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

2002 RESEARCH VESSEL PROGRAMME

REPORT: RV CORYSTES: CRUISE 13/02

STAFF:

M Boon (SIC)	J Keable (pt 1)
I Holmes (2IC)	R Humphreys (pt 1)
S Milligan	J Ellis (pt 2)
B Harley	R Scott (pt 2)
M Parker-Humphreys	G Burt (pt 2)
C Fox (pt 1)	J Araujo (U.C.Leicester) (pt 2)

DURATION:

4 September – 5 October 2002
All times are BST

LOCATION:

Part 13a - Irish Sea (VIIa); Bristol Channel & Celtic Sea (VII f&g)
Part 13b - Western English Channel (VIIe)

AIMS:

1. To carry out a 4m beam-trawl survey of groundfish in support of EC 1639/2001 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 quantify the epibenthos using 4m beam trawl by-catch.
4. To collect surface sea-water samples for the analysis of Tritium and Caesium. (AE001) (B. Smith EG 1).
5. To collect fish samples in support of other CEFAS projects and training courses.

NARRATIVE:

<u>Part 13a – Irish Sea & Bristol Channel beam trawl survey</u>

CORYSTES sailed from Lowestoft at 0900h on Wednesday 4 September. After a smooth passage through the Channel, CORYSTES proceeded to the eastern Celtic Sea to start the beam trawl survey grid in the Inner Bristol Channel (BCI) at 0646h on 6 September. Fishing continued until 1800h when CORYSTES commenced water sampling in the Bristol Channel and Severn Estuary for Tritium H-3 analysis. The next day fishing continued in Swansea Bay until 1600h

when CORYSTES returned to the Severn Estuary to complete the water sampling. The water sampling stations in this area were completed by 0030h on 8 September and trawling recommenced at 0700h. All BCI stations were completed by 9 September, and CORYSTES proceeded to Cardigan Bay to commence the St George's Channel (SGC) beam trawl stations on 10 September. CORYSTES then proceeded to the North Wales coast to commence the Irish Sea South (ISS) and Irish Sea North (ISN) beam trawl stations. On the evening of 12 September CORYSTES dropped anchor in Llandudno Bay in order to pick up an extra seaman, a replacement CTD and a fine resolution seagoing balance. All ISS and ISN stations were completed by 17 September and CORYSTES steamed to the Western Irish Sea to fish the Irish Sea West (ISW) and remaining SGC stations. The ISW stations were completed on 19 September and CORYSTES docked in Dublin late afternoon for a change of staff and to take on stores. CORYSTES left Dublin on 21 September to continue fishing the SGC stations, which were completed on 22 September. Fishing in the Outer Bristol Channel (BCO) then commenced, and all BCO stations were completed on 24 September. CORYSTES then steamed to the western English Channel to commence the VIIe Beam Trawl survey.

Part 13b – Western English Channel beam trawl survey

In previous years, the FV CARHELMAR was chartered to conduct the VIIe Beam Trawl survey in the Brixham Bay area. However, in order to increase the survey coverage and improve sampling levels on all species of finfish and epibenthos, it was decided to use the RV CORYSTES to conduct the survey this year.

Fishing commenced at 0705h on Wednesday 25 September and eight valid tows were fished that day. The final tow at Prime Station D3 was hauled with turns in the net. This would have caused loss of fish above the cod-end liner so the tow was deemed to be invalid and was repeated without incident. Eight of the nine planned stations were fished on 26 September, the tow at Prime C2 having to be abandoned due to static gear along the tow. The following day, Prime C2 was fished successfully along with eight others. During the next three days a further 28 stations were fished without incident in fine weather. The final five 'CARHELMAR' stations were completed by 1240h on Tuesday 1 October. CORYSTES then began a survey of some additional, exploratory tows. As these tows had never been fished on CORYSTES before, the fishing skipper decided that it would be worth while running over the tows before shooting in order to check that the ground was suitable for our gear. A total of twelve exploratory stations were fished offshore between Start Point and Lands End. The exploratory tows were completed by 3 October and CORYSTES set course for Lowestoft, docking at 0800h on 5 October.

RESULTS

Aims 1 & 2

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). A water sample was taken at the first and last station every day for salinity calibration purposes, and surface temperature and salinity readings were logged at every station using the continuous recorder. All station details, fish catch, length distributions and biological data were entered into the Fishing Survey database.

