

# **FISHERIES SCIENCE PARTNERSHIP**

## **Report on catches of cod and other species in the Eastern Celtic Sea and Bristol Channel by FV Our Josie Grace in spring 2004**

**Fisheries Management Group  
CEFAS, Lowestoft  
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## **Introduction**

The DEFRA-funded Fisheries Science Partnership was established between DEFRA<sup>1</sup>, CEFAS<sup>2</sup> and NFFO<sup>3</sup> for the duration of financial year 2003/4. The objective was to enable the fishing industry to demonstrate the results of commercial fishing in a number of priority fishing areas nominated by the NFFO. Fishing vessels were chartered to fish commercially, usually under dispensation from the quota regulations, to obtain new data on the catch rate and size distribution of target species, and in some cases by-catch species. Ten projects were scheduled and completed. The charter of suitable fishing vessels was arranged by the NFFO, and work plans were developed between NFFO, CEFAS and the vessel skippers. CEFAS deployed sea-going staff to record raw data that were subsequently returned to the laboratory at Lowestoft for input and analysis.

CEFAS acknowledges the help of the NFFO and skippers during the conduct of these studies. The data and results are the intellectual property of the vessel skippers, CEFAS and NFFO.

1. Department of Environment, Food and Rural Affairs
2. Centre for Environment, Fisheries and Aquaculture Science
3. National Federation of Fishermen's Organisations

## **The Eastern Celtic Sea and Bristol Channel cod project**

This report presents the initial results of an FSP project carried out on the trawl fishery for cod in the eastern Celtic Sea and Bristol Channel in spring 2004. The project used a commercial twin rig trawler, the FV Our Josie Grace, from 13 Feb to 1 April equipped with an 85 mm mesh codend. The work plan involved trawling under dispensation from the quota regulations on grounds chosen by the vessel skippers. No other trawl survey was undertaken by CEFAS in this region in the same season. [The closest in time is the recently started Irish and Celtic Sea GFS on CEFAS Endeavour in November/December 2003.]

Here we present

- Catch per unit effort of cod, haddock, whiting, plaice, lemon sole, and sole;
- Discards for 5 species as % of total numbers caught.
- The distribution of numbers at length for cod, haddock, and whiting.
- Species compositions of the catches.

Tagging and finclipping of 24 cod was also undertaken during the cruise but no results were available for reporting here.

## **Methods**

The FV Our Josie Grace (BD 287) is a trawler of 14m reg. length, gross tonnage 35, with a 221 Kw engine.

The trawl used was a twin rig box trawl, maximum mesh size 150 mm, codend 85 mm single braided twine. The port net was fitted with 12 to 14 inch rock hoppers while the starboard net had 8 to 10 inch rock hoppers. Since cod are known to escape beneath trawl ground gear, the different sized rollers on each side may have affected catch rates of cod. The trawl was fished with Bisons 7' 6" trawl doors.

The trawl was towed for between 2 and 5 hours, except at station 37 when towing was for 40 minutes only. The average towing time was 3.7 hours. Towing speeds over the ground varied between 2 and 4 knots. All cod were measured and other commercial species were measured when time permitted. Cod, haddock, and whiting were classified as 'discarded' or 'retained' according to advice from the fishing crew. Weighing facilities were not available on the FV Our Josie Grace.

## **Results**

### *Data summary*

The position, date, and time of valid hauls, and the numbers of fish caught for seven commercial species, are shown in Appendix 1. A total of 167 cod and 30 whiting were otolithed (but are not yet aged). Recorded catches of monk, hake, and megrim were negligible.

The catch data presented in the report below are converted to numbers per hour towed per net (catch per hr. per net) so as to diminish the effects on catch of variable tow times, and to standardise between the source of samples (i.e. whether both nets, the port net, or the starboard net). To achieve this conversion, all numbers caught per hr. by the twin rig were divided by 2 while all numbers caught per hr. by either the port or the starboard net were left unchanged. This does not allow for different catching efficiencies of the port and starboard nets that may have arisen from the different rock hoppers fitted (see above). However, separate results for the two nets from single tows of the twin rig were not available and it is not therefore possible to estimate relative catching efficiencies satisfactorily. The cruise report prepared after the FSP survey can be found as Appendix 2 and was drawn upon in the preparation of this text.

### *Fishing stations*

The survey was broken into 6 fishing periods for logistical and weather-related reasons. Trip parts, which nets were used to supply the catch sample for measuring, dates, haul numbers, localities fished, and average towing hours are summarised in Table 1. Locations of all stations are shown in Figure 1.

**Table 1.** NE Irish Sea FSP otter trawl survey, Feb-Mar 2004, cruise code OJG 1/04: details of fishing activities.

Part	Catches measured from	Dates in 2004	Hauls	N hauls	Locality	Average tow hrs.
1	Both nets stns 1-10 Port net stns 11-21	13 Feb - 18 Feb	1- 21	21	W and S of Lundy	3.66
2	Both nets stns 22-28 Port net stns 29-33	24 Feb - 27 Feb	22 - 33	12	N side of Bristol Ch.	4.06
3	Both nets stns 34-41 Stbd net stns 42-47	28 Feb - 3 March	34 - 47	14	N side of Bristol Ch.	4.30
4	Port net stns 48-51 Stbd net stns 52-64	5 - 9 March	48 - 64	17	Off Hartland Pt & W of Lundy	3.48
5	Port net stns 65-73	16 - 18 March	65 - 73	9	NE Bristol Ch. (tagging)	2.93
6	Stbd net stns 74-77	31 Mar - 1 Apr	74 - 77	4	NE Bristol Ch.	4.04

### *Geographic plots by species*

Geographic plots of numbers caught per hour per net, and of percentages discarded for 5 of the more numerous and valuable commercial species are described below.

#### 1. Cod - Fig. 2a-d.

The largest numbers of cod per hour per net were taken west of Hartland Point and near Swansea Bay. See fig. 2a. However, many of the cod west of Hartland Point were discarded. See fig. 2b. Fig. 2c shows the variability of cod catches from station to station in sequence. The highest catch rate was 6 cod per hour per net. The length frequency distribution, fig. 2d, showed three size groups. The smallest group, between 23 and 35 cm length, consisted of fish below the minimum landing size (35 cm). There were also two distinct larger groups, between 43 and 65 cm, and between 65 and 100 cm. Mature and running fish were frequently observed in the larger size groups. The smallest running male was 42 cm.

#### 2. Haddock - Fig. 3a-d.

The largest numbers of haddock per hour per net were taken west of Hartland Point. See fig. 3a. However, for several of these hauls, 100% of the fish were discarded. See fig. 3b. Fig. 3c shows the high variability of haddock catches from station to station in sequence. One catch exceeded 350 fish per hour per net. The length frequency distribution, fig. 3d, reveals the prevalence of small individuals, less than 33 cm, in the catches. Larger individuals, up to 64 cm, occurred only rarely.

#### 3. Whiting - Fig. 4a-d.

The largest numbers of whiting per hour per net were taken west of Hartland Point. See fig. 4a. However, for many hauls there, and more eastwards into Bristol Channel,

100% of the whiting caught were discarded. Fig. 4c shows the high variability of whiting catches from station to station in sequence. Several catches exceeded 150 fish per hour per net. The length frequency distribution, fig. 4d, reveals the prevalence of small individuals, less than 33 cm, in the catches. Larger fish were hardly present.

#### 4. Plaice - Fig. 5a-b.

The largest numbers of plaice were taken off Padstow. The highest catch rate was 31 fish per hour per net. For most hauls, discarding was slight.

#### 5. Lemon sole - Fig. 6a.

The largest numbers of lemon sole were taken off Padstow. The highest catch rate was 14 fish per hour per net. No discarding was reported.

#### 6. Sole - Fig. 7a

The largest numbers of sole were taken off Padstow. Fig. 7b shows the variability of catches from haul to haul sequentially. The highest catch rate was 24 fish per hour per net. No discarding was reported.

### *Species composition of catches*

Species composition is of interest in relation to catch composition rules, and to concerns about the linkage between the catch of cod and other species. Figure 8 therefore makes paired comparisons between the number of cod, haddock, whiting, plaice and sole caught by the FV Our Josie Grace. Each point in a panel of the figure represents the number of fish of a pair of species in one haul. In each row, the vertical location of a point is the number of fish of the species labelled in that row, whilst the horizontal location of a point in each panel is the number of fish of the species labelled in the appropriate column. The panels below the diagonal holding the names of the fish are a mirror image of those above.

If the nets selected strongly for one species to the exclusion of another, the points would tend to lie in vertical or horizontal strings, and if one species was strongly linked to another the points would tend to cluster round a 45° line. For OJG 1/04, only plaice and sole were mutually exclusive in the observed catches. For other species, the results do not indicate strong exclusions or associations for any pair. Part of the problem for drawing general conclusions is that some species were only caught in a small number of the hauls made on the survey, or perhaps went unrecorded due to time constraints on the single observer. The joint occurrence of zeros is not informative for assessing species associations in catches.

## **Summary and conclusions**

1. Up to 6 cod per hour per net were taken by the FV Our Josie Grace with a twin-rig trawl and 85 mm codend. Grounds near Swansea Bay were most productive. Many cod were taken west of Hartland Point but most of these were discarded. Retained

fish belonged to 2 size groups, 43-65 cm, and 65-100 cm. Mature and running fish were frequent in these groups.

2. Much larger numbers of haddock were caught at some locations, up to 350 fish per hour per net, but many of these were discarded. For several hauls, discarding was 100% due to the small size of the fish.

