lepidion eques
8791010600	Halargyreus	8791010601	Halargyreus affinis
8791030000	Gadidae		
8791030200	Boreogadus	8791030201	Boreogadus saida
8791030400	Gadus	8791030402	Gadus morhua
8791030800	Lota	8791030801	Lota lota
8791030900	Pollachius	8791030901	Pollachius virens
		8791030902	Pollachius pollachius
8791031100	Brosme	8791031101	Brosme brosme
8791031300	Melanogrammus	8791031301	Melanogrammus aeglefinus
8791031500	Rhinonemus	8791031501	Rhinonemus cimbrius
8791031600	Phycis	8791031602	Phycis blennoides
8791031700	Trisopterus	8791031701	Trisopterus minutus
		8791031702	Trisopterus luscus
		8791031703	Trisopterus esmarki
8791031800	Merlangius	8791031801	Merlangius merlangus
8791031900	Molva	8791031901	Molva molva
		8791031902	Molva dipterygia
		8791031904	Molva macrophthalma
8791032000	Gaidropsurus	8791032001	Gaidropsurus vulgaris
		8791032002	Gaidropsurus mediterraneus
8791032100	Gadiculus	8791032101	Gadiculus argenteus
8791032200	Micromesistius	8791032201	Micromesistius poutassou
8791032300	Raniceps	8791032301	Raniceps raninus
8791032400	Ciliata	8791032401	Ciliata mustela
		8791032402	Ciliata septentrionalis
8791032500	Onogadus	8791032501	Onogadus argenteus
8791032600	Antonogadus	8791032601	Antonogadus macrophthalmus
8791040000	Merluccidae		
8791040100	Merluccius	8791040105	Merluccius merluccius
8792010000	Ophidiidae		
8792010600	Ophidion	8792010607	Ophidion barbatum
8792020000	Carapidae		
8792020200	Echiodon	8792020202	Echiodon drummondi
8793010000	Zoarcidae		
8793010500	Lycenchelys	8793010513	Lycenchelys sarsi
8793010700	Lycodes	8793010724	Lycodes vahlII
		8793010725	Lycodes esmarkii
8793012000	Zoarces	8793012001	Zoarces viviparus
8794010000	Macrouridae		
8794010100	Coryphaenoides	8794010117	Coryphaenoides rupestris
8794010400	Coelorinchus	8794010405	Coelorinchus coelorinchus
8794010600	Malacocephalus	8794010601	Malacocephalus laevis
8794010800	Nezumia	8794010801	Nezumia aequalis
8794011500	Trachyrhynchus	8794011501	Trachyrhynchus trachyrhynchus
		8794011502	Trachyrhynchus murrayi
8794011600	Macrourus	8794011601	Macrourus berglax

8803010000	Exocoetidae		
8803010100	Cypselurus	8803010101	Cypselurus heterurus
		8803010106	Cypselurus pinnatibarbatus
8803010500	Danichthys	8803010501	Danichthys rondeletii
8803010700	Exocoetus	8803010701	Exocoetus obtusirostris
8803020000	Belonidae		
8803020500	Belone	8803020502	Belone belone
8803030000	Scomberesocidae		
8803030200	Scomberesox	8803030201	Scomberesox saurus
8805020000	Atherinidae		
8805021000	Atherina	8805021002	Atherina boyeri
		8805021003	Atherina presbyter
8810010000	Diretmidae		
8810010100	Diretmus	8810010101	Diretmus argenteus
8810020000	Trachichthyidae		
8810020100	Gephyroberyx	8810020101	Gephyroberyx darwini
8810020200	Hoplostethus	8810020201	Hoplostethus atlanticus
		8810020202	Hoplostethus mediterraneus
8810050000	Berycidae		
8810050100	Beryx	8810050101	Beryx decadactylus
		8810050102	Beryx splendens
8811030000	Zeidae		
8811030300	Zeus	8811030301	Zeus faber
8811060000	Caproidae		
8811060300	Capros	8811060301	Capros aper
8813010000	Lampridae		
8813010100	Lampris	8813010102	Lampris guttatus
8815020000	Trachipteridae		
8815020100	Trachipterus	8815020102	Trachipterus arcticus
8815030000	Regalecidae		
8815030100	Regalecus	8815030101	Regalecus glesne
8818010000	Gasterosteidae		
8818010100	Gasterosteus	8818010101	Gasterosteus aculeatus
8818010200	Pungitius	8818010201	Pungitius pungitius
8818010500	Spinachia	8818010501	Spinachia spinachia
8819030000	Macrorhamphosidae		
8819030100	Macrorhamphosus	8819030101	Macrorhamphosus scolopax
8820020000	Syngnathidae		
8820020100	Syngnathus	8820020119	Syngnathus rostellatus
		8820020120	Syngnathus acus
		8820020123	Syngnathus typhle

8820020200	Hippocampus	8820020209	Hippocampus hippocampus
		8820020210	Hippocampus ramulosus
8820022100	Entelurus	8820022101	Entelurus aequoreus
8820022200	Nerophis	8820022201	Nerophis lumbriciformis
		8820022202	Nerophis ophidion
8826010000	Scorpaenidae		
8826010100	Sebastes	8826010139	Sebastes marinus
		8826010151	Sebastes mentella
		8826010175	Sebastes viviparus
8826010300	Helicolenus	8826010301	Helicolenus dactylopterus
8826010600	Scorpaena	8826010628	Scorpaena scropha
		8826010629	Scorpaena porcus
8826011100	Trachyscorpia	8826011101	Trachyscorpia cristulata
8826020000	Triglidae		
8826020300	Peristedion	8826020316	Peristedion cataphractum
8826020500	Trigla	8826020501	Trigla lucerna
		8826020503	Trigla lyra
8826020600	Eutrigla	8826020601	Eutrigla gurnardus
8826020700	Trigloporus	8826020701	Trigloporus lastoviza
8826020800	Aspitrigla	8826020801	Aspitrigla cuculus
		8826020802	Aspitrigla obscura
8831010000	Icelidae		
8831010100	Icelus	8831010101	Icelus bicornis
8831020000	Cottidae		
8831020300	Artediellus	8831020308	Artediellus europaeus
8831020800	Cottus	8831020825	Cottus gobio
8831022200	Myoxocephalus	8831022205	Myoxocephalus quadricornis
		8831022207	Myoxocephalus scorpius
8831023800	Triglops	8831023807	Triglops murrayi
8831024600	Taurulus	8831024601	Taurulus bubalis
		8831024602	Taurulus lilljeborgi
8831060000	Cottunculidae		
8831060100	Cottunculus	8831060101	Cottunculus microps
8831080000	Agonidae		
8831080800	Agonus	8831080801	Agonus decagonus
		8831080803	Agonus cataphractus
8831090000	Cyclopteridae		
8831090200	Careproctus	8831090232	Careproctus longipinnis
		8831090233	Careproctus reinhardi
8831090800	Liparis	8831090828	Liparis liparis
		8831090831	Liparis montagui
8831091500	Cyclopterus	8831091501	Cyclopterus lumpus
8835020000	Serranidae		
8835020100	Morone	8835020102	Morone saxatilis
8835020400	Epinephelus	8835020435	Epinephelus guaza
8835022300	Serranus	8835022316	Serranus cabrilla
8835022800	Polyprion	8835022801	Polyprion americanus

