

International Council for the  
Exploration of the Sea

C.M. 1973/F: 12  
Demersal Fish (Northern) Committee  
Ref.: Pelagic Fish (N) and Statistics Cttees

REPORT OF THE ROUND FISH WORKING GROUP 1973

The meeting was held in Aberdeen from 13 to 15 March 1973 and the following members participated:

O Bagge	Denmark	
N Daan	Netherlands	
D Danielssen	Norway	
J R G Hislop	United Kingdom	
M J Holden	United Kingdom	
R Jones	United Kingdom	(Chairman)
F Lamp	Germany	
G Rauck	Germany	
H Reinsch	Germany	
G Wagner	Germany	

The Working Group was proposed by the Demersal Fish (Northern) Committee at the 1972 Council Meeting, the Resolution (C. Res. 1972/2:16) being that:

"The North Sea Roundfish Working Group will continue its work by correspondence, and a special meeting on standardisation of gears for O-group surveys will be held for three days in March 1973 in Aberdeen". The Group also took note of ICES Resolution C. Res. 1972/4:1 and the attendant documents Anon, 1972 and Christensen, 1972 dealing with the establishment of an ICES automatic data processing system, and with the layout of Bulletin Statistique, and with the standardisation of area subdivisions in the North Sea.

The Group took these as its main mandates, but also decided to discuss the following topics:

1. The collection of roundfish data from the International Young Herring Surveys.
2. The collection of roundfish data from egg and larval surveys.
3. The current state of the North Sea Roundfish stocks.
4. The programme for 1973.

O-group Surveys

1. Type of gear

The Working Group had no experimental data for comparing gears for catching O-group gadoids, except that of Scottish workers who had found both the Isaacs Kid and Engels nets unsatisfactory and were now using their own design of young fish trawl. Both the English and Netherlands representatives

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had also found the Engels trawl unsatisfactory. Scottish workers now have four years' data based upon the use of their net and the Netherlands have been using a similar net but rigged differently. The differences between the Scottish and Dutch gears are:

- (a) that the Dutch net is simpler to construct and the mesh sizes of some of the panels are different, and
- (b) that there are major differences in the rigging, and board and warp size used with the net.

It was finally agreed that England and Scotland would adopt the Dutch version of the net but would use the Scottish method of rigging. The Netherlands found difficulty in accepting this rig for their net because of the difficulties this would raise in working some of the shallower parts of the North Sea. It was decided that they would retain their existing rig for at least 1973, but would provide data on the depth and width of the mouth opening for comparison with the other gears. Whatever method of rigging was adopted, it was realised that the net would be unsuitable for sampling the very shallow areas of the southern North Sea. However, estimates of year class size of the 0-group cod in this area are provided by the yearly beam trawl surveys along the continental coast.

## 2. Methods of fishing the gear and choosing sampling stations.

In the absence of any data on comparative methods of fishing 0-group gadoids, there was no evidence as to which might give the most representative samples. The Scottish members of the Group presented data which showed that some species, notably Norway pout, made diurnal migrations in and out of the scattering layer and that the larger 0-group cod were probably not present in this layer. It was concluded that fishing only the scattering layer, which is normally associated with the thermocline, probably did not produce a representative sample. The following method of fishing was therefore agreed:

- a) Hauls should be of one hour's duration
- b) The speed of tow should be  $2\frac{1}{2}$  knots
- c) Immediately after shooting the net should be fished as close to the bottom as possible for approximately 20 minutes.
- d) It should then be fished at the level of the thermocline, if present, for 20 minutes, or if not in the middle of the water column.
- e) It should then be fished for 20 minutes as near the surface as possible. (The duration of towing at each depth level will depend upon the time it takes to shoot the net and to raise it between each depth level.)

It was agreed that sampling stations should be:

- a) In the middle of statistical squares.

b) That statistical squares should be worked in groups of fours (See Fig. 1) and that the squares within each group should be sampled within the shortest possible time. This is to minimise the time for growth of the fish during the period within which each group of squares is sampled, so that the length distributions of the O-group gadoids caught refer to almost the same dates.

