

**CENTRE FOR ENVIRONMENT, FISHERIES AND AQUACULTURE SCIENCE
LOWESTOFT LABORATORY, LOWESTOFT, SUFFOLK NR33 OHT**

2002 RESEARCH VESSEL PROGRAMME

REPORT: RV CIROLANA: CRUISE 5

STAFF:

Part A

T W Boon (SIC)
G Course (2 SIC)
B Rackham
N Bunn
M Etherton
K Sullivan
B Horton
D Righton

D Brown (14 – 15 Aug)

Part B

T W Boon (SIC)
G Course
B Rackham
N Bunn
R A Ayers (2 SIC)
R Taylor
A Tidd
J Blanchard
T Dinmore
K Warr

DURATION: Part A: 8 August – 23 August
Part B: 24 August – 7 September

LOCATION: North Sea

AIMS:

1. To carry out a groundfish survey of the North Sea as part of the ICES co-ordinated IBTS, using a standard GOV trawl in order to obtain information on:
 - a) Distribution, size composition and abundance of all fish species caught.
 - b) Age – length distribution of selected species.
 - c) Distribution of fish in relation to their environment.
 - d) Distribution of macrobenthos and anthropogenic debris.
 - e) Surface and bottom temperature and salinity data using CTD.
 - f) Length, weight & maturity information using individual fish measurements, in support of the EU Data Regulation.
2. To collect acoustic data at two operating frequencies (38 kHz and 120 kHz) continuously throughout the cruise. Data recorded from the 38 kHz transducer will be combined with GOV trawl data and an estimate of total abundance made for roundfish species. This work will form part of a three year project (CATEFA) aimed at examining the relationships between trawl catches and acoustic data.
3. To calibrate the 38kHz transducer.
4. To collect material for fish identification courses (T Watson, CEFAS Lowestoft).

5. To preserve material from diseased fish (S Feist, CEFAS Weymouth)
6. To collect fish white muscle and queen scallop tissue for stable isotope analysis, as part of an ongoing study on the effects of fishing in the North Sea (S Jennings, CEFAS Lowestoft).
7. To obtain ageing material and biological information from horse mackerel (*Trachurus trachurus*) from the southern North Sea (G Eltink, RIVO for the horse mackerel assessment working group)

NARRATIVE:

(all times are GMT)

RV CIROLANA sailed from Lowestoft at 2200h 8 August and steamed south to a position east of the Thames Estuary, Lat. 51°46.2'N; Long. 01°46.3'E; where the survey began at 0707h on the following day. Sampling at each primary station consisted of one thirty-minute tow with the GOV trawl. Temperature and salinity profiles were obtained using an AML micro CTD held in a purpose built mounting on the port trawl door. Sampling at three primary stations was completed on each of the first five days, working northwards through the southern Bight of the North Sea up to Lat.55°N. On 14 August the opportunity was taken to remedy a number of problems that had developed with the EDC system. Two trawl hauls were made and then D Brown was embarked by sea rider from Whitby bringing spare EDC units on board. One haul was made on 15 August in Baymans Hole, the catch being used to test replacement and repaired EDC equipment. D Brown was disembarked by sea rider at Whitby during the afternoon and the vessel made passage to position Lat. 55°43.4'N; Long. 02°43.7'E to recommence the grid the following morning. Four trawl hauls were made on each of the two following days. On 18 August net damage was sustained during the third haul but this was repaired in time to successfully repeat the haul in daylight. Seven hauls over the next two days completed work in the Danish sector and progressed the survey northwards along the edge of the Norwegian Deep. Poor weather reduced the 21st August to a two haul day and oil industry activity enforced a station position move for the first haul the following day. However three hauls were completed that day and two during the next day taking the vessel into the vicinity of the Tyne where the mid trip staff changes were effected. During the following three days 10 hauls along the western edge of the survey area were completed. Early on the 27 August the north western most haul was completed and the vessel made passage for Lerwick to take a mid trip break. On 29 August the survey recommenced at position Lat. 61°15.4'N; Long. 00°21.4'W and completed three hauls on that day and the following day, predominantly in poor weather conditions. On 31 August, after two hauls, the weather deteriorated further and the later part of the day was spent dodging in a south-westerly gale. During the first haul on the following day the cause of the loss in ships power, experienced since the previous afternoon, became clear. Flotsam was observed streaming from the propeller area. Although pieces of this debris periodically broke free and there was a steady improvement in steaming speed, completion of the survey took one day longer than was projected. Incorporated in this delay, but not materially contributing to it, was an over night detour into Aberdeen to land a crew member for medical treatment. The survey was completed at a position Lat. 56°49.2'N; Long. 00°23.4'E at 1713h on 5 September. An over night passage was made to the North East coast where three further hauls were made in an area where reasonable catches of 1-group cod had been made earlier during the survey.

