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Report of the International Bottom Trawl Survey Working Group (IBTSWG)

8–12 April 2013

Lisbon, Portugal

ICES International Council for the Exploration of the Sea

CIEM Conseil International pour l'Exploration de la Mer

International Council for the Exploration of the Sea
Conseil International pour l'Exploration de la Mer

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Executive summary

The International Bottom Trawl Working Group (IBTSWG) met in Lisbon, Portugal, from 8-12 April 2013. Altogether 22 participants from 12 countries took part in the meeting, most of who are involved in designing and conducting bottom trawl surveys. One participant represented the ICES Data Centre.

Terms of reference (a) to (f) have been met and progress is described in the relevant sections of the report (see table of contents). Work on ToR (g), the submission of updated manuals to SISP, is planned for early summer of 2013 in order to allow WKESST to review the manuals during their meeting in September 2013. Major developments, achievements, agreed actions of the group itself and recommendations from the 2013 meeting are summarized below:

Section 5 (on ToR a) presents individual annual surveys coordinated by IBTSWG using a standard reporting format, containing the individual survey's coverage as well as aggregated results, including tables presenting samples obtained for the target species, or additional samples collected under the DCF (Data Collection Framework).

For the areas of the North Sea and the Northeastern Atlantic, combined maps of species distributions have been produced (see Section 5.4 and Annex 6).

Section 6 (on ToR b) documents ongoing work on the improvement of survey manuals.

Section 7 (on ToR c) provides a review of the outcome of the workshop WKDATR, initiated by IBTSWG 2012 and held in January of 2013, in order to overcome observed issues in data handling in DATRAS. Progress is being summarized, and an action list for IBTSWG has been agreed to follow up (included in the overall Action List in Annex 4).

Section 8 (on ToR d) reviews the conditions for producing from survey data indices based on swept-area, instead of haul time. This work build upon work of WGISDAA, and will be continued over the next two years, in order to create the conditions for such indices and start initial comparisons with selected datasets.

Section 9 (on ToR e) presents the first year's work toward compile the status quo, and proposing ways forward in standardization on the different materials and specifications of the GOVs and gear currently used by the IBTS participants. A table has been created which all members are asked to fill in by December 2013, to collate the details of the currently applied rigging routines. In a Working Document (WD1, Annex 7), the effect of variable sweep length has been evaluated with a GOV using groundgear type D.

Section 10 (on ToR f) presents two tables created in collaboration with WGBEAM, answering an OSPAR request on maximizing the use of available sources of data for monitoring of biodiversity.

1 Administrative details

Working Group name

IBTSWG

Year of Appointment

2013

Reporting year within current cycle (1, 2 or 3)

1 (for multiannual ToRs)

Chair(s)

Anne Sell, Germany

Meeting venue

Lisbon, Portugal

Meeting dates

8–12 April 2013

2 Terms of Reference a) – z)

ToR	Description	Background	Science Plan topics addressed	Duration	Expected Deliverables
a	Coordination and reporting of North Sea and Northeastern Atlantic surveys, including appropriate field sampling in accordance to the EU Data Collection Framework	Intersessional planning of Q1- and Q3- surveys; communication of coordinator with cruise leaders; combing the results of individual nations into an overall survey summary.	113, 121, 141, 144, 161, 162, 173, 211, 251, 252, 311, 321	Recurrent annual update	1) Survey summary including collected data and description of alterations to the plan, to relevant assessment-WGs (WGHMM, WGCSE, WGNEW, WGNSSK, HAWG, WGDEEP, WGEF, WGEEL, WGCEPH, WGHANSA) and SCICOM. 2) Indices for the relevant species to assessment WGs (see above) 3) Planning of the upcoming surveys for the survey coordinators and cruise leaders.
b	Review IBTS manuals and consider additional updates and improvements in survey design and standardization	Intersessional activity, ongoing in order to improve survey quality	161, 162, 321	Permanently ongoing	Updated version of survey manual, whenever substantial changes are made (intersessionally)

c	Address DATRAS-related topics in cooperation with DUAP: data quality checks and the progress in re-uploading corrected datasets, quality checks of indices calculated, and prioritizing further developments in DATRAS. Step 1: Discussing and commenting on the results of the DUAP-workshop	Multi-annual activity, supported by workshop in 2012-13 to solve issues with highest priorities.	161, 162, 321	Multi-annual activity, supported by workshop in 2012-13 to solve issues with highest priorities;	Prioritized list of issues and suggestion for solutions and for quality checking routines, as well as definition of possible new DATRAS products, submitted to DATRAS group at ICES. Once data quality control routines are estabished, annual check of recent survey data. Step 1: IBTSWG evaluation of the workshop results, including suggestions and recommen-dations. For ICES-datacenter, DUAP, survey managers.
d	Produce a swept-area-based index (instead of haul time-based index) to be explored in collaboration with the WGISDAA	Swept-area is suggested as an alternative to haul time, because it would remove possible bias resulting from different riggings or gear specifications. In order to evaluate the effect changing to new indices, IBTSWG intends to liase with relevant stock coordinators or assessment groups at ICES.	141, 144	3 years	Manuscript for paper or CRR, analysing the potential advantages of moving to swept-area-based standardization. To be presented to assessment groups for evaluation by 2015.
e	Compile status quo, report and propose ways forward in standardization, on the different materials and specifications of the GOVs and gears currently used by the IBTS participants. Analyse and report on the effect of variable sweep length and standardization on the uses in the IBTS.	Some aspects of the gear applied in the surveys are not required to be standardized. The effect of these variations are to be evaluated. Partly, different standards for sweep lengths have been applied in Q1 vs. Q3 surveys. (For this ToR, IBTS seeks support from gear technology experts and welcomes their contribution.)	141,144	3 years	Technical paper / manuscript.

f	Provide a response in terms of a joint annex in the reports from IBTSWG and WGBEAM, on maximizing the use of available sources of data for monitoring of biodiversity. The WGBIODIV should be consulted in the process. Advice would be sought as to 1) the quality of these potential data sources and how they could be used, including but not limited to the relevance of outcomes identified in chapter 8 of the ICES MSFD D3+ report to Descriptors 1, 4 and 6. OSPAR request 2013-4	The purpose of this request is to seek ICES advice on the potential sources of data and information that may be available to support the monitoring and assessment of biodiversity in relation to commitments under MSFD so as to maximize efficiencies in the use of available resources, for example where efficiencies could be made to identify where there are monitoring programmes or data sources that can deliver multiple indicators, which may relate to different Descriptors, (e.g. The Data Collection Framework could be used to implement D3 and D1 indicators), or where with a small additional effort existing monitoring could be amplified to deliver a broader set of data.	OSPAR request	1 year	Report by 15 May 2013
g	Ensure that the most recent versions of each survey manual is submitted to the Series of ICES Survey Protocols (SISP)	The Series of ICES Survey Protocols (SISP) is an online, web-accessible series of ecosystem (fishery) survey manuals, covering the protocols and procedures used in ICES coordinated fisheries and ecosystem surveys, including trawl, acoustic, and ichthyoplankton surveys (http://www.ices.dk/products/surveyprotocols.asp). The aim is to have all ICES coordinated surveys allocated an ISSN number and become openly available.		As appropriate	Updates of SISP.

3 Summary of Work plan

Year 1	Datras Workshop, adjustment of Quality-checking Routines (ToR c); laise withstock coordinators and assessment groups, evaluate data availability for gear parameters in Datras and in national databases (ToR d); Compile status quo, Seek and collate input from gear experts (ToR e); Evaluate output from WKECES 2012 (ToR f).
Year 2	Evaluate the effect of changing to swept-area-based indices for additional examples/ stocks, particularly linked to WGISDAA and benchmark process (ToR d). Continue analyses of different GOV configurations (ToR e). Evaulate opportunities of IBTS to address actual requirements for MSFD and EAFM (ToR f).
Year 3	Continue to evaluate the effect of chaning to swept-area-based indiced for additional examples/ stocks (ToR d). Continue analyses of different GOV configurations (ToR e). Evaulate opportunities of IBTS to address actual requirements for MSFD and EAFM (ToR f).
Recurrent annual activity	Updates for ToRs a and c. Additionally: ToRs a and b ongoing intersessionally.

4 List of Outcomes and Achievements of the 2013 IBTSWG

- Description of survey products: Survey summaries of IBTS-coordinated surveys for Q3/Q4 2012 and Q1 2013.
- Updates of survey manual for the International Bottom Trawl Surveys in the North Sea, and in the Northeastern Atlantic Areas. Revision of the manual for plankton sampling with MIK nets during IBTS surveys. All three manuals will be submitted to review by SGESST by June 30, 2013.
- Review of recommendations from WKDATR (Workshop on DATRAS data Review Priorities and Checking Procedures), initiated by IBTSWG 2012, and held in January of 2013 with participation of ICES Data Centre and DATRAS data submitters. Preparation of an Action List of next steps in terms of applying checking procedures and correction of errors in national data.
- Definition of conditions for producing indices based on swept-area, instead of haul time; building upon work of WGISDAA.
- Template for a table on GOV rigging to be populated by all survey participants to be filled in by December 2013, as part of the compilation of the status quo of gear currently used by the IBTS participants:
- Two tables created in collaboration with WGBEAM, answering an OSPAR request on maximizing the use of available sources of data for monitoring of biodiversity.

5 Coordination of North Sea and Northeastern Atlantic surveys (ToR a)

5.1 Q1 North Sea Survey

5.1.1 General overview

The North Sea IBTS Q1 survey aims to collect data on the distribution, relative abundance and biological information on a range of fish species in ICES area IIIa, IV and VIId. During daytime a bottom trawl is used. This is the GOV (Grand Ouverture Verticale), with groundgear A or B. A CTD was deployed at most trawl stations to collect temperature and salinity profiles. During night-time herring larvae are sampled with a Midwater Ringnet (MIK-- similar to the original Methot Isaacs–Kidd net but with a ring instead of quadratic frame). Age data were collected for cod, haddock, whiting, saithe, Norway pout, herring, mackerel, and sprat, and a number of additional species (see information provided by country).

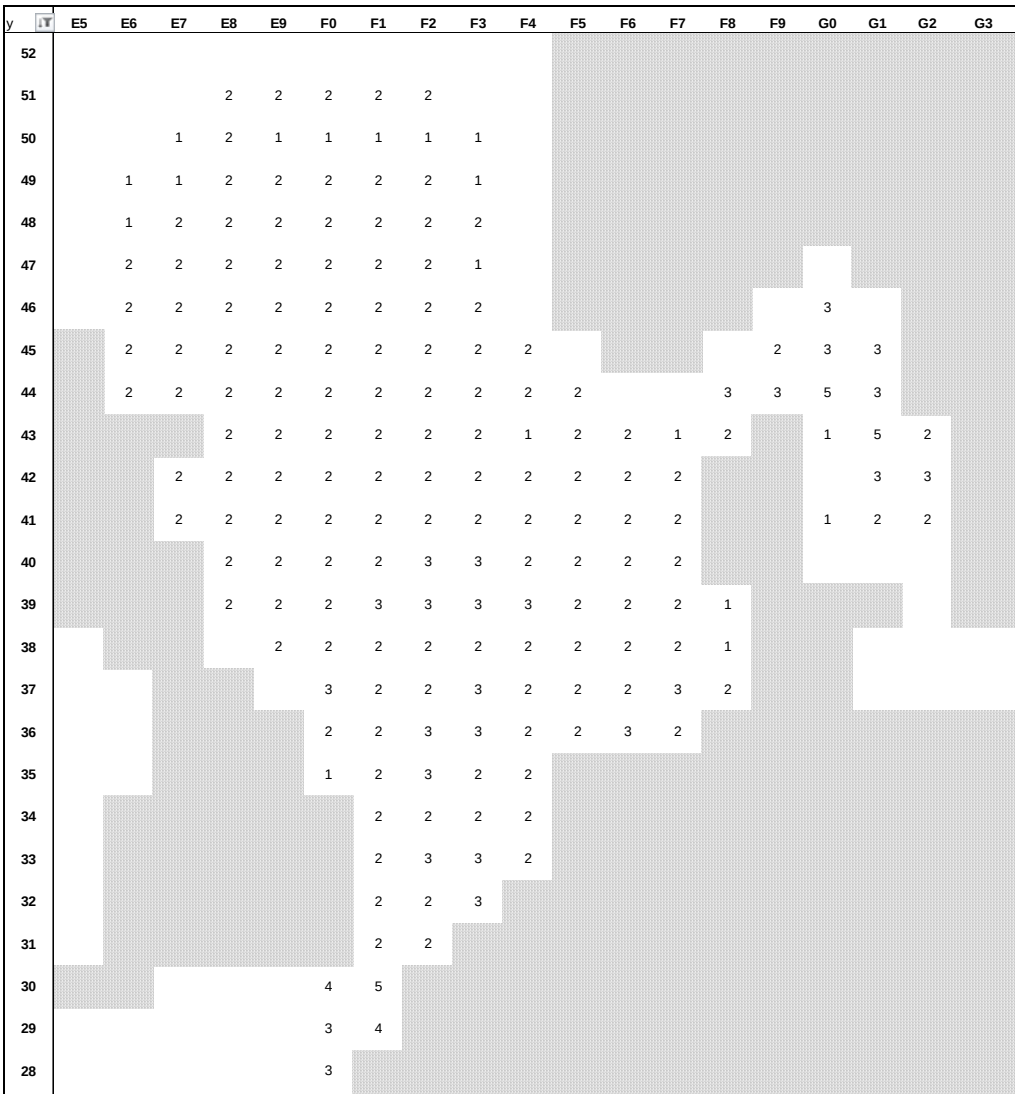
The Swedish research vessel RV Argos which has participated in IBTS Q1 since the beginning of the survey has not been available since 2010 Q3 and is now scrapped. During the 2011 Q1 survey Sweden used a smaller ship, RV Mimer, but this was not a cost-effective alternative and Sweden has since 2011 Q3 contracted RV Dana from Denmark. The current contract runs until the end of 2014.

The full fleet that participated in the quarter 1 survey in 2013 consisted of six vessels: "Dana" (Sweden+ Denmark), "G.O. Sars" (Norway), "Scotia" (Scotland), "Thalassa" (France), "Tridens II" (Netherlands) and "Walther Herwig III" (Germany). The survey covered the period 15 January to 22 February (see Table 5.1.1.1). During a part of the period the weather was harsh, especially in the northern part of the survey area. In two weeks, 25 January to 8 February, the wind reached speeds to 10Bft. This forced multiple vessels to stop their activities. Although in total, 388 GOV and 634 MIK hauls were carried out (see Figure 5.1and Figure 5.2). All rectangles were covered by at least 1 GOV haul and nearly all planned rectangles were covered by at least 1 MIK haul.

Biological data are collected from a large number of species, for most of these species length, weight, sex and maturity and age material were collected (Table 5.1.1.2). In a small number of cases no age material was collected (see information provided by country).

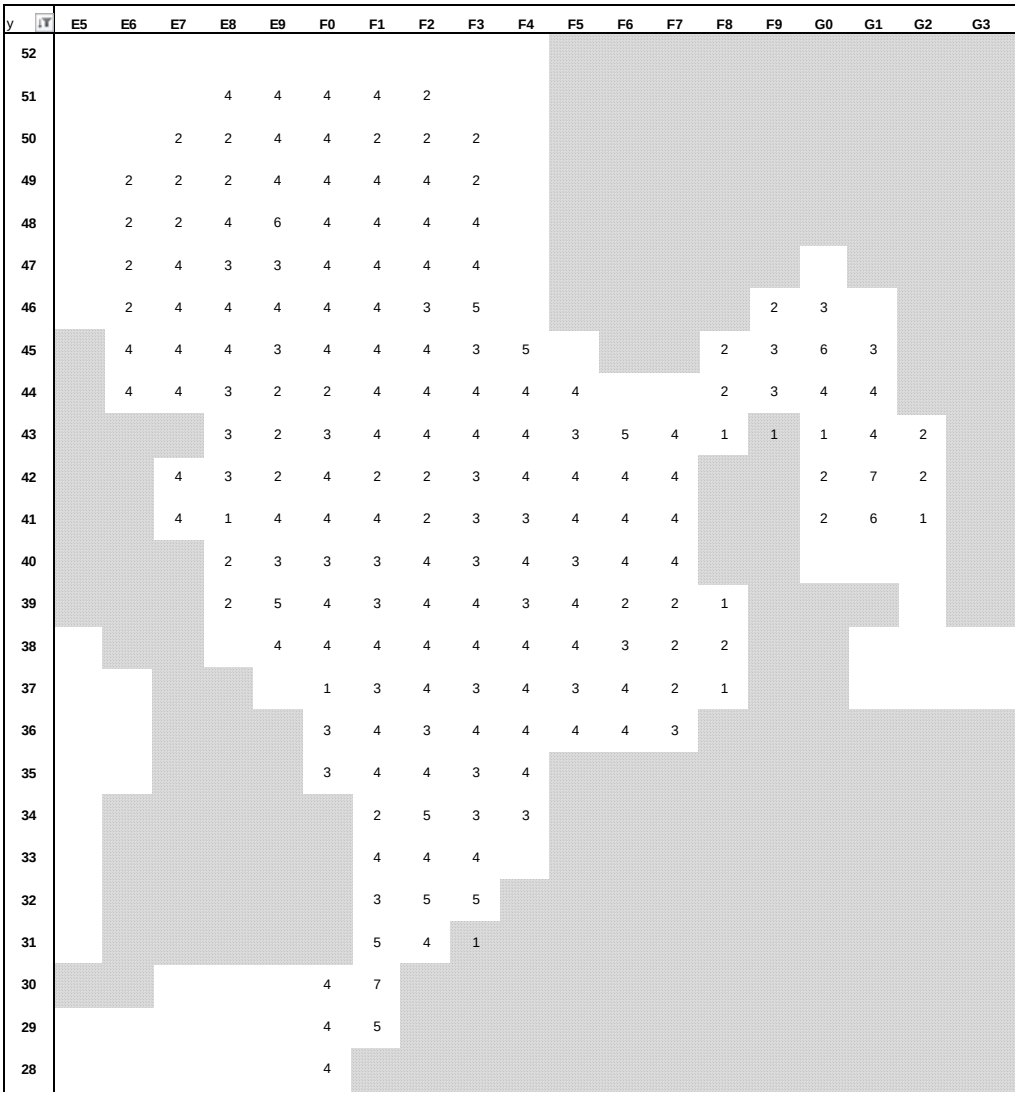
Table 5.1.1.1. Overview of the surveys performed during the North Sea IBTS Q1 survey in 2013.

country	vessel	January																February																		
		15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
French	Thalassa																																							
Sweden	Dana																																							
Germany	Walter Herwig 3																																							
The Netherlands	Tridens 2																																							
Norway	G.O. Sars																																							
Scotland	Scotia III																																							
Denmark	Dana																																							



y	E5	E6	E7	E8	E9	F0	F1	F2	F3	F4	F5	F6	F7	F8	F9	G0	G1	G2	G3
52																			
51				2	2	2	2	2											
50			1	2	1	1	1	1	1										
49		1	1	2	2	2	2	2	1										
48		1	2	2	2	2	2	2	2										
47		2	2	2	2	2	2	2	1										
46		2	2	2	2	2	2	2	2							3			
45		2	2	2	2	2	2	2	2	2					2	3	3		
44		2	2	2	2	2	2	2	2	2	2			3	3	5	3		
43				2	2	2	2	2	2	1	2	2	1	2		1	5	2	
42			2	2	2	2	2	2	2	2	2	2	2				3	3	
41			2	2	2	2	2	2	2	2	2	2	2			1	2	2	
40				2	2	2	2	3	3	2	2	2	2						
39				2	2	2	3	3	3	3	2	2	2	1					
38					2	2	2	2	2	2	2	2	2	1					
37						3	2	2	3	2	2	2	3	2					
36						2	2	3	3	2	2	3	2						
35						1	2	3	2	2									
34							2	2	2	2									
33							2	3	3	2									
32							2	2	3										
31							2	2											
30						4	5												
29						3	4												
28						3													

Figure 5.1. Number of hauls per ICES-rectangle with GOV during the North Sea IBTS Q1 2013.



y	E5	E6	E7	E8	E9	F0	F1	F2	F3	F4	F5	F6	F7	F8	F9	G0	G1	G2	G3
52																			
51				4	4	4	4	2											
50			2	2	4	4	2	2	2										
49		2	2	2	4	4	4	4	2										
48		2	2	4	6	4	4	4	4										
47		2	4	3	3	4	4	4	4										
46		2	4	4	4	4	4	3	5						2	3			
45		4	4	4	3	4	4	4	3	5				2	3	6	3		
44		4	4	3	2	2	4	4	4	4	4			2	3	4	4		
43				3	2	3	4	4	4	4	3	5	4	1	1	1	4	2	
42			4	3	2	4	2	2	3	4	4	4	4			2	7	2	
41			4	1	4	4	4	2	3	3	4	4	4			2	6	1	
40				2	3	3	3	4	3	4	3	4	4						
39				2	5	4	3	4	4	3	4	2	2	1					
38					4	4	4	4	4	4	4	3	2	2					
37						1	3	4	3	4	3	4	2	1					
36						3	4	3	4	4	4	4	3						
35						3	4	4	3	4									
34							2	5	3	3									
33							4	4	4										
32							3	5	5										
31							5	4	1										
30						4	7												
29						4	5												
28						4													

Figure 5.2. Number of hauls per ICES-rectangle with MIK during the North Sea IBTS Q1 2013.

Table 5.1.1.2. Overview of biological samples collected during the North Sea IBTS Q1 survey in 2013.

Species	GER	NOR	SCO	DEN	NETH	SWE	FRA	Total
Clupea harengus	857	568	401	791	443	1593	488	5141
Merlangius merlangus	831	422	892	469	853	444	1018	4929
Melanogrammus aeglefinus	833	533	1219	235		303	164	3287
Pleuronectes platessa	334	38		566	342	625	934	2839
Sprattus sprattus	340		154	573	399	602	256	2324
Gadus morhua	225	207	421	111	94	714	118	1890
Trisopterus esmarkii	334	106	451	104	123	147	54	1319
Pollachius virens	209	427	362	27		155		1180
Merluccius merluccius	181	390	151	38	5	243		1008
Limanda limanda					19		500	519
Eutrigla gurnardus		397				24		421
Scomber scombrus	141	25	78	6	61			311
Microstomus kitt	126	4		169				299
Chelidonichthys cuculus	83		96				112	291
Glyptocephalus cynoglossus		11		7		160		178
Platichthys flesus					21		93	114
Solea solea					11	39	27	77
Alosa fallax					48			48
Leucoraja naevus			43					43
Dicentrarchus labrax							34	34
Raja montagui			27					27
Scopthalmus maximus	2			3	9		7	21
Buglossidium luteum				2	17			19
Lophius piscatorius	10	4		3				17
Amblyraja radiata			15					15
Mullus surmuletus							7	7
Zeus faber	5		2					7
Chelidonichthys lucerna							5	5
Dipturus batis cf. intermedia[1]			5					5
Hippoglossoides platessoides		4						4
Leucoraja fullonica			4					4
Micromesistius poutassou		2						2
Dipturus batis[1]			2					2
Lophius budegassa				1				1
Hippoglossus hippoglossus		1						1

[1]) "*Dipturus batis*" is the currently accepted name listed in the WoRMS list. During previous years, taxonomists have discussed whether the larger form should be separated into another species, *Dipturus intermedia*, in which case the smaller one would be called *D. flossada*. Currently, there are intentions to keep "*D. batis*" for the smaller (*flossada*) form only, while the larger could be called "*D. intermedia*".

We therefore used the following nomenclature within this report:

-"*Dipturus batis*" for any definite "*flossada*" form

-"*Dipturus batis cf. intermedia*" for the larger form

-"*Dipturus batis*-complex" in case of any doubt.

Note that at present, different versions exist in DATRAS databases, see Section 7.4.

5.1.2 Survey summaries by country

5.1.2.1 Denmark – North Sea Quarter 1 IBTS

Nation:	Denmark	Vessel:	RV Dana
Survey:	02/13	Dates:	1 – 18 February 2013

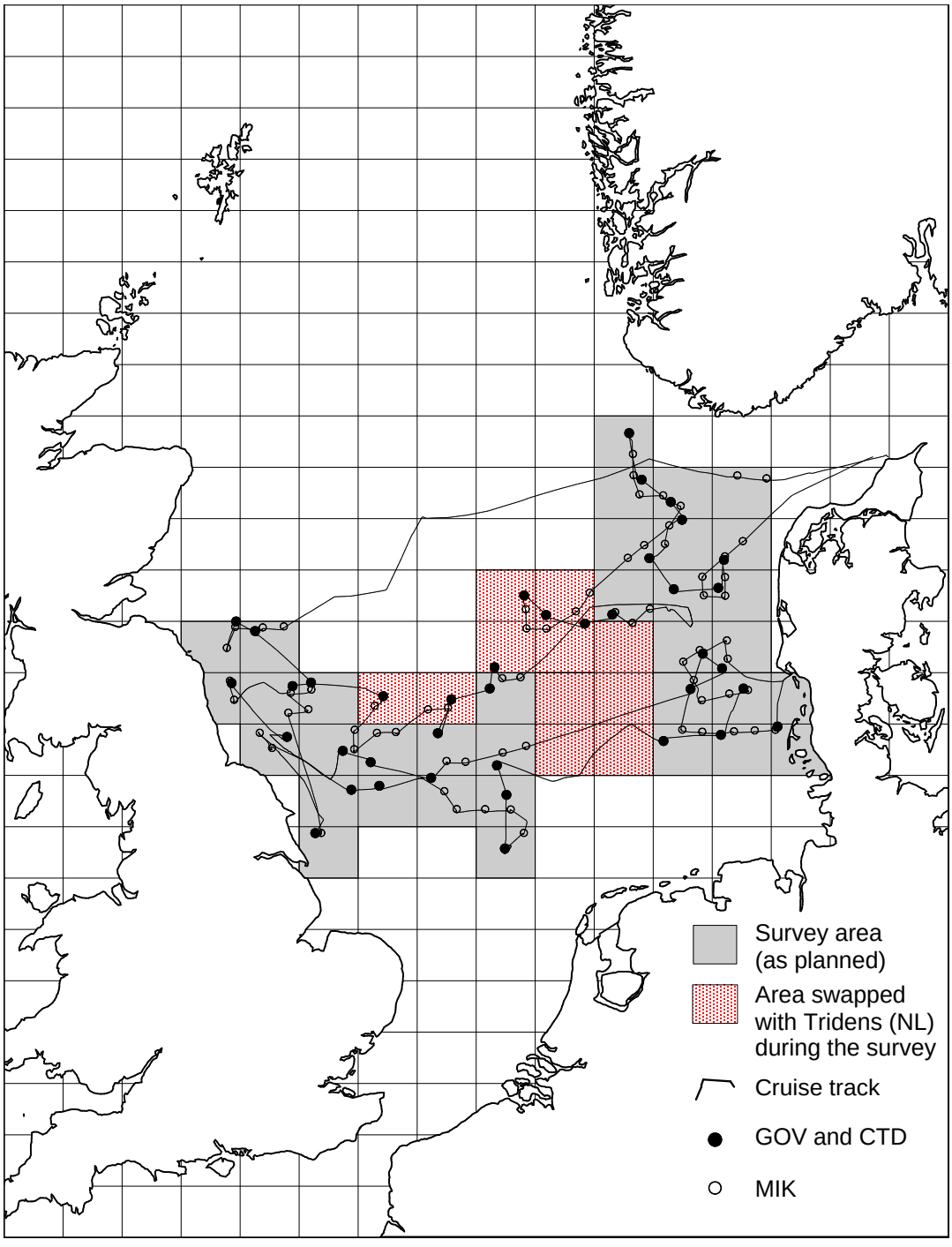
Cruise	The IBTS North Sea Q1survey aims to collect data on the distribution, relative abundance and biological information on a range of fish species in ICES area IIIa and IV. CTD was deployed at each trawl station to collect temperature and salinity profiles. Age and maturity data were collected for cod, haddock, whiting, saithe, Norway pout, hake, herring, mackerel, sprat, plaice, turbot, witch flounder, lemon sole, sole and monkfish. Sampling for herring larvae is carried out during night-time.
Gear details:	The bottom trawl used was the GOV 36/47 rigged with groundgear A on all stations and the Exocet kite. SCANMAR sensors for net opening and door spread were used in all hauls. Herring larvae were sampled with a MIK-net (Midwater ringnet with a diameter of 2 m).
Notes from survey (e.g. problems, additional work etc.):	The cruise plan was not fully fulfilled as planned due to adverse weather conditions. Some rectangles were swapped with Tridens, and 39 out of the planned 40 GOV stations but only 72 from the 80 stations planned were conducted. In several cases, the recommendation that the MIK hauls should be at least 5 nm inside the statistical rectangles was not followed in favour to conduct as many tows as possible with a minimum distance of 10 nm in the available time. The small fine-meshed ringnet was not used during the survey. Due to the small number of deck crew it is impossible to handle the MIK-net with the extra fine-meshed ring. Marine litter from the trawl catches was sorted according to the IBTS template, and stomachs of grey gurnard and hake were collected.
Number of fish species recorded and notes on any rare species or unusual catches:	About 70 species of fish and shellfish were recorded during the survey.

Stations fished

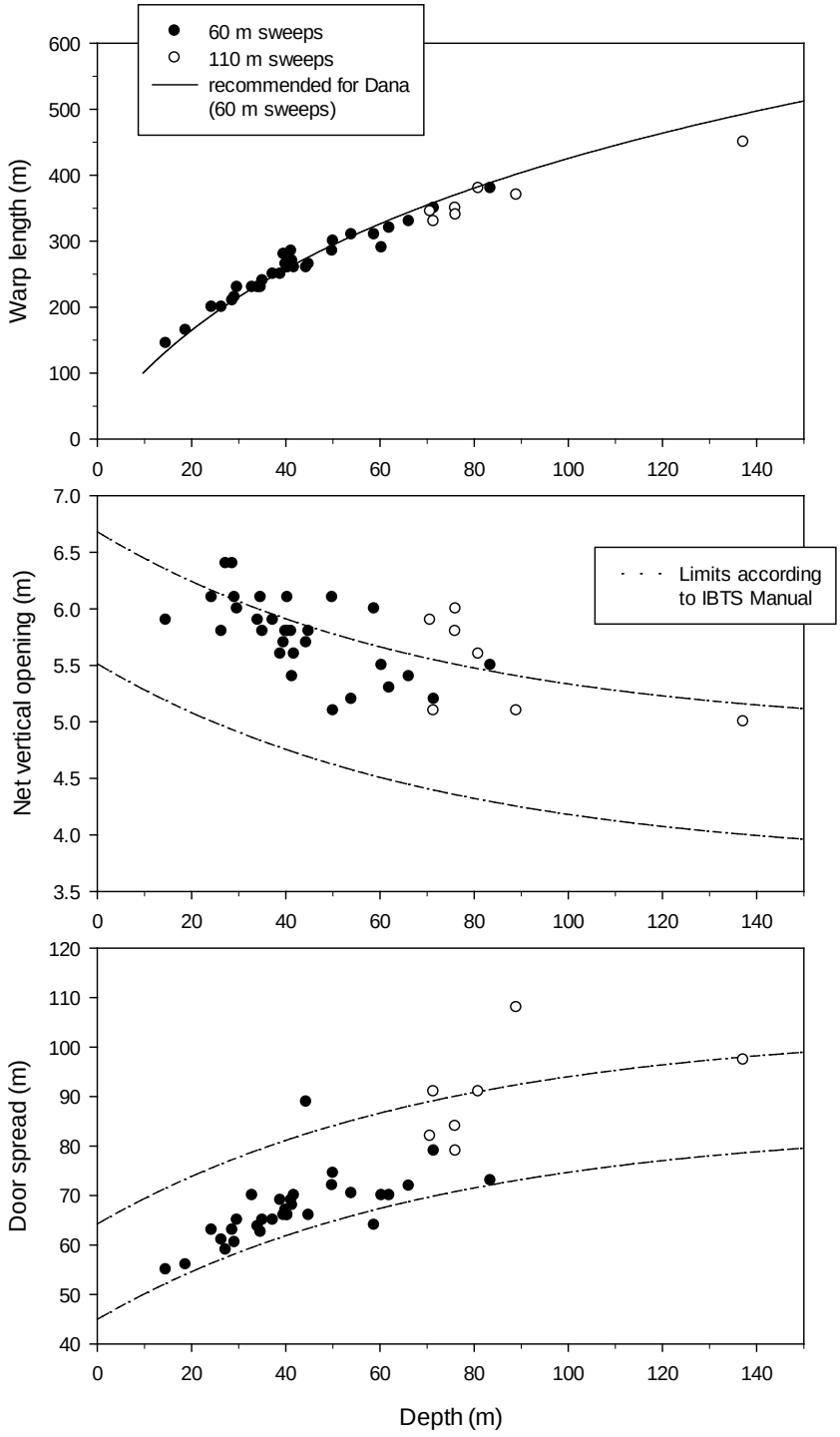
ICES Divisions	Strata	Gear	Tows planned	Valid	Additional	Invalid	% stations fished	comments
IV	N/A	GOV-A	40	39	0	1	100	
		MIK	80	72	0	-	90	

Number of biological samples (individual length, weight, maturity and age)

Species	Age	Species	Age
Clupea harengus	791	*Scomber scombrus*	6
Gadus morhua	111	*Merluccius merluccius*	38
Melanogrammus aeglefinus	235	*Lophius piscatorius*	3
Merlangius merlangus	469	*Lophius budegassa*	1
Pollachius virens	27	*Scopthalmus maximus*	3
Sprattus sprattus	573	*Glyptocephalus cynoglossus*	7
Trisopterus esmarkii	104	*Microstomus kitt*	169
Pleuronectes platessa	566	*Solea solea*	2



Cruise track and sampling locations for Dana during the Q1 IBTS 2013 (Denmark).



Performance of the GOV trawl, Dana Q1 IBTS 2013 (Denmark).

Actions:

- Following this Danish initiative to produce graphs on gear geometry relationships, it is suggested to all countries to include such graphs accordingly and IBTSWG decided to create a template or software routine for this.

5.1.2.2 France – North Sea Quarter 1 IBTS (IBTS1Q – FRA)

Nation:	France	Vessel:	Thalassa
Survey:	IBTS13	Dates:	15 January – 14 February 2013

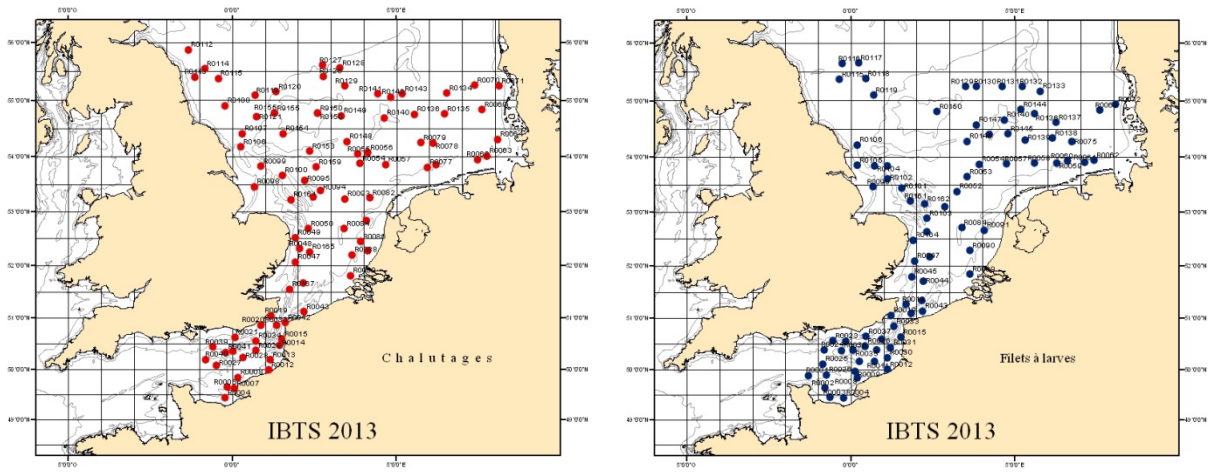
Cruise	Participation to the North Sea IBTS Q1 survey. France sampled the southern part of the North Sea and the Eastern English Channel. Sampling for herring larvae (MIK) were carried out during night-time. CTD was deployed at each trawl station and each MIK stations to collect temperature and salinity profiles. Age data were collected for 16 species.
Gear details:	The gear used is the IBTS standard GOV 36/47 with groundgear A, Exocet kite and with Marpor sensors to record doors, wings and vertical openning parameters. For larvae the standard MIK net is used.
Notes from survey (e.g. problems, additional work etc.):	The Thalassa left Brest (France) the 15th of January. On the way, outside the IBTS area, there were 6 GOVs and 10 MIKs in the Western Channel (Bay of Seine and off English coast). At each station, hydrological measurements were made. The Eastern Channel (area 10) was covered first with 14 GOV hauls and 14 MIK stations. In the North Sea, 66 GOV hauls and 59 MIK stations were carried in the areas south of 56°30N. At each trawl and MIK net station, a CTD was deployed Additional works: • The Wishin8 was put up the MIK ring (eggs samples) • The CUFES device (Continuous Underwater Fish Egg Sampler) was used during all the survey (day and night) in the English Channel and the North Sea and 548 samples were collected. • Samples for zoo and phytoplankton were collected • Acoustic data were recorded (Echosounder ER60 and multibeam echosounder) • Observers for mammals and birds have collected information during the 10 days in the English Channel and Southern North Sea. Problem encountered : A MIK net damaged at the beginning of the survey.
Number of fish species recorded and notes on any rare species or unusual catches:	85 different species were recorded. Shellfish were also measured and benthic fauna identified at each hauls.

Stations fished

ICES Divisions	Strata	Gear	Tows planned	Valid	Additional	Invalid	% stations fished	comments
VIId	ICES squares	GOV	10	14	4	1	100%	
VIId		MIK	10	14	4	0	100%	
IVb,c		GOV	58	66	8	2	100%	
IVb,c		MIK	110	59	0	0	55%	
	TOTAL (GOV/MIK)		68/120	80/73	12/4	3/0		

Number of biological samples (individual length, weight, maturity and age)

Species	Age	Species	Age
Merlangus merlangius	1 018	*Platichtys flesus*	93
Pleuronnectes platessa	934	*Trisopterus esmarkii*	54
Limanda limanda	500	*Dicentrarchus labrax*	34
Clupea harengus	488	*Solea solea*	27
Sprattus sprattus	256	*Scophtalmus maximus*	7
Melanogrammus aeglefinus	164	*Mullus surmuletus*	7
Gadus morhua	118	*Chelidonichthys lucerna*	5
Chelidonichthys cuculus	112		



Thalassa GOV hauls (left) and MIK hauls (right) IBTS 2013-Q1.

5.1.2.3 Germany – North Sea Quarter 1 IBTS (IBTS1Q – GER)

Nation:	Germany	Vessel:	Walther Herwig III
Survey:	362	Dates:	21 January – 22 February 2013

Cruise	North Sea IBTS Q1 survey aims to collect data on the distribution, relative abundance and biological information of bottom fish in ICES Subareas IVa, b and c. The primary focus is on the demersal species cod, haddock, whiting, saithe, and Norway pout and the pelagic species herring, sprat and mackerel. Abundance and size spectra of all fish species caught are recorded.
Gear details:	IBTS standard GOV 36/47 with groundgear A (standard); SCANMAR sensors for door and wing spread and vertical net opening.
Notes from survey (e.g. problems, additional work etc.):	Of the planned 77 stations for the IBTS Q1 survey, 65 were fished (11 rectangles not fished due to prevailing rough weather, 1 rectangle with invalid tow). The GOV in the standard version was used and 65 accompanying depth profiles of temperature and salinity were obtained with a CTD combined with a water sampler for nutrient samples. MIK hauls were done with a small fine-meshed ringnet (designed for the collection of fish eggs) attached to the main MIK.
Number of fish species recorded and notes on any rare species or unusual catches:	Overall, 61 species of fish were recorded during the survey. 1 specimen of the streaked gurnard (*Trigloporus lastoviza*) was caught in 47E8 east of the Orkney Islands.

Stations fished (aims: to complete 77 valid tows per year). Strat: strata; Add: Additional tows; inv: Invalid

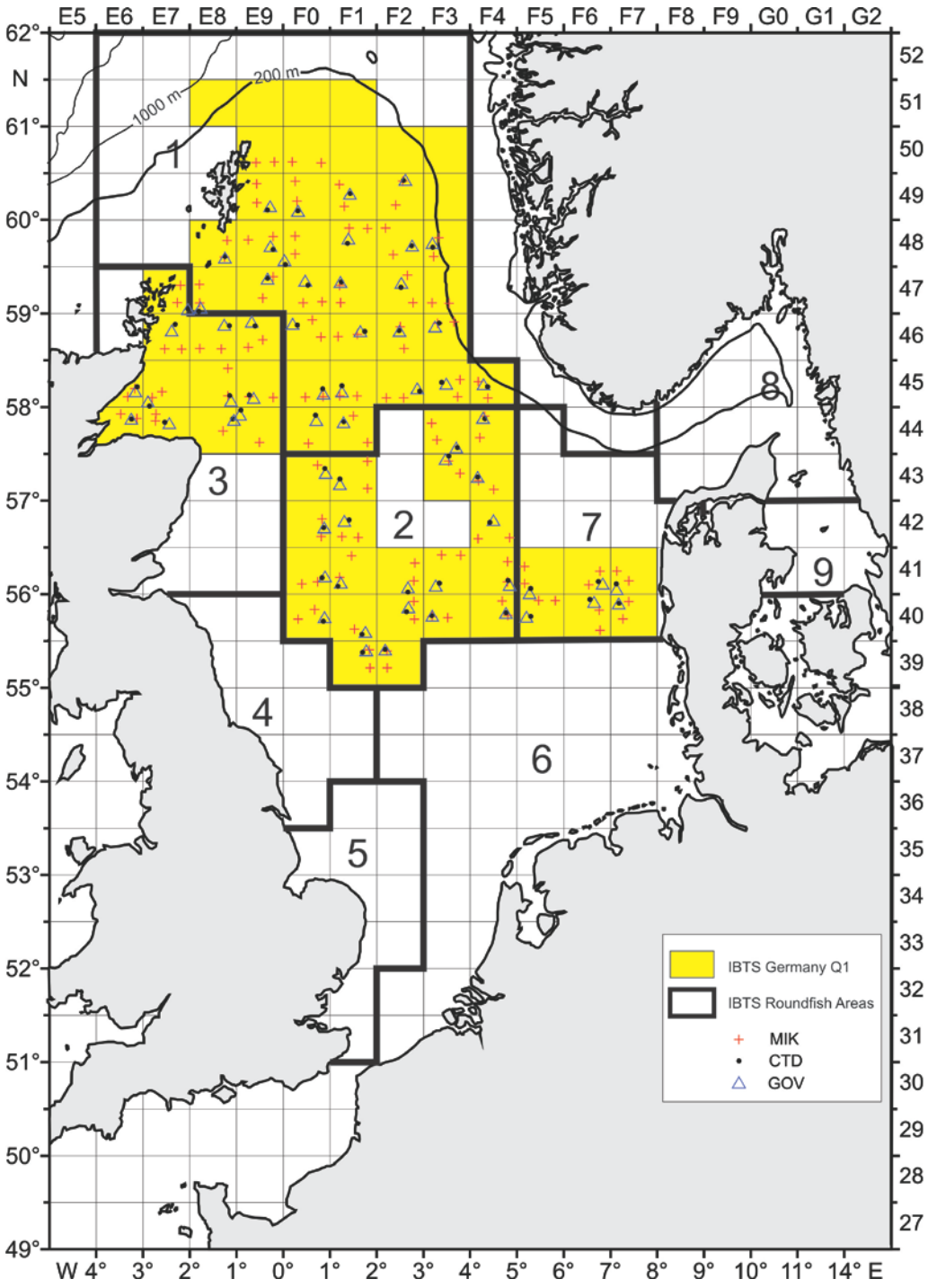
ICES Divisions	Strat.	Gear	Towsplanned	Valid	Add.	Inv.	% stations fished	comments
IV	N/A	Std. GOV	77	65	0	1	84%	
IV	N/A	MIK	154	131	0	0	85%	

Number of biological samples (maturity and age material)

Species	Age	Species	Age
Chelidonichthys cuculus	83	*Pleuronectes platessa*	334
Clupea harengus	857	*Pollachius virens*	209
Gadus morhua	225	* *Psetta maxima*	2
* *Lophius piscatorius*	10	*Scomber scombrus*	141
Melanogrammus aeglefinus	833	*Sprattus sprattus*	340
Merlangius merlangus	831	*Trisopterus ermarki*	334
** *Merluccius merluccius*	181	*Zeus faber*	5
* *Microstomus kitt*	126		

*** Maturity only.**

**** Otoliths taken but age readings not conducted yet.**



Stations of Walther Herwig III (cruise 362) during the Q1 IBTS 2013.