8835160000	Centrarchidae		
8835160200	Ambloplites	8835160201	Ambloplites rupestris
8835160500	Lepomis	8835160505	Lepomis gibbosus
8835160600	Micropterus	8835160601	Micropterus dolomieu
		8835160602	Micropterus salmoides
8835180000	Apogonidae		
8835180400	Epigonus	8835180403	Epigonus telescopus
8835181200	Rhctogramma	8835181201	Rhctogramma sherborni
8835270000	Echeneidae		
8835270100	Remora	8835270103	Remora remora
8835280000	Carangidae		
8835280100	Trachurus	8835280103	Trachurus trachurus
		8835280105	Trachurus mediterraneus
		8835280106	Trachurus picturatus
8835280800	Seriola	8835280801	Seriola dumerili
8835280900	Trachinotus	8835280911	Trachinotus ovatus
8835281500	Naucrates	8835281501	Naucrates ductor
8835282400	Lichia	8835282401	Lichia amia
8835330000	Caristiidae		
8835330100	Caristius	8835330101	Caristius macropus
8835430000	Sparidae		
8835431000	Dentex	8835431002	Dentex macropthalmus
		8835431005	Dentex dentex
8835430600	Pagrus	8835430601	Pagrus pagrus
8835430800	Pagellus	8835430801	Pagellus bogaraveo
		8835430802	Pagellus acarne
		8835430804	Pagellus erythrinus
8835430900	Boops	8835430901	Boops boops
8835431100	Sparus	8835431101	Sparus aurata
		8835431102	Sparus pagurus
8835431200	Spondyliosoma	8835431201	Spondyliosoma cantharus
8835440000	Sciaenidae		
8835441100	Umbrina	8835441107	Umbrina canariensis
		8835441108	Umbrina cirrosa
8835442700	Argyrosomus	8835442701	Argyrosomus regium
8835450000	Mullidae		
8835450200	Mullus	8835450202	Mullus surmuletus
		8835450203	Mullus barbatus
8835700000	Cepolidae		
8835700100	Cepola	8835700102	Cepola rubescens
8835710000	Bramidae		
8835710100	Brama	8835710102	Brama brama
8835710300	Pterycombus	8835710301	Pterycombus brama
8835710400	Taractes	8835710403	Taractes asper
8835710700	Taractichthys	8835710701	Taractichthys longipinnis
8835720000	Percichthyidae		

8835720100	Dicentrarchus	8835720101	Dicentrarchus labrax
		8835720102	Dicentrarchus punctatus
8836010000	Mugilidae		
8836010100	Mugil	8836010101	Mugil cephalus
8836010700	Chelon	8836010704	Chelon labrosus
8836010900	Liza	8836010901	Liza ramada
		8836010902	Liza auratus
8839010000	Labridae		
8839012300	Coris	8839012306	Coris julis
8839013300	Crenilabrus	8839013301	Crenilabrus melops
8839013400	Centrolabrus	8839013401	Centrolabrus exoletus
8839013500	Ctenolabrus	8839013501	Ctenolabrus rupestris
8839013600	Labrus	8839013603	Labrus berggylta
		8839013605	Labrus mixtus
8839013700	Acantholabrus	8839013701	Acantholabrus palloni
8840060000	Trachinidae		
8840060100	Trachinus	8840060101	Trachinus vipera
		8840060102	Trachinus draco
8842010000	Blenniidae		
8842010100	Blennius	8842010104	Blennius ocellaris
		8842010110	Blennius gattorugine
		8842010115	Blennius pholis
8842012400	Coryphoblennius	8842012401	Coryphoblennius galerita
8842020000	Anarhichadidae		
8842020100	Anarhichas	8842020102	Anarhichas denticulatus
		8842020103	Anarhichas lupus
		8842020104	Anarhichas minor
8842120000	Stichaeidae		
8842120500	Chirolophis	8842120505	Chirolophis ascanii
8842120900	Lumpenus	8842120905	Lumpenus lampraeformis
8842121800	Leptoclinus	8842121801	Leptoclinus maculatus
8842130000	Pholididae		
8842130200	Pholis	8842130209	Pholis gunnellus
8845010000	Ammodytidae		
8845010100	Ammodytes	8845010105	Ammodytes tobianus
		8845010106	Ammodytes marinus
8845010200	Gymnammodytes	8845010201	Gymnammodytes semisquamatus
8845010300	Hyperoplus	8845010301	Hyperoplus lanceolatus
		8845010302	Hyperoplus immaculatus
8846010000	Callionymidae		
8846010100	Callionymus	8846010106	Callionymus lyra
		8846010107	Callionymus maculatus
		8846010120	Callionymus reticulatus
8847010000	Gobiidae		
8847011300	Gobius	8847011304	Gobius auratus

		8847011307	Gobius cobitis
		8847011308	Gobius cruentatus
		8847011316	Gobius niger
		8847011320	Gobius paganellus
		8847011325	Gobius gasteveni
8847014900	Crystallogobius	8847014901	Crystallogobius linearis
8847015000	Gobiusculus	8847015001	Gobiusculus flavescens
8847015100	Pomatoschistus	8847015101	Pomatoschistus minutus
		8847015102	Pomatoschistus pictus
		8847015103	Pomatoschistus microps
		8847015104	Pomatoschistus norvegicus
8847016500	Lebetus	8847016501	Lebetus orca
		8847016502	Lebetus guilleti
8847016600	Aphia	8847016601	Aphia minuta
8847016700	Lesueurigobius	8847016702	Lesueurigobius friesii
8847016800	Buenia	8847016802	Buenia jeffreysii
8847016900	Thorogobius	8847016901	Thorogobius ephippiatus
8850010000	Gempylidae		
8850010400	Ruvettus	8850010401	Ruvettus pretiosus
8850010700	Nesarchus	8850010701	Nesarchus nasutus
8850020000	Trichiuridae		
8850020100	Benthodesmus	8850020101	Benthodesmus simonyi
8850020200	Trichiurus	8850020201	Trichiurus lepturus
8850020300	Aphanopus	8850020301	Aphanopus carbo
8850020400	Lepidopus	8850020401	Lepidopus caudatus
8850030000	Scombridae		
8850030100	Euthynnus	8850030101	Euthynnus pelamis
		8850030105	Euthynnus quadripunctatus
8850030200	Sarda	8850030202	Sarda sarda
8850030300	Scomber	8850030301	Scomber colias
		8850030302	Scomber scombrus
8850030400	Thunnus	8850030401	Thunnus alalunga
		8850030402	Thunnus thynnus
		8850030403	Thunnus albacares
		8850030405	Thunnus obesus
8850030700	Auxis	8850030701	Auxis rochei
		8850030702	Auxis thazard
8850031200	Orcynopsis	8850031201	Orcynopsis unicolor
8850040000	Xiphiidae		
8850040100	Xiphias	8850040101	Xiphias gladius
8850050000	Luvaridae		
8850050100	Luvarus	8850050101	Luvarus imperialis
8850060000	Istiophoridae		
8850060100	Istiophorus	8850060101	Istiophorus platypterus
8850060300	Tetrapterus	8850060301	Tetrapterus albidus
8851010000	Centrolophidae		
8851010200	Hyperoglyphe	8851010201	Hyperoglyphe perciforma
8851010300	Centrolophus	8851010301	Centrolophus niger

