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

2004 RESEARCH VESSEL PROGRAMME

REPORT: RV CORYSTES: CRUISE 14/04

STAFF:

Part A	Part B
I Holmes (SIC)	M Boon (SIC)
M Boon(2IC)	M Parker Humphreys (2IC)
S Milligan	G Course
R Scott	S Walmsley
M Parker Humphreys	J Keable
J Smith	J Smith
M Brown (8-13 Sept)	R Humphreys
R Humphreys (13–24 Sept)	I Holmes (4-10 October)
J Kennedy (Liverpool Univ.) (17-24 Sept)	

DURATION:

8 September – 10 October 2004
All times are BST

LOCATION:

Part 14a - Irish Sea (VIIa); Bristol Channel & Celtic Sea (VIIf&g)
Part 14b - Western English Channel (VIIe)

AIMS:

1. To carry out a 4m beam-trawl survey of groundfish in support of the EU Data Collection Regulations 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 sole, plaice, lemon sole and other commercially important finfish species.
3. To determine the distribution and relative abundance of juvenile and adult sole and plaice.
4. To quantify epibenthos using 4m beam trawl by-catch.
5. To collect surface seawater samples in the Bristol Channel and Western English Channel for processing on return to Lowestoft for the analysis caesium and tritium. (AE001) (D McCubbin EFS).
6. To collect fecundity samples in support of plaice recruitment project (CO423).
7. To collect fish samples in support of other CEFAS projects and training courses

NARRATIVE:

Part 14a – Irish Sea & Bristol Channel beam trawl survey

CORYSTES sailed from Lowestoft at 1730h, Wednesday 8 September. After a good passage through the Channel, CORYSTES proceeded through the western English Channel where two water-sample stations for Caesium and Tritium analysis were collected en-route. CORYSTES then proceeded to the eastern Celtic Sea to start the beam trawl survey grid. Fishing commenced on 10 September at 0740h in the Outer Bristol Channel (BCO) and continued into the Inner Bristol Channel (BCI) until 11 September at 2345h when CORYSTES commenced the water sampling 'grid' in the Bristol Channel and Severn Estuary for Tritium H-3 analysis. These 32 water collection stations were completed at 1605h, 12 September and CORYSTES then proceeded to anchor at Blue Anchor Road off Minehead at 1815h to take shelter from on-going westerly gales.

CORYSTES left its anchorage at 0715h, 13 September, in order to resume the fishing grid in BCI, but strong winds and a heavy swell meant that this was abandoned and CORYSTES returned to anchor in 'Blue Anchor Road'. At 2030h, Mary Brown was put ashore at Watchet harbour and Richard Humphreys was picked up. CORYSTES remained at anchor due to poor weather conditions until 1350h, 14 September.

Fishing was resumed at 1721h and continued until the BCI fishing grid was completed at 1630h, 16 September. CORYSTES then proceeded north to commence the St George's Channel (SGC) and Irish Sea West (ISW) beam trawl stations on 17 September. On the evening of 17 September, CORYSTES steamed to Douglas (IOM) in order to pick up Jim Kennedy to carry out fecundity sampling on plaice caught in the Irish Sea. On 18 September, CORYSTES began the Irish Sea South (ISS) fishing stations. On the afternoon of 18 September, CORYSTES paused in order to participate in an emergency safety exercise carried out in conjunction with the RNLI lifeboat based at Llandudno. The lifeboat crew boarded CORYSTES to attend to a 'victim' of a chemical spillage, providing first aid before safely transferring the casualty on a stretcher onto the lifeboat. This exercise was successfully completed at 1420hrs.

The fishing survey continued until 0842h September 20 when worsening weather halted further progress and CORYSTES steamed to Ramsay Bay (IOM) to take shelter, arriving at 1500hrs. Fishing in Irish Sea North (ISN) began at 1530h 21 September in Luce Bay, and continued until 0748h, 23 September, when engine failure meant that the survey had to cease. CORYSTES took anchor off Walney Island whilst repairs were carried out. Upon completion of repairs, CORYSTES steamed to Workington docking at 0830h 24 September for a change of staff and to take on additional supplies.

