

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

**2008 RESEARCH VESSEL PROGRAMME**

**REPORT: RV CORYSTES: SURVEY 3/08**

**STAFF:**

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**DURATION:**

16 September – 6 October 2008

**LOCATION:**

Irish Sea (VIIa); Bristol Channel & Celtic Sea (VIIf&g)

**AIMS:**

1. To carry out a 4m beam-trawl survey of groundfish 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 as part of CEFAS' requirements under the EU data regulations.
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 for processing on return to Lowestoft for the analysis of caesium and tritium (AE001) (C Smedley EFS).
6. At the request of the North Devon Fisherman's Association (NDFA), Defra/Cefas agreed to conduct some exploratory tows within the NDFA's voluntary seasonal closed area North of the Lundy MPA. The aim of this work is to substantiate the appropriateness of a potential agreed national measure to protect populations of juvenile skate (*Rajidae*).
7. To collect GSI data on female whiting.

NARRATIVE: (All times GMT)

Cefas scientists arrived in Belfast at 1830h 15 September in order to join CORYSTES. On 15<sup>th</sup> & 16<sup>th</sup> September, all survey gear and associated equipment was loaded, assembled and tested prior to sailing. CORYSTES sailed from Belfast at 1400h on 16<sup>th</sup> September. The fishing gear was deployed, towed for 5 minutes and retrieved in Belfast Lough to ensure that all was in good working order.

Fishing commenced in the Irish Sea West (ISW) at prime station 444 at 1823h. One valid tow was completed successfully and CORYSTES then headed southwards overnight to the Bristol Channel. Fine weather ensured that between September 17<sup>th</sup> and 20<sup>th</sup>, a total of 36 stations were fished, comprising the 32 stations of the inner Bristol Channel sector (BCI) and three stations of the outer Bristol Channel sector (BCO). CORYSTES then headed northwards to complete the stations in Cardigan Bay (St George's Channel, SGC) on the 21<sup>st</sup> September. Further good weather allowed CORYSTES to move northwards into Liverpool Bay (Irish Sea South, ISS) and up to the Solway Firth (Irish Sea North, ISN). Between 22<sup>nd</sup> and 24<sup>th</sup> September, 27 further tows were completed in ISS (16 tows), ISN (10 tows) and ISW (1 tow).

On September 25<sup>th</sup>, 7 valid tows were fished in ISN (6 tows, completion of ISN) and ISS (1 tow). On the 8<sup>th</sup> tow of the day (prime station 53, ISS), an exceptionally large catch was made, which took 2 hours to winch to the surface. It was clear that the catch (suspected to be approximately 6 t of queen scallops), could not be brought aboard and that the cod end would have to be opened using the safety release line rigged for such a purpose. However, the beam had also turned on hauling and it was only through the great skill of the CORYSTES crew that the line could be reached and the cod end safely emptied. The gear was brought aboard and upon inspection, 3 missing links were identified in the chain mat, and several bosom meshes had split. The gear was repaired ready for fishing the next morning.

On the morning of September 26<sup>th</sup>, prime station 53 was fished again, this time for 15 minutes only and at a perpendicular angle to the previous tow. Again, the net filled beyond capacity with suspected queen scallops. In this case, the cod end and cod end liner split during hauling and the catch emptied before reaching the surface. The cod end and liner were deemed beyond repair and were replaced. CORYSTES steamed to station 423 (ISW), approximately 7 miles west of prime station 53. As a precaution, this station was towed for 15 minutes only. Some 2.5 baskets of QSC were caught. The tow was considered valid and the survey continued. A further 5 stations were fished, bringing the total of valid stations for the day to 6. On 27<sup>th</sup> September, 5 ISW stations were fished off the Irish coast, before CORYSTES headed into Dublin to take on board water. CORYSTES docked in Dublin at 1900h on 27<sup>th</sup> September.

CORYSTES left Dublin at 0645h on 29<sup>th</sup> September and headed directly to prime station 229 (Saint George's Channel, SGC), just off Dublin. Fishing recommenced at 0808h on 29<sup>th</sup> September. Between 29<sup>th</sup> September and 1<sup>st</sup> October severe westerly gales hampered fishing opportunities. However, 6 SGC, 2 ISW and 3 South East Ireland (SEI) prime stations were fished, completing the tows for the ISW sector.

Since the weather was predicted to turn northwesterly, CORYSTES headed towards the Bristol Channel during the night of the 1<sup>st</sup> October with the intention of undertaking water sampling the next day. However, a slight improvement in the weather allowed this

plan to be deferred in favour of experimental fishing for juvenile rays in an area to the north of the Lundy Marine Protected Area. A total of 6 experimental tows were completed before the weather once again brought an end to fishing operations. The planned water sampling for the 3<sup>rd</sup> October was abandoned due to gale force winds in the Bristol Channel and CORYSTES steamed to Swansea Bay for cover. However, slight easing of weather conditions allowed the water sampling to begin at 1120 h on the 3<sup>rd</sup> October. Sampling was completed at 2323h that evening, with 38 water stations completed. Samples could not be collected from two Cardiff Bay stations (W23 & W31) because of unfavourable tides.

Due to continuing southwesterly gales, CORYSTES spent the 4<sup>th</sup> October sheltered off the north Devon coast. Efforts were made to fish again the following day, but with no change in the weather or hope of fishing at all, the fishing survey was deemed completed at 0728h on 5<sup>th</sup> October and CORYSTES proceeded towards Swansea. CEFAS scientists began the process of cleaning up and packing away of equipment in readiness for docking. CORYSTES docked in Swansea at 1145h 5<sup>th</sup> October and unloading took place on the morning of 6<sup>th</sup> October. Cefas scientists departed CORYSTES and returned to Lowestoft on 6<sup>th</sup> October.

## RESULTS:

### Aims 1, 2 & 3

The survey gear was the standard 4m-beam trawl (number 3) 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 AFBI Seabird continuous logging system. A SAIV Micro CTD unit was attached to the 4m-beam trawl in order to record the temperature and salinity depth profile at each fishing station fished. In addition surface water was taken at each station and at the first and last fishing station on each working day a surface sample was taken simultaneously with a Niskin bottom water sample and a CTD profile.