		8851010302	Centrolophus medusophagus
8851020000	Nomeidae		
8851020200	Cubiceps	8851020203	Cubiceps gracilis
8851030000	Stromateidae		
8857030000	Bothidae		
8857030400	Scophthalmus	8857030402	Scophthalmus maximus
		8857030403	Scophthalmus rhombus
8857031700	Arnoglossus	8857031702	Arnoglossus laterna
		8857031703	Arnoglossus imperialis
		8857031706	Arnoglossus thori
8857032100	Zeugopterus	8857032101	Zeugopterus punctatus
8857032200	Phrynorhombus	8857032201	Phrynorhombus norvegicus
		8857032202	Phrynorhombus regius
8857032300	Lepidorhombus	8857032301	Lepidorhombus boscii
		8857032302	Lepidorhombus whiffiagonis
8857040000	Pleuronectidae		
8857040500	Glyptocephalus	8857040502	Glyptocephalus cynoglossus
8857040600	Hippoglossoides	8857040603	Hippoglossoides platessoides
8857040900	Limanda	8857040904	Limanda limanda
8857041200	Microstomus	8857041202	Microstomus kitt
8857041400	Platichthys	8857041402	Platichthys flesus
8857041500	Pleuronectes	8857041502	Pleuronectes platessa
8857041800	Reinhardtius	8857041801	Reinhardtius hippoglossoides
8857041900	Hippoglossus	8857041902	Hippoglossus hippoglossus
8858010000	Soleidae		
8858010600	Solea	8858010601	Solea solea
		8858010610	Solea lascaris
8858010800	Buglossidium	8858010801	Buglossidium luteum
8858010900	Microchirus	8858010902	Microchirus azevia
		8858010903	Microchirus variegatus
8858011000	Bathysolea	8858011001	Bathysolea profundicola
8858011100	Dicologlossa	8858011101	Dicologlossa cuneata
8858020000	Cynoglossidae		
8858020200	Cynoglossus	8858020201	Cynoglossus browni
8860020000	Balistidae		
8860020200	Balistes	8860020205	Balistes carolinensis
8860020500	Canthidermis	8860020501	Canthidermis maculatus
8861010000	Tetradontidae		
8861010100	Lagocephalus	8861010102	Lagocephalus lagocephalus
8861040000	Molidae		
8861040100	Mola	8861040101	Mola mola
8861040200	Ranzania	8861040201	Ranzania laevis

APPENDIX VIII

SPECIES VALIDITY CODE

0 = INVALID INFORMATION	Information lost.
1 = VALID INFORMATION	No per hour and total length composition recorded; applies also when No per hour is zero.
2 = PARTLY VALID INFORMATION	Refers to haul validity code P; only valid for fish over 20 cm because no liner has been used; applies also when No per hour is zero.
3 = LENGTH COMPOSITION INCOMPLETE	Only part of the catch has been measured.
4 = TOTAL NO PER HOUR ONLY	Catch sampled for No per hour only; no length measurements.
9 = VALID INFORMATION AVAILABLE BUT NOT RECORDED ON THE FILE	Data not processed on the file.

APPENDIX IX

AREA CODES, SAMPLING AREAS AND STANDARD AREAS FOR THE CALCULATION OF ABUNDANCE INDICES

AREA CODES

0	=	ICES Statistical Rectangles	See Doc. C.M. 1977/Gen:3.
1	=	Four Statistical Rectangles	See Figure 6.1
2	=	Standard Roundfish Areas	See Figure 6.2
3	=	Herring Sampling Areas	See Figure 6.3

NB: There has been confusion in the definition of herring areas in the past and for some years no ALK's may have been collected for areas 14, 15 and 67, in which case these areas must be considered as subsets of 12, 13 and 63 respectively. The Skagerrak/ Kattegat areas have also not always been distinguished in which case the appropriate code should be 80.

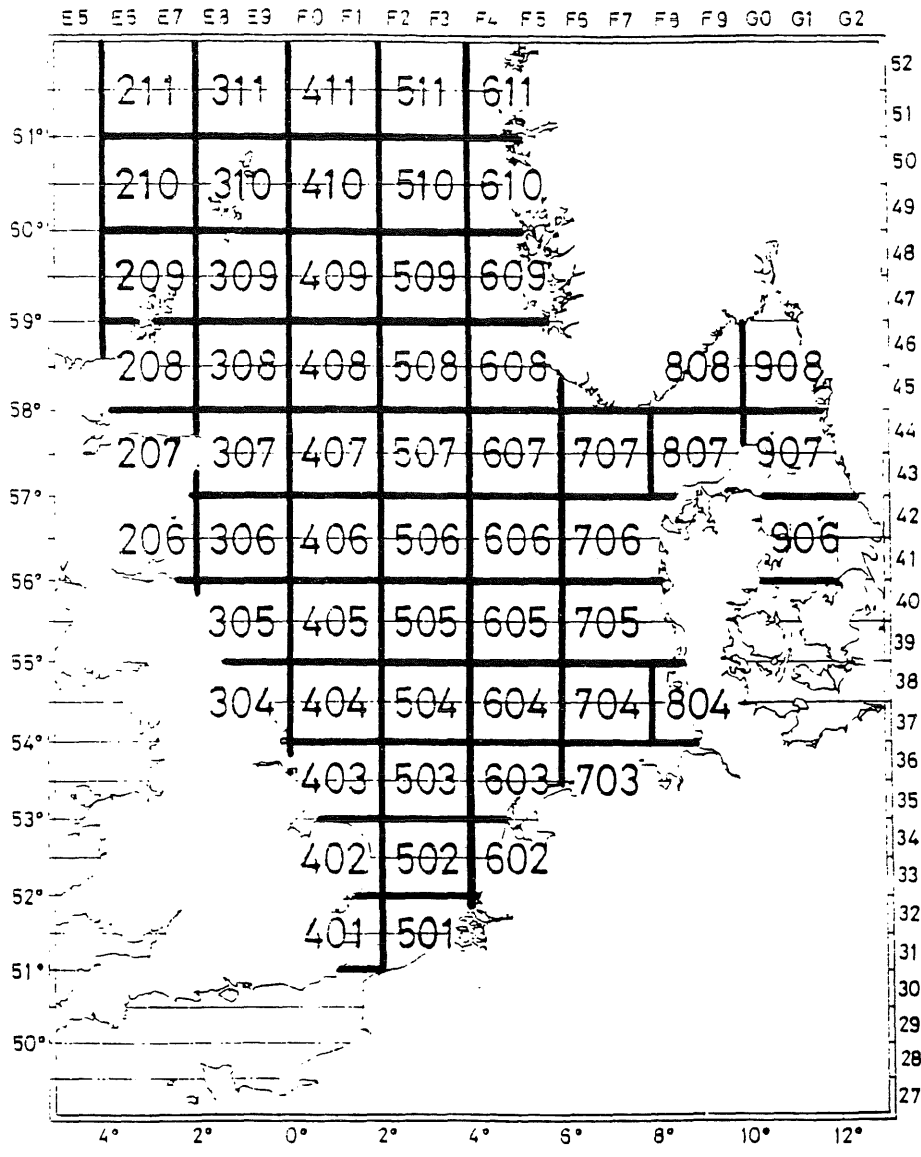


Figure 6.1 Four Statistical Rectangles: used for sampling roundfish otoliths up to and including 1979, for herring up to and including 1982.