CORYSTES left Workington at 0830h 25 September and proceeded to finish off the ISN and ISS fishing stations. Upon completion at 1619h, CORYSTES then steamed west to recommence the ISW, SGC and BCO survey grids, completing these at 1617h 30 September. CORYSTES then steamed to the western English Channel to commence the VIIe beam trawl survey.

Part 14b – Western English Channel beam trawl survey

Fishing commenced at 0718h on Friday 1 October southwest of Lands End, and 5 new exploratory stations plus 3 'X' stations were fished in this area before heading to the 'CARHELMAR' station grid. Fishing commenced on the 58 'CARHELMAR' tows the next day and continued until 1806h on 3 October when in worsening conditions, CORYSTES steamed for shelter overnight in Tor Bay. Work recommenced the next morning after breakfast and continued until 1755h when CORYSTES steamed to Brixham in order to pick up Ian Holmes to age sole from the Carhelmar grid in order to provide 2004 estimates of abundance at age for the VIIe sole stock. CORYSTES then proceeded to fish the remaining 'CARHELMAR' stations. These were completed by 1814h on 7 October. A few of the 'CARHELMAR' stations were moved slightly due to new cables, or reduced to 15 minutes to avoid fixed gear or in known areas of large quantities of weed or excessive abundance of small fish. An 18 m ledge was trawled over at the beginning of Prime station F1, and although there was no damage to the gear, the net took about 3 tonnes of sandy gravel, and it is recommended that this station should be moved to the west next year. On completion of the 'CARHELMAR' grid, CORYSTES proceeded to collect 4 water-sample stations for Caesium and Tritium analysis overnight, before fishing 7 'X' and 'Y' experimental tows on Friday 8 October. The last station (Y3) was then fished again by both sets of 4m-beam trawl gear together on the starboard and port winches in order to compare the fishing behaviour of the different sets of gear. On completion of this exercise, CORYSTES was asked to recover a Smart buoy off Hastings. The buoy was located and found to be undamaged, but because of strong easterly winds and rough seas, CORYSTES was unable to recover the buoy. CORYSTES then steamed to Lowestoft, docking at 0600h on 10 October.

RESULTS:

Aims 1, 2 & 3

The survey gear was the standard 4m-beam trawl with chain mat, flip-up ropes and the net was fitted with a 40mm cod-end liner. All fish and selected commercial shellfish were identified to species, weighed and measured (large catches of an individual species were sub-sampled beforehand). Surface temperature and salinity readings were logged at every station using the continuous recorder. In addition, a SAIV Micro CTD unit was attached to the 4m-beam trawl in order to record the temperature and salinity depth profile at each station fished. All station details, fish catch, length distributions and biological data were entered into the Fishing Survey database. The number of otoliths taken in each ICES Division is shown in Table 1 below.

Table 1. Numbers of fish otolithed by ICES division

	VIIa	VIIe	VIIf	VIIg	Total
Anglerfish *(L.piscatorious)*	22	36	13	7	78
Anglerfish *(L.budegassa)*	0	0	0	1	1
Bass	1	0	12	1	14
Brill	15	10	4	0	29
Cod	114	0	2	0	116
Dab	245	120	207	0	572
Haddock	37	4	0	12	53
Hake	3	19	3	9	34
Lemon sole	92	52	57	4	205
Megrim	1	84	0	5	90
Plaice	1519	213	327	3	2062
Sole	522	280	488	36	1326
Turbot	7	0	8	1	16
Whiting	167	27	28	32	254
Total	2745	845	1149	111	4850

Part 14a – Irish Sea & Bristol Channel (ISBC) beam trawl survey

The trawl survey covering the Irish Sea and Bristol Channel is divided up into six sectors consisting of 108 beam trawl tows, of which 107 were successfully fished (figure 1a), including 65 ISN, ISS and BCI stations used for tuning data in the Northern and Southern Shelf assessment Working Groups. A total of 9 Prime stations – numbers 12 (Walney Island), 27 (Morecambe Bay), 40 (Red Wharf Bay), 313 (Tremadoc Bay), 203 (Dundrum Bay), 214 and 220 (north of Dublin), 233 (south of Wicklow) and 501 (southwest of Milford Haven) were reduced from the standard 30 minutes to 15 minute tows because of expected large catches of weed, shell or small flatfish. Prime station number 43 (mid-ISS) was moved this year due to a cable being laid over the existing tow. The new position was due south of the original position within the same depth contour.