3. Whiting were also caught in large numbers in some locations, with several catches exceeding 150 fish per hour per net. For many hauls, discarding was 100% due to the small size of the fish.

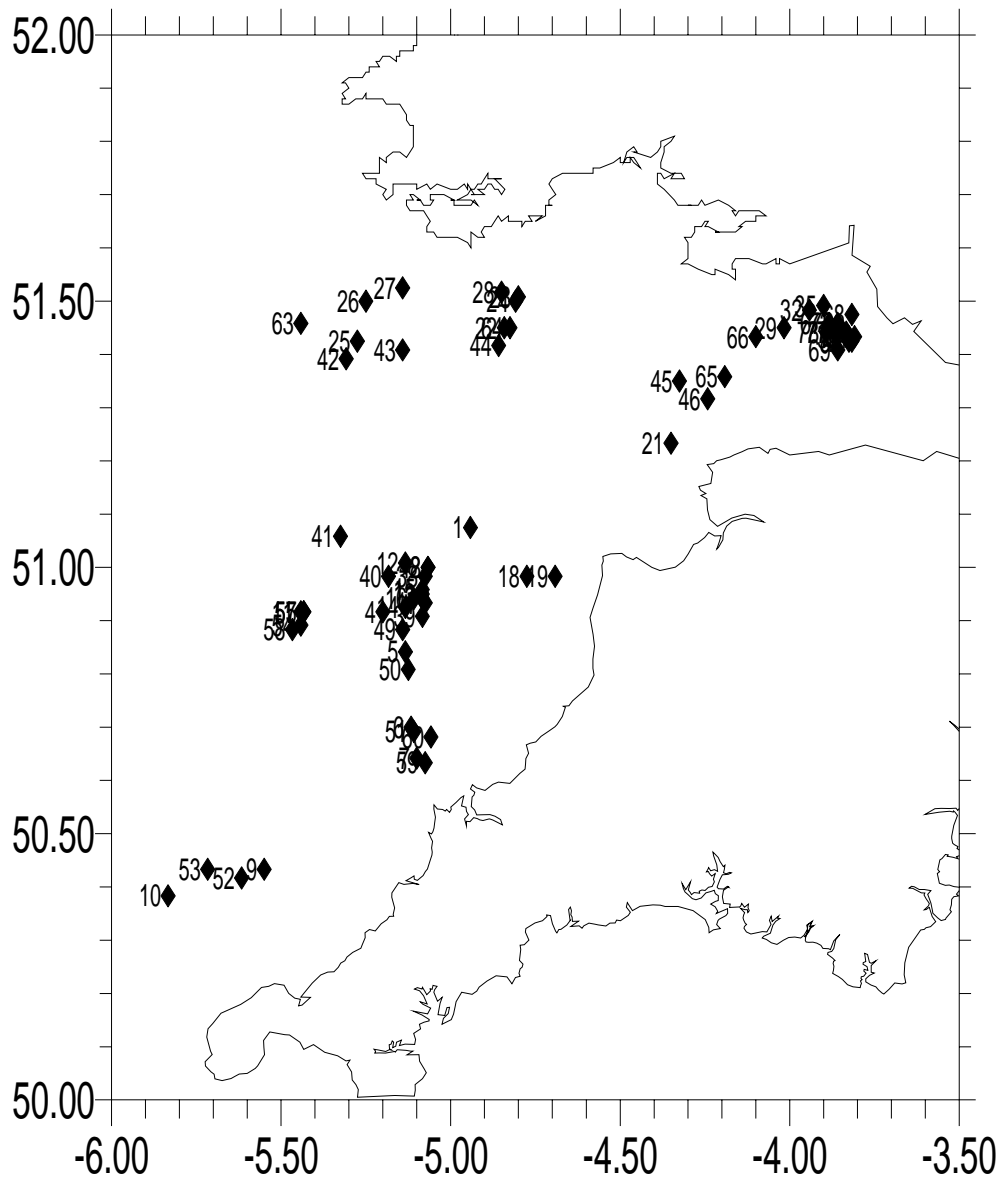
4. The high discarding rates observed for the roundfish may be the result of using 85 mm mesh for the codend of the trawl on this survey. A larger size would be expected to cause less wastage of small fish.

5. The roundfish catches taken by the twin rig trawl were supplemented by flatfish, notably on grounds near Padstow.

6. A few catches containing plaice or sole contained one species but not both, suggesting - but only weakly - that plaice and sole might be catchable separately by twin rigs. Exclusions and associations between other pairs of commercial species were not clearly indicated. More catch data over a wider range of circumstances are needed before firm conclusions about relationships between species in twin rig catches can be drawn.

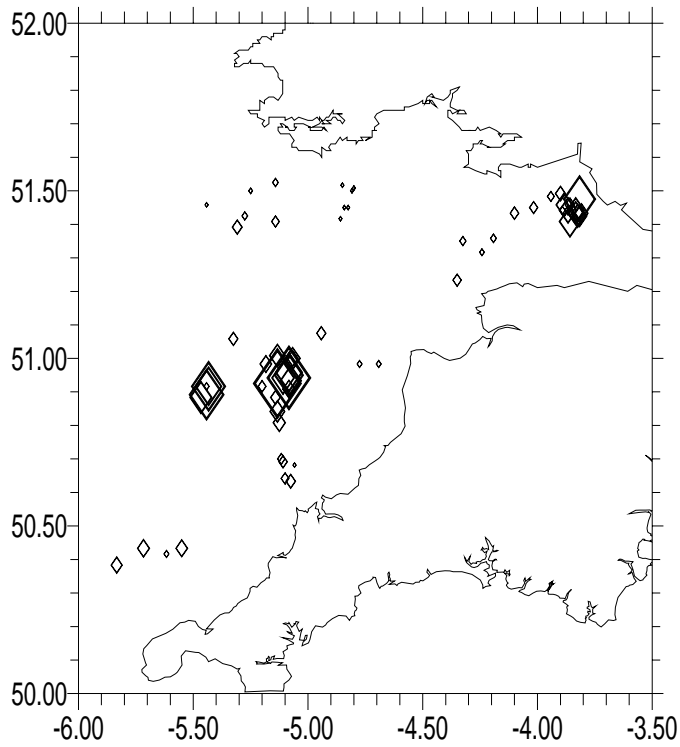
7. Interpretation of the results of this survey in terms of catch per unit effort was hindered by variable use of the port, starboard, or both nets of the twin rig, and by the different ground gear fitted on each side. Thus comparisons of catches from one place to another, or, in future, from one year to another, may be affected by details of the gear used at each location. In future, if operational circumstances allow, the use of identical nets on each side of the twin rig would make a more standardised survey if the catches from different sides of the twin rig are analysed at different stations, as proved necessary on this survey due to occasional damage to one of the nets. A twin rig offers good opportunities to compare performance of different gears fitted to each side, provided that the experimental setup is towed repeatedly where fish are caught, and the catches in the two nets are analysed separately. This was not achieved on OJG 1/04.