Part 13a – 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 109 half-hour beam trawl tows. Of the 67 stations used for tuning data (ISN, ISS, BCI) in the Northern and Southern Shelf assessment Working Groups, 66 were fished successfully, and 108 stations in total were completed successfully (Figure 1a). Prime station 106 in BCI was invalid due to gear damage over rough ground, and it is recommended that this station is omitted in future surveys. Prime stations 40 (Red Wharf Bay), 313 (Tremadoc Bay), 203 (Dundrum Bay), 214 & 220 (north of Dublin), 233 (south of Wicklow) and 501 (southwest of Milford Haven) were reduced to 15 minute tows because of expected large catches of weed, shell or small flatfish. Prime 1 in Luce Bay was not fished due to potential unexploded ordnance, and Prime 2 was fished southeast of the restricted area. A few other stations were moved short distances to avoid snagging undersea cables (an increasing problem in this busy sea area).

Pre-recruit plaice were most abundant off the east coast of Ireland, in inshore waters off north Wales and northwest England, and in Liverpool Bay and the Solway Firth (Figure 2). Catches of plaice increased by 83% from last year in ISN and 16% in ISS. In ISW catches decreased by 13% while in SGC there was an increase of 7%. In BCI, plaice catches decreased by 6%. Pre-recruit sole were most abundant in the Bristol Channel and in inshore waters off north Wales and Liverpool Bay (Figure 3). Total catches of sole by area remained much the same as last year, although there was an overall slight decrease on last year's results.

Part 13b – Western English Channel beam trawl survey

A total of 58 'CARHELMAR' tows were fished (Figure 1b), including 56 tows used in the estimation of recruitment for plaice and sole at the Southern Shelf Working Group and two inshore stations south of Teignmouth.

No 0-group plaice were caught this year. Although large numbers were caught last year, catches of 1-group plaice were not significantly higher this year than last. This anomaly has also been seen in earlier years, when, in 1999 large numbers of 0-groups were caught but there was not a significant increase in the numbers of 1-year olds in the catches in 2000. The overall catch rate for plaice was 17.4 fish/hr, which is lower than the 2001 catch rate (25.8) and, for the first time in five years, below the 5-year mean for the survey series (24.8). The overall catch rate for sole was 10.3, which is well below last year's catch rate (18.8) and also below the 5-year mean (17.4) for the series.

The use of CORYSTES on this part of the survey meant that for the first time, all fin-fish and commercial crustaceans were weighed and measured at each haul. Otoliths were taken from stratified samples of sole, plaice, lemon sole and dab, and from all turbot, brill, cod, haddock, hake, anglerfish, megrim and whiting. All otolithed fish were weighed individually, and the sex and maturity stage recorded. Table 1 shows the numbers of fish otolithed in each ICES division.

Twelve exploratory tows were fished over two and a half days. The catches of plaice (3 total, 0.5 nos/hr) and sole (5 total, 0.83 nos/hr) at these stations were low.

Table 1. Numbers of fish otolithed by ICES division

	VIIa	VIIe	VIIf	VIIg	Total
Anglerfish	51	43	37	9	140
Bass (scales)	0	0	2	0	2
Brill	11	9	8	0	28
Cod	26	1	0	0	27
Dab	170	162	170	1	503
Haddock	13	1	3	49	66
Hake	4	3	22	28	57
Lemon sole	101	31	79	2	213
Megrim	0	2	3	2	7
Plaice	1362	247	320	9	1938
Sole	466	153	466	20	1105
Turbot	6	2	18	4	30
Whiting	133	60	65	28	286
Total	2343	714	1193	152	4402

Aim 3

During the first half of the cruise, the presence of benthic species in each catch was recorded. The by-catch of epi-benthic invertebrates was quantified in the second half of the cruise, thus providing data on the invertebrate fauna of the outer Bristol Channel and western English Channel, areas for which there were previously only limited quantified data. Catches in the outer Bristol Channel were generally small and dominated by echinoderms (e.g. *Astropecten irregularis, Luidia sarsi, Asterias rubens* and *Marthasterias glacialis*) and crustaceans (e.g. *Pagurus prideaux, Inachus* spp., *Macropodia tenuirostris* and *Liocarcinus* spp.).