Unfortunately the third haul resulted in extensive damage to the trawl. A course was set for Lowestoft and the vessel was docked at 2136h 7 September.

RESULTS:

Aim 1. A 30 minute GOV trawl haul was successfully completed at each of the 75 primary station positions and 3 additional hauls were attempted. Light gear damage was sustained during one haul and severe damage during a further two hauls. Trawling was carried out using the standard specification for International Bottom Trawl Surveys (North Sea). An AML micro CTD was used in a purpose built mount on the port trawl door to obtain temperature and salinity data. Results were very encouraging with good profiles from at least 71 of the 79 trawl hauls. Data for 3 of the remaining 8 may still be held on one unit which presently will not communicate with the down loading software (performance report to SIGS). A chart indicating the position of each valid trawl station is attached (Figure 1). Scanmar equipment was used to monitor headline height and door spread. At each station, the catch of each species was weighed and all fish, or representative samples, were measured. Samples of otoliths for age determination were taken as specified in standard instructions. Benthos and crustacea were identified to the species wherever possible and recorded as present. Any anthropogenic waste material was recorded and weighed. The resultant data were input to computer database using the CEFAS Electronic Data Capture System. These data will be analysed at CEFAS Lowestoft and will provide a major input to the ICES assessment of North Sea gadoids and pelagic species.

Aim 2. Two scientific echosounders (operating at 38KHz and 120 KHz) were used continuously throughout the cruise. Return data were split between two integrated analytical systems: the Simrad EK500 scientific sounder system and the QTC Seaview seabed classification system. EK500 data at both frequencies will be used for the identification of fish targets and seabed depths. Both operating frequencies were scrutinised to aid in the identification of echo targets and bad data regions. Post processing will be undertaken using the 38 kHz only, which is considered to be the standard operating frequency for fisheries acoustics surveys. Further work on these data will be undertaken at the Lowestoft Laboratory and will include the use of expert classification systems such as neural networks to examine relationships between trawl catches and acoustics data. Data input into the QTC system were used for seabed classification, using both frequencies. Preliminary post-processing using QTC IMPACT was undertaken on data returned from the 38 kHz sounder indicating a considerable diversity of seabed types (>10) during the course of a single day's cruise track. Similar results were obtained from analysing results obtained from the 120Khz sounder. Complete analysis of seabed classification of the full cruise track will be possible after completion of the survey following analyses and merging of daily datasets.

Aim 3. Due to changes in plans immediately prior to cruise departure, no attempt was made to complete this aim.

Aim 4. Specimens of more than 57 different species were preserved for the Laboratory's fish identification courses.

Aim 5. No unusual occurrences of diseased fish were encountered on the survey.

Aim 6. A total of 445 white muscle tissue samples were collected from 15 different species of fish at 21 stations in areas A (9) and B (12) for stable isotope analysis. No tissue was

collected from *Aequipecten opercularis*, *Arctica islandica*, *Astarte sulcata* or *Modiolus modiolus* as live samples did not occur in the trawl. The latter three species were additional to the stated aim.

Aim 7. Ageing material and biological information were obtained from 125 horse mackerel (*Trachurus trachurus*) from trawl hauls made in southern and east central North Sea.

MISCELLANEOUS:

The following aims, which did not appear in the cruise programme, were also accomplished.

1. Two 25l carboys and a 1l bottle of sea water were taken at 38 selected primary stations for later analysis for caesium 137 (B D Smith, CEFAS Lowestoft).
2. Five specimens each of cod (*Gadus morhua*), haddock (*Melanogrammus aeglefinus*), whiting (*Merlangius merlangus*), plaice (*Pleuronectes platessa*), saithe (*Pollachius virens*) and scampi (*Nephrops norvegicus*) and two specimens of hake (*Merluccius merluccius*) were individually deep frozen (M Winterbone, Food Research Institute, Norwich)
3. Specimens of a selection of different species were deep frozen (S Hetherington, CEFAS Lowestoft)
4. Three additional trawl hauls were attempted, one each in ICES rectangle 39E9, 39F0 and 37F0, to better delimit the extent of an aggregation of 1-group cod (*Gadus morhua*). The third haul resulted in extensive damage to the trawl.
5. The heads of three specimens of starry smooth hound (*Scyliorhinus stellaris*) were deep frozen for DNA and dentition investigations (M Harris, Tampa Bay, Florida, USA)