The above instructions refer to the standard O-group surveys only and the Working Group agreed that provided the surveys were completed according to the standard instructions there was nothing to prevent any nation carrying out particular experiments with other sampling techniques.

### 3. Timing of the surveys

As the surveys are intended to sample O-group cod, haddock and whiting some compromise in the time of sampling was considered necessary because the three species spawn at different times. The Working Group recommended that the surveys be carried out between mid-June and mid-July.

### 4. Co-ordination of the 1973 surveys

Noting that the dates for the 1973 survey cruises have already been set, and that they do not agree with the recommendation in section 3, the nations participating in the 1973 surveys agreed to co-ordinate their surveys as follows:

<u>Nation</u>	<u>from</u>	<u>to</u>	<u>Area</u>	<u>Vessel</u>
England	29/5	19/6	54°00'N to 57°30'N	Corella
Netherlands	11/6	22/6	53°00'N to 56°00'N	W Beukelsz
"	2/7	13/7	55°30'N to 58°30'N) west of 06°00'E )	Tridens
Scotland	4/7	1/8	56°30'N to 61°00'N) west of 04°00'E )	Explorer

The scientists-in-charge of the cruises are requested to co-ordinate their operations so that the Corella and the Willem Beukelsz and the Tridens and the Explorer can carry out comparative hauls.

The German representatives said that the present minefield areas shown on the charts, which are not sampled at present, were now out of date and agreed to circulate charts showing the 1 test cleared areas so that the survey could be extended.

### 5. Standardisation of data presented

It was agreed to present all data in the following standardised form.

a) Charts showing numbers of O-group fish per hour's fishing per statistical rectangle for all Roundfish species separately.

b) Tables, showing for each group of 4 rectangles:

- (i) numbers per hour's fishing of each 0-group roundfish species.
- (ii) mean lengths of each 0-group roundfish species.
- (iii) length, range, and standard deviation of lengths, for each 0-group roundfish species.
- (iv) sampling date.

In view of the lateness of the surveys in relation to the ICES Council Meeting, the General Secretary has been consulted with a view to submitting 0-group survey results later than the normal deadline for ICES papers.

#### 6. Analysis of results

It was agreed that attempts to evaluate the results should be postponed until several years 0-group data have been collected and compared with estimates of year-class size obtained from the fully recruited fish.

#### Automatic Data Processing and the Requirements for making Assessments

The Working Group took note of Resolution 1972/4:1 and Document Anon, 1972 in connection with the possible introduction of an ICES automatic data processing system for fishery statistics.

The Group considered that for assessment work the following data were required:

1. Catch and effort data.
2. Length composition data, raised to numbers of fish landed at each length.
3. Age composition data raised to numbers of fish landed at each age.
4. Mean lengths at each age.
5. Mean weight at each age.
6. Proportion of fish retained at each length by each gear.
7. Proportion of fish not discarded at each length.
8. Bertalanffy coefficients of best fitting growth curves.

With regard to length groupings, it was recognised that different groupings would be required for different purposes. It was recommended that for complete flexibility, length measurement should be collected on a per centimetre basis, with provision for outputting according to any grouping that may be required.

With regard to areas, it was also recognised that different areas would be required for different purposes. For complete flexibility it was recommended that:

- a) catch and effort data should be collected on a statistical rectangle basis, with provision for outputting according to any rectangle grouping that may be required.
- b) biological data for cod, haddock and whiting should be collected according to the areas shown in Fig. 2.

With regard to time units, it was agreed that

- (a) catch and effort data should be collected on a monthly basis, with provision for outputting on any combination of months that may be required.
- (b) biological data should be collected on a 3 monthly basis with provision for outputting according to any combination of quarters that may be required.

#### Layout and Content of Bulletin Statistique

The Working Group considered the layout and content of Bulletin Statistique with reference to the question posed in C. Res. 1972/4:1.

The existing layout in the Bulletin Statistique was discussed and compared with the layout in the 1971 ICNAF Statistical Bulletin.