In contrast, catches in Start Bay comprised typical inshore fauna, where *Liocarcinus* spp., hermit crabs (*Pagurus bernhardus*), curly weed (*Alcyonidium diaphanum*), starfish (*Asterias rubens*) and brittlestars (*Ophiura* spp.) were abundant. Catches further offshore were dominated by large echinoderms (e.g. *Psammechinus miliaris*) and crustaceans (e.g. *Pagurus prideaux, Liocarcinus* spp., *Macropodia tenuirostris*), and some areas had large catches of sessile fauna (hydroids, *Cellaria*, tube-worms etc.). Queen scallops (*Aequipecten opercularis*) were generally common offshore, with many juveniles settled on *Cellaria*.

Further west, the catches from the exploratory tows comprised *P. prideaux, A. opercularis* and large echinoderms (*Astropecten irregularis, Luidia ciliaris, L. sarsi, Porania pulvillus, Anseropoda placenta, Marthasterias glacialis, Echinus acutus, Echinus esculentus* and *Spatangus purpureus*).

Aim 4

Surface seawater samples of one litre from each of 39 stations in the Bristol Channel and Severn Estuary were collected for Tritium H-3 analysis; and 51 litres from 19 stations in the Western English Channel for Tritium H-3 and Caesium Cs-137 analysis, for Bryan Smith (CEFAS, Lowestoft).

Aim 5

Julio Neves de Arajuo (University of Leicester) joined CORYSTES after the mid-cruise break in Dublin to collect and preserve stomach contents of 17 species of fish (up to 30 stomachs per species) for subsequent identification in the laboratory. The species included flatfish (plaice, sole, dab, solenette, thickback sole and scaldfish), gadoids (poor cod and whiting), elasmobranchs (lesser-spotted dogfish and rays) and various non-target teleosts (gurnard, dragonet and pogge). In total about 400 samples were collected. These samples will provide some of the data necessary for stucturing a trophic ecosystem model (Ecopath with Ecosim) of the Western English Channel.

Samples of plaice, sole and lemon sole were taken for dietary analyses at selected stations in the western English Channel (Prime stations D3, D4, J4, J5, J6, M3, I4) for Melanie Bergmann (University of Wales, Bangor).

Samples of plaice, sole and whiting were frozen whole for otolith removal training for I. Holmes (CEFAS, Lowestoft).

Otoliths were taken from lemon soles in the size range 5-20 cm for M. Easey (CEFAS, Lowestoft).

All pogges caught in ISS, ISN and BCI were frozen for M. Parker-Humphreys (CEFAS, Lowestoft).

Samples of pipefish were frozen for J. Ellis (CEFAS, Lowestoft).

Five hake were frozen for the Institute of Food Research, Norwich.

Up to 25 commercial size fish of each species (cod, whiting, dab, flounder, plaice and sole) were frozen from eleven selected stations, for contaminant analysis for Dr A. Franklin (CEFAS, Burnham).

All lesser and greater weevers caught in ICES division VIIa were frozen for Dr. R. Nash (Port Erin Marine Lab, University of Liverpool).

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

Micro CTD

An AML Micro CTD unit (number 7035) was attached to the 4m beam trawl in order to record a temperature and salinity depth profile at each station fished. It was fitted to the headline, behind the beam itself, to afford some protection whilst the beam trawl was on the bottom. During the first three days the unit recorded successfully on all of the 25 tows fished. However, the unit failed to record on any of the nine tows on 9 September. On investigation it was found that the batteries may have been to blame but this was not conclusive. The spare unit (7036) was tested but it was not possible to make this unit record at all. The batteries were replaced 4 times before unit 7035 worked but on the first station of the next day the unit failed to record again. The batteries were replaced once again and the unit recorded successful casts for the remainder of the day. Six stations were fished on 11 September and all but the final tow recorded successfully.

The six tows on 12 September were all successful. A replacement unit (7037) was collected that evening and this unit was tested on the seven tows fished on 13 September. In order to guarantee a successful cast on every station it was decided to place both units 7035 and 7037 onto the beam trawl. This proved to be useful on 14 September when both units worked intermittently but successful cast information was obtained for all eight stations fished, using both of the units. For the next four days unit 7035 worked intermittently but 7037 produced a successful cast on every station. It was decided to use only CTD 7037 after the changeover of staff in Dublin. On testing the unit before deployment on 22 September, it did not respond so was not deployed on the first tow of the day. The problem was resolved and the unit was successfully deployed on the remaining four stations that day. Unfortunately the unit did not perform well the following day and only one successful cast was recorded. On the final day the Micro CTD recorded successfully on all four casts. Of a total of 109 stations fished on this part of the survey, 93 stations have complete Micro CTD casts. Because of the uncertainty of the grounds in VIIe, the Micro CTD was not used on this part of the survey.