5.1.2.4 Netherlands – North Sea Quarter 1 IBTS (IBTS1Q – NED)

Nation:	The netherlands	Vessel:	RV Tridens II
Survey:	01/13-02/13	Dates:	21 January – 21 February 2013

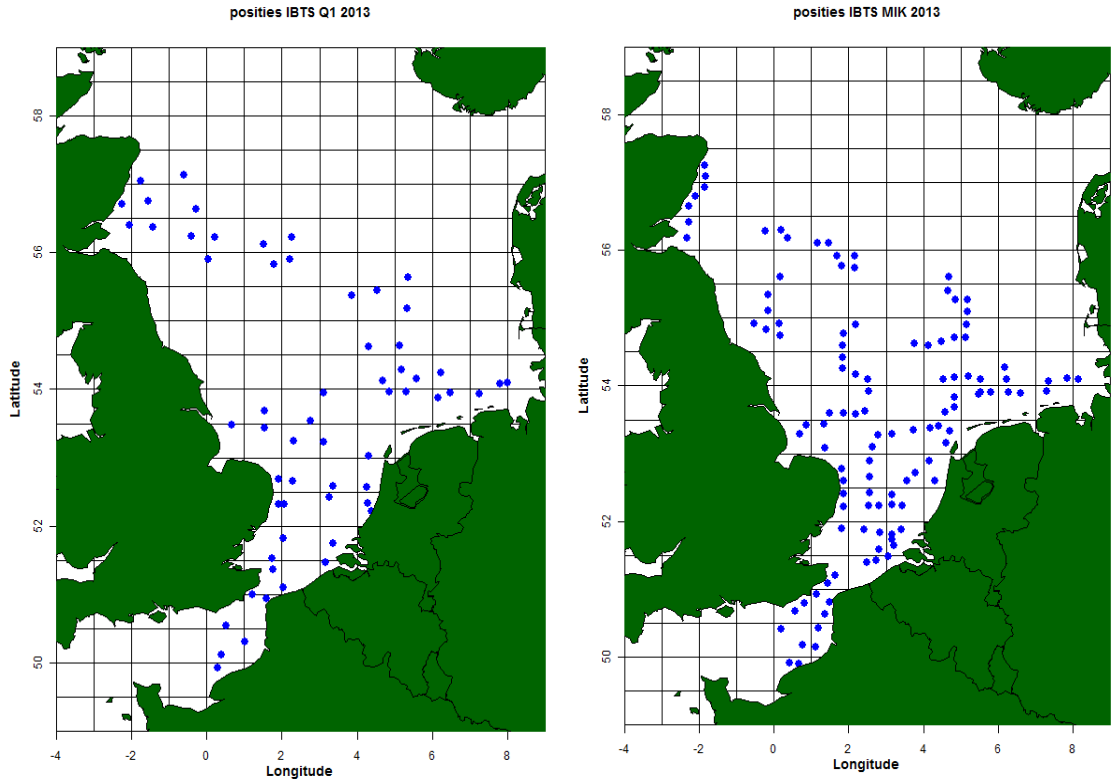
Cruise	The IBTS North Sea Q1survey aims to collect data on the distribution, relative abundance and biological information on a range of fish species in ICES area IIIa, IV and VII. CTD was deployed at each trawl station to collect temperature and salinity profiles. Age and maturity data were collected for cod, haddock, whiting, Norway pout, hake, herring, mackerel, sprat, plaice, flounder, sole and twait shad. Sampling for herring larvae is carried out during night-time.
Gear details:	The bottom trawl used was the GOV 36/47 rigged with groundgear A on all stations. MARPORT sensors for net opening and door spread were used in all hauls. Herring larvae were sampled with a MIK-net (Midwater ringnet with a diameter of 2 m).
Notes from survey (e.g. problems, additional work etc.):	The cruise plan was fully fulfilled, however not completely as planned due to adverse weather conditions. Some rectangles were swapped with DANA, but 6 more hauls than the 54 planned GOV stations were done, and 120 compared to the 108 stations planned were conducted. • Marine litter from the trawl catches was sorted intensive • All MIK hauls were done with a small fine-meshed ringnet (designed for the collection of fish eggs) attached to the main MIK. • At the same locations as the MIK hauls of the fourth week of the survey, in the Channel and southern North Sea, GulfVII samples were collected. • During the first and the fourth week water samples were collected at most MIK stations. • 15 rays and 77 sharks were tagged • Stomachs of grey gurnard and mackerel were collected (DG mare project). • Sepiola/Sepietta were collected for Naturalis. • Fin clips from flounder and various skates and sharks were collected Problems: In the second week one of the MIK nets was torn apart, and the reserve net was ripped of the ring. The first net could be repaired and the Scottish were so kind to help us and lend us one of their spare nets (which we haven't used at the end). The MARPORT system is still very unstable. To improve the output various locations in the net were tried. The best seemed to be when it was tightly tied in a hole made in the upper part of the net just behind the headline. It was further stabilized with a cable attached to a separate winch on deck. The output on door spread seems reasonable on most occasions; the data on net-opening should not be trusted.
Number of fish species recorded and notes on any rare species or unusual catches:	About 76 species of fish and 66 other species were recorded during the survey.

Stations fished

ICES Divisions	Strata	Gear	Tows planned	Valid	Additional	Invalid	% stations fished	comments
IV	N/A	GOV-A	49	49	4	2	108	
		MIK	98	98	9	1	109	
VIId	N/A	GOV-A	5	5	1	-	120	
		MIK	10	10	1	-	110	

Number of biological samples (individual length, weight, maturity and age)

Species	Age	Species	Age
Clupea harengus	443	*Scomber scombrus*	61
Gadus morhua	94	*Merluccius merluccius*	5
Melanogrammus aeglefinus	269	*Alosa fallax*	48
Merlangius merlangus	853	*Scopthalmus maximus*	9
Platichthys flesus	21	*Buglossidium luteum*	17
Sprattus sprattus	399	*Limanda limanda*	19
Trisopterus esmarkii	123	*Solea solea*	11
Pleuronectes platessa	342		



GOV trawls (left) and MIK-hauls (right) carried out on "Tridens II" during the Q1 IBTS 2013.

5.1.2.5 Norway – North Sea Quarter 1 IBTS (IBTS1Q – NOR)

Nation:	Norway	Vessel:	G.O. Sars
Survey:	2013101	Dates:	23 January – 22 February 2013

Cruise	The IBTS Q1 aims to collect data on the distribution and relative abundance and biological information of commercial fish in the north and central North Sea. The primary species sampled were herring, saithe, cod, haddock, whiting, mackerel, Norway pout, hake, sole, witch flounder, grey gurnard, and plaice. MIKs were used to sample larvae (herring, sprat) and MIK-Ms for fish eggs. During the cruise, an hydrographic transect (Utsira, Norway – Start Point, UK) collected data on hydrography, nutrients, plankton, and herring larvae.
Gear details:	The trawl used was an IBTS standard GOV 36/47 with groundgear A, the Exocet kite, and SCANMAR sensors. The sensors logged door distance, depth and angle, headline height and all trawl-eye data. Sensors were used throughout the cruise to monitor net parameters and performance.
Notes from survey (e.g. problems, additional work etc.):	All areas were covered (40 bottom trawls, 80 MIKs). An additional 5 bottom trawls and 8 MIKS were picked up in the northern areas (61E8-F2). Two, not four, MIKs were taken in area 61F2 because there is very little area where water depth ≤ 200; there would have been no temporal and/or spatial resolution in the samples. In One invalid tow (gear came fast and tore belly of net). This tow was redone, so the ICES rectangle was completed. Two tows were coded quality = 3; catch appeared representative of area, but headline height was low and catch was reduced compared to echogram. CTD casts, recording temperature and salinity, were made at most stations (weather permitting). There are no CTDs for the first 3 stations; they were accidentally omitted from the bridge plan. One hydrographical transect (Utsira-Start Point) was completed. Seabird counts by JNCC were limited due to bad weather conditions. *ICES special requests*. Stomachs were collected for grey gurnard and hake; whole mackerel were frozen for stomachs. This was a large data request (sampled 5 stomachs from 5-cm length intervals from each tow), required extra staffing, and was a large cost to the project. Unless personnel from the requesting institute joined the survey, such requests may not be met in future due to budget constraints. Marine litter was recorded. Thirty-nine Sepiolidae were collected. *Additional requests*. Twenty stomachs collected from saithe (Ifremer). IMR: total length, head length, and headless lengths from 8 commercial species, max 100 measurements per species; gill tissue samples from 100 saithe from the spawning area; fin clip samples (5 per fish) from 15 species. Benthos was recorded and identified to species by the taxonomist on board.
Number of fish species recorded and notes on any rare species or unusual catches:	Rare species: *Walvisteuthis virilis*, found at two stations. Taxonomist was on board and identification is correct. A total of approximately 137 species, including benthos, were recorded; not all benthos could be identified to species. Fifty-six species were measured.

Stations fished.

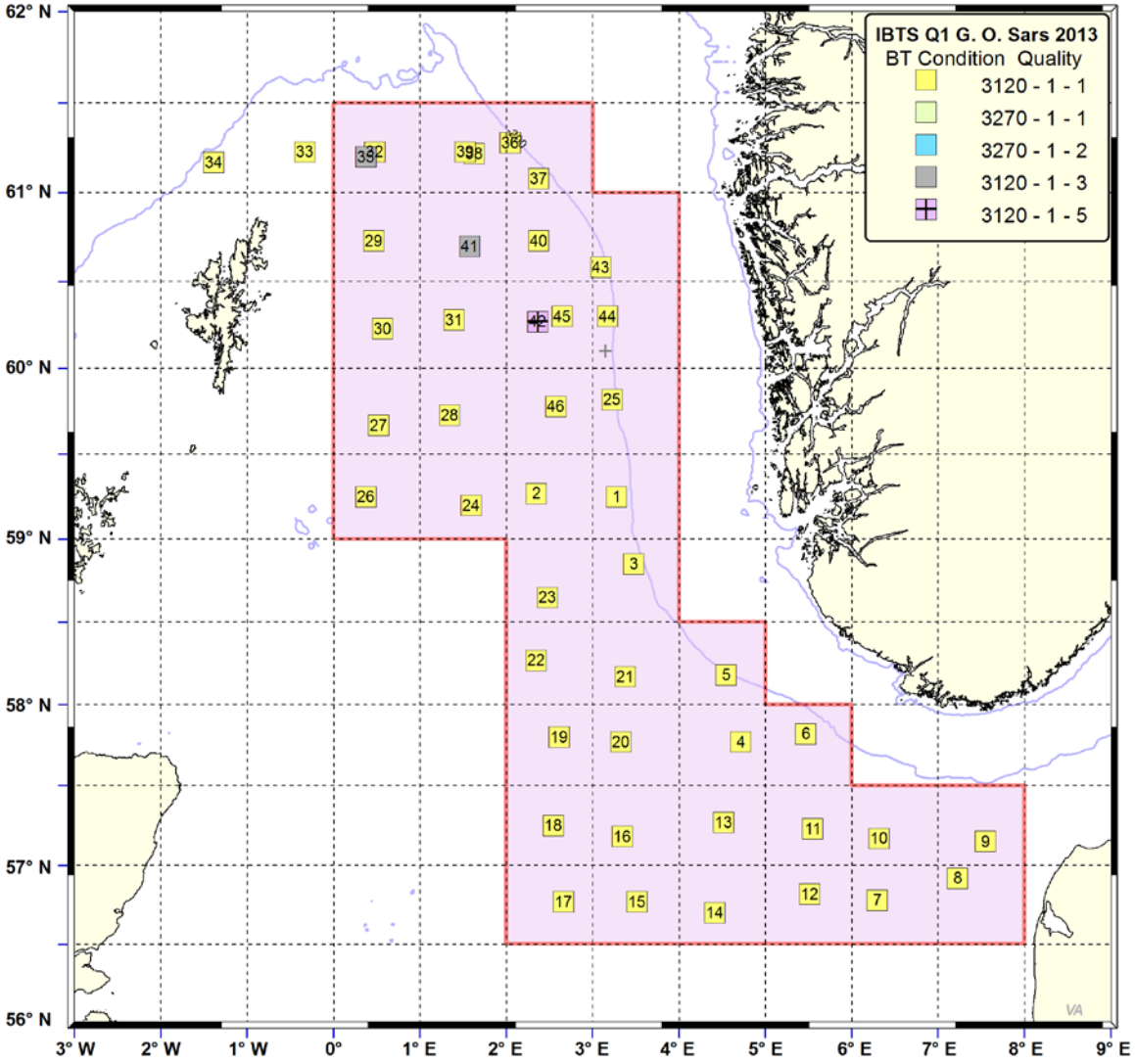
ICES	Div	Strata	Gear	Tows planned	Valid	Additional	Invalid	% stations fished
IV		N/A	GOV	40	45	6	1	112
			MIK	80	88	8	0	110
		TOTAL		40/80	45/88	6/8	1/0	

Special requests.

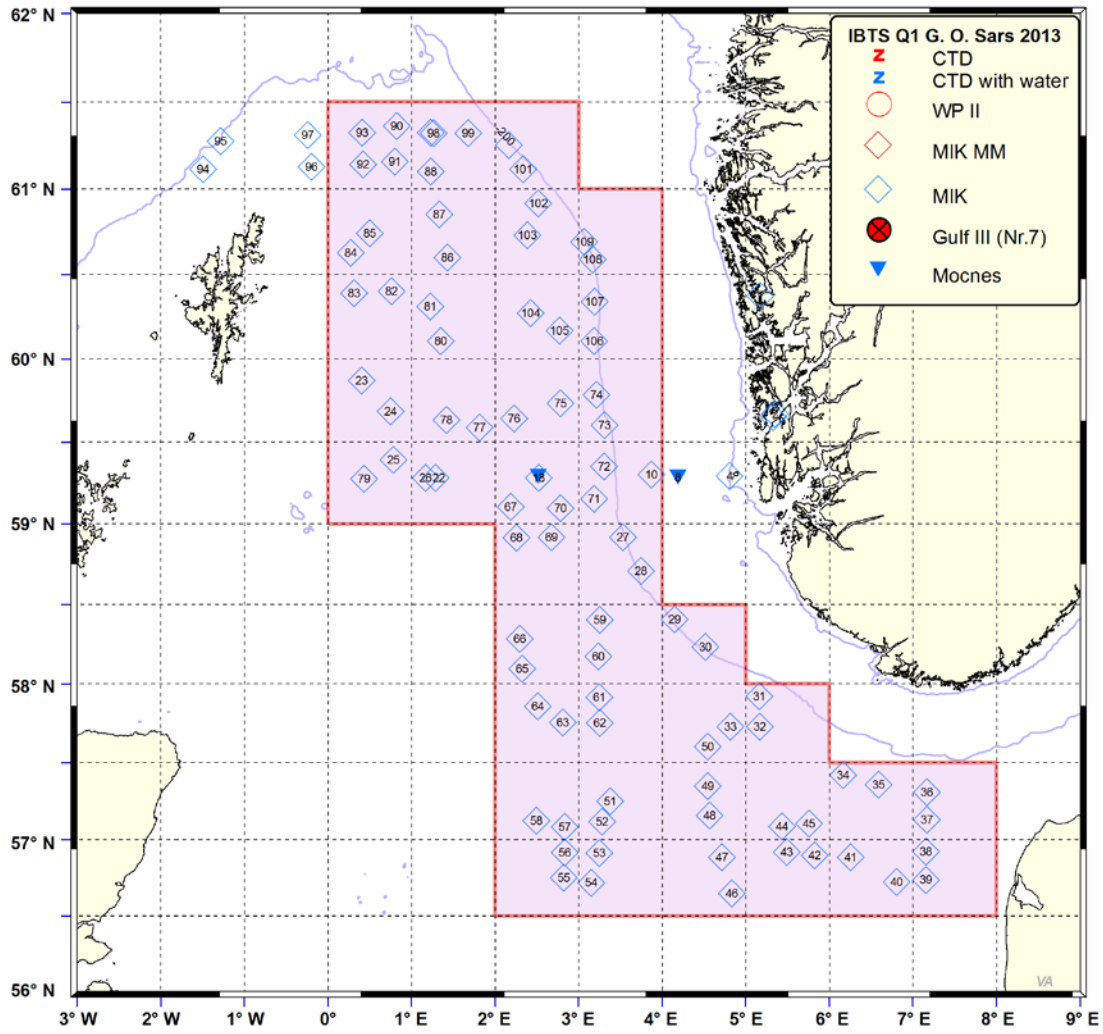
INSTITUTE	SPECIES		NO. STATIONS
EU-DG MARE project	Grey gurnard	Stomachs	32
EU-DG MARE project	Hake	Stomachs	19
EU-DG MARE project	Mackerel	Stomachs	15
NCB Naturalis	Sepiolidae	Identification material	23
Ifremer	Saithe	Stomachs	10
IMR, genetics	Saithe	Genetics	5
IMR, genetics	15 species	Genetics	18
IMR, headless lengths	8 species		22

Number of biological samples collected (maturity and/or aging materials):

SPECIES	NO. SAMPLES	SPECIES	NO. SAMPLES
Lophius piscatorius	4	*Micromesistius poutassou*	2
Eutrigla gurnardus	397	*Scomber scombrus*	25
Merluccius merluccius	390	*Glyptocephalus cynoglossus*	11
Microstomus kitt	4	*Merlangius merlangus*	422
Clupea harengus	568	*Pollachius virens*	427
Gadus morhua	207	*Trisopterus esmarkii*	106
Melanogrammus aeglefinus	533	*Pleuronectes platessa*	38
Hippoglossus hippoglossus	1	*Hippoglossoides platessoides*	4



Trawl stations during IBTS 2013 Q1. Bottom trawl is the GOV 36/47 with the Exocet kite. Two stations had tow quality 3 (trawl sensors showed the trawl opening was reduced, most likely due to current) and one quality 5 (tore net, invalid tow). Numbers indicate station number. Contour line indicates 200 m depth.



Position of MIK (open diamond) and MOC (solid triangle) stations; numbers indicate station numbers. Station 89 and 96 were in the same location, but were taken several days apart. Contour line indicates 200 m depth.

5.1.2.6 Sweden – North Sea Quarter 1 IBTS (IBTS1Q – SWE)

Nation:	Sweden	Vessel:	Dana
Survey:	1/13	Dates:	17 January–28 January 2013

Cruise	Q1 North Sea survey aims to collect data on the distribution and relative abundance and biological information of commercial fish in area IIIa and IV. The primary species are cod, haddock, sprat, herring, Norway pout, plaice, sole, hake and saithe. The aim of the MIK- trawl survey is mainly to catch North Sea autumn spawning herring larvae.
Gear details:	IBTS standard GOV 36/47 with groundgear A, Exocet kite with SCANMAR door, bottom contact, trawl eye and headline height sensors. Methot Isaacs–Kidd midwater ringtrawl. Night-time oblique hauls.
Notes from survey (e.g. problems, additional work etc.):	Due to asbestos problems on board RV Argos discovered in 2011, Sweden is currently using RV Dana for their DCF-financed cruises. Sweden undertook the survey using their own trawls and doors and using Dana's sensors. No bottom contact sensor was available. Sweden is using long sweeps when trawling greater depths than 70 m. The trawl was fitted with new sweeps in January 2013. The cruise started in Hirtshals (home port of RV Dana) and the fishing started off the Danish northern shores in good weather. In the afternoon the ship was entertained by a pod of killer whales, an awesome sight for everyone onboard. Mid-cruise there was a short stop in Lysekil to exchange personnel. The cruise ended in Lysekil. On two occasions during the cruise Dana was called to participate in rescue-actions. In total 46 valid hauls were made; 27 in the Skagerrak and 19 in the Kattegat. In the Kattegat we encountered ice approx. 3-5 cm thick in the southeast and performed four hauls under such conditions. Opening and door spread remained stable and the hauls were judged to be valid. Twice we had to reset the trawl, once because the wires crossed during shooting and once because the sensor measuring door spread had to be changed. Hydrographical sampling was carried out with the CTD probe and related probe for oxygen measurement. In total 14.9 tonnes were caught consisting of 65 species of fish, 4 species of cephalopods and 9 species of crustaceans. Biological sampling was undertaken as usual on the target species recommended in the manual including whiting, hake and sole. Biological data were also collected for witch flounder and grey gurnard. Invertebrates and litter were recorded accordingly. Additional tasks performed during the survey: • Herring and cod for radioactivity analysis in Lowestoft, England • Stomach collection on cod, whiting, hake and grey gurnard • Collection of Sepiolidae for Jeroen Goud in the Netherlands • Gonad collection from cod, whiting, haddock and hake for histology
Number of fish	Overall, 65 species of fish were recorded during the survey.

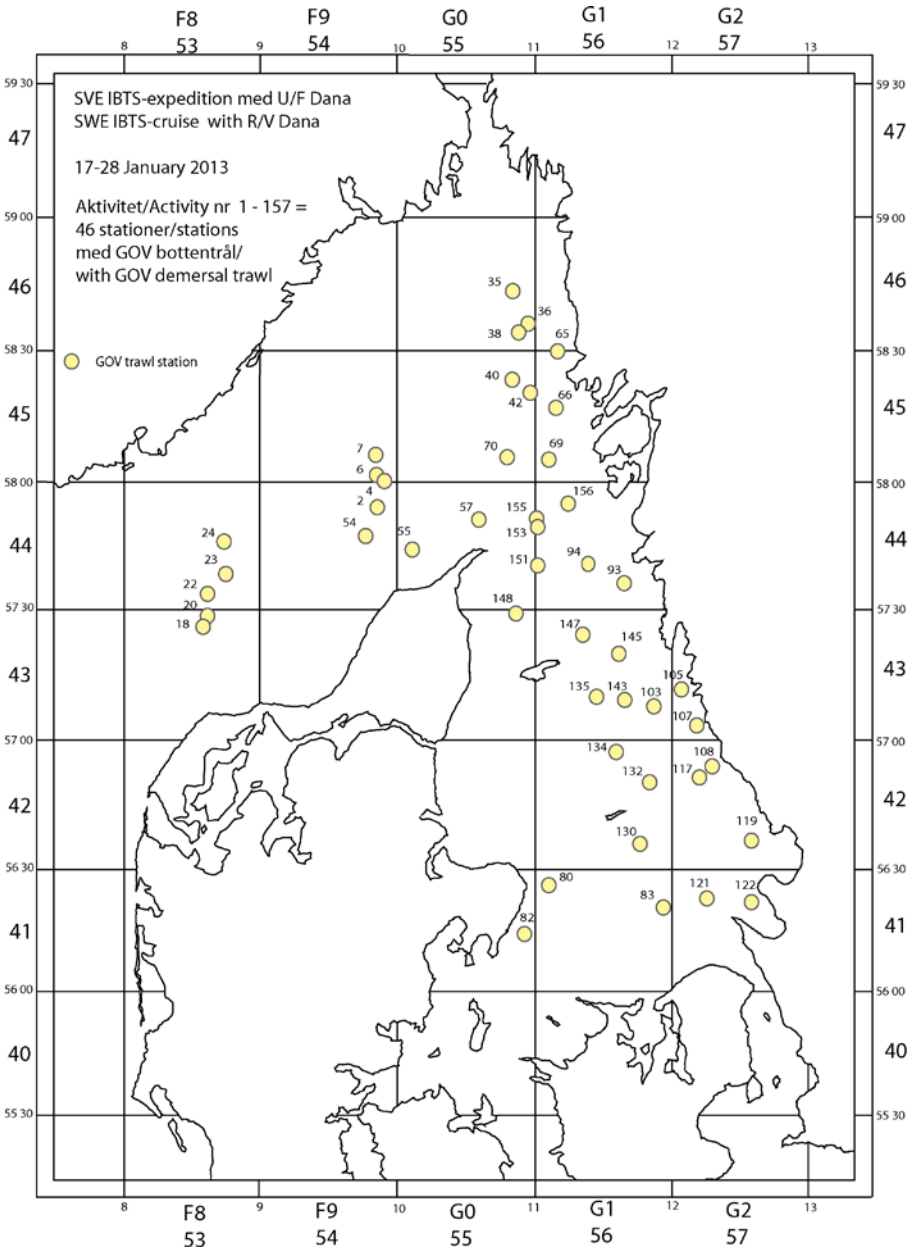
species recorded and notes on any rare species or unusual catches:	The following species which we rarely see were caught on this cruise; *Phycis blennoides* – only 5 specimen caught in Swedish IBTS history *Mustelus asterias* – a rare acquaintance by our standard.

Stations fished (aims: to complete 46 valid tows per year)

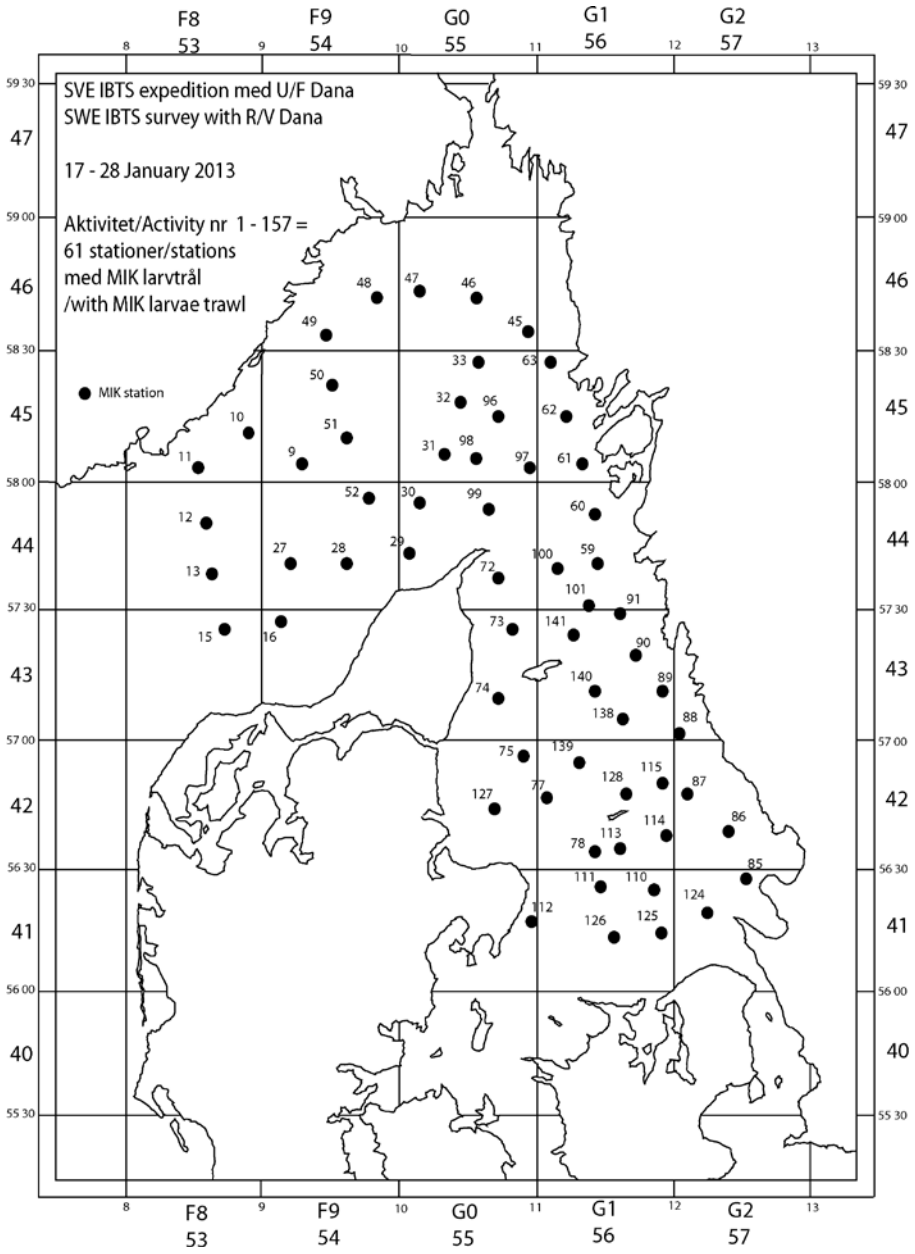
ICES Divisions	Strata	Gear	Tows planned	Valid	Additional	Invalid	% stations fished	comments
IIIa	N/A	GOV	46	46	0	0	100	
IIIa	N/A	MIK	61	61	0	0	100	
		TOTAL	46/61	46/61	0	0	100	

Number of biological samples (individual length, weight, maturity and age)

Species	Age	Species	Age
Clupea harengus	1593	*Sprattus sprattus*	602
Gadus morhua	714	*Trisopterus esmarkii*	147
Melanogrammus aeglefinus	303	*Merluccius merluccius*	243
Solea solea	39	*Glyptocephalus cynoglossus*	160
Merlangus merlangius	444	*Eutrigla gurnardus*	24
Pollachius virens	155	*Pleuronectes platessa*	625



Fished stations with the Dana during the Q1 IBTS - SWE 2013.



MIK stations with the Dana during the Q1 IBTS - SWE 2013.

5.1.2.7 UK (Scotland) – North Sea Quarter 1 IBTS (IBTS1Q – SCO)

Nation:	UK (Scotland)	Vessel:	Scotia
Survey:	0213S (IBTS Quarter 1)	Dates:	25 January – 15 February 2013

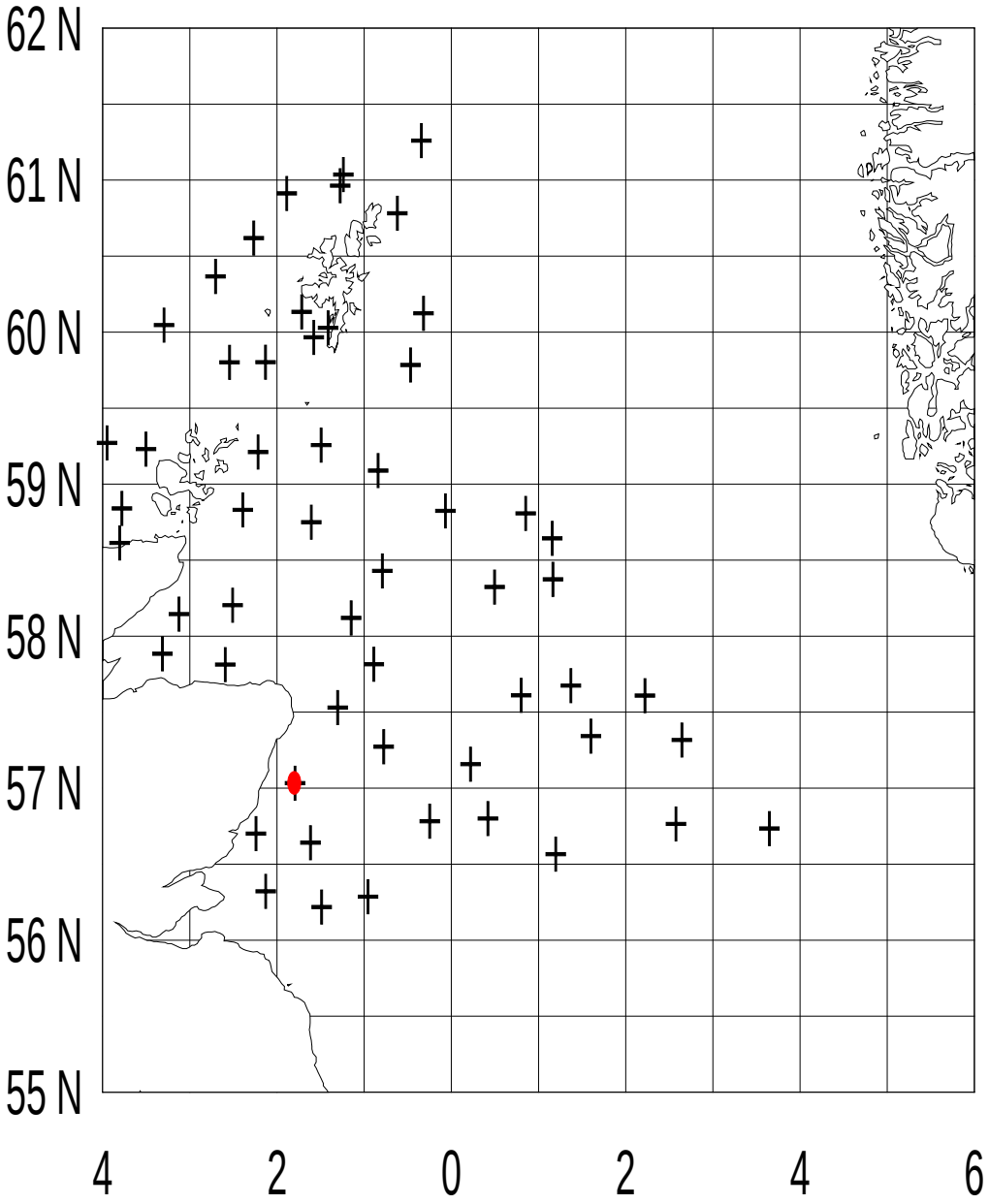
Cruise	Q1 North Sea IBTS survey aims to collect data on the distribution, relative abundance and biological information (in connection with EU Data Directive 1639/2001) on a range of fish species in ICES area IVa and IVb. Age data were collected for cod, haddock, whiting, saithe, Norway pout, herring, mackerel and sprat.
Gear details:	GOV using groundgear B on 3 stations off the northeast coast of Scotland and all stations north of 57 deg 30 min North and groundgear A used on all other stations south of 57deg 30min North. Long sweeps were used in the first 12 tows on this survey. Herring larvae are sampled with a MIK net – mid water ringnet with a diameter of 2mm.
Notes from survey (e.g. problems, additional work etc.):	Weather conditions for the majority of the cruise were generally poor to very poor! Nevertheless Scotia made good progress right up until near the end of the survey when we were forced to dodge and lose one day doe to storm force 10 sea conditions. Ship's thermosalinograph was run continuously throughout the cruise. Temperature, salinity and water samples for nutrient analyses were collected at each station. A total of 56 valid hauls was achieved with all allocated stations covered. A total of 94 valid MIK tows were completed with the intention of 2 being undertaken within each statistical rectangle where fishing events occurred. However, due to the severe weather conditions encountered, only 1 MIK sample was taken in the case of 5 of the statistical rectangles. The remaining rectangles all received 2 MIK sampling events. The small fine-meshed ringnet was not used during the survey. Due to the small number of deck crew it is impossible to handle the MIK-net with the extra fine-meshed ring. SCANMAR and bottom contact sensors were used throughout the cruise to monitor net parameters and performance.
Number of fish species recorded and notes on any rare species or unusual catches:	A total of 90 species were recorded during the survey. Biological data were recorded for a number of species in accordance with the requirements of the EU Data Regulations

Stations fished (aims: to complete 54 valid tows per year)

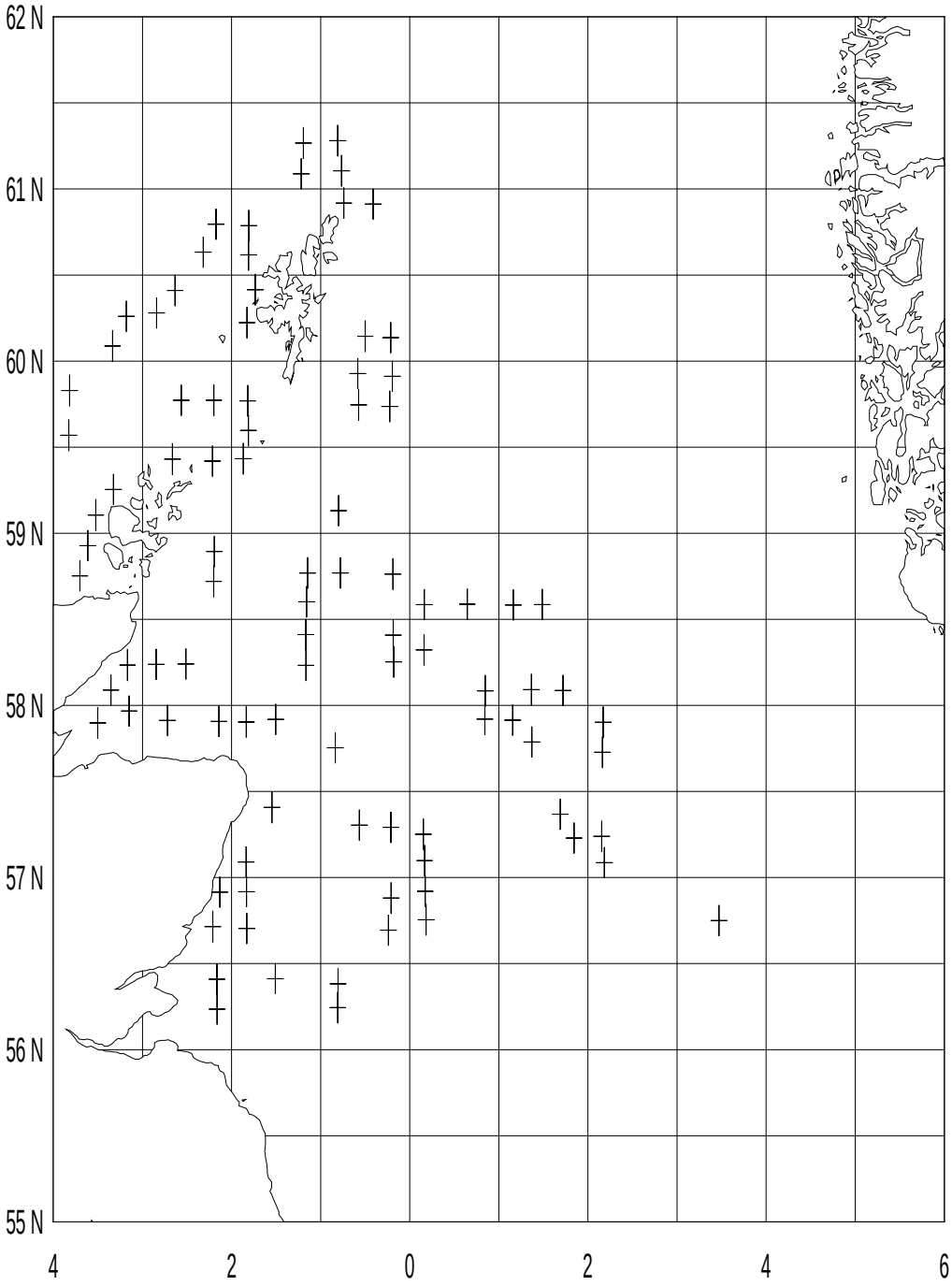
ICES Divisions	Strata	Gear	Tows Planned	Valid	Valid with rock-hopper	Additional	Invalid	% stations fished	comments
IVa		GOV – B	39	41	-	0	0	105	
IVa		GOV - A	0	0		0	0	n/a	
IVb		GOV – A	12	12		0	1	100	
IVb		GOV - B	3	3	-	0	0	100	
	TOTAL		54	56		0	1	102	

Number of biological samples (maturity and age material, *maturity only):

Species	No.	Species	No.
Clupea harengus	401	*Scomber scombrus*	78
Gadus morhua	421	*Trisopterus esmarkii*	451
Melanogrammus aeglefinus	1219	**Merluccius merluccius*	151
Merlangius merlangus	892	*Spattus sprattus*	154
**Chelidonichthys cuculus*	96	*Pollachius virens*	362
**Leucoraja fullonica*	4	**Dipturus batis cf. intermedia*	5
**Leucoraja naevus*	43	**Dipturus batis*	2
**Raja montagui*	27	**Amblyraja radiata*	15



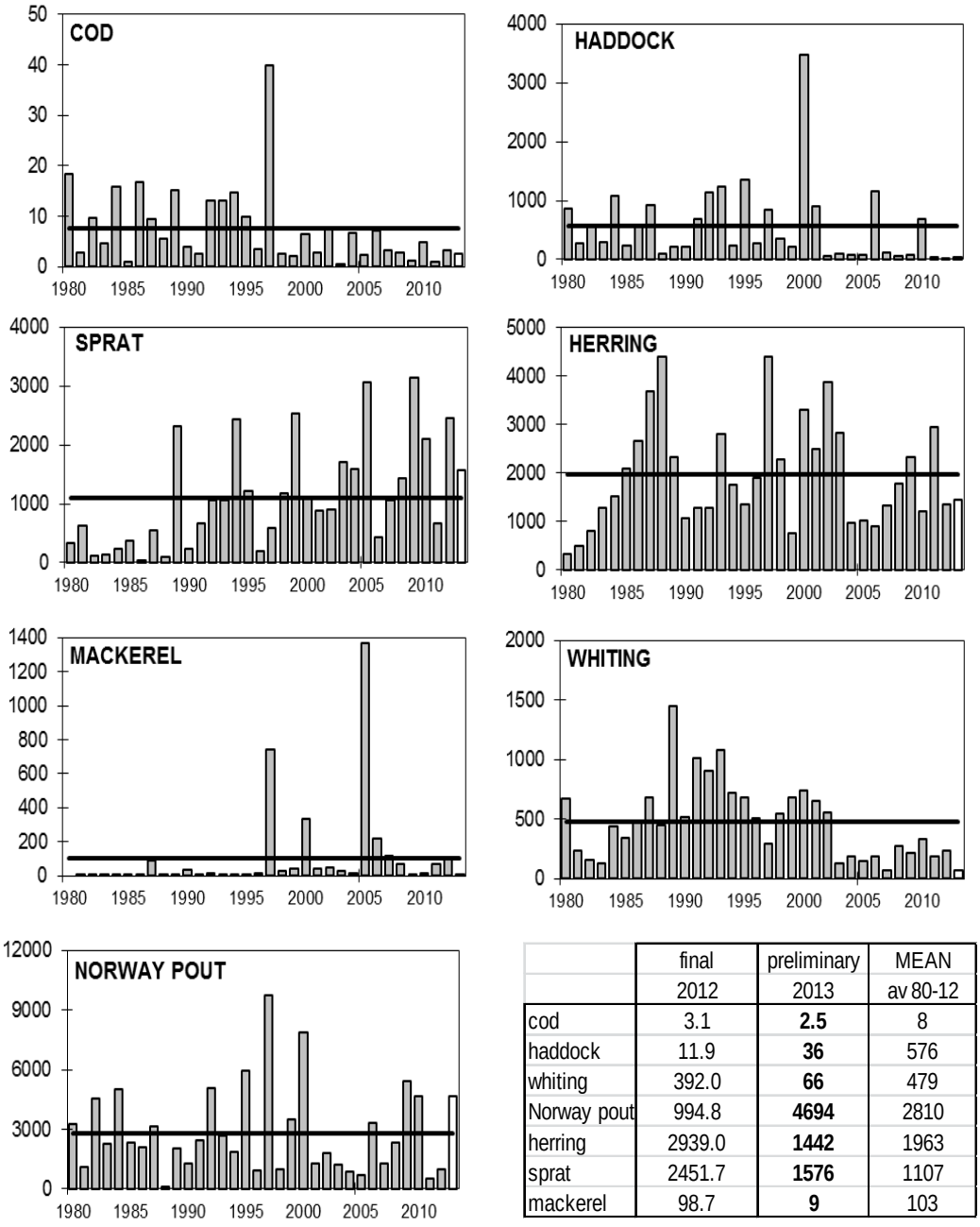
Haul locations. 2013 IBTS Q1 Scotia (foul hauls in red).



MIK tow positions and relative sample size for Herring larvae. 2013 IBTS Q1 Scotia.

5.1.3 GOV – Preliminary indices

The preliminary indices for the recruits of seven commercial species based on the 2013 quarter 1 survey are shown in Figure 5.3. According to these preliminary results, sprat showed a year class in 2013 above the long-term average for the years 1980–2012, and also Norway pout showed a year class above the long year average. The catches of the other species are below average, especially the index of haddock and mackerel are very low compared to the other years in the time-series.



	final 2012	preliminary 2013	MEAN av 80-12
cod	3.1	**2.5**	8
haddock	11.9	**36**	576
whiting	392.0	**66**	479
Norway pout	994.8	**4694**	2810
herring	2939.0	**1442**	1963
sprat	2451.7	**1576**	1107
mackerel	98.7	**9**	103

Figure 5.3. Time-series of indices for 1-group (1-ring) herring, sprat, haddock, cod, whiting, Norway pout, and mackerel caught during the quarter 1 IBTS survey in the North Sea, Skagerrak and Kattegat. Indices for the last year are preliminary, and based on a length split of the catches.

5.1.4 MIK- Index

For the ICES Herring Assessment Working Group for the area South of 62°N (HAWG), the IBTS survey provides recruitment indices and abundance estimates of adults of herring and sprat. Sampling at night with fine-meshed nets (MIK; Midwater Ringnet) was implemented from 1977 onwards, and the catch of herring larvae has been used for the estimation of 0-ringer abundance in the survey area. The 0-ringer abundance (IBTS-0 index) the total abundance of 0-ringers in the survey area is used as recruitment index for the North Sea herring stock. Index values are calculated as described in the HAWG report of 1996 (ICES, 1996); (MIK Sampling Manual - to be submitted to WKESST in June 2013).

The index value of 0-ringer abundance of the 2012 year class is estimated at 50.4. The index estimate is less than last year's estimate for the 2011 year class. This is about only 46% of the long-term mean, and shows a further continuation of the series of relatively poor recruitments starting with the 2002 year class.

The 0-ringers caught in 2013 were predominantly found in 2 distinct areas: one in the western part of the central and northern North Sea with its core close to the Scottish and northern English coast. The other area of high larvae abundance was situated in the southeastern North Sea in the continental waters along the Dutch, German and Danish coasts (Figure 5.4). Low larval densities were found in the Southern Bight, the Kattegat in the Central North Sea while the Skagerrak and the northern and north-eastern parts of the North Sea were virtually devoid of herring larvae. This pattern differs from those of the previous years where the highest concentrations were always close to the Scottish coast. This year, two core areas with high abundance could be detected in the western and eastern North Sea, respectively. For the first time since 1992, the abundance of larvae in the eastern part was higher than in the western part of the North Sea. In contrast to last year, again high concentrations of smaller Downs herring larvae were found in the ringnet catches in the area of the English Channel.