It was agreed that, in the interest of aiding publication by the direct use of computer print-outs, the Group would not want to oppose a change in the layout of the Bulletin Statistique. It was thought however, that the actual choice of layout should be made by the Statistics Committee of ICES.

The area subdivisions in the Bulletin Statistique were discussed and it was agreed that if any change in layout is to take place, it would be useful to record landings from ICES Regions VIIa and VIIf separately.

#### The Subdivision of Roundfish Stocks in the North Sea

The Working Group took note of the area subdivisions in papers by Christensen 1972 and Jones 1972.

These were discussed in the light of recent tagging data and a subdivision of the North Sea for cod, haddock and whiting was agreed for reporting data to the ICES Statistical News Letters.

For other roundfish species, it was felt that there was not yet enough information to make firm recommendations.

The area subdivision that was finally agreed is shown in Fig. 2. Further subdivision of the areas shown may ultimately be desirable, but the Group decided to wait for the approval of these sub-areas before making any further subdivisions.

It was noted that whilst the western boundary of the North Sea is along longitude 4°W, this was not necessarily the best boundary line for roundfish stocks off the north coast of Scotland. To cover this region adequately, however, it would be necessary to extend the subdivisions shown in Figure 2 to include the Scottish west coast grounds. This was not done, as this region does not come within the present mandate of the Working Group.

The Group wish to bring this point to the attention of the Demersal Fish (Northern) Committee and to the Statistics Committee.

## Young Herring Surveys

### 1. Objectives

It was agreed that roundfish data collected from the International Young Herring Surveys should be used for obtaining estimates of year class strength for cod, haddock and whiting.

### 2. Data recording

It was agreed that the following information should be reported from each country participating in these cruises for cod, haddock and whiting separately.

(a) the numbers per hour's fishing of I-group, II-group and 3 years and older fish combined per rectangle, and

(b) the mean lengths and standard deviations of I and II group fish per 4 rectangles, according to the groupings shown in Fig. 1.

It was agreed that to simplify the work of editing, roundfish data collected on the International Young Herring Surveys should be collected on a standard form, copies of which will be prepared and distributed by N Daan.

Responsibility for editing the data has been subdivided as follows:

Cod	O Bagge (Denmark)
Haddock	N Daan (Netherlands)
Whiting	J Hislop (United Kingdom)

In addition, N Daan has agreed to act as coordinator for all three species and to prepare the final joint report for submission to the Council meeting.

All countries carrying out Young Herring Surveys are requested to send their 1973 and also all their past cod, haddock and whiting data to the three editors respectively. The 1973 data are required by May 1st and the data from previous years before the end of 1973.

The Group noted that at present there is no coverage of the northern North Sea by the Young Herring Surveys.

The Group wish to bring to the attention of the Pelagic Fish (Northern) Committee the suggestion that countries engaged in the Young Herring Surveys should extend their cruises northwards to cover the whole North Sea.

## Larval Surveys

### 1. Objectives

The aims of larval surveys were discussed and it was agreed that

(a) single surveys could be valuable for defining spawning areas: and

(b) that larval surveys could also be used for estimating the size of the parent spawning stock and determining spawning times, but that for these purposes, a series of surveys during the course of the spawning season would be necessary.

## 2. Gear

Although the Gulf III was recognised as an appropriate gear for carrying out fish larval surveys it was recognised that instances could arise when other gears might be preferred.

## 3. Data Recording

It was agreed, that when reporting fish larval data, the following details should be recorded:

- a) separate charts should be prepared for each of the main roundfish species, showing the numbers of eggs of all stages combined and the numbers of larvae per  $m^2$ . It was recognised that the gear would not necessarily be worked throughout the entire column when sampling over deep water. This could be important, since a calculation of the number of eggs or larvae per  $m^2$  will be dependent on the depth within which the spawning products are assumed to be located. It was recommended therefore that estimates of the numbers per  $m^2$  should be accompanied by a note of the depth range within which the eggs or larvae are assumed to be distributed.
- b) It was recommended that whatever gear was used, a note should be included of the method of computation of numbers per unit volume.