All catch details and sample data were entered directly into the Electronic Data Capture (EDC) system and uploaded directly into the Fishing Survey System (FSS). Station details were manually entered into the FSS using information provided by the officer of the watch. The total number of otoliths/scales taken in each ICES Division is shown in Table 1. Table 2 shows the top 10 species by both weight (kg) and number of individuals caught in core survey tows (SEI and Lundy stations excluded)

**Table 1. Numbers of fish otolithed by ICES division**

	VIIa	VIIb	VIIg	Total
Anglerfish ( <i>Lophius piscatorius</i> )	5	5	4	14
Brill	21	10	0	31
Cod	25	5	0	30
Dab	226	177	46	449
Bass	0	12	0	12
Haddock	9	0	13	22
Hake	12	10	16	38
Lemon Sole	43	72	5	120
Megrim	0	0	19	19
Plaice	1236	339	10	1585
Sole	306	319	19	644
Turbot	4	16	2	22
Whiting	150	58	36	244
<b>Total</b>	<b>2037</b>	<b>1023</b>	<b>170</b>	<b>3230</b>

**Table 2: Summary of the main species caught over the entire survey**

	Weight caught (kg)				Number caught		
	2008	2007	2006		2008	2007	2006
Plaice	662	704	629	Dab	8792	9782	11523
Lesser spotted dogfish	650	630	603	Poor Cod	6436	6679	8105
Dab	432	471	536	Plaice	6296	7549	6639
Sole	207	187	172	Solenette	5926	7179	5642
Thornback ray	140	129	134	Whiting	4666	1854	2530
Common dragonette	117	130	98	Common dragonette	2647	3014	2333
Poor cod	116	138	103	Scaldfish	2044	1866	1996
Whiting	107	68	58	Sole	1913	1321	1240
Solenette	81	86	77	Grey Gurnard	1520	1956	1297
Grey gurnard	54	55	49	Lesser spotted dogfish	1448	1481	1320
<b>TOTAL (All species)</b>	<b>3075</b>	<b>3316</b>	<b>3043</b>	<b>TOTAL (All species)</b>	<b>47107</b>	<b>50823</b>	<b>48792</b>

The trawl survey covering the Irish Sea and Bristol Channel is divided up into six sectors consisting of 108 beam trawl tows, of which 98 were successfully fished (Figure 1), including all 65 ISN, ISS and BCI stations used for tuning data in the Northern and Southern Shelf assessment Working Groups. A total of 8 Prime stations – numbers 27 (Morecambe Bay), 40 (Red Wharf Bay), 313 (Tremadoc Bay), 203 (Dundrum Bay), 214 and 220 (north of Dublin), 233 (south of Wicklow), 501 (southwest of Milford Haven) were reduced from the standard 30-minutes to 15-minute tows because of expected large catches of weed, shell/small flatfish. In addition, 3 prime stations were reduced to 15 or 20-minute tows as a precautionary measure following the exceptionally large catches seen at these stations in 2007. A few other stations were moved short distances to avoid snagging undersea cables (an increasing problem in this busy sea area) or to avoid static gear.

In addition to the standard grid, 3 additional stations were fished in the SEI sector and 6 stations were fished in the proposed Lundy box extension. For this year's survey, BCO stations were dropped in favour of the experimental fishing off Lundy. Table 3 shows the number of gear deployments undertaken on the survey.

**Table 3:** Summary of gear deployments

Gear	Valid	Additional	Replicate	Invalid	Total
Standard 4m Beam trawl with cod end liner	99	6	N/A	2	107
Water sample for Caesium analysis	38	N/A	N/A	N/A	38
Surface salinity samples	98	N/A	N/A	N/A	98
Niskin sea-bed water samples	21	N/A	N/A	N/A	21

Abundances of pre-recruit and recruited plaice and sole in the Irish Sea and Bristol Channel are shown in Figures 2 and 3. As with last year's survey, pre-recruit plaice were most abundant off the east coast of Ireland and in inshore waters off north Wales and northwest England. Pre-recruit sole were most abundant in the Bristol Channel, particularly Carmarthen Bay and in inshore waters off north Wales and Liverpool Bay. Abundances of pre-recruit and recruited dab and lemon sole are shown in Figures 4 and 5.

Plaice: Plaice abundance, by number and weight showed mixed fortunes in comparison to last year's survey. In BCI, plaice abundance increased for the third year running. Abundance by number and weight in this year's survey is similar to that of the series high in 2004. In contrast, plaice number and abundance decreased in BCO from the series high observed in 2007. However, it should be noted that the sampling of BCO was incomplete. In the Irish Sea, ISS plaice abundance was up 13% and 8% by number and weight, respectively. This is the second year in which an increase has been observed. In contrast, catches in both ISN and ISW were down on those in 2007.

Sole: Numbers of sole were up for the third year running in BCI, with abundance up 89% and 45% by number and weight on last year, respectively. In the ISS and ISN sectors, catches have remained at a similar level for the last 3 years. In ISW however, catches increased, particularly in terms of the number of sole caught, which was 91% higher than in 2007. Sole in SGC continues to decline.

Dab: Dab in BCI continue to show small increases in abundance by weight, but a small decrease in number of fish caught was seen. In BCO a dramatic increase was seen in abundance. However, this presents a mean and some stations usually less abundant in the species may not have been sampled. Catches in ISS and ISW remain relatively stable. In ISN, the slow increase from the series low of 2006 continues and in SGC, a similarly slow increase from the 2005 low is seen.

Lemon sole: Catch rates of lemon sole remain low in all survey sectors (Figure 9).

Noteworthy changes to the catch rates of other main species were increases in the abundance of lesser-spotted dogfish in the Bristol Channel sectors, but decreases in the three Irish Sea sectors. Whiting increased in ISW and ISS, but showed a moderate decrease in ISW

#### Aim 4 - Epibenthos

At 24 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 at one station due to all staff being fully employed in processing of the fish catch. At this station, a sample of the epi-benthic by-catch was labelled and frozen for subsequent analysis upon return to Lowestoft

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 2 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 38 stations in the Bristol Channel & Severn Estuary for Tritium H-3 analysis for Carol Smedley. (Cefas, Lowestoft).

#### Aim 6 - Additional sample collection

Additional samples were taken in support of other CEFAS projects:

A) No rare or unusual fish were caught on the survey, although an electric ray (*Torpedo nobiliana*) was caught in the Outer Bristol Channel for the first time on this survey. A photograph was also taken.

