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MINISTRY OF AGRICULTURE, FISHERIES AND FOOD FISHERIES LABORATORY, LOWESTOFT, SUFFOLK, ENGLAND

1977 RESEARCH VESSEL PROGRAMME

REPORT: RV CIROLANA: CRUISE 9

(PROVISIONAL: Not to be quoted without prior reference to the author)

STAFF

J	G Pope	(in charge)
J	Nichols	
B	Knights	a a substant a
R	Turner	, il ul Mai
S	Milligan	
J	Smith	(Ham. Dock)
D	Hyland	(Fleetwood)
A	Hunter	(Shields)

DURATION

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Joined ship 1530 h 17 August Left Grimsby 2000 h 18 August Arrived Grimsby 1630 h 12 September

All times are Greenwich Mean Time

LOCALITY

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North Sea

AIMS 1913

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To carry out a groundfish survey of the North Sea. 1. To obtain lengths and age distribution of cod, haddock, whiting and 2. plaice.

To collect and preserve fish hearts for ageing studies (Dr Greer Walker). 3.

4. To collect water samples for caesium studies (FRL).

To collect blood samples from saithe (Dr Jamieson). 5.

To sample the area of the Norway Pout fishery for by catch. 6.

7. To tag spiny dogfish (Mr Holden).

To collect mackerel samples (Dr Lockwood).

Other aims received too late for inclusion in the published cruise programme :-

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To bring back two live halibut 60-80 cm for Dr Purdom. 9.

10. To keep an echo record of the survey (paper record from fish graph) (Dr Pawson).

To collect sprat samples (Dr Johnson). 11. 11 g.

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12. To collect Blue Whiting sample (Dr Pawson).

13. To collect Norway Pout samples (Dr Pawson).

14. To collect sandeels for fish food (Dr Htun-Han).

- 15. To collect plankton samples (Dr Dodge).
- 16. To collect typical mixtures of small fish for Mr Blacker's fish identification courses.
- 17. To photograph and preserve sample of Horse Mackerel (Dr Lockwood).

NARRATIVE

The scientific staff joined RV CIROLANA at Grimsby at 1530 h 17 August 1977. Severe weather conditions made sailing impractical on the evening tide of the 17th and again on the morning tide of the 18th. RV CIROLANA departed the lockpits at 2000 h 18 August. The groundfish survey (Aim 1) was commenced on the morning of the 19th off the Tyne, water sample stations being taken along the cruise track where appropriate.

To achieve Aim 5 in time for results to be available to ICES for 23 August passage was made to the area of the Floden Ground on the night of 20-21 August. Fishing directed to Aim 6 was made in this area on the 21st and 22nd. Results from this work were phoned directly to Mr Burd at ICES on 23 August. Thereafter the survey was continued until 1930 h 25 August when severe gale conditions caused a cessation of work until 1518 h 26 August. Due to time lost to bad weather conditions several planned stations were omitted from the survey in the Shetland area. The torturous bottom topography in this area forced appropriate modifications to the fishing gear and consequently it was felt best to omit stations where the risk of gear damage was highest and where results if obtained would be biassed by gear changes. The loss of a complete set of gear on hauling on the 27th caused a further station to be omitted in this area. Heavy weather again forced the omission of a planned group of stations on 29 August and on 6 September. The general pattern of work was to cover two primary survey points in one day, making three trawl hauls at each and to use the night where possible to extend to coverage of the North Sea for Aim 4.

The cruise track is shown in Figure I. Figure II shows trawl stations and Figure III shows water sample stations.

RV CIROLANA docked at Grimsby at 1630 h 12 September 1977.