Finally, we were asked three times during this survey to allow RAF rescue or training helicopters to land a man on board as a training exercise, off Bideford and St Maughan in daylight, and off Holyhead at night. We were happy to co-operate in these exercises.

Our thanks go to all the officers and crew of RV CORYSTES for their help and support during this survey.

M J Boon
5 October 2002

INITIALLED: R. Millner

SEEN IN DRAFT:
Master: A. Reading
Senior Fishing Mate: B. Salter

DISTRIBUTION:
Basic List +

M Boon
S Milligan
I Holmes
B Harley
M Parker-Humphreys
C Fox
J Keable
R Humphreys
J Ellis
R Scott
G Burt
J Araujo (University of Leicester)
M G Pawson
R S Millner
M J Armstrong (DANI, Belfast)
P Connolly (DOM, Dublin)
FCO (for Republic of Ireland)
Sea Fisheries Committees:
Cumbria
North Western and North Wales
South Wales
Devon
Cornwall

Figure 1a. Corystes 13a/02 - Station Positions for ISBC survey area

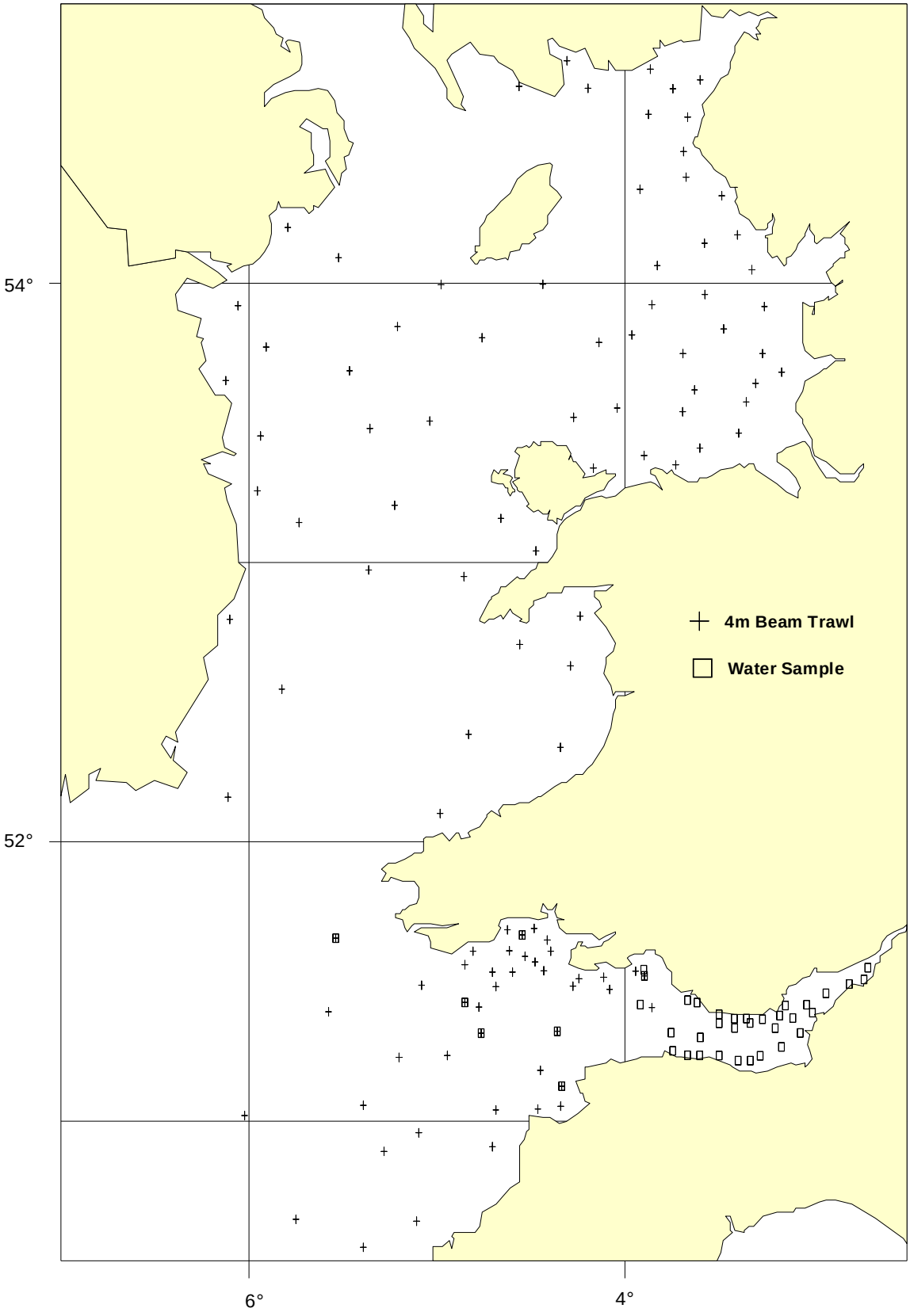


Figure 1b. Corystes 13b/02 - Station positions for VIIe survey area

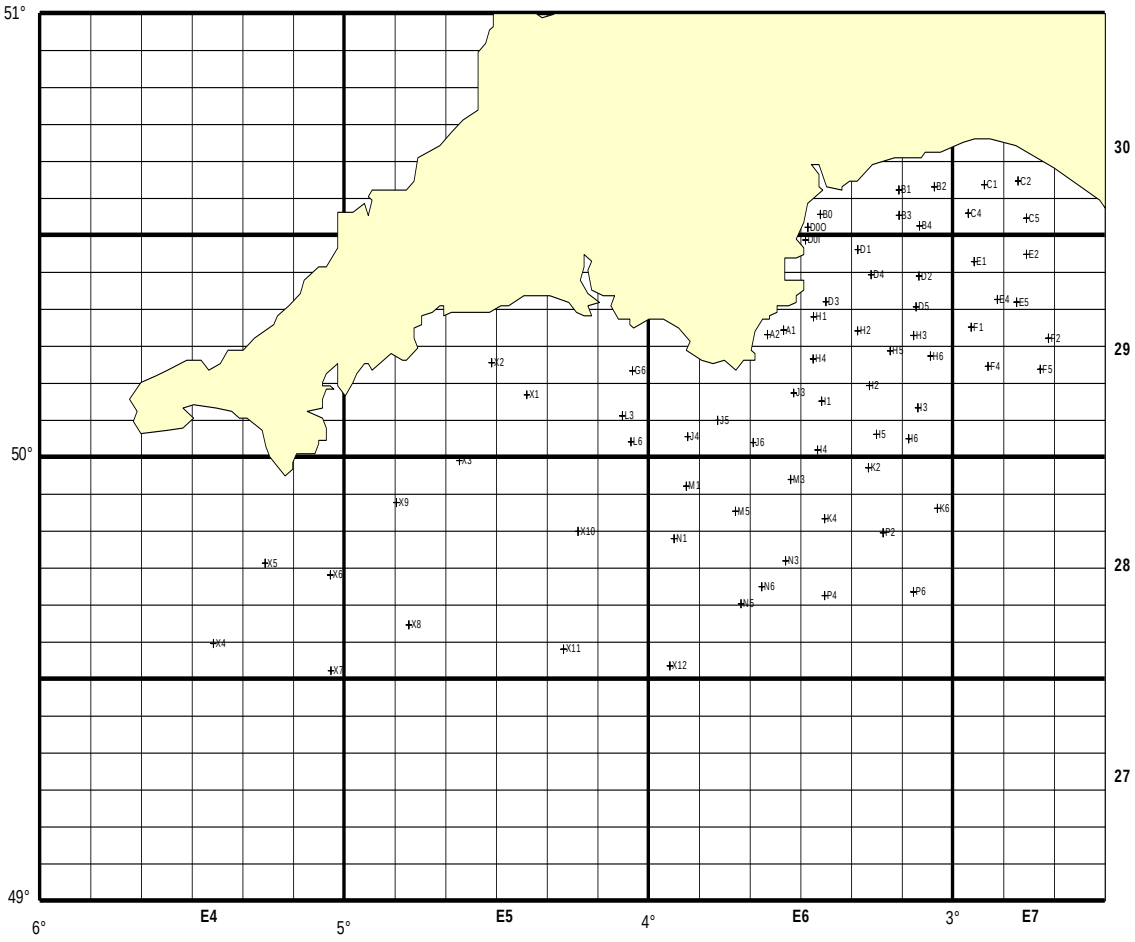