B) Samples of dab (*Limanda limanda*), lesser spotted dogfish (*Scyliorhinus canicula*), mixed ray (*Raja spp.*), edible crab (*Cancer pagurus*) and octopus (*Eledone cirrhosa*)

were collected for the radiological monitoring programme from the northern part of the Irish Sea. No specimens of cuttlefish (*Sepia officinalis*) or spider crabs (*Maia squinado*) were caught in the required sea areas. P Rumney (CEFAS, Lowestoft).

C) All monkfish (*Lophius piscatorius*) had illicia taken. S Warne (CEFAS, Lowestoft).

D) A total of 78 measurements of jellyfish caught were taken. These were identified to species and measured across the 'umbrella' disc. D Righton (CEFAS Lowestoft)

E) A number of samples requiring confirmation of species identification at Lowestoft were frozen. J Ellis (CEFAS, Lowestoft)

F) A total of 6 experimental tows were undertaken within the current North Devon Fisherman's Association voluntary seasonal closed area. Tows varied in duration from 7 – 20 minutes duration, due to the high presence of static gear in the area.

G) A total of 44 female whiting were sampled for Gonadosomatic Index (GSI) and photographs were taken of the gonads *in situ* and dissected from the body.

### Micro CTD

The SAIV Micro CTD unit number 488 was attached to the 4m-beam trawl in order to record the temperature and salinity depth profile at each station fished and this was successful in recording data on all fishing days. A total of 100 successful CTD data collections out of a total of 101 valid fishing stations were made.

### Niskin water sample collection

The starboard gantry was used in the collection of bottom water samples with a SAIV Micro CTD unit and a niskin sampler attached to the warp. The sample was routinely taken at around 5m off the seabed. A total of 21 niskin bottom water samples and associated CTD data were collected.

### Continuous CTD data collection

The on-board Seabird continuous monitoring system was used to collect surface temperature and salinity. This successfully collected data on all survey fishing and water collection days.

### Cetacean Observations

A total of 4 sightings of Cetaceans were recorded during the survey. Details of location, date/time and identification were noted on each occasion. Two sightings were of common dolphin (*Delphinus delphis*) and two were of pilot whale (*Globicephala melas*). Details were collected for the Sea Watch Foundation.

### Fish ID quality control tests

During the survey, two fish identification tests were carried out. For each test, 10 species were randomly selected from the catch and all scientists on-board were asked

to identify them (common name, Latin name and FSS code). Any wrongly identified species were discussed detailing specific identification aspects.

Finally, our thanks once again go to all the officers and crew of CORYSTES for their help, support and advice during this survey. As a result of their skill and co-operation, the survey aims were achieved, occasionally in difficult conditions. In addition, our thanks go also to the CEFAS staff from SIGS section for once again providing an excellent service in setting up the EDC and associated sample collection equipment prior to sailing.

S A Walmsley  
October 2008

INITIALLED: B Harley

SEEN IN DRAFT: Master: Capt S McBride  
First Officer: A Lincoln

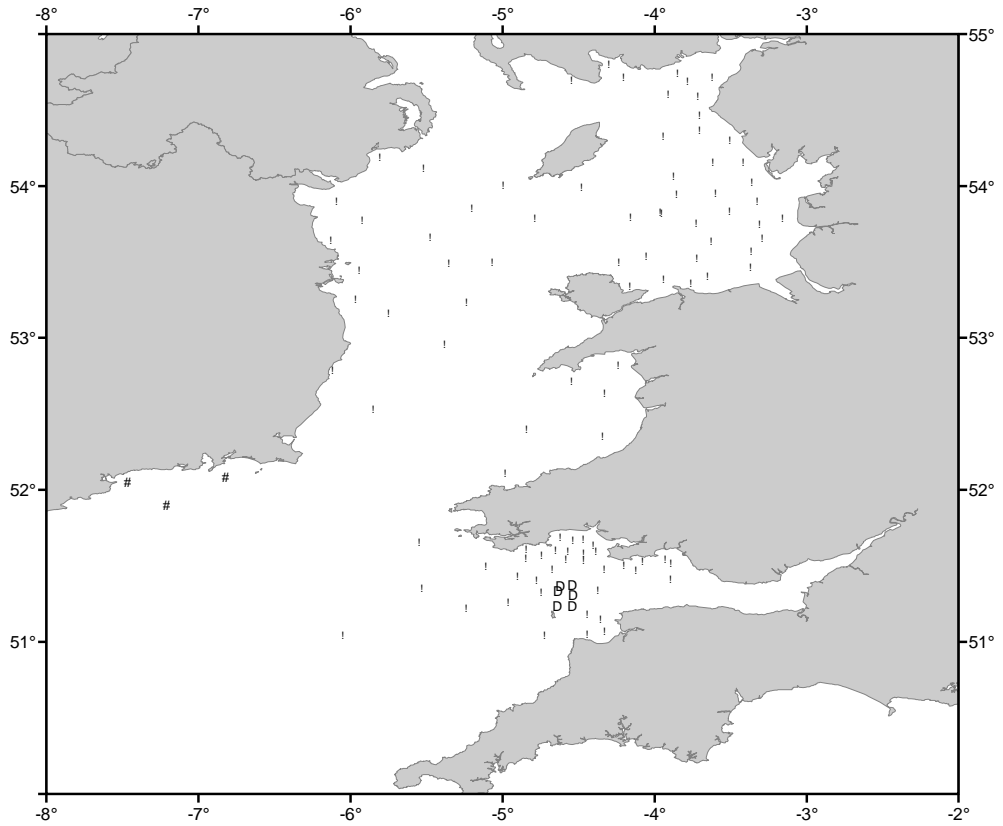
DISTRIBUTION:  
Basic List +

S Walmsley  
I Holmes  
L Readdy  
B Hatton  
M Etherton  
S Armstrong  
J Pettigrew  
D Duggan

S Kupschus  
S Flatman  
B Harley  
R Briggs (AFBI NI, Belfast)  
P Connolly (DOM, Dublin)  
FCO (for Republic of Ireland)  
Sea Fisheries Committees:  
Cumbria  
North Western and North Wales  
South Wales  
Devon  
Cornwall