Prime station 131 (E of Lundy Island) was not fished due to static gear (no clear tow). A few other stations were either moved short distances or hauled ‘early’ to avoid snagging undersea cables (an increasing problem in this busy sea area) or to avoid static gear.

Abundances of juvenile (pre-recruit) plaice and sole in the Irish Sea and Bristol Channel are shown in Figures 2 and 3. Pre-recruit plaice were most abundant off the east coast of Ireland, in inshore waters off north Wales and northwest England. Pre-recruit sole were most abundant in the Bristol Channel and in inshore waters off north Wales and Liverpool Bay.

Numbers of plaice in BCI per half-hour tow increased by 50% from last year although the total weight fell by 11%, indicating that many more small plaice were caught this year. ISS catch numbers increased by 38% and weights by 44%, this result being heavily influenced by the large catch taken at prime station 43 (1165 fish per half hour tow compared to 125 fish in 2003 and 31 fish in 2002). The exceptionally high catch of plaice at this station may have been affected by poor weather conditions; the fish were

located in a muddy 'hollow' on the seabed where they may have been taking shelter. Exclusion of this station should be considered when working up the survey indices of abundance. Elsewhere, plaice catch rates increased by 23% in ISW but decreased by 21% in ISN, by 51% in SCG and by 38% in BCO.

Catch rates of sole per half-hour tow increased by 27% in BCI, by 23% in ISS, by 26% in ISN and by 16% in BCO compared with 2003. However they decreased by 25% in SGC and by 25% in ISW. Dab catch rates decreased by 66% in SGC, by 25% in BCO and by 19% in ISS, but remained high in other areas. Lemon sole catch rates dropped over the whole survey area, the highest decreases being in ISN (-83%), ISS (-44%) and ISW (-37%). It is interesting to note that numbers of plaice in BCI and dab in ISW both increased while total weight decreased, indicating that there were more small fish in these areas and a possible strong year-class coming through.

Noteworthy changes to the catch rates of other main species showed large increases in the numbers of lesser spotted dogfish, whiting and thornback rays caught throughout the whole Irish Sea and Bristol Channel area.

Part 14b – Western English Channel beam trawl survey

A total of 58 'CARHELMAR' tows were fished (Figure 1b). Overall catches of plaice, sole and dab were down on last year. These reductions in numbers were particularly high on stations D0(O) and D0(I) where plaice were down from 24 fish last year to 10 this year, sole dropped from 26 to nil, and dab from 63 to 5. Catches of lemon sole showed a slight increase this year, while catches of most other species also fell this year. 14 exploratory tows were fished west of Start Point, including 9 'X' and 'Y' stations fished last year, plus 5 new stations off the Scilly Isles. Catches of plaice and sole on the 'X' and 'Y stations were slightly down on last year. Catches of other main species remained similar to last year.

Because of the low catches of fish this year, it was decided to fish both beams together after the last haul of the cruise to see if the catch rates were influenced by the gear. Beam no 3 was towed from the starboard winch (as per the rest of the cruise), and beam no 2 from the port winch, along a line 50m south of and parallel to prime station Y3. Generally, catches were similar to the original tow, but the starboard side gear appeared slightly more efficient than the port side gear, which suggests that the gear was fishing efficiently throughout the cruise.

Given uncertainties in the current state of the VIIe sole stock and the possibility that the stock could be subject to a stock recovery plan next year, fisheries managers agreed that an early view of the 2004 survey indices would be helpful. Therefore, Ian Holmes rejoined CORYSTES to age all VIIe sole caught on the CARHELMAR grid in order to provide 2004 estimates of abundance at age. The survey indices were calculated and the results sent to Lowestoft early on the 8th October, where they could then be fed into the stock analysis being provided to the autumn ACFM (Advisory Committee for Fisheries Management) meeting beginning 8th October. The 2003 survey indices showed record high levels of 1-year-olds (2002 year-class), and it was hoped that these would appear in the 2004 survey indices as 2-year-olds. However, the results showed that overall sole catches in 2004 from this area fell by around 40% compared to 2003, and that the high numbers of 2-year-olds hoped for did not materialise.

