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

2011 RESEARCH VESSEL PROGRAMME
REPORT: RV ENDEAVOUR: SURVEY 11/12

STAFF:
Sally Songer (SIC)
Richard Ayers (2IC)
David Brown (CRP)
Joanne Smith
Mary Brown
Stephen Shaw
Gary Burt
Neil Pearson (18-25 July)

DURATION:
18 July – 31 July 2012

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 sample litter on every station
6. To collect live crabs and starfish for Yarmouth Sea Life centre.
7. To collect water samples for nutrient analysis for Naomi Greenwood.
8. To run the PCO2 meter for Naomi Greenwood
9. To photograph benthos and beam trawl operations.

NARRATIVE:

The SIC and 2IC joined the Endeavour on the morning of 16 July to allow them time to unload the gear and set up the fishroom before the arrival of the rest of the scientific team in

the afternoon of 17 July (15:30h). Safety inductions were carried out at 16:00h for those members of the scientific team who required them.

The vessel sailed from Portland docks at 06:00h on 18 July, and headed to the first survey station. En route the toolbox talk took place.

A typical station consisted of deployment of the 4m beam trawl with mini CTD from the starboard 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 surface water samples were taken from the ferrybox or clean supply when the ferrybox was inoperative. 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 survey commenced with the Niskin being deployed to the west of the Isle of Wight in proximity of Poole and Christchurch bay at prime station 44, (VIId inshore English side) at 09:31h, the beam trawl was shot at 09:41h.

This first tow was used as a shake down and no problems were encountered. During 18 July seven prime beam trawl stations were completed. All were valid. The vessel then held position overnight to start work at prime station 25 (VIId inshore English side) the following morning, spending the day working to the west of the Isle of Wight.

All prime stations were fished in the standard way, except those noted below.

Primes 43, 45 and 68 were hauled after 20 minutes to avoid static gear.

Prime 47 was run for only 20 minutes to avoid shallow water at the west end of the tow and an historic wreck at the east end.

Prime 49 was abandoned due to excessive amounts of static gear along the course of the tow. This has been the case at this site for the previous two surveys also.

Prime 50 a small tear was sustained in the Codend, the liner was intact and the station was deemed valid.

On the evening of 19 July the vessel proceeded to station 10 (VIId French side) where operations commenced on the morning of 20 July, picking up all prime stations in the French sector in the standard way, except those noted below.

Prime 12 was moved slightly to the west to avoid a cable on the seabed. This new position should be retained going forward.

Primes 9, 8, and 7 were towed for 20 minutes with the warp at 3:1 to avoid excessive catches of sand and gravel.

Prime 4 produced an unusually small catch containing no fish. After a full gear inspection was carried out and no damage found, the station was repeated towing in the other direction

as the fishing skipper suspected strong tides had kept the net off the bottom the first time around. The repeat tow yielded a much more usual catch.

Prime 2 was invalid as a very large catch of sand and gravel was sustained, the weight of which would have been preventing the gear from fishing effectively. The station was not repeated.

Prime 30 was hauled after 20 minutes to avoid shallow water at the end of the tow.

Prime 71 was hauled after 20 minutes to avoid some large sand ridges.

Prime 70 yielded a very small catch on the first attempt so after a thorough inspection of the gear an additional 20 minute tow was carried out in the same location, producing a much better catch of fish and benthos.

Prime 69 rescue boat 2 was launched for a test run before towing commenced. The boat overheated causing a slight delay in operations while it was recovered to the vessel.

Prime 65 the fishing line parted on the top starboard side of the gear on hauling due to weight of brittle stars in the net, this would not have affected the way the gear was fishing so the haul was deemed valid.

Prime 68 was hauled after 20 minutes to avoid static gear.

The French side of the VIId grid was completed on the evening of 23 July; the vessel then transited North West to begin operations on the morning of 24 July at Prime 73 (VIId English side). On the 24 July 9 prime stations were fished successfully. The vessel then proceeded east to anchor off Shoreham ready to put Neil Pearson ashore on the morning of 25 July.