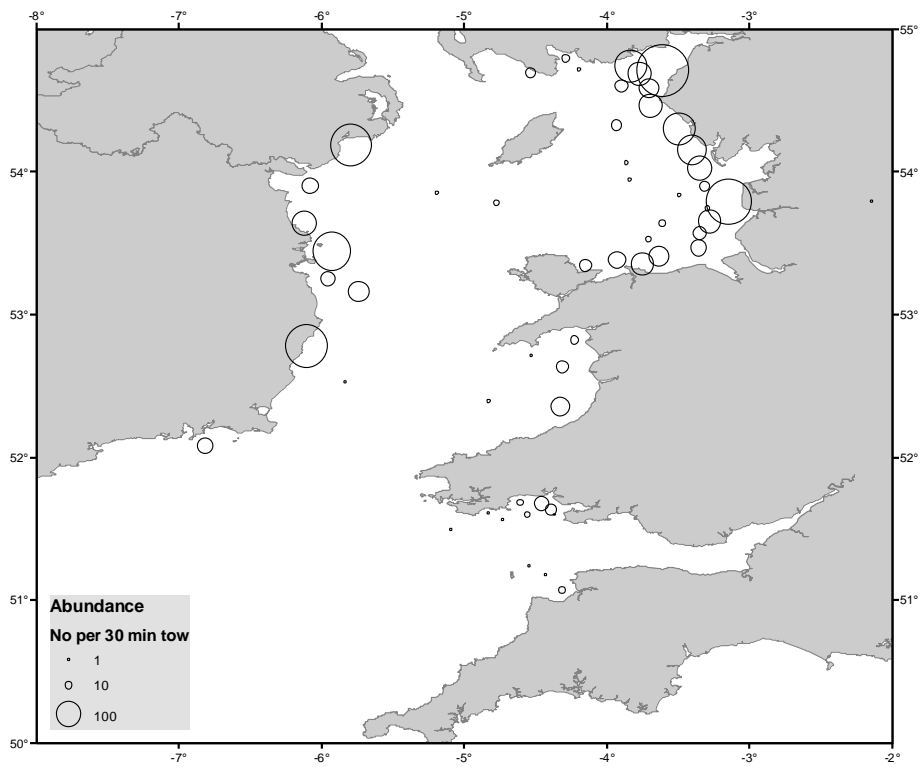


**Figure 1 - Station Positions for Cory 3/08. Closed circles represent stations in the core survey grid, crosses represent experimental tows to the north of Lundy and closed triangles indicate additional tows made in the SEI sector.**

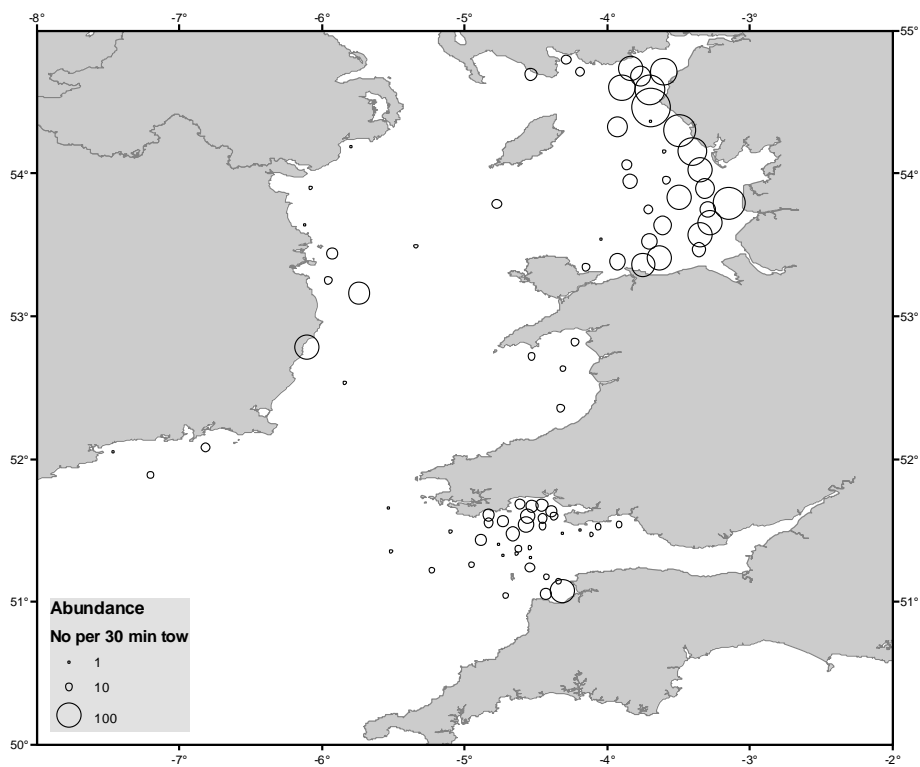


**Figure 2 - Abundance (number caught per 30 minute tow) of pre-recruit (a) (<21 cm TL) and recruited (b) ( $\geq 21$  cm TL) plaice.**

a)



b)

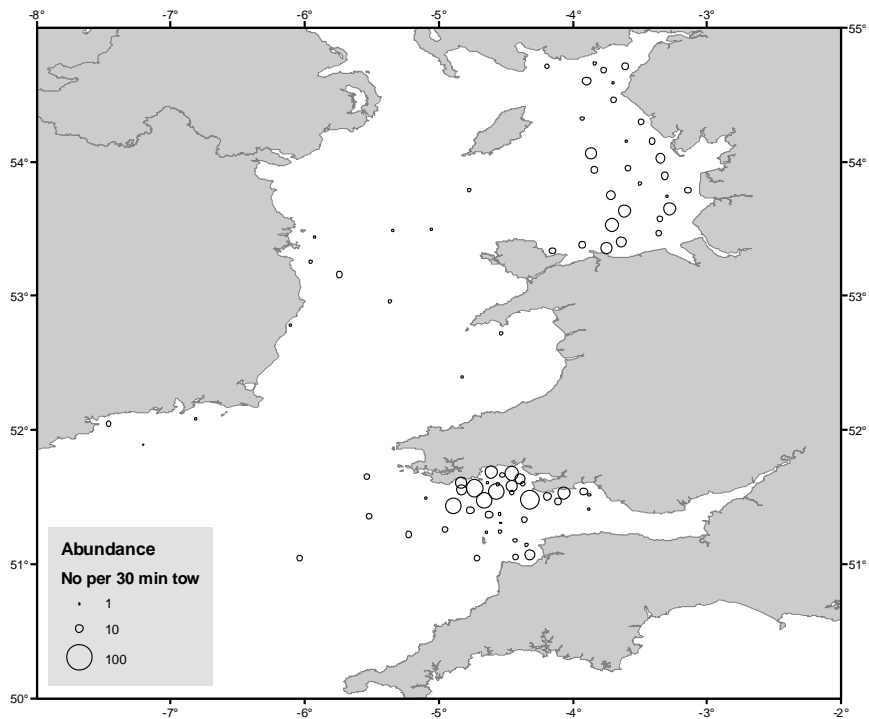


**Figure 3 - Abundance (number caught per 30 minute tow) of pre-recruit (a) (<21 cm TL) and recruited (b) ( $\geq 21$  cm TL) sole.**

a)