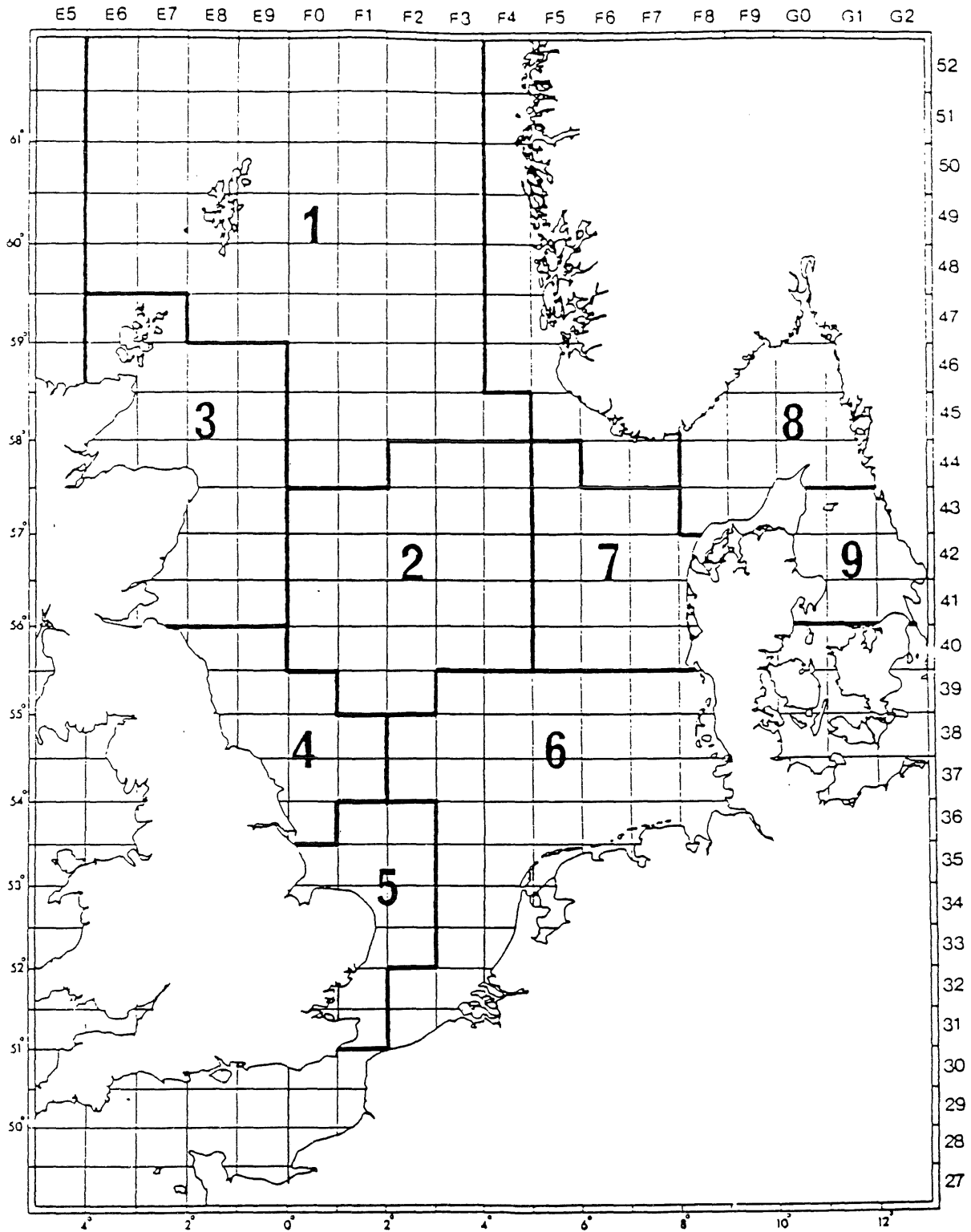


Figure 6.2 Standard Roundfish Areas: used for roundfish since 1980, for all standard species since 1991.

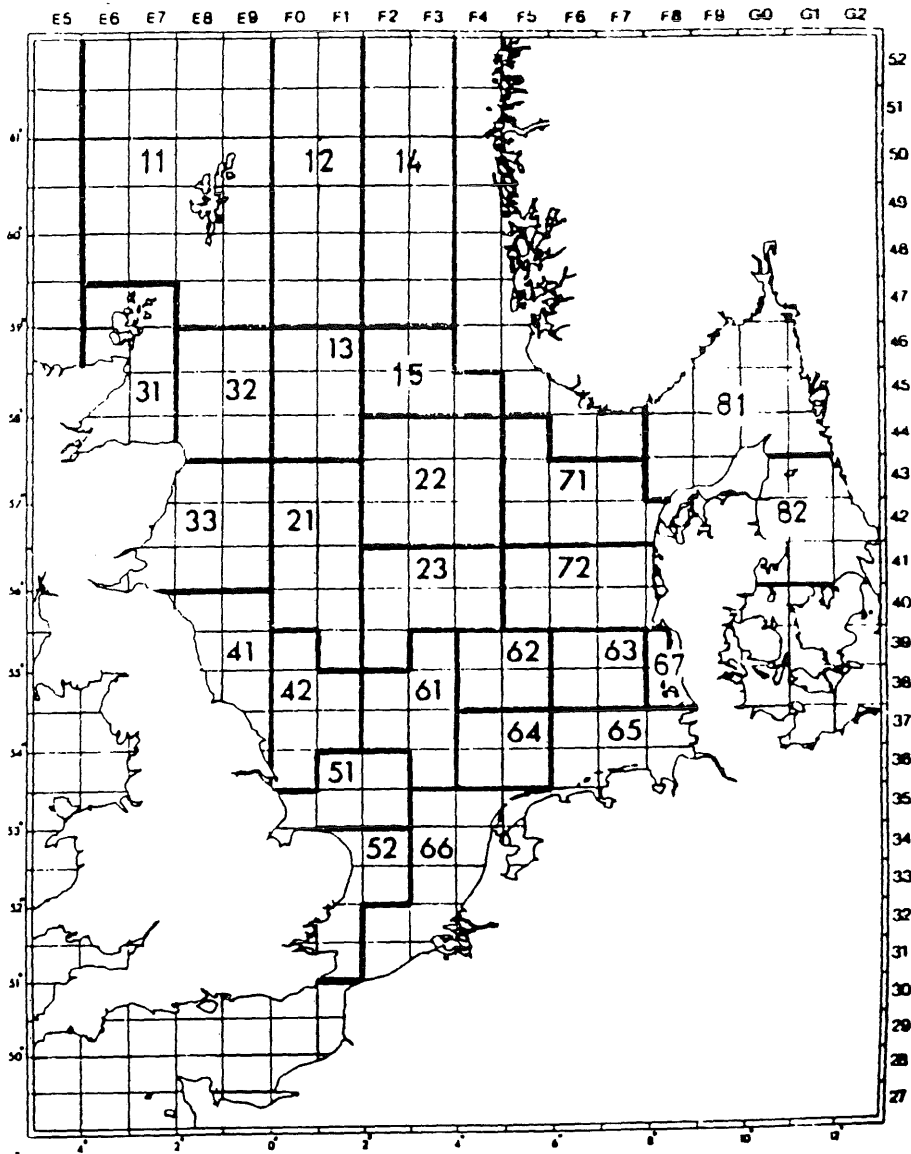


Figure 6.3 Herring Sampling Areas: used in the period 1983-1990.