On the morning of the 25 July Neil Pearson was taken ashore in work boat 1 at 0800hrs. While this was in progress the vessel continued to work around the vicinity of Shoreham until such time that the work boat was safely back aboard. Work then continued eastward along the English coast, finishing with Prime 75 on the evening of the 26 July, this concluded the VIId part of the survey grid. All stations were fished in the standard way except for those noted below.

Prime 56 was hauled after 14 minutes to avoid static gear, the catch was processed as additional and the station was not repeated.

Prime 57 was abandoned due to static gear along the tow.

Prime 59 was moved slightly to the west to avoid static gear.

From the morning of Tuesday 25 July onwards the vessel was operating on 3 engines as a safety precaution due to an electrical problem with bus coupler 2.

On the evening of the 26 July the vessel transited to the Belgian sector with the intention of carrying out additional tows in this area on 27 July. The anchor was dropped near to Additional station 113 at 2100 and the vessel rested overnight ready to begin work here in the morning.

5 additional stations were fished successfully in the Belgian sector on 27 July; one additional station (112) was also picked up in IVc heading back in towards the English coast. At the end of the day Prime 119 was successfully completed, yielding a good catch of small soles.

On the 28 and 29 July the remaining stations in IVc off the East Anglian coast were completed. Prime 93 was abandoned as it now lies in the middle of the London array wind farm. At Prime 105 the starboard warp parted on hauling due to human error. The gear was recovered intact. A toolbox talk was convened to discuss the event, a near miss report was filed and all proper procedures were followed.

On the morning of 30 July the remaining two fishing stations were completed, thus concluding the survey.

The vessel docked in Lowestoft on the morning of 31 July.

RESULTS:
Primary aims.
Aim 1.

Region	Valid 30 mins	Valid 20 mins	Invalid	Number of stations without valid result	Total tows
VIId (English)	33	3	1	2	37
VIId (French)	24	7	1	1	32
IVc	12	3	0	0	15
Total	69	13	2	3	84

