

**THE CENTRE FOR ENVIRONMENT, FISHERIES & AQUACULTURE SCIENCE,  
LOWESTOFT LABORATORY, LOWESTOFT, SUFFOLK, NR33 0HT.**

**2013 RESEARCH VESSEL PROGRAMME  
REPORT: RV ENDEAVOUR: SURVEY 12/13**

**STAFF:**

Sally Songer (SIC)  
Joanne Smith (2IC)  
Richard Ayers (CRP)  
Gary Burt  
Charlotte Jennings  
James Pettigrew  
Matthew Sherlock

Paul Gardiner (11-16 July)  
Neil Pearson (16-24 July)

Kirsty Everly (Exeter Student)

**DURATION:**

11 July – 24 July 2013

**LOCALITY:**

English Channel (VIId), North Sea (IVc).

**PRIMARY AIMS:**

1. To undertake a beam trawl survey in the southern North Sea and eastern Channel as part of an ICES co-ordinated research programme.
2. To obtain fisheries independent data on the distribution and abundance of commercial flatfish species.
3. To collect biological data, including maturity and weight at age, of commercial species, to satisfy the requirements of the EU data regulations.
4. To identify the epibenthos by-catch taken in the 4-metre beam trawl and to quantify 12 species as agreed at the Beam Trawl Working Group.

**SECONDARY AIMS:**

5. To collect micro litter using the manta trawl
6. To sample litter caught in the beam trawl on every station
7. To collect berried crabs and lobsters for brood stock
8. To collect live crabs and starfish for Yarmouth Sea Life centre.
9. To collect water samples for nutrient analysis for Naomi Greenwood.
10. To run the PCO<sub>2</sub> meter for Naomi Greenwood
11. To collect radio analytical samples of flat and roundfish in VIId for Paul Rumney
12. To collect FSA fish samples

13. To collect biological information on smooth hounds
14. To tag and release smooth hounds and rays
15. To collect length/weight information on selected species

## **NARRATIVE:**

The scientific team joined the Endeavour at 0800 on the morning of 11 July. Inductions were given for those needing them at 0830. The vessel sailed from Lowestoft at 0945, heading to the first survey station (Prime 100). En route the toolbox talk took place. A safety drill was held at 1330. Throughout the course of the trip two other drills were carried out, emergency steering and deck fire.

The survey commenced with the ESM2 logger being deployed at Prime Station 100 in the North Sea off Harwich, this was followed by deployment of the 4m beam.

This first tow was used as a shake down and no problems were encountered. During 11 July 2 prime beam trawl stations were completed. Both were valid. The vessel then proceeded South west to begin operations on the morning of 12 July at Prime Station 75 (VIIId inshore English side), spending the day working west along the English coast. A total of 8 Prime stations were fished successfully during the day.

During the course of the survey the manta trawl was deployed on Prime stations 23, 44, 49, 51, 55, 62, 67, 74, 78, 83, 97 and 99.

Prime stations 7, 10, 18, 24, 27, 37, 47, 54, 62, 72, 74, 78, 82 and 100 were full benthic sorts.

For the following 4 days the vessel continued to work along the English coast in an Easterly direction. All stations were completed in the standard way with the following exceptions:

Prime station 59 was moved slightly to the west and hauled after 20 minutes to avoid static gear.

Prime stations 49 and 56 were abandoned due an abundance of static gear.

Prime station 53 had to be hauled after 12 minutes to avoid static gear. This station was deemed invalid and not repeated.

On the evening of 14 July work boat 1 was deployed at 1800 to collect a Selex engineer from Shoreham to attempt to rectify problems with the Internet. The chief steward was put ashore along with the engineer at 2130 and not replaced. Once the work boat was safely recovered the ship proceeded to Prime station 27 to begin operations there the following morning.

Prime station 22 was fished at a warp ratio of 4:1 to ensure the gear would remain on the bottom despite a strong tide.

Prime station 47 was reduced to 22 mins to avoid a wreck, static gear and very shallow water.

Prime station 50 was reduced to 20 mins to avoid two dredgers working at the end of the tow.