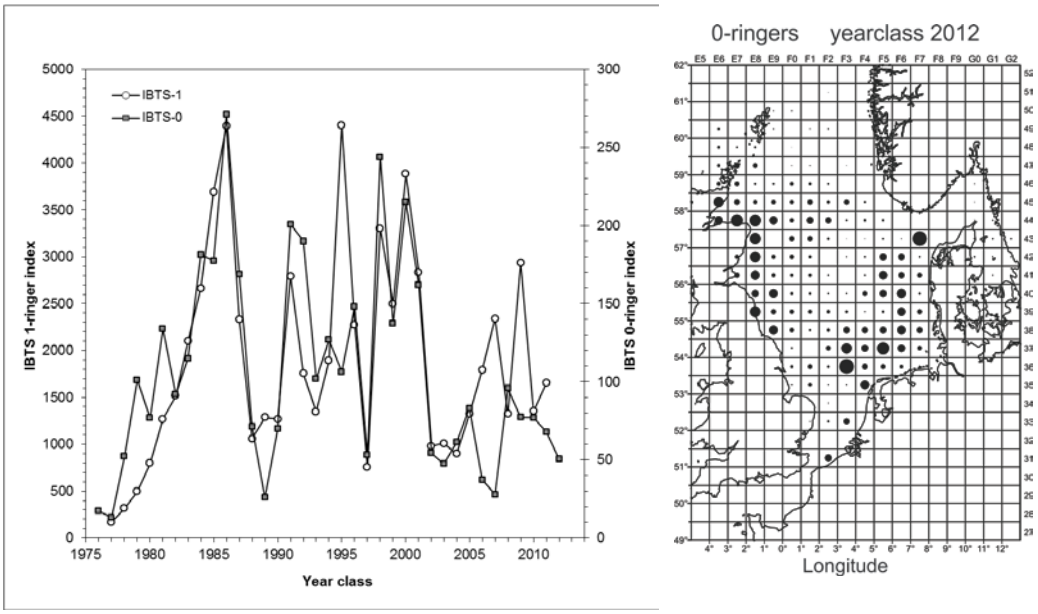


Figure 5.4. Distribution of MIK caught herring larvae during the IBTS Q1 2013 (right) and the time-series of herring larvae and 1-ringers since 1976 (left).

5.1.5 Planning and participation in 2014

The available ships time for the quarter 1 survey in 2014 is expected to be as usual as described in the manual, with an aim to carry out the major proportion of the survey in February.

Denmark, France, Germany, Netherlands, Norway, Scotland and Sweden have confirmed their participation in the 2014 Q1 survey as in the last years. Sweden will participate again using RV Dana.

Germany requested to swap allocation of some of their rectangles with other countries in order to optimize the required steaming time between haul positions, and to facilitate a full coverage of the survey area. Their request was to cover the rectangles 44F2, 43F2, 42F2 and 42F3 and let their rectangles 51E8, 51E9, 50E9 and 49E9 be covered by other countries. Scotland agreed to cover 51E8 and 51E9 and Norway agreed to cover 50E9 and 49E9 (Figure 5.5). For the latter two rectangles, Norway requested to be informed about known clear tow positions. The result of this swap is that Scotland will cover the two specified rectangles alone, and these will now be fished with groundgear B twice. Exchange of these rectangles applies to both, GOV and MIK sampling

Denmark requested to reduce their effort in two rectangles largely covered by land, 39F8 and 38F8. The request is to cover these rectangles by only a single GOV haul. 39F8 could then be covered by Denmark, while 38F8 could be covered by France alone. Reducing this effort will allow Denmark to increase effort in the rectangles 42F7 and 43F7, which is running ahead of a request by the Chair of WGNSSK for extra data on plaice. (Denmark will as in the past conduct only 1 MIK haul in 38F8, avoiding the shallow eastern half of the rectangle, which is also partly covered by land.)

The Netherlands and Denmark exchanged some rectangles in 2013 because of severe weather conditions. The exchange eventually provided an opportunity to consider a permanent exchange of those rectangles. This discussion will be continued, while the Q1 survey coordinator will draft a plan for a permanent exchange of rectangles.

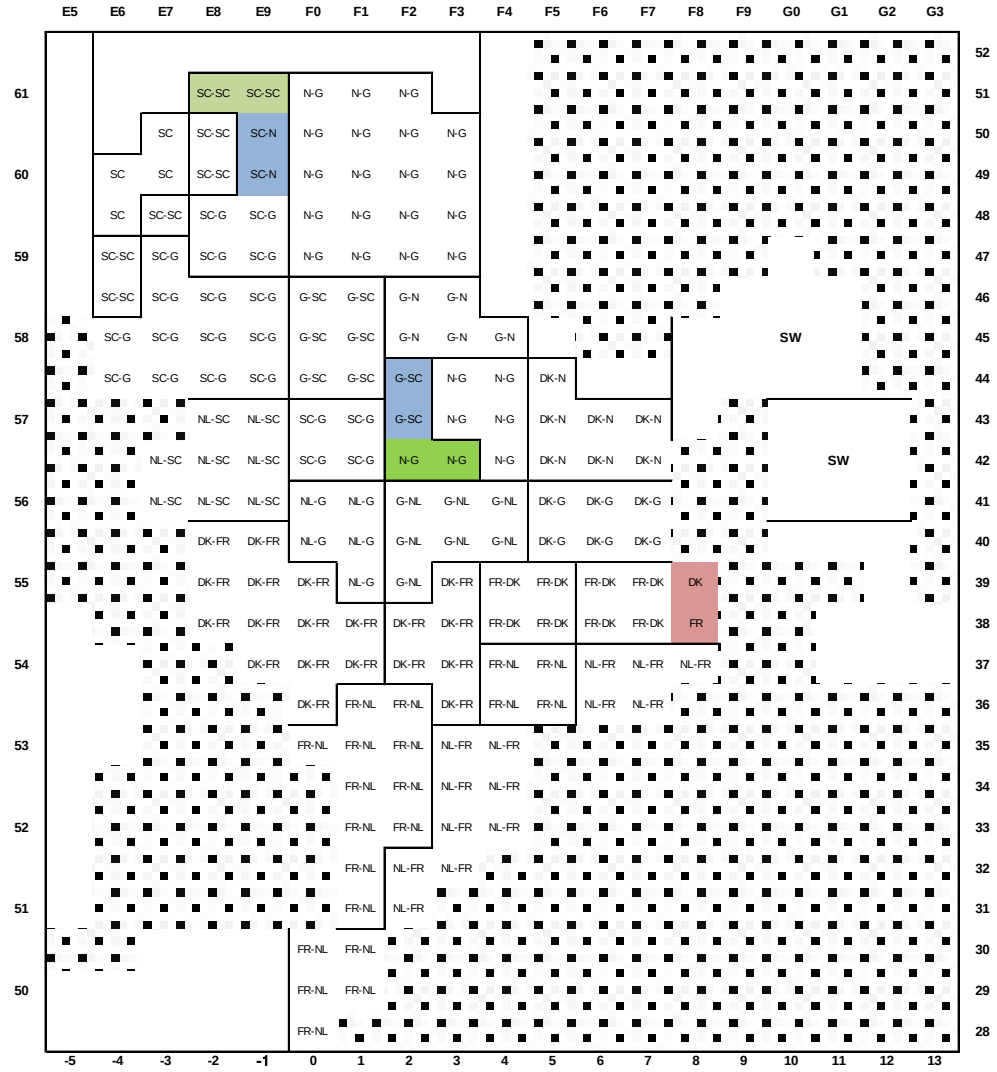


Figure 5.5. Altered allocation map, colored rectangles are the once with change compared to the 2013 map.

5.1.5.1 Biological sampling of additional species

During the IBTSWG meeting in 2009, new requirements from the DCF became available, overruling the previous data call from 2007, and requesting additional sampling of a new group of species (including some already sampled), see IBTSWG report 2009 Table 12.2 (ICES, 2009)).

In order to avoid work overload, the survey coordinators were appointed to design a scheme in which sampling of all species would be divided among the participating countries. The sampling scheme agreed upon by the participants of the first quarter North Sea IBTS for the years 2010-2012 is given in Table 5.1.5.1. In 2013, the same sampling was executed as proposed for 2010 as there were no new DCF requirements. Up to date in April 2013, no new DCF requirements are in place, whereupon it has been decided to carry over the presented scheme starting again in 2013, and consequently sample in 2014 the same species as proposed for 2011.

The responsibility for sampling specific species is appointed to the countries that are most likely to catch these species (based upon catches from the years 2007–2009). To assure a valuable dataset, the same protocol for sampling will be followed as ac-

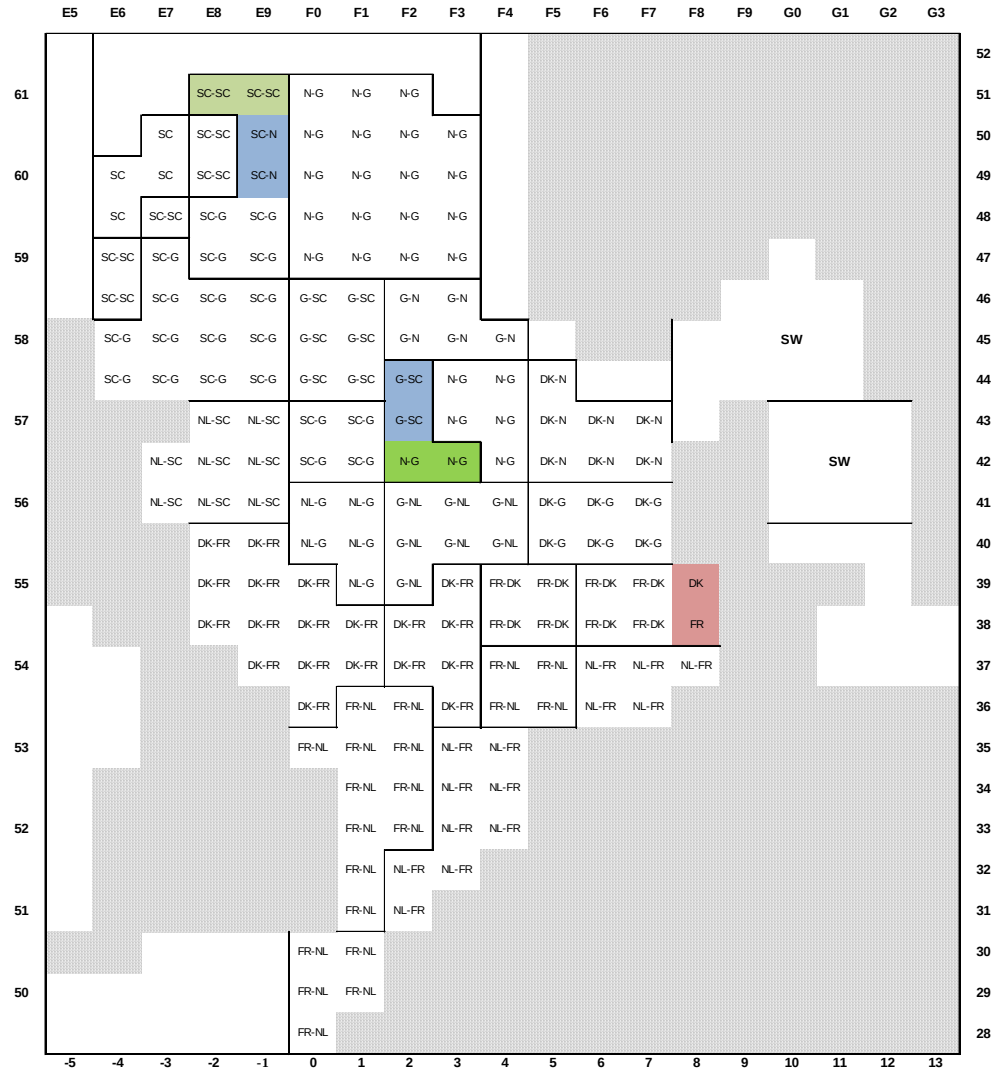


Figure 5.5. Altered allocation map, colored rectangles are the once with change compared to the 2013 map.

5.1.5.1 Biological sampling of additional species

During the IBTSWG meeting in 2009, new requirements from the DCF became available, overruling the previous data call from 2007, and requesting additional sampling of a new group of species (including some already sampled), see IBTSWG report 2009 Table 12.2 (ICES, 2009)).

In order to avoid work overload, the survey coordinators were appointed to design a scheme in which sampling of all species would be divided among the participating countries. The sampling scheme agreed upon by the participants of the first quarter North Sea IBTS for the years 2010-2012 is given in Table 5.1.5.1. In 2013, the same sampling was executed as proposed for 2010 as there were no new DCF requirements. Up to date in April 2013, no new DCF requirements are in place, whereupon it has been decided to carry over the presented scheme starting again in 2013, and consequently sample in 2014 the same species as proposed for 2011.

The responsibility for sampling specific species is appointed to the countries that are most likely to catch these species (based upon catches from the years 2007–2009). To assure a valuable dataset, the same protocol for sampling will be followed as ac-

counts for the standard species, including the aim of sampling a number of 8 individuals per 1-cm length group per roundfish area.

Being the only country sampling in Skagerrak and Kattegat, Sweden was invited to decide for themselves upon the sampling scheme in Skagerrak/ Kattegat, following the DCF requirements.

Table 5.1.5.1. Scheme for biological sampling of additional species during the NS-IBTS Q1, (Y = annual, T = triennial sampling).

Species (Engl.)	Species (Latin)	A/S/W/Mat	sampling
Witch flounder	*Glyptocephalus cynoglossus*	T	Sweden to consider DCF requirements
Plaice	*Pleuronectes platessa*	Y	Sweden to consider DCF requirements
Sole	*Solea solea*	Y	Sweden to consider DCF requirements
Hake	*Merluccius merluccius*	Y	Sweden to consider DCF requirements

Species (Engl.)	Species (Latin)	A/S/W/Mat	RCM numb	sampling	2010	2011	2012	2013	2014
Red gurnard	*Chelidonichthys cuculus*	T	100	8 per 1 cm group	Ge-Sc			Ge-Sc	
Witch flounder	*Glyptocephalus cynoglossus*	T	100	8 per 1 cm group	Dm-No			Dm-No	
Ling	*Molva molva*	T	100	8 per 1 cm group		Ge-No			Ge-No
Turbot	*Scophthalmus maximus*	T	920	8 per 1 cm group		Dm-Nl			Dm-Nl
Brill	*Scophthalmus rhombus*	T	920	8 per 1 cm group			Dm-Fr		
Sole	*Solea solea*	Y	5570	8 per 1 cm group	Fr-Dm-Nl	Fr-Dm-Nl	Fr-Dm-Nl	Fr-Dm-Nl	Fr-Dm-Nl
Tub gurnard	*Chelidonichthys lucerna*	T	480	8 per 1 cm group		Fr-Sc			Fr-Sc
John Dory	*Zeus faber*	T	10	5 per country	Ge-Sc			Ge-Sc	
Lemon sole	*Microstomus kitt*	T	350	8 per 1 cm group			No-Ge		
Hake	*Merluccius merluccius*	Y	800/550	8 per 1 cm group	Ge-No-Sc	Ge-No-Sc	Ge-No-Sc	Ge-No-Sc	Ge-No-Sc
Flounder	*Platichthys flesus*	T	450	8 per 1 cm group			Fr-Nl		
Striped red mullet	*Mullus surmuletus*	T	600/200	8 per 1 cm group	Fr-Nl			Fr	
Plaice	*Pleuronectes platessa*	Y	9550	8 per 1 cm group	All countries	All countries	All countries	All countries	All countries
Spotted ray	*Raja montagui*	T			Continue with national collection. Review after WK outcome				
Cuckoo ray	*Leucoraja naevus*	T			Continue with national collection. Review after WK outcome				
Starry ray	*Raja radiata*	T			Continue with national collection. Review after WK outcome				

5.1.6 Other issues

5.1.6.1 Exchange of rectangles between partners

In Q1 of 2013, rectangles were swapped between partners, due to weather conditions preventing the sampling as planned. As this exchange is now preferred to be repeated regularly, communication with the relevant assessment groups is needed.

Actions:

- The Q1 survey coordinator will draft a plan for a permanent exchange of rectangles between Denmark and Netherlands
- The proposed rectangle exchange for Q1 should be communicated to the relevant working groups.

5.1.6.2 Otoliths of additional species

According to Table 5.1.5.1, otoliths of additional species have been collected in previous years as well as in 2013. It appears that not all otoliths are and can be read by the nations collecting them, e.g. Germany collected otoliths for hake, red gurnard, ling

and John Dory. In some cases there might already be or might exist options for bilateral agreements, specifically for witch flounder, hake and plaice.

Norway collected all three of these species and is unable to process these. Sweden offered to process at least their 2013 witch flounder otoliths. The Netherlands offered to process at least their 2013 plaice otoliths. Norway and Sweden collected hake otoliths for which no exchange has been arranged yet. Scotland collected hake otoliths as well, but arranged reading of these otoliths via a bilateral agreement with UK/ Cefas.

As of yet, the collection of otoliths and resulting processing of age data does not appear to be linked satisfactorily to an overall concept of data analysis and utilization of the results.

5.1.6.3 Addional sampling of fish eggs (MIK)

Not all countries used the additional small fine-mesh ringnet ("MIKkey" net) on their MIK, as it was originally recommended by WGEGGS to obtain samples of fish eggs, mainly to support sampling of the cod and plaice egg survey. Contributions by this additional sampling are voluntary and IBTSWG principally encourages them. So far however, it is unclear to the institutes what to do with the samples, or where extra funding for it should come from.

Recommenation:

- IBTSWG recommends that WGALES gives guidance on this requested.

5.1.6.4 Staff Exchange

No staff exchange was undertaken during the 2013 Q1 surveys, and there are yet no concrete plans for an exchange during Q3 and in 2014. However, staff exchange of sea-going technical and scientific personnel between countries is still encouraged. Taking part in other countries surveys allows the study of each other trawling and biological sampling procedures on-board ships, and may lead to new insights to improve one's own protocol.

5.1.7 References

ICES. 1996. Report of the Herring Assessment Working Group for the Area South of 62°N. ICES CM 1996/ACFM:10.

ICES. 2009. Report of the International Bottom Trawl Survey Working Group (IBTSWG). ICES CM 2009/RMC:04.

5.2 Q3 North Sea Survey

5.2.1 General overview

Five vessels for six counties, participated in the quarter three survey in 2011: Dana (Denmark), Walther Herwig III (Germany), Dana (Sweden), Johan Hjort (Norway), Cefas Endeavour (England) and Scotia (Scotland). In all, 324 valid GOV hauls were made. Although this allowed at least one station in every rectangle, a few rectangles did not achieve the required 2 stations. 48F1, 44F2 and 41F4 would normally be fished twice under normal circumstances and these were not completed due to issues described in the survey summaries in Section 4.2.2.

The North Sea, Skagerrak and Kattegat quarter 3 surveys have now completed 22 years in their coordinated form. Table 5.2.1.1 shows the effort ascribed in the current year. From 2007 onwards a combined index has been calculated for Norway pout and used by the Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak (WGNSSK), whereas the remaining indices were calculated by country. The combined Q3 cod index was once again rejected after issues described in the WGNSSK2011, related to data inconsistencies resulting from resubmissions of data from national laboratories to DATRAS. This issue may continue in the short term as historic data are reloaded.

Once again Sweden was required to charter the Danish research vessel Dana to carry out their survey, because the Swedish vessel was not operational.

From 2010 onwards clear tow information was accessible through DATRAS by downloading the data for all countries. It should be noted that this information should be used with caution but it is still a useful guide to help survey leaders identify clear tows.

Table 5.2.1.1. Number of valid hauls and days at sea per country for quarter 3 surveys in 2012.

Year		Denmark	Germany	Sweden	Norway	UK England	UK Scotland	Total
2012	Days	18	12	12	28	32	22	127
	Hauls	49	29	45	42	75	84	324

Table 5.2.1.2. Number of planned stations in 2013.

Country	Vessel	Number of planned stations in quarter 3 2013
Denmark	Dana	46
Germany	Walther Herwig III	29
Sweden	Dana	49
Norway	Johan Hjort	53
UK England	Endeavour	76
UK Scotland	Scotia	84
	Total	337

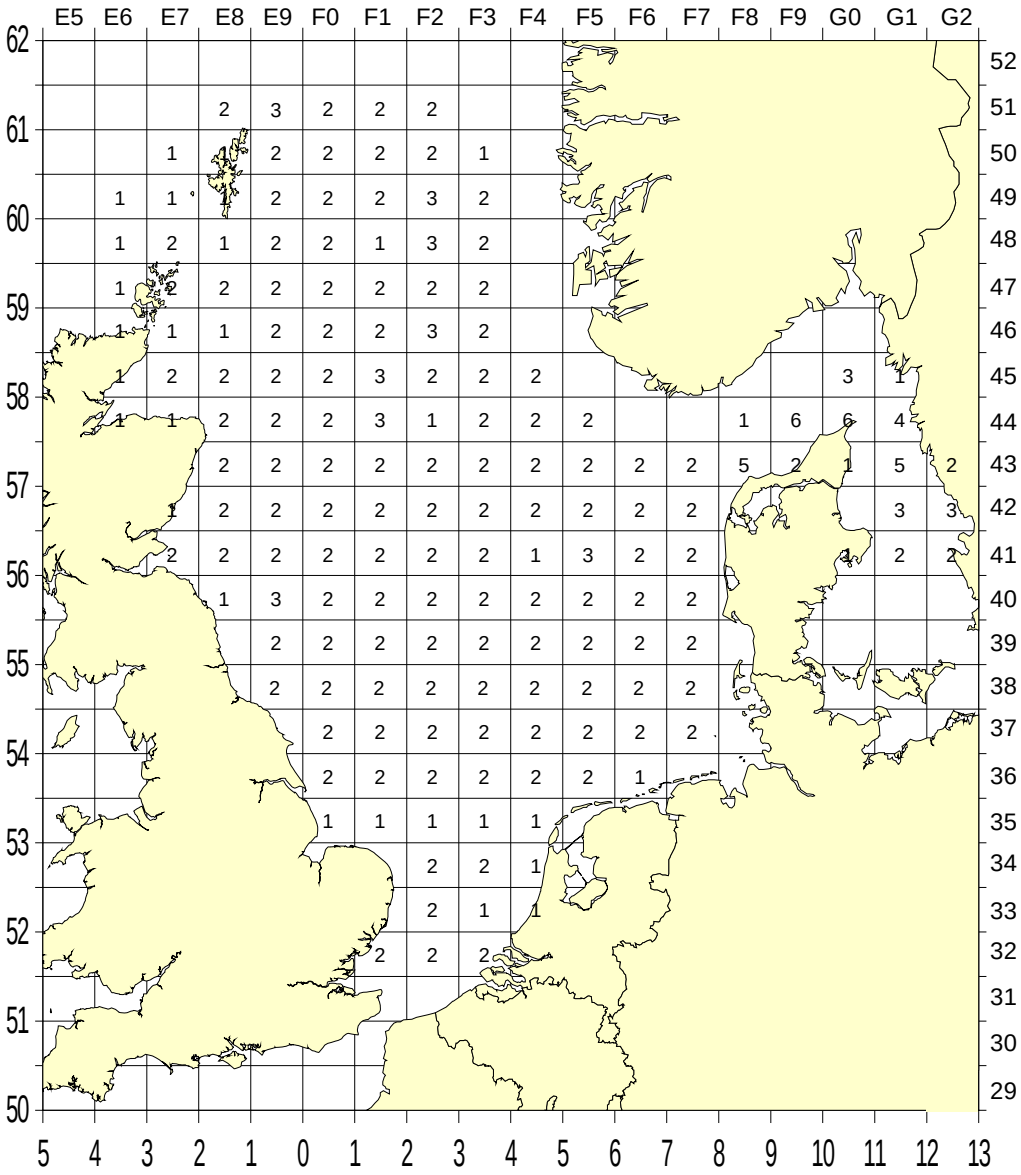


Figure 5.6. Number of stations fished by rectangle by all participants of the 3rd Quarter IBTS survey 2012.

5.2.2 Survey summaries by country

To standardize the summary reports within this working group report, the survey summaries for all cruises are provided in a standard form.

5.2.2.1 UK (England and Wales) – North Sea Quarter 3 IBTS

Nation:	UK (England and Wales)	Vessel:	Cefas Endeavour
Survey:	13/12	Dates:	8 August – 8 September 2012

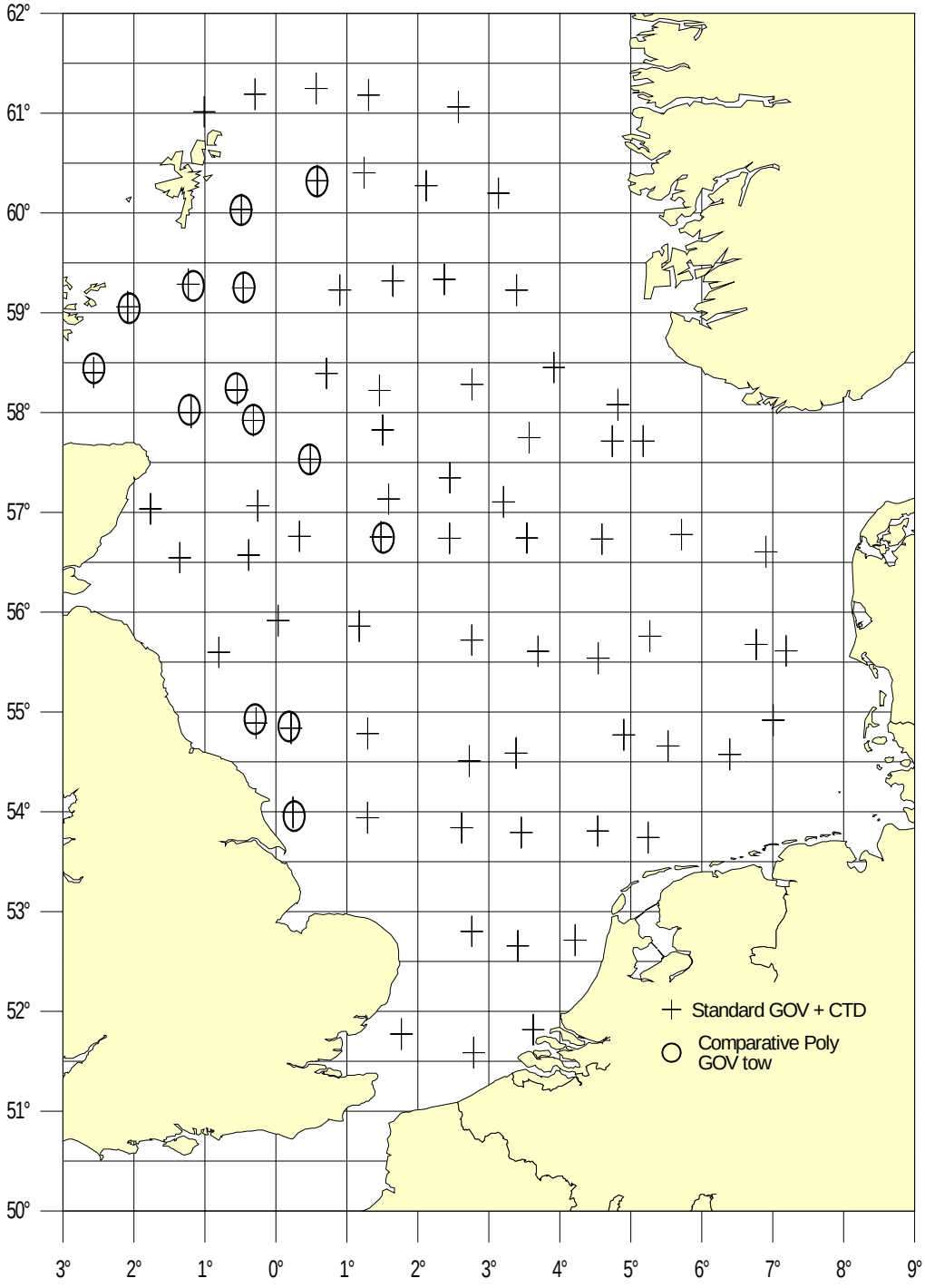
Cruise	Q3 North Sea survey aims to collect data on the distribution and relative abundance, and biological information of commercial fish in IV. The primary species are cod, haddock and whiting, sprat, herring, mackerel, Norway pout, plaice and saithe.
Gear details	IBTS standard GOV 36/47 with groundgear A, Exocet kite with SCANMAR door, wing and headline height sensors.
Notes from survey (e.g. problems, additional work, etc.):	As well as the usual 75 GOV stations, a further 14 primary stations were fished with a polyethylene GOV. This is the 4th year of a medium term project with the purpose of analysing possible differences in catchability between the nylon and polyethylene gears. On every GOV station the litter in the trawl was recorded to the new protocol requested at the 2010 IBTS meeting in Lisbon. In addition 74 valid CTD casts were carried out to collect high quality environmental data. A further 17 additional aims were carried out during the survey, the three most significant of which were 1) to collect samples for Particle Size Analysis from stations around the grid, 2) identify and collect jellyfish from MIK net and GOV hauls to support a project looking at methods for improved jellyfish monitoring and 3) Collect and cryopreserve tissue and muscle samples from species for the University of Bedford 'Frozen Ark' project.
Number of fish species re-corded and notes on any rare species or unusual catches:	Overall, **90** species of fish were recorded during the survey. Species of note caught this year during the survey are *Galeus melastomus*, *Dipturus batis* species-complex, *Sebastes viviparous*, *Maurolicus muelleri* and *Engraulis encrasicolus*.

Stations fished (aims: to complete 75 valid tows per year)

ICES Divisions	Strata	Gear	Tows Planned	Valid	Additional	Invalid	% Stations fished	Comments
IV	N/A	IBTS standard GOV	75	75	0	2	100	
IV	N/A	IBTS Q4 poly GOV	-	14	-	-	-	Internal study

Number of biological samples (age material, *maturity only)

species	number	species	number
Clupea harengus	938	*Limanda limanda*	368
Gadus morhua	271	*Scomber scombrus*	423
Melanogrammus aeglefinus	810	*Lophius piscatorius*	21
Merlangius merlangus	1019	*Scophthalmus rhombus*	11
Pollachius virens	417	*Chelidonichthys cuculus*	8
Sprattus sprattus	414	*Mullus surmuletus*	6
Psetta maxima	11		
Trisopterus esmarki	229		
Microstomus kitt	235	**Leucoraja naevus*	27
Pleuronectes platessa	1201	**Raja clavata*	31
Chelidonichtthys lucerna	14	**Raja montagui*	31
Eutrigla gurnardus	220	**Amblyraja radiata*	53



Plot of station positions of UK (Eng) Q3 IBTS 2012.

5.2.2.2 Sweden – North Sea Quarter 3 IBTS

Nation:	Sweden	Vessel:	Dana
Survey:	8/12	Dates:	11 August – 21 August 2012

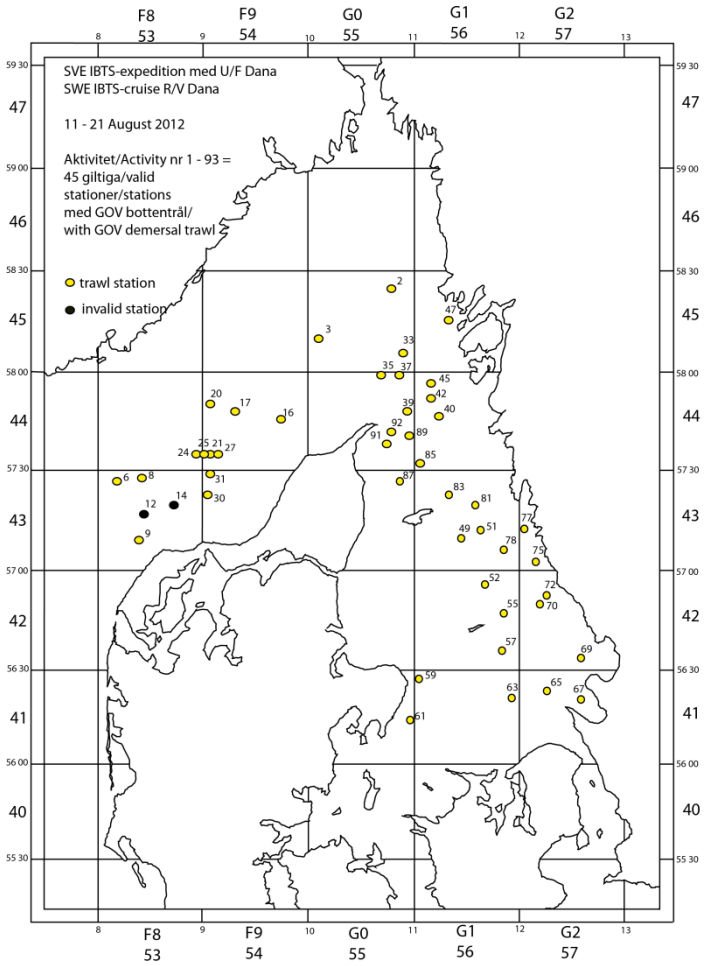
Cruise	Q3 North Sea survey aims to collect data on the distribution and relative abundance, and biological information of commercial fish in area IIIa and IV. The primary species are sprat, herring, cod, haddock, whiting, Norway pout, hake, saithe, plaice and sole.
Gear details:	IBTS standard GOV 36/47 with groundgear A, Exocet kite with SCANMAR door, bottom contact, trawl eye and headline height sensors.
Notes from survey (e.g. problems, additional work etc.):	In the past Sweden has conducted the IBTSq3 cruise in late August until mid-September. This time, the Swedish IBTS was pushed forward due to Dana already being booked so the cruise started in the first trimester of August. The cruise was undertaken in wonderful weather and completed as planned except for one mishap; both Swedish GOV trawls were torn after only five hauls towed and once again, Denmark came to our rescue and kindly lent us their trawls. So the remainder of the cruise was performed using the Danish GOV mounted with Swedish trawl doors. In total 45 valid hauls were made; 26 in the Skagerrak and 19 in the Kattegat. Two invalid haul in the western Skagerrak were replaced by two additional hauls in the surrounding area in the same depth strata. On four occasions (stations 9, 31, 45, 52) the hauls were shortened by 1-5 min respectively because of foul bottom and fishing gear in line of the tow. The net opening was noticeably low at two stations; station 9 (3.2m) and 85 (3.3 m) due to strong currents. Hydrographical sampling was carried out with the CTD probe and related probe for oxygen measurement. In total 16.4 tonnes were caught consisting of 62 species of fish, 6 species of cephalopods, 8 species of prawns and 4 species of large commercial crustaceans. Biological sampling was undertaken as usual on the target species recommended in the manual including whiting, hake and sole. Biological data were also collected for witch flounder. Invertebrates and litter were recorded according to the IBTS manual rev. VIII. Additional tasks performed during the survey: • Herring and cod for radioactivity analysis in Lowestoft, England • Herring and dab from Fladen to the Natural History Museum for analysis of environmental pollutants.
Number of fish species recorded and notes on any rare species or unusual catches:	Overall, 63 species of fish were recorded during the survey. The following species we caught this cruise but otherwise rarely see; *Phycis blennoides* – only 5 specimen caught in our IBTS history *Sebastes viviparus* - rarely caught, so far 15 specimen caught. *Leptoclinus maculatus* - zero caught prior to 1998; after that 20 specimen caught. (It is yet unclear whether the earlier absence of this species in survey records was due to identification problems, or whether it was a true phenomenon.)

Stations fished (aims: to complete 45 valid tows per year)

ICES Divisions	Strata	Gear	Tows planned	Valid	Additional	Invalid	% stations fished	comments
IIIa	N/A	GOV	45	45	2	2	100	
	TOTAL		45	45	2	2	100	

Number of biological samples (age material, *maturity only):

Species	Age	Species	Age
Clupea harengus	1028	*Sprattus sprattus*	619
Gadus morhua	553	*Trisopterus esmarkii*	151
Melanogrammus aeglefinus	234	*Merluccius merluccius*	136
Pollachius virens	165	*Pleuronectes platessa*	837
Solea solea	19	*Glyptocephalus cynoglossus*	275
Merlangus merlangius	380		



Cruise track of Dana during the SWE Q3 IBTS 2012.

5.2.2.3 Germany – North Sea Quarter 3 IBTS

Nation:	Germany	Vessel:	Walther Herwig III
Survey:	356	Dates:	19 July – 16 August 2012

Cruise	This cruise contributed to the Q3 IBTS in the North Sea, and also had the second objective and to monitor the bottom fish fauna and the benthic epifauna in six 10-by-10 nm areas (part of the German Small-Scale Bottom Trawl Survey; GSBTS). North Sea IBTS Q3 survey aims to collect data on the distribution, relative abundance and biological information of fish in ICES Subareas IVa, b and c. The primary focus has been on the demersal species cod, haddock, whiting, saithe, and Norway pout and the pelagic species herring, sprat and mackerel. Abundance and size spectra of all fish species caught are recorded.
Gear details:	IBTS standard GOV 36/47 with groundgear A (standard); SCANMAR distance sensors for door and wing spread and "Trawl eye" for vertical net opening. For data from the last 11 IBTS hauls conducted, no values for distance of wings (parameter recommended) exist due to an instrument failure, but values for distance of otter boards (parameter mandatory) exist for all 29 IBTS haul.
Notes from survey (e.g. problems, additional work etc.):	Depth profiles of temperature and salinity were obtained with a 'Seabird' CTD combined with a water sampler for nutrient samples. Instead of the planned haul in 44E9, a haul has been conducted, for which the shooting position laid in 44E8 (1.005 °W) and which crossed over to 44E9 during towing (end at 0.9733 °W). While this was unintended and deviates from the assignment, we kept the data for this (partly) "44E8"-haul in the database, entered under 44E8 due to its shooting position. Many of the hauls conducted in the immediate vicinity (within the same 10 x 10 nm "box") had to be terminated prematurely due to large swarms of herring, several hauls had to be stopped after even less than 20 min. The haul uploaded to DATRAS was towed for the full 30 min., and contained about 2.6 t of herring - the average of 18 hauls in "Box D" of the GSBTS was around 4.5 t of herring. Additional activities during the survey beyond the regular IBTS tasks included sampling of benthic epifauna with a 2-m beam trawl and sediment sampling with a van Veen grab (collaboration with 'Senckenberg'). Two ornithologists recorded abundances of seabirds for the "Seabirds at Sea" program, and conducted experiments on discard feeding (collaboration with the Research and Technology Centre, FTZ Büsum). Furthermore, for a pilot study on bycatch in the GOV, a full analysis of benthic macro-invertebrates caught with the net was conducted for selected stations. Besides the regular survey tasks, sampling was also performed for stomach analyses of demersal fish species for the EU projects VECTORS and MYFISH (collaboration with Hamburg University). Benthos samples for stable isotope analyses were collected for the Thünen Institute of Fisheries Ecology. The Q3 IBTS survey was -as always - conducted back to back with the German national survey GSBTS (German Small-scale Bottom Trawl survey). Both surveys use the same principle fishing methods but at different spatial scales.
Number of fish	During the survey, 45 species of fish were recorded on IBTS stations.

species recorded and notes on any rare species or unusual catches:	

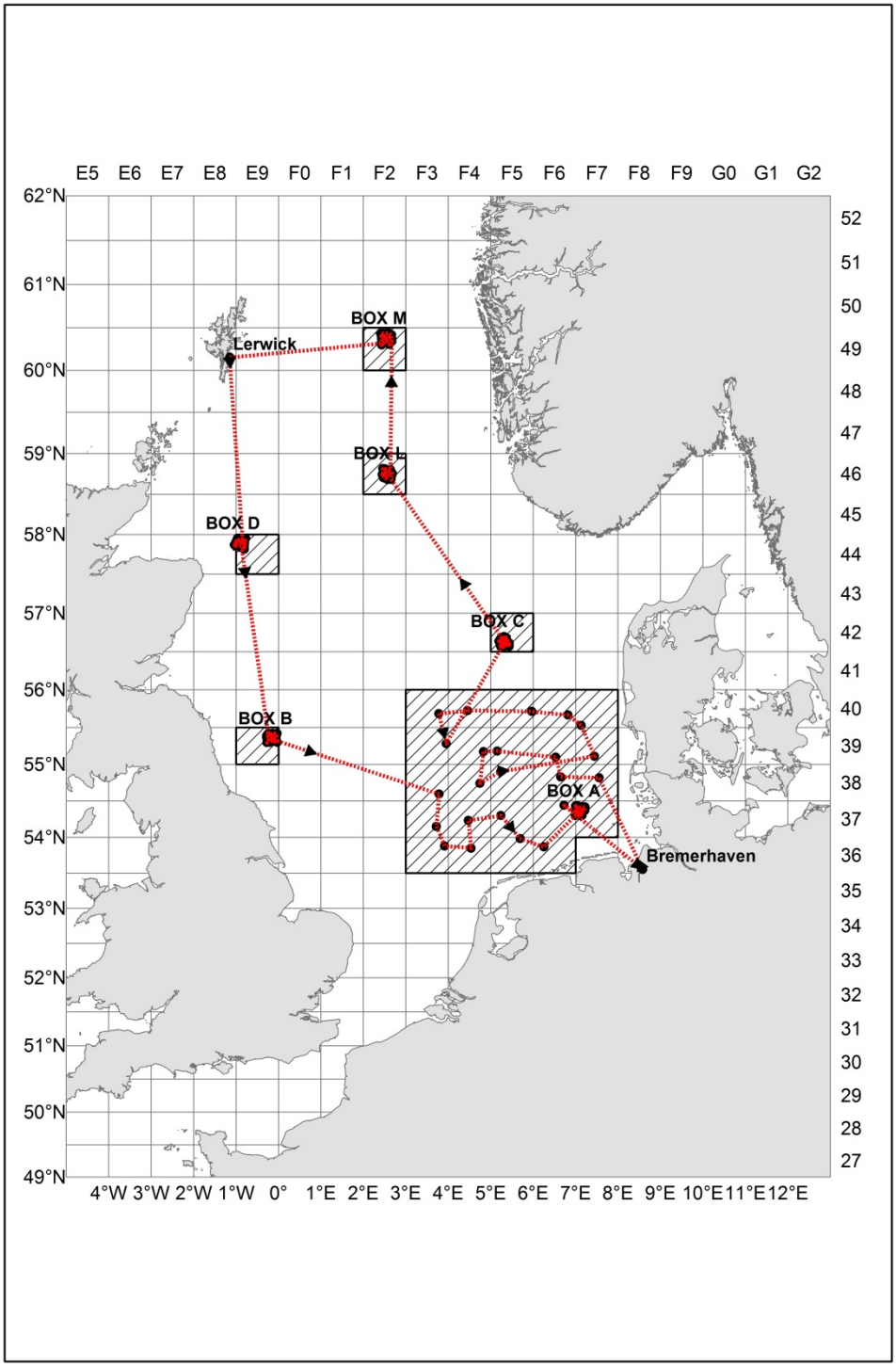
Stations fished (Goal: 29 valid tows per year)

ICES Divisions	Strata	Gear	Tows planned	Valid	Additional	Invalid	% stations fished
IV	N/A	IBTS standard GOV	29	29	0	0	100

Number of biological samples (age material)

Species	Number	Species	Number
Clupea harengus	383	*Pollachius virens*[1]	12
Gadus morhua [1]	85	*Scomber scombrus*	377
Melanogrammus aeglefinus [1]	161	*Sprattus sprattus*	336
Merlangius merlangus [1]	516	*Trisopterus esmarckii*	81
Pleuronectes platessa	434		

[1] **Maturity not recorded in Q3.**



Cruise track of WH 356, GSBTS and IBTS, 19 July – 16 August 2012. Hatched area: ICES rectangles sampled within the IBTS; "Boxes", areas of investigation within the German Small-scale Bottom Trawl Survey (GSBTS).

5.2.2.4 Denmark – North Sea Quarter 3 IBTS

Nation:	Denmark	Vessel:	Dana
Survey:	07/12	Dates:	23 July – 8 August 2012

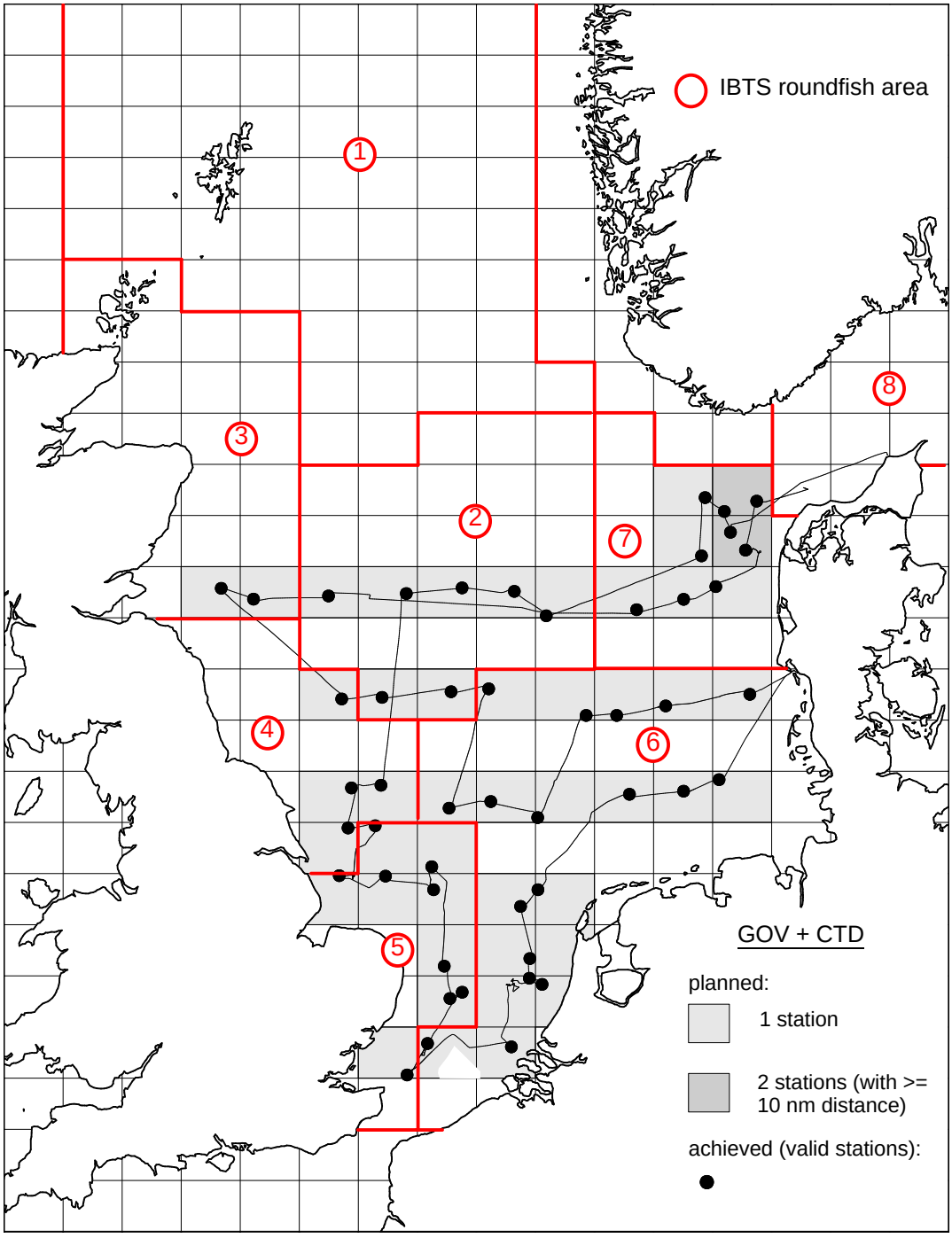
Cruise	The IBTS North Sea Q3 survey aims to collect data on the distribution, relative abundance and biological information on a range of fish species in ICES area IIIa and IV. CTD was deployed at each trawl station to collect temperature and salinity profiles. Age data were collected for cod, haddock, whiting, saithe, herring, mackerel, sprat, plaice, turbot, witch flounder and monkfish. Norway pout were not caught.
Gear details:	The bottom trawl used was the GOV 36/47 rigged with groundgear A and the Exocet kite (49 stations).
Notes from survey (e.g. problems, additional work etc.):	SCANMAR sensors were used and data for net opening and door spread were received for all valid hauls. Relative high values for net opening were recorded at shallow depths although larger warp length than specified in the manual were used. Rectangle 34F4 was not fished due to problems finding a suitable tow position in the available time in this area. Marine litter was recorded but due to limitations in staff only in four main categories and not in the detailed categories specified in IBTS manual.
Number of fish species recorded and notes on any rare species or unusual catches:	About 65 species of fish and shellfish were recorded during the survey.