T W Boon
7 September 2001

SEEN IN DRAFT:

Master	R J McCurry
Senior Fishing Mate	A G Lincoln

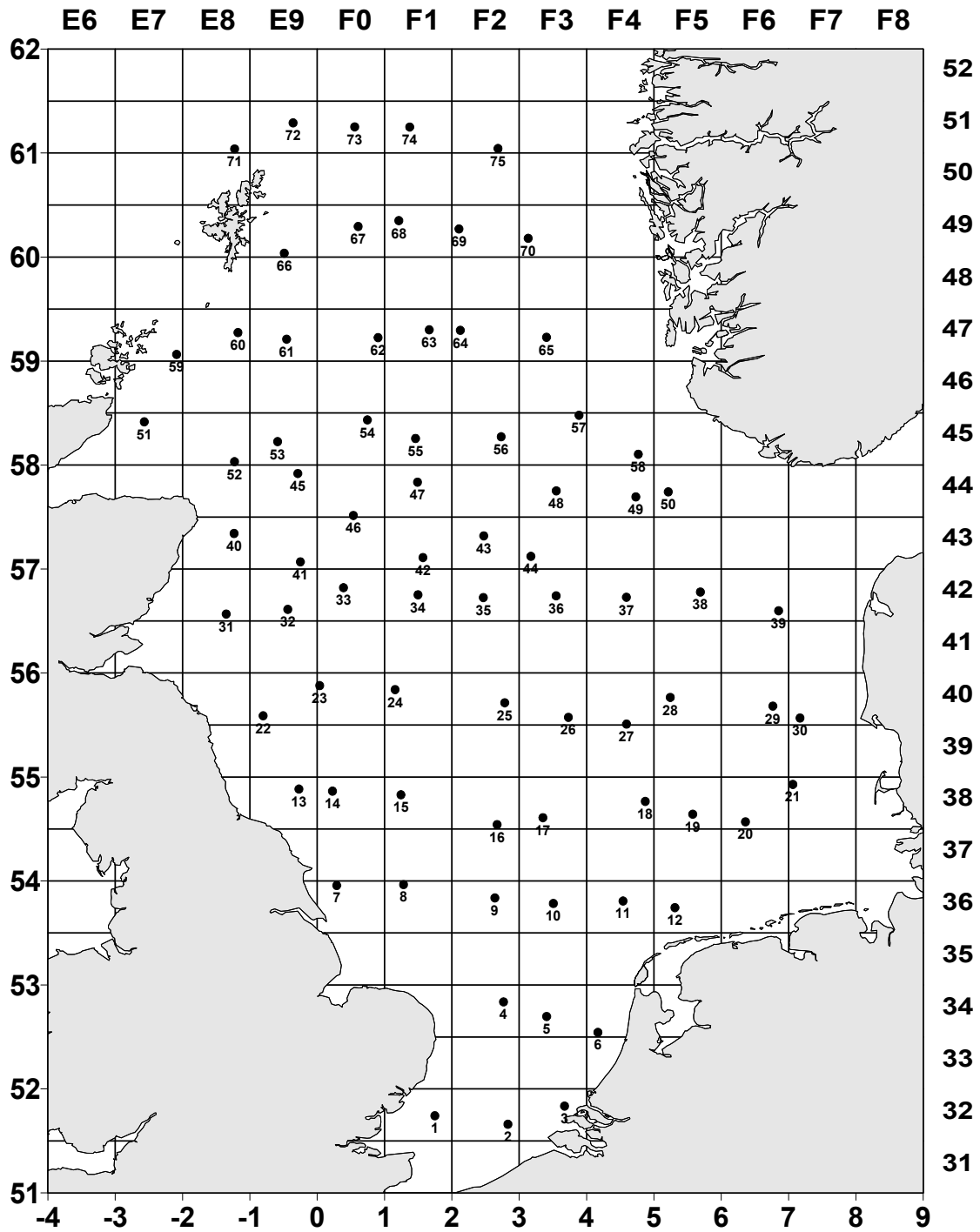
INITIALLED:

Surveys Contract Manager	R Millner
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DISTRIBUTION:

Basic list +

T W Boon	G Course	B Rackham
N Bunn	M Etherton	K Sullivan
B Horton	D Righton	R A Ayers
A Tidd	R Taylor	J Blanchard
T Dinmore	K Warr	D Brown



Primary fishing positions
Cirolana 5/2002