Once the English side of VIId was complete (Prime station 44, at 1526 on 16 July) the vessel proceeded to Swanage where work boat 1 was once again deployed for a personnel transfer, taking Paul Gardiner ashore and picking up Neil Pearson. Once the boat had been safely recovered the vessel steamed south to Prime station 10 in the French sector to begin operations here on the morning of 17 July, work continued eastwards along the French coast for the next 4 days.

On the morning of the 17 July there were problems retrieving the blade when the block fell out of the winch causing it to be stuck in an intermediate position. The depth was adjusted on the first two stations of the day to compensate for this difference in blade position. This problem was rectified by the third station of the day, Prime station 9.

Prime stations 4, 6, 7, 9, 16, 29, 70, 71, 73 and 95 were reduced to 20 minutes and fished at a warp ratio of 3:1 due to a history of catching large quantities of mud, rock or brittle stars.

Prime station 19 was hauled early after 22 minutes to avoid static gear on the tow.

On the evening of 20 July with the VIId sector of the survey complete the vessel proceeded to IVc, south of the Thames estuary to begin work the following morning at Prime station 79, before progressing in a Northerly direction for the rest of the day, completing a total of 7 prime stations.

Prime stations 79 and 97 were fished for 20 minutes at a warp ratio of 3:1 to avoid large catches of gravel.

On the evening of 21 July the vessel transversed to the Belgian sector where 5 additional stations were fished successfully on 22 July. After these stations had been completed the vessel steamed over to the remaining IVc stations anchoring off Orford to begin the final part of the survey on the morning of the 23 July.

On 23 July the remaining 5 Prime stations were fished successfully, the vessel then proceeded to anchor North of Lowestoft ready for docking the following morning.

The vessel docked in Lowestoft on the morning of 24 July.

## RESULTS:

### **Primary aims.**

#### Aim 1.

A typical station consisted of deployment of the 4m beam trawl with mini CTD from the port winch. The beam was towed for 30 minutes at a warp ratio of 3.5:1 unless the ground was known to yield an unmanageable catch, in which case the warp and tow time were shortened to 3:1 and 20 minutes respectively. Before the first tow and after the last tow each day the Niskin was deployed with mini CTD and ESM2 logger and surface water samples were taken from the ferrybox or clean supply when the ferrybox was inoperative. The ESM2/Niskin was also deployed in the middle of each day. At the end of each day's fishing and as required throughout the course of the day's operations the gear was thoroughly inspected for damage. The blade was fully down on all stations except those where water depth was prohibitively shallow, at such points the blade was fully retracted.

Region	Valid 30 mins	Valid 20 mins	Invalid	Abandoned due to static gear	Total valid tows
VIIId (English)	31	5	1	3	36
VIIId (French)	19	11	0	0	30
IVc	15	4	0	0	19
Total	65	20	1	3	85

Table 1. The number of valid and invalid tows fished during the survey.