Stations fished

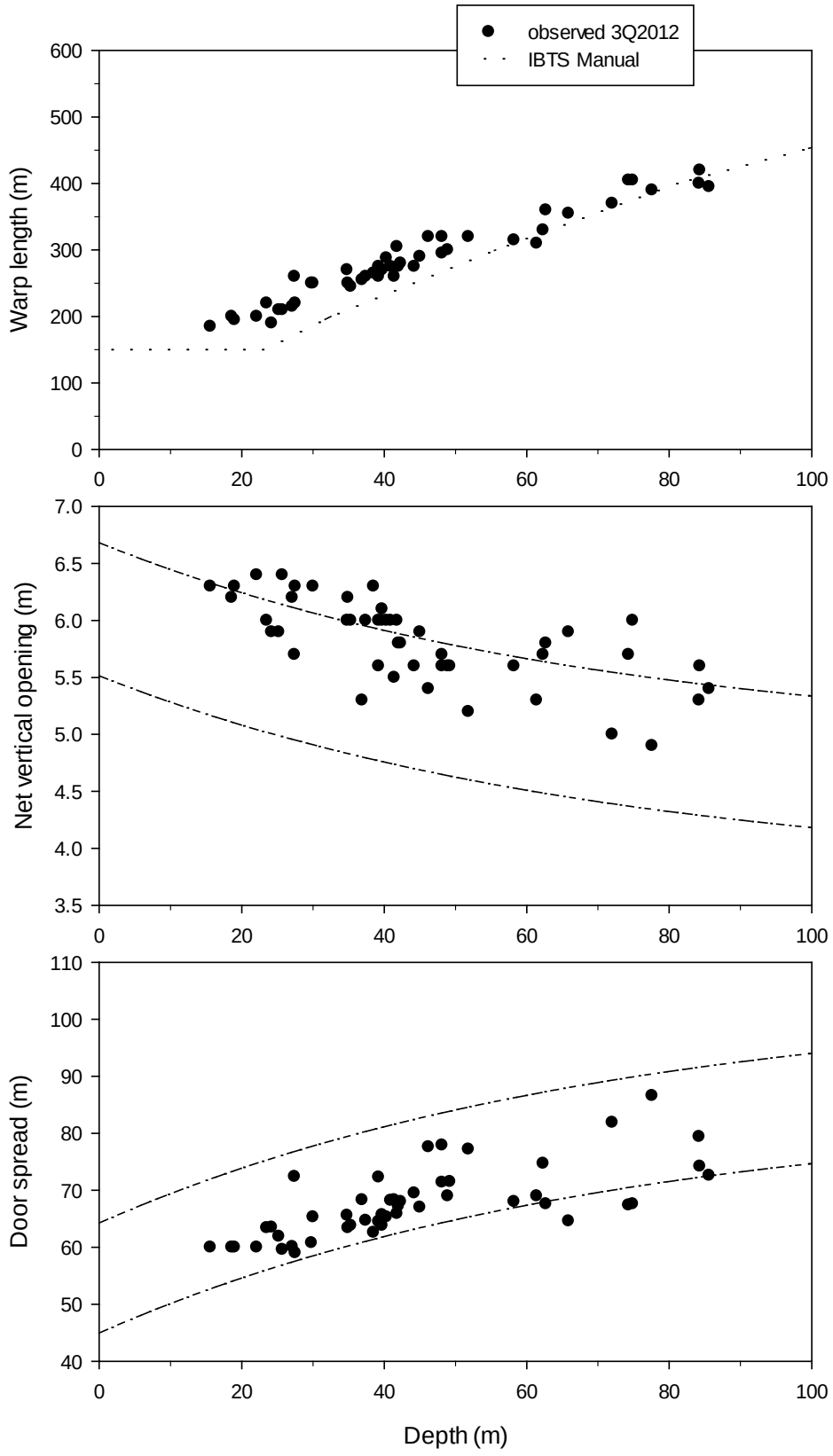
ICES Divisions	Strata	Gear	Tows planned	Valid	Additional	Invalid	% stations fished	comments
IV	N/A	GOV	49	49	0	1	100	

Number of biological samples (individual length, weight and age)

Species	No	Species	No
Clupea harengus	584	*Sprattus sprattus*	506
Gadus morhua	218	*Trisopterus esmarkii*	0
Melanogrammus aeglefinus	255	*Scomber sconbrus*	414
Merlangius merlangus	673	*Pleuronectes platessa*	902
Pollachius virens	1	*Lophius piscatorius*	9
Scophthalmus maximus	5	*Glyptocephalus cynoglossus*	70



Cruise track and sampling locations for Dana during the Q3 IBTS 2012.



Performance of the GOV trawl, Dana Q3 IBTS 2012 (Denmark).

5.2.2.5 UK (Scotland) – North Sea Quarter 3 IBTS

Nation:	UK (Scotland)	Vessel:	Scotia
Survey:	0912S (IBTS Quarter 3)	Dates:	22 July – 12 August 2012

Cruise	Q3 IBTS North Sea Groundfish survey aims to collect data on the distribution, relative abundance and biological information (in connection with EU Data Directive 1639/2001) on a range of fish species in ICES area IVa and IVb. Age data were collected for cod, haddock, whiting, saithe, Norway pout, herring, mackerel and sprat.
Gear details:	GOV using groundgear B on stations north of 57deg 30min North and groundgear A on stations south of 57deg 30min North.
Notes from survey (e.g. problems, additional work etc.):	The GOV was deployed on 87 occasions. A total of 84 valid hauls were achieved and there were 3 foul hauls. During the survey groundgear 'A' was used on all stations at latitudes south of 57'30N whereas groundgear 'B' was deployed on all stations north of 57'30N. In all 41 stations were completed successfully using groundgear 'A' rig and 43 stations with groundgear 'B'. The locations used for the trawl positions were a combination of established trawl locations as well as completely new locations. To begin with random positions were placed within each sampled survey rectangle. For rectangles containing more than one valid fishing tow then the nearest established tow to the random position was chosen and for those rectangles where there was only one suitable fishing tow then either that tow was used or if the situation allowed, a completely new tow would be sourced within 5nm of the random position. In all 13 new tows were sourced during this survey and the intention is to expand this until all of the sampled rectangles within the current survey area contain at least 2 sampling locations thus enhancing the randomization of the sample locations within the sampled survey rectangles. The SCANMAR system was used to monitor headline height, wing spread, door spread and distance covered during each tow. A bottom contact sensor was attached to the groundgear for each tow to monitor ground contact as well as to validate touch-down and lift-off of the groundgear. The data were downloaded for further analysis in the laboratory. In the main the fishing operations were completed without incident, however on the afternoon of the 29 July while undertaking haul 350 in 41F5 the net stuck fast on the bottom and despite numerous attempts to release it the gear was lost with only the doors being retrieved. Efforts were made to retrieve the gear user a creeper but this was to no avail and a new net was rigged. The station was repeated successfully on the same tow but beyond the location of the fastener. As a result of the time lost rectangle 41F4 was dropped from the survey plan in order for Scotia to maximize the overnight steam west to commence next morning at rectangle 42F2. Fishing was carried out in the main during the daylight period commencing each day at first light. Otoliths from all pelagic species as well as the haddock and Norway pout were aged at sea with the remaining demersal species (cod, whiting and saithe) being aged back at the institute. All haul summary data, length frequency and pelagic age data were also punched at sea. (See Figure 5.2.2.5.3 for station positions)
Number of fish species recorded and notes on any rare species or unusual catches:	A total of 83 different species were observed during the trip with a total catch weight of 44,230kg. 0+ numbers in 2012 for cod, haddock and whiting saw an increase on both 2010 and 2011 estimates; however they are still well below the 10 year average for each. Norway Pout (not shown here) saw the highest cpue index seen in the

	surveys history with an index for 0+ of 100,666 fish /10 h. For the 1+ group the picture is somewhat different with both haddock and whiting significantly down on recent years and therefore the 10 year average. 1+ cod numbers are up on last year and indeed slightly above the average of the last 10 years 86 species with a total catch weight of 30.48 tonnes were recorded during the survey with the most interesting specimen encountered being a Yarrell's Blenny (*Chirolophis ascanii)* which was caught in square 40E8. Other interesting species noted were a sunfish *(Mola mola)* that was recorded by one of the seabird observers in 41F6 and a humpback whale *(Megaptera novaeangliae)* that was seen breaching clear of the water repeatedly just outside the entrance to Aberdeen harbour upon our return on the 11th August. Total catch weights (tonnes) for the major species are as follows, cod - 0.9, haddock - 3.8, whiting – 1.8, herring – 8.1, mackerel – 1.7, sprat – 1.6, Norway pout – 3.8 and saithe – 0.9. **Acoustic surveying of oil and gas installations** Passive acoustic surveying using the EK60 scientific sounder was completed successfully on 10 installations within the survey area (see Figure 5.2.2.5.3). This involved Scotia requesting clearance from and liaising with the rigs involved and then steaming at a reduced speed in a straight line up to and then away from the exclusion zone perimeter at 500m distance from the installation. In the case of the submerged Piper Alpha stack Scotia was able to survey right over the top of it thus allowing an uninterrupted transect to be completed for this site. The resulting acoustic data from these sites will be analysed by Oceanlab Scientists with a view to continuing research on how gas and oil platforms act as potential refugia for ichthyofauna in the North Sea.

Stations fished (aims: to complete 84 valid tows per year)

ICES Divisions	Strata	Gear	Tows Planned	Valid	Valid with rock-hopper	Additional	Invalid	% stations fished	comments
IVb		GOV-A	42	41	-	0	2	98	One of invalid stations was repeated.
IVa		GOV-B	43	43	-	0	1	100	Invalid station was repeated.
TOTAL			84	84	-	0	0	99	1 station dropped

Number of biological samples (age material, *maturity only):

Species	Age
Gadus morhua	532
Melanogrammus aeglefinus	1329
Merlangius merlangius	1288
Pollachius virens	491
Clupea harengus	798
Scomber scombrus	362
Trisopterus esmarkii	309
Sprattus sprattus	307
Dipturusbatis cf. intermedia	3*
Amblyraja radiata	97*
Leucoradia naevus	46*
Raja brachyura	9*
Raja montagui	95*

Q3 cpue data for major species: 2012			
Species	**Strata**	**Mean ind/h**	**Mean kg/h**
Gadus morhua	All	10.87	21.98
Melanogrammus aeglefinus	All	291.90	93.96
Merlangius merlangus	All	499.71	44.28
Merluccius merluccius	All	27.90	19.57
Pollachius virens	All	22.92	22.79
Clupea harengus	All	1797.77	199.29
Scomber scombrus	All	269.08	42.59
Sprattus sprattus	All	2846.40	39.74
Lepidorhombus whiffiagonus	All	3.80	1.39
Pleuronectes platessa	All	113.30	25.35
Microstomus kitt	All	78.28	10.42
Limanda limanda	All	78.28	47.85
Hippoglossoides platessoides	All	269.55	11.11
Glyptocephalus cynoglossus	All	0.86	0.24
Psetta maxima	All	0.27	0.36
Hippoglossus hippoglossus	All	0	0
Trachurus trachurus	All	69.28	21.46
Trisopterus esmarkii	All	11106.90	92.7
Trisopterus minutus	All	1022.06	6.59
Gadiculus argenteus	All	35.12	0.27
Argentina silus	All	1.25	0.03
Argentina sphyraena	All	76.83	4.29
Micromesistius poutassou	All	3.51	0.26
Scopthalmus rhombus	All	0.02	0.01

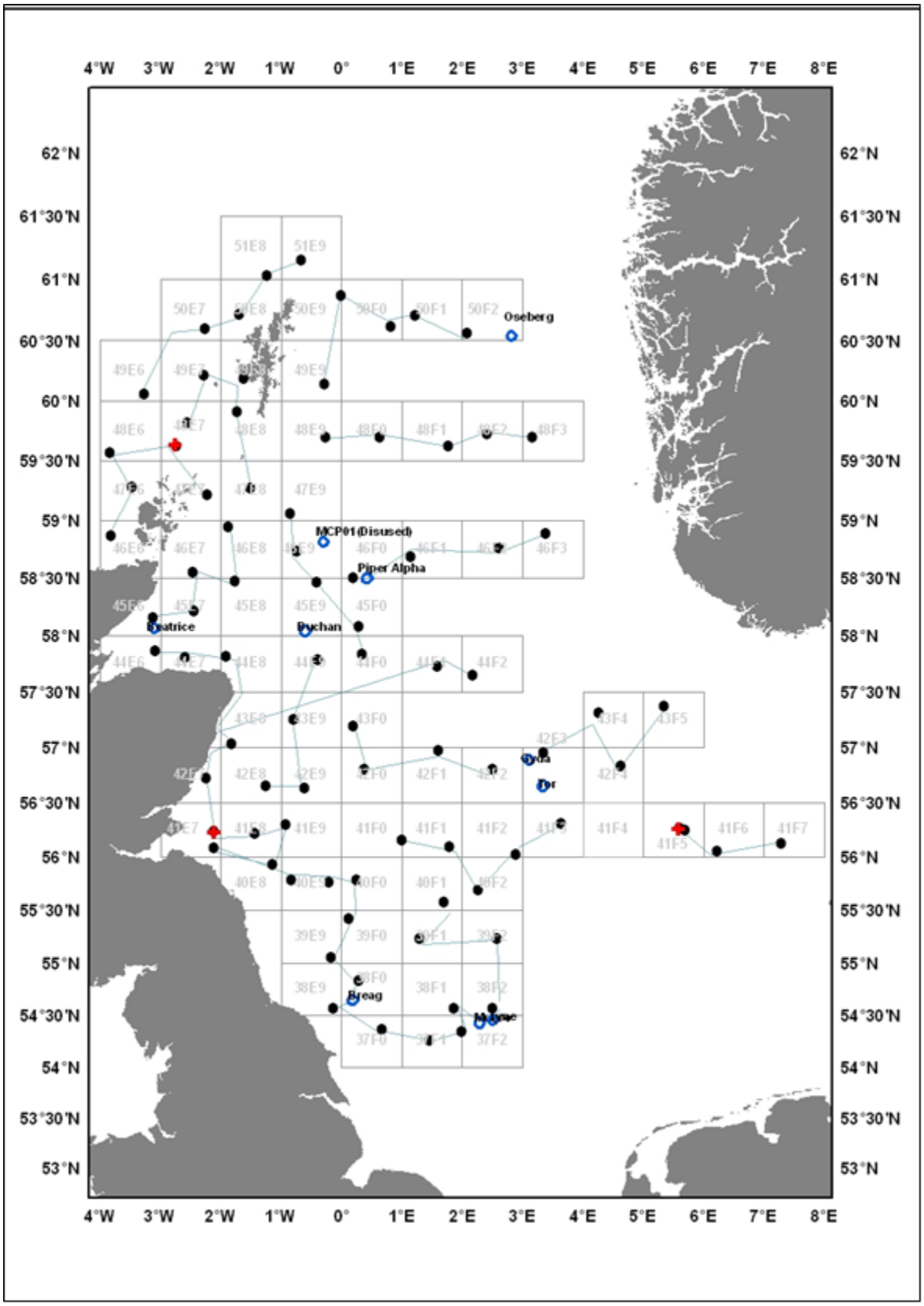


Figure 5.2.2.5.3. Survey map for cruise 0912S. Black circles denote sampling positions, red crosses denote locations of foul hauls. Open blue circles denote location of surveyed oil and gas installations.

5.2.2.6 Norway – North Sea Quarter 3 IBTS

Nation:	Norway	Vessel:	Johan Hjort
Survey:	2012207	Dates:	25 June- 23 July 2012

Cruise	Q3 North Sea IBTS aims to collect data on the distribution and relative abundance and biological information of commercial fish in Area IV. The primary species are cod, haddock, sprat, herring, Norway pout, plaice, sole, hake and saithe. The acoustic survey is coordinated by PGEGGS and provides indices to calculate the quantity of herring, sprat and saithe. The two hydrographic sections (Utsira - Start Point) collect data on hydrography, nutrients, plankton, herring and sprat larvae. Process studies examine the life-history dynamics of fish larvae. Additional sampling includes gill samples of saithe for genetic analysis and stomach sampling for saithe. Extra tows were done deeper than 200 m in the Norwegian trench, but these are not uploaded to DATRAS.
Gear details:	IBTS standard GOV 36/47 with groundgear A, Exocet kite and SCANMAR door, trawl eye and headline height sensors was used for the IBTS stations. For the pelagic index a small salmon trawl (spectra) 50x10 meter was used (not uploaded to DATRAS).
Notes from survey (e.g. problems, additional work etc.):	The cruise was fulfilled as planned. Sampling of herring was not adequate in the western area. The haul done in 48F1 was non-standard and therefore not included as a valid IBTS tow. Due to unforeseen circumstances, the station in 44F2 was not fished.
Number of fish species recorded and notes on any rare species or unusual catches:	Overall, 148 species was recorded during the survey, out of this, 58 were fish species.

Stations fished (aims: to complete 55 valid tows per year)

ICES Divisions	Strata	Gear	Tows planned	Valid	Additional	Invalid	% stations fished	comments
IV	N/A	GOV		45	5	0	100	
	TOTAL		NA	100	0	0	100	

Number of biological samples (maturity and age material):

Species	Age	Species	Age
Clupea harengus	1331	*Pollachius virens*	337
Gadus morhua	490	*Trisopterus esmarki*	138
Melanogrammus aeglefinus	396	*Merlangius merlangus*	279
Pollachius pollachius	6		

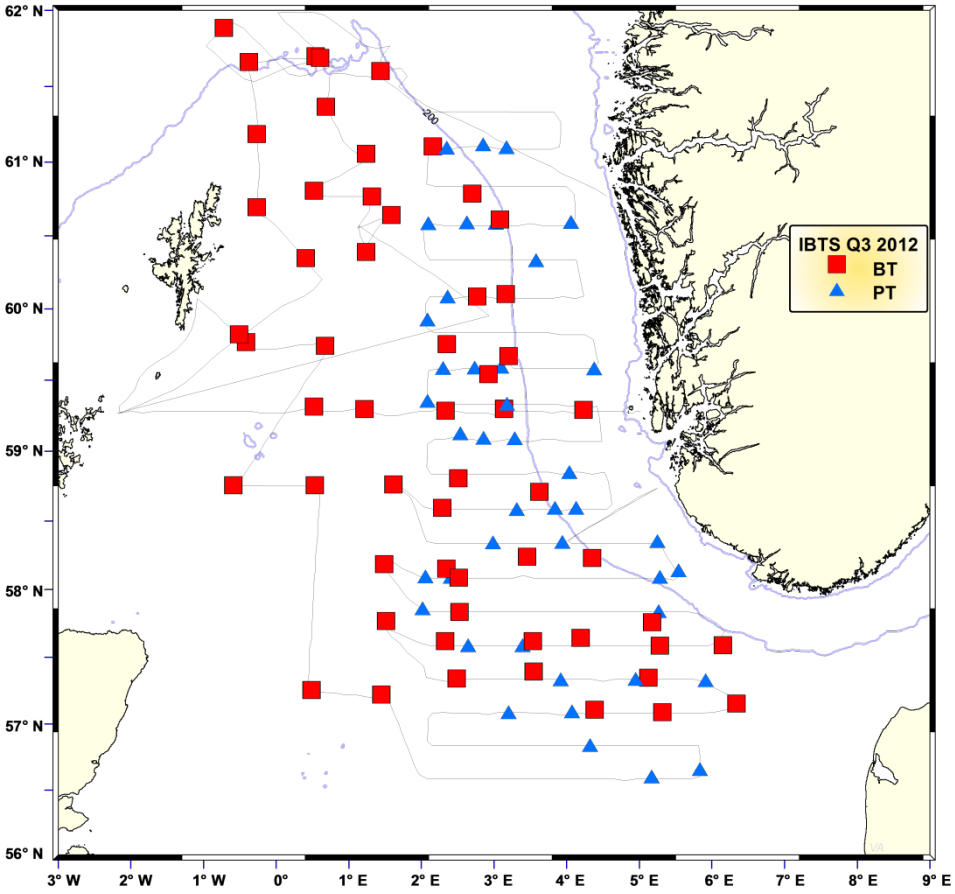
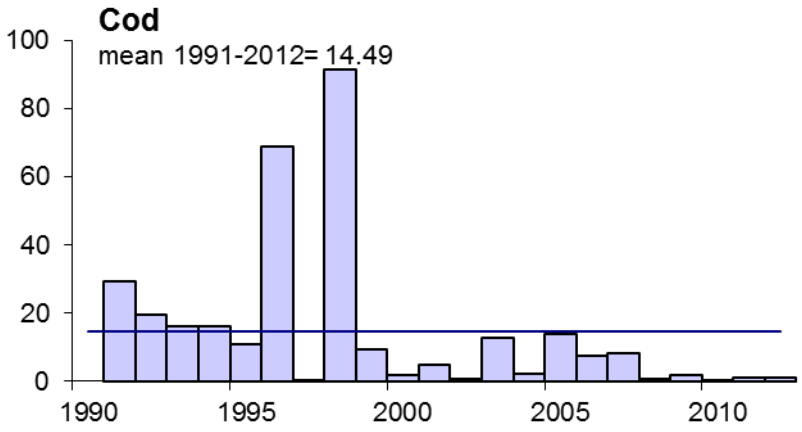
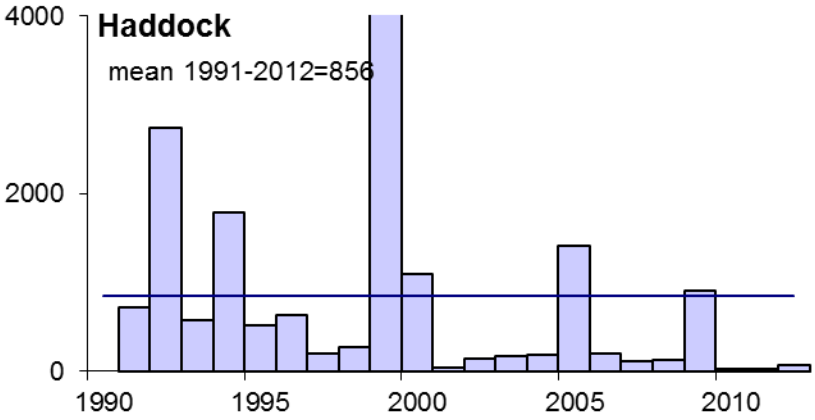


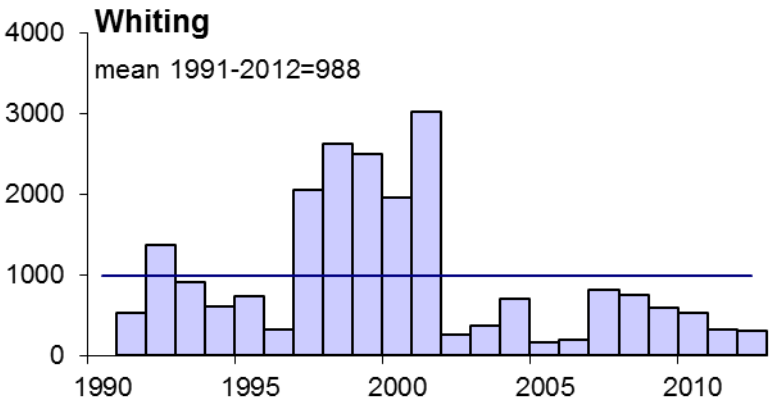
Figure 5.2.2.6.1. Bottom trawl (BT) and pelagic trawl (PT) stations during the North Sea survey in July 2012.

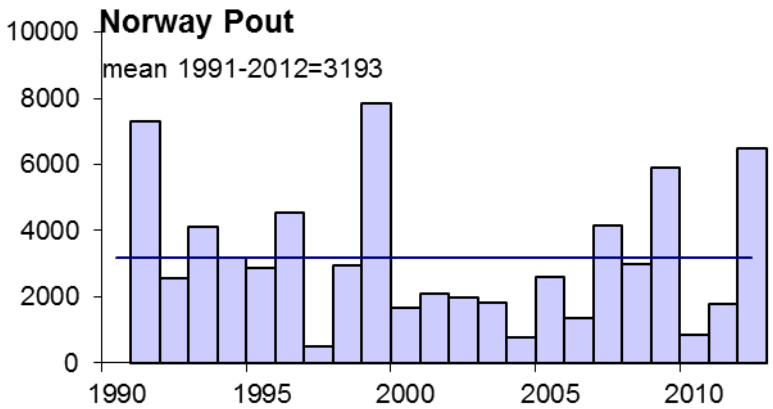
5.2.3 Overall results

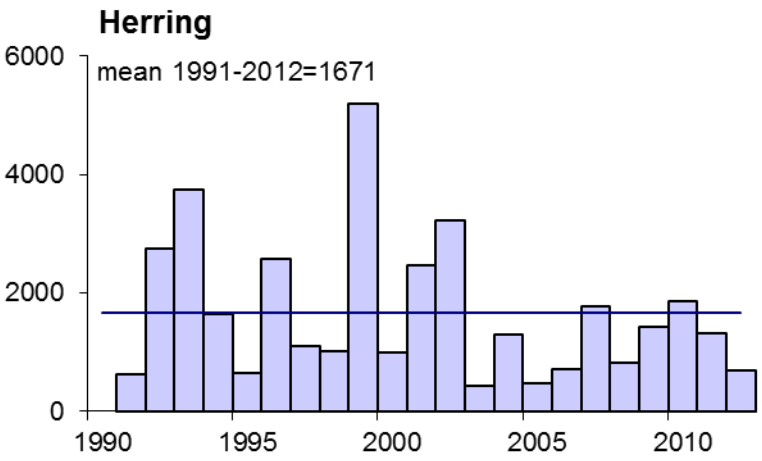
The combined indices for the 0-group recruits of seven commercial species based on the 2012 quarter 3 surveys are shown in Figure 5.2.3.1. With the exception of Norway Pout, every index for the target species is below the long-term mean.






Whiting
mean 1991-2012=988
4000
3000
2000
1000
0
1990
1995
2000
2005
2010


Norway Pout
mean 1991-2012=3193
10000
8000
6000
4000
2000
0
1990
1995
2000
2005
2010


Herring
mean 1991-2012=1671
6000
4000
2000
0
1990
1995
2000
2005
2010

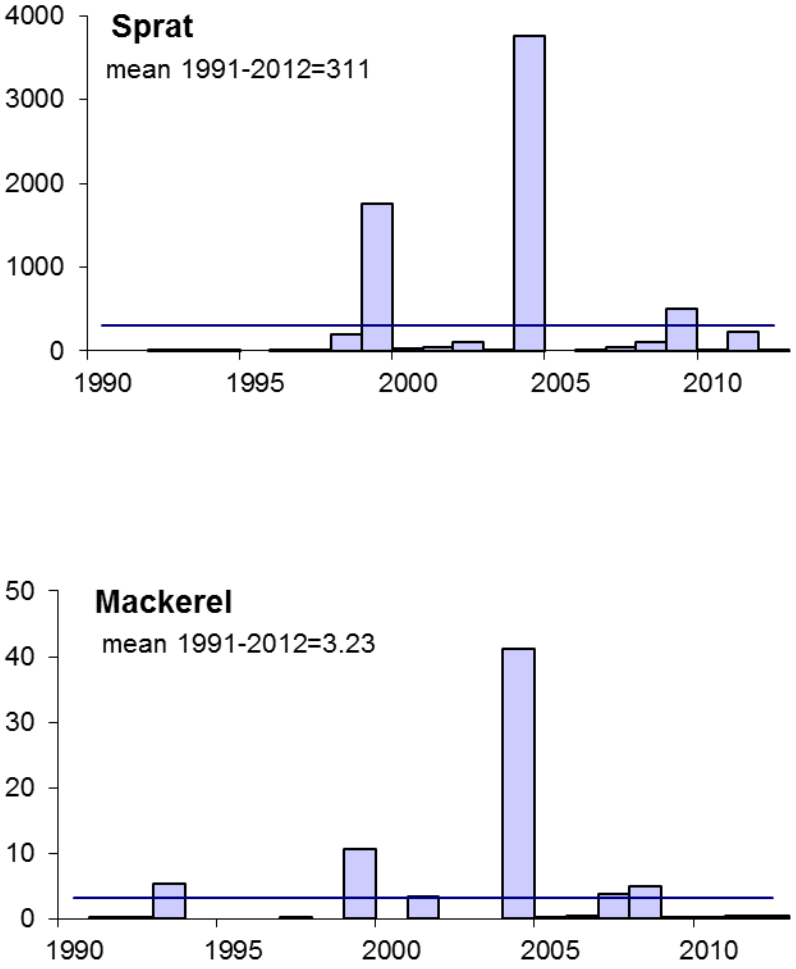


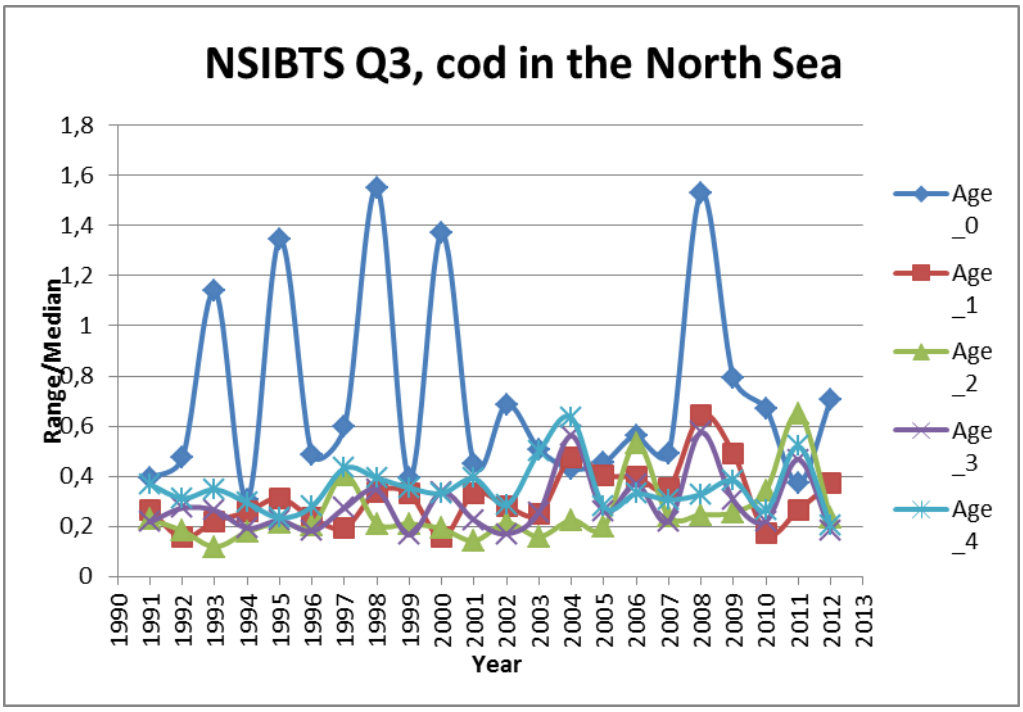
Figure 5.7. Time-series of indices for 0-group species during the quarter 3 IBTS survey in the North Sea, extracted from DATRAS.

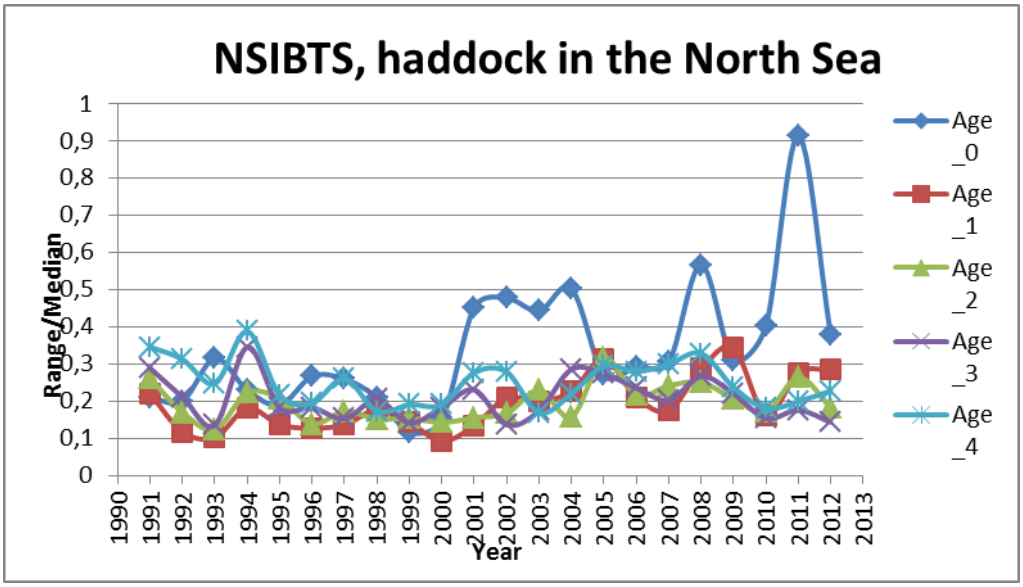
Table 5.2.3.1. Gives an overview of the number of biological samples as reported per country in Section 5.1.2.

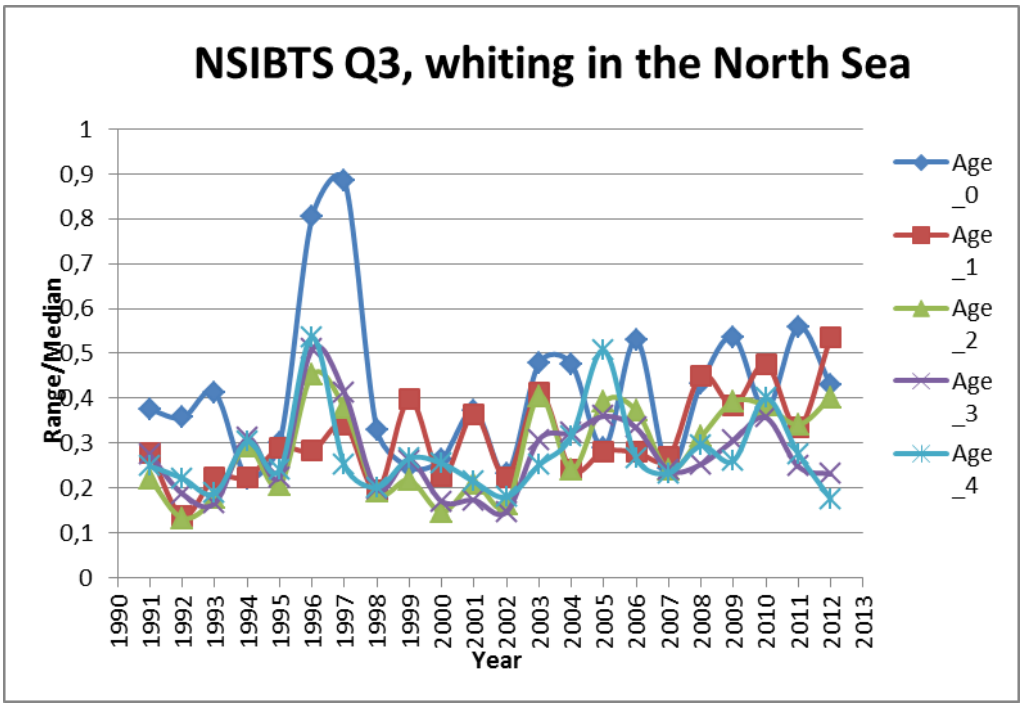
Species	Den	Eng	Ger	Sco	Swe	Nor	total
Target species							
Clupea harengus	584	938	383	798	1028	1331	**5062**
Gadus morhua	218	271	85	532	553	490	**2149**
Melanogrammus aeglefinus	255	810	161	1329	234	396	**3185**
Merlangius merlangus	673	1019	516	1288	380	279	**4155**
Pollachius virens	1	417	12	491	165	337	**1423**
Sprattus sprattus	506	414	336	307	619		**2182**
Trisopterus esmarki		229	81	309	151	138	**908**
Scomber scombrus	414	423	377	362			**1576**
Additional species							
Scophtalmus rhombus		11					**11**
Solea solea					19		**19**
Pollachius pollachius						6	**6**
Microstomus kitt		235					**235**
Glyptocephalus cynoglossus	70				275		**345**
Lophius piscatorius	9	21					**30**
Lophius budegassa							
Merluccius merluccius							
Mullus surmuletus		6					**6**
Scophthalmus maximus	5						**5**
Trachurus trachurus							
Pleuronectes platessa	902	1201	434		837		**3374**
Limanda limanda		368					**368**
Eutrigla gurnardus		220					**220**
Chelidonichthys cuculus		8					**8**
Chelidonichthys lucerna		14					**14**
Amblyraja radiata		53		97			**150**
Dipturus batis complex		3		3			**6**
Raja montagui		31		95			**126**
Raja clavata		31					**31**
Raja brachyura				9			**9**
Leucoraja naevus		27		46			**73**

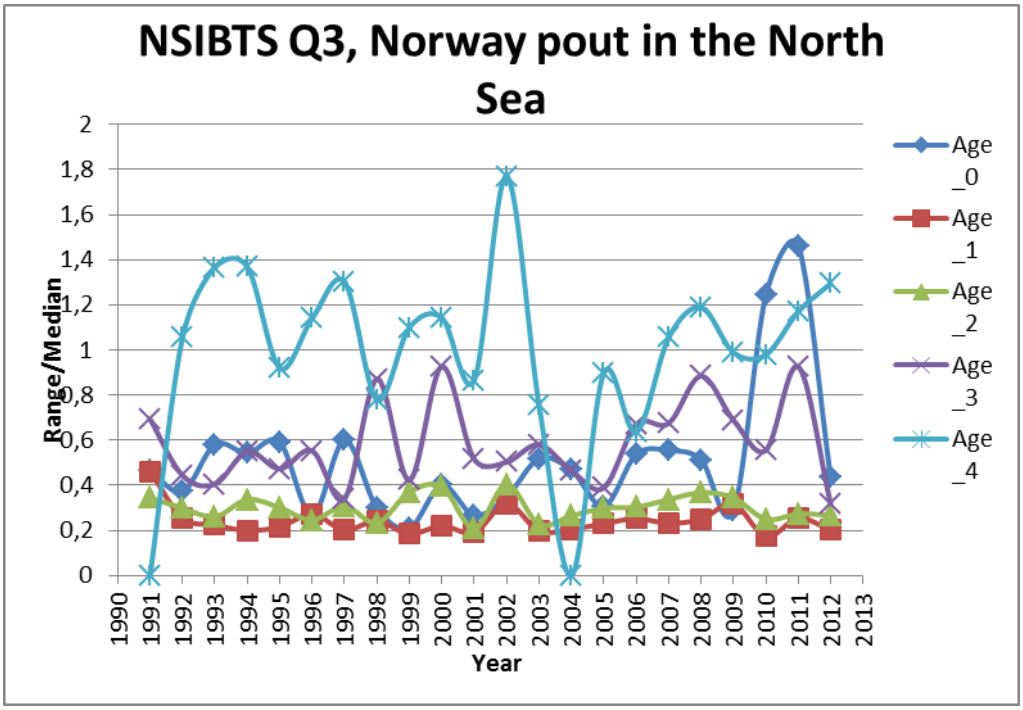
5.2.4 Precision estimates

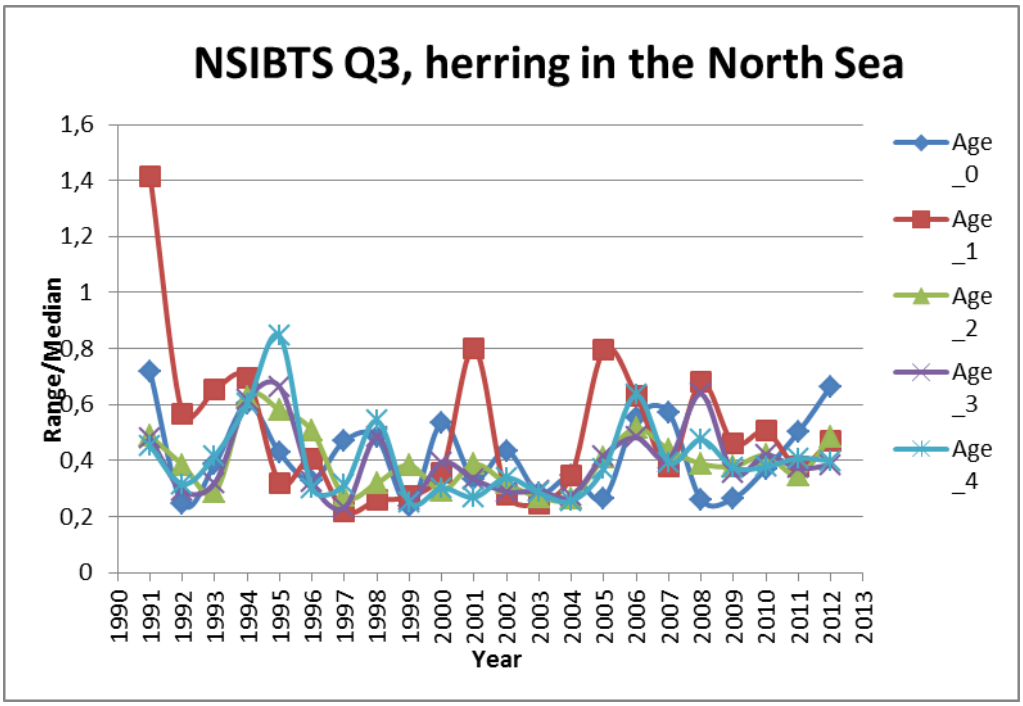
The ICES DATRAS system now provides precision estimates for the survey area. They are provided in Figure 5.8. Precision estimate for individual species in NSIBSQ3 for the North Sea below as plots over the time-series.