Aim 4 - Epibenthos

At 36 selected fishing stations, samples of the epi-benthic by-catches were sorted and 32 'core species' identified and quantified. A standard operating procedure (SOP) for the processing of this by-catch was provided. It was not possible to complete this additional work on some of the busier survey days when staff were fully employed with the processing of the fish catches, and on these stations samples of the epi-benthic by-catch were labelled and frozen for subsequent analysis upon return to Lowestoft. If this cruise aim is to continue, the provision of a scientist dedicated to this work should be considered for future surveys.

At all fishing stations on the survey, catches of 9 sentinel taxa of benthic invertebrates were recorded. The total weight of the remaining by-catch of epi-benthic invertebrates was recorded on all except 3 stations where the by-catch was very heavy and had to be estimated. The weight of rocks caught in the trawl was also recorded at each station.

Aim 5 – Water sampling

1 litre surface seawater samples were collected from 43 stations in the Bristol Channel and Severn Estuary and 22 stations in the Western English Channel for Tritium H-3 analysis. In addition, 50 litre surface seawater samples were collected at 22 stations in the Western English Channel for Caesium Cs-137 analysis. These were taken for David McCubbin (CEFAS, Lowestoft).

Aim 6 – Fecundity sample collection

James Kennedy (Liverpool University) joined CORYSTES in order to collect fecundity and muscle tissue samples from mature female plaice in support of plaice recruitment project (MO423). In total 30 whole ovary samples and 23 fecundity samples were successfully collected from Irish Sea fishing stations within the Liverpool Bay area. Muscle samples from all sampled fish were also collected. In addition, 14 whole plaice were frozen for use in the trialling of biopsy techniques.

Aim 7 - Additional sample collection

Additional fish samples were taken in support of other CEFAS projects and training courses:

Specimens of 57 species of fish caught were frozen individually for use on future RN/SFI fish identification courses. Dr. C. Fox (CEFAS, Lowestoft)

7 specimens of Bullhuss (*Scyliorhinus stellaris*) were tagged with Peterson discs and released. Dr J Ellis (CEFAS, Lowestoft)

290 tissue samples from thornback ray (*Raja clavata*) small-eyed ray (*Raja microcellata*) and selected samples of other ray species caught were taken for genetic studies. Dr J Ellis (CEFAS, Lowestoft)

49 samples of squat lobsters were preserved. Dr. J Ellis (CEFAS, Lowestoft).

1 mantis shrimp (*Meiosquilla desmaresti*) was frozen. J Herbert (Marine Conservation Society).

2 dab (*Limanda limanda*) caught in the Western English Channel were frozen. A Franklin (CEFAS, Burnham on Crouch).

Illicia from all otolithed anglerfish (*Lophius piscatorius* & *L. budegassa*) were removed and placed in the otolith packet with the otoliths. S Warne (CEFAS, Lowestoft)

10 'sets' of selected species (each with 15 individuals) were collected and frozen as part of the on-going CEFAS fish ID quality control programme. In addition, all scientific staff participating in the survey were tested on their fish identification at 4 stations during the survey. M Etherton (CEFAS, Lowestoft).

Micro CTD

SAIV Micro CTD unit number 426 was attached to the 4m-beam trawl in order to record the temperature and salinity depth profile at each station fished. It was successful in collecting data on all 180 prime and experimental fishing stations fished.

Our thanks go to all the officers and crew of RV CORYSTES for their help and support during this survey. It is due to their expertise and dedication that so many of the 'core' fishing stations were successfully fished, given the severe weather experienced for the duration of the survey.