### CEND 12/13 Stations Fished

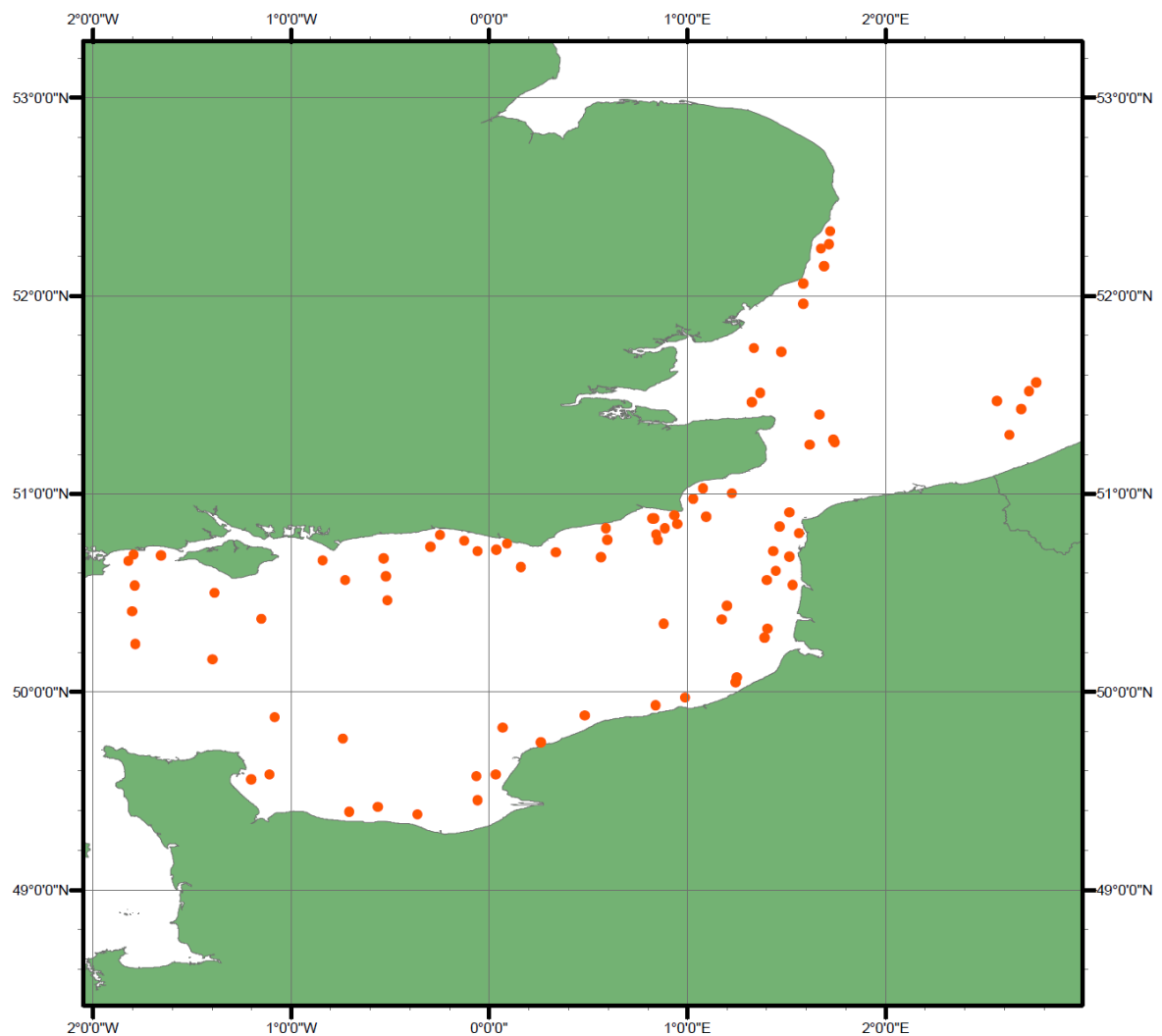


Figure 1 –Stations fished during 2013 survey.

## Aims 2 & 3

All otolithed fish were measured to the whole cm below, weighed individually, sexed and where required assigned a sexual maturity code based on a 4-stage key if required. Table 2 shows the otoliths collected for the main commercial fish species. All non-commercial finfish by-catch caught was identified to species level, weighed and measured. In addition the following shellfish and cephalopods were also weighed and measured, cuttlefish (*Sepia officinalis*), *Alloteuthis spp*, *Loligo spp*, edible crab (*Cancer pagurus*), lobster (*Homarus gammarus*), scallops (*Pecten maximus*), velvet swimming crab (*Necora puber*) and spider crab (*Maia squinado*), while queen scallops (*Aequipecten opercularis*) and oysters (*Ostrea edulis*) were weighed and counted. The numbers of individual fish measured this year for the main commercial species can be seen in Table 3.

In total 180 different species were recorded.

Figures 2 – 5 show the spatial distribution of dab, lemon sole, plaice and sole caught during the survey

Region	Brill	Cod	Dab	Flounder	Lemon sole	Plaice	Sole	Bass	Whiting	Turbot
VIIId English	8	0	144	19	33	631	329	2	39	2
VIIId French	10	2	199	12	43	486	226	1	4	17
North Sea (IVc)	5	8	221	25	53	237	386	0	68	3
Total	23	10	564	56	129	1243	941	3	111	22

Table 2. Otoliths collected from the main commercial species by strata.