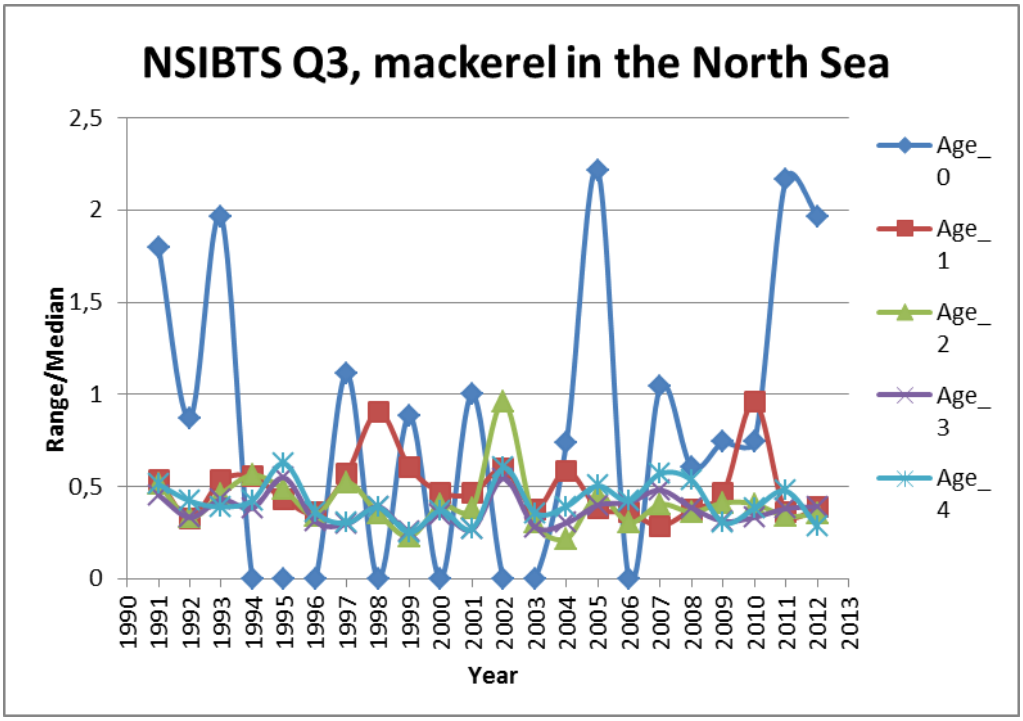





NSIBTS Q3, whiting in the North Sea
Range/Median
Year
Age_0
Age_1
Age_2
Age_3
Age_4


NSIBTS Q3, Norway pout in the North Sea
Range/Median
Year
Age_0
Age_1
Age_2
Age_3
Age_4


NSIBTS Q3, herring in the North Sea
Range/Median
Year
Age_0
Age_1
Age_2
Age_3
Age_4


NSIBTS Q3, mackerel in the North Sea
Range/Median
Year
Age_0
Age_1
Age_2
Age_3
Age_4

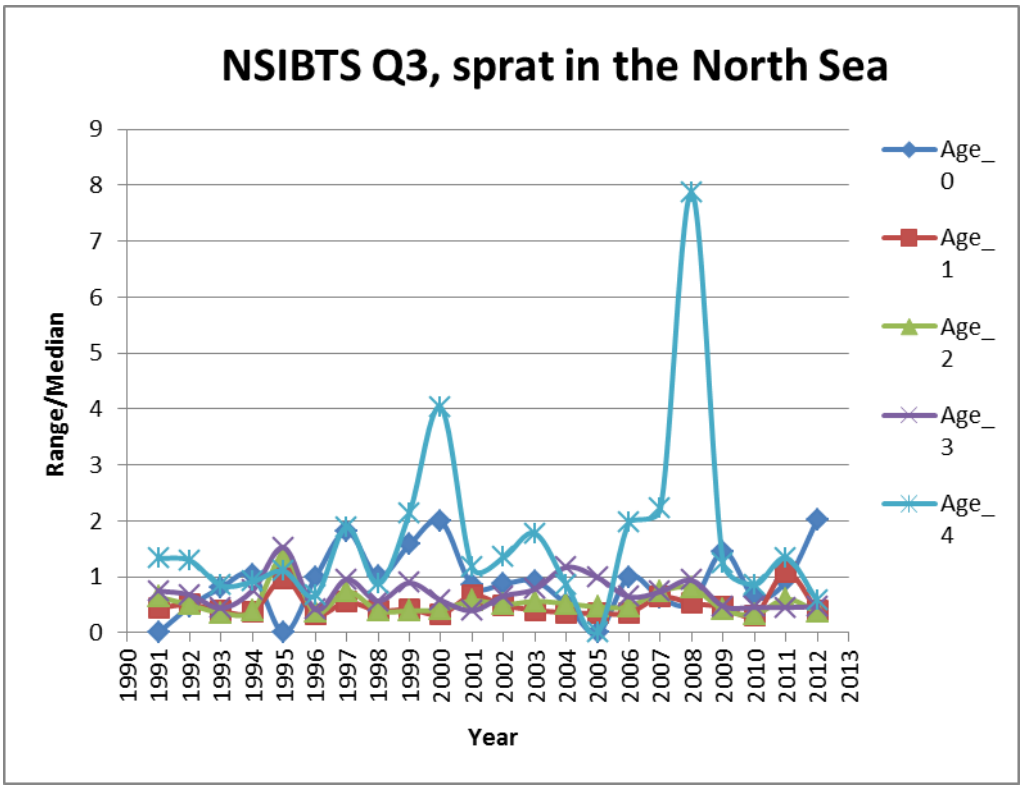


Figure 5.8. Precision estimate for individual species in NSIBSQ3 for the North Sea.

5.2.5 Participation in 2013

All regularly contributing countries intend to participate in the quarter 3 2013 IBTS survey program. Below is a table showing the expected program dates for each country for this year.

England	Cefas Endeavour	3 August to 3 September 2013
Denmark	Dana	31 July to 16 August 2013
Germany	Walther Herwig III	26 July to 22 August 2013
Norway	Johan Hjort,	4 July to 4 August 2013
Scotland	Scotia	31 July to 21 August 2013
Sweden	Dana	20 August to 31 August 2013

Norway asked to drop the station fished in 43F0 and UK (Cefas) have agreed to take on the responsibility for this station from 2013 onwards. This will be reflected in the review of the SISP for the North Sea to be completed after September 2013.

5.2.6 Staff exchange in 2012 between France and England

There is a recommendation from the IBTS working group as well as the SSGESST (SCICOM Steering Group on Ecosystem Surveys Science and Technology) that seagoing technical or scientific personnel take part in other countries' surveys in order to study trawling and biological sampling procedures onboard ships partaking in internationally coordinated programs.

There is a growing awareness within the ICES internationally coordinated monitoring programs of the usefulness of such an exchange between individual countries' vessels. This allows the study of each other's trawling and biological sampling procedures onboard ships, and may lead to new insights to improve one's own protocol.

During the 2011 Q1 survey, the scientist in charge of the Q3 English NSIBTS survey has participated in the IBTS North Sea survey (NSIBTS) on the French Research Ship Thalassa, and a working document on this exchange was presented during the IBTSWG 2011 (ICES, 2011). In return, Yves Vérin was invited by Cefas to participate to the 2012 quarter 3 survey carried out on the RV Endeavour between the 8th of August and the 9th of September. This survey is generally conducted in two parts and Yves joined the second half, between the 24th of August and the 9th of September, from Aberdeen to Lowestoft. A report of this experience is attached to this report as a working document (Annex 7; WD 4).

The work done on the Endeavour and the Thalassa were fully explained and compared in details in the working document presented at the WG 2011 by Cefas. The tables in the 2013 Working Document describe the main differences observed on the two vessels based on the 2011 Cefas report and observations during the Q3 cruise in August 2012. Remarks or improvements made on the Thalassa since Cefas exchange in IBTS Q1 2011 are also listed.

5.3 Northeastern Atlantic

5.3.1 General overview

In 2012, seven vessels from five countries performed 12 surveys along the Northeastern Atlantic IBTS area. A total of 989 hauls, were accomplished within 289 days at sea distributed between the first, third and fourth quarter (see Table 5.3.1.1 below for a complete summary of surveys, days at sea and hauls performed). Survey coverage has been reduced due to the cessation of the Cefas Q4 Western IBTS GFS (see below) and to the IPMA (Portugal) administrative and budgetary problems to carry out the PT-GFS Autumn survey, since the RV Noruega was under repair and not available on time for the survey. The number of valid tows detailed below is 965, with a decrease of 15% compared to the tows performed in 2011, and specially missing the information from the Portuguese coast, not covered by any other institute. Within these surveys are included, as in previous years, three spring surveys (Scotland, Northern Ireland and Spanish survey of the Gulf of Cádiz), as well as the common autumn and winter surveys.

Table 5.3.1.1. Summary of surveys, hauls and days at sea per country performed on the IBTS Northeastern Atlantic area.

Country	Survey	Hauls				Days
		Planned	Valid	Null	Total	
UK-Scotland	UK-SCO-Q1-SWC	60	64	-	64	22
	UK-SCO-Q3-Rock	40	36	-	36	13
	UK-SCO-Q4-SWC	63	63	3	66	22
UK-North Ireland	UK-NIGFS-Q1	60	60	7	67	26
	UK-NIGFS-Q4	60	59	-	59	13
Ireland	IGFS-Q4	170	172	6	178	45
France	FR-CGFS	103	96	7	103	26
	FR-EVHOE	150	134	-	134	42
Spain	SPPorc-Q3	80	85	-	85	30
	SPNGFS Q3-4	126	126	1	127	32
	SP-Gulf of Cádiz-Q1	41	33	-	33	8
	SP-Gulf of Cádiz-Q4	41	37	-	37	10
Total		994	965	24	989	289

Weather have been reported to be fairly good and has not affected the general surveys' development, although breakdowns and technical problems have meant some days lost for FR-EVHOE, SP-Gulf of Cádiz Q4, but the overall coverage remains being complete for the area excepting the Portuguese coast.

In this respect, the IBTSWG recognizes the efforts made during 2012 by IPMA to overcome the budgetary and administrative constraints of national scope, that turned unfeasible RV Noruega reparation or chartering of another research vessel on time to undertake 2012 PT-GFS. However IBTSWG is aware of the current operability of RV Noruega and the plan to conduct PT-GFS in autumn 2013 as well as the actions in place for the acquisition of a new research vessel.

France presented the plan to perform the CAMANOC ecosystem survey starting in September 2014 (see details under Section 5.3.5).

Spain presented the results of the inter-calibration experiment between the stern trawler RV *Cornide de Saavedra* (commonly used to perform SPNGFS and SPGCGFS) and the RV *Miguel Oliver*, a new 70-m stern trawler that will undertake the surveys

carried out by the former from 2013 onwards (Working Document: WD 2 in Annex 7). The inter-calibration was performed during the first leg of the SP-North Survey, covering the first two sectors with 59 valid hauls. Same methodology and gear were used on both vessels, apart from the old wooden doors, standard on the SPNGFS on the RV Cornide de Saavedra, that were replaced on Miguel de Oliver by the PolyValent Thyboron doors, which will be used from now on. Results of the experiment will also be presented to the assessment working groups that use the abundance indices, mainly WGHMM, but also WGEF and WGWIDE. The experiment has in analogy also been undertaken for the Gulf of Cádiz on 2013 SP-Gulf of Cádiz Q1, but results are still being analysed.

A summary of the biological sampling conducted within the IBTS NE Atlantic in 2012 is presented in Section 5.3.3 on Table 5.3.3.1.

5.3.2 Survey summaries by country

5.3.2.1 UK-Scotland: SCOGFS-Q1 (Western Division Bottom Trawl Survey*)

Nation:	UK (Scotland)	Vessel:	RV Scotia
Survey:	0312S (WIBTS Q1)	Dates:	19 February – 11 March 2012

Cruise:	Random stratified demersal trawling survey of the grounds off the north and west coast of Scotland - ICES Subarea VIa. Purpose of the cruise: Provision of cpue index for main commercial demersal species within ICES Subarea VIa. To obtain temperature and salinity data from the surface and seabed at each trawling station. Collect additional biological data in connection with the EU data collection framework (DCF). Opportunistic sampling using the Gulf 7 to determine densities of mackerel eggs within the area covered by the trawl survey.
Gear details:	GOV Trawl (BT 137) fitted with groundgear D. Gulf 7 plankton sampler.
Notes from survey (e.g. problems, additional work etc.):	No significant problems were encountered during the survey. The 2012 survey design was the same as that used in 2011 in that rather than relying on fixed trawling locations it has migrated to a new random-stratified survey design with trawl locations randomly distributed within 10 'a priori' sampling strata (see Figure 5.9 below). Trawls are undertaken on suitable ground as near to the specified sampling position as is practicable and within a radius of 5 nautical miles of the previously selected sample position. 57 out of 60 core sample positions were undertaken using these criteria, with 3 stations being dropped on account of bad weather or unsuitability of terrain. 3 replacement stations were completed to negate the impact of the dropped stations. A secondary list of additional stations was created at random for each of the sampling strata and the secondary station that was nearest to the dropped core location was chosen as the replacement. Three additional stations were completed and in addition one station was repeated. There were no foul hauls and a net total of 64 valid stations were completed during the survey. Despite encountering strong winds for large periods of the survey Scotia managed to proceed onwards - albeit at a reduced pace – for most of the survey with only 36 hours fishing time being lost to bad weather. Where possible trawls were standardized at 30 minutes duration, however factors such as large marks of fish on the sounder, bad weather and sparsity of trawlable ground in several locations resulted in the duration of 13 of the 64 valid trawls being less than the half hour. It should be noted however that there were no valid stations where the duration of the haul was less than 15minutes, thus complying with the recommendation as stated in the IBTS manual (ICES, 2012a). Similarly, the intention was to restrict fishing operations to the hours of daylight however time lost due to poor weather, coupled with the additional time spent sourcing new tows and running over prospective new trawl ground necessitated a relaxation of this policy with the result that 7 out of the 64 valid tows were conducted outwith the daylight period. Sweep length was altered according to bottom depth. 80m is the cutoff for deploying the 110m sweep rig, standardizing the configuration with the Irish VIa survey. This resulted in 6 of the shallower stations being completed using the 60m sweep rig and the remaining deeper 58 stations being completed using the 110m sweep rig. See also Figure 5.9 for distribution of short sweep tows. Oblique tows using the Gulf 7 sampler towed at 5 knots were completed was 16 occasions during 6 nights when Scotia was in close proximity to the shelf edge. Mini transects were performed straddling the 200m isobath from east to west in order to collect data on mackerel spawning. Stations were typically 15nm apart. Evidence of mackerel spawning was found at 10 of the 16 stations sampled with

	the largest concentrations (maximum = 81) being located NW of Donegal in the SW corner of the survey area (see Figure 5.10, left and right panels).
	The cpue index – numbers caught per 10 hours fishing - calculation for 1-group gadoids (cod, haddock, whiting and saithe) weights the indices for each of the 10 new sampling strata (Figure 5.9) by the surface area of said stratum. These are then pooled to produce the index for the ICES Subarea VIa. This is seen as a more unbiased and more precise method than the previous method that weighted the indices by the number of valid hauls within each of the previous strata (old demersal sampling areas). The indices for the 4 species can be found below in Table 5.3.2.1.

Table 5.3.2.1. New cpue indices for ICES Subarea VIa (ind caught/10 h) derived from the new survey strata and weighted according to area of each stratum for cod, haddock, whiting and saithe.

Species	Age.0	Age.1	Age.2	Age.3	Age.4	Age.5	Age.6	Age.7	Age.8	Age.9	year
cod	NA	12.13	25.30	23.51	4.26	4.03	2.53	4.84	0.69	0.00	2012
haddock	NA	130.31	170.59	3897.78	112.07	91.06	74.95	409.73	8.45	12.43	2012
whiting	NA	3251.28	312.66	861.59	85.90	15.54	5.90	7.41	2.58	0.00	2012
saithe	NA	0.00	0.33	40.27	17.62	1.22	1.06	0.75	0.62	0.25	2012

This is a new index and only 2 years old and as such is not comparable with the previous index that was created using the old demersal sampling areas and therefore the cpue values for previous years are not displayed.

Overall there was a significant increase in weight recorded for cod in 2012 with 21.24 kg/h caught compared with 9.58 kg/h in 2011. Haddock saw a small increase in 2012 with 153.4 kg/h recorded compared to 148.8 kg/h in 2011 whereas whiting in 2012 was 46.86 kg/h compared with 49.3 kg/h in 2011.

An 18% increase in the catch weight for mackerel was seen in 2012 with 11.2 tonnes being recorded compared to 9.2 tonnes for 2011. As in 2011, a large proportion (70%) of the mackerel observed were juveniles or subadults. Total weight of herring recorded for the survey continued to show a considerable decrease as compared to 2011 with only 1.6 tonnes for 2012 being recorded compared to 5.6 tonnes for 2011. Total catches of Norway Pout decreased in weight with 3.9 tonnes in 2012 compared with 7.4 tonnes in 2011. The survey recorded a total catch weight of 44.6 kg with 96 species being recorded for the survey. Unusual species of particular interest that were caught during the survey included a 220-cm bluntnose sixgill shark (*Hexanchis griseus*) that was caught and returned very much alive in haul 73 and a white skate (*Rostroraja alba*) that similarly was returned alive in haul 113. As regards the latter species this is only the second occurrence of this species on the fisheries management database that holds all the Scottish Bottom Trawl Survey data, the only occurrence being back in 1987.

Stations fished (aim to complete 60 valid tows per year)

ICES Divisions	Strata	Gear	Tows planned	Valid	Valid with rock-hopper	Additional	Invalid	% stations fished	comments
Via		GOV-D	60	64	57	4	0	107	
TOTAL			60	64	57	4	0	107	

Number of biological samples (maturity and age material, *maturity only):

Species	Age	Species	Age
Gadus morhua	238	*Pollachius pollachius*	5*
Melanogrammus aeglefinus	1208	*Scopthalmus rhombus*	2*
Merlangius merlangius	1094	*Conger conger*	6*
Pollachius virens	161	*Dipturus batis cf. intermedia* [1]	41*
Merluccius merluccius	454*	*Dipturus batis* [1]	2*
Lepidorhombus whiffiagonis	164	*Leucoraja naevus*	68*
Clupea harengus	763	*Raja clavata*	76*
Scomber scombrus	409	*Raja brachyura*	6*
Lepidorhombus boscii	1*	*Molva molva*	32*
Trisopterus esmarkii	307	*Raja montagui*	173*
Sprattus sprattus	302	*Mustelus mustelus*	4*
Lophius budegassa	10*	*Mustelus asterias*	11*
Psetta maxima	4*	*Leucoraja fullonica*	1*
Lophius piscatorius	28*	*Rostroraja alba*	1*
Brosme brosme	1*		

[1] **) See explanation on *Dipturus* with Section 5.1.1.2.**

CPUE data for major species in 2012 Q1:

Species	Strata	Mean nos/hr	Mean kgs/hr
Gadus morhua	All	8.37	21.242
Melanogrammus aeglefinus	All	478.71	153.41
Merlangius merlangus	All	532.92	46.857
Merluccius merluccius	All	42.71	19.566
Pollachius virens	All	6.23	6.088
Clupea harengus	All	733.34	63.574
Scomber scombrus	All	3739.77	387.871
Lophius piscatorius	All	0.95	2.506
Lepidorhombus whiffiagonus	All	8.81	1.863
Pleuronectes platessa	All	97.78	11.14
Microstomus kitt	All	30.63	3.699
Limanda limanda	All	156.25	8.669
Hippoglossoides platessoides	All	18.17	0.54
Glyptocephalus cynoglossus	All	3.88	0.45
Trachurus trachurus	All	1707.26	360.26
Trisopterus esmarkii	All	4259.83	131.069
Trisopterus minutus	All	228.77	8.932
Gadiculus argenteus	All	93.73	0.91
Argentina silus	All	0.92	0.02
Argentina sphyraena	All	93.9	4.976
Micromesistius poutassou	All	267.06	14.30
Scopthalmus rhombus	All	0.07	0.3

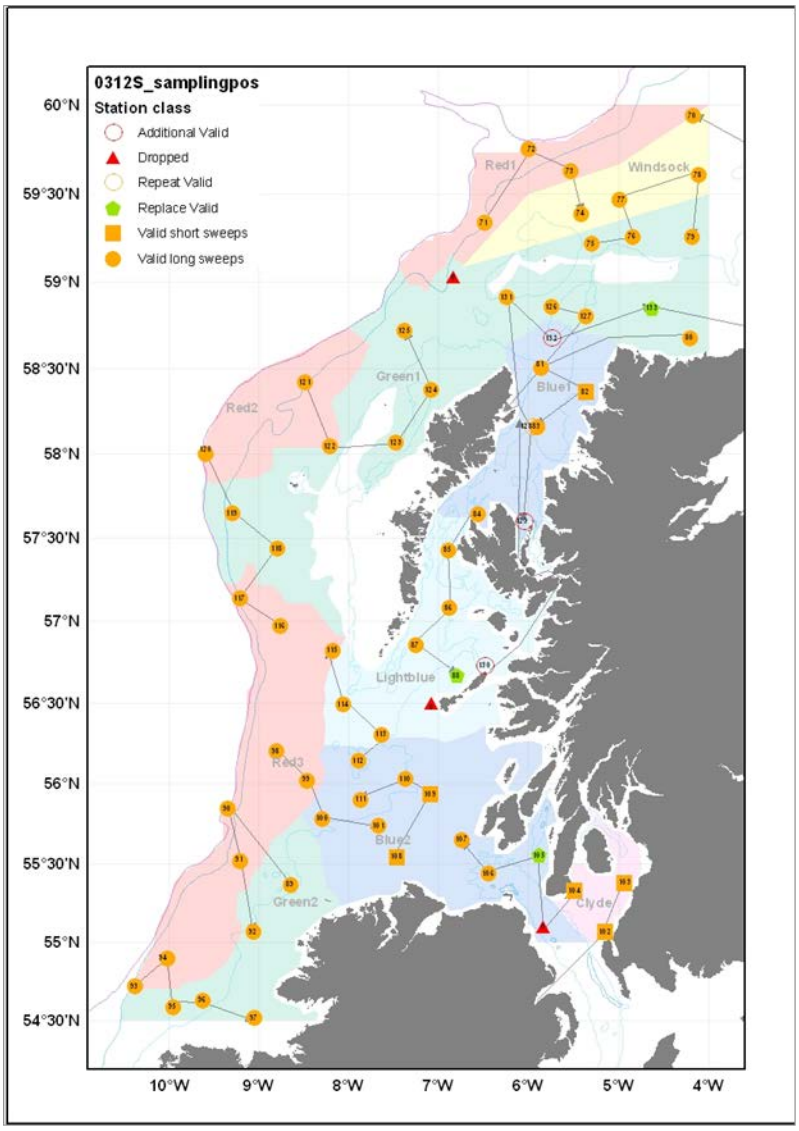


Figure 5.9. Trawl Positions for Scotland IBTS Q1 survey 2012 (Foul / Invalid tows displayed in red).

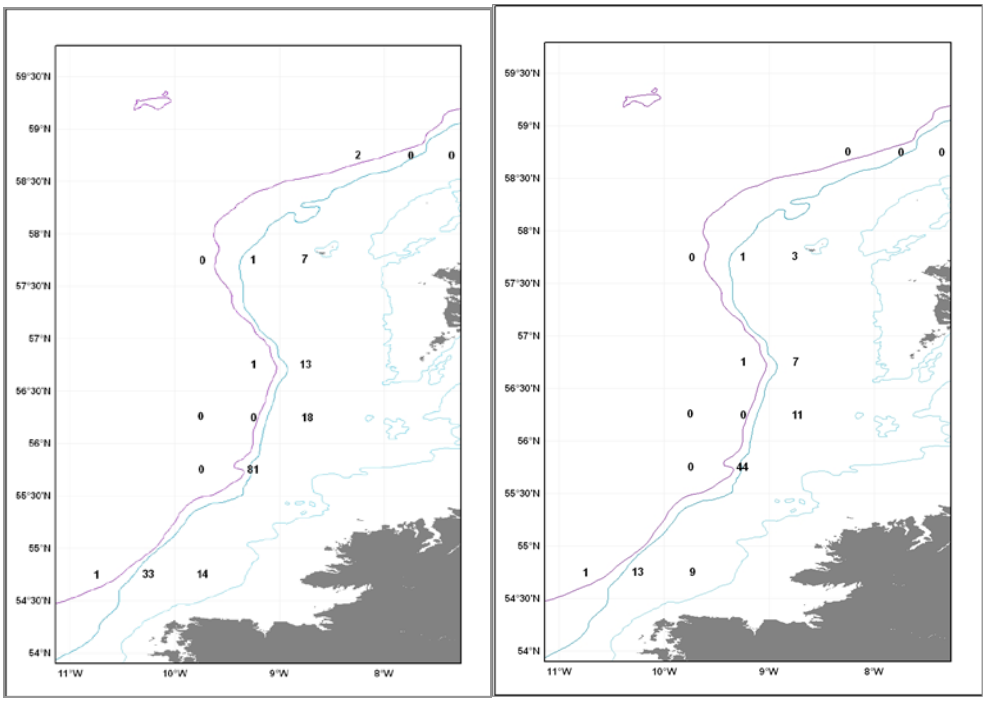


Figure 5.10. 0312S Gulf 7 deployments and total numbers of mackerel eggs present (left panel) and numbers of stage 1 mackerel eggs present (right panel). 100, 200 and 500-m isobaths are also provided for reference.

5.3.2.2 UK–Scotland: SCORoc Q3 West of Scotland Rockall Survey** Q3)

Nation:	UK (Scotland)	Vessel:	RV Scotia
Survey:	1112S Q3	Dates:	8 – 13 September 2012
Cruise	Q3 Rockall Haddock survey aims to collect data on the distribution, relative abundance and biological information (EU Data Directive 1639/2001) on haddock and a range of other fish species in ICES area VIb. Age data are collected for haddock, whiting, saithe and mackerel.		
Gear details:	The GOV was used throughout the cruise with groundgear "D". The SCANMAR system was used throughout the cruise to monitor headline height, wing spread, door spread and distance covered during each tow. A bottom contact sensor was attached to the groundgear for each tow and a temperature at depth sensor attached to the headline.		
Notes from survey (e.g. problems, additional work etc.):	This year the new survey design introduced in 2011 was modified to take into account the fact that no haddock were caught in any of the stations >300m in depth in 2011. Depth coverage was limited to 350m as opposed to 400 m. Trawl stations were selected randomly by computer over 4 depth strata: 0-150m, 150-200m, 200-250m, 250-350m. The total number of stations in each stratum was weighted according to the overall area of the strata and the relative importance regarding haddock as ascertained from previous surveys. If the ground at the precise location of the station proved to be unsuitable for trawling, the station was moved to the nearest trawlable ground within a maximum of 5 nm from the original site while remaining within the same depth stratum. There were no foul hauls. One haul in the 250-350m stratum was dropped due to the presence of gillnets to the north of Rockall. Fishing was carried out during daylight commencing each day at first light. Otoliths were aged subsequently at the laboratory. All haul summary data and length frequencies were entered at sea. A CTD was deployed at selected stations across the survey. At night video transects were made of the seabed. A total of 36 valid hauls were achieved.		
Number of fish species recorded and notes on any rare species or unusual catches:	55 species were caught during the survey for a total catch weight of 32885 kg. No cod were recorded this year and a total of only 6 saithe were recorded. There were large catches overall of blue whiting (> 11 tonnes) and grey gurnards (>13 tonnes). In contrast to 2011, 2012 showed evidence of very strong recruitment with > 14 thousand 0-groups being recorded for 10 hours fishing (Table 5.3.2.2). There were very small numbers of 1 year old through 6 year old fish, representing the poor state of recruitment since 2005 (Figure 5.11). Accordingly only 7 year old fish were present in good number, representing the strong year class of 2005. Again no haddock were recorded at depths greater than 300 m.		

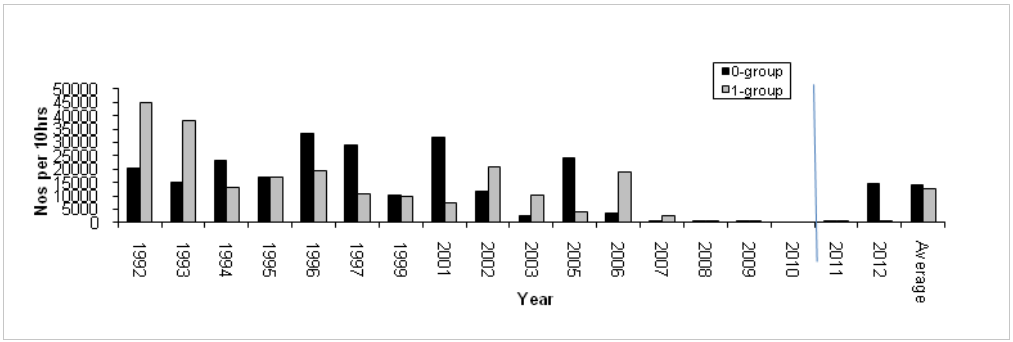


Figure 5.11. The provisional 0-group indices for haddock at Rockall in 2012, shown relative to the previous years and the long-term average since 1992. Blue vertical line represents starting date for application of the new survey design.

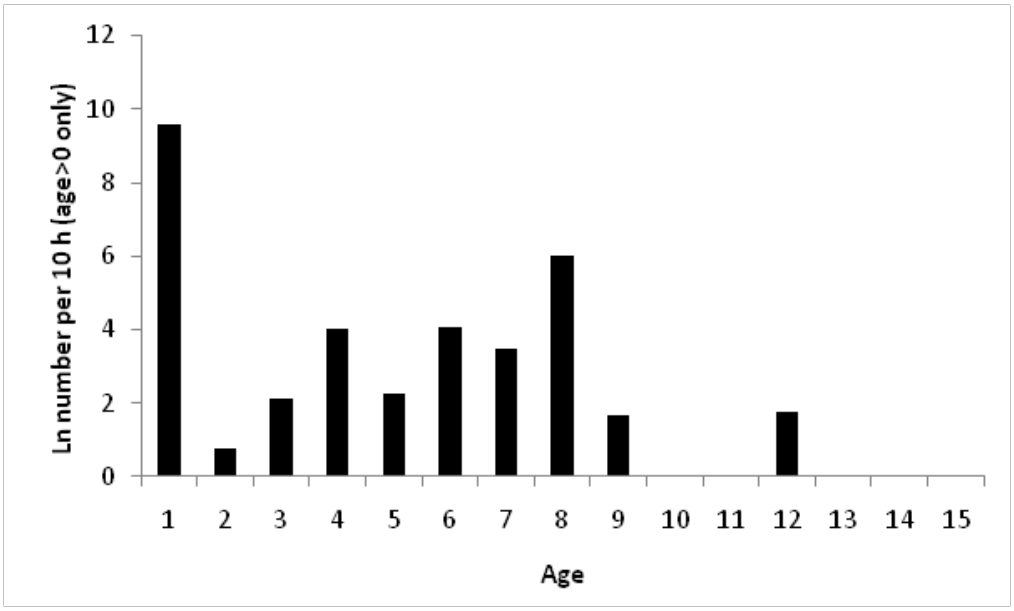


Figure 5.12. Abundance indices (log transformed) of haddock for each age class >0 in 2012 at Rockall. Actual values are displayed in Table 5.3.2.2.

Table 5.3.2.2. Abundance indices of haddock for each age class Rockall 2012.

Age	Ind/10 h
0	14779
1	2.2
2	8.5
3	55.8
4	9.6
5	59.3
6	32.0
7	413.0
8	5.3
9	0.4
10	0
11	5.8
12	0
13	0
14	0

Note: A total of 94 whiting were caught of which 93 were 0-gp individuals of size range 10-17cm with one 2 yr individual of 33cm.

Stations fished (aims: to complete 40 valid tows per year in ICES Subarea VIb)

ICES Divisions	Strata	Gear	Stations Planned	Valid Stations Achieved	Additional Stations	Invalid Stations	% Stations Achieved	Comments
VIb	All	GOV-D	40	36	0	0	90	

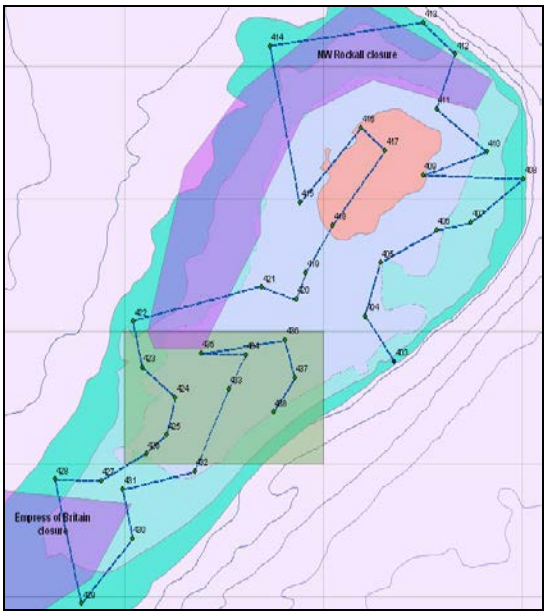
Q3 SCRocGFS cpue data for major species: 2012

Species	Strata	mean nos/hr	mean kg/hr
Micromesistius poutassou	All	8975	619.5
Eutrigla gurnardus	All	3277	743.6
Gadiculus argenteus	All	2505	46.7
Melanogrammus aeglefinus	All	2390	111.2
Trisopterus minutus	All	1021	53.2
Sebastes viviparus	All	557	65.6
Argentina sphyraena	All	386	26.2
Scomber scombrus	All	298	39.7
Microstomus kitt	All	83	9.4
Lepidorhombus whiffiagonis	All	70	11.6
Hippoglossoides platessoides	All	52	13.8
Glyptocephalus cynoglossus	All	12	2.4

Number of biological samples (maturity and age material):

Species	Ln/Wt/Mat/Age	Species	Ln/Wt/Mat/Age
Melanogrammus aeglefinus	638	*Dipturus batis cf. flossada**	23
Merlangius merlangus	72	*Dipturus oxyrinchus**	2
Pollachius virens	6	*Raja clavata**	9
Scomber scombrus	44	*Squalus acanthias**	6
		*Leucoraja naevus**	1

***maturity only**



Trawl stations completed at Rockall. Dashed blue line = approximate cruise track, numbered points = trawl positions (midpoints), Purple boxes = NEAFC closures for the protection of corals, green box = NEAFC closure for protection of haddock. Survey strata – red: 0–150m, light purple 150–200m, light blue: 200-250m mid-blue: 250–350m.

5.3.2.3 UK–Scotland: SCOGFS–Q4 (Western Division Bottom Trawl Survey Q4)

Nation:	UK (Scotland)	Vessel:	RV Scotia
Survey:	1612S	Dates:	13 November – 4 December 2012

Cruise	Q4 Western Groundfish survey aims to collect data on the distribution, relative abundance and biological information (in connection with EU Data Directive 1639/2001) on a range of fish species in ICES areas VI and VII. Age data were collected for cod, haddock, whiting, saithe, herring, mackerel and sprat.
Gear details:	GOV (+belly lines) with groundgear D for all stations.
Notes from survey (e.g. problems, additional work etc.):	66 valid hauls Scotia experienced moderate weather for the majority of this survey. This resulted in the trip achieving a total of 69 trawl hauls with the GOV. Of this total, 3 were assigned as foul hauls due to the level of gear damage sustained. The SCANMAR gear monitoring system and the NOAA bottom contact sensor were used throughout the survey to observe the gear performance.
Number of fish species recorded and notes on any rare species or unusual catches:	89 fish species were encountered during the survey for a total catch weight of 25,772 kg. Biological data were recorded for a number of species in accordance with the requirements of the EU Data Regulations. Catch of note was a dramatic increase in the number of streaked gurnards (*Trigloporus lastoviza*) encountered.

Stations fished (aims: to complete 63 valid tows per year)

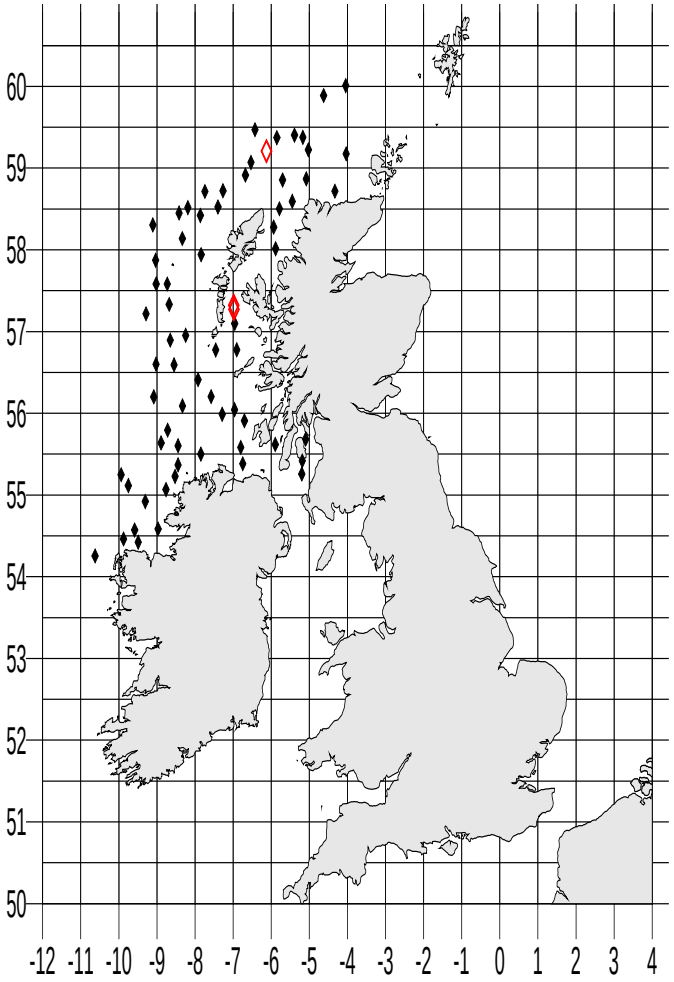
ICES Divs	Strata	Gear	Tows planned	Valid	Valid with rock–hopper	Additional	Invalid	% stations fished	comments
VI		GOV - D	63	63	-	-	3	100	
VII		GOV - D	3	3	-	-	-	100	(*)
	TOTAL		66	66			3	100	

(*) Undertaken at request of mackerel assessment group, WGWIDE

Number of biological samples (maturity and age material, *maturity only):

Species	Age	Species	Age
Clupea harengus	356	*Merluccius merluccius**	243
Gadus morhua	176	*Psetta maxima**	2
Melanogrammus aeglefinus	1006	*Pollachius virens*	259
Merlangius merlangus	714	*Scomber scombrus*	263
*Molva molva**	34	*Zeus faber**	80
*Dipturus batis cf. intermedia**[1]	60	*Spratus spratus*	180
*Dipturus batis **[1]	2	*Trispoterus esmarkii*	273
*Raja clavata**	66	*Raja brachyura**	1
*Leucoraja naevus**	66	*Raja montagui**	156

[1] **) See explanation on *Dipturus* with Section 5.1.1.2.**



Cruise track of Scotia during the Q4 WC – IBTS 2012 (1612S).

5.3.2.4 UK – Northern Ireland: Northern Irish Groundfish Survey Q4 2012 – Q4NIGFS

Nation:	UK (Northern Ireland)	Vessel:	RV Corystes
Survey:	41/12	Dates:	04-16 October 2012

Cruise	Q4 Irish Sea survey aims to collect data on the distribution and relative abundance, and biological information of commercial fish in VIIa. The primary species are cod, haddock and whiting, herring and plaice.
Gear details:	Rock-hopper otter trawl with a 17 m footrope fitted with 250 mm non-rotating rubber discs. SCANMAR sensors were fitted to gear and trawl parameters recorded, including trawl eye sensor.
Notes from survey (e.g. problems, additional work etc.):	Very little gear damage and relatively good weather meant very little fishing time was lost overall. One of the prime station had to be moved slightly due to a new windfarm. Expansion of existing and the construction of new windfarms, as well as the expansion of pot fishing areas, are becoming a problem in the eastern Irish Sea in terms of being able to fish at some historic stations for the full tow duration. Additional work included quantifying external parasite loads in whiting and cod by area and collection of tissue samples from mature cod and hake for a genetics study.
Number of fish species recorded and notes on any rare species or unusual catches:	Overall, 60 species of fish were recorded during the survey. A large haul of spurdog (*Squalus acanthias*) of 3250 kg (for 20 min tow) was caught off the Lambay Deep. Large catches of herring were common where > 0.5 t catches were recorded at 3 stations for 20 min tows. Unusual individual catches of interest were a sea lamprey (*Petromyzon marinus*), garfish (*Belone belone*) and a goldsinny wrasse (*Ctenolabrus rupestris*).

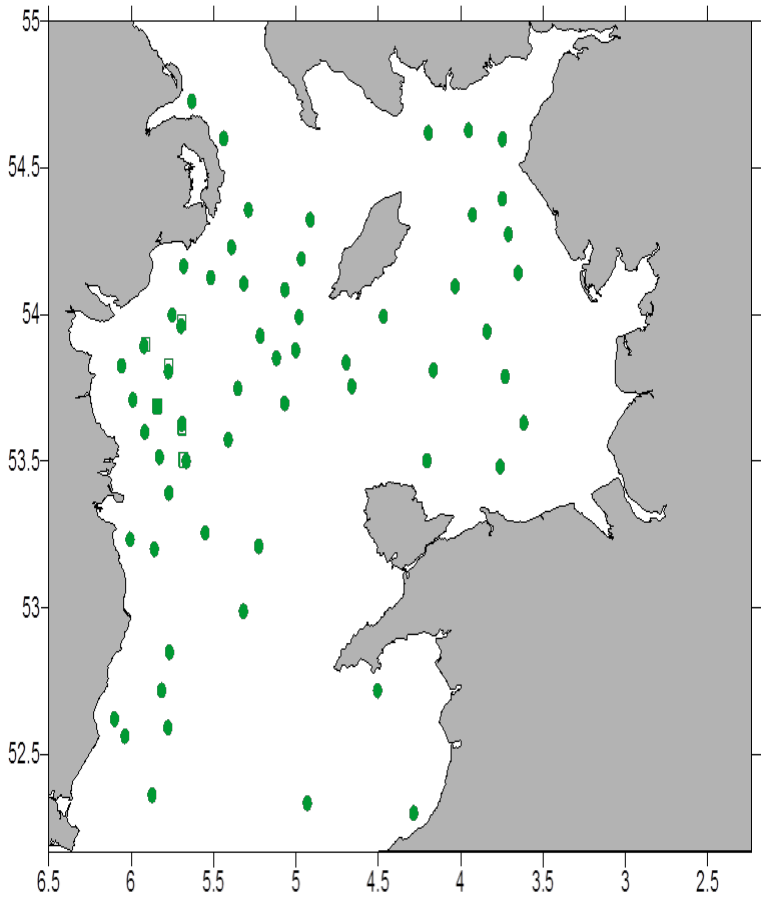
Stations fished (aims: to complete 60 valid tows per survey)

ICES Divisions	Strata	Gear	Tows planned	Valid	Additional	Invalid	stations fished %
VIIa	All	Rock-hopper	60	60	0	7	100
	TOTAL		60	60	0	7	100

Number of biological samples (maturity and age material):

Species	No	Species	No
Chelidonichthys cuculus	94	*Psetta maximus*	1
Conger conger	7	*Scophthalmus rhombus*	11
Dicentrarchus labrax	1	*Squalus acanthias*	199
Gadus morhua	65	*Zeus faber*	23
Melanogrammus aeglefinus	550		
Merlangius merlangus	1080		
Merluccius merluccius	33	*Raja brachyura**	30
Microstomus kitt	43	*Raja clavata**	40
Molva molva	1	*Raja montagui**	117
Pleuronectes platessa	238	*Leucoraja naevus**	22

*** Maturity only.**



Map of valid survey stations completed during the Northern Irish Q4 groundfish survey. Solid circles = valid hauls, Open squares = invalid hauls.

5.3.2.5 UK – Northern Ireland: Northern Irish Groundfish Survey Q1 2012 – Q1NIGFS

Nation:	UK (Northern Ireland)	Vessel:	RV Corystes
Survey:	10/12	Dates:	05 – 30 March 2012

Cruise	Q1 Irish Sea survey aims to collect data on the distribution and relative abundance, and biological information of commercial fish in VIIa. The primary species are cod, haddock, whiting, herring and plaice.
Gear details:	Rock-hopper otter trawl with a 17 m footrope fitted with 250 mm non-rotating rubber discs. SCANMAR sensors were fitted to gear and trawl parameters recorded.
Notes from survey (e.g. problems, additional work etc.):	Very little gear damage and relatively good weather meant very little fishing time was lost overall. Expansion of existing and the construction of new windfarms is becoming a problem in the eastern Irish Sea. Additional work included quantifying external parasite loads in whiting and cod by area, collecting fish maturity data and photographes for maturity workshop (WKMSGAD), collecting Sepiolidae samples and elasmobranchs samples for a PhD project.
Number of fish species recorded and notes on any rare species or unusual catches:	Overall, 70 species of fish were recorded during the survey. Large catches of herring were common where >0.5 t catches were recorded at 6 stations, with the largest catch off Dundrum Bay of 2.4 t for a 1 hr tow. A large catch of haddock (0.515 t) was observed off Lambay Deep in the western Irish Sea. Unusual individual catches of interest were butterfish (*Pholis gunnellus*) and salmon (*Salmo salar*) in the western Irish Sea, streaked gurnard (*Trigloporus lastoviza*) in the eatern Irish Sea, and sea bass (*Dicentrarchus labrax*) and pilchard (*Sardina pilchardus*) in the St Georges Channel.

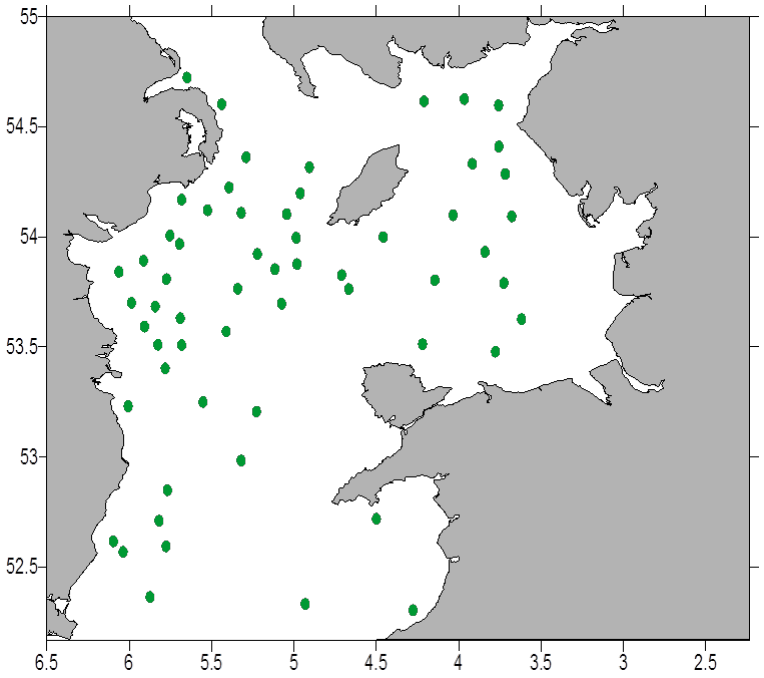
Stations fished (aims: to complete 60 valid tows per year).