**Fig. 1.**  
**E Celtic Sea FSP trawl survey, spring 2004:**  
**Station positions**



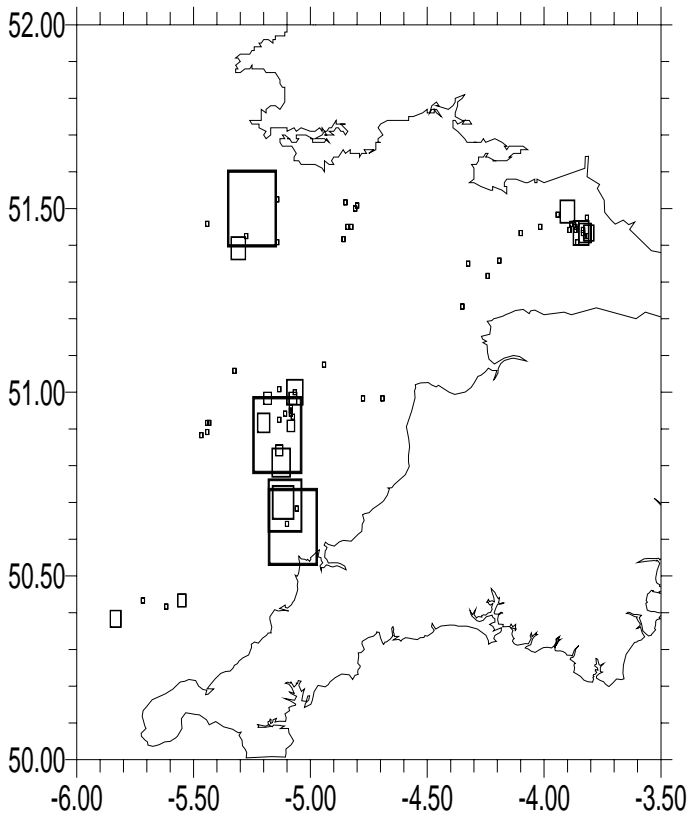
Diamond = OJG 1/04

**Fig. 2(a). E Celtic Sea FSP trawl survey, Feb-Mar 2004:**  
**COD: Numbers per hour per net**



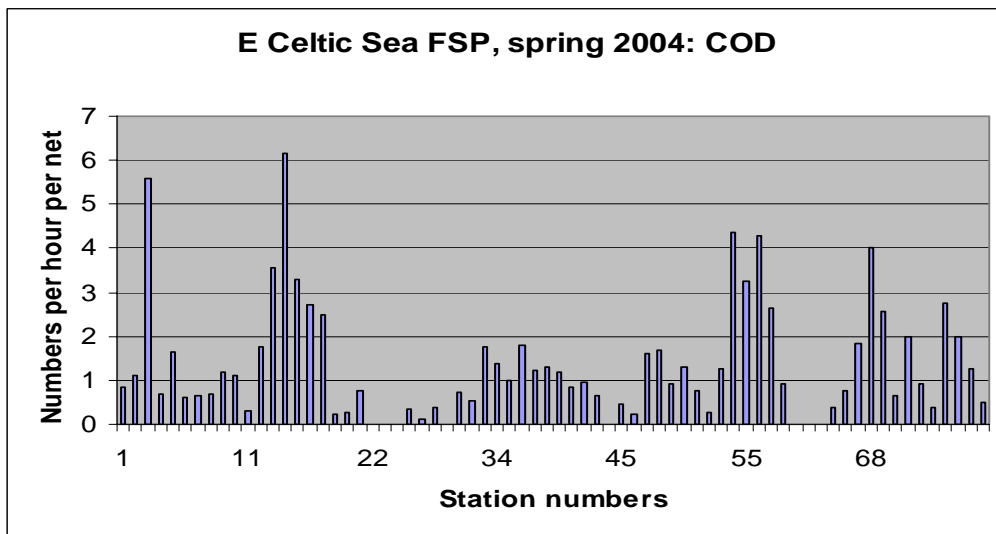
Diamond = OJG 1/04  
Scaling: Largest symbol = 6 fish per hour per net

**Fig. 2(b). COD: Discard percentages**

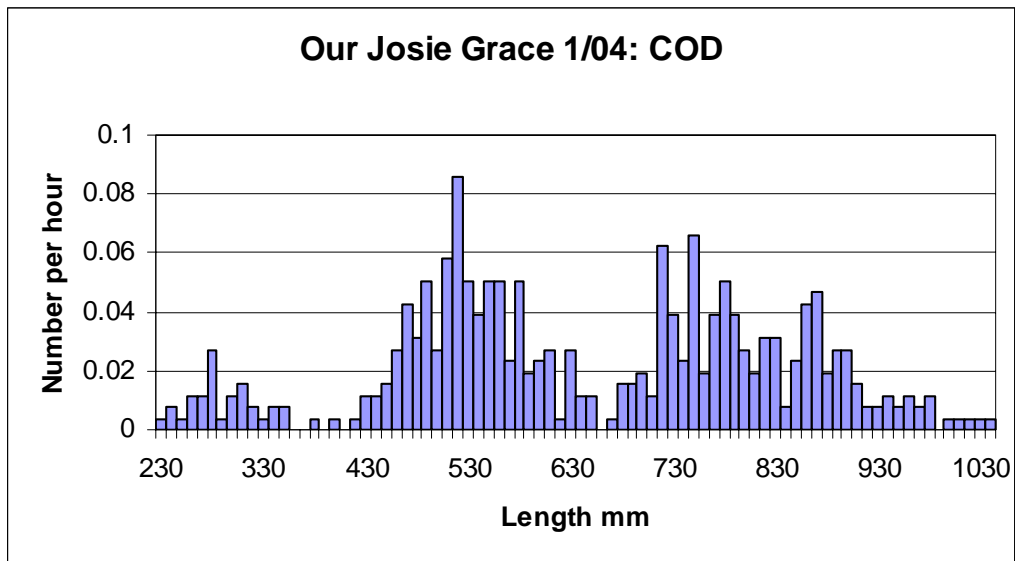


Scaling: Largest symbol = 100%

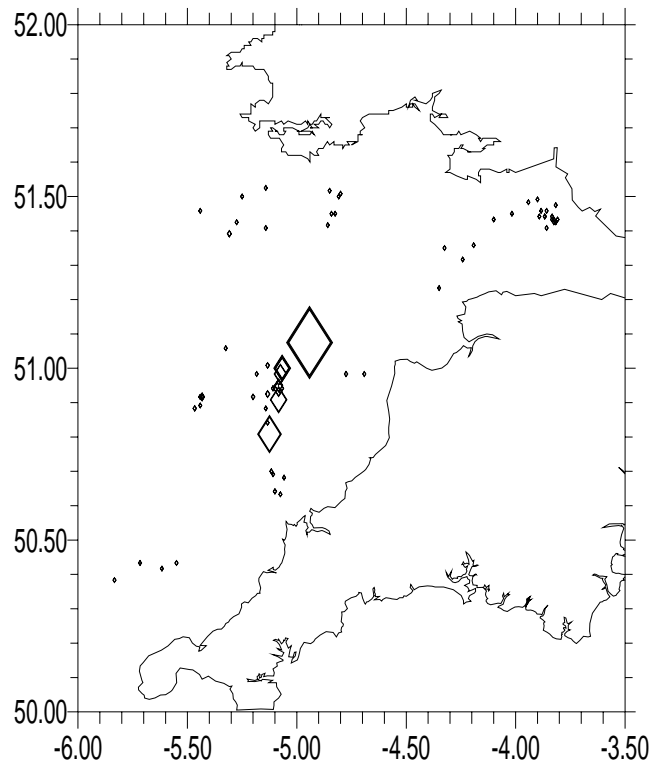
**Fig. 2(c) Catch data in station order.**



**Fig. 2(d). Eastern Celtic Sea FSP survey, Feb - March 2004:  
COD: Length frequency distribution**

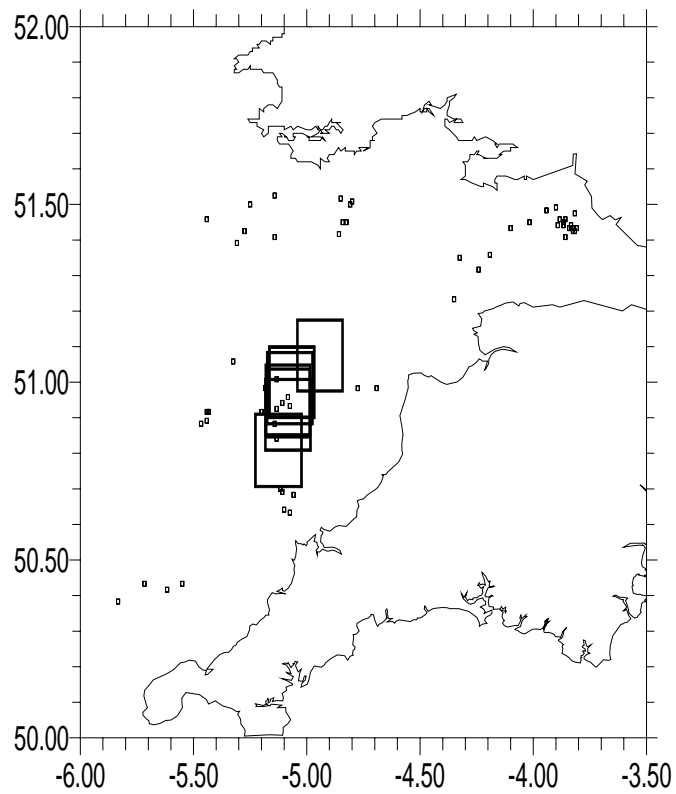


**Fig. 3(a). E Celtic Sea FSP trawl survey, Feb-Mar 2004:  
Haddock: Numbers per hour per net**



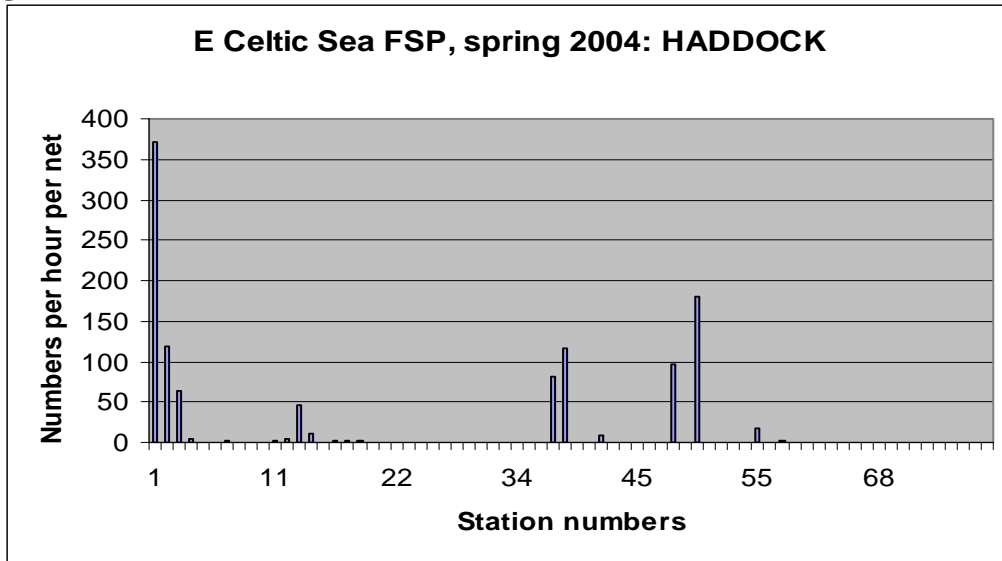
Diamond = OJG 1/04  
Scaling: Largest symbol = 370 fish per hour per net

