CRUISE: CIRO 2_01

STAFF:

T W Boon (SIC)
B Harley (2 SIC)
A Payne
J Dann
M Etherton
D Brown
T Woods
R Taylor
C Firmin (from 31 Jan)
R Flatt
T Hammond

DURATION: 30 January – 19 February

LOCATION: North Sea

AIMS:

1. To carry out a groundfish survey of part of the North Sea 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 information using individual fish measurements.
   This will contribute to the ICES co-ordinated International Bottom Trawl Survey for quarter 1.

2. To collect acoustic data suitable for indicating the horizontal and vertical distribution of fish biomass, in particular diel changes in vertical availability of fish to the trawl gear.

3. Calibrate the acoustic equipment.

4. Investigate methods for producing absolute biomass estimates for selected fish using the acoustic and trawl data via GAM analysis, and using published length to TS conversions.

5. To investigate the feasibility of measuring plankton abundance with the 120 kHz transducer by examining the correspondence between Methot Isaacs Kidd trawl catch and acoustic backscatter at this frequency.

6. To collect tissue samples from a range of fish species and size-classes for stable isotope analysis (S. Jennings).

7. To collect dab and whiting tissue for bass feeding experiments (C. Sweeting, University of Newcastle)

8. To collect material for fish identification courses (T Watson, CEFAS Lowestoft)

9. To collect specimens for bio-archaeological studies (N Steel, Bradford University)

NARRATIVE:
(all times are GMT)

RV CIROLANA sailed from Lowestoft at 1330h 30 January. Once clear of the port entry channels, an opportunity was taken for newly arrived casual deck crew to practice shooting the trawl. During this operation a fault in the main engine control panel left the vessel with reduced propulsion power. The fault was remedied and the vessel was steamed slowly south to begin the survey east of the Thames estuary, (ICES rectangle 32F1) at 0715h on the following day. Sampling in each ICES rectangle consisted of one thirty-minute tow with the GOV trawl and one surface to bottom Conductivity, Temperature, Depth (CTD) profile. Sampling at three stations was completed on the first day such that CIROLANA was back off Lowestoft by early evening to pick up an additional member of the scientific staff. Three further stations were worked during 1 Feb after which another return trip to Lowestoft was made to pick up spares for the net drum hydraulic system. Three stations were completed on each of the next two days, working northwards over the selected area off the English east coast (Figure 1). The weather was deteriorating by this time making CTD profiles impossible at some positions. Only one trawl haul was made on 4 Feb. The vessel then dodged in easterly gales. Work recommenced late morning on 5 Feb in ICES rectangle 38F0 with two trawl hauls but no CTD's completed that day. Over the next three days all but two of the remaining rectangles in the preferred area were completed. Due to mechanical failure of their research vessel, the French had been unable to participate in the survey. Cirolana was directed towards further areas allocated to the French. Work continued to the east and then south during the next two days and then, to avoid the effects of strong southerly winds, areas in the German Bight were worked. The remainder of the cruise was spent in fine weather completing rectangles in the Central North Sea and Southern Bight. All of the rectangles allocated to France were worked, with the exception of six that were not visited off the Danish coast and 31F2 in which suitable fishing grounds could not be found. Gear damage was sustained at only one haul in rectangle 32F2. Cirolana docked in Lowestoft at 0700h on 19th February.

RESULTS:
Aim 1. Fifty-three 30 minute GOV trawl stations were successfully completed. Damage was sustained during one haul only. Trawling was carried out using the standard specification for International Young Fish Surveys. At 46 trawling positions a CTD profile was made to obtain temperature and salinity data. A chart indicating the ICES rectangles worked 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.

Aims 2. and 4. Acoustic data, from the dual frequency (38 and 120 kHz) EK500 scientific sounder, was logged to the 'Echoview' acquisition and processing system during the entire ships track. Standard methods were used to estimate the abundance of selected main species, these results then being compared to density predictions from trawl station data. Although

provisional results show a strong correlation between the two methods with most species, final results will depend on a full calibration of the survey equipment. The diel changes in availability of acoustic density to the bottom trawl gear were also plotted throughout the cruise, this showing a pronounced pattern.

Aim 3. The acoustic equipment could not be calibrated due to weather conditions, available time, and lack of a suitable location.

Aim 5. Four Methot Isaacs Kidd tows were carried out during dark hours as part of a feasibility study for estimating plankton abundance by acoustics.

Aim 6. All aims of the isotope analysis data collection were achieved. Sampling occurred at 52 of the 53 valid fishing stations. Eighteen species were identified for sampling by length category. Of these, 3 were sampled over their complete length range and a further 9 over more than 50% of their length range. In all 196 tissue samples were collected including, 117 tissue samples of dab (*Limanda limanda*) from 41 stations and 84 tissue samples of whiting (*Merlangius melangus*) from 31 stations. Finally, at 35 stations, the catch was sorted into weight classes and tissue samples taken from each class.