## Current State of North Sea Roundfish Stocks

Total international landings of the major roundfish species taken in the North Sea are shown in Table 1 for the period 1961-1971.

It was noted that during the last five years, landings of cod, haddock, whiting, Norway pout and saithe have all been higher than they have ever been before.

For cod, haddock and whiting it was recognised that the increase has probably been due mainly to favourable year classes.

For Norway pout, favourable year classes have also played a part, but the Working Group could not say that this was the only cause of the long term increase in the landings.

For saithe the Working Group noted that the increase in landings in recent years had been particularly striking. In view of the fact that an ICES Coalfish Working Group is due to meet in 1973 however, no further observations on this species have been made by the Roundfish Working Group.

Of the re-assessments available to the Working Group since those made in 1968 (Anon 1969) was one for cod (Holden and Flatman 1971) showing that Z was probably lower than that estimated in 1968 (0.7 compared with 1.1). However, even at this level of Z, the yield per recruit is still less than that which would be obtained at the optimum value of Z.

The Working Group saw no reason to change the conclusions reached in the previous report (Anon 1969) that cod, haddock and whiting were being fished at a level in excess of that required for generating the maximum sustainable yield. For this reason, the Working Group considered that levels of fishing effort on these stocks in the North Sea should not be allowed to increase, and that consideration should be given to controlling and probably to decreasing fishing effort in the North Sea. The need for this was considered to be particularly urgent now that quota regulations have been introduced in the ICNAF area and are likely to be implemented in parts of the NEAFC area in the near future. The Working Group saw the need for regulatory measures to prevent the diversion of fishing effort into the North Sea from areas where quotas had been taken up.

Because of this, the Group recognised that there is a need for a joint assessment of all demersal fish species in the North Sea.

As a first step, the Group agreed that further data should be collected and existing data should be compiled with a view to making further roundfish assessments according to the area subdivisions shown in Fig. 2.

#### Programme for 1973

The 1973 programme of cruises covering egg and larval surveys, 0- and 1- group surveys, and tagging experiments is given in table 2.

Egg and larval surveys are centred off the Scottish east coast, off the Belgian coast, and in the Southern North Sea.

0- and 1- group cruises continue to be of 3 kinds according to the kind of gear used.

Cruises using pelagic trawling gear are scheduled for the summer and are centred over the southern, central and northern North Sea.

A beam trawl will be used demersally in a survey off the Dutch, German and Belgian coasts in April and again in October. (Waddensea programme)

Other demersal trawling will be carried out by USSR, Netherlands, Norway and Scotland in various parts of the North Sea.

Roundfish data have been collected from the International Young Herring Surveys carried out in February.

Tagging of various species will be carried out in various regions, and mainly in the Northern North Sea.



## Summary of Main Points of the Report

### O-Group Surveys

The following notes and recommendations were made:

1. It was noted that complete agreement on the type of gear to be used had not yet been reached.
2. That hauls should be made in the middle of statistical rectangles and that the choice of position and time should be independent of the presence or absence of echo traces.
3. That haul duration, towing speed and depth of fishing with respect to groups of rectangles should be as detailed in this report under "O-group surveys, 2".
4. That surveys should be carried out between mid June and mid July.
5. That data should be presented in the form of ICES papers as detailed in this report under "O-group surveys 5".

### Young Herring Surveys and Egg and Larval Surveys

Recommendations are made in these two sections of the report for the reporting of roundfish data from the International Young Herring Surveys, and from egg and larval surveys.

### Future Assessments

The Group recommended that data should be compiled for making further roundfish assessments according to the area subdivisions shown in Fig. 2.

### Points for the attention of ICES Committees

Various points arose during the meeting that the Working Group would like to be brought to the attention of various ICES committees.

### Demersal Fish (Northern) Committee

The Group wishes to draw the attention of this Committee particularly to the following points.