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

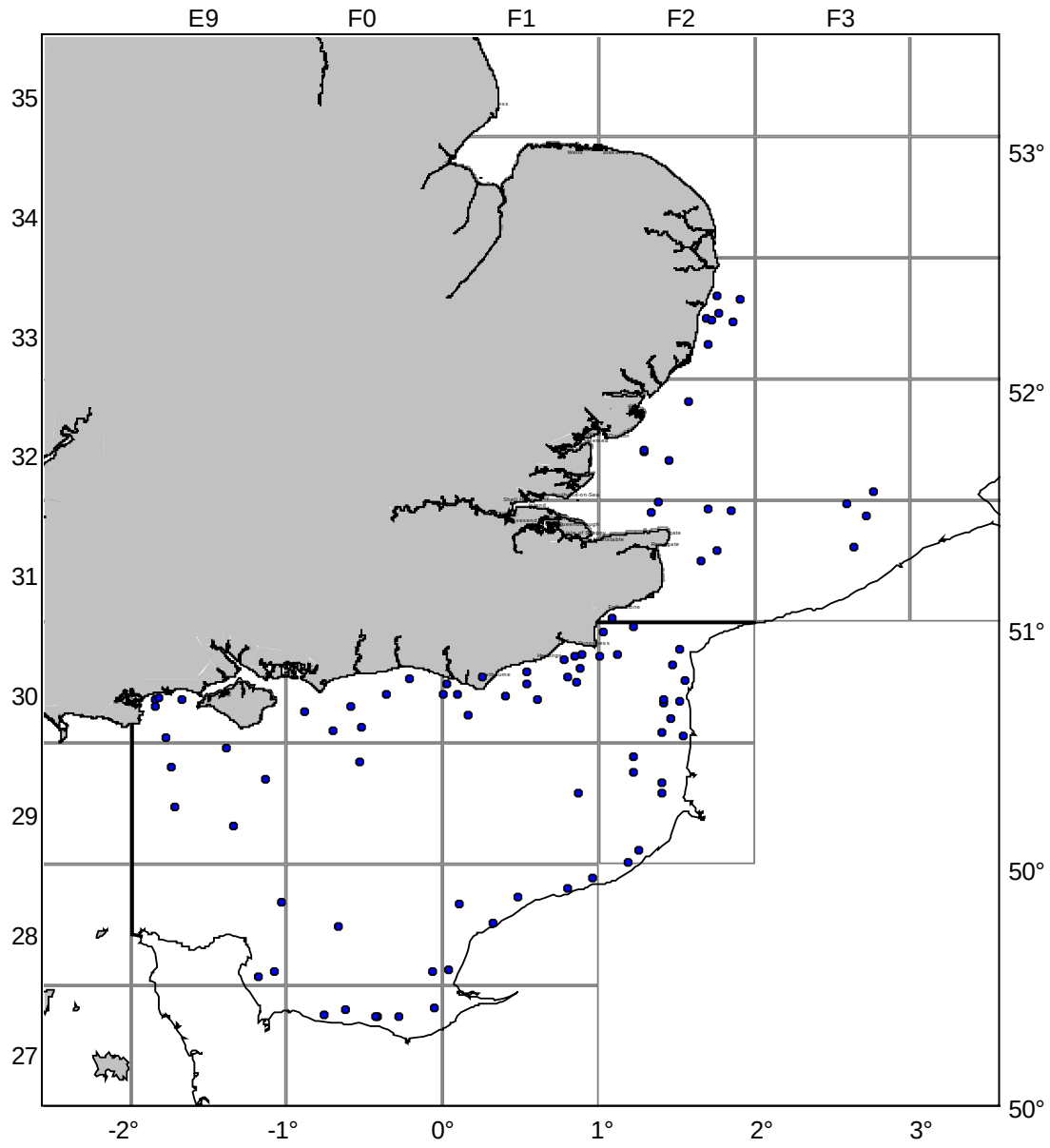

Figure 1 –Stations fished during survey.

Aims 2 & 3

All otolithed fish were measured to the whole cm below, weighed individually, sexed and 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 only. The numbers of individual fish measured this year for the main commercial species can be seen in Table 3.

In total 175 different species were recorded. Figure 2 (dab), figure 3(lemon sole), figure 4 (plaice) and figure 5 (sole) show bubble plots of the spatial distribution of catches for those specific species.

Region	Brill	Cod	Dab	Flounder	Lemon sole	Plaice	Sole	Bass	Whiting	Turbot
VIId English	3	2	96	38	68	475	241	3	55	2
VIId French	3	4	135	28	105	436	214	0	4	13
North Sea (IVc)	2	4	39	43	47	60	297	0	55	0
Total	8	10	270	109	220	971	725	3	114	15

Table 2. Otoliths collected from the main commercial species in each sampling region.

Species	Species code	VIId English	VIId French	IVc North Sea	Total
Brill	BLL	3	3	2	8
Cod	COD	2	4	4	10
Cuttlefish	CTC	175	372	15	562
Dab	DAB	730	503	63	1296
Flounder	FLE	47	32	48	127
Lemon Sole	LEM	78	117	47	242
Plaice	PLE	1391	1790	67	3248
Sole	SOL	325	225	840	1390
Turbot	TUR	2	14	0	16
Whiting	WHG	197	4	74	211
Bass	ESB	3	0	0	3
Velvet swimming crab	MLP	19	615	326	1171

Table 3. Number of fish measured from the main commercial species, in each sampling region.

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

Table 4 – Comparison of catch weight in kg for the main commercial species over the last 3 surveys (2009-2012).

As shown in table 4 in general catches in 2012 were slightly lower than in 2011 for all species except cuttlefish, and cod as mentioned above. Catches of plaice showed a slight decrease on last year but were still higher than in the previous two years. Catches of sole have decreased over the last 4 years, with this year's catch being down 13.5kg on last year.

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 encountered was noted as an observation in the database at species or other taxonomic grouping. There were 9 sentinel species that if encountered at any time on any tow, should be removed and quantified. We primarily encountered Ross Coral (*Pentapora foliacea*) (at 9 stations) and *Sabelleria spinulosa* of these species (at 3 stations); sponge crabs (3 stations) and mantis shrimps (*Meiosquilla desmaresti*) (1station) were also caught. All 12 planned full benthic stations in VIId and 3 in IVc were sampled successfully.

Secondary aims.

Aim 5. Litter was recorded in line with the protocol provided on every valid beam trawl station.