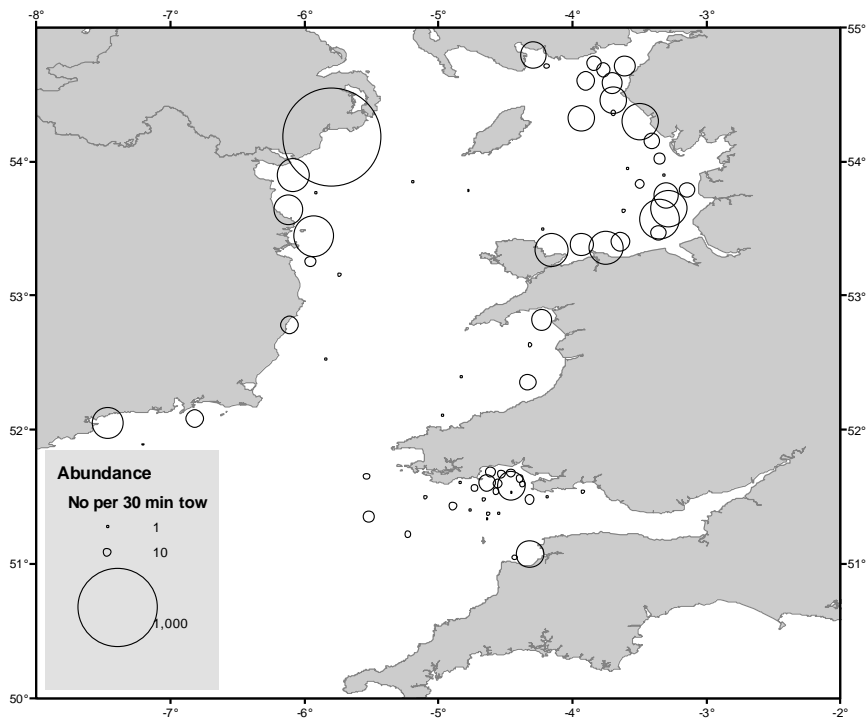


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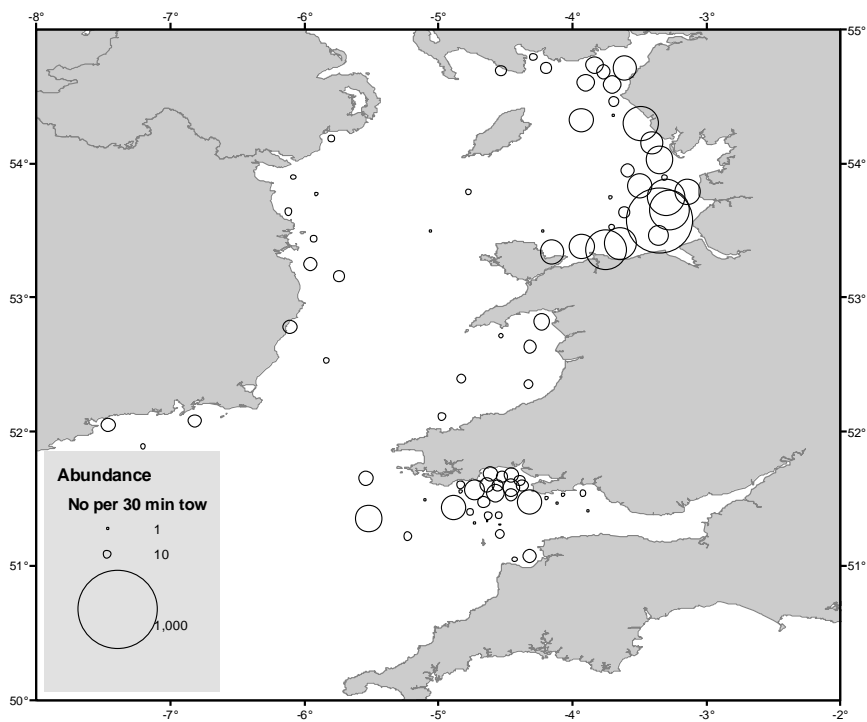


**Figure 4 - Abundance (number caught per 30 minute tow) of pre-recruit (a) (<16 cm TL) and recruited (b)(≥16 cm TL) dab.**

a)

