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THE CENTRE FOR ENVIRONMENT, FISHERIES & AQUACULTURE SCIENCE,
LOWESTOFT LABORATORY, LOWESTOFT, SUFFOLK

2000 RESEARCH VESSEL PROGRAMME

REPORT: RV CORYSTES, CRUISE 10

STAFF: R Millner
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M Boon
M Easey
T Mead
A Cook
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DURATION: Left Lowestoft 1530 h, 25 July
Docked Lowestoft 0620 h, 8 August

LOCALITY: North Sea (IVc) and eastern English Channel (VIIId).

AIMS:

1. To undertake a beam trawl survey in the southern North Sea and eastern English Channel as part of an international programme to i) obtain fisheries independent data on the distribution and abundance of commercial flatfish species and ii) derive age compositions of sole and plaice for use in the assessment of stock size.
2. To collect biological data including maturity and weight at age of commercial flatfish and non-commercial fish by-catch.
3. To quantify the seabed sediments and epibenthos using 4m beam trawl by-catch data, a specially designed 2m beam trawl, and remote acoustic seabed discrimination systems (QTC).
4. To carry out a detailed survey on and around the Hastings Shingle Bank.
5. To collect biological data on the reproductive cycle and population genetics of the ctenostomate bryozoan genus *Bowerbankia*.

NARRATIVE:

CORYSTES sailed from Lowestoft at 1530h on 25 July and, in the absence of R Millner, B Harley acted as SIC. Three stations in the outer Thames were completed before steaming overnight to start the survey in VIId off Dungeness on 26 July. In good conditions CORYSTES worked the 4m beam trawl, 2m beam trawl and acoustic seabed discrimination lines (QTC) at selected sites along the Sussex coast. On the 27 of July staff from Bangor University were put ashore by sea rider at Sovereign Harbour, Eastbourne having observed the method of deploying the 4m trawl and R Millner was taken aboard. Earlier, B Meadows had come aboard to exchange the Furono sounder in the dry laboratory. CORYSTES then continued working along the southern coast, completing all stations in the English sector of the survey on 30 July and entering French waters near the Cherbourg peninsula. In continuing fine weather, sampling continued without interruption along the French coast except for a number of extremely large hauls of brittle stars (up to 7 tonnes at station 78 off Ouistreham in QTC box 9, which took nearly 3 hours to haul onboard). All primary survey stations in VIId were completed by midday on the 4 August. CORYSTES then sailed for Hastings and began a detailed QTC grid in a box approximately 3.5 x 5.5 nm around the Hastings Shingle Bank dredging site. The QTC grid was completed at 0426 h on 5 August and the following day was spent sampling for fish and benthos using 2m and 4m beam trawls. On 6 and 7 July the remaining stations in the Thames were completed before CORYSTES docked at Lowestoft at 0500h on 8 August.

RESULTS:

Aim 1: All 77 primary stations used in the estimate of year class strength of sole and plaice, together with 5 additional stations, were completed in VIId and 15 stations fished successfully in IVc (Figure 1). At each station the standard 4m beam trawl, fitted with chain mat, flip-up ropes and 40mm cod-end liner was trawled for 30 minutes at a speed of 4 knots. All fish were counted, weighed and measured. Length stratified samples of otoliths of plaice, dab, lemon sole, brill and turbot were taken from the English and French sectors of the survey and all soles caught were sexed and otolithed. Commercial shellfish (scallops, cuttlefish and spider crabs) were counted and weighed and edible crabs measured. The number of otoliths collected are shown below:

| | sole | Plaice | dab | lemon sole | brill | turbot |
|----------------------|------|--------|-----|------------|-------|--------|
| VIId: English sector | 523 | 179 | 166 | 32 | 20 | 7 |
| VIId: French sector | 411 | 288 | | | | |
| IVc | 398 | 105 | 137 | 35 | - | - |

Otoliths of sole, plaice, lemon sole, turbot and brill were aged on board.

Sole abundance: Figure 2 shows the distribution and abundance of sole. The catches were dominated by the 1998 year class as 2 year olds (Figure 3). The catch rate of sole averaged 1.7kg/h on the English side (1.3kg/h in 1999) compared with 2.0kg/h on the French coast (2.1kg/h in 1999).

Plaice abundance: Figure 4 shows the distribution and abundance of plaice. Large plaice were found in high abundance in particular along the French coast north of the Baie de Somme. The catch rate of plaice averaged 4.0kg/h on the English side (2.3kg/h in 1999) compared with 11.8kg/h on the French coast (5.7kg/h in 1999).

Other species: Baillans wrasse (*Crenilabrus bailloni*), noted as excessively rare in northern European seas (Wheeler, 1978), were recorded at 2 stations associated with rough ground (36 & 94).