ICES Divisions	Strata	Gear	Tows Planned	Valid	Additional	Invalid	stations fished %
VIIa		Rock-hopper	60	59	0	0	98
	TOTAL		60	59	0	0	98

Number of biological samples (maturity and age material).

Species	No	Species	No
Chelidonichthys cuculus	189	*Pollachius pollachius*	10
Conger conger	5	*Psetta maximus*	2
Dicentrarchus labrax	1	*Scophthalmus rhombus*	27
Gadus morhua	260	*Squalus acanthias*	32
Melanogrammus aeglefinus	668	*Zeus faber*	23
Merlangius merlangus	1372		
Merluccius merluccius	91		
Molva molva	3	*Leucoraja naevus* *	14
Pleuronectes platessa	582	*Raja brachyura* *	11
Lepidorhombus whiffiagonis	1	*Raja clavata* *	64
Microstomus kitt	114	*Raja montagui* *	104

*** Maturity only.**



Map of valid survey stations completed during the Northern Irish Q1 groundfish survey (filled circles: valid tows).

5.3.2.6 Ireland: IGFS (Irish Shelf Groundfish Survey Q3-Q4)

Nation:	Ireland	Vessel:	RV Celtic Explorer
Survey:	IGFS	Dates:	24 September – 7 October 2012 (VIa) 16 November – 16 December 2012 (VIIb,g,j)

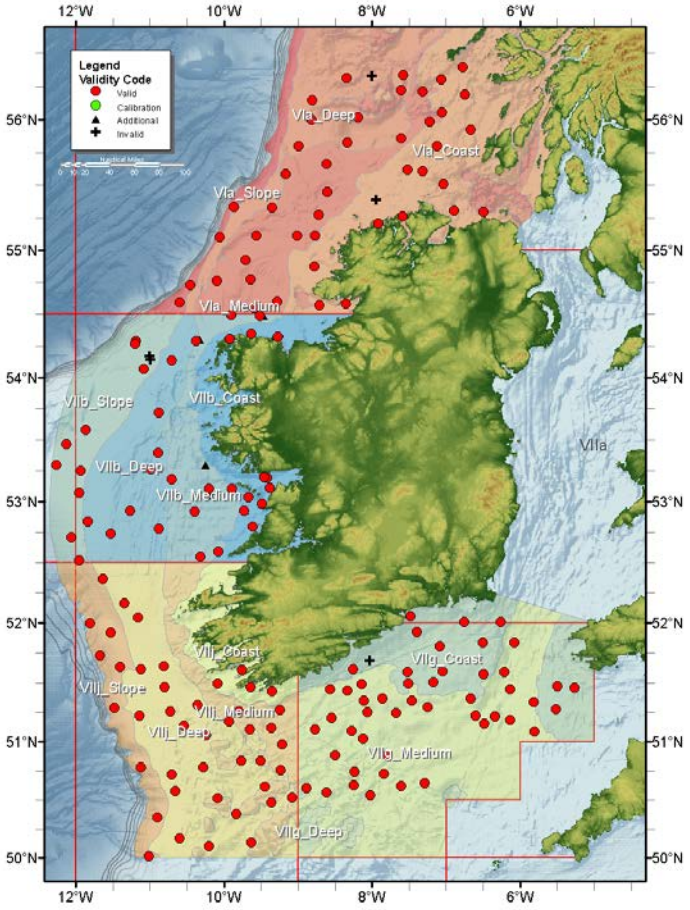
Cruise	The Q4 Irish Groundfish survey collects data on the distribution, relative abundance and biological parameters of commercial fish in VIa south, VIIb and VIIg,j north. The indicess currently utilized by assessment WG's are for haddock, whiting, plaice, cod, hake and sole. Survey data also provided for white and black anglerfish, megrim, lemon sole, saithe, ling, blue whiting and a number of elasmobranchs as well as several pelagics (herring, horse mackerel and mackerel). An additional deep-water strata (200-600m) was added in 2005 and is recently incoporated into the main survey area for index calculation.
Gear details:	Two gear survey since 2004, using GOV groundgear "A" for areas VIIb,g and j; and "D"for area VIa.
Notes from survey (e.g. problems, additional work etc.):	No significant weather disruption in 2012.
Number of fish species recorded and notes on any rare species or unusual catches:	In 2012, 79 species of fish, 16 elasmobranch, 10 cephalopod and 51 crustacean species were caught. As is evident in the table of survey trends below, hake (*M. merluccius*) was significantly up in both the Celtic Sea and west of Scotland. Horse mackerel (*T. trachurus*) catches were relatively higher this year in the Celtic Sea only, but not noticeably elsewhere . Overall, small hall were a dominant component of the catches in 2012, with very low biomass west of 9 degrees in the Celtic Sea.

Stations fished (aim to complete 170 valid tows per year).

ICES Divisions	Strata	Gear	Tows planned	Valid	Additional	Invalid	stations fished %	comments
VIa	All	D	45	44	2	2	102	
VIIb,c	All	A	38	37	7	3	123	
VIIg	All	A	46	49	0	1	104	
VIIj	All	A	40	42	0	0	105	
	TOTAL		170	172	0	6		

Number of biological samples (maturity and age material, *maturity only, ** additional/triennial sampling):

Species	No	Species	No
Clupea harengus	568	*Lophius budegassa*	101
Gadus morhua	229	*Lophius piscatorius*	288
Melanogrammus aeglefinus	2002	*Molva molva*	88
Merlangius merlangus	2161	*Solea solea*	141
Merluccius merluccius	827	*Scomber scombrus*	1099
Micromesistius poutassou	796	*Trachurus trachurus*	832
Pollachius virens	233	**Raja brachyura*	19
Lepidorhombus whiffiagonis	1003	**Raja clavata*	303
Microstomus kitt	614	**Leucoraja naevus*	114
Pleuronectes platessa	1197	**Raja montagui*	417



Map of survey stations completed by the Irish Groundfish Survey in 2012. Valid: red circles; Invalid: crosses. Survey strata are bounded by feint grey lines relating to the 80m, 120m, 200m and 600m contours respectively with an agreed arbitrary survey limit running north–south in VIIc.

Biomass and numbers of individual species caught: Year estimate 2012 (y_i); previous year estimate 2011 (y_{i-1}); average of last two years estimate ($y_{(i,i-1)}$); average of the previous three year estimates 2008-10 ($y_{(i-2,i-3,i-4)}$). As results for survey trends are ratios they are sensitive to stocks with high variance, therefore comparing the 2 yr vs. 5 yr trend is advisable.

Biomass and number estimates								
			Biomass index			Number index		
Species	Strata	Valid tows	yi	yi/yi–1	y(i,i–1)/ y(i–2,i–3,i–4)	yi	yi/yi–1	y(i,i–1)/ y(i–2,i–3,i–4)
			kg/h	%	%	Ind/hr	%	%
Gadus morhua	VIa	44	4.0	-21.6	-22.0	4.0	18.9	-11.1
Melanogrammus aeglefinus	VIa	44	166.0	18.4	229.7	407.2	-12.5	179.5
Clupea harengus	VIa	44	131.0	-77.4	1327.2	823.4	-74.2	575.7
Merluccius merluccius	VIa	44	23.5	22.4	-30.2	133.5	325.0	-25.1
Trachurus trachurus	VIa	44	299.2	-39.7	110.5	1488.9	-46.2	86.1
Scomber scombrus	VIa	44	210.5	-23.2	49.5	1974.2	-3.9	103.7
Lepidorhombus whiffiagonis	VIa	44	2.1	-7.4	37.1	7.3	-12.7	18.4
Lophius piscatorius	VIa	44	3.6	101.3	42.5	1.6	69.8	54.2
Pleuronectes platessa	VIa	44	18.1	0.2	106.0	108.8	-8.9	91.2
Solea solea	VIa	44	0.7	-0.4	110.8	2.6	-1.8	74.9
Micromesistius poutassou	VIa	44	67.8	-19.6	-19.6	1255.8	-68.0	-30.3
Merlangius merlangus	VIa	44	85.6	36.5	38.7	480.5	53.3	-22.9
Gadus morhua	VIIbgj	128	7.4	-37.1	217.5	2.2	-66.5	65.2
Melanogrammus aeglefinus	VIIbgj	128	92.7	-51.0	-33.6	269.6	-69.4	-74.3
Clupea harengus	VIIbgj	128	48.7	104.9	36.5	662.0	112.4	34.3
Merluccius merluccius	VIIbgj	128	42.3	169.3	1.2	826.1	214.5	118.6
Trachurus trachurus	VIIbgj	128	11.3	442.6	-92.8	267.1	1481.3	-78.1
Scomber scombrus	VIIbgj	128	210.2	103.2	106.0	3283.8	4.0	243.7
Lepidorhombus whiffiagonis	VIIbgj	128	3.8	-34.5	-5.6	18.6	-37.1	-31.8
Lophius piscatorius	VIIbgj	128	5.9	-15.2	29.2	3.7	-44.5	36.6
Pleuronectes platessa	VIIbgj	128	6.0	-40.2	-4.7	35.4	-40.9	-9.9
Solea solea	VIIbgj	128	0.2	-75.7	-2.7	0.8	-76.7	-2.5
Micromesistius poutassou	VIIbgj	128	54.3	35.0	-47.0	1641.8	-19.5	-45.0
Merlangius merlangus	VIIbgj	128	130.0	-30.0	54.3	807.5	-41.2	4.6

5.3.2.7 UK – England: EN_Cefas-A,B (Western Area Groundfish Survey Q4)

Cessation of the Cefas Q4 Western IBTS Groundfish Survey

In 2011, the UK government brought in austerity measures that affected UK government departments. Defra was affected by this and cuts had to be made to their overall budgets. Cefas needed to find savings from their national program and one of the outcomes of this was that a decision was made to halt one of the primary IBTS surveys. STECF and the EU Commission were informed of this decision and in order to mitigate some of the criticisms, particularly by STECF, Cefas agreed to attempt a reduced Celtic Sea survey in 2012. However the decision was taken to move the timing of this new survey into the first quarter in order to make better use of daylight and having the added advantage of fishing during the peak of spawning for the target species. A trial survey was carried out in February 2013. Cefas has yet to analyse and interpret the results from this trial, however initial evidence suggest that, further work is required for this survey to meet all of the aims of a successful IBTS survey.

5.3.2.8 France: FR-EVHOE (Celtic Sea/Bay of Biscay Groundfish Survey Q4)

Nation:	**France**	**Vessel:**	**RV Thalassa**
Survey:	EVHOE 2012	Dates:	18 October – 1 December 2012

Cruise	EVHOE groundfish survey aims to collect data on the distribution and relative abundance, biological information of all fish and selected commercial invertebrates in subareas VIIf-j VIIIa,b. The primary species are hake, monkfish, anglerfish, megrim, cod, haddock and whiting, with data also collected for all other demersal and pelagic fish. CTD temperature and salinity profiles are recorded at each trawling position. Sampling design is stratified random.
Gear details:	A GOV with standard groundgear (A) but no kite replaced by 6 extra floats. Marport device for doors, wings, and vertical net opening.
Notes from survey (e.g. problems, additional work etc.):	86% of the initial program was achieved: i e 134 over 155 stations with 130 being valid ; Thalassa was out of order during 3 days at the end of the leg1 .This caused reduction in the number of hauls performed. • 10 videos transects in VIIj in deep waters (400 – 800m) for location of corals reefs. • 19 'boxes' of profiles with the SMFH (multi beam echosounders) were realized at night or after trawlings at the end of the day. • Sorted and determined benthos at each trawl station. • Marine litter recorded (counted and weighted) at each trawl station. • Observers for birds and mammals during legs1 and two (Bay of Biscay and South Celtic Sea) Additionnal work: • collecting tissue sample from hake for genetic studies • Survival rates on rays and *Squalus acanthias* Trawls informations not yet available due to problem of integration of Marport output data.
Number of fish species recorded and notes on any rare species or unusual catches:	177 species recorded.

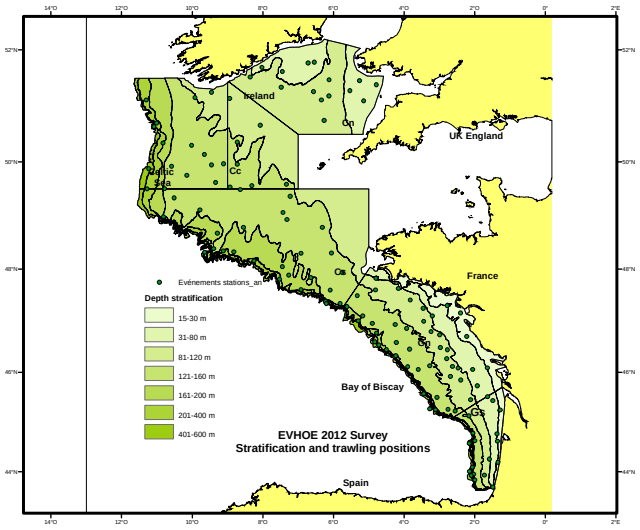
Stations fished

ICES Divisions	Strata	Tows planned	Valid	Additional	% stations fished	comments
VII	Cc3	9	5		55%	
	Cc4	20	12		60%	
	Cc5	3	2		67%	
	Cc6	3	3		100%	
	Cc7	2	2		100%	
	Cn2	7	8	1	114%	
	Cn3	7	7		100%	
	Cs4	20	14		70%	

ICES Divisions	Strata	Tows planned	Valid	Additional	% stations fished	comments
	Cs5	10	8		80%	
	Cs6	3	2		67%	
	Cs7	2	2		100%	
VIII	Gn1	3	3		100%	
	Gn2	4	5	1	125%	
	Gn3	16	16		100%	
	Gn4	21	16		76%	
	Gn5	3	4	1	133%	
	Gn6	2	3	1	150%	
	Gn7	2	1		50%	
	Gs1	3	3		100%	
	Gs2	3	3		100%	
	Gs3	3	3		100%	
	Gs4	3	3		100%	
	Gs5	2	1		50%	
	Gs6	2	2		100%	
	Gs7	2	2		100%	
TOTAL		155	130	4	84%	

Number of biological samples (maturity and age material, *only maturity, weight, length no age):

Species	Age	Species	Age
Merluccius merluccius	967	*Lophius piscatorius*	243
Gadus morhua	57	*Solea solea*	71
Melanogrammus aeglefinus	344	*Pleuronectes platessa*	146
Merlangius merlangus	413	*Chelidonichyis cuculus*	153
Lepidorhombus whiffiagonis	156	*Micostomus kitt*	121
Lophius budegassa	190	*Glyptocephalus cynoglossus*	77
Dicentrarchus labrax	185	*Mullus surmuletus*	35



Map of station positions and depth strata for the EVHOE 2012 Q4 survey.

5.3.2.9 France: FR-CGFS (The Channel Groundfish Survey Q4)

Nation:	France	Vessel:	RV Gwen Drez
Survey:	CGFS12	Dates:	2 – 27 October 2012

Cruise	The first objective of the Channel Ground Fish Survey carried out every year in October since 1988 is to collect data on the distribution, the relative abundance, and biological information on commercial fish in in the Eastern English Channel and the south of the North Sea. The most important species are cod (*Gadus morhua*), whiting (*Merlangus merlangius)*, plaice (*Pleuronectes platessa*), striped red mullet (*Mullus surmuletus*) and bass (*Dicentrachus labrax*)
Gear details:	The gear used is a GOV trawl adapted to the ship power. The headline and the groundrop are respectively 19.70 m and 25.90 m long. The mesh size in the codend is 10mm (20 mm stretched). To record the main trawl parameters, SCANMAR sensors are used. Hydrological (temperature, salinity) parameters are gathered thanks to NKE sensor hang up on the headline.
Notes from survey (e.g. problems, additional work etc.):	96 valid hauls were carried out in the whole area at the same position as every year but seven hauls were not validated because of trawl damages. Some specimen of fish were gathered to determinate the trophic level.
Number of fish species recorded and notes on any rare species or unusual catches:	Overall, 70 species of fish were recorded during the survey. Benthos fauna were identified and counted by species. Total biomass and abundance area decreasing compared with 2011 mainly due to the fall of plaice, striped red mullet, dab (*Limanda limanda*) and pout (*Trisopterus luscus*).

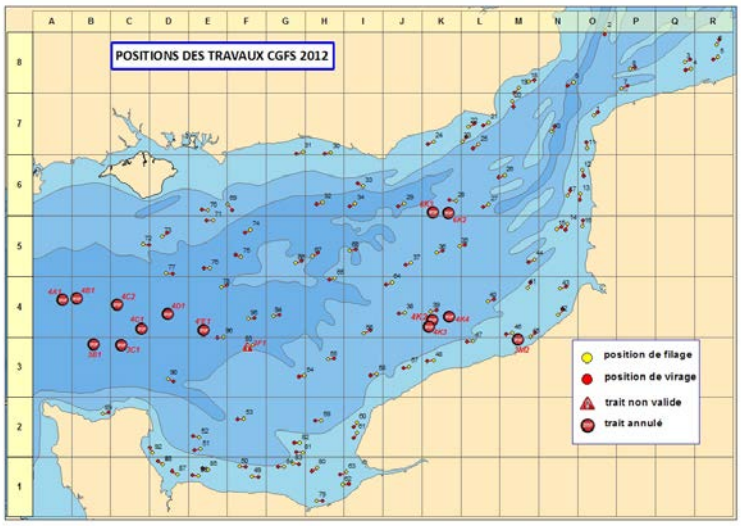
Stations fished (aims: to complete 103 valid tows per year)

ICES Divisions	Strata	Gear	Tows planned	Valid	Additional	Invalid	% stations fished	comments
VIId, IVc,		GOV	103	96	0	7	93%	
	TOTAL		103	96	0	7		

Number of biological samples (maturity and age material):

Species	Age	Species	Age
Gadus morhua	41	*Pleuronectes platessa*	211
Merlangius merlangus	243	*Mullus surmuletus*	78
Dicentrachus labrax	166		

***maturity only.**



Map of station positions for CGFS 2012, Quarter 4.

5.3.2.10 Spain: SP-PorcGFS (The Porcupine Groundfish Survey Q3)

Nation:	SP (Spain)	Vessel:	RV: Vizconde de Eza
Survey:	Porcupine 2012	Dates:	1 - 30 September 2012

Cruise	Spanish Porcupine bottom trawl survey aims to collect data on the distribution and relative abundance, and biological information of commercial fish in Porcupine bank area (ICES Division VIIb-k). The primary target species are hake, monkfish, white anglerfish and megrim, which abundance indices are estimated by age, with abundance indices also estimated for *Nephrops*, four-spot megrim (*Lepidorhombus boscii*) and blue whiting (*Micromesistius poutassou*). Data collection is also collected for several other demersal fish species and invertebrates.
Survey Design	This survey is random stratified with two geographical strata (northern and southern) and 3 depth strata (170–300 m, 301–450 m, 451–800 m). Stations are allocated at random according to the strata surface.
Gear details:	Porcupine baca 39/52 (Otter trawl gear)
Notes from survey (e.g. problems, additional work etc.):	Weather conditions good during most of 2012 survey, with only one day in which it was impossible to work. A day and a half was lost at the beginning of the survey due to administrative problems due to Spanish problems in permit application. Additional work undertaken included 91 CTD casts at most trawl stations and in non-trawlable areas to obtain a general image of the hydrography. Due to time constrains only 2 boxcorer were carried out
Number of fish species recorded and notes on any rare species or unusual catches:	First estimates: Overall, 98 species of fish, 42 crustaceans, 32 molluscs and 26 echinoderms species were recorded during the survey.

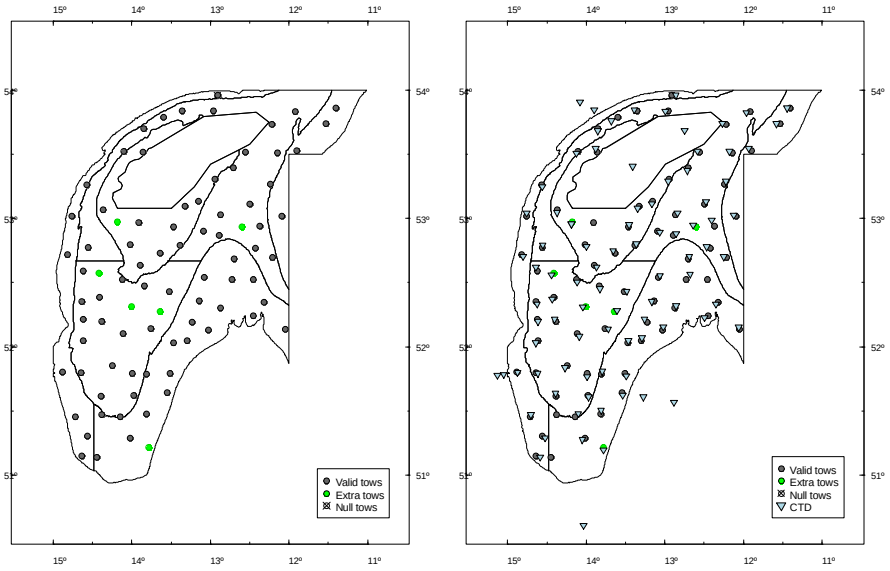
Stations fished (aims: to complete 80 valid tows per year)

ICES Divisions	Strata	Gear	Tows planned	Valid	Additional	Invalid	% stations fished	comments
VIIcb-k	All	Porcupine baca 39/52	80	79	6	-	98.8%	Also available by depth and geographical strata
	TOTAL		80	79	6	-	98.8%	

Number of biological samples (maturity and age material):

Species	Age	Species	Age
Merluccius merluccius	996	*Molva molva*	112
Lepidorhombus whiffiagonis	749	*Conger conger*	39
Lepidorhombus boscii	341	*Helicolenus dactylopterus*	200
Lophius budegassa	36	*Phycis blennoides*	150
Lophius piscatorius	234		
Scomber scombrus	12		
*Nephrops norvegicus**	409		

***maturity only.**



Trawl stations in Porcupine 2012 survey (left panel), CTD stations in relation to trawl stations (right panel).

Biomass and number estimates

			Biomass index			Number index		
Species	**Strata**	**Valid tows**	**yi kg/30 min**	**yi/yi−1 %**	**y(i,i−1)/ y(i−2,i−3,i−4) %**	**yi Ind/30 min**	**yi/yi−1 %**	**y(i,i−1)/ y(i−2,i−3,i−4) %**
Merluccius merluccius	All	79	44.58	47.6	56.8	39.90	7.4	-11.0
Lepidorhombus whiffiagonis	All	79	10.82	10.2	36.9	130.21	2.9	14.7
Lepidorhombus boscii	All	79	8.70	28.3	31.6	120.07	32.6	43.4
Lophius budegassa	All	79	0.92	22.7	59.6	0.41	41.4	-11.0
Lophius piscatorius	All	79	10.70	51.6	23.8	2.85	46.2	24.8
Micromesistius poutassou	All	79	175.99	52.9	10.3	1853.75	28.4	-30.1
Nephrops norvegicus	All	79	0.43	-20.4	5.4	8.72	-35.2	-24.1

y_i, year estimate (2012); y_{i-1}, previous year estimate (2011); $y_{(i,i-1)}$, average of last two year estimates (2012 and 2011); $y_{(i-2,i-3,i-4)}$, average of the previous three year estimates (2008–2010).

5.3.2.11 Spain: Sp-North (Spanish North Coast Survey Q3-Q4)

Nation:	SP (Spain)	Vessel:	Cornide de Saavedra
Survey:	N12	Dates:	21 September – 22 October 2012

Cruise	Spanish North Coast bottom trawl survey aims to collect data on the distribution and relative abundance, and biological information of commercial fish in ICES Divisions VIIIc and Northern IXa. The primary species are hake, monkfish and white anglerfish, megrim, four-spot megrim, blue whiting and horse mackerel abundance indices are estimated by age, with abundance indices also estimated for *Nephrops*, and data collection for other demersal fish and invertebrates.
Survey Design	This survey is random stratified with five geographical strata along the coast and 3 depth strata (70-120 m, 121–200 m, 201–500 m). Stations are allocated at random within the trawlable stations available according to the strata surface.
Gear details:	Standard baca 36/40
Notes from survey (e.g. problems, additional work etc.):	Additional work undertaken included CTD casts at all trawl stations and ground sediment samples with a cylinder attached to the groundrope. Seabirds census was also carried out during fishing manoeuvres. Analyses of stomach contents of main demersal species was performed in all hauls during the survey. As in previous years 2 additional hauls were done to cover shallow stations between 30 and 70 m although gillnets set in some of the planned areas reduced the opportunities for sampling in shallow waters. Furthermore, additional tows were conducted at 9 deep stations between 500 and 700 m. An intercallibration with the RV *Miguel Oliver* was carried out during the Galician part of the survey to prepare the replacement of the RV *Cornide de Saavedra* (see working document WD 2 in Section 7). Callibration hauls in the French EEZ were not planned due to schedule constrains
Number of fish species recorded and notes on any rare species or unusual catches:	A total of 302 species were captured, 106 fish species, 53 crustaceans, 39 molluscs, 24 echinoderms and 22 other invertebrates.

Stations fished (aims: to complete 111 valid tows per year)

ICES Divisions	Strata	Gear	Tows planned	Valid	Additional	Invalid	% stations fished	comments
VIIIc	All	Standard baca	96	96	9(1)	0	100%	Also available by depth
IXa North	All	Standard baca	19	19	2(1)	0	100%	
	TOTAL		126	115	11	1	100%	

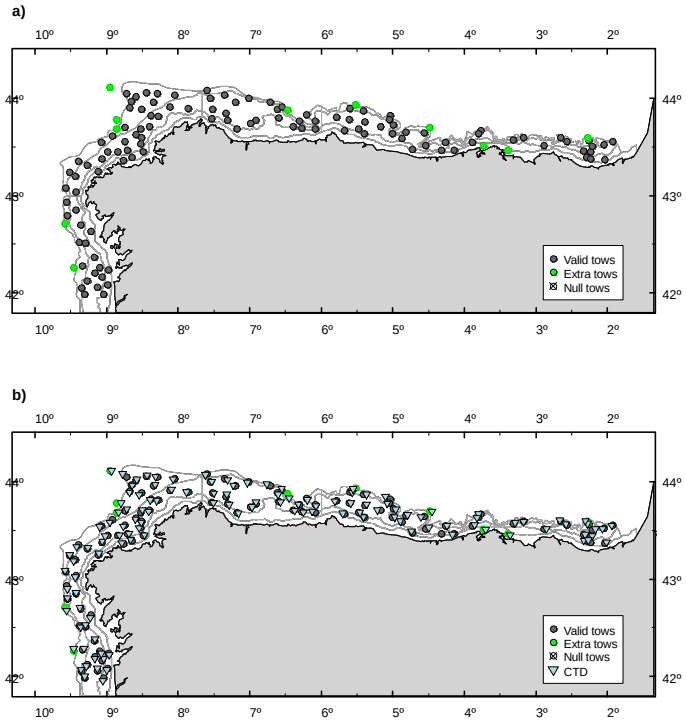
(1) Additional hauls on shallow and deep grounds.

Number of biological samples (maturity and age material):

Species	Age	Species	Age
Merluccius merluccius anual ALK	687	*Merluccius merluccius* daily growth	320
*Lepidorhombus whiffiagonis**	400 (384)	*Scomber colias*	20
*Lepidorhombus boscii**	505 (502)	*Trisopterus luscus*	349
Lophius budegassa	98	*Helicolenus dactylopterus*	200
Lophius piscatorius	99	*Phycis blennoides*	146
Trachurus trachurus	407	*Conger conger*	199
Micromesistius poutassou	1001	*Engraulis encrasicolus*	343
Scomber scombrus	428	*Zeus faber*(1)	150

*** Total number of otoliths collected, in brackets number eventually read.**

(1) Specimens frozen to be processed in the laboratory.



Trawl stations in Northern Spanish Shelf 2012 survey (top panel), CTD stations in relation to trawl stations (bottom panel).

Biomass and number estimates

			Biomass index			Number index		
Species	**Strata**	**Valid tows**	**Yi kg30 min**	**yi/yi −1 % incr.**	**y(i,i−1)/ y(i−2,i−3,i−4) % incr.**	**Yi Ind/30 min**	**yi/yi −1 % incr.**	**y(i,i−1)/ y(i−2,i−3,i−4) % incr.**
Merluccius merluccius	VIIIc	96	7.71	0.9	26.0	278.2	30.6	1.3
Lepidorhombus boscii	VIIIc	96	6.28	26.1	63.2	87.2	16.6	56.2
Lepidorhombus. whiffiagonis	VIIIc	96	1.67	-22.7	105.9	10.9	-47.0	115.0
Lophius budegassa	VIIIc	96	0.66	4.8	115.0	0.9	39.3	79.5
Lophius piscatorius	VIIIc	96	1.25	38.9	-35.1	1.2	-3.9	-45.9
Micromesistius poutassou	VIIIc	96	68.56	75.8	1.8	2658.2	248.1	-39.8
Nephrops norvegicus	VIIIc	96	0.03	-25.0	250.0	0.4	-37.9	111.2
Trachurus trachurus	VIIIc	96	7.5	25.6	-28.3	419.7	232.0	-6.1
Scomber scombrus	VIIIc	96	1.24	-55.1	134.4	13.3	-77.0	240.4

y_i, year estimate (2012); y_{i-1}, previous year estimate (2011); $y_{(i,i-1)}$, Average of last two year estimates (2012 and 2011); $y_{(i-2,i-3,i-4)}$, Average of the previous three year estimates (2008–2010).

Biomass and number estimates:

			Biomass index			Number index		
Species	**Strata**	**Valid tows**	**yi kg/30 min**	**yi/yi−1 % incr.**	**y(i,i−1)/ y(i−2,i−3,i−4) % incr.**	**yi Ind/30 min**	**yi/yi−1 % incr.**	**y(i,i−1)/ y(i−2,i−3,i−4) % incr.**
Merluccius merluccius	IXaN	19	11.96	-21.3	-6.3	389.4	1.7	-22.7
Lepidorhombus boscii	IXaN	19	4.18	39.8	22.6	57.8	36.6	-11.0
Lepidorhombus whiffiagonis	IXaN	19	0.01	-88.9	-59.5	0.1	-92.1	-57.7
Lophius budegassa	IXaN	19	0.39	-40.0	6.1	0.2	33.3	-44.1
Lophius piscatorius	IXaN	19	0.48	700.0	35.0	0.3	480.0	-13.6
Micromesistius poutassou	IXaN	19	70.27	199.4	-20.5	2809.6	367.4	-13.0
Nephrops norvegicus	IXaN	19	0.01	0.0	-62.5	0.1	-41.7	-80.2
Trachurus trachurus	IXaN	19	0.44	-70.3	-31.6	13.7	103.0	-72.5
Scomber scombrus	IXaN	19	0.64	-96.7	37.9	4.2	-98.8	86.2
Merluccius merluccius	All	111	8.44	-5.6	15.3	297.3	22.8	-5.9
Lepidorhombus boscii	All	111	5.92	27.6	57.1	82.1	18.7	43.8
Lepidorhombus whiffiagonis	All	111	1.38	-23.3	101.3	9.1	-47.3	111.3
Lophius budegassa	All	111	0.61	-3.2	86.0	0.7	39.6	62.8
Lophius piscatorius	All	111	1.11	48.0	-33.7	1.1	0.0	-45.4
Micromesistius poutassou	All	111	68.85	89.5	-2.4	2684.2	264.9	-36.4
Nephrops norvegicus	All	111	0.02	-33.3	25.0	0.4	-37.5	56.9
Trachurus trachurus	All	111	6.28	20.8	-28.4	349.9	230.6	-7.8
Scomber scombrus	All	111	1.14	-79.7	73.1	11.7	-89.1	140.0

y_i, year estimate (2012); y_{i-1}, previous year estimate (2011); $y_{(i,i-1)}$, Average of last two year estimates (2012 and 2011); $y_{(i-2,i-3,i-4)}$, Average of the previous three year estimates (2008-2010).

5.3.2.12 Spain: SP-GC-Q1 : (Spanish Gulf of Cadiz Bottom Trawl Survey)

Nation:	SP (Spain)	Vessel:	Cornide de Saavedra
Survey:	Q1 SP-GCGFS (ARSA 0312)	Dates:	19–26 March 2012

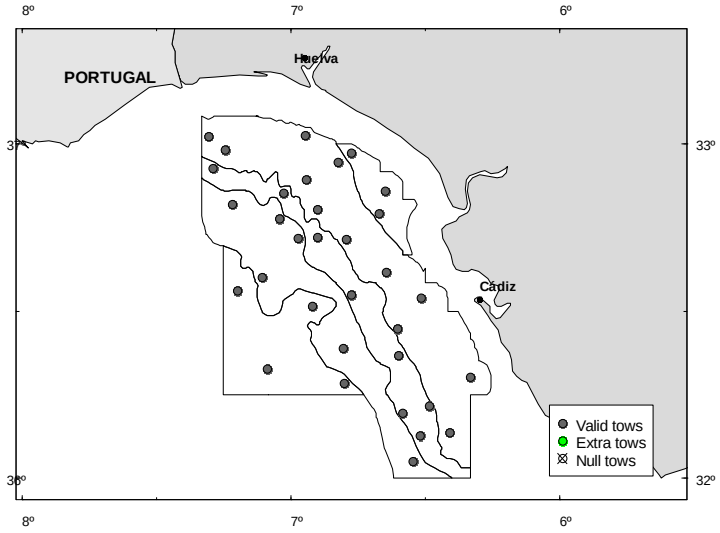
Cruise	Spanish Gulf of Cadiz bottom trawl survey aims to collect data on the distribution and relative abundance, and biological information of commercial fish in the Gulf of Cadiz area (ICES Division IXa). The primary species are hake, horse mackerel, wedge sole, sea breams, mackerel and Spanish mackerel. Data and abundance indices are also collected and estimated for other demersal fish species and invertebrates as rose and red shrimps, *Nephrops*, and cephalopod molluscs.
Gear details:	Standard baca 36/40
Notes from survey (e.g. problems, additional work etc.):	Additional work undertaken included CTD stations from one at every trawl stations. The cut-off in the budget for ARSA Q1 survey, forced a reduction of the vessel-days for this survey causing the reduced number of stations from what was originally planned and the historical series. Additional works included CTD samplings for a project related with the water flow across the Gibraltar Strait.
Number of fish species recorded and notes on any rare species or unusual catches:	Overall, 124 species of fish, 56 of crustacean and 46 of molluscs were recorded during the survey.

Stations fished (aims: to complete 41 valid tows per year)

ICES Divisions	Strata	Gear	Tows planned	Valid	Additional	Invalid	% stations fished	comments
IXa	All	Standard baca 36/40	41	33	-	0	80%	Also available by depth
	TOTAL		41	33	-	0	80%	

Number of biological samples (maturity and age material, *maturity only)

Species	Age	Species	Age
Merluccius merluccius	357	*Loligo vulgaris**	308
*Merluccius merluccius**	1844	*Loligo forbesi**	7
*Parapenaeus longirostris**	1027	*Sepia officinalis**	43
*Nephrops novergicus**	44	*Eledone cirrhosa**	56
*Squilla mantis**	135	*Eledone moschata**	257
*Octopus vulgaris**	75		



Map of sampling grid and station positions.

Biomass and number estimates:

			Biomass index			Number index		
Species	**Strata**	**Valid tows**	**yi kg/h**	**yi/yi−1 %**	**y(i,i−1)/ y(i−2,i−3,i−4) %**	**yi Ind/h**	**yi/yi−1 %**	**y(i,i−1)/ y(i−2,i−3,i−4) %**
Merluccius merluccius	All	33	1.75	-6.9	-25.3	37.86	49.1	-26.6
Micromesistius poutassou	All	33	0.02	-99.4	364.0	0.14	-99.8	444.3
Nephrops norvegicus	All	33	0.04	-20	-62.5	0.76	-53.7	-62.1
Parapenaeus longirostris	All	33	0.88	-44.3	-20.5	143.46	-45.4	-34.1
Octopus vulgaris	All	33	0.95	227.6	-65.2	1.12	154.5	-63.9
Loligo vulgaris	All	33	0.28	12	15.2	3.60	108.1	212.3
Sepia officinalis	All	33	0.21	-16	-78.4	0.63	21.2	-76.5

y_i, year estimate (2012); y_{i-1}, previous year estimate (2011); $y_{(i,i-1)}$, Average of last two year estimates (2012 and 2011); $y_{(i-2,i-3,i-4)}$, Average of the previous three year estimates (2008–2010).

5.3.2.13 Spain: Sp-GC-Q4 (Spanish Gulf of Cadiz Bottom Trawl Survey)

Nation	SP (Spain)	Vessel	Cornide de Saavedra
Survey	Q4 SP-GCGFS (ARSA 1112)	Dates	2-18 November 2012

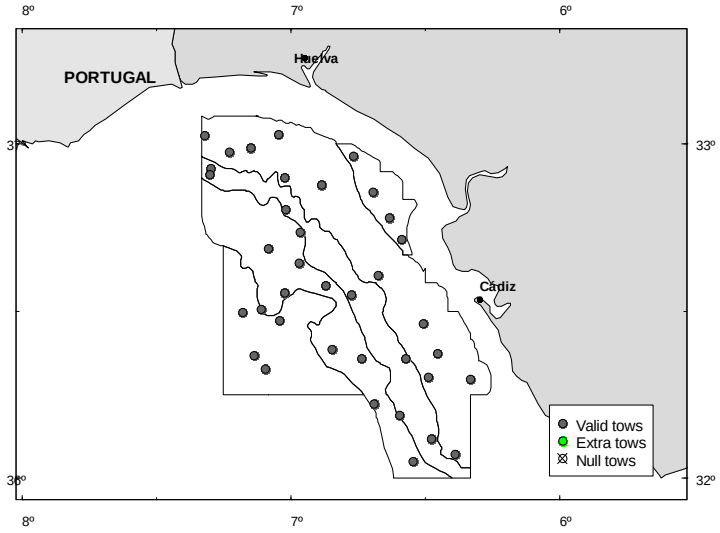
Cruise	Spanish Gulf of Cadiz bottom trawl survey aims to collect data on the distribution and relative abundance, and biological information of commercial fish in the Gulf of Cadiz area (ICES Division IXa). The primary species are hake, horse mackerel, wedge sole, sea breams, mackerel and Spanish mackerel. Data and abundance indices are also collected and estimated for other demersal fish species and invertebrates as rose and red shrimps, *Nephrops*, and cephalopod molluscs.
Gear details	Standard baca 36/40
Notes from survey (e.g. problems, additional work etc.)	Additional work undertaken included CTD stations from one at every trawl stations. Sampling sediments with boxcorer and fish biological sampling to look for contaminants in commercial species. A technical problem with the vessel forced a 5 days break in the middle of the survey and thus a reduced number of hauls, being only possible to perform a 90% of the hauls planned.
Number of fish species recorded and notes on any rare species or unusual catches:	Overall, 142 species of fish, 52 of crustacean and 55 of molluscs were recorded during the survey

Stations fished (aims: to complete 41 valid tows per year)

ICES Divisions	Strata	Gear	Tows planned	Valid	Additional	Invalid	% stations fished	comments
IXa	All	Standard baca 36/40	41	37	-	0	90%	Also available by depth
	TOTAL		41	37	-	0	90%	

Number of biological samples (maturity and age material, *maturity only):

Species	Age	Species	Age
Merluccius merluccius	311	*Loligo vulgaris**	472
*Merluccius merluccius**	1732	*Loligo forbesi**	246
*Parapenaeus longirostris**	1580	*Sepia officinalis**	253
*Nephrops novergicus**	287	*Eledone cirrhosa**	190
*Octopus vulgaris**	484	*Eledone moschata**	640



Map of sampling grid and station positions.

Biomass and number estimates:

			Biomass index			Number index		
Species	**Strata**	**Valid tows**	**yi kg/h**	**yi/yi−1 %**	**y(i,i−1)/ y(i−2,i−3,i−4) %**	**yi ind/h**	**yi/yi−1 %**	**y(i,i−1)/ y(i−2,i−3,i−4) %**
Merluccius merluccius	ALL	37	2.69	81.8	-28.4	38.84	31.1	-26.4
Micromesistius poutassou	ALL	37	1.87	835	-67.8	46.11	2974	-76.3
Nephrops norvegicus	ALL	37	0.12	100	-18.2	4.92	115.8	-4.6
Parapenaeus longirostris	ALL	37	1.1	-10.6	-33.9	180.48	-20.6	-54.7
Octopus vulgaris	ALL	37	3.33	382.6	87.3	10.89	731.3	244.6
Loligo vulgaris	ALL	37	1.89	656	57.4	9.04	336.7	39.3
Sepia officinalis	ALL	37	0.74	-7.5	42.6	2.57	4.9	123.4

y_i, year estimate (2012); y_{i-1}, previous year estimate (2011); $y_{(i,i-1)}$, average of last two year estimates (2012 and 2011); $y_{(i-2,i-3,i-4)}$, average of the previous three year estimates (2008–2010).

5.3.2.14 Portugal: PT-GFS (Autumn Groundfish Survey Q3-Q4)

The Portuguese Autumn Groundfish Survey (PT-GFS), undertaken every year since 1979, aims to estimate indices of abundance and biomass of demersal species, focussing in providing the necessary information for stock assessment of commercial species. This survey is the most important source regarding information for biodiversity, biological parameters, food habits and distribution for a large number of marine species on the Portuguese shelf and slope.

This survey was not carried out in 2012, having important negative affects by:

- disrupting the time-series of the distribution and abundance for a large number of marine species in the Portuguese waters;
- disrupting the time-series of abundance indices independent from the fishery for commercial species;
- disabling the update of stock assessments of hake, horse mackerel and blue whiting (these resources are shared with other countries, thus having also a multinational negative affect);
- preventing the use of this time-series for the advice on data-limited stocks;
- compromising the estimation of the DCF indicators and the MSFD descriptors necessary to provide an evaluation of the Good Environmental Status (GES) for the Portuguese mainland coast.

IBTSWG recognizes all the efforts made by IPMA during 2012 to overcome the budgetary and administrative constraints of national scope that turned unfeasible RV Noruega reparation or chartering of another research vessel on time to undertake 2012 PT-GFS. However, IBTSWG is aware of the current operability of RV Noruega and the plan to conduct PT-GFS in autumn 2013 as well as the actions in place for the acquisition of a new research vessel.

5.3.3 Results

5.3.3.1 Biological samples

Table 5.3.3.1gives an overview of the number of biological samples as reported per country/survey with in the Northeastern Atlantic area (in Section 5.3.2).

Table 5.3.3.1. Number of individuals sampled for maturity and/or age.

	Sco			NIrl		Irl	Eng	Fra		Sp			Pt
	Q1	Q3	Q4	Q1	Q4			CGFS	EVHOE	Porc	Nort	G.Cadiz(1)	
Target species							-						-
Clupea harengus	763		356			568	-						-
Gadus morhua	238		176	260	65	229	-	41	57				-
Lepidorhombus boscii	1*						-			341	502		-
Lepidorhombuwhiffiagonis	164			1		1003	-		156	749	384		-
Lophius budegassa(2)	10*					101	-		190	36	98		-
Lophius piscatorius (2)	28*					288	-		243	234	99		-
Melanogrammus aeglefinus	1208	638	1006	668	550	2002	-		344				-
Merlangius merlangus	1094	72	714	1372	1080	2161	-	243	413				-
Merluccius merluccius				91	33	827	-		967	996	1007	357+311	-
*Merluccius merluccius**	454		243				-					1884+1580	-
Pollachius virens	161	6	259			233	-						-
Scomber scombrus	409	44	263			1099	-			12	428		-
Sprattus sprattus	302		180				-						-
Trachurus trachurus						832	-				407		-
Trisopterus esmarkii	307		273				-						-
*Nephrops norvegicus**							-			409		44+287	-
Additional species							-						-
Brosme brosme	*1**						-						-
Chelidonichthys cuculus				*189*	*94*		-		*153*				-
Conger conger	*6**				*7*		-			*39*	*199*		-
Dicentrarchus labrax				*1*	*1*		-	*166*	*185*				-
Engraulis encrasicolus							-				*343*		-
Glyptocephalus cynoglossus							-		*77*				-
Helicolenus dactylopterus							-			*200*	*200*		-
Micromesistius poutassou						*796*	-				*1001*		-
Microstomus kitt				*114*	*44*	*614*	-		*121*				-
Molva molva	*32**		*34**	*3*	*1*	*88*	-			*112*			-
Molva macrophthalma							-						-
Mullus surmuletus							-	*78*	*35*				-
Phycis blennoides							-			*150*	*146*		-
Pleuronectes platessa				*582*	*238*	*1197*	-	*211*	*146*				-
Pollachius pollachius	*5**						-						-
Psetta maxima	*4**		*2**	*2*	*1*		-						-
Scophthalmus rhombus	*2**			*27*	*11*		-						-
Scomber colias							-				*20*		-

	Sco			NIrl		Irl	Eng	Fra		Sp			Pt
	Q1	Q3	Q4	Q1	Q4			CGFS	EVHOE	Porc	Nort	G.Cadiz(1)	
Solea solea						*141*	-		*71*				-
Trisopterus luscus							-				*349*		-
Zeus faber				*23*	*23*		-				*150*		-
Raja brachiura *	*6*		*1*	*11*	*30*	*19*	-						-
Raja clavata *	*76*	*9*	*66*	*64*	*40*	*303*	-						-
Raja montagui *	*173*		*156*	*104*	*117*	*417*	-						-
Rostraja alba *	*1*												
*Dipturus batis cf. intermedia*1*	*41*		*60*				-						-
*Dipturus batis *1*	*2*	*23*	*2*				-						-
*Dipturus oxyrinchus**		*2*					-						-
Leucoraja fullonica *	*1*						-						-
Leucoraja naevus *	*68*	*1*	*66*	*14*	*22*	*114*	-						-
Mustelus mustelus *	*4*						-						-
Mustelus asterias *	*11*						-						-
Squalus acanthias		*6*		*32*	*199*		-						-

*** Samples collected for maturity only.**

(1) Q1 + Q4.