I D Holmes & M J Boon
10 October 2004

INITIALLED: Dr R. Millner

SEEN IN DRAFT: Master: Capt M. Elliot
Senior Fishing Mate: B. Salter

DISTRIBUTION:

Basic List +

I Holmes
M Boon
M Parker-Humphreys
J Smith
R Humphreys
S Milligan
R Scott
G Course
S Walmsley
M Brown
J Keable
J Kennedy (Liverpool Univ)
R S Millner
S Flatman
T Boon
R Briggs (DARDNI, Belfast)
P Connolly (DOM, Dublin)
FCO (for Republic of Ireland & France)
Sea Fisheries Committees:
Cumbria
North Western and North Wales
South Wales
Devon
Cornwall

Figure 1a

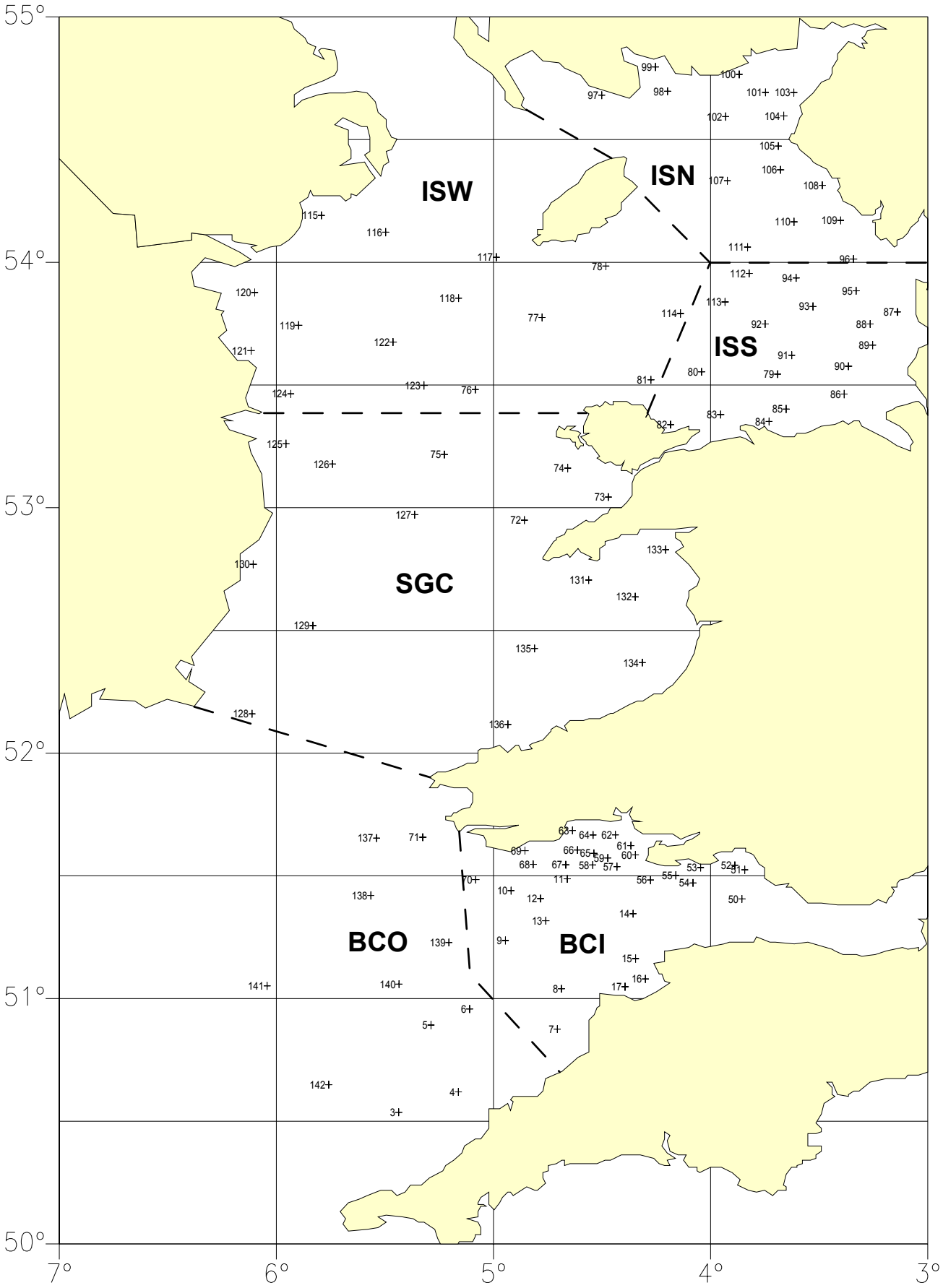

Figure 1b.