**Fig. 3(b). Haddock: Discard percentages**

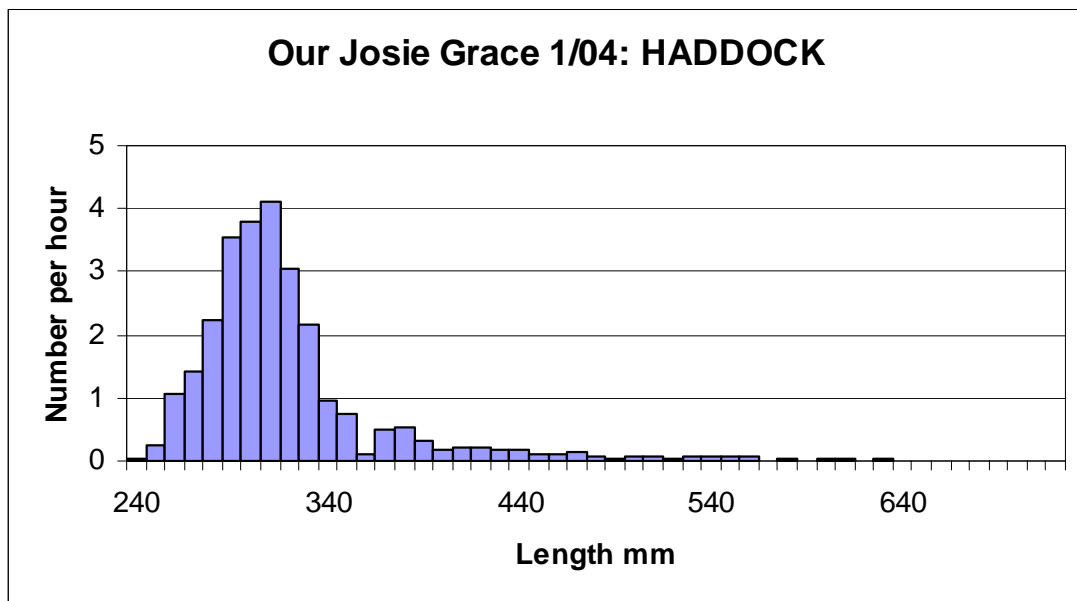


Scaling: Largest symbol = 98%

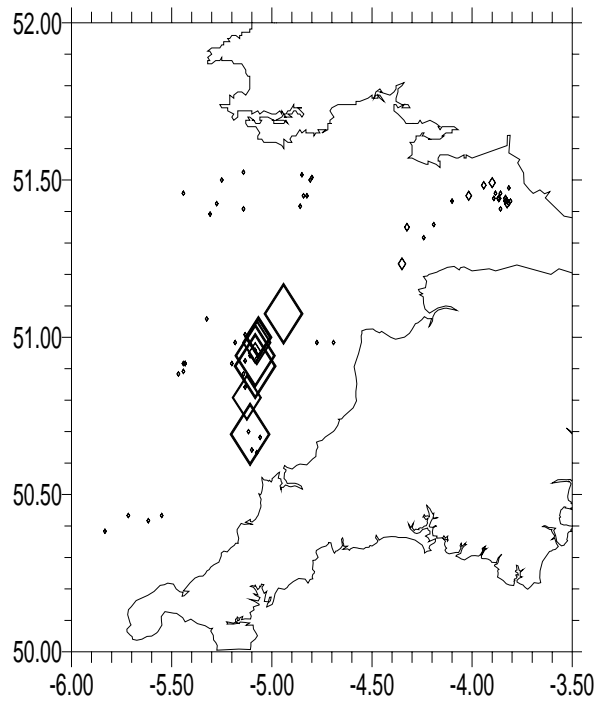
**Fig. 3(c) Catch data in station order.**



**Fig. 3(d). Eastern Celtic Sea FSP survey, Feb - March 2004: HADDOCK: Length frequency distribution**

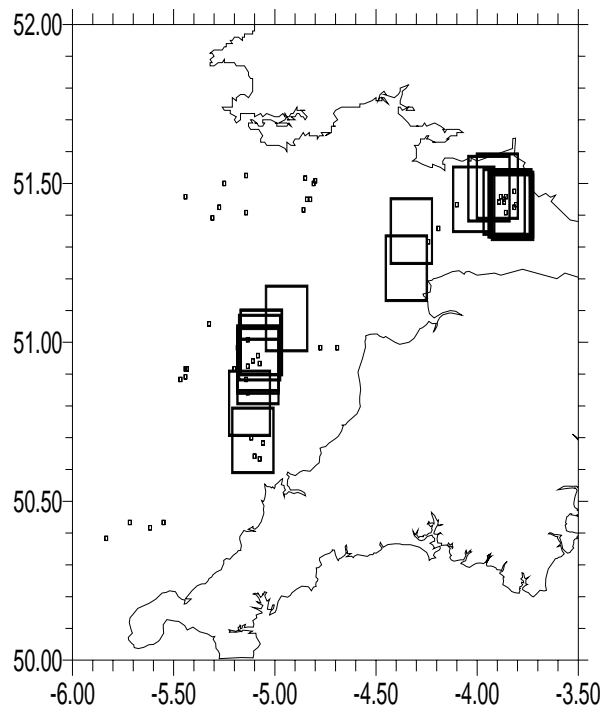


**Fig. 4(a). E Celtic Sea FSP trawl survey, Feb-Mar 2004:**  
**WHITING: Numbers per hour per net**



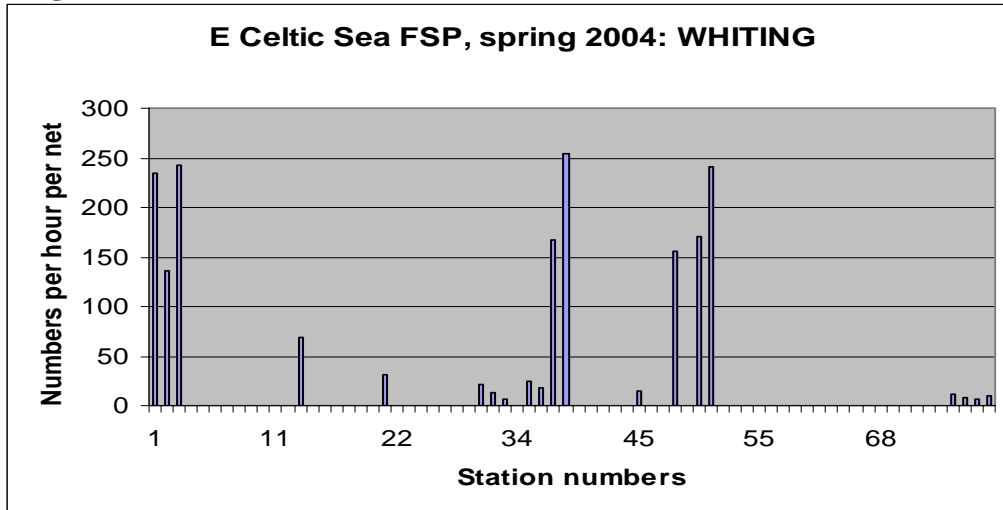
Diamond = OJG 1/04  
Scaling: Largest symbol = 253 fish per hour per net

**Fig. 4(b). WHITING: Discard percentages**

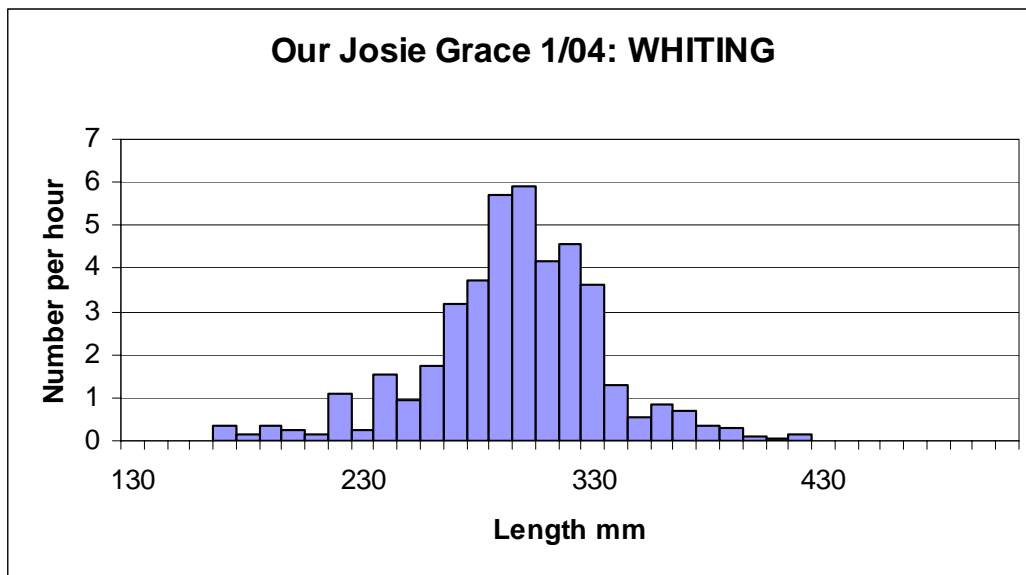


Scaling: Largest symbol = 100%

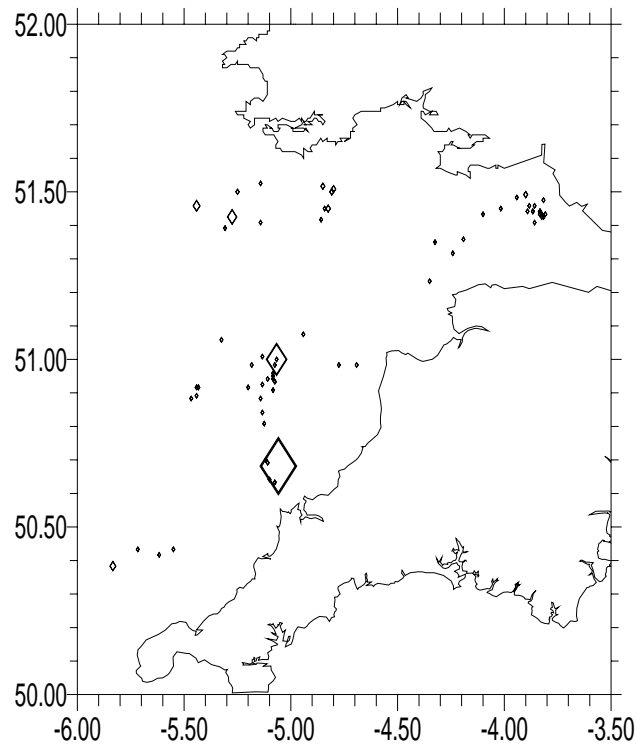
**Fig. 4(c) Catch data in station order.**