Aim 2: All otolithed fish were measured to the nearest mm, weighed individually, sexed and assigned a maturity based on a seven-stage key. All non-commercial fish by-catch from the 4m trawl were identified, weighed and measured. Abundance of benthos from each haul was recorded. All benthic material collected as by-catch material in the 4m trawl was identified to species level, counted and weighed. The results were used to identify macrobenthic assemblages within the eastern English Channel.

Aim 3: An acoustic survey of the seafloor was conducted at all primary stations using the ground discrimination system QTC. A total of 15 acoustically different seabed types was identified and displayed in real-time. The relationship between these bottom types and the species composition of benthic fauna collected as by-catch material and in the 2m beam trawl was examined. The strength of this relationship was tested at 10 previously unsampled 4m beam trawl stations. Patterns with the acoustic data, coupled with information on water depth and bottom shear stress were strongly associated with the composition of by-catch species. For example, high densities of *Ophiothrix* were matched to a specific acoustic signature.

Aim 4: A QTC grid measuring 3.5 x 5.5 nm was worked around the Hastings Shingle Bank dredge site. A total of 5 acoustically distinct regions was identified and subsequently ground-truthed, using a Day grab (0.1m²), and 4m and 2m beam trawl tows. Using QTC, the positioning of grab and beam trawl sampling stations was aided by 'real-time' interpretation of the seafloor. Each acoustically distinct region was characterised by a different substrate type ranging from fine sand to coarse gravelly sand. In general, a higher diversity of epibenthic faunas was associated with regions outside the main dredge site. QTC identified the dredge area (centre point approximately 50.74N 0.57W) as acoustically distinct from all other regions.

Aim 5: All 4m and 2m trawl samples were examined for the ctenostomate bryozoan genus *Bowerbankia*. The bryozoan was found to be rare in the offshore habitats examined but small amounts of material were collected. Samples of a variety of bryozoans were collected for the British Museum and *Alcyonidium* spp. for Swansea University.

Other aims: Samples of live spider crabs were collected for Cambridge University and a number of live fish and invertebrate species obtained for the local Sea Life Centre.

Richard Millner/B Harley
8 August 2000

Seen in draft: R Williams *rw* (Master)
R Graham *Rg* (Senior Fishing Mate)

Initialed: GPA *GPA*

Distribution:
Basic list +

R Millner
B Harley
J Cotter
M Boon
M Easey
T Mead
A Cook
S Freeman
A Waschenbach, Swansea University
M Kaiser, University of Wales, Bangor
Fishing Skipper CORYSTES
R de Clerck, FRS, Belgium
F van Beek, RIVO, Netherlands
A Tetard, IFREMER, France
Kent and Essex, Sussex, Southern SFC

Figure 1. Position of stations Corystes 10/00.