Figure 2

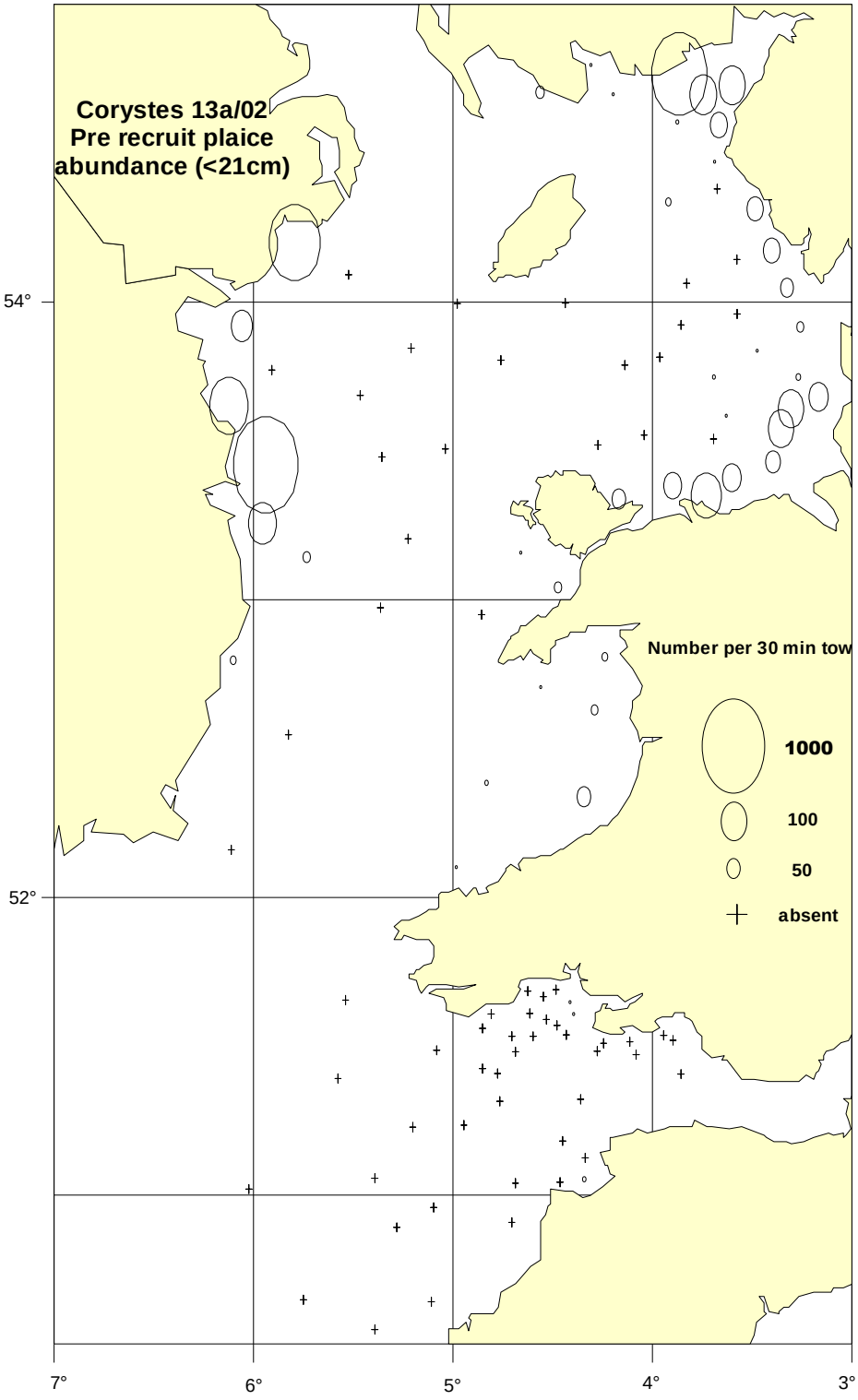
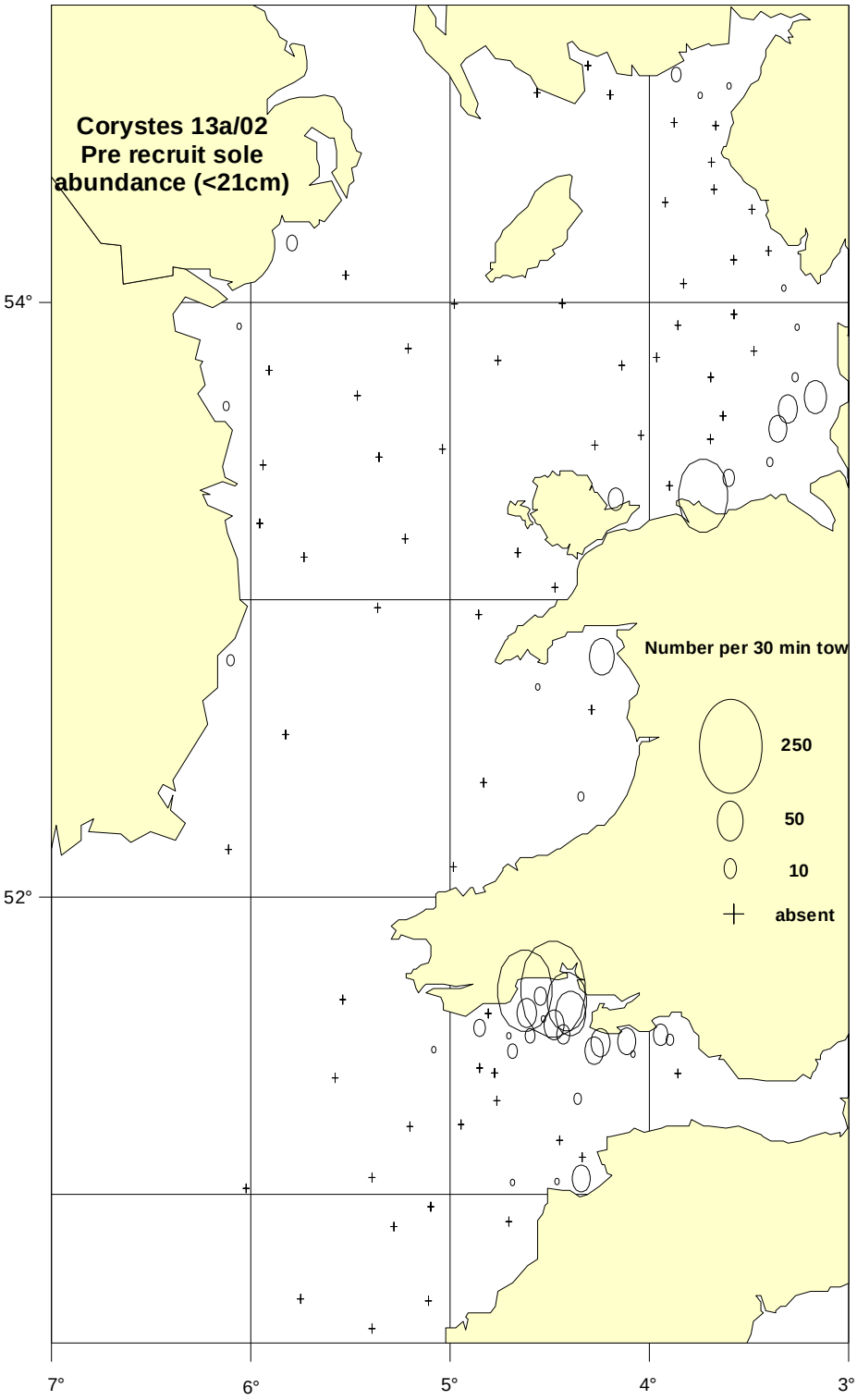

Corystes 13a/02
Pre recruit plaice
abundance (<21cm)
Number per 30 min tow
1000
100
50
absent
54°
52°
7°
6°
5°
4°
3°

Figure 3


Corystes 13a/02
Pre recruit sole
abundance (<21cm)
Number per 30 min tow
250
50
10
absent
54°
52°
7°
6°
5°
4°
3°