RESULTS

Aim 1. Groundfish Survey

The survey was designed as a semirandom stratified groundfish survey, the stratifications being depth (< 30, 30-50, 50-100, 100-150 and > 150metres) and areas. The strata areas are shown on Chart II which also shows the position of trawl hauls. In general three trawl hauls were made at each primary sampling point. The average catch from each group of three hauls for Cod, Haddock, Saithe, Whiting and Plaice are available in a preliminary scientific report which also shows the total and average catches of each species by Area Strata. Due to the heavy weather experienced it was necessary to remove four primary sampling points from the grid and reduce the number of hauls of some others to two per primary point. Results from each trawl haul were input into the HP 2100A computer and stored as files which it was possible to interogate to provide preliminary results. This was particularly valuable in several ways (1) The discipline of getting data on to the computer ensured all questions were resolved while they were still fresh in people's minds. (2) It enabled validity checks to be made on the data for discrepancies between weights and length distributions. (3) It considerably eased the job of raising distributions when fish were measured in different size categories. (4) It enabled the results to be reviewed rapidly. At each primary survey point surface and bottom temperature and salinity were sampled by Nansen bottle casts. Data of catch weight and of length were originally recorded on special forms (Form A and Form B) which are attached to this report. The completed sheets filed by station, the Naturalist's log book and the Hydrographic log book form the basic documentation for this aim.

Aim 2.

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Length distributions were obtained for each fish species on each trawl haul. Stratified otolith samples were collected for cod, haddock and whiting from subareas defined by the North Sea Roundfish Working Group (see chart 4).

Stratified samples of otoliths for plaice were collected from areas suggested by Dr Bannister (see Chart 5). Additionally stratified samples of otoliths for saithe and for lemon soles were collected for the roundfish areas and plaice areas respectively. The preliminary scientific report gives details of the number of otoliths in each length group in each area and their serial numbers.

In addition to these, small samples of otoliths were collected from the following species to archive against the possibility of future interest in them:

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1.	Ling	6.	Gurnard (Grey)	11.	Dover sole
2.	Tusk	7.	Pollack	12.	Witch
3.	Megrin	8.	Tub Gurnard	13.	N. Pout
4.	Long Rough Dab	9.	Lesser weever	-	
5.	Dad	10.	Poor cod		

Additionally, miscellaneous otoliths were taken from several other species to assay their readability (catfish, monk). Weight, sex and maturity were examined for otolithed fish and their gut contents examined and recorded on form C. An example of form C is appended to this report. A first analysis of gut contents is contained in the preliminary scientific report.

Aim 3. Hearts

Fish hearts were taken for histological examination from twenty species. Hearts from ood, mackerel and saithe were taken from over the total length range of the fish caught, and those of any large fish of other species were taken when the opportunity arose. A total of over 100 hearts were collected.

Aim 4.

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Water samples were taken along the cruise track in order to assay the level of caesium in the surface waters of the North Sea. Where possible these were made at the intersections of a $\frac{1}{2}$ degree of latitude and 1 degree of longitude graticule. Opportunity was taken on night steams to extend the coverage as far as possible. Chart 3 shows water stations taken on the survey. In addition to surface stations, bottom samples were taken using Niskin bottles in a section of the North Sea at approximately 57°30' north (see chart 3). This was achieved by adding a Niskin bottle to the Nansen bottle string when hydrographic observations were made at the end of trawl stations. In each case a 25 litre sample was collected and processed by passing it through an ASG cartridge for subsequent processing by FRL.

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Blood from 25 saithe were taken when material became available. Samples were taken at stations 54, 93 and 117. In addition about 25 crabs were collected for genetic studies from station 141 - 143.

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Trawl stations additional to those of the survey were made in the area of the Fladen Ground. These gave extra information on the by catch rate of the juveniles of commercial gadoids in the areas of the Norway Pout box and industrial fishing areas immediately outside of the Pout box in the Fladen area. Results from these were worked up and telephoned to Mr Burd at ICES in time for the meeting of the Working Group on Norway pout.

Aim 7.

Aim 5.

Aim 6.