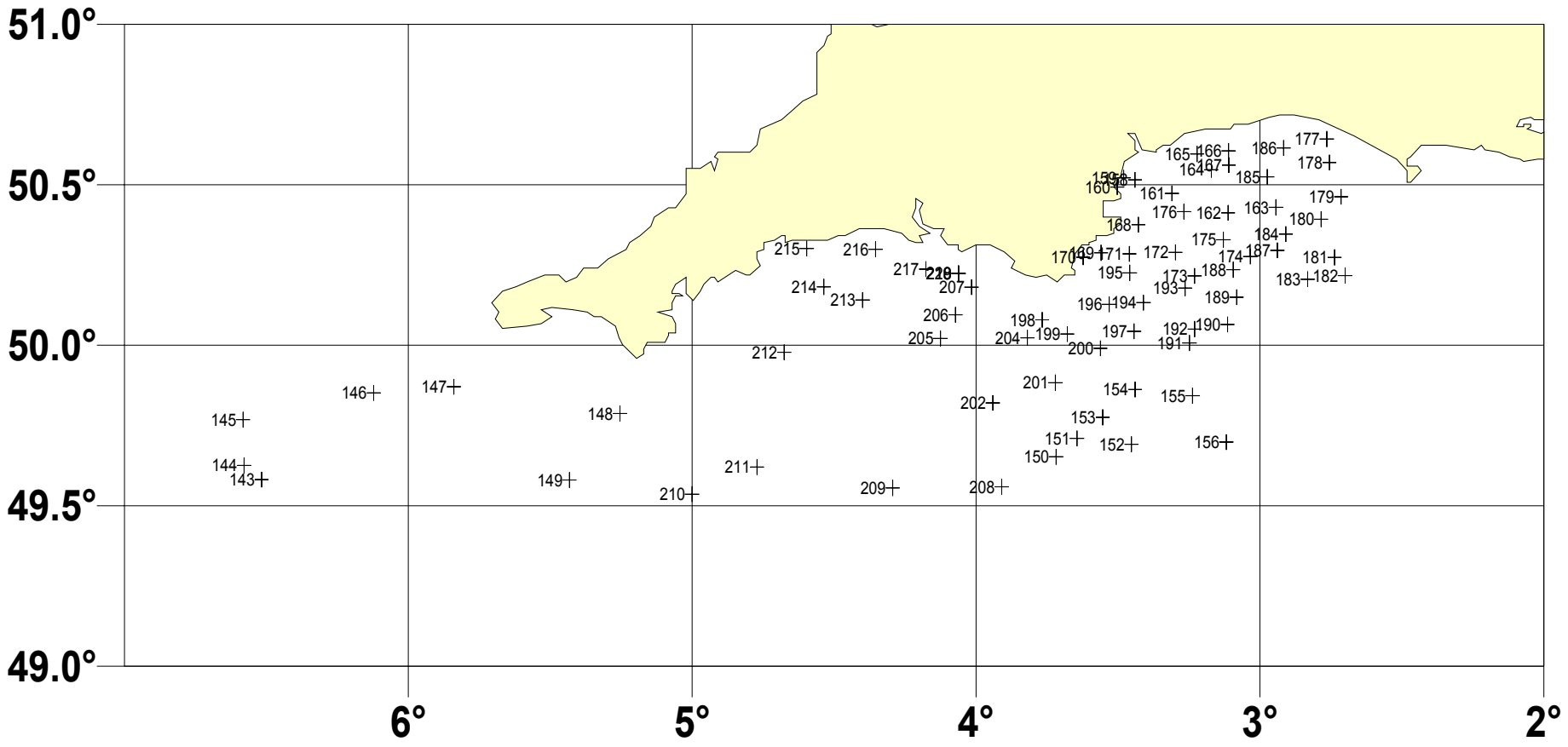
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Figure 2.