Species	Species code	VIIId English	VIIId French	IVc North Sea	Total
Brill	BLL	9	10	5	24
Cod	COD	0	2	8	10
Cuttlefish	CTC	71	309	10	390
Dab	DAB	1023	307	409	1739
Flounder	FLE	66	21	34	121
Lemon Sole	LEM	74	79	61	214
Plaice	PLE	2279	1414	328	4021
Sole	SOL	538	238	803	1579
Turbot	TUR	2	18	3	23
Whiting	WHG	112	4	326	442
Bass	ESB	2	1	0	3
Velvet swimming crab	MLP	16	754	307	1077

Table 3. Number of fish measured from the main commercial species by strata.

Species	Weight in Kg				
	2013	2012	2011	2010	2009
Plaice	865.792	727.978	859.005	721.99	628.117
Sole	174.702	154.018	167.496	183.622	343.064
Dab	131.997	91.208	115.12	104.089	149.414
Lemon Sole	38.37	47.272	65.78	17.96	41.53
Cuttlefish	55.165	100.120	61.121	121.85	92.685
Flounder	35.875	36.99	49.447	27.29	107.235
Whiting	20.076	26.039	45.347	53.162	54.823
Velvet swimming crab	66.874	41.326	45.195	44.401	75.8
Brill	14.785	2.795	24.019	14.219	8.9
Turbot	10.835	17.65	23.124	19.315	7.98
Bass	2.79	1.345	13.125	4.995	9.52
Cod	2.887	13.391	3.575	1.055	31.035

Table 4 – Comparison of catch weight (kg) for the main commercial species over the last 5 surveys (2009-2013).

As shown in table 4 catches of plaice, sole, dab, velvet swimming crabs, brill and bass were slightly higher in 2013 than 2012. Catches of all other species were slightly down. However all catches were within the range seen over the previous 5 years with only plaice being significantly higher than all other years except 2011.

#### AIM 4:

On certain specified stations a full benthic sort was carried out to identify the numbers and weights of species encountered. In addition on all other stations benthos observed was recorded by species or other taxonomic grouping. There were 9 sentinel species that if encountered at any time on any tow, were removed and quantified. Of these we primarily encountered Ross Coral (*Pentapora foliacea*) (7 stations); *Sabellaria spinulosa* (4 stations); sponge crabs (6 stations) and mantis shrimps (*Meiosquilla desmaresti*) (2 station). All 12 planned full benthic stations in VIId and 3 in IVc were sampled successfully.

#### Secondary aims.

Aim 5. Micro litter was collected using the manta trawl and preserved at 14 prime stations.

Aim 6. Litter was collected and recorded in line with the protocol provided on every valid beam trawl station.

Aim 7. Two live berried edible crabs and 1 live berried spider crab were collected for return to the lab for brood stock.

Aim 8 Live crabs and starfish were collected for Yarmouth Sea Life centre.

Aim 9 Water samples for nutrient analysis were collected in line with the supplied protocol at all sites requested by Naomi Greenwood.

Aim 10 The PCO2 meter was run throughout the course of the survey, and monitored for flow rates and alarms throughout.

Aim 11 Six radio analytical samples were collected for Paul Rumney.

Aim 12 Three FSA fish samples were collected for Robin Law.

Aim 13 Biological information was collected for all smooth hounds caught. 1 female smooth hound was frozen for further analysis.

Aim 14 Five starry smooth hounds, 1 spotted ray and 1 nurse hound were tagged and released.

Aim 15 No additional length weight information was collected for Joana Silva as no appropriate species were caught.

### **Other work**

A new EDC configuration wizard was written to mitigate any potential problems with EDC set up for future trips.