Aim 6. Live velvet swimming crabs, shore crabs, edible crabs and a variety of starfish were kept in tanks on board to be delivered to Yarmouth Sea life centre on return to Lowestoft.

Aim 7. Water samples for nutrient analysis were collected to the supplied protocol at all sites requested by Naomi Greenwood.

Aim 8. The PCO2 meter was run throughout the course of the survey, and monitored for flow rates and alarms throughout. The system was flushed through with clean water twice.

Aim 9. Photographs of benthos and of the beam trawl in operation were taken.

Other work
1 new RV measuring board and 6 new market sampling measuring boards were constructed.

The Scanmar was tested to ensure it was communicating effectively and the EDC kit was PAT tested.

Blog completed and posted daily.

Acknowledgements
The SIC would like to offer her 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 possible.

S Songer
30/07/12

INITIALLED: Brian Harley

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

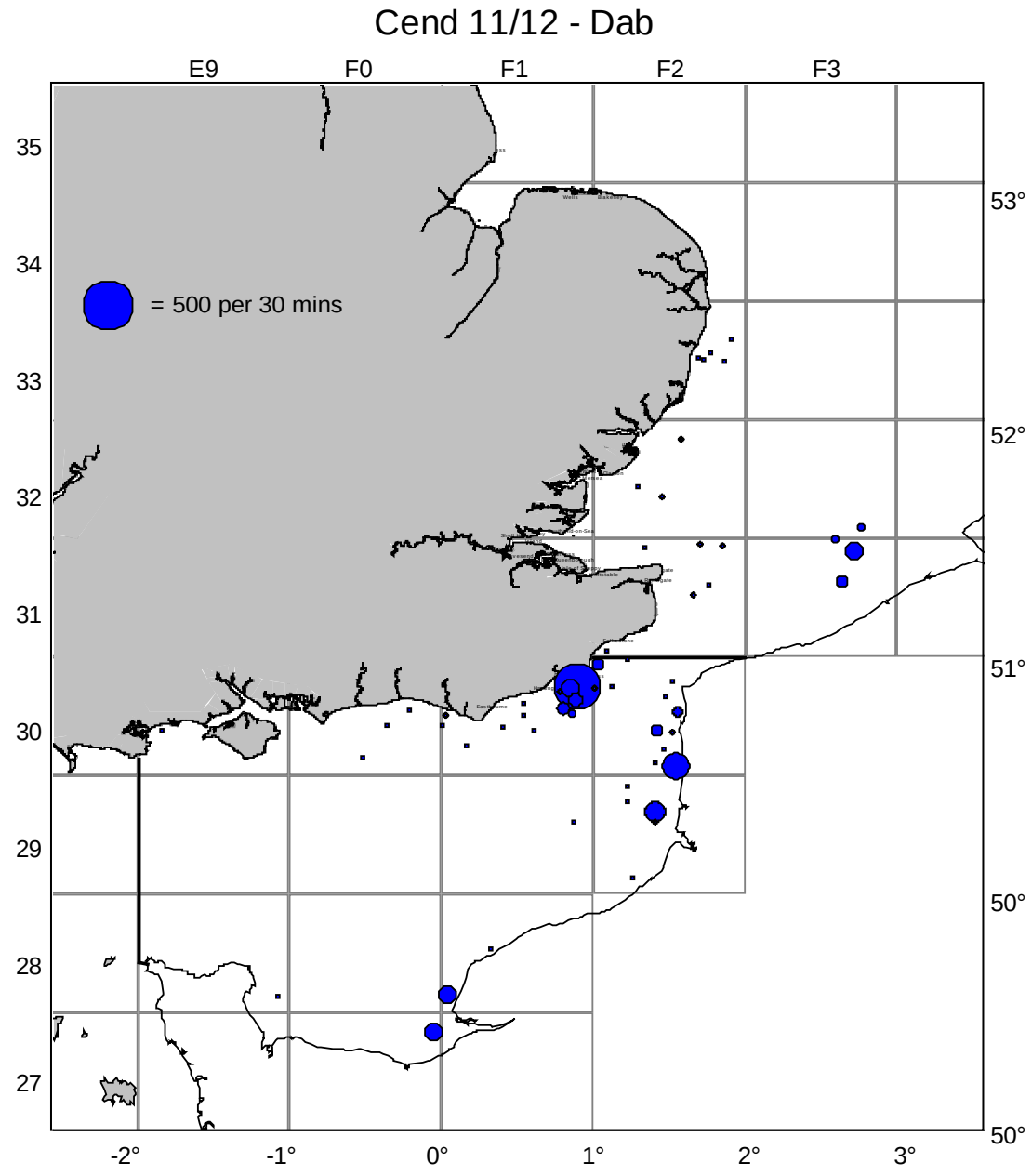

Figure 2 – Distribution of dab caught on 2012 survey.