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Catch rates of spurdogs were low at stations throughout the North Sea. Catches were in general of only one or two fish per haul which were tagged where their condition was satisfactory. About 50% of fish were tagged, 106 fish being released during the survey. It is concluded that this species is a poor subject for a Robson rolling tagging experiment. <u>R madiata</u>, which was caught in most areas in reasonable quantities, would seem a better subject of such an experiment in future years.

Tank rejects from the spurdog tagging were treated as part of the groundfish survey catch. Additionally they were weighed individually in order that the weight of tagged fish can be estimated and later included in groundfish survey results.

Aim 8.

Mackerel samples were collected for Dr Lockwood from Stations 24 & 25. No fish were caught in a spawning condition.

Aim 9.

One halibut was caught on 23 August at Station 47. Although larger than that requested it was decided to keep it alive. Severe gales on 25 and 26 August however resulted in extensive scaling and fin damage and the animal being in a moribund condition it was killed on the 26th. It proved to be a male stage III of 102 cms. A second halibut was caught on 23 August, failed to survive the heavy weather of 29 August and was found dead on 1 September.

Aim 10.

The Marconi Fishgraph was run continuously through the cruise at Dr Pawson's request. Workloads on staff precluded an echo sounder watch being set. It was however anotated from time to time with depth, gain settings, time etc. After some experimentation a gain setting of 7.5 was adopted. The Radio Officer gave most valuable assistance in the maintenance of the equipment and in anotating records.

Aim 11.

Sprat samples were taken for Dr Johnson at Stations 5, 136 and 197. Catch-rates of sprat were low at the English Coast and no other opportunities arose to collect samples. Aim 12.

Samples of Blue Whiting were taken for Dr Pawson. These were mostly of small fish of 10-20 cm. Very few adult Blue Whiting were caught in the survey and samples of these were frozen. Samples came from Stations 59, 68, 120, 122, 123.

Aim 13.

Norway pout samples were taken for Dr Pawson in the area of the Fladen Ground and other areas. These were from Stations 24, 59, 70, 77, 92, 116.

Aim 14.

Sandeels were collected for Dr Htun Han for fish food.

Aim 15.

Several plankton samples were taken for Dr Dodge at various trawl stations using a 325 mpi pup sampler to filter sub-surface water from a pumped source.

Aim 16.

Typical mixtures of small fish were collected for use on Mr Blacker's fish identification courses for Fishery Officers.

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Aim 17.

Following a telegram request, photographs of scad were taken and specimens frozen for Dr Lockwood.

Other matters

- 1. Catches of herring were in general confined to a few fish At stations 10 and 136 however sufficient numbers were caught for a sample to be taken.
- 2. Examples of O-group poor cod were preserved.
- 3. A length sample of <u>Nephrops</u> was taken at Station 196 (Outer Silver Pit).
- 4. The thermograph was run throughout the trip.
- 5. The H.P. 2100A computer was installed before the trip and run continuously. It gave valuable and trouble-free service throughout the cruise. Use of the computer for recording data from such surveys and for the production of preliminary results does however require that one scientist be almost fully committed to this duty. A series of programs for the input of trawl catch data and for producing preliminary results under DOS-M were developed and are available on request. The computer proved of the utmost value in handling the cruise documentation.
- 6. A preliminary scientific report of the cruise was assembled during the time at sea. This contains details of otoliths collected, length distributions, stomach content analysis, catch rates by area etc. It is intended as a concise summary of the cruise results which is hoped will make the kinds of data available from the cruise apparent to any-one wishing to use them.

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Data from the cruise will be held on computer file and be 7. accessible to special analysis. J G Pope 22.9.77 SEEN IN DRAFT THF (Master) WJS (Skipper) AJL AJLINITIALLED DISTRIBUTION Basic list + J G Pope J Nichols B Knights R Turner S Milligan J Smith (Ham. Dock) D Hyland (Fleetwood) B Knights A Hunter (Shields) . ئ • : đ • 1 at 1.1 : 5 . . 6



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CHART 2



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Form A

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Liparis		·		
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R. naevus				
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