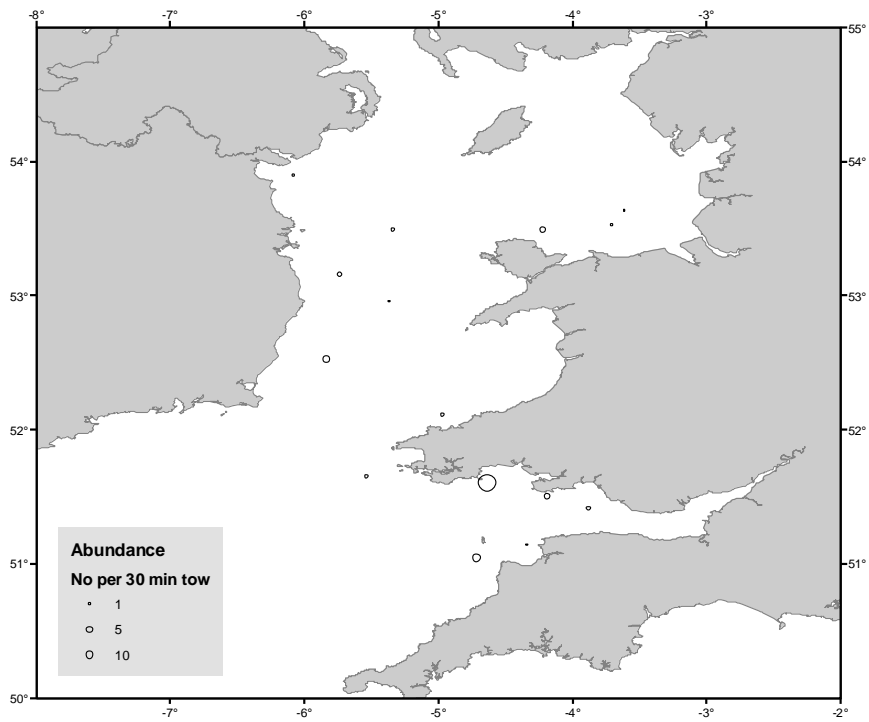


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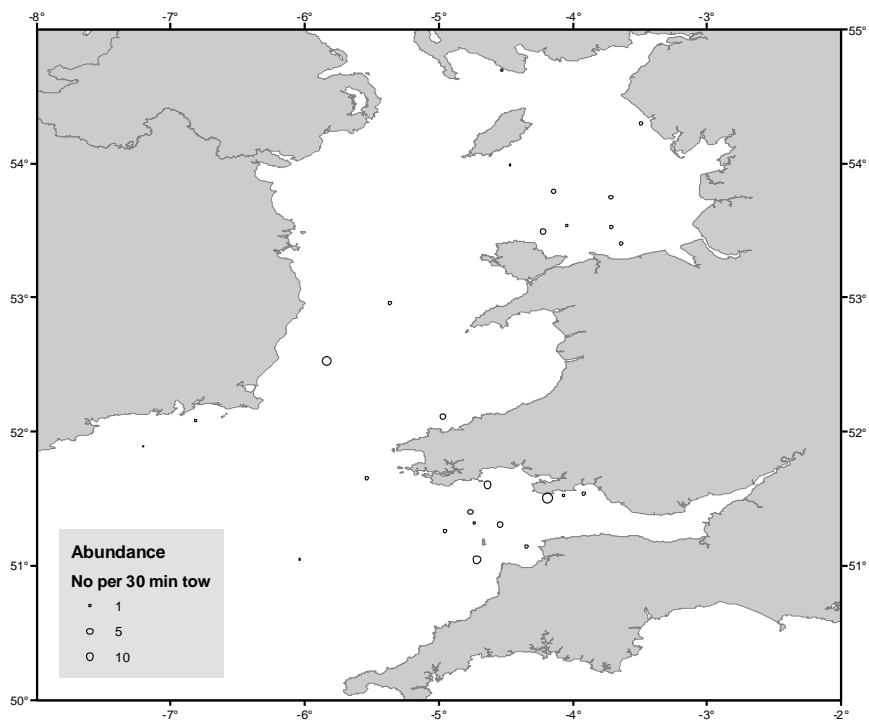


**Figure 5 - Abundance (number caught per 30 minute tow) of pre-recruit (a) <19 cm TL) and recruited (b)(≥19 cm TL) lemon sole.