### Acknowledgements

As SIC of this survey I would like to offer my sincere thanks to the officers and crew of the Cefas Endeavour for their support and expertise throughout the course of the survey, without which it would not have been possible to achieve the survey aims. I would also like to thank everyone on board for creating a welcoming and happy atmosphere aboard the vessel and always being prepared to go the extra mile.

S Songer  
24/07/13

INITIALLED:

DISTRIBUTION:

Basic list +

Cruise staff

Fishing Skipper Cefas Endeavour

W Demare, Belgium

Frans v Beek, Netherlands

Joel Vigneau, France

Kent and Essex, Sussex, Southern and Eastern SFCs

DARD Northern Ireland

# CEND 12/13 Dab Distribution

Distribution of fish caught per 30 minutes

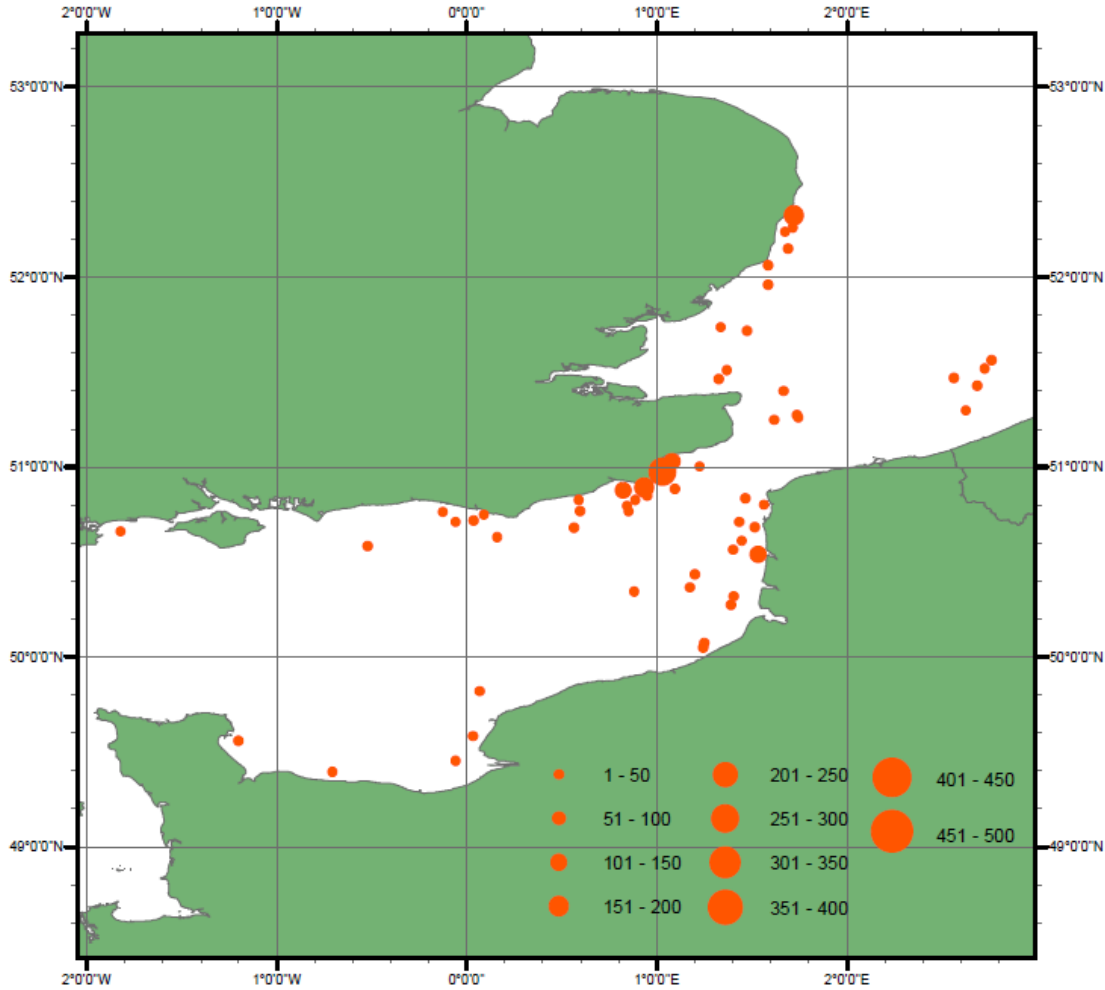


Figure 2 – Distribution of dab caught on 2013 survey.