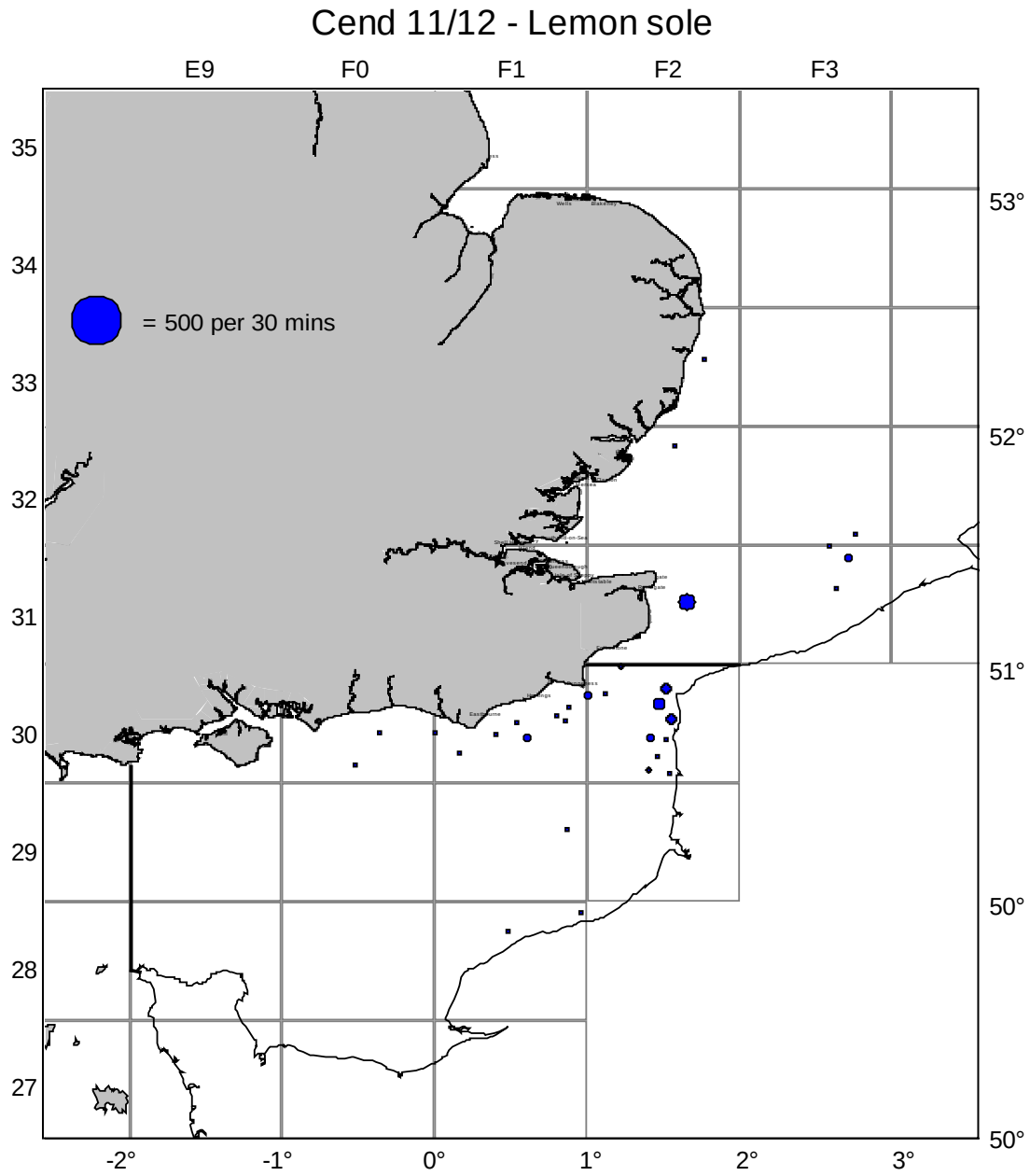

Figure 3 – Distribution of lemon sole caught on 2012 survey.