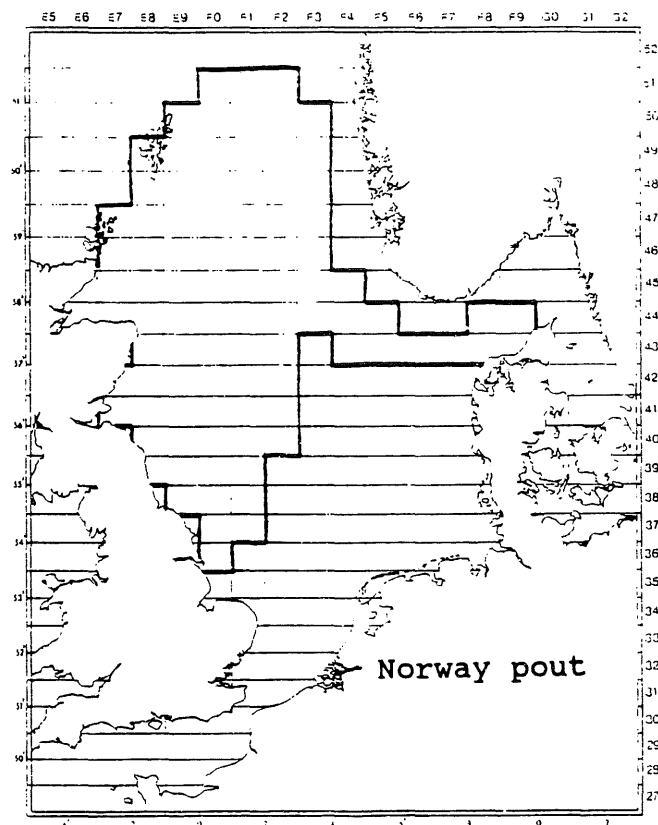
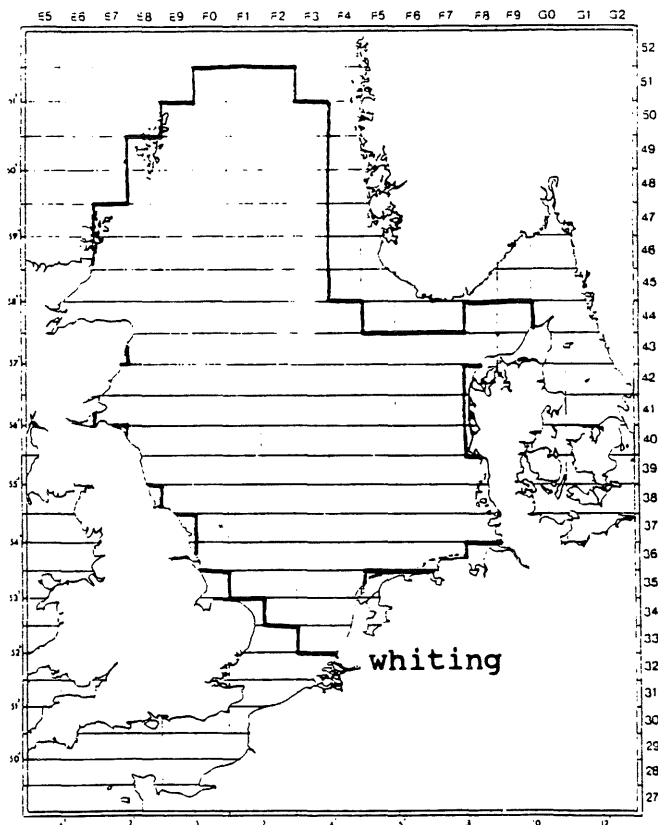
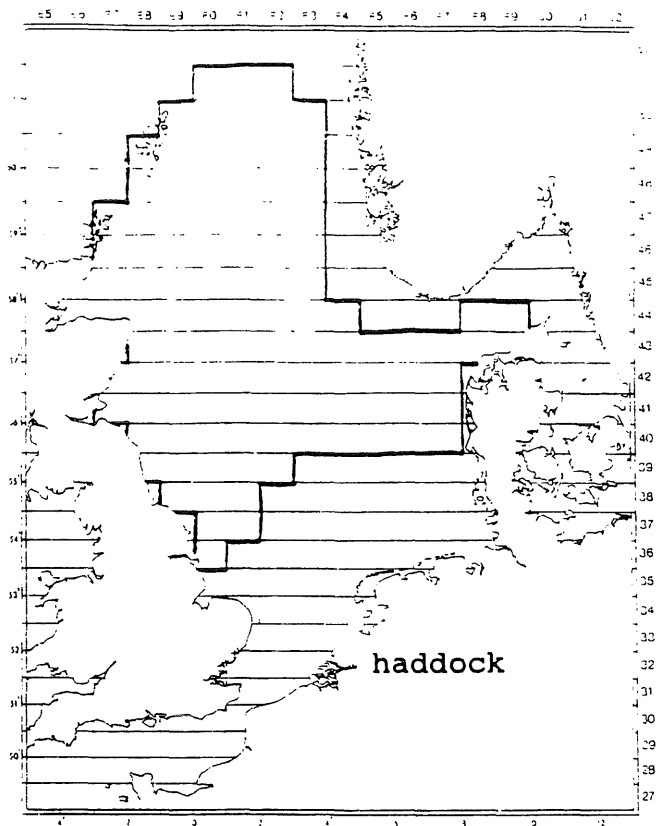
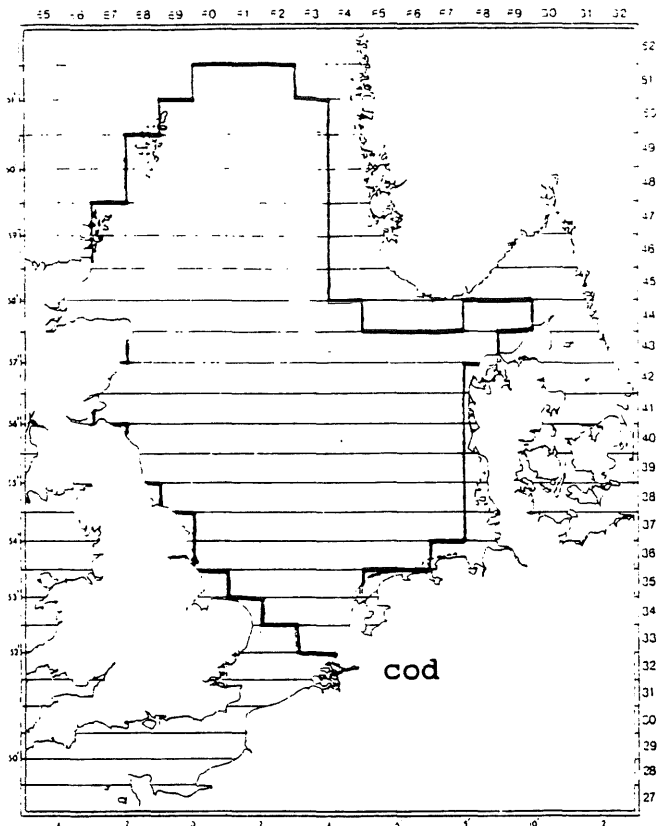


Figure 6.4 Standard areas for the calculation of the 'TYFS' abundance indices.