(2) Otoliths + Illiciums (In the case of anglers and monkfish both, otoliths and the first radium of the dorsal fin are collected).

1) See explanation on *Dipturus* with Section 5.1.1.2.

5.3.4 Participation planned for 2013/2014

Survey	Code	Starting	Ending	expected hauls	Planned Intercal
UK-Scotland Rockall	UK-SCRocQ3	09/09/13	17/09/13	40	-
UK-Scotland Western (aut.)	UK -SCOWQ4	15/11/13	06/12/13	60	-
UK-Scotland Western (spring)	UK-SCOWQ1	17/02/14	10/03/14	60	-
UK-North Ireland (aut.)	UK-NIGFS			60	-
UK-North Ireland (spring)	UK-NIGFS			60	-
Ireland – Groundfish Survey Via	IE-IGFS	25/09/13	6/10/13	45	-
Ireland – Groundfish Survey VIIb,g,j	IE-IGFS	28/10/13	1/12/13	125	-
UK-England and Wales	Discontinued survey			-	-
France – EVHOE	FR-EVHOE	17/10/13	01/12/13	155	SPNGFS
France - Western Channel	FR-CGFS	01/10/13	30/10/13	110	-
Spain – Porcupine	SP-PorcGFS	01/09/13	30/09/13	80	-
Spain - North Coast	SP-NGFS	17/09/13	25/10/13	115	EVHOE
Spain - Gulf of Cádiz (Spring)	SP-GCGFS Q1	19/02/13	01/03/13	43	Internal
Spain - Gulf of Cádiz (Aut.)	SP-GCGFS Q4	01/11/13	15/11/13	43	-
Portugal - (Aut.)	PT-PGFS 2012	01/10/13	31/10/13	96	-

Intercal: intercalibration between vessels.

5.3.5 Plans for future surveys

France presented the plan to perform the CAMANOC ecosystem survey, first to be executed in September 2014. Ifremer propose using a substantially modified GOV to cover the hard grounds in the Western English Channel with semi-pelagic rigging, without lower wings and with double footrope with larger rubber disks. The general-purpose of the survey and details on the alterative GOV rigging are presented in a working document in Annex 7 (WD 5-2013, CAMANOC Survey). The intention is that from 2015 onwards, the CAMANOC Survey will be carried out in combination with the FR-CGFS and/or EVOHE to derive new indices for the area to be used for stock assessment and the MSFD purposes.

IBTSWG previously defined criteria for coordination of surveys under IBTS, including specifically: "b) A brief outline of the management need/context for the survey should be provided by an ICES assessment working group"; and "h) Assessment working groups should confirm (e.g. after a five year period) that any surveys targeting specific stocks and not using gears used in the standard IBTS surveys are still providing data of high quality that are used for assessment and provision of advice."

IBTSWG supports efforts to provide coordinated survey data for the important Channel area, but highlighted two key concerns that should be addressed:

1) Historically no IBTS indices from this area have proven usable by ICES assessment groups. Therefore specific indices need to be identified and an analytical approach discussed with the relevant expert group (e.g. WGNSSK, WGCSE, and WGISDDA) in conjunction with IBTSWG.

2) Use of an independent gear requires either a time-series to be constructed or inter-calibration data be made available before the usefulness of an index can be evaluated. If a new gear is pursued, information on how CAMANOC proposes to integrate and evaluate the survey outputs in terms of the broader IBTS and ICES context needs to be presented.

Comments from IBTSWG:

The IBTSWG discussed the presented survey plan. In principle, the group welcomes the initiative but encourages that the following aspects be considered in the further development in order to obtain full support:

1) To demonstrate the relevance of the new survey, the proposal should explain major processes in the Channel area, which of them and how they would be tackled through this survey. – What will the specific data outputs be, and how will they contribute to understanding of fish stocks and the wider ecosystem?

2) The working document identified a large number of ICES working groups that could potentially utilize data derived from the CAMANOC survey. In order to assess the potential value of the survey, it would be useful to have a list of specific demands and data gaps which the survey could address. Where do relevant stock assessment groups see the need to obtain data for the specific area and season that CAMANOC will cover? To which expert group will the data be sent? The survey proposal should contain explanation on how a non-standard index will be used and by which working group(s). Similarly, if applicable, what specific other data needs for ecosystem parameters have been identified, which could be covered by CAMANOC?

3) The Channel is an important area and there is a need to provide improved data for it, but it appears to be a complex area with at least some migratory stocks. Can the survey contribute to their assessment? If so, is the linkage with data from other surveys required? How will the data relate to the surrounding surveys? No indices have been used from the western Channel area historically, and IBTSWG suggested it is likely due to movements between adjacent Divisions. Therefore it is also likely the indices will have to be combined or weighted by neighbouring data to make sense, and consequently may not survive as an independent index, unlike most indices in the Northeastern Atlantic area.

4) A GOV with an alternative setup has been suggested instead of the standard GOV, in order to cope with the rough ground in the sampling area and to catch juvenile fish and benthic macro-invertebrates. The suggested gear modifies the GOV by cutting away the lower wings. For the proposed gear however, no comparison with a standard GOV exists yet. During the discussion of this proposal, the IBTSWG questioned whether a better option could be to use one of the already existing groundgears within the Northeastern Atlantic surveys, namely groundgear 'D', to facilitate possible comparisons with other IBTS surveys and avoid expensive intercalibrations experiments. It has been suggested that Ifremer may also consider using the strengthened GOV that other nations (Scotland, Ireland and England) have been using on their Atlantic surveys: It contains guard meshes in the belly sheet and is more robust than the North Sea variant whereas still retaining the overall standard configuration of the GOV. The net has been used for 3 years now and has been found to be extremely robust in dealing with a broad spectrum of substrata. Nevertheless, the French partners at Ifremer believe the rock-hopper groundgear of type D to be not well adapted to the Western English Channel due to the presence of boulders in the area. The choice of the proposed rigging is a compromise chosen to carry out a survey in an area where no fishery-independent data are available until now. - If, consequently, the presented altered GOV with cut wings will be applied, then IBTSWG recommends analysing its catchability for the relevant species, and conducting comparative fishing experiments with the GOV in order to approach standardization. Ifremer already indicated that inter-calibration experiments will take place, at least during the first years, with the CGFS-FR survey in the overlap area in the central Channel–at no extra cost, comparing the GOV with groundgear A and the "GOV Camanoc".

5) If the survey is to be conducted on a regular basis, IBTSWG could - based on the survey's clearly stated main objectives and target species to be sampled - review its outcome when a time-series of 3-5 years has been completed. The need and implications of an independent index need to be communicated clearly as well as the possible requirement for significant inter-calibration if a viable index is to be produced in this important area. There are significant landings from the Channel area and no viable IBTS survey data to date - therefore the working group considers this an important task for IBTSWG to pursue. (The review would then to be suggested as a formal ToR for IBTSWG.)

Recommendation:

IBTSWG recommends that Ifremer present the survey proposal, addressing the points outlined above, at WGISDDA and specifically address the issues of: (1) Producing indices for ICES area VIIde, where indices have historically not been usable. And (2) Considering that VIIde is of relevance to both North Sea and Celtic Sea stocks and respective working groups, a communication from both groups on how data could be integrated into assessments from either or both areas.

Action Points:

Members of IBTSWG to start a discussion with gear technologists and survey experts at Ifremer, in order to help preparation of a survey proposal to be presented at WGISDDA.

5.4 Combined results

5.4.1 Combined North Sea and Northeastern Atlantic survey results

Catches from latest bottom trawl surveys (IBTS) in the North Sea and the Northeastern Atlantic areas covered by the IBTS (see Table 5.4.1 and Figure 5.4.1) are mapped and presented in Annex 6. In 2012 maps two gaps are evident when compared with previous IBTSWG reports, since as stated on their respective summary reports: both Portuguese and UK-Cefas English surveys were not performed. The gap left by the Portuguese survey is especially evident, given the large part of the shelf not covered by any other vessel, while in the case of Cefas, the gap is noticeably on the western part of the British channel and southwestern part of England, but the Celtic Sea area is partly covered by other Q4 surveys (FR-EVHOE and IGFS), making the gap less conspicuous.

Regarding IBTSWG report 2012 maps for 2011 surveys and the comparison with 2012 maps in this report, it is important to note that original versions of 2011 maps were affected by the DATRAS duplication of data spotted during last year report (see Section 7.4.2 on (ICES, 2012b). Consequently maps on Annex 6 for IBTSWG 2012 report have been corrected and reissued on ICES web:

(http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/SSGESST/2012/IBTSWG_Annex%206.%20Maps.pdf), showing results those are similar to present year maps in Annex 6. Some remarkable results comparing with previous year include the abundance of European hake, especially recruits, in all the western area from western Scotland and Ireland to north Iberian Peninsula, with Irish and FR-EVHOE surveys getting larger catches in numbers compared to previous years. Also remarkable is the abundance of small horse mackerel (<15 cm) that show a marked decrease on the North Sea, but large catches on the Northeaster Atlantic part, especially on French shelf. Last, the abundance of both species of angler, present important abundances on the western margin of the area. For other species the distribution and abundances present similar patterns and levels as in previous year.

Table 5.4.1.1. Species for which distribution maps have been produced, with length split for pre-recruit (0-group) and post-recruit (1+ group) where appropriate. The maps cover all the area encompassed by surveys coordinated within the IBTSWG (North Sea and Northeastern Atlantic area).

Scientific	Common	Code	Fig No	Length Split (<cm)
Clupea harengus	Herring	HER	6-7	17.5
Gadus morhua	Atlantic Cod	COD	2-3	23
Galeorhinus galeus	Tope Shark	GAG	32	
Lepidorhombus boscii	Four-Spotted Megrim	LBI	16-17	19
Galeus melastomus	Blackmouthed dogfish	DBM	40	
Lepidorhombus whiffiagonis	Megrim	MEG	14-15	21
Leucoraja naevus	Cuckoo Ray	CUR	30	
Lophius budegassa	Black-bellied Anglerfish	WAF	20-21	20
Lophius piscatorius	Anglerfish (Monk)	MON	18-19	20
Merlangus merlangius	Whiting	WHG	24-25	20
Melanogrammus aeglefinus	Haddock	HAD	4-5	20
Merluccius merluccius	European hake	HKE	8-9	20
Micromesistius poutassou	Blue whiting	WHB	26-27	19
Mustelus asterias	Starry Smooth Hound	SDS	33	
Mustelus mustelus	Smooth Hound	SMH	34	
Nephrops norvegicus	Norway Lobster	NEP	28	
Pleuronectes platessa	European Plaice	PLE	22-23	12
Raja clavata	Thornback ray (Roker)	THR	35	
Raja microocellata	Painted/Small Eyed Ray	PTR	36	
Raja montagui	Spotted Ray	SDR	37	
Raja undulata	Undulate Ray	UNR	38	
Scomber scombrus	European Mackerel	MAC	12-13	24
Scyliorhinus canicula	Lesser Spotted Dogfish	LSD	29	
Scyliorhnus stellaris	Nurse Hound	DGN	39	
Sprattus sprattus	European sprat	SPR	41	
Squalus acanthias	Spurdog	DGS	31	
Trachurus picturatus	Blue Jack Mackerel	JAA	43	
Trachurus trachurus	Horse Mackerel (Scad)	HOM	10-11	15
Trisopterus smarkii	Norway pout	NPO	42	

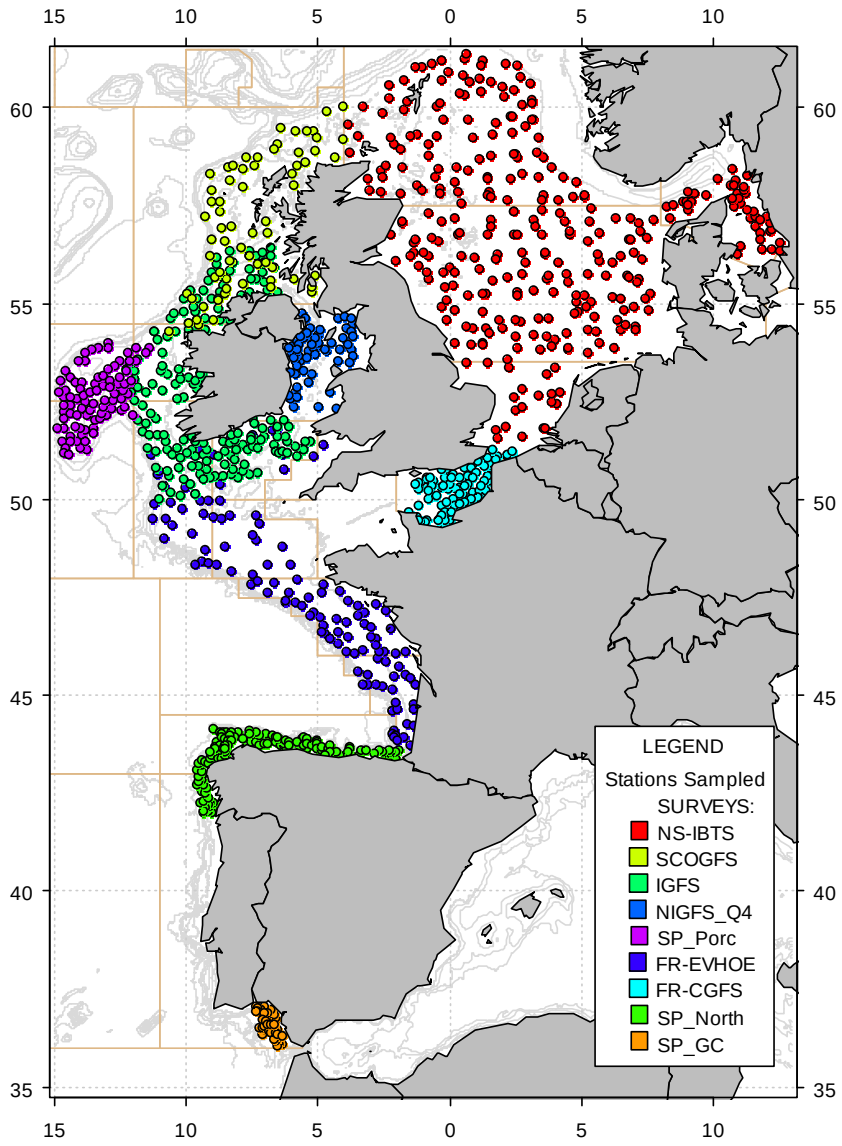


Figure 5.13. Station positions for the IBTSurveys carried out in the Northeastern Atlantic and North Sea area in summer/autumn of 2012.

5.5 References

ICES. 2012a. Manual for the International Bottom Trawl Surveys. Series of ICES Survey Protocols. SISP 1-IBTS VIII. 68 pp.

ICES. 2012b. Report of the International Bottom Trawl Survey Working Group (IBTSWG), 27–30 March 2012, Lorient, France. ICES CM 2012/SSGESST:03. 323 pp.

6 Survey Manuals (ToR b)

In 2012 IBTSWG agreed on a new version of the North Sea IBTS Manual, namely revision VIII, that following a petition of IBTS and other survey groups to document changes in the surveys, and maintain their traceability, was released as the 1st issue of the Series of ICES Survey Protocols (SISP; ICES, 2012a).

One of the ideas behind issuing the SISP series was to submit the protocols to be published to an external. The external revision of the North Sea Manual was performed and submitted to the IBTSWG before its 2013 meeting as explained and commented in Section 6.1, where also responses and measures taken after the revision are commented and addressed to be addressed before WKESST meeting under 2013 Annual Science Conference where the requirements that survey protocols should cover.

6.1 North Sea Manual

As the first manual, the North Sea IBTS manual revision VIII has been published in the new format of Series of ICES Survey Protocols, SISP, in 2012. At the same time, it has been sent to an external reviewer for comments on its structure and the contents. A very constructive review has been produced in December of 2012 by Philip Politis, Fishery Biologist at the US National Marine Fisheries Service, Ecosystems Surveys Branch, in Woods Hole, Massachusetts. Key suggestions for improvement of the manual included the following:

- To improve the balance between readability and detail, description of the survey history should be separated from rest of the manual and moved into a separate document. The manual itself should focus on current survey methods.
- It is suggested that the manual focus on detailing the methods currently used by each country and outlining or potentially standardizing, any discrepancies between methods.
- The introduction should – apart from a very brief statement on the development of the survey – include the elements: Objectives, Survey area, seasonal timing of the survey, countries involved, primary gear and survey vessels.
- The protocol should clearly specify the survey design, following a number of aspects listed in the review.
- Separation of two sections for (a) gear quality assurance and quality control, and (b) gear design with specifics of the GOV-trawl used in this survey.
- In the section on standard fishing methods, the protocol should outline the methods currently used by each country, e.g. for the selection of haul positions or adjustment of fishing gear depending on fishing conditions.
- A separate section on haul validation is suggested.

During the 2013 IBTSWG, the review was evaluated and first steps toward a next revision addressing the reviewer's suggestions have been undertaken. It was agreed that the amendment of the NS-IBTS manual will be continued until 30 June, 2013 when the new version of the manual will be submitted to SSGESST.

6.2 Manual for the Midwater Ringnet sampling during IBTS Q1

A complete draft of the manual for the MIK plankton sampling during Q1 IBTS was available for revision during the 2013 IBTSWG. Also in this case, it has been decided to allow for internal revision and changes until 30 June, 2013, before the manual will be submitted for consideration by WKESST in September of 2013.

6.3 Northeastern Atlantic Manual

Finally, the Western and Southern areas IBTS manual, redefined as Northeastern Atlantic IBTS manual was not issued intersessionally in 2012. The reason for this was that it was considered better to wait for the review of NS protocol and IBTS reactions and answers, and also to allow the inclusion of recent changes in some Northeastern Atlantic surveys. After the review of the SISP1-IBTSVIII presented and discuss in section ToR b) Section 6.1, the members of the Northeastern Atlantic IBTS, agreed to update the manual and produce a draft to be submitted for its consideration for the WKESST, and further external revision until June 2013.

This new version of the Northeastern Atlantic IBTS Manual will be drafted following the revisions agreed and discussed on the new version of the IBTSVIII manual, but containing a general introduction of the common standards and protocols used in the Surveys on the NE Atlantic area, but will also include individual sections for each survey detailing the survey design and stratification process, the area covered, time frame and time-series, sampling design and allocation, vessel, gear and QA/QC protocols followed. The recent changes in different surveys will also be updated in the relevant summary tables in the manual (e.g. Tables 2.2. sampling materials, or 3.1 in (ICES, 2010).

Other changes that will be adopted are:

- Survey areas will be also updated (see Table 7.1. in (ICES, 2010)) together with the compilation of shape files of the survey sectors and strata on the Northeastern Atlantic IBTS. These shape files will be used for the checking procedures and quality controls underdevelopment within DATRAS, and for the estimation of the abundance indices stratified to the area were relevant. Besides the shape files will be used within the manual to adopt a common format for the areas maps.
- Include survey specific plots of warp shot, headline height and door spread for the water depth of deployment for surveys using gears not included and considered in the North Sea IBTS manual (namely GOV with different groundgears configuration).
- A revision of the list of surveys and adopt the survey acronyms to fit the acronyms used in the ICES assessment WGs.
- The inclusion of the Marine litter data collection protocol and Marine Litter form as a general IBTS protocol, following the forms on NS manual.
- The description of the Scottish surveys (Q1, Q4 and Rockall) will be updated to reflect the changes undertaken in recent years and nowadays survey design.

7 Review of WKDATR recommendations for IBWSWG (ToR c)

IBTSWG 2012 recommended that a Workshop on DATRAS data Review Priorities and checking Procedures with participation of ICES Data Centre and DATRAS data submitters be organized. This workshop (WKDATR) was held in January of 2013 and co-chaired by Ingeborg de Boois and Neil Holdsworth. The main goal of the workshop was to improve data quality in DATRAS by (1) by proposing checking procedures to be applied during uploading/reloading processes and (2) detecting errors in existing products. The report is available at

http://www.ices.dk/community/groups/Pages/WKDATR.aspx

The report and action points identified within it have been evaluated by a subgroup during the IBTSWG meeting. Quality checks on the data in DATRAS are a multi-annual ToR and will continue intersessionally.

7.1 Overview of feedback on DATRAS function from WKDATR and WGNSSK

The table below lists the issues that arose at WKDATR and questions raised by WGNSSK, with comments by IBTSWG.

Table 5.4.1.1. Issues identified during WKDATR or questions by WGNSSK (left column) and reply from IBTSWG 2013.

Issue	Outcome from subgroup discussions at IBTSWG 2013 X
CatCatchWght check	England, Scotland and Germany will investigate length-weight functions and will provide ICES with a definitive list for DATRAS to use to check CatCatchWght. Code to carry these checks out will be included in the IBTS toolbox for IBTSWG 2014.. (See Action List)
One exchange format for submitting IBTS data < 2004 and from 2004 onwards; field ranges might vary for both sets	IBTSWG agreed that this should be implemented;– recommendation to Data Centre.
Northeastern Atlantic surveys: field ranges and error checks table.	Each survey leader was given a table to review and revise as necessary. The current action for all Northeastern Atlantic surveys series table of checks to be filled in for IBTSWG 2013 report.
Polygons of aggregation areas other than StatRec	Scotland agreed to do this for the North Sea Q1 and Q3 surveys and the Northeastern Atlantic survey leaders will also send the polygon files to the ICES Data Centre representative before the end of the year. (See Action List)
Review of the reference tables used in indices calculations	The Cefas representative of WKDATR and IBTSWG was tasked with this however, due to other commitments this was not carried out in time for IBTSWG. This will be put as a priority for him for next year's ToR. (See Action List)
WGNSSK 2012. Recommendations on dealing with survey data WGNSSK recommends a "resubmission ban" or a gateway scheme where no recalculations are performed within the two weeks before the assessment WG meeting.	This instigated a significant discussion about data quality and use. IBTSWG believes that data and products from the ICES Data Centre should be as up-to-date as possible, and therefore DATRAS should not stop data submitters submitting their files. There is a recommendation by WKDATR to create version histories of the submitted files, which will be available on the DATRAS homepage. Information of version history and accompanying remark field for explanation with submission are sufficient to find out whether and what changes exist in re-submitted files.

Issue	Outcome from subgroup discussions at IBTSWG 2013 X
Additional information on Exchange data	Exchange files must have same number of fields compare to submitted files, but a new "flat file" product will allow additional information to be made available to the data downloader. The additional information should include the following: • Calculated fields need to be added in the flat file, i.e. for values which are not part of the exchange field but derive from it - e.g. ICES area sampled • Survey name • International maturity scale • ICES stock name
Reporting new species for which code is not currently available in WoRMS	A better link to WoRMS is required and the Data Information Group (DIG) will contact the WoRMS team to get new species added and once created, resubmission of the species data will occur. This will be tested for one year after which the procedure and progress will be evaluated. In addition, if a new species occurs within a set of survey data, a warning will be given during screening to highlight this during the upload. The national submitter will need to send the Latin name of the species to the DATRAS data officer and when DATRAS team receive the new code from WORMS, the submitter will be informed and they need to resubmit their file with valid AphiaID (See Action List)
New field in the reporting format that would specify the type of length measurements	Not high priority, not to be introduced with the current IBTS format, but field will be added when the Data Centre revises the exchange format.
Flagging of non-standard stations/ IBTS non-standard gear	Recommendation to data submitters- Use haul validity = "P" -Not part of indices calculation but maybe part of the other data products. Could be used to filter before calculations if required by expert group. -A new remark field needs to be part of download bundle for explanation of P written by submitter while uploading the file
Linking oceanographic data to DATRAS	If a data user requires these data, both datasets are already available and can be downloaded from DATRAS database and the Ocean database http://www.ices.dk/marine-data/data-portals/Pages/ocean.aspx , respectively. GIS or other software can be used to combine them. Otherwise they can download layers from ICES data portal: http://ecosystemdata.ices.dk/map/index.aspx
Groundrope weight in HH data	A warning is issued if there is no value for WgtGroundRope
Depth value in HH data	A "raise error" message is issued if there is no value for depth
Cross-check on speed, distance, haul duration and shooting/hauling positions based on the HH records downloaded from DATRAS	Presentations on these checks were given during the meeting and the action - to carry out the checks and to resubmit erroneous data - was agreed upon. (See Action List).
Ground Speed in HH data	A "raise error" message is issued if there is no value for GroundSpeed

7.1.1 Additional request regarding DATRAS from IBTSWG

In addition a request to utilize the unused field "Rigging" in the HH record was raised. This is in order to input the length of the adjuster chain in the groundgear of the GOV. The rationale for this is that short adjustment-chain the groundgear will

fish lighter on the bottom, and the catchability of different benthos is affected. Still, the rigging may be needed in areas with rougher bottom. The ICES Data Centre will need to be contacted to investigate whether this is possible.

7.2 Checking combination of DataType and SubFactor

WKDATR asked IBTSWG to review the DataType as entered in the HH records against the SubFactors recorded in the HL records.

7.2.1 DataType and SubFactor: definitions

DataType contains information on the way the catch processing has occurred. The following values are allowed (http://vocab.ices.dk/?ref=9):

-9	Invalid hauls
C	Data calculated as cpue (number per hour)
R	Data by haul
S	Sub sampled data

SubFactor is the subsampling factor used for length measurements. When half of the catch of a specific species was measured, SubFactor is 2. If a quarter of the species was measured, SubFactor is 4. Subsampling could be done by fraction, volume, weight or numbers, and so, all values larger than or equal to 1 are allowed in this field. SubFactor less than 1 should not occur, as it is not possible to measure more fish than caught. SubFactor -9 occurs for (a) invalid hauls where no length measurements are available but individual fish information has been collected (CA records) or (b) CA records from multiple hauls. In this case, no 'real' haul information can be related to the CA records, as the hauls are all taken on different positions, times, etc. DATRAS cannot accept CA records without HH information, so a so-called 'dummy haul' (a haul only containing real information on date, statrec has to be created.

7.2.2 DataType and SubFactor: allowed combinations

When DataType is C then the subsampling factor should always be 1, as data are already raised to numbers per hour and no information on the original numbers caught in the haul is available. This mainly applies to historical data, as the historic dataset only contained information transformed to numbers per hour. When countries have not resubmitted the data, or the raw data are not available, then only numbers per hour are available.

DataType R reflects the fully sorted catches. The subsampling factor might vary by species., but should always be at least 1 as it is not possible to (a) not record a subsampling factor (resulting in SubFactor -9), (b) measure more fish than caught (SubFactor < 1).

DataType S reflects catches which were only partly sorted. This only happens in case of very large catches as it is then not possible to (a) get all the entire catch on board or (b) get the whole catch processed in a decent way. The SubFactor in such cases should always be larger than 1, as a SubFactor 1 means that the full catch was sorted.

DataType -9 should be used for invalid hauls, or for so-called dummy hauls.

7.2.3 Wrong combinations in IBTSWG data

Table 7.2.3.1 shows the occurrences of combinations that should not be allowed in DATRAS. For most cases, the solution is straightforward.

1. If **DataType=S and SubFactor=1** and species information is available, then DataType should be changed into DataType=R. However, the DataType of the other hauls within that survey-year-country combination should also be checked for correct DataTypes as there is a possibility that the wrong DataType is reported for the complete national dataset.
2. If **DataType=S or DataType=R and SubFactor=-9** and no species information is available, then DataType should be changed in -9.
3. If **DataType=S or DataType=R and SubFactor=-9** and species information is available, then SubFactor should be checked. If there is no information on SubFactor available, then either DataType should be changed to C (numbers per hour) or to -9 (invalid)

Table 7.2.3.1. DataType-SubFactor: number of occurrences of combinations that should not be allowed in DATRAS.

			EVHOE	IE-IGFS	NS-IBTS			SP-NORTH	SP-PORC
Year	Data Type	Sub Factor	FRA	IRL	DEN	ENG	NED	SPA	SPA
1997	S	1	12913						
1998	S	-9	1						
		1	12548						
1999	S	1	11019						
2000	S	-9	1						
		1	10019						
2001	R	-9							8
	S	1	18255						
2002	R	-9					1	2	5
2003	R	-9		9			4		3
	S	-9	1	203					
		1	14376	17219				5037	
2004	R	-9		3					6
	S	-9	1	188					
		1	15876	20914					
2005	R	-9		3			3		5
	S	-9	1	169					
		1	16701	16796					
2006	R	-9		11				1	4
	S	-9		200					
		1	13781	22179		8073			
2007	R	-9		1					4
	S	-9	2	152					
		1	18664	24497		8207			
2008	R	-9						1	4
	S	-9		60		1			
		1	19275	24857		7681			
2009	R	-9					2	3	4
	S	1	16995			6275			
2010	R	-9						1	2
	S	-9				1			
		1	16885			6901			
2011	R	-9						1	3
	S	-9				29			
		1				8169			
2012	R	-9			5	23			

Action: All information listed above should be checked by the country responsible and changed as soon as possible in DATRAS, by resubmitting the data.

7.3 Checking distance against duration, speed and calculated distance

WKDATR asked IBTSWG to review the values for distance towed against haul duration and ground speed respectively as currently stored in DATRAS. HH Exchange files were downloaded from datras.ices.dk and the variables were plotted using an R script. Additionally, based on shooting and hauling positions, the distance towed was calculated and compared with the observed distance towed.

7.3.1 Distance against duration

Figure 7.1 shows the result for distance against duration by survey, for all years uploaded in DATRAS. Figure 7.2 is similar, but then per country for NS-IBTS. The upper blue line is the line when fishing 5 knots, the black line 4 knots, the lower blue line reflects fishing speed 3 knots.

Almost all figures show outliers. The limit of the x-axis is set to 60 minutes; however DATRAS contains a number of hauls that lasted longer than 60 minutes, up to 326 minutes. The NS-IBTS NOR dataset does not contain any information on distance towed.

Action: all countries to cross-check the distance, speed and duration information for the complete dataset, and resubmit data where appropriate.

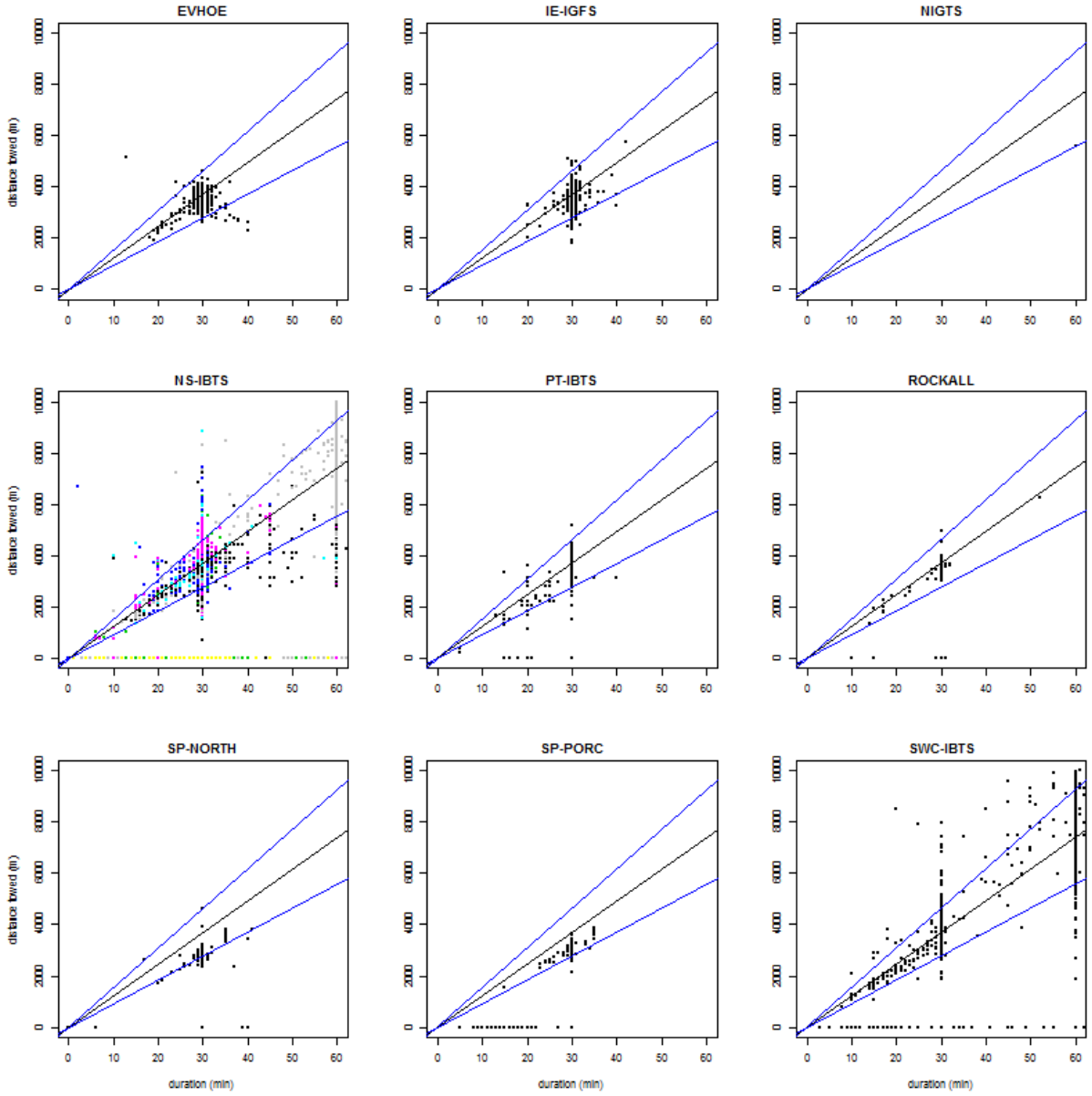


Figure 7.1. Distance towed against duration, by survey, all years. In NS-IBTS the different colours reflect different countries. Upper blue line: fishing speed 5 knots, black line fishing speed 4 knots, lower black line fishing speed 3 knots.

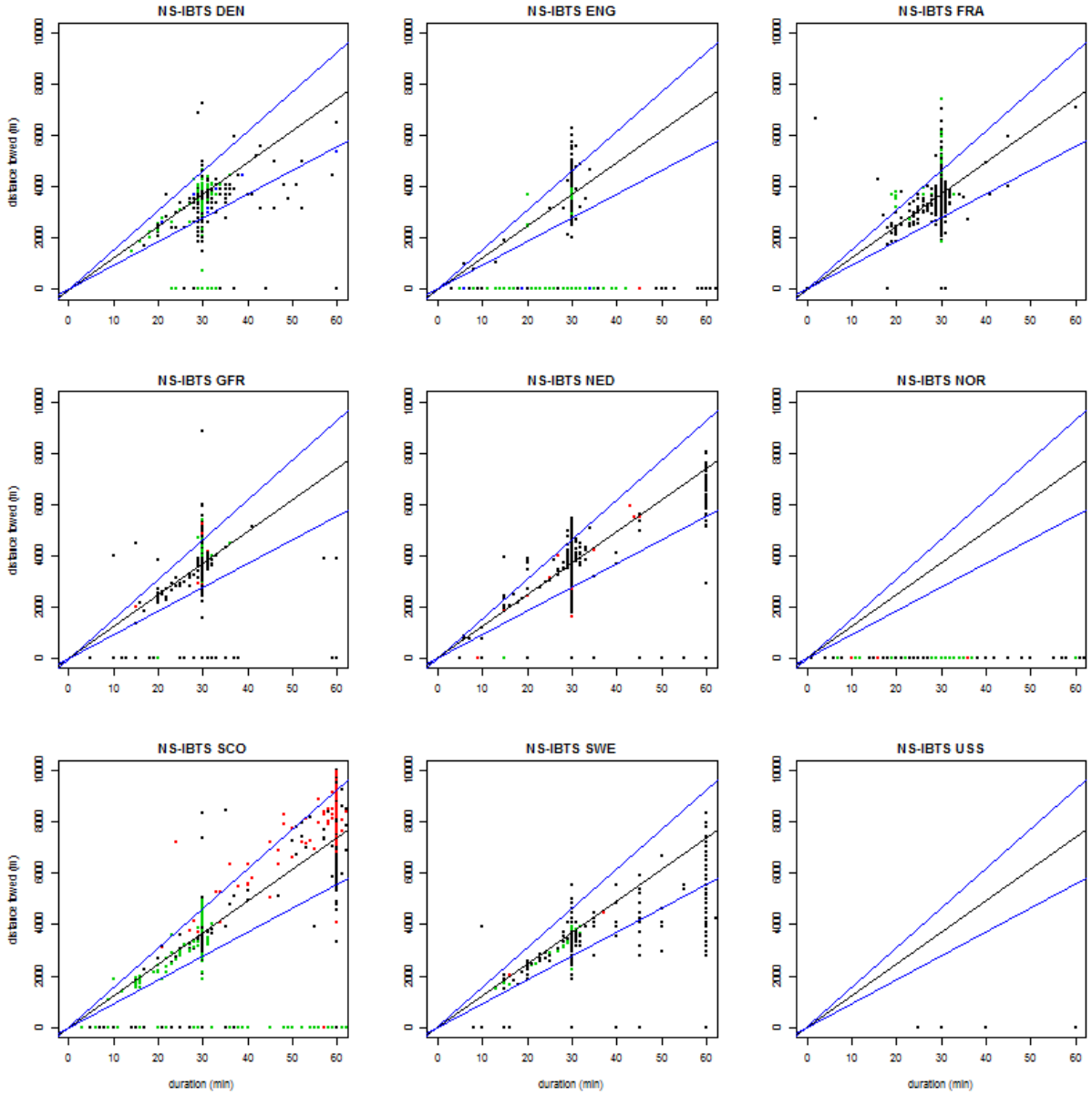


Figure 7.2. Distance towed against duration for NS-IBTS, by country, all years. The different colours reflect different quarters. Upper blue line: fishing speed 5 knots, black line fishing speed 4 knots, lower black line fishing speed 3 knots.

7.3.2 Distance against speed over ground

In line with the comparison above, distance towed was plotted against speed over ground (Figure 7.3 and Figure 7.4). This revealed that some countries (DATRAS acronyms: PT-IBTS, NS-IBTS GFR&NED) probably submit a standard speed over ground, at least in some cases because the actual speed over ground is not recorded on board. IBTSWG decided that -9 should not be allowed for speed and so, if speed is not observed, the default for the survey should be entered. Some countries do not report speed over ground at all or only in a few years (NS-IBTS NOR, NS-IBTS ENG). Especially for NS-IBTS NOR this complicates future swept-area calculations, as distance is also not available. However, for Norway in 1997 and from 2004 onwards speed has been reported as speed through water. This is a submission error as it actually is GroundSpeed, therefore the respective correction can be made.

Actions:

- All countries reporting -9 for GroundSpeed to resubmit files with the standard survey speed following the manual.
- Norway to resubmit 1997 and 2004-2013 with GroundSpeed filled in and SpeedWater -9 where appropriate.

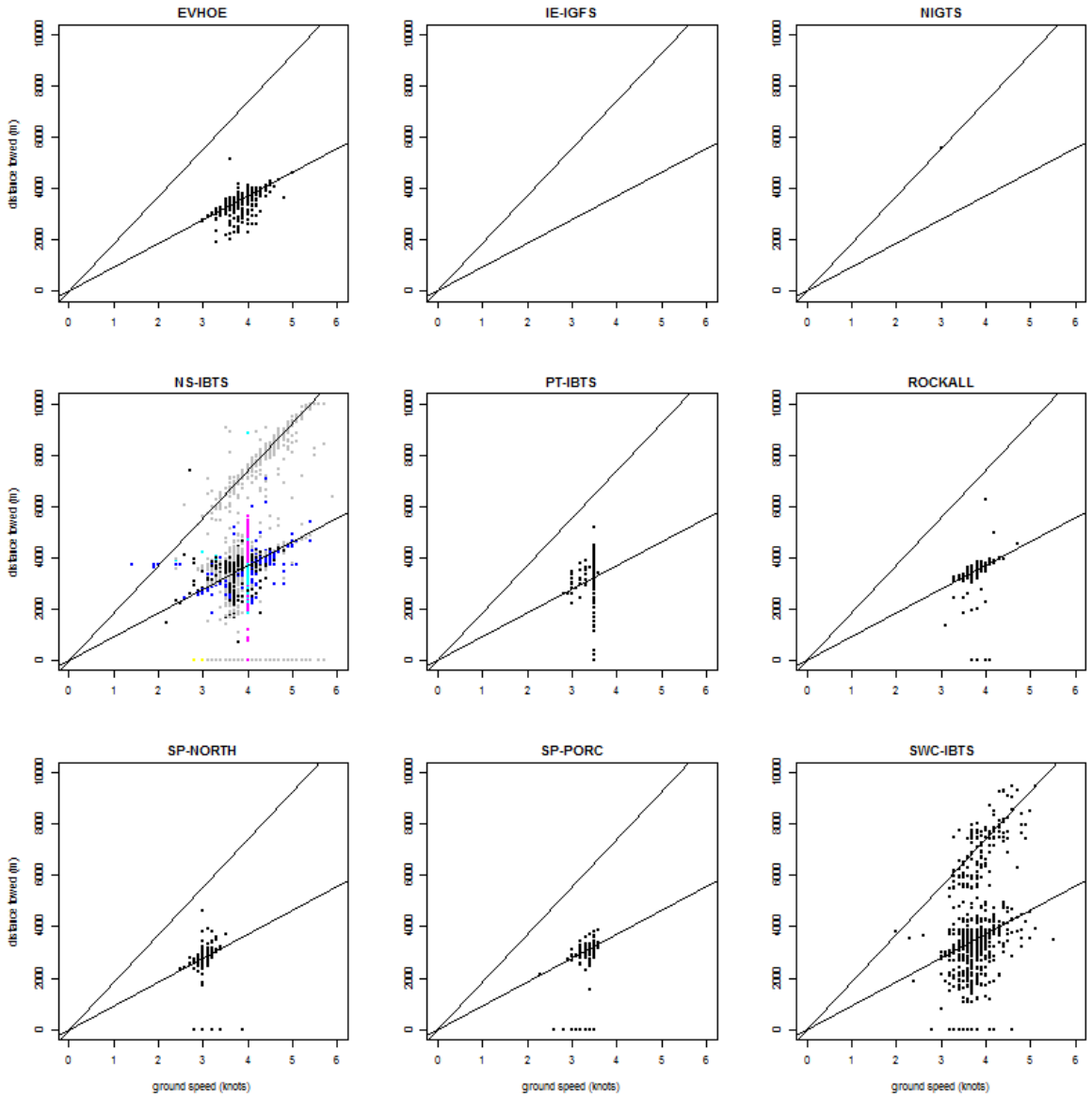


Figure 7.3. Distance towed against speed over ground, by survey, all years. In NS-IBTS the different colours reflect different countries. Lower black line: distance when fishing for 30 minutes with 4 knots ground speed, the upper black line fishing for 60 minutes with 4 knots ground speed.

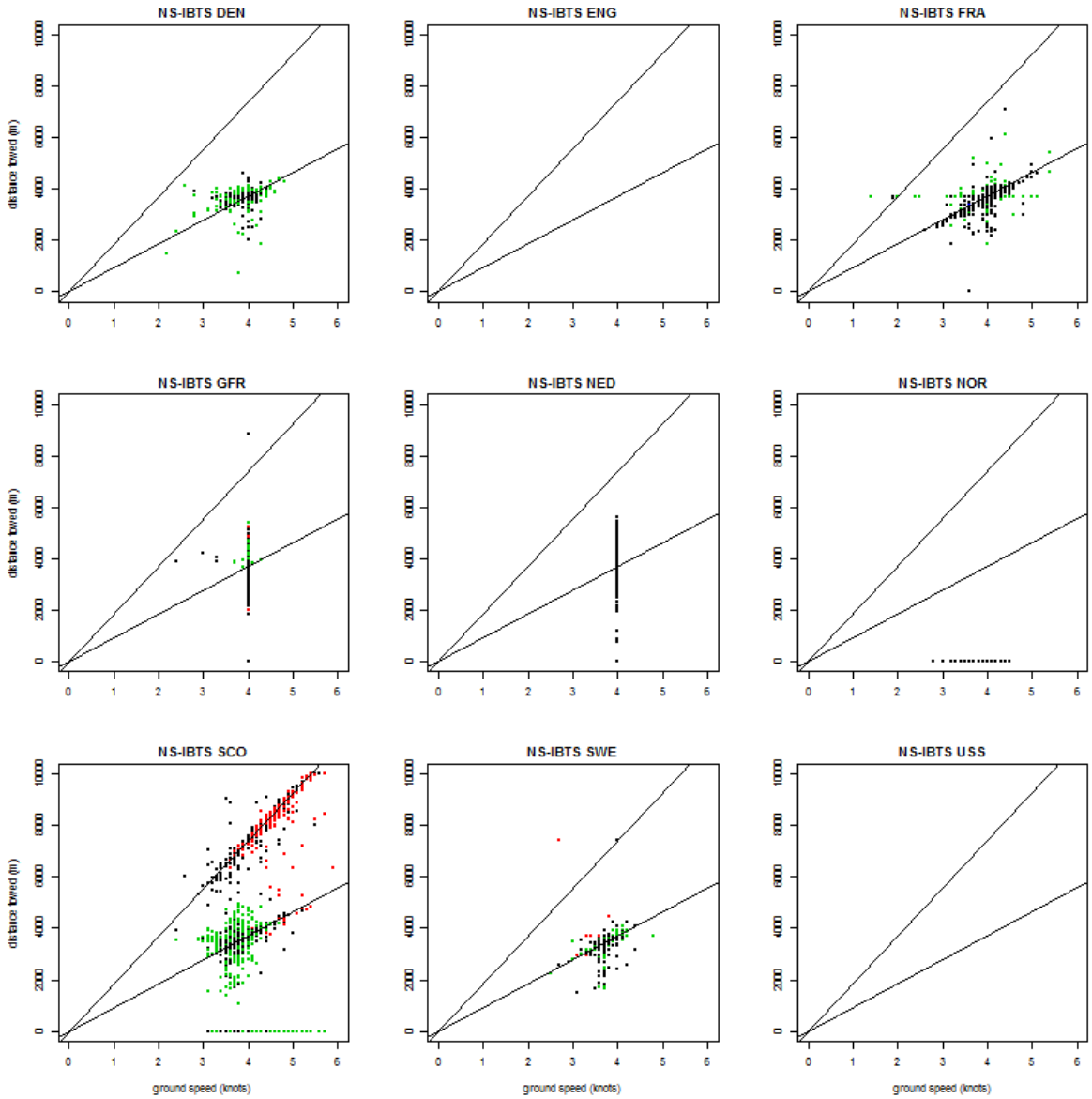


Figure 7.4. Distance towed against speed over ground, by survey, all years for NS-IBTS, by country, all years. The different colours reflect different quarters. Lower black line: distance when fishing for 30 minutes with 4 knots ground speed, the upper black line fishing for 60 minutes with 4 knots ground speed.