1. The area subdivisions suggested in Fig. 2 for the presentation of cod, haddock and whiting data to the ICES Statistical News Letters.
2. The point made in this report under "The subdivision of roundfish stocks in the North Sea", that the area subdivision shown in Fig. 2 cannot be completed satisfactorily without extending the area under consideration to include the region to the west of Scotland.
3. The need for a re-assessment of the North Sea roundfish stocks to take account of the area subdivision shown in Fig. 2.

### Statistics Committee

The Group wishes to draw the attention of this Committee to the parts of the report headed:

"Automatic data processing and requirements for making assessments"

"Layout and content of Bulletin Statistique"

"The subdivision of roundfish stocks in the North Sea"

Pelagic Fish (Northern) Committee

The Group wishes to draw the attention of this Committee to the need, for roundfish work, for an extension of the International Young Herring Surveys northwards to cover the northern North Sea (see under "Young Herring Surveys").

References

- Anon (1969) Report of the Working Group on Assessment of Demersal species in the North Sea.  
ICES Co-op. Res. Rep. Ser. A. No. 9.
- Anon (1972) Report of the Meeting of the Working Group on Eventual Establishment of an ICES ADP System for Fishery Statistics.  
ICES CM/D:7.
- Christensen, J. M. 1972 Standardisation of area sub-division for biological sampling of Demersal Species. ICES CM/D:12.
- Holden, M. J. and Flatman, S. (1972) An assessment of North Sea cod stocks using virtual population analysis. ICES C.M.F:21.
- Jones, R. (1972) The subdivision of Demersal Stocks within the North Sea.  
ICES C.M./F:13.

Table 1

Landings (000's metric tons) of principal Roundfish species  
from the North Sea.

(from Bulletins Statistiques and Anon, 1969)

Species	Cod	Haddock	Whiting	Saithe	Norway Pout
Year					
1961	108.4	69.1	85.3	31.0	33.8
1962	90.6	53.1	64.4	22.3	157.0
1963	110.2	59.6	99.0	27.6	166.8
1964	125.2	201.5	87.7	55.1	82.7
1965	181.6	224.6	110.1	68.9	59.3
1966	228.5	272.1	157.9	86.9	52.7
1967	249.8	167.4	91.2	72.5	180.2
1968	285.3	139.5	144.9	97.4	468.7
1969	199.0	639.7	199.0	106.0	134.5
1970	224.7	671.8	181.5	169.5	273.6
1971	320.0	257.9	112.2	206.3	358.9

Table 2

## North Sea programme of Roundfish research 1973

	Egg and larval surveys	0- and 1- group surveys	IYHS (1)	Tagging
France	-	5-14/3 S. North Sea (2)	No	-
England	-	29/5-19/6 - pelagic	Yes	24/7-7/8 Cod tagging in the northern North Sea
Scotland	Jan. - east coast of Scotland	4/7-1/8 - pelagic 20/4-18/5 ) 30/11-21/12) demersal	Yes	28/3-11/4) offshore 2-9/4 ) N. North 11-26/6) Sea 2-26/11
Denmark	March	-	Yes	2-24/3 - Cod transplan- tation April - cod tagging in rectangle M11
Norway	-	May - N. North Sea for industrial species Oct-Nov - demersal trawling	No	-
Belgium	2 monthly surveys off the Belgian coast.	Monthly surveys off the Belgian coast.	No	1000 cod off Belgian coast
Netherlands	1-19/1 Channel & S. Bight 5-16/2 S. Bight 5-16/3 S. Bight 19/2-2/3 Central N. Sea	11-22/6 - pelagic - S. North Sea 2-13/7 - pelagic - N. North Sea 17-28/9 - demersal - N. North Sea	Yes	17-28/9 - N. North Sea
USSR	Mar-April North of 58°N	Feb-April ) Oct-Nov ) demersal	Yes	Haddock, whiting and saithe in summer
Germany	January	-	Yes	January
Waddensea programme (3)		2-13/4 ) 1-12/10) beam trawl		

(1) Participation in the International Young Herring Survey

(2) Study of the interrelationships of cod and whiting stocks in the Southern North Sea