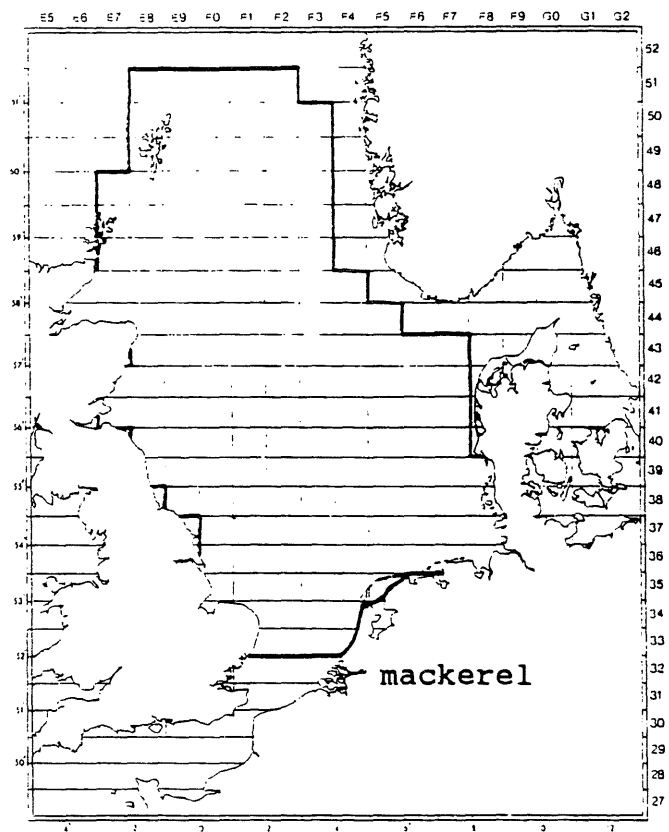
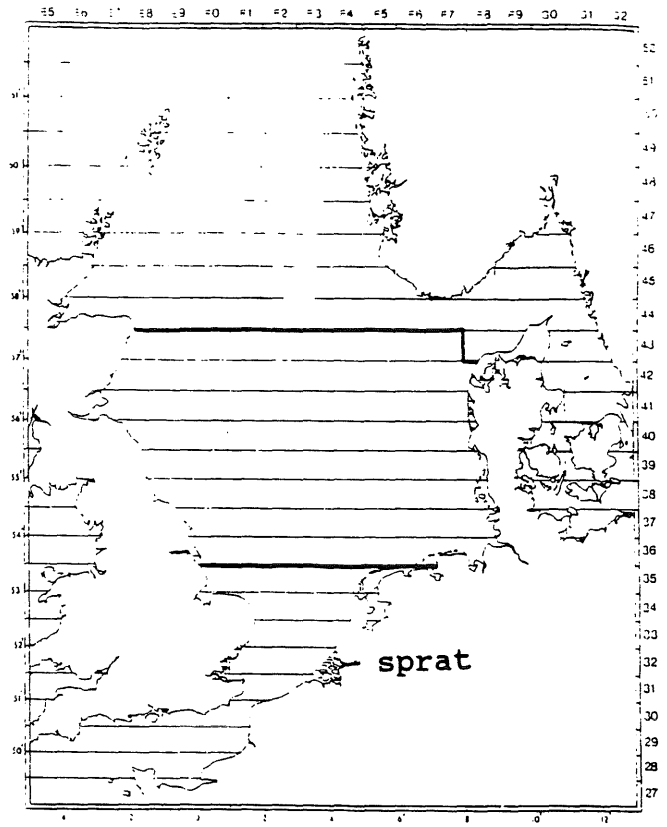
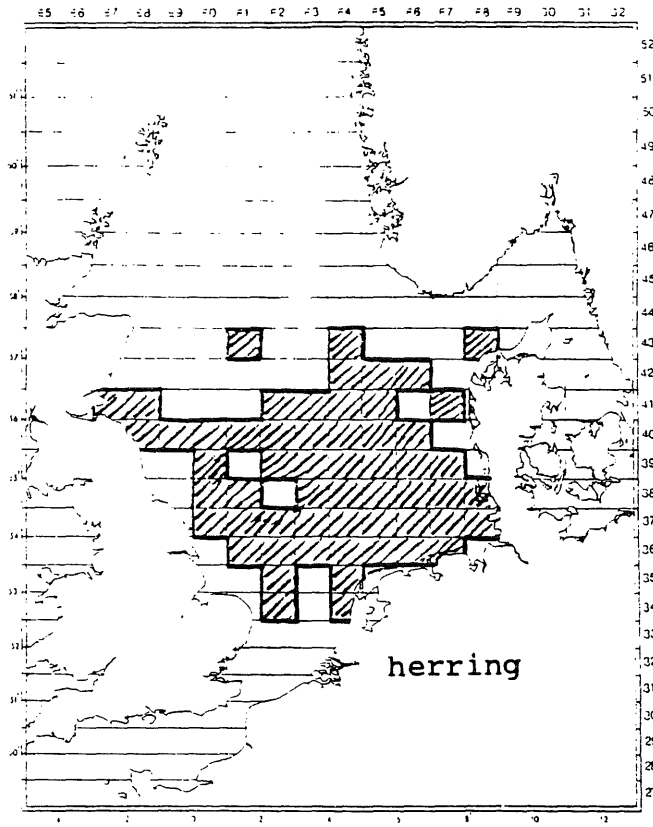