### CEND 12/13 Lemon Sole Distribution

Distribution of fish caught per 30 minutes

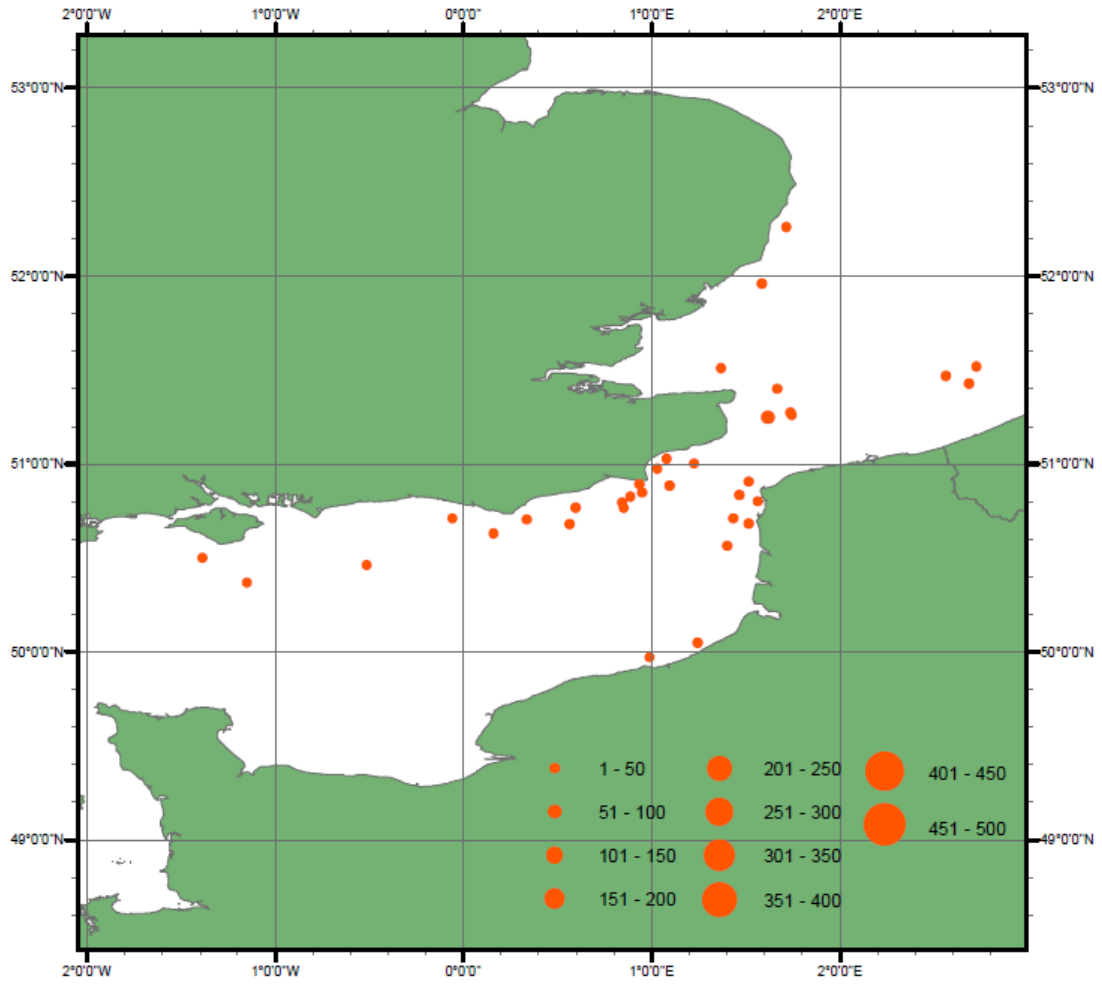


Figure 3 – Distribution of lemon sole caught on 2013 survey.