**

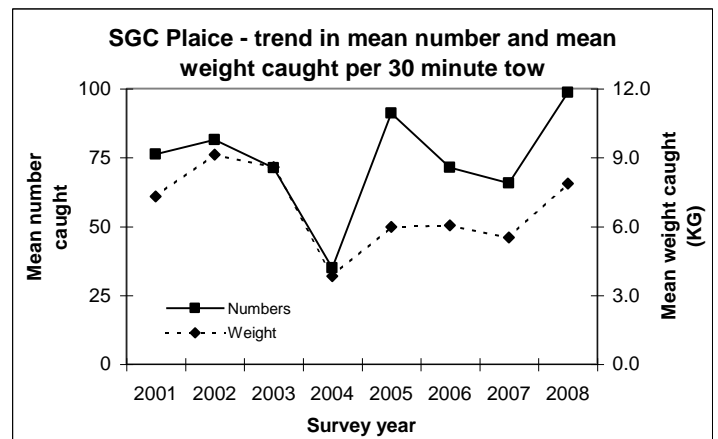
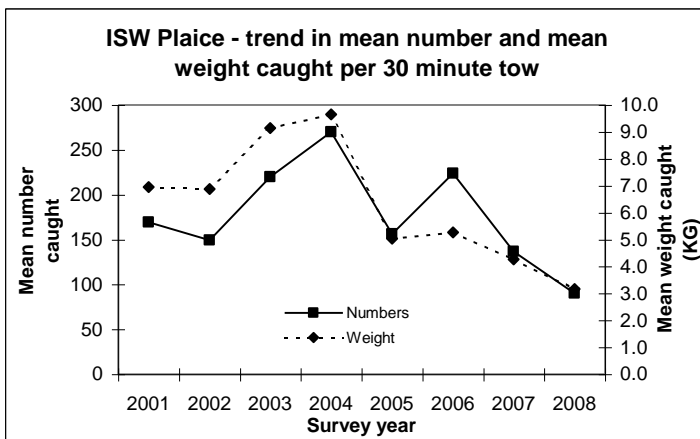
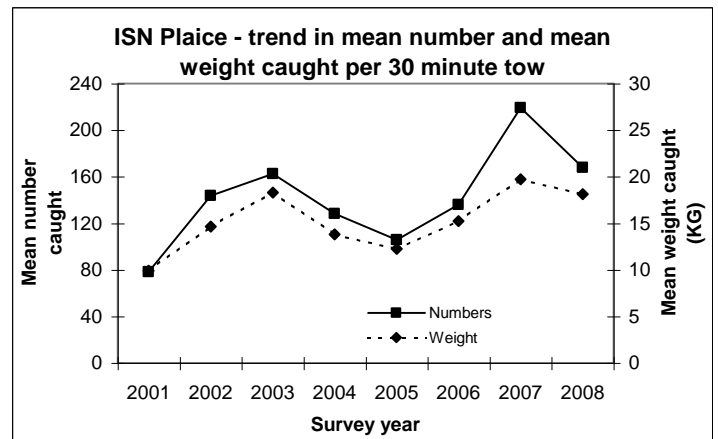
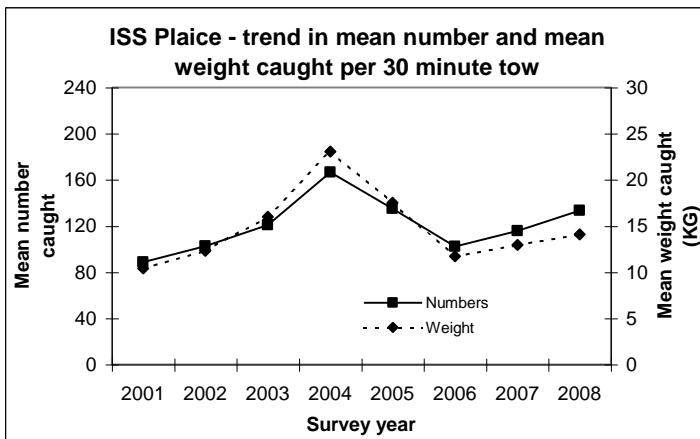
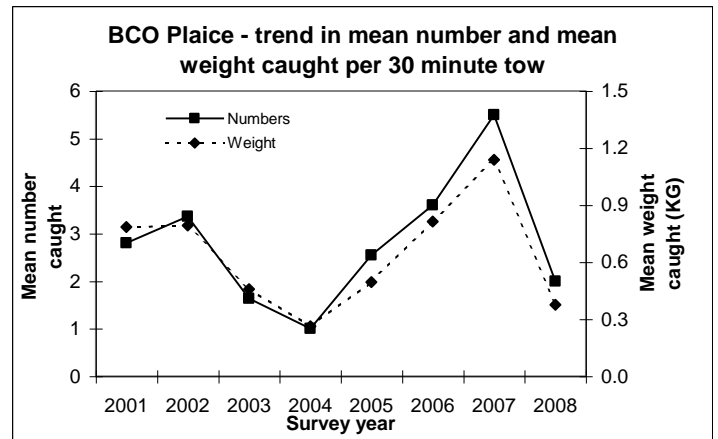
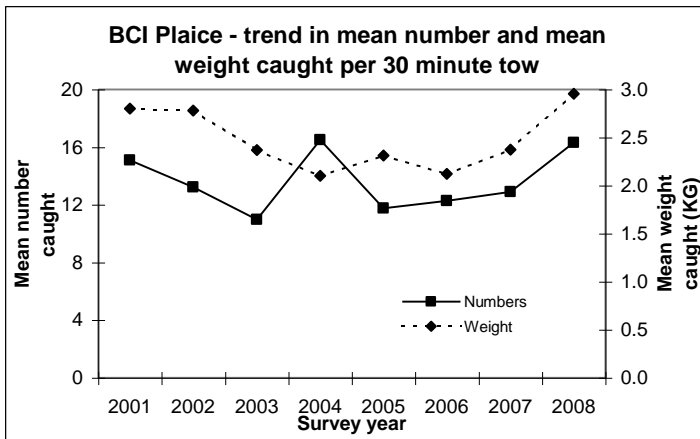
a)