Figure 6.4 Continued

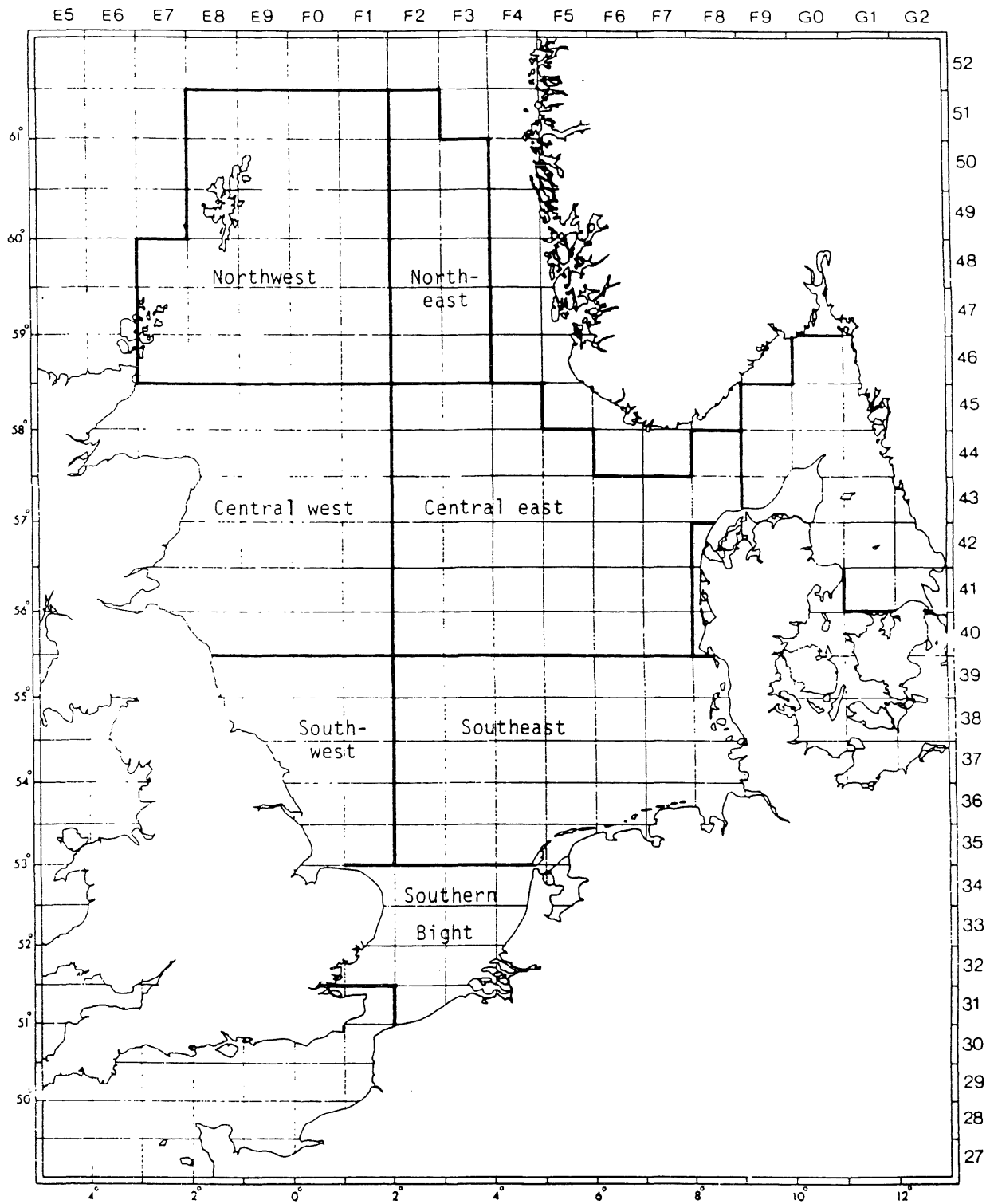


Figure 6.5 Subareas used for the calculation of abundance indices of herring larvae.

APPENDIX X

LENGTH SPLITS USED TO PROVIDE PRELIMINARY NUMBERS AT AGE

Age Quarter	0-group			1-group			
	2	3	4	1	2	3	4
cod	11	18	23	25	33	38	44
haddock	12	17	20	20	27	30	32
whiting	9	17	20	20	23	24	26
Norway pout	-	13	14	15	15	16	20
herring	-	15.5	17.5	20.0	21.0	23.0	24.5
sprat	-	-	10.0	10.0	10.5	13.0	14.0
mackerel	-	17	24	25	25	30	31
saithe	-	22	25	25	25	33	38
plaice	-	10	12	-	-	19	21

NB The lengths indicated are 'less than' lengths: 0-group cod in quarter 2 are fish <11 cm

APPENDIX XI

DRAFT PROPOSALS FOR 'WESTERN DIVISION'

NB This appendix only contains proposals for those parts of the Manual that will differ from the North Sea and Skagerrak/Kattegat IBTS Manual.

Rigging (western and southern areas)

The rigging is given in Figure 2.3.

The length of the sweeps should depend on the bottom depth:

- m sweeps (including backstrops) are used in water depths less than 70 m,
- m sweeps (including backstrops) are used in deeper waters.

However, on the very rough ground found to the west of Scotland and Ireland, in the Celtic Sea and in the Channel it is often necessary to use 60 m sweeps even in water deeper than 70 m depth.

[The above section on sweep lengths will be discussed further in talks led by the western division coordinator]

The standard groundrope with 10-20 cm rubber discs as shown in Figure 2.4 should be used throughout the survey area. The extra weights in the groundrope are 70 kg in the square, 35 kg in each wing and 35 kg in each wing-end. These weights should be evenly spread over the appropriate length of groundrope and this can be achieved by wrapping chain externally around the groundrope or, preferably, by interspersing the rubber discs with steel discs of the same diameter..

This standard gear should be used wherever possible but it is recognised that over much of the western division the grounds are very rough and some institutes prefer to use the groundgear illustrated in Figure App. 1.

It is very important to achieve good bottom contact over the whole groundrope and this should be checked regularly. A proper contact of the net can be indicated by acoustic devices, wearing on chains and presence of benthic organisms and flatfish in the catch. The contact of the net with the bottom can also be greatly influenced by changing the length of the adjustment chain between the lower leg and the bumper bobbin. The normal length of this chain is 2 metres but on rough ground it can be shortened to 1.7 metres; if the gear is fishing too light it can be lengthened to 2.2 metres. In addition the wings can be flown on extremely rough ground but all these modifications should be avoided if at all possible.

For a proper performance of the net it is essential that the four upper bridles are of identical length, and regular checks should be made to ensure this. It is also recommended that a total check of the trawl is carried out prior to the survey.

Standard fishing method (western and southern areas)

Standard fishing speed is 4 knots measured as trawl speed over the ground. The recommended speed is set as a target and actual (ground) speed and distance towed should be monitored and reported. It is also recommended that the speed of the trawl through the water should be monitored and reported.

Each haul lasts 30 minutes. Start time is defined as the moment when the vertical net-opening and doorspread are stable at a trawl speed of 4 knots. Stop time is defined as the start of pull back.

Vertical net opening and doorspread should be monitored at 30 second intervals and mean values should be reported. It is recommended that wing spread is also measured.

The recommended warp/depth ratio for the GOV trawl is shown in Figure 2.5. A minimum warp length of 150 m should be used as below this length the gear becomes unstable and insufficient spread is achieved. There is no maximum fishing depth in the western division.

Sampling of GOV-trawl catches and sampling areas (western and southern areas)

Length composition

Length distributions are recorded for all fish species caught. Length is defined as total length (measured from tip of snout to tip of caudal fin). Length is measured to 0.5 cm below for herring and sprat, and to 1 cm below for all other species.

In case the catch of a certain species is too large to measure all individuals, a sub-sample may be taken which should contain at least 50 specimens.

If a certain species is caught in two clearly distinct size groups, each of these size groups should be sampled separately by measuring at least 50 fish from each of them.

In case of large catches ($n > 1000$) of any species, the minimum sample size given above should be doubled.

Certain related species that are hard to distinguish from one another may be grouped by genus or larger taxonomic unit.

Sampling for age, sex and maturity

Otolith samples are collected within the specified sampling areas as illustrated in Figure App. 2. For all species the same areas are used but care should be taken not to extract otoliths from fish that exhibit length deformities.