Aim 7. Dab samples were collected where large individuals were abundant in the catch. Approximately 100kg of unfilleted dab were collected and frozen.

Aim 8. Specimens of more than 35 different species were preserved for the Laboratory's fish identification courses.

Aim 9. Specimens of seven different species were frozen for bioarchaeological studies.

MISCELLANEOUS:
Examples of spotted dragonet (*Callionymus maculatus*), reticulate *dragonet (Callionymus reticulatus*), bull rout (*Myoxocephalus scorpius*) and sea scorpion (*Taurulus bubalis*) were frozen for identification comparisons towards satisfying a Term of Reference of the forthcoming IBTS Working Group meeting.

T W Boon
19 February 2001

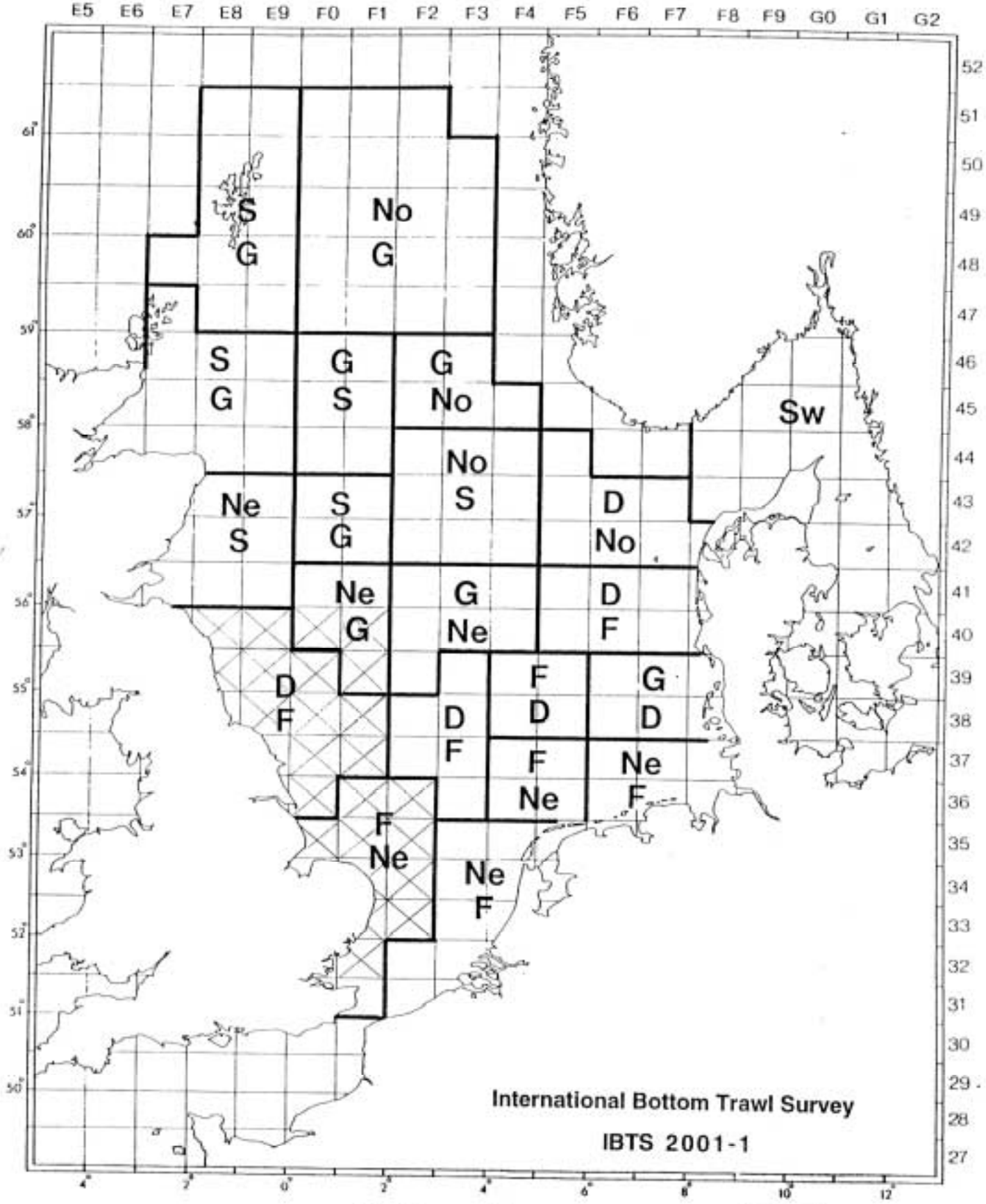
SEEN IN DRAFT:

Master	A M T Reading
Senior Fishing Mate	B W Salter

INITIALLED:

Surveys Contract Manager	R Millner

Figure 1.



Station allocation

Upper country in each area has first responsibility for MIK sampling

Cirolana