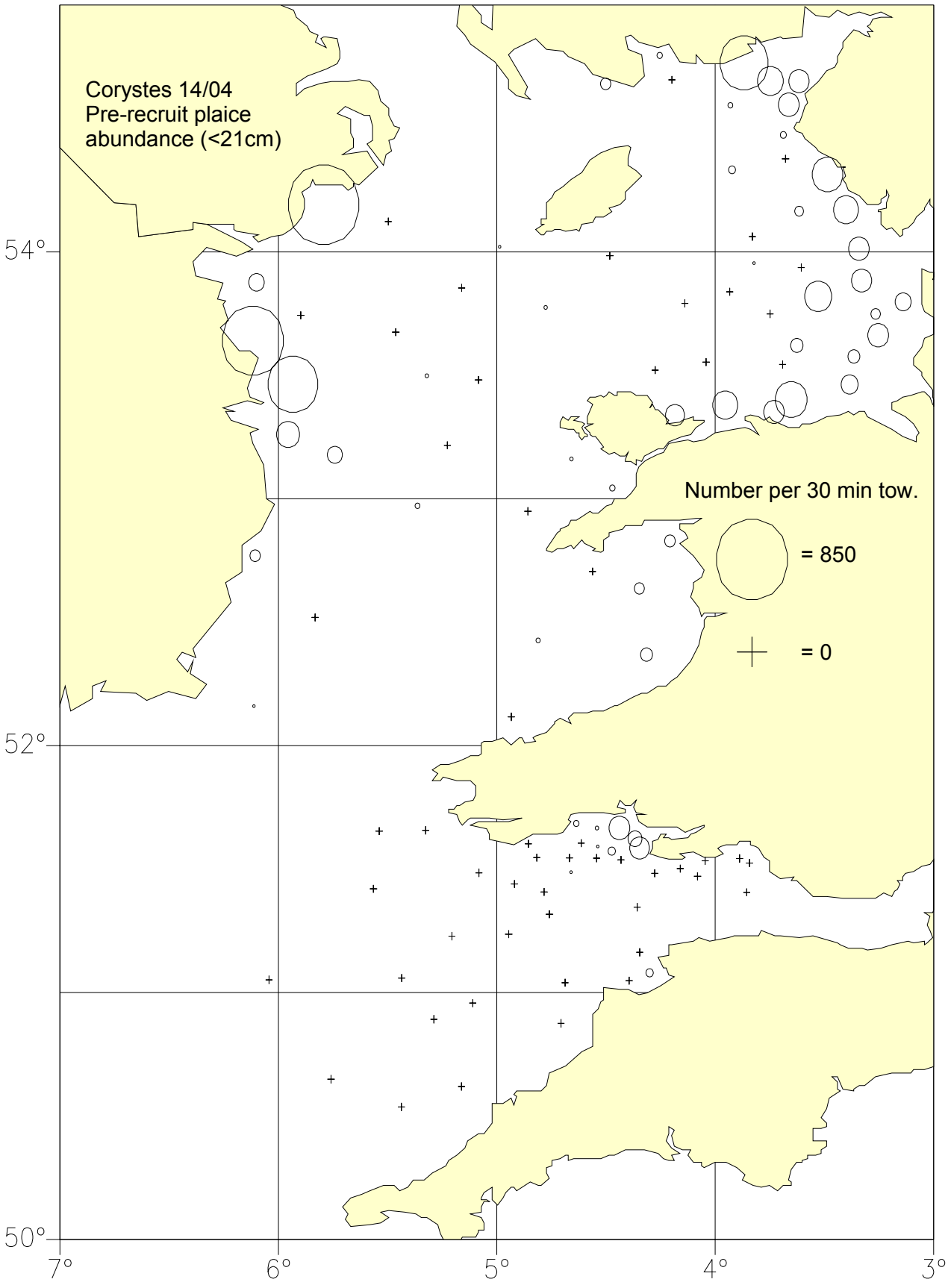
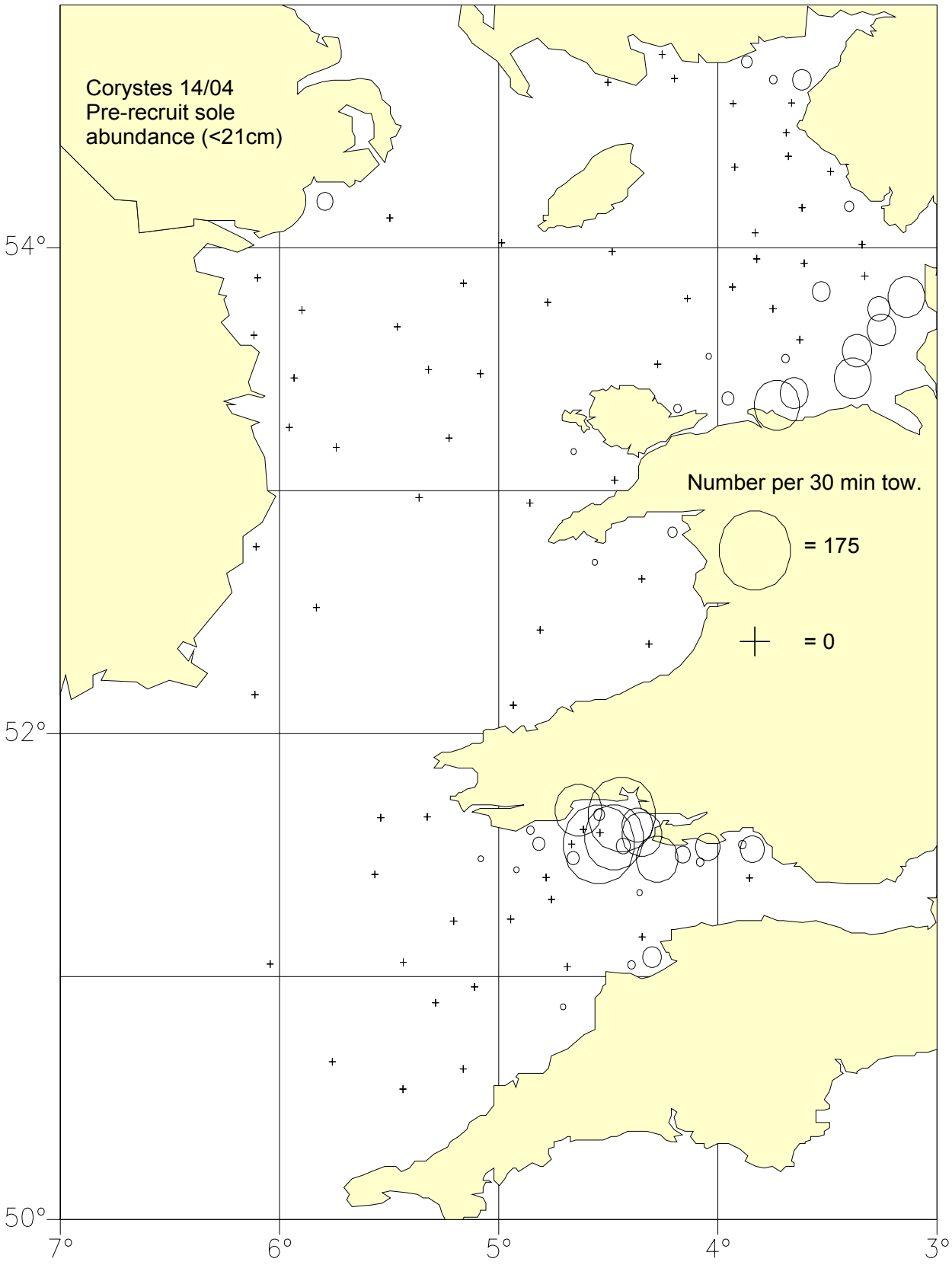

Corystes 14/04
Pre-recruit plaice
abundance (<21cm)
Number per 30 min tow.
= 850
= 0
54°
52°
50°
7°
6°
5°
4°
3°

Figure 3.


Corystes 14/04
Pre-recruit sole
abundance (<21cm)
Number per 30 min tow.
= 175
= 0
54°
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6°
5°
4°
3°