**Fig. 4(d). Eastern Celtic Sea FSP survey, Feb - March 2004: WHITING: Length frequency distribution**

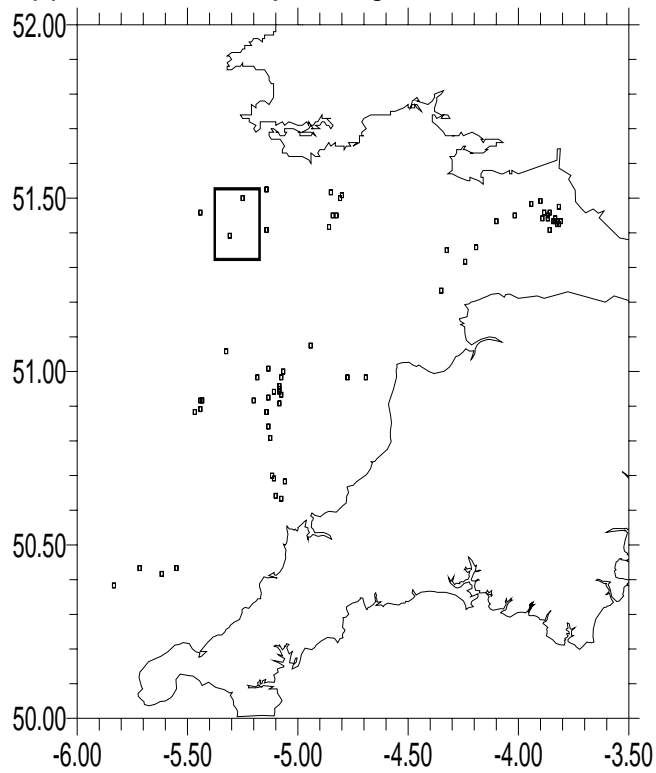


**Fig. 5(a). E Celtic Sea FSP trawl survey, Feb-Mar 2004:**  
**PLAICE: Numbers per hour per net**



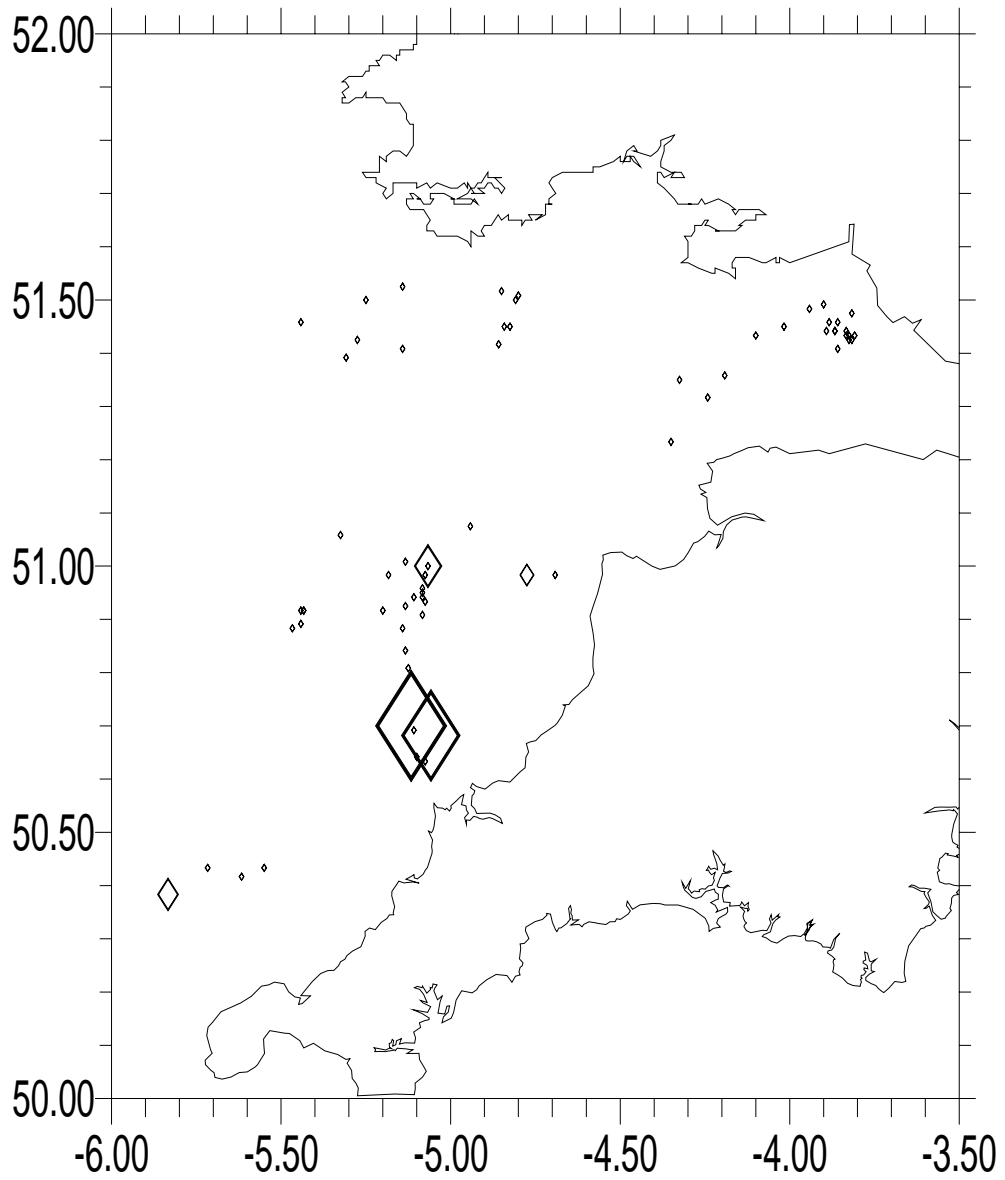
Diamond = OJG 1/04  
Scaling: Largest symbol = 31 fish per hour per net

**Fig. 5(b). PLAICE: Discard percentages**



Scaling: Largest symbol = 90%

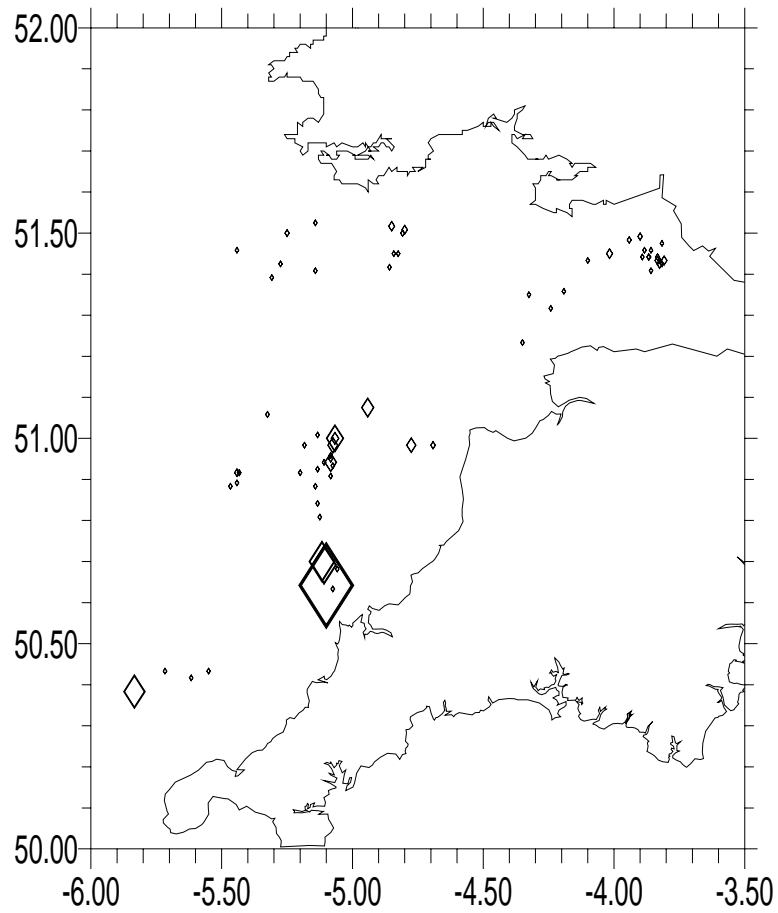
**Fig. 6(a). E Celtic Sea FSP trawl survey, Feb-Mar 2004:  
LEMON SOLE: Numbers per hour per net**