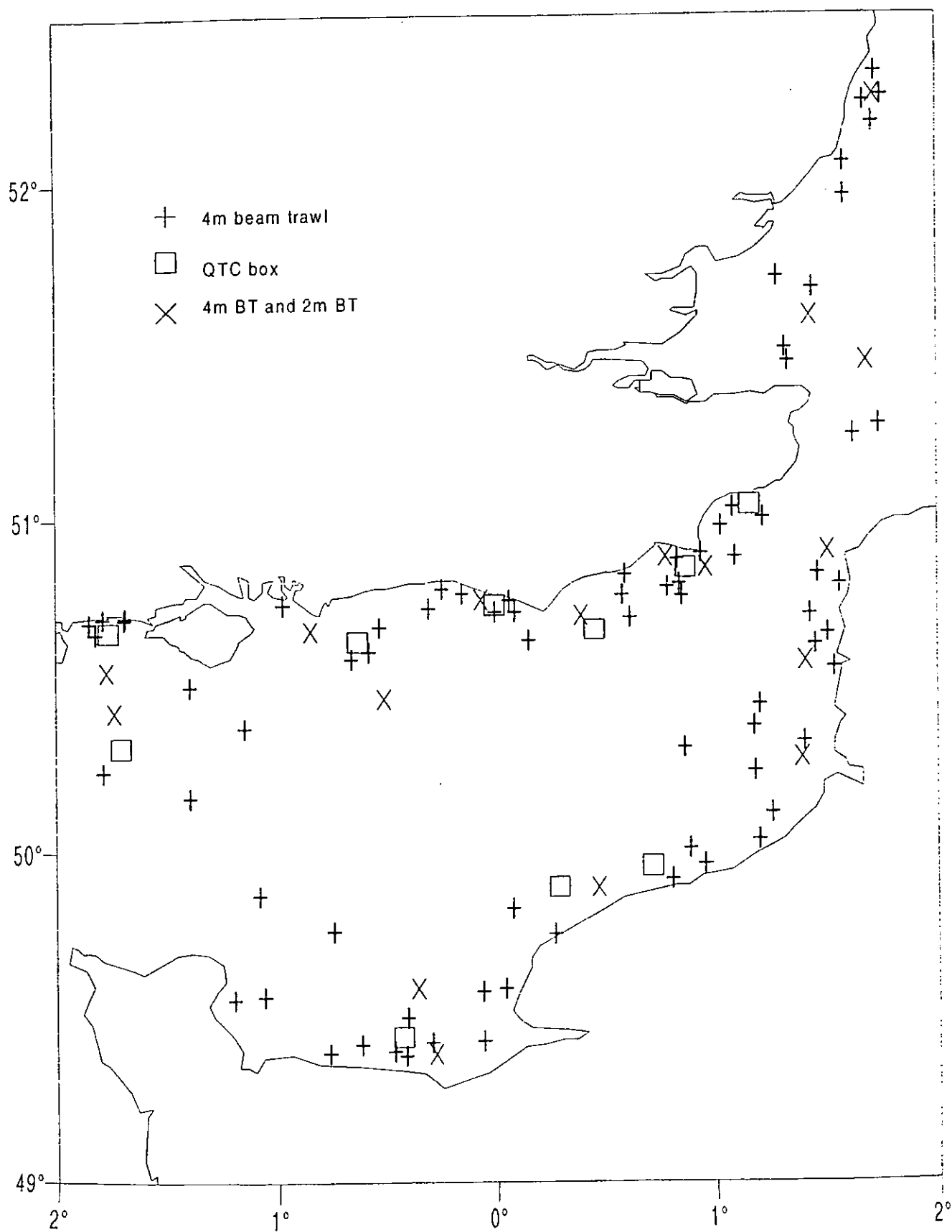


Figure 2. Abundance of sole *Corystes* 10/00

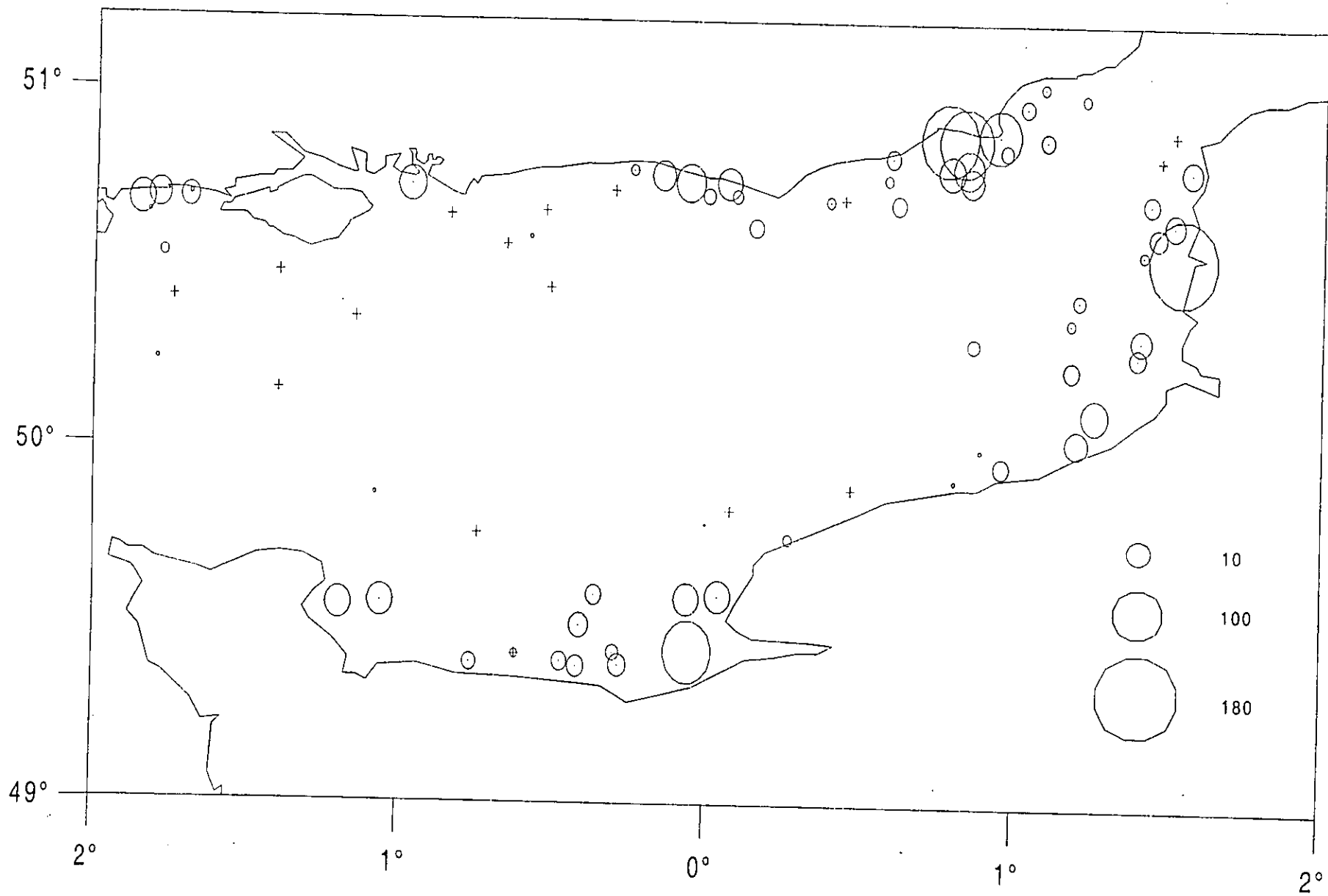


Figure 3. Comparison between