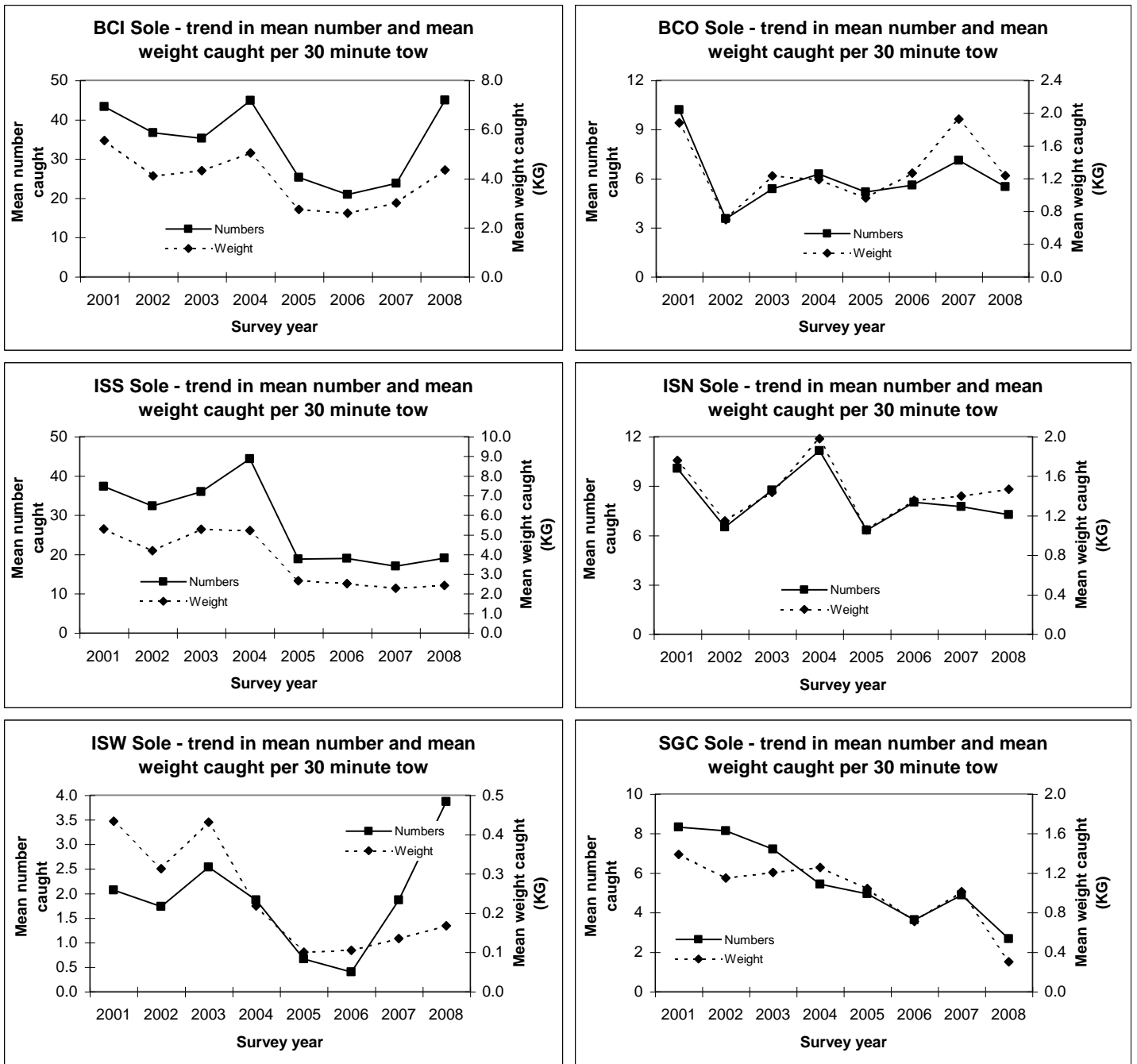
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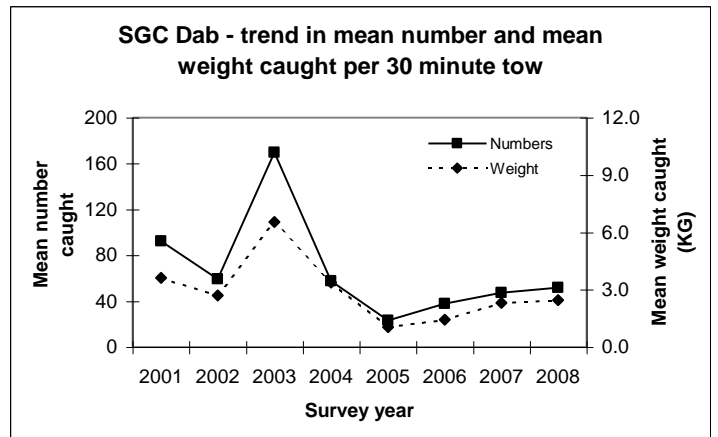
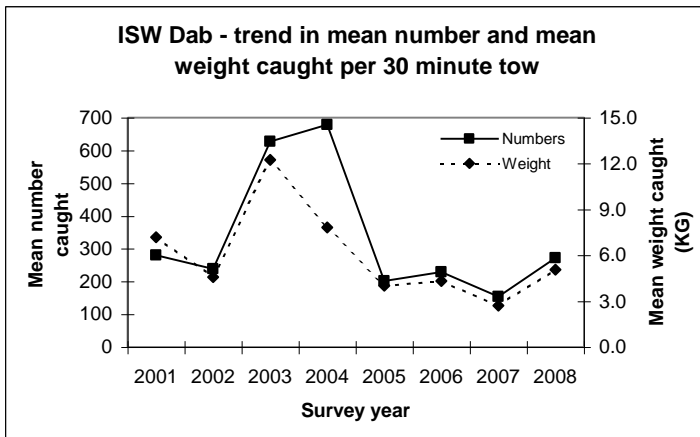
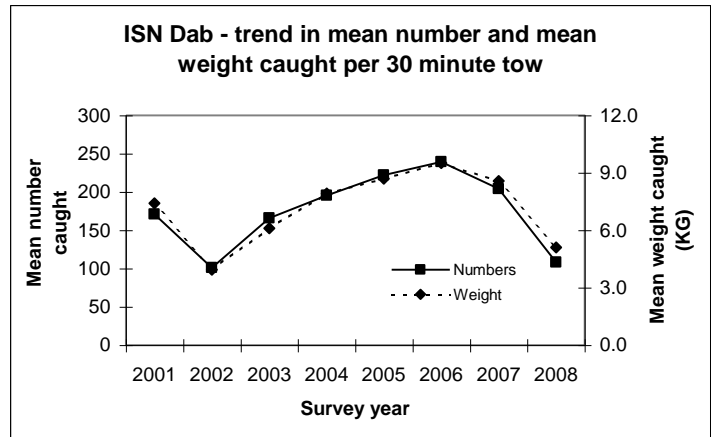
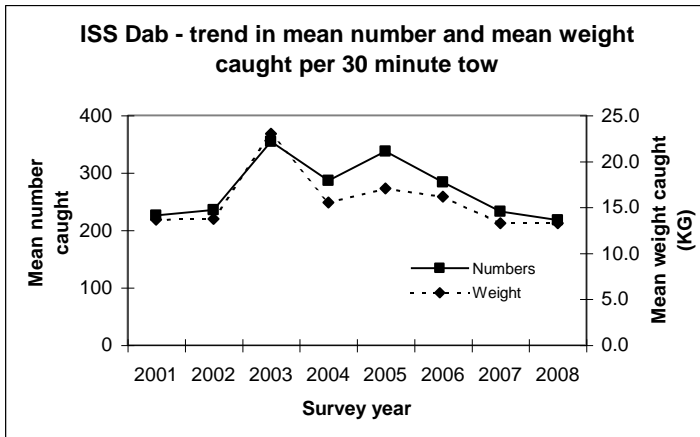
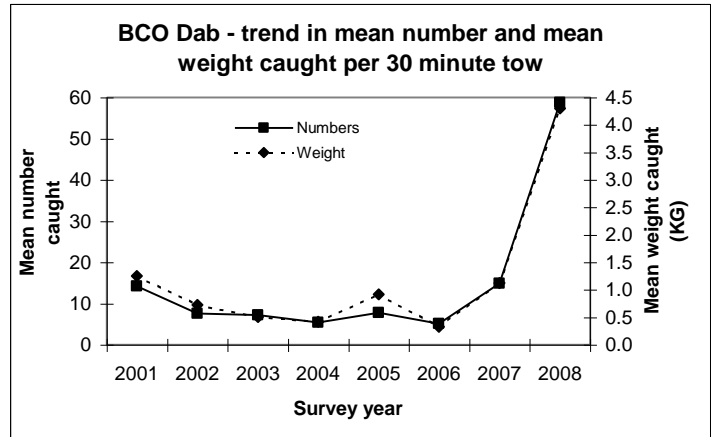
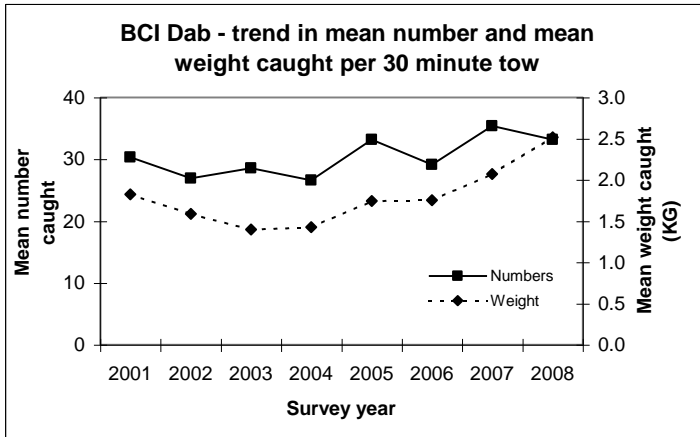
**Figure 6 - Corystes 2/07 mean number and weight of plaice caught per 30-minute tow by survey area**



**Figure 7 - Corystes 2/07 - mean number and weight of sole caught per 30-minute tow by survey area**



**Figure 8 - *Corystes* 2/07 - mean number and weight of dab caught per 30-minute tow by survey area**





**Figure 9 - Corystes 2/07 - mean number and weight of lemon sole caught per 30-minute tow by survey area**