Diamond = OJG 1/04

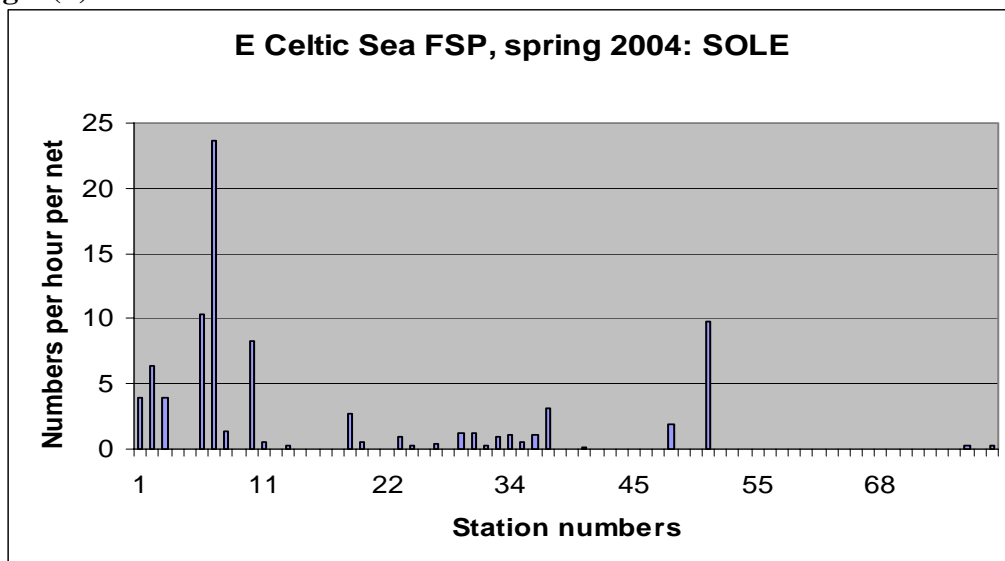
Scaling: Largest symbol = 14 fish per hour per net

**Fig. 7(a). E Celtic Sea FSP trawl survey, Feb-Mar 2004:  
SOLE: Numbers per hour per net**

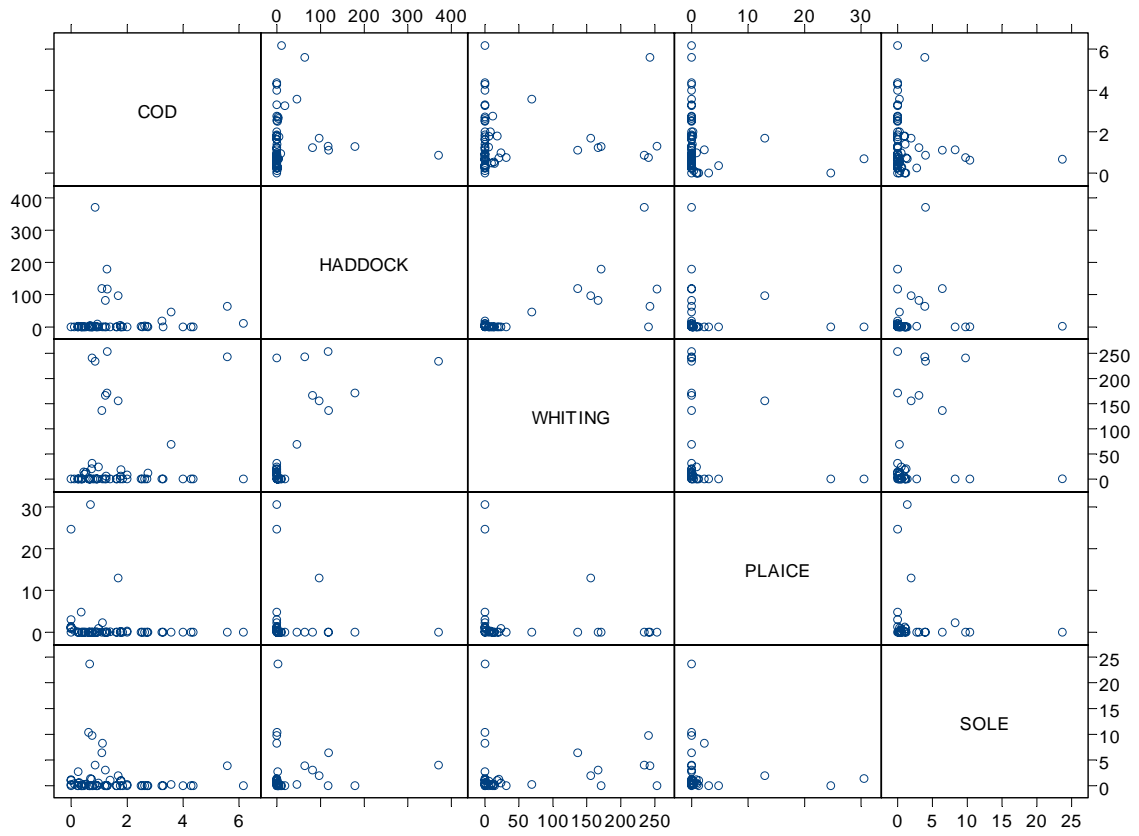


Diamond = OJG 1/04  
Scaling: Largest symbol = 24 fish per hour per net

**Fig. 7(b) Same data in station order.**



**Fig. 8. Eastern Celtic Sea FSP trawl survey, Feb - Mar 2004. Numbers of individual fish of 5 commercial species per hr. per net in catches of FV Our Josie Grace.**



**APPENDIX 1: E Celtic Sea and Bristol Channel FSP Survey, spring 2004: Station and catch details for 7 species of fish.**  
**Selected abbreviations: N=numbers caught, WHG=whiting, PLE=plaice, LEM=lemon sole, MON=monk, SOL=sole.**

Stn	Rect	Gear	Shot Lon	Shot Lat	Haul Lon	Haul Lat	Date shot	Time shot	Tow hrs	COD_N	HAD_N	WHG_N	PLE_N	LEM_N	MON_N	SOL_N
1	31E4	Twin rig box trawl 85mm SB	-4.85	51.10	-5.03	51.05	13-Feb-04	16:20	3.50	6	2594	1640	0	0	2	28
2	31E4	Twin rig box trawl 85mm SB	-5.05	51.05	-5.08	50.95	13-Feb-04	20:10	2.73	6	648	746	0	0	0	35
3	30E4	Twin rig box trawl 85mm SB	-5.08	50.95	-5.08	50.93	13-Feb-04	23:25	4.12	46	526	2000	0	0	0	32
4	30E4	Twin rig box trawl 85mm SB	-5.23	50.92	-5.17	50.92	14-Feb-04	8:00	3.67	5	28	0	0	0	0	0
5	30E4	Twin rig box trawl 85mm SB	-5.15	50.92	-5.12	50.77	14-Feb-04	12:05	3.67	12	0	0	0	0	0	0
6	30E4	Twin rig box trawl 85mm SB	-5.13	50.77	-5.10	50.63	14-Feb-04	16:20	4.00	5	2	1	0	112	2	83
7	30E4	Twin rig box trawl 85mm SB	-5.08	50.63	-5.12	50.65	14-Feb-04	20:55	3.00	4	14	4	0	0	0	142
8	30E4	Twin rig box trawl 85mm SB	-5.45	50.52	5.42	50.45	15-Feb-04	7:54	3.60	5	0	0	220	0	0	10
9	29E4	Twin rig box trawl 85mm SB	-5.42	50.45	-5.68	50.42	15-Feb-04	12:10	3.75	9	0	0	0	0	1	0
10	29E4	Twin rig box trawl 85mm SB	-5.72	50.40	-5.95	50.37	15-Feb-04	16:25	2.67	6	0	0	12	18	0	44
11	30E4	Port side of twin rig box trawl 85mm SB	-5.53	50.87	-5.35	50.97	16-Feb-04	7:30	3.42	1	4	0	0	0	0	2
12	30E4	Port side of twin rig box trawl 85mm SB	-5.23	51.03	-5.03	50.98	16-Feb-04	12:05	3.42	6	16	0	0	0	0	0
13	30E4	Port side of twin rig box trawl 85mm SB	-5.03	50.98	-5.13	50.92	16-Feb-04	15:55	3.92	14	179	270	0	0	0	1
14	30E4	Port side of twin rig box trawl 85mm SB	-5.17	50.92	-5.10	50.93	16-Feb-04	20:35	3.08	19	33	0	0	0	0	0
15	30E4	Port side of twin rig box trawl 85mm SB	-5.12	50.93	-5.05	50.98	17-Feb-04	0:15	4.25	14	0	0	0	0	0	0
16	30E4	Port side of twin rig box trawl 85mm SB	-5.05	50.97	-5.17	50.92	17-Feb-04	4:45	4.42	12	10	0	0	0	0	0
17	30E5	Port side of twin rig box trawl 85mm SB	-5.17	50.92	-4.98	50.95	18-Feb-04	9:30	4.00	10	6	0	0	0	0	0
18	30E5	Port side of twin rig box trawl 85mm SB	-4.78	50.98	-4.77	50.98	17-Feb-04	15:25	4.03	1	8	0	0	8	0	11
19	30E5	Port side of twin rig box trawl 85mm SB	-4.77	50.98	-4.62	50.98	17-Feb-04	19:45	3.92	1	2	0	0	0	0	2
21	31E5	Port side of twin rig box trawl 85mm SB	-4.35	51.20	-4.35	51.27	18-Feb-04	8:40	4.00	3	0	126	0	0	0	0
22	31E5	Twin rig box trawl 85mm SB	-4.72	51.43	-4.97	51.47	24-Feb-04	12:40	4.00	0	0	0	0	0	0	0
23	31E5	Twin rig box trawl 85mm SB	-4.98	51.48	-4.62	51.53	24-Feb-04	17:30	4.00	0	0	0	10	0	0	8
24	31E5	Twin rig box trawl 85mm SB	-4.62	51.52	-5.00	51.48	24-Feb-04	22:00	4.00	0	0	0	8	0	0	2
25	31E4	Twin rig box trawl 85mm SB	-5.43	51.42	-5.12	51.43	25-Feb-04	6:10	4.17	3	0	0	40	0	0	0