catch at age of sole (%) from Corystes surveys in 1999 and 2000.

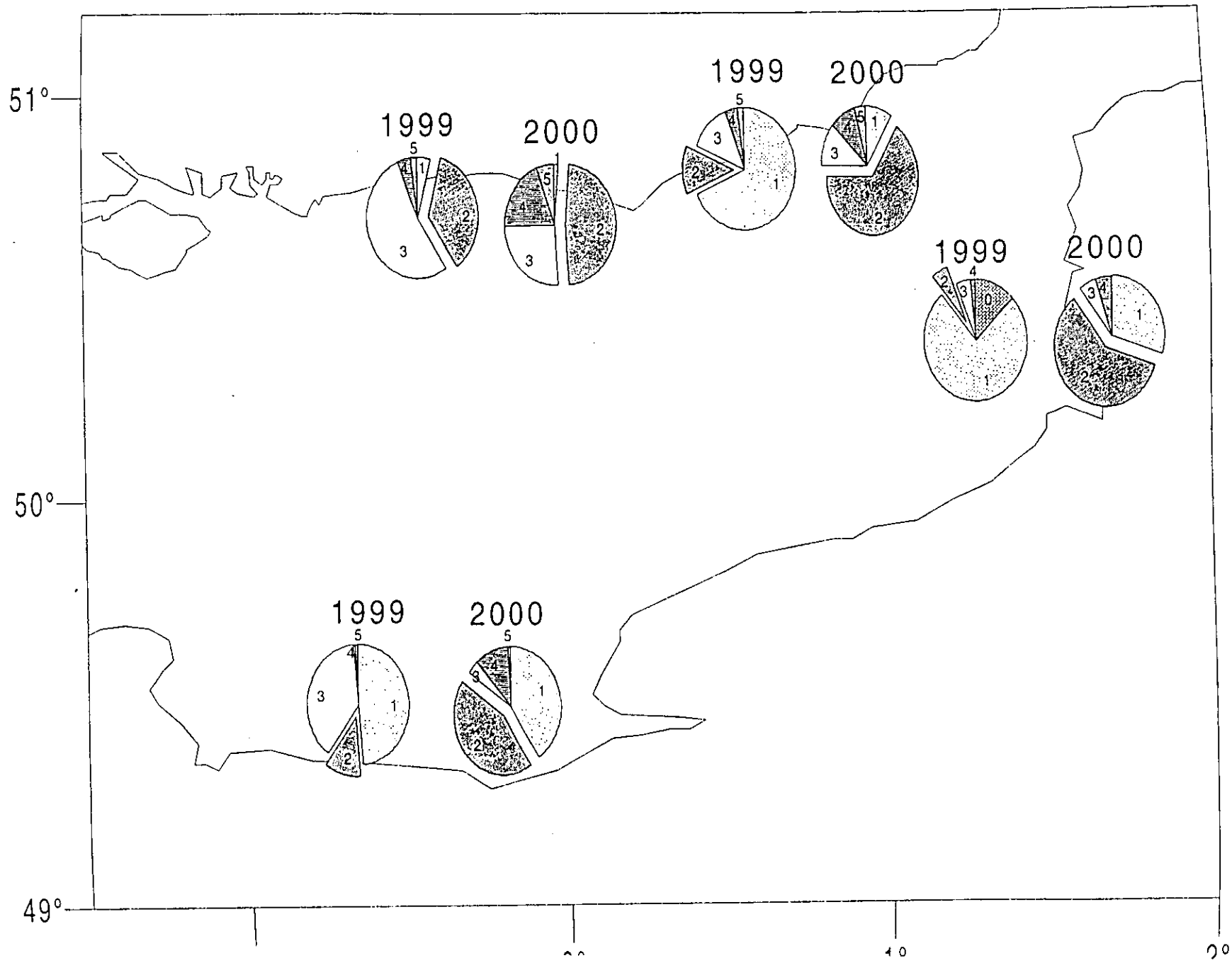


Figure 4. Abundance of plaice *Corystes* 10/00