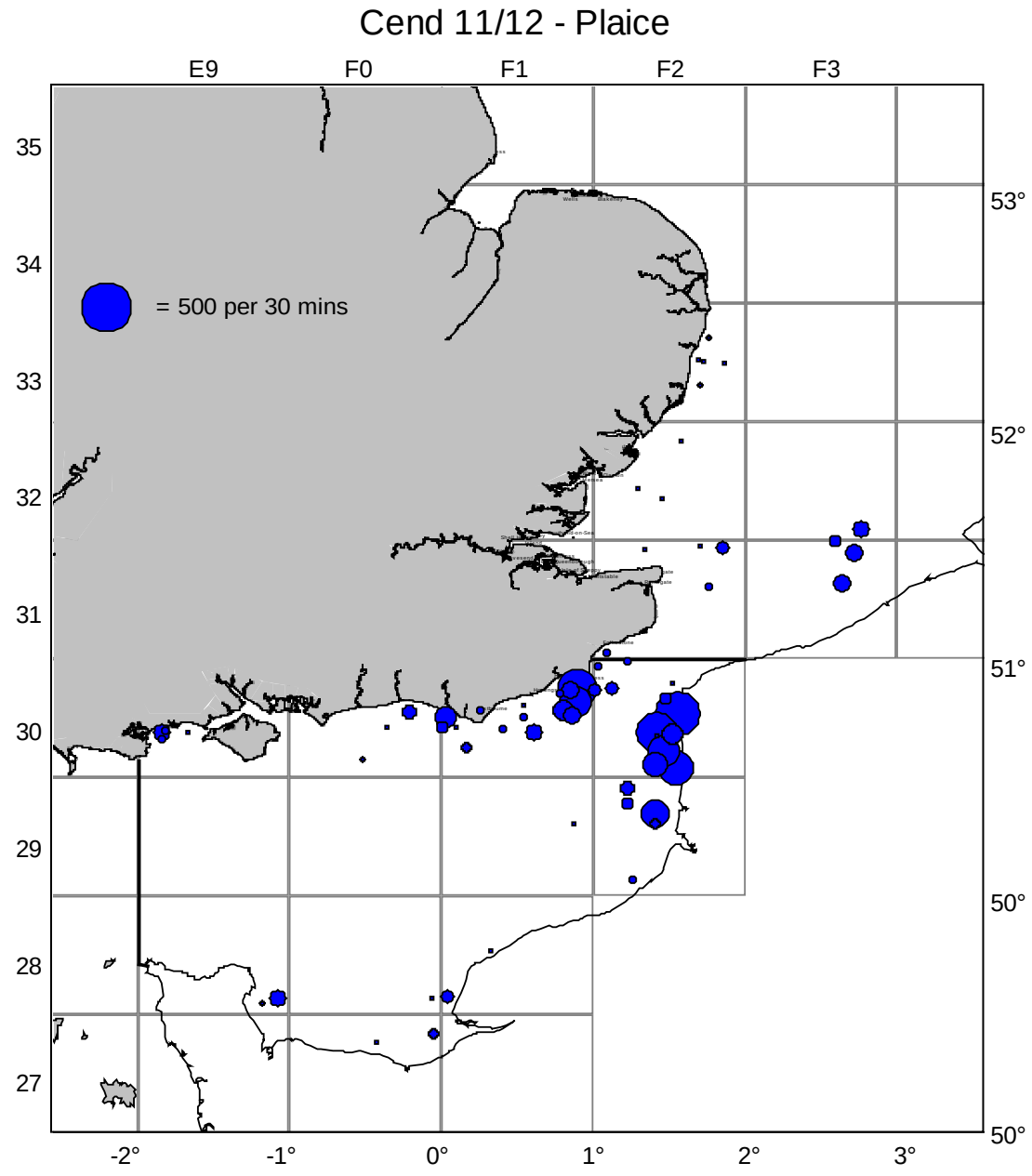

Figure 4 – Distribution of plaice caught on 2012 survey.