**APPENDIX 1 continued: E Celtic Sea and Bristol Channel FSP Survey, spring 2004: Station and catch details for 7 species of fish.**

Stn	Rect	Gear	Shot Lon	Shot Lat	Haul Lon	Haul Lat	Date shot	Time shot	Tow hrs	COD_N	HAD_N	WHG_N	PLE_N	LEM_N	MON_N	SOL_N
26	31E4	Twin rig box trawl 85mm SB	-5.12	51.43	-5.38	51.57	25-Feb-04	10:45	4.25	1	1	0	3	0	0	3
27	31E5	Twin rig box trawl 85mm SB	-5.32	51.57	-4.97	51.48	25-Feb-04	16:15	4.00	3	0	0	0	0	0	0
28	31E5	Twin rig box trawl 85mm SB	-4.95	51.50	-4.75	51.53	25-Feb-04	20:45	4.25	0	0	0	7	0	0	10
29	31E6	Port side of twin rig box trawl 85mm SB	-4.20	51.47	-3.83	51.43	26-Feb-04	7:10	4.08	3	0	84	0	0	0	5
32	31E6	Port side of twin rig box trawl 85mm SB	-4.03	51.52	-3.85	51.45	26-Feb-04	21:15	3.75	2	0	50	0	0	0	1
33	31E6	Port side of twin rig box trawl 85mm SB	-3.80	51.45	-3.87	51.42	28-Feb-04	4:05	4.50	8	0	27	1	0	0	4
34	31E6	Twin rig box trawl 85mm SB	-3.85	51.43	-3.77	51.43	28-Feb-04	9:20	4.67	13	1	0	1	0	0	10
35	31E6	Twin rig box trawl 85mm SB	-3.77	51.45	-4.03	51.53	28-Feb-04	14:25	4.08	8	0	196	7	0	0	4
36	31E6	Twin rig box trawl 85mm SB	-3.93	51.47	-3.72	51.38	28-Feb-04	20:55	3.92	14	0	144	0	0	0	8
38	30E4	Twin rig box trawl 85mm SB	-5.00	51.05	-5.15	50.92	29-Feb-04	20:20	4.08	10	667	1360	0	0	0	25
39	30E4	Twin rig box trawl 85mm SB	-5.00	50.90	-5.17	50.92	01-Mar-04	1:20	4.25	11	999	2154	0	0	0	0
40	30E4	Twin rig box trawl 85mm SB	-5.15	50.92	-5.22	51.05	01-Mar-04	6:00	4.17	10	0	0	0	0	0	0
41	31E4	Twin rig box trawl 85mm SB	-5.25	51.10	-5.40	51.02	01-Mar-04	11:55	4.17	7	3	0	0	0	0	1
42	31E4	Stbd side of twin rig box trawl 85mm SB	-5.30	51.42	-5.32	51.37	01-Mar-04	19:20	4.25	4	38	0	0	0	0	0
43	31E4	Stbd side of twin rig box trawl 85mm SB	-5.30	51.42	-4.98	51.40	01-Mar-04	23:55	4.67	3	4	2	0	0	0	0
44	31E5	Stbd side of twin rig box trawl 85mm SB	-4.88	51.42	-4.83	51.42	02-Mar-04	7:15	4.42	0	0	0	0	0	0	0
45	31E5	Stbd side of twin rig box trawl 85mm SB	-4.50	51.32	-4.15	51.38	02-Mar-04	14:55	4.38	2	0	63	0	0	0	0
46	31E5	Stbd side of twin rig box trawl 85mm SB	-4.13	51.38	-4.35	51.25	02-Mar-04	19:30	4.25	1	0	0	0	0	0	0
47	31E6	Stbd side of twin rig box trawl 85mm SB	-3.83	51.40	-3.80	51.45	03-Mar-04	4:10	4.33	7	0	0	0	0	0	0
48	31E4	Port side of twin rig box trawl 85mm SB	-5.00	51.08	-5.13	50.92	05-Mar-04	10:20	4.17	7	404	649	54	20	0	8
49	30E4	Port side of twin rig box trawl 85mm SB	-5.13	50.92	-5.15	50.85	05-Mar-04	14:50	2.17	2	0	0	0	0	0	0
50	30E4	Port side of twin rig box trawl 85mm SB	-5.15	50.85	-5.10	50.77	05-Mar-04	17:30	2.33	3	418	399	0	0	0	0
51	30E4	Port side of twin rig box trawl 85mm SB	-5.13	50.75	-5.08	50.63	05-Mar-04	20:30	4.00	3	0	963	0	0	0	39
52	29E4	Stbd side of twin rig box trawl 85mm SB	-5.43	50.45	-5.80	50.38	06-Mar-04	6:10	4.00	1	0	0	0	0	0	0
53	29E4	Stbd side of twin rig box trawl 85mm SB	-5.80	50.38	-5.63	50.48	06-Mar-04	10:30	4.00	5	0	0	0	0	0	0

**APPENDIX 1 continued: E Celtic Sea and Bristol Channel FSP Survey, spring 2004: Station and catch details for 7 species of fish.**

Stn	Rect	Gear	Shot Lon	Shot Lat	Haul Lon	Haul Lat	Date shot	Time shot	Tow hrs	COD_N	HAD_N	WHG_N	PLE_N	LEM_N	MON_N	SOL_N
54	30E4	Stbd side of twin rig box trawl 85mm SB	-5.53	50.85	-5.35	50.93	06-Mar-04	18:30	3.67	16	0	0	0	0	0	0
55	30E4	Stbd side of twin rig box trawl 85mm SB	-5.35	50.93	-5.52	50.90	06-Mar-04	22:30	4.00	13	72	0	0	0	0	0
57	30E4	Stbd side of twin rig box trawl 85mm SB	-5.33	50.97	-5.53	50.87	07-Mar-04	6:30	3.50	15	0	0	0	0	0	0
58	30E4	Stbd side of twin rig box trawl 85mm SB	-5.53	50.85	-5.40	50.92	07-Mar-04	10:20	3.42	9	10	0	0	0	0	0
59	30E4	Stbd side of twin rig box trawl 85mm SB	-5.07	50.63	-5.08	50.63	08-Mar-04	7:30	3.33	3	0	0	0	0	0	0
60	30E4	Stbd side of twin rig box trawl 85mm SB	-5.08	50.63	-5.03	50.73	08-Mar-04	11:10	3.00	0	0	0	74	34	0	0
63	31E4	Stbd side of twin rig box trawl 85mm SB	-5.03	51.45	-5.85	51.47	09-Mar-04	7:10	4.00	0	0	0	12	0	0	0
64	31E5	Stbd side of twin rig box trawl 85mm SB	-4.85	51.45	-4.80	51.45	09-Mar-04	11:30	3.17	0	0	0	4	0	0	0
65	31E5	Port side of twin rig box trawl 85mm SB	-4.18	51.35	-4.20	51.37	15-Mar-04	17:15	2.50	1	0	0	0	0	0	0
66	31E5	Port side of twin rig box trawl 85mm SB	-4.10	51.43	-4.10	51.43	09-Mar-04	20:15	2.58	2	0	0	0	0	0	0
67	31E6	Port side of twin rig box trawl 85mm SB	-3.82	51.45	-3.95	51.47	17-Mar-04	3:15	3.25	6	0	0	0	0	0	0
68	31E6	Port side of twin rig box trawl 85mm SB	-3.90	51.50	-3.73	51.45	17-Mar-04	7:10	2.50	10	0	0	0	0	0	0
69	31E6	Port side of twin rig box trawl 85mm SB	-3.78	51.43	-3.93	51.38	17-Mar-04	10:15	2.75	7	0	0	0	0	0	0
70	31E6	Port side of twin rig box trawl 85mm SB	-3.97	51.47	3.77	51.43	17-Mar-04	13:35	3.00	2	0	0	0	0	0	0
71	31E6	Port side of twin rig box trawl 85mm SB	-3.75	51.43	-3.98	51.45	17-Mar-04	17:25	3.00	6	0	0	0	0	0	0
72	31E6	Port side of twin rig box trawl 85mm SB	-3.97	51.47	-3.75	51.45	18-Mar-04	2:00	3.33	3	0	0	0	0	0	0
73	31E6	Port side of twin rig box trawl 85mm SB	-3.75	51.47	-4.03	51.42	18-Mar-04	5:40	2.67	1	0	0	0	0	0	0
74	31E6	Stbd side of twin rig box trawl 85mm SB	-3.90	51.42	3.78	51.45	31-Mar-04	18:05	4.00	11	0	47	0	0	0	0
75	31E6	Stbd side of twin rig box trawl 85mm SB	-3.82	51.45	-3.85	51.43	31-Mar-04	22:15	4.00	8	0	33	1	0	0	1
76	31E6	Stbd side of twin rig box trawl 85mm SB	-3.85	51.43	-3.80	51.43	01-Apr-04	2:30	4.00	5	0	23	0	0	0	0
77	31E6	Stbd side of twin rig box trawl 85mm SB	-3.83	51.43	-3.90	51.45	01-Apr-04	6:50	4.17	2	0	41	0	0	0	1