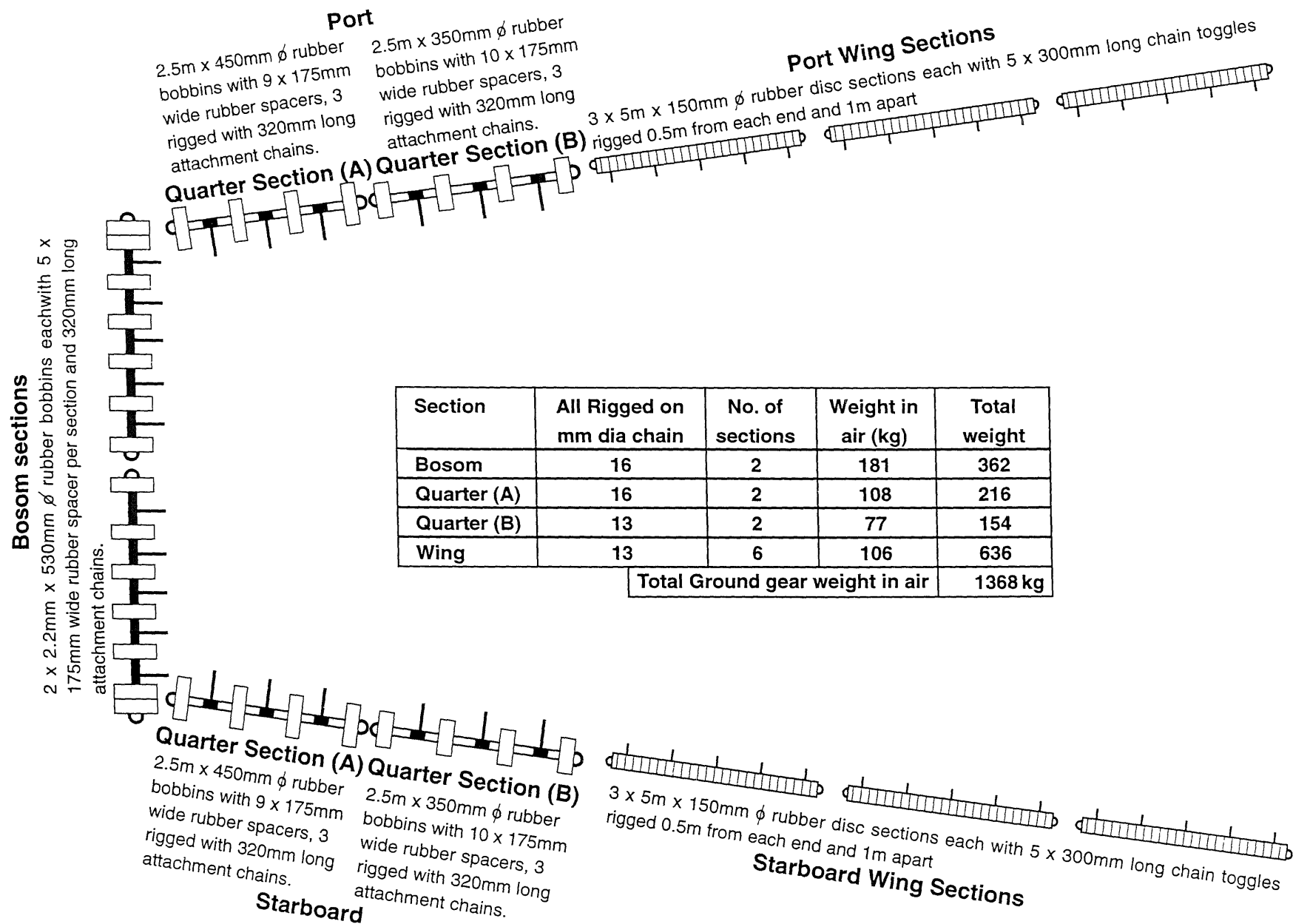
The target species and otolith requirements are to be discussed.

For the smallest size groups, that presumably contain only one age group, the number of otoliths per length class may be reduced. Conversely more otoliths per length are required for the larger length classes.

Sex and maturity data may be reported for each species for which age data are collected. Maturity stages should be reported according to the simplified maturity scale given in Appendix II.

GOV 36/47 GROUND FISH SURVEY TRAWL : Ground gear rigging (Ground gear C)

Figure App. 1. Proposed heavy groundrope for the 36/47 GOV Trawl.



Section	All Rigged on mm dia chain	No. of sections	Weight in air (kg)	Total weight
Bosom	16	2	181	362
Quarter (A)	16	2	108	216
Quarter (B)	13	2	77	154
Wing	13	6	106	636
Total Ground gear weight in air				1368 kg

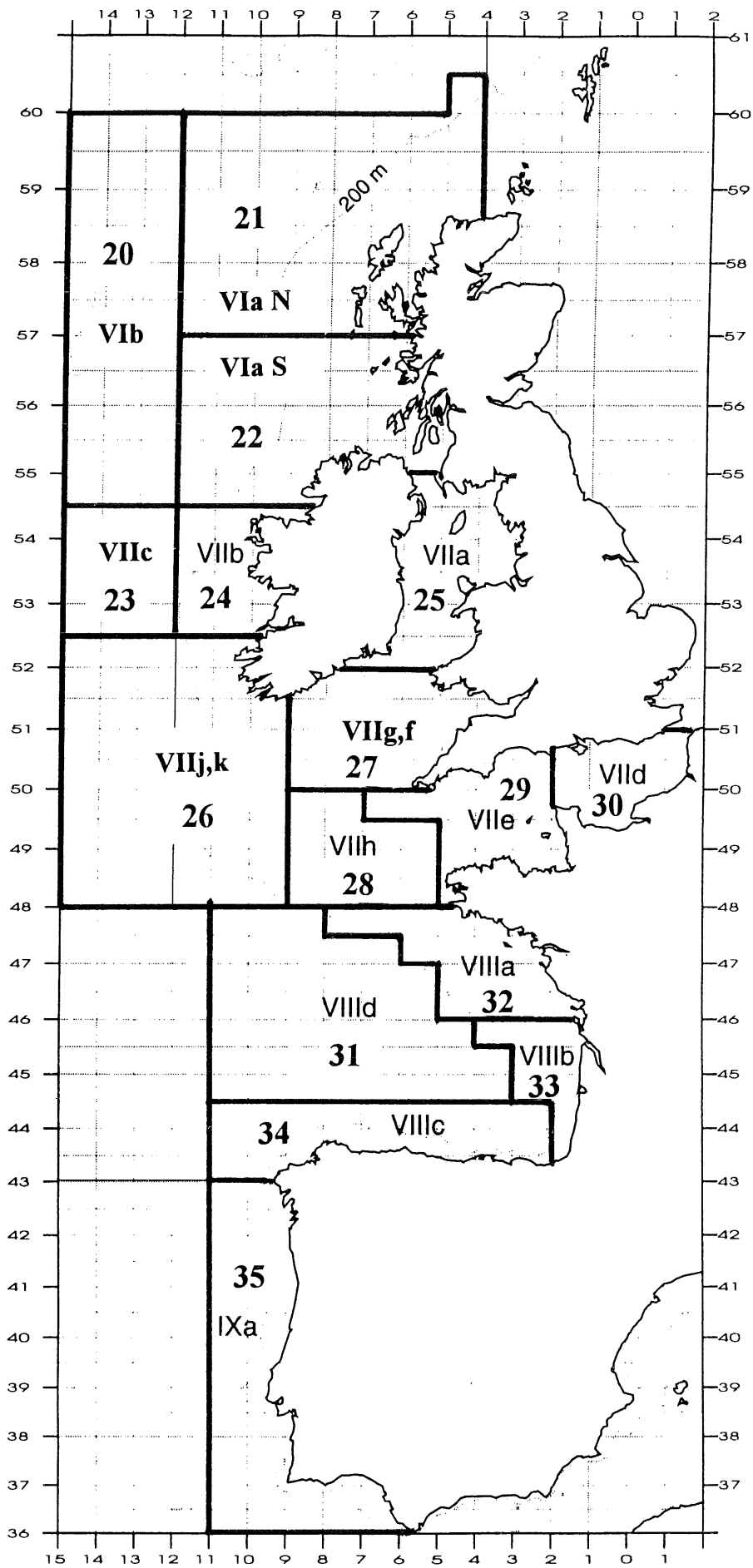


Figure App. 2. Proposed sampling areas for Subareas: VI, VII and VIII and Division IXa.