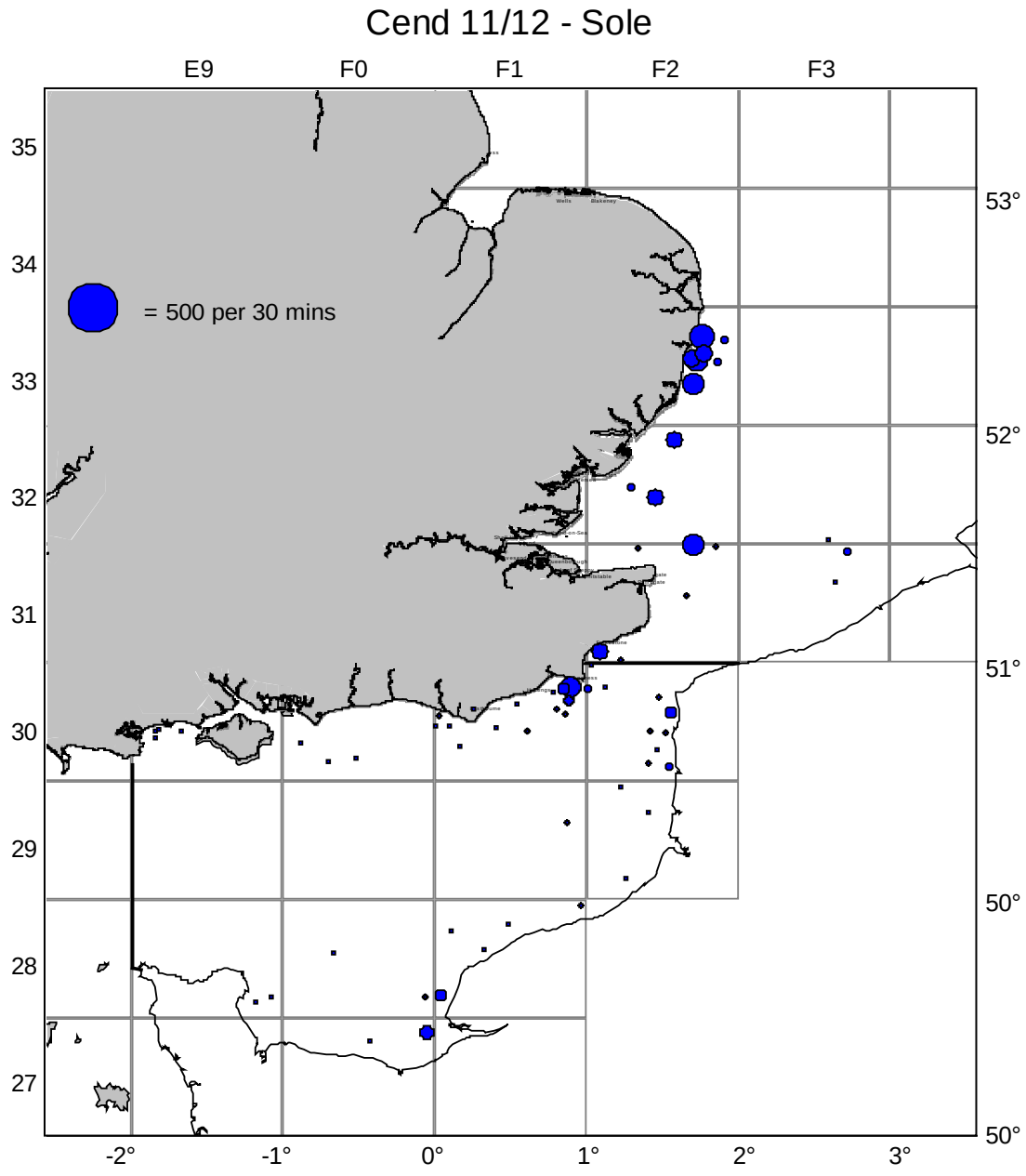

Figure 5 – Distribution of sole caught on 2012 survey.