**APPENDIX 2**  
**TRAVEL REPORT FISHERIES PARTNERSHIP CRUISE WESTERN COD**  
**F.V. OUR JOSIE GRACE (BD287) ILFRACOMBE**

**Staff** J Dann (JD) (13<sup>th</sup> February - 31<sup>st</sup> March)

D Righton (DR) (16 – 18 March)

O Heffernan (OH) (16 – 18 March)

**Narrative:**

Part 1 13<sup>th</sup> - 18<sup>th</sup> February 6 days

JD joined the vessel on the morning of the 13<sup>th</sup> with skipper Scott Wharton in charge and proceeded to grounds to the west of Lundy. Fishing with twin rigged Bison trawls, starboard with 12 and 14-inch rock hoppers and port with 8 and 10-inch rock hoppers, commenced late in the afternoon. A few cod (6) were caught for a 3-hour tow the predominant species caught was lesser spotted dogfish (10 baskets). All whiting were discarded, as were haddock <40cm in length as the market price did not make it viable to land them. A further 2 stations were worked on 13<sup>th</sup> to the South and South West of Lundy respectively, 46 cod were caught on the later all of which were mature. All gurnards were retained for pot bait.

Fishing continued on 14<sup>th</sup> South West of Lundy where running and mature cod were taken in small numbers <10 per haul on all 4 hauls carried out on that day. Sole were caught on the “Tanker Ground” where approximately 11 Belgium beam trawlers were working. The final haul of the day NNW of Trevoise Head yielded mainly flatfish (plaice, lemon sole and sole).

Fishing continued to the North of St Ives on 15<sup>th</sup> with similar results. On the 16<sup>th</sup> a further 4 stations were worked in the area North of Pendeen. The retained catch comprised mainly of flatfish with cod only being caught in double figures at three final 2 stations of the day. During the morning of the 17<sup>th</sup> similar catch rates were obtained for cod SW of Lundy. On the afternoon of 17<sup>th</sup> fishing moved to WSW of Hartland Point and cod catches dropped to single figures. The predominant species in this area were rays (Thornback, Small eyed, Blonde and Spotted). Similar catches were taken the following day off Baggy Point before the vessel proceeded to Ilfracombe to off load the catch on the 18<sup>th</sup>. As the medium term forecast was bad JD returned to Lowestoft on the 19<sup>th</sup> returning again on the 23<sup>rd</sup> of February.

Part 2a 24<sup>th</sup> - 27<sup>th</sup> February 4 days

The vessel sailed on the morning tide on the 24<sup>th</sup> with skipper P Wharton in charge. Due to the prevailing marginal weather conditions, that made fishing offshore difficult, it was decided to investigate commercial tows off Milford Haven where cod had been caught in the past at this time of year. Fishing commenced in the afternoon and 3 hauls of 4 hours duration were completed. These hauls yielded a total of 3 cod the predominant retained, commercial species being mixed rays. Lesser-spotted dogfish were present in large numbers and these were kept for pot bait. There were very few fish discarded, those that were comprised mainly of undersize rays. Fishing continued until the early hours of 26<sup>th</sup> in moderate sea conditions with relatively low catches before the vessel proceeded eastwards up the Bristol Channel to recommenced fishing using a single rig Bison, port trawl. Tows off Swansea and further up the Bristol Channel produced disappointing catches comprising mainly of Lesser spotted

dogfish. The final tow off the South Scar Buoy yielded 2 cod after which the vessel docked for a 14-hour break and change of skipper in Ilfracombe on the 27th.

#### Part 2b 27<sup>th</sup> February - 3<sup>rd</sup> March 5 days

The voyage recommenced later that day with skipper Scott Wharton in charge and the vessel proceeded to a position south of the Scar Buoy where fishing commenced using the Twin rig Bison trawls. A days fishing, 4 hauls, was carried out in the vicinity of the South Scar and Nash Bank buoys. Cod were present on all hauls with an average catch rate of 1 basket (36kg) for a 4-hour tow. Most fish were mature with very few undersize cod being represented in the catches. Bass were caught on all hauls the biggest catch being 2 baskets (68 fish). The catches of rays dropped off as the fishing progressed eastwards up the Bristol Channel. Lesser-spotted dogfish was again the most predominant species caught, these being kept as bait. A haul of Minehead on 29<sup>th</sup>, using the Port trawl, resulted in the net being severely damaged. In view of the damage and the lack of information on clear tows in the area it was decided to proceed back to the grounds off Lundy. A replacement trawl was collected en-route at Ilfracombe in the afternoon, a process that took 2 hours. The vessel then proceeded to grounds off SW of Lundy to commence fishing with Twin rig. On the third haul the port wing was damaged which required 2 hours mending. As cod catches had been low all day, averaging 9 fish (1 basket) per haul the vessel proceeded further North to recommence trawling with a single rig, Starboard trawl. The vessel then steamed eastwards overnight to resume fishing on 2<sup>nd</sup> March.

Of note:

- Belgium beamer activity on the first 2 hauls, presumably targeting sole.
- Running male cod as small as 42 cm caught
- Ran out of haddock the further east we fished
- Gurnards mainly grey but with some red and tub as well as lesser-spotted dogfish retained for pot bait.

Several Pollack were caught off Gower Shoals on the first haul, which were retained as market price good. Remaining hauls of the day comprised mainly lesser-spotted dogfish, only 3 cod were caught.

By monitoring VHF traffic between vessels it was obvious that the catch rates we were getting was being reflected by other UK vessels fishing in the area. The only reports of large catches of cod being caught were from netters and trawlers working in a 20-mile square box to the S.E of Eire. Fishing continued on local grounds, off Ilfracombe, where a total of 13 cod were taken in three 4-hour tows. The vessel docked in Ilfracombe on 3<sup>rd</sup> March for a 36-hour break.

#### Part 3 5<sup>th</sup> - 9<sup>th</sup> March 5 days

Fishing resumed off Harland Point on 5<sup>th</sup> March with skipper Paul Wharton in charge. On the first haul the predominant species was grey gurnard, which was again retained as bait. Fishing continued southwards over the following 24 hours with very few cod in catches. On the afternoon of 6<sup>th</sup> the French Trawler fleet was sighted, 19 vessels. Hauls in the same area as these vessels netted around 2 to 3 baskets (72-108kg) of cod for a 4-hour tow. A deteriorating forecast meant that we had to leave these grounds and proceed inshore and dock in Padstow awaiting improving conditions the following day. Fishing continued inshore working northwards from Padstow to Hartland Point on the 8<sup>th</sup>, no cod were caught. The

following day the weather improved and fishing commenced west of Lundy. There were no cod in any of the 3 hauls worked in this vicinity; the most predominant commercial species were rays. Lesser-spotted dogs were again retained as bait. The vessel docked in Ilfracombe on the afternoon of the 9<sup>th</sup> and as weather was not suitable to continue fishing JD travelled back to Lowestoft the following day.

#### Part 4 16<sup>th</sup> - 18<sup>th</sup> March 3 days

Arrangements were made with Dave Righton to carry out tagging on the following cruise to commence on Friday 12<sup>th</sup> March. Adverse weather conditions over the weekend meant this was delayed until the 15<sup>th</sup> on which day JD travelled down as well to go on the vessel if the weather was still too bad to tag. DR and OH went to sea on 16<sup>th</sup> and JD remained in Ilfracombe awaiting their return on either 17<sup>th</sup> or 18<sup>th</sup> before continuing the survey. Unfortunately when the tagging finished on the 18<sup>th</sup> the forecast was very bad and the vessel proceeded to Bideford for shelter, therefore staff travelled home.

#### Part 5 31<sup>st</sup> March 1 day

The length of the charter had to be reduced to 24 days due to funding problems and JD returned to Ilfracombe on 30<sup>th</sup> March to carry out the last days fishing. Fishing commenced on the afternoon of the 31<sup>st</sup> March finishing on the morning of April 1<sup>st</sup>. The vessel docked on the afternoon of the 1<sup>st</sup> April. The fishing was carried out in the region of the Scar, Nash and Lemon Weed where a total of 23 mature cod were taken from four 4-hour tows.

SFI London (Pt1) and Plymouth (Pt2-5) were informed of all the sailing and landing dates of the Josie Grace under the Fisheries Partnership Contract. The skipper also annotated his official logbook accordingly with "Western Cod Survey" for the days fished.

#### Results:

A total of 77 tows were completed, 75 of which were valid. The catches of the main commercial species are shown in Table 1, Trawl positions are shown in Figure 1 and distribution plots of cod and ray catches are given in Figures 2-3.

Cod were measured at all stations where they were caught and other commercial species were measured when time permitted.

A total of 167 cod and 30 whiting were otolithed. There were 13 cod tagged internally with electronic tags on the Nash / Scar and a further 11 with external tags.

Fin ray samples were hard to acquire due to working conditions; in consequence only 6 were collected.

J Dann  
15 April 2004