(3) Joint programme - 3 countries (Belgium, Netherlands, Germany)

Fig.1 Grouping of statistical rectangles for reporting on 0-group surveys

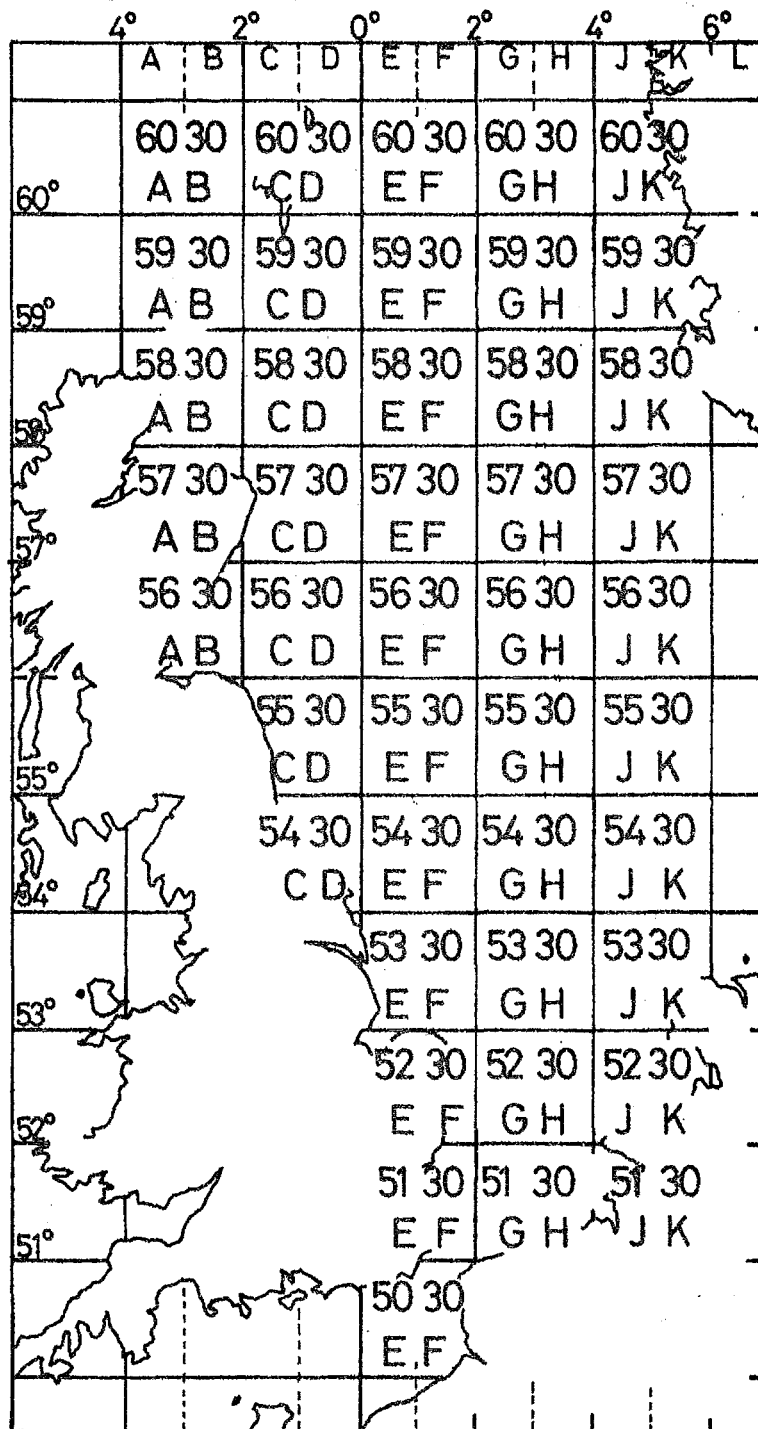


Fig.2 Recommended sub divisions of the North Sea for reporting cod, haddock and whiting data to the ICES statistical news letters