# CEND 12/13 Plaice Distribution

Distribution of fish caught per 30 minutes

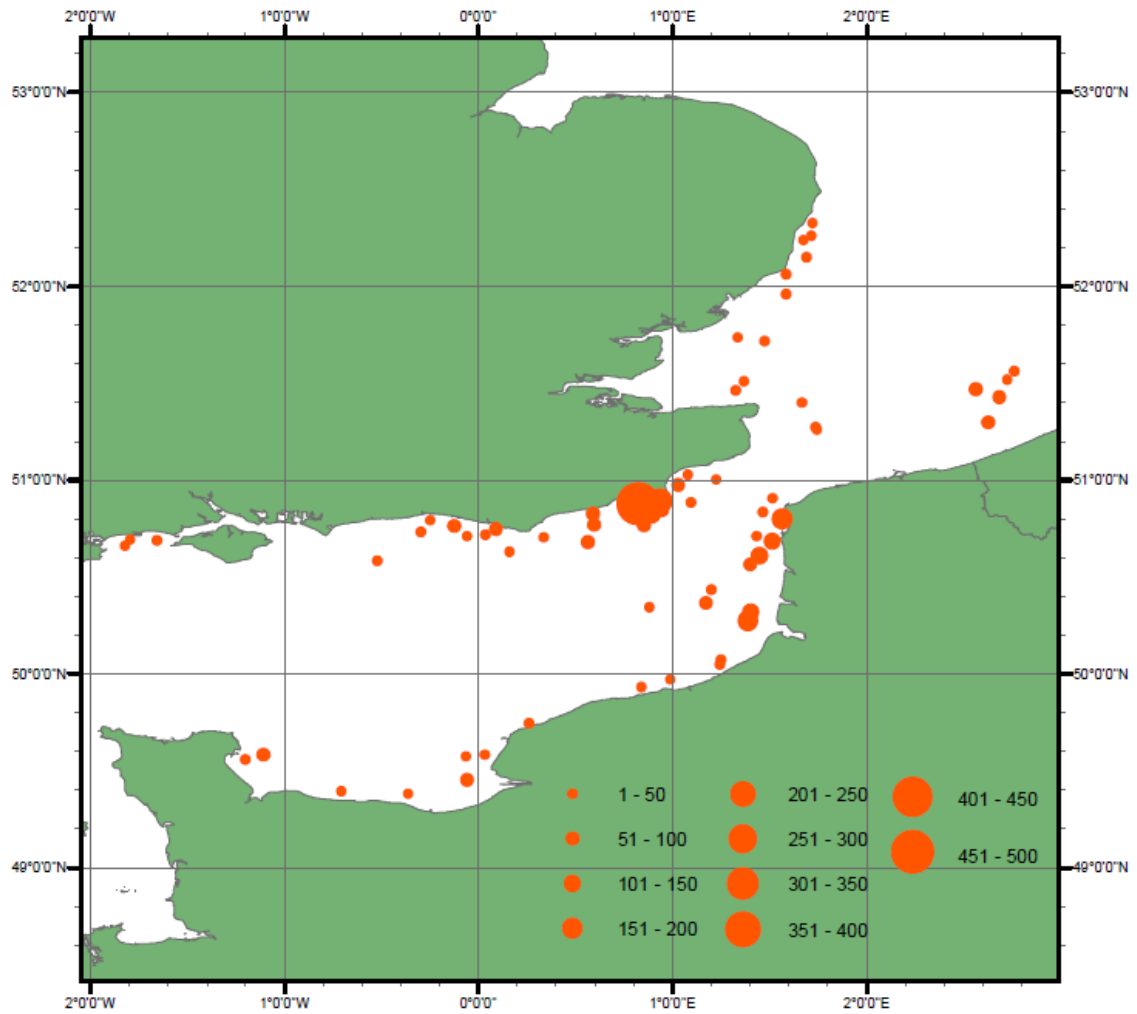


Figure 4 – Distribution of plaice caught on 2013 survey.

# CEND 12/13 Sole Distribution

Distribution of fish caught per 30 minutes

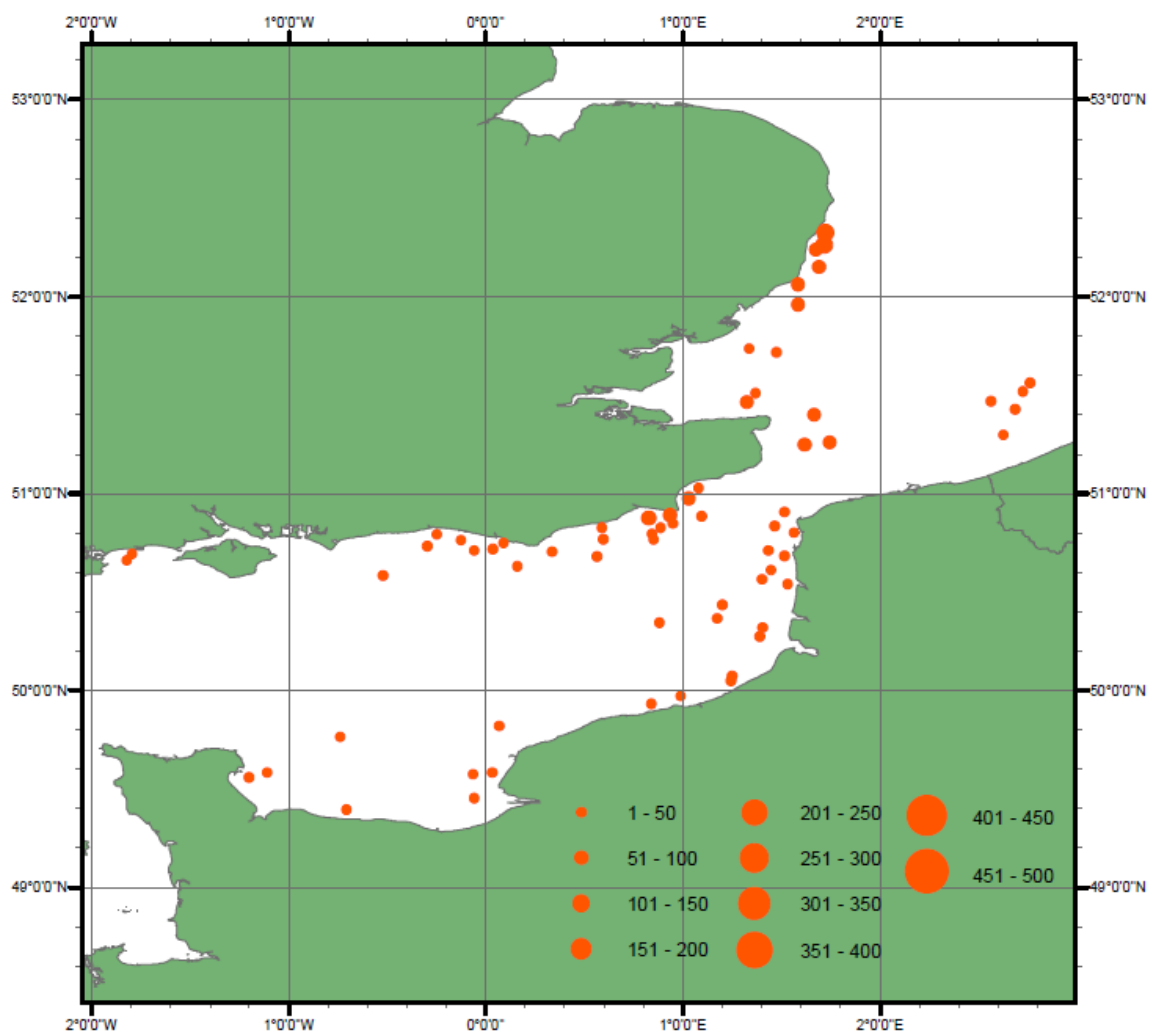


Figure 5 – Distribution of sole caught on 2013 survey.