7.3.3 Distance against calculated distance

The distance towed was calculated based on the shooting and hauling positions as recorded in DATRAS. If hauling position was not available, calculated distance was set to -9. It is to be expected that there are some differences between the observed and calculated distance, as a fishing tracks might not be straight lines, as the calculated distance assumes.

Figure 7.5 shows the plots of observed distance against calculated distance for all surveys coordinated by IBTSWG. Figure 7.6 is similar, for only NS-IBTS, by country. From the figures it becomes clear that there are a few real outliers in the dataset (e.g. PT-IBTS, NS-IBTS NED&SWE). This might be due to either wrongly recorded distance or to errors in shooting or hauling position.

On the other hand, there are also plots where observed and calculated distances are identical for the complete time-series. This can be explained in two ways: (1) the ship always fish in a straight line, without any displacement by currents or (2) the distance stored in DATRAS is not the observed distance, but the submitted distance is calculated based on shooting and hauling position. During IBTSWG 2013, the two options above were discussed, and the second explanation (calculated distance added) applied to all data where observed distance and calculated distance were equal. As only observed data should be uploaded into DATRAS, all occurrences of calculated distance should be replaces by either the observed distance if available, or by -9. It is recommended that a column 'calculated distance' be added to the so-called new DATRAS product 'flat file' (see WKDATR report (ICES, 2013)).

Actions:

- All countries submitting calculated distance to DATRAS to replace this by either the observed distance or -9 (applies to: SP-NORTH, SP-PORC, EVHOE, IE-IGFS, NIGTS, maybe part of SWC-IBTS, NS-IBTS DEN, part of NS-IBTS ENG)
- Vaishav Soni and Dave Stokes to compare the ICES Data Centre algorithm used for calculating distance with the algorithm used by Dave Stokes.

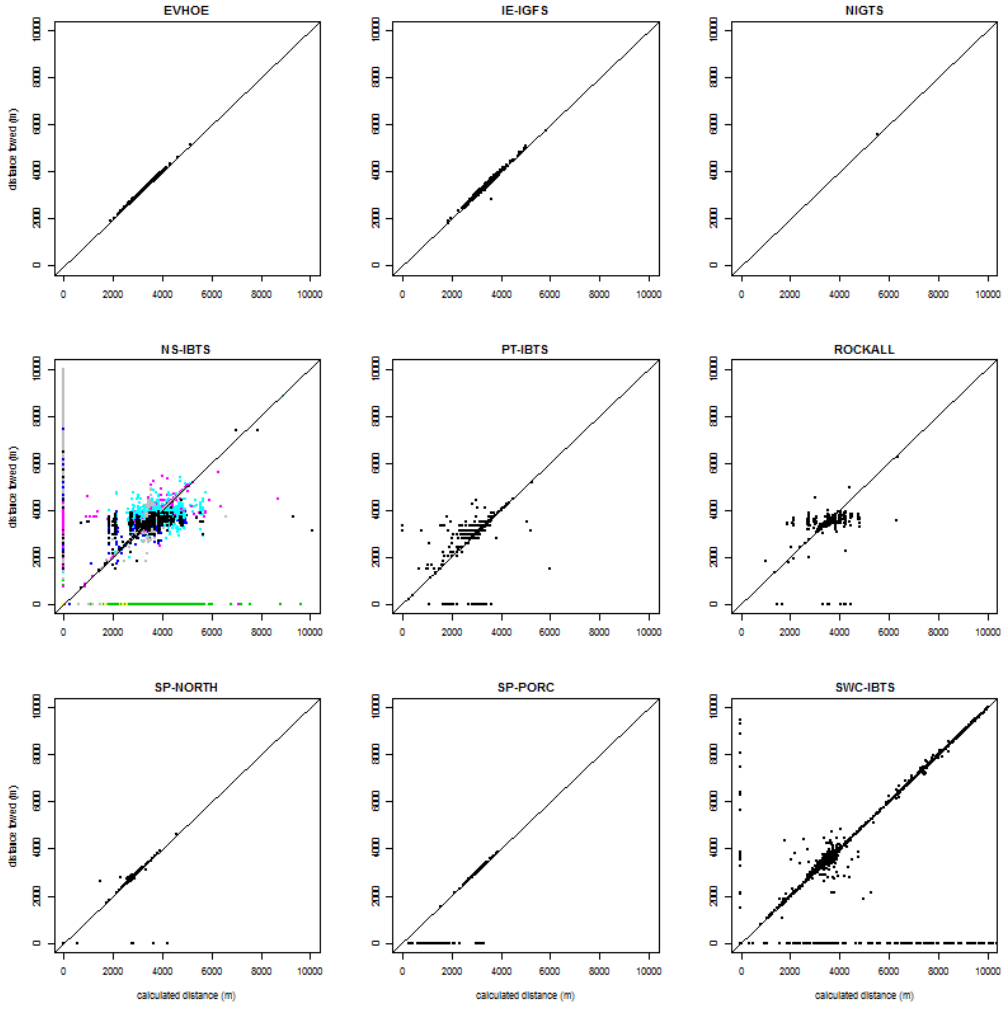


Figure 7.5. Observed distance towed against calculated distance, by survey, all years. In NS-IBTS the different colours reflect different countries. Black line: observed distance=calculated distance.

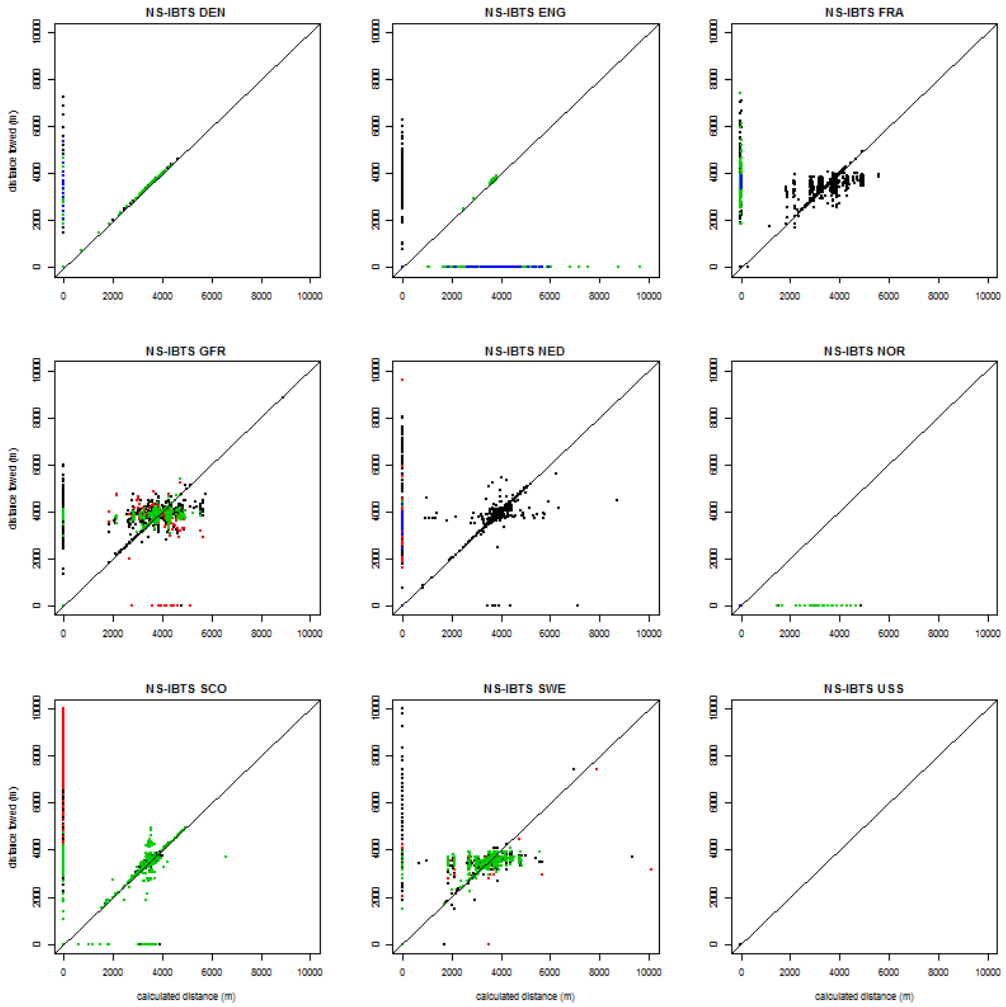


Figure 7.6. Observed distance towed against calculated distance, by survey, all years for NS-IBTS, by country, all years. The different colours reflect different quarters. Black line: observed distance=calculated distance.

7.3.4 Swept-area calculation: what should be checked

As there is an increasing demand to calculate swept-area-based indices from IBTS coordinated surveys (see also chapter 8), it is important to have all important variables available. Table 7.3.4.1 shows the information needed to calculate swept-area.

The swept-area is calculated in different ways for herding and non-herding species. First of all, the categorization of the species should be done. There is already information available from literature but it is worth to critically go through the lists currently used (Fraser *et al.*, 2007; Piet *et al.*, 2009)

From: http://www.mafcons.org/documents/report/Chapter09Annex4Fish.pdf).

Table 7.3.4.1. Information needed to calculate swept-area for individual hauls.

Species type	Information needed	Alternative information 1	Alternative information 2
Herding species	Door spread	Mean door-spread (DS) based on depth (D) 1: DS = 33.251* log D + 15.744 9.2.3.1.1	
	Observed distance	Calculated distance from shooting and hauling position	Calculated distance from speed over ground and haul duration
Non-herding species	Wing spread	Door spread+algorithm	Mean wingspread (WS) based on depth (D) 2: WS = 6.8515 * log D + 5.8931
	Observed distance	Calculated distance from shooting and hauling position	Calculated distance from speed over ground and haul duration

Actions:

- Before calculating a swept-area-based index, an analysis of the variables above should be done, to check if all information is available to calculate the swept-area
- In case calculations from door spread to wing spread are required, IBTSWG should supply ICES Data Centre with one or more algorithms (if necessary by country, gear type) to do so, including clear Excel examples for parts of the dataset, and including narrative text for documentation purposes.

7.4 Species inconsistencies

In 2012, DATRAS shifted from TSN (ITIS, itis.gov) coding to Aphia (WoRMS, marinespecies.org) coding for species in the database. WKDATR asked IBTSWG to investigate the effects of the change on the output.

7.4.1 Differences between WoRMS and DATRAS

Errors may occur due to different reasons in the transfer from WoRMS species identities to DATRAS. First of all, the scientific names or the species codes in the species list used might vary between the original WoRMS list (marinespecies.org) and the species list used currently in DATRAS. The differences between the species names in both lists are presented in Table 7.4.1.1and Table 7.4.1.2. Error types 1, 2, and 3 are due to slight differences in spelling and can be easily changed. Error type no. 4 is a serious one, caused by a typing error in the coding. In the case given, the correct AphiaID for *Crossaster* should be 123336.

[1] From http://www.mafcons.org/documents/report/Chapter09Annex4Fish.pdf)
[2] From http://www.mafcons.org/documents/report/Chapter09Annex4Fish.pdf)

Table 7.4.1.1. Inconsistencies between latest versions of the WoRMS database and the ICES database, comparison by joining AphiaID codes from the DATRAS and marinespecies.org species lists, respectively.

Error_no.	AphiaID	WoRMS (scientific name)	DATRAS (scientific name)
1	125158	*Leptasterias (Leptasterias) muelleri*	*Leptasterias muelleri*
2	125475	Phycidae	Phycidae˜
3	416668	*Loligo forbesii*	*Loligo forbesiiÿ*

Table 7.4.1.2. Inconsistencies between last version WoRMS database and ICES species list, comparison by joining scientific names from DATRAS species list and marinespecies.org species list.

Error no.	scientific name	WoRMS(AphiaID)	DATRAS (AphiaID)
4	Crossaster	123336	123386

It is recommended that ICES Data Centre changes the AphiaID for *Crossaster* into 123336 and changes the scientific names of "*Leptasterias muelleri*"," Phycidae "and "*Loligo forbesiiÿ*" into the correct names.

7.4.2 Differences between WoRMS and TSN

The second source of inconsistency can be found in differences between the old (TSN, itis.gov) and the new (WoRMS, marinespecies.org) coding system. For end-users this is the most visible inconsistency. This problem can only exist when not all data are stored using the same species coding system. Currently, data uploaded in DATRAS before 2012 are coded by the TSN system, and data from 2012 onwards by the WoRMS system. As this complicates searching for data of a specific species and so, directly affects the end-users, it should be solved as soon as possible. Table 7.4.2.1 shows the differences in scientific species names between the old and the new system.

Table 7.4.2.1. Differences in species names in IBTS dataset, by survey, full time-series.

Survey	ITIS (scientific name)	WoRMS (scientific name)
EVHOE	*Argyropelecus olfersi*	*Argyropelecus olfersii*
EVHOE	*Aspitrigla cuculus*	*Chelidonichthys cuculus*
EVHOE	*Aspitrigla obscura*	*Chelidonichthys obscurus*
EVHOE	*Balistes carolinensis*	*Balistes capriscus*
EVHOE	*Caelorinchus caelorhincus*	*Coelorinchus caelorhincus*
EVHOE	*Cepola rubescens*	*Cepola macrophthalma*
EVHOE	*Ciliata mustella*	*Ciliata mustela*
EVHOE	*Entelurus aequerius*	*Entelurus aequoreus*
EVHOE	*Gaidropsarus macropthalmus*	*Gaidropsarus macrophthalmus*
EVHOE	*Hippocampus ramulosus*	*Hippocampus guttulatus*
EVHOE	*Labrus bimaculatus*	*Labrus mixtus*
EVHOE	*Loligo forbesii*	*Loligo forbesiiÿ*
EVHOE	*Macroparalepis affine*	*Macroparalepis affinis*

Survey	ITIS (scientific name)	WoRMS (scientific name)
EVHOE	*Maia squinado*	*Maja brachydactyla*
EVHOE	*Molva macropthalma*	*Molva macrophthalma*
EVHOE	*Notolepis rissoi*	*Arctozenus risso*
EVHOE	*Notoscopelus kroeyeri*	*Notoscopelus kroyeri*
EVHOE	*Solea vulgaris*	*Solea solea*
EVHOE	*Sparus auratus*	*Sparus aurata*
EVHOE	*Stomias boa ferrox*	*Stomias boa ferox*
EVHOE	*Synaphobranchus kaupi*	*Synaphobranchus kaupii*
EVHOE	*Torpedo marmorata*	*Torpedo (Torpedo) marmorata*
EVHOE	*Torpedo nobiliana*	*Torpedo (Tetronarce) nobiliana*
EVHOE	*Trachinus vipera*	*Echiichthys vipera*
EVHOE	*Trigla lucerna*	*Chelidonichthys lucerna*
EVHOE	*Zeugopterus norvegicus*	*Phrynorhombus norvegicus*
IE-IGFS	*Cancer bellanius*	*Cancer bellianus*
IE-IGFS	*Centroscymnus crepidater*	*Centroselachus crepidater*
IE-IGFS	*Loligo forbesii*	*Loligo forbesiiÿ*
IE-IGFS	*Solea vulgaris*	*Solea solea*
IE-IGFS	*Torpedo nobiliana*	*Torpedo (Tetronarce) nobiliana*
IE-IGFS	*Zeugopterus norvegicus*	*Phrynorhombus norvegicus*
NS-IBTS	*Anarhichas ocellatus*	*Anarrhichthys ocellatus*
NS-IBTS	*Aspitrigla cuculus*	*Chelidonichthys cuculus*
NS-IBTS	*Buenia jeffreysi*	*Buenia jeffreysii*
NS-IBTS	*Ciliata mustella*	*Ciliata mustela*
NS-IBTS	*Culicoides˜sordidellus (insect)*	*Microchirus (Microchirus) variegatus*
NS-IBTS	*Entelurus aequerius*	*Entelurus aequoreus*
NS-IBTS	*Gaidropsarus macropthalmus*	*Gaidropsarus macrophthalmus*
NS-IBTS	*Labrus bimaculatus*	*Labrus mixtus*
NS-IBTS	*Liza ramado*	*Liza ramada*
NS-IBTS	*Loligo forbesii*	*Loligo forbesi*
NS-IBTS	*Loligo forbesii*	*Loligo forbesiiÿ*
NS-IBTS	*Lumpenus lumpretaeformis*	*Lumpenus lampretaeformis*
NS-IBTS	*Lycenchelys sarsi*	*Lycenchelys sarsii*
NS-IBTS	*Macropipus puber*	*Necora puber*
NS-IBTS	*Macrorhamphosus scolopax*	*Macroramphosus scolopax*
NS-IBTS	*Maia squinado*	*Maja brachydactyla*
NS-IBTS	*Maja squinado*	*Maja brachydactyla*
NS-IBTS	*Myoxocephalus quadricornis*	*Triglopsis quadricornis*
NS-IBTS	*N/A*	*Sepiola tridens*
NS-IBTS	*NULL*	*Salmo trutta trutta*
NS-IBTS	*Notolepis rissoi*	*Arctozenus risso*
NS-IBTS	*Onchidella celtica*	*Onchidella celtica*
NS-IBTS	*Phycinae*	*Phycidae˜*
NS-IBTS	*Raja batis*	*Dipturus batis*

Survey	ITIS (scientific name)	WoRMS (scientific name)
NS-IBTS	*Raja fullonica*	*Leucoraja fullonica*
NS-IBTS	*Raja naevus*	*Leucoraja naevus*
NS-IBTS	*Raja radiata*	*Amblyraja radiate*
NS-IBTS	*Scophthalmus maximus*	*Psetta maxima*
NS-IBTS	*Solea vulgaris*	*Solea solea*
NS-IBTS	*Syngnathoidei*	*Syngnathidae*
NS-IBTS	*Taurulus lilljeborgi*	*Micrenophrys lilljeborgii*
NS-IBTS	*Torpedo marmorata*	*Torpedo (Torpedo) marmorata*
NS-IBTS	*Trachinus vipera*	*Echiichthys vipera*
NS-IBTS	*Trigla lucerna*	*Chelidonichthys lucerna*
NS-IBTS	*Triglops pingeli*	*Triglops pingelii*
NS-IBTS	*Zenopsis ocellata*	*Zenopsis conchifer*
NS-IBTS	*Zeugopterus norvegicus*	*Phrynorhombus norvegicus*
SP-NORTH	*Raja naevus*	*Leucoraja naevus*
SP-PORC	*Molva macropthalma*	*Molva macrophthalma*
SP-PORC	*Raja naevus*	*Leucoraja naevus*
SWC-IBTS	*Argyropelecus olfersi*	*Argyropelecus olfersii*
SWC-IBTS	*Aspitrigla cuculus*	*Chelidonichthys cuculus*
SWC-IBTS	*Balistes carolinensis*	*Balistes capriscus*
SWC-IBTS	*Blennius gattorugine*	*Parablennius gattorugine*
SWC-IBTS	*Caelorinchus caelorhincus*	*Coelorinchus caelorhincus*
SWC-IBTS	*Cepola rubescens*	*Cepola macrophthalma*
SWC-IBTS	*Ciliata mustella*	*Ciliata mustela*
SWC-IBTS	*Culicoides˜sordidellus (insect)*	*Microchirus (Microchirus) variegatus*
SWC-IBTS	*Gaidropsarus macropthalmus*	*Gaidropsarus macrophthalmus*
SWC-IBTS	*Labrus bimaculatus*	*Labrus mixtus*
SWC-IBTS	*Loligo forbesii*	*Loligo forbesi*
SWC-IBTS	*Loligo forbesii*	*Loligo forbesiiÿ*
SWC-IBTS	*Lumpenus lumpretaeformis*	*Lumpenus lampretaeformis*
SWC-IBTS	*Macropipus puber*	*Necora puber*
SWC-IBTS	*Malacocephalus laevis*	*Malacocephalus (Malacocephalus) laevis*
SWC-IBTS	*Phycinae*	*Phycidae˜*
SWC-IBTS	*Raja batis*	*Dipturus batis*
SWC-IBTS	*Raja naevus*	*Leucoraja naevus*
SWC-IBTS	*Scophthalmus maximus*	*Psetta maxima*
SWC-IBTS	*Solea vulgaris*	*Solea solea*
SWC-IBTS	*Stomias boa ferrox*	*Stomias boa ferox*
SWC-IBTS	*Taurulus lilljeborgi*	*Micrenophrys lilljeborgii*
SWC-IBTS	*Trachinus vipera*	*Echiichthys vipera*
SWC-IBTS	*Trigla lucerna*	*Chelidonichthys lucerna*
SWC-IBTS	*Zenopsis conchifera*	*Zenopsis conchifer*
SWC-IBTS	*Zeugopterus norvegicus*	*Phrynorhombus norvegicus*

It is recommended that ICES Data Centre adds an extra column to the Exchange file containing the WoRMS coding for all data stored in DATRAS. Additionally, it is recommended to create the "flat file" proposed by WKDATR (see Section 4.2.4 of (ICES, 2013)), as soon as possible.

7.4.3 Use of unaccepted species codes

Last, but not least, errors might occur when invalid species names are used in the database. As long as only the invalid code is being used for a species this does not lead to any problems for end-users, but when old unaccepted codes occur in the database next to the valid species codes, this will lead to errors.

Table 7.4.3.1. Species for which unaccepted WoRMS codes are used in DATRAS.

Survey	Scientific name	Aphiaid	Status
NS-IBTS	*Chelidonichthys lucernus*	274877	Unaccepted
NS-IBTS	*Diplecogaster bimaculata*	126513	Unaccepted
NS-IBTS	*Gasterosteus aculeatus*	126505	Unaccepted
NS-IBTS	*Liparis liparis*	127219	Unaccepted
NS-IBTS	*Loligo forbesi*	140270	Unaccepted
NS-IBTS	*Loligo subulata*	341892	Unaccepted
NS-IBTS	*Luidia sarsi*	178639	Unaccepted
NS-IBTS	*Macropipus puber*	154300	Unaccepted
NS-IBTS	*Psetta maxima*	154473	Unaccepted
NS-IBTS	*Salmo trutta*	127187	Unaccepted
SP-NORTH	*Chelidonichthys lucernus*	274877	Unaccepted
SWC-IBTS	*Chelidonichthys lucernus*	274877	Unaccepted
SWC-IBTS	*Loligo forbesi*	140270	Unaccepted
SWC-IBTS	*Psetta maxima*	154473	Unaccepted

Recommendations:

When institutes submit data they have to be able to upload data in the latest format. It is recommended that ICES Data Centre changes the codes for the unaccepted names to the accepted name codes for the species in Table 7.4.3.1.

In general, it is recommended that ICES Data Centre finds a way forward to incorporate WoRMS updates in the submission checking procedures. WoRMS is being updated continuously and analogously, the DATRAS reference tables should be updated more frequently.

8 ToR d. Produce a swept-area-based index (instead of haul time-based index) to be explored in collaboration with the WGISDAA (ToR d – multiannual, year 1)

The importance of a swept-area estimation, strongly emphasized by IBTSWG, has also been supported by two ICES groups that met earlier in 2013, namely WGISDAA (Working Group on Improving use of Survey Data for Assessment and Advice) and WKDATR (DATRAS data Review Priorities and checking Procedures).

The calculation of swept-area (e.g. Fraser *et al*., 2007), preferably based on towed distance and wingspread was in fact included among the requests for new DATRAS products discussed during WKDATR. This request arose from a joint meeting between WKDATR and WGCHAIRS, where WKDATR collected feedback on DATRAS products from the assessment group chairs. For all otter trawl surveys wingspread should be submitted, and thus it has been recommended that IBTSWG checks the various datasets for the availability of wingspread information and completes missing values where possible.

Two members of IBTSWG attended WGISDAA 2013, where the use of a swept-area based index was dealt with. During the meeting data exploration led to the assertion that changes in gear performance have occurred over time for both the 1st and the 3rd quarter. A conversion to Swept-area Index was thus recommended, implying cpue being provided in numbers per swept-area instead of numbers per hour to account for differences between countries, years and quarters. However, it was agreed that little further progress was possible until the current data availability of gear parameters was addressed by the national survey managers.

The basic assumption behind an international coordinated survey, such as IBTS, is that the fishing method applied by the different countries is standardized, in order to calculate accurate fisheries independent combined indices. However, during the past years it became clear to the IBTSWG that the standard sampling gear (GOV) used during the IBTS survey is deployed in somewhat different ways by different countries. The reason for this discrepancy is partly to be found in the different components of the national gears (e.g. trawl doors, sweeps) and partly in the different rigging procedures. Concerning the former issue, options to fully standardize all gear parameters between survey participants, are constrained by the individual nations' ships and their mode of operation. Yet, some of the differences in gear may be overcome over time. The latter aspect - differences in rigging - is linked to national drifts from the standard procedures described in the manual, in terms of scope ratio (warp/depth), door spread, headline height (vertical net opening) and sweep length at different depths. As a matter of fact, with modern trawl doors and netting materials, it is impossible to meet all the originally recommended gear parameters simultaneously. Thus for those countries that are following the established warp ratio, the door spread and net opening achieved are widely outside the target ranges included in the manual. The result is higher door spread and a lower headline height, with the divergence increasing with the depth, compared to the values shown in the manual. The consequent obvious change of the sampling unit (swept-area) leads to the violation of a basic assumption in conducting a standard survey, where a standard gear, towed at a standard speed for a set period, would sweep a fixed area of seabed (Forest and Minet, 1981).

Furthermore the use of two different sweep lengths at different depth (60 meters down to 70 meters and 110 meters thereafter), required by the manual during the first quarter survey, is not uniformly applied by all countries causing additional drifts from the standard deployment of the gear. The effect of sweeps length on net geometry and on the catch rates of different species has been evaluated in a study conducted by the Marine Scotland Laboratory and results will soon be available. While correction for swept-area is quite straightforward, the affect of different gear geometry on fish behaviour and thus susceptibility to capture is not always simple and is again highlighted in this study (Annex 7, working document WD 1).

All in all, the resulting fishery-independent combined indices, which are currently normalized to haul duration, cannot be considered fully standardized due to the all above mentioned discrepancies and correction factors need to be applied in order to standardize the unit of effort. Swept-area can easily be estimated, where the tow occurs in a straight line, using the distance towed between shoot and haul position together with the trawl opening either in terms of door or, when available, wing spread. When significant deviation from a straight line occurs the calculation of towed distance will require either multiple GPS waypoints or else speed over ground and tow duration. Relative abundance indices, standardized by the swept-area, are undoubtedly more accurate than the typically used duration-based indices.

This emphasizes the need for each country, having the responsibility to record and upload to DATRAS all the values showing the gear geometry and performance, to fill the gaps in the database. Unfortunately in some cases the values are missing not because of a lack of uploading but because never recorded. In case of door spread, IBTSWG 2013 discussed the possibility to use an algorithm to estimate door spread when the value is missing because not recorded (see below).

Thus during IBTSWG2013 it was once more highlighted that the currently used CPUE, in terms of number per hour, may be biased by swept area and that distribution maps and annual abundance indices would not be consistent if differences in the swept area between e.g. years or quarters occur. Analyses of measured door spread values from the 1st and 3rd quarter North Sea IBTS (2000-2013) reveal differences between vessels, years and quarters. Door spread increases from about 60 m at 25 m depth to more than 100 m at 150 m depth in the 1st quarter NS-IBTS (

, Figure 8.2) and large dissimilarities between the countries are found in particular at depths larger than 70 meters at which some, but not all, countries uses long sweeps (

, Figure 8.2). Door spread has been less variable between countries in the 3rd quarter except for 2011 and 2012 in which one country used a restricting rope which kept the door spread at about 50 m irrespectively of depth (Figure 8.3, Figure 8.4). For both quarters, a considerable amount of values for door spread area missing and this problem is most pronounced for the years prior to 2004 for both quarters but also in the 1st quarter 2012. However, door spread can be estimated from its relationship with depth but this should be done specifically by country and periods of years, and need to done for short and long sweeps separately. It was unanimously decided that these estimates of door spread, will be inserted as an additional column in a new DATRAS product ("the flat files") to keep them separate from the observed raw data store in the HH records. Despite the fact that the monitoring of parameters which are necessary to calculate swept area such as observed towed distance or speed over ground (see section 7.3) in addition to door spread is mandatory, there are still many gaps in the database, and it was agreed that providing this information back in time for as many as possible (at least back to 2004) by each country has high priority.

The available of information on wing spread is even much more limited (in contrast to door spread, wing spread data are not mandatory at present, but recommended to monitor) and also there pronounced differences between countries are found (Figure 8.5). There reasons for these differences are not clear at the moment but may be related to differences in trawl rigging and placement of the wing spread sensors. These issues have to be resolved before an adequate conversion of door to wing spread for all countries becomes possible. Although net geometry should be predictable from

the available measurements, countries who do not currently measure wing spread are strongly encouraged to do so in future.

A generic equation for calculating door or wing spread using its relation with depth for one country e.g. Scotland will likely not work for all cases i.e. for countries changing from short to long sweeps at depths larger than 70 m in the 1st quarter or in cases in which a restriction rope in front of the doors has been used.

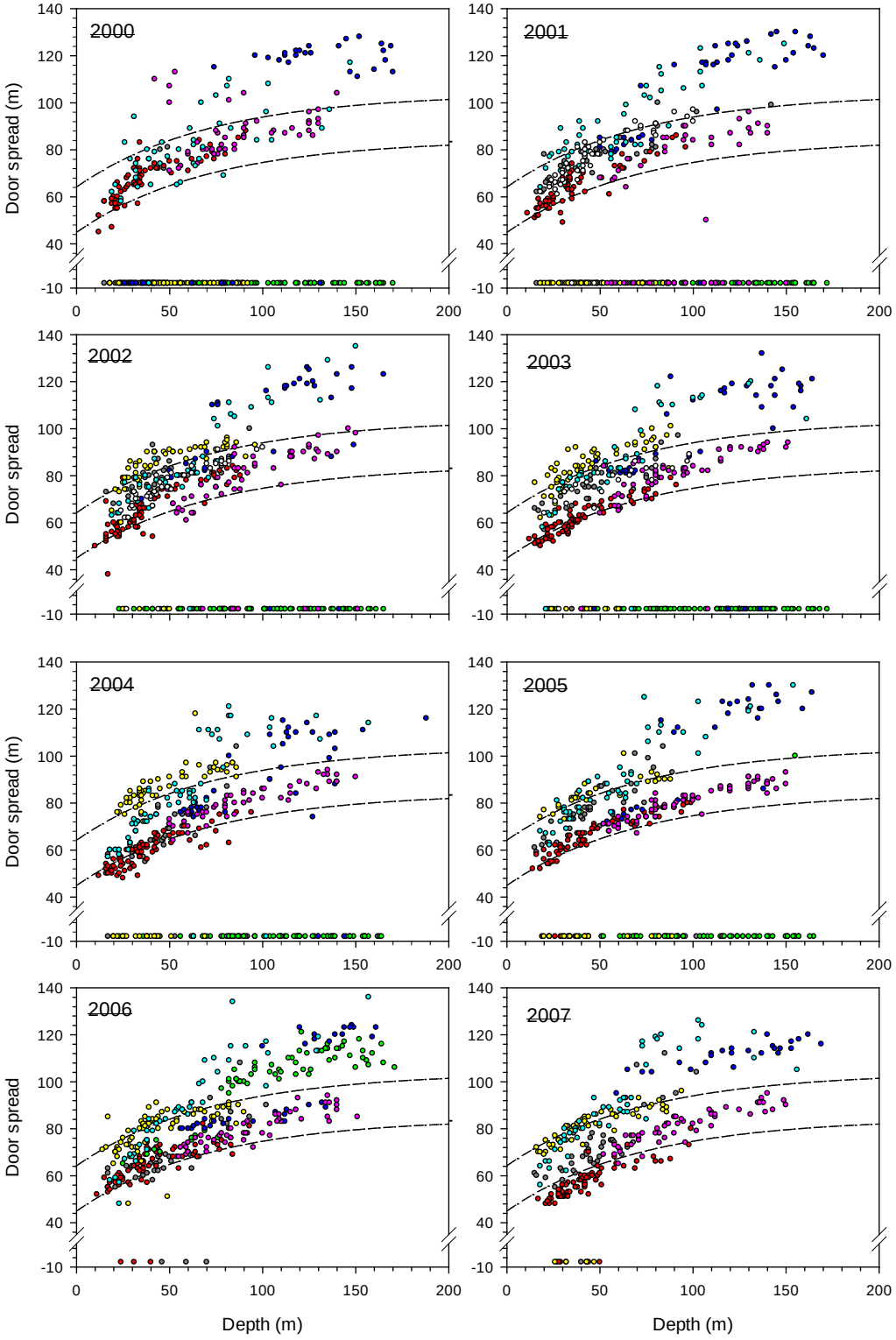


Figure 8.1. GOV door spread by country, 1st quarter NS-IBTS, 2000 – 2007 (see Figure 8.2 for legend).

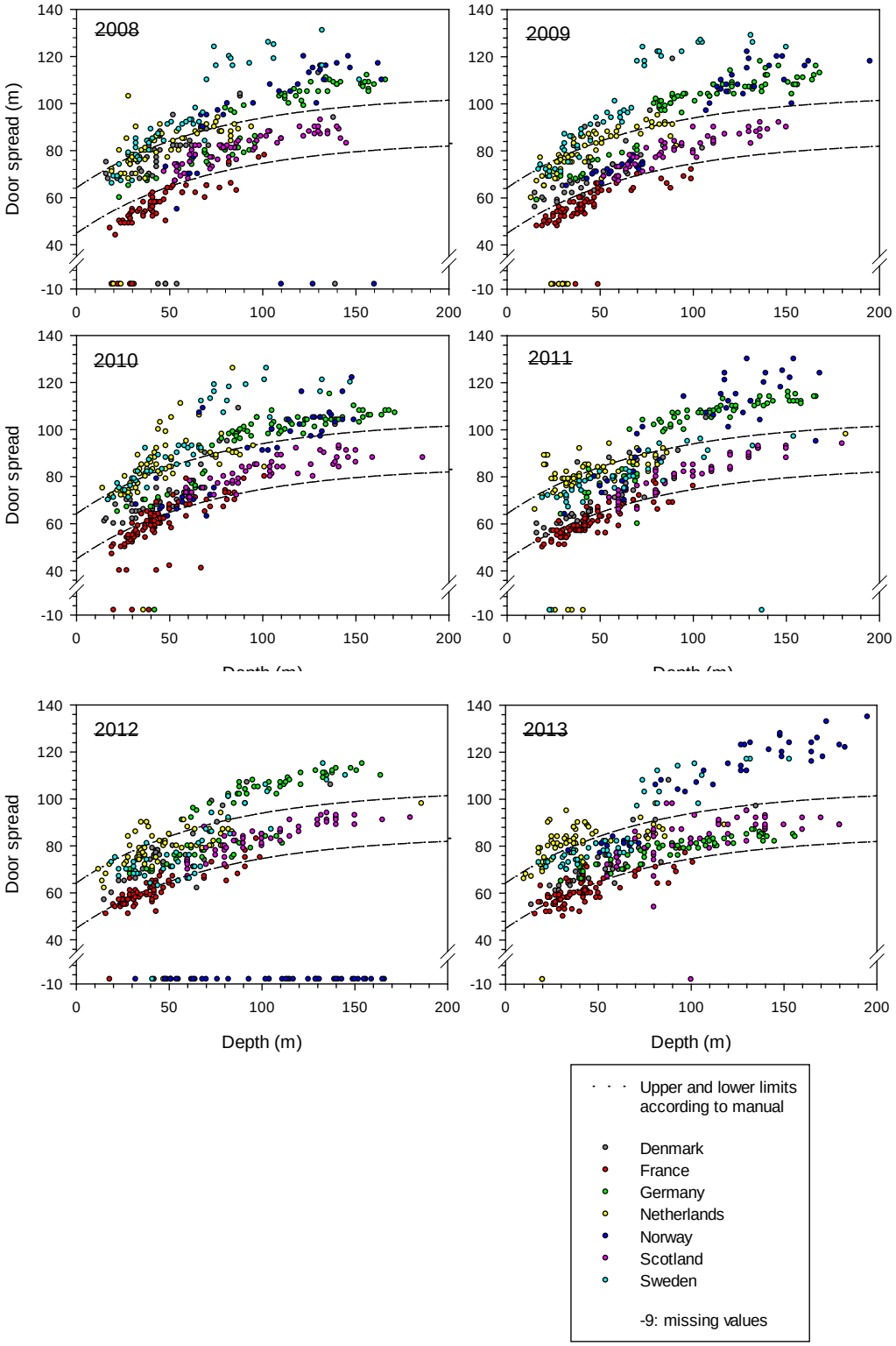


Figure 8.2. GOV door spread by country, 1st quarter NS-IBTS, 2008 – 2013.

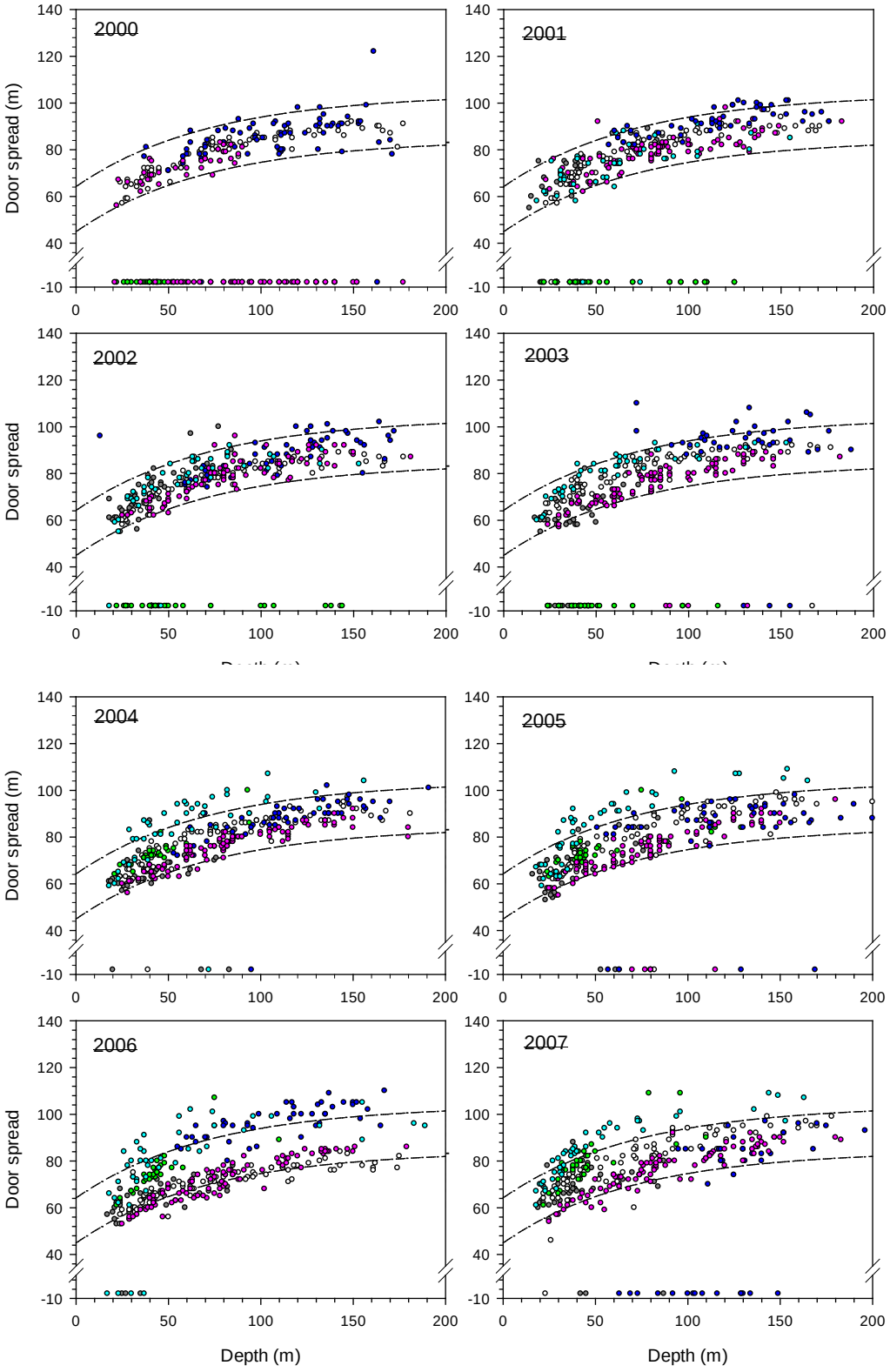


Figure 8.3. GOV door spread by country, 3rd quarter NS-IBTS, 2000 – 2007 (see Figure 8.4 for legend).

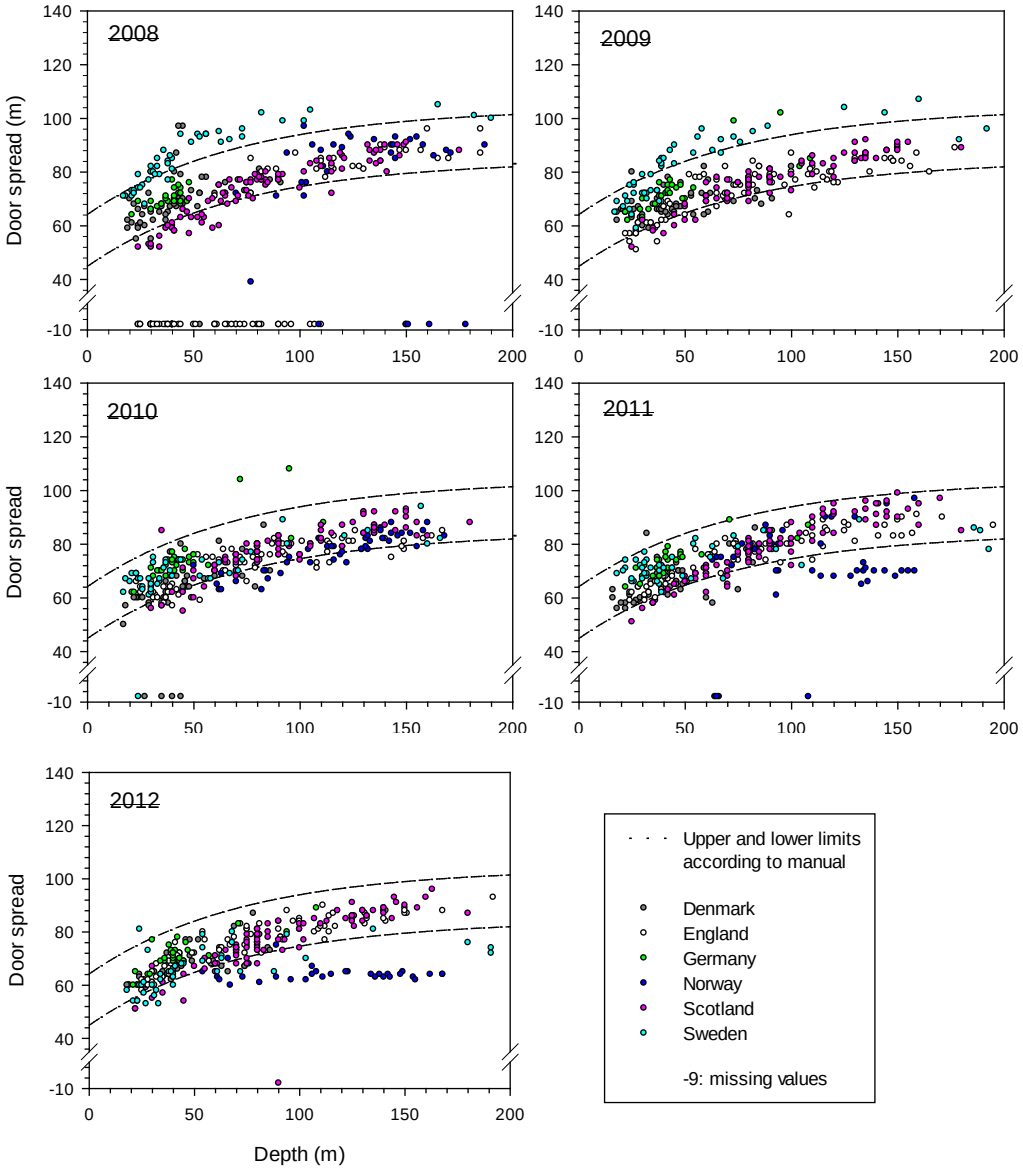


Figure 8.4. GOV door spread by country, 3rd quarter NS-IBTS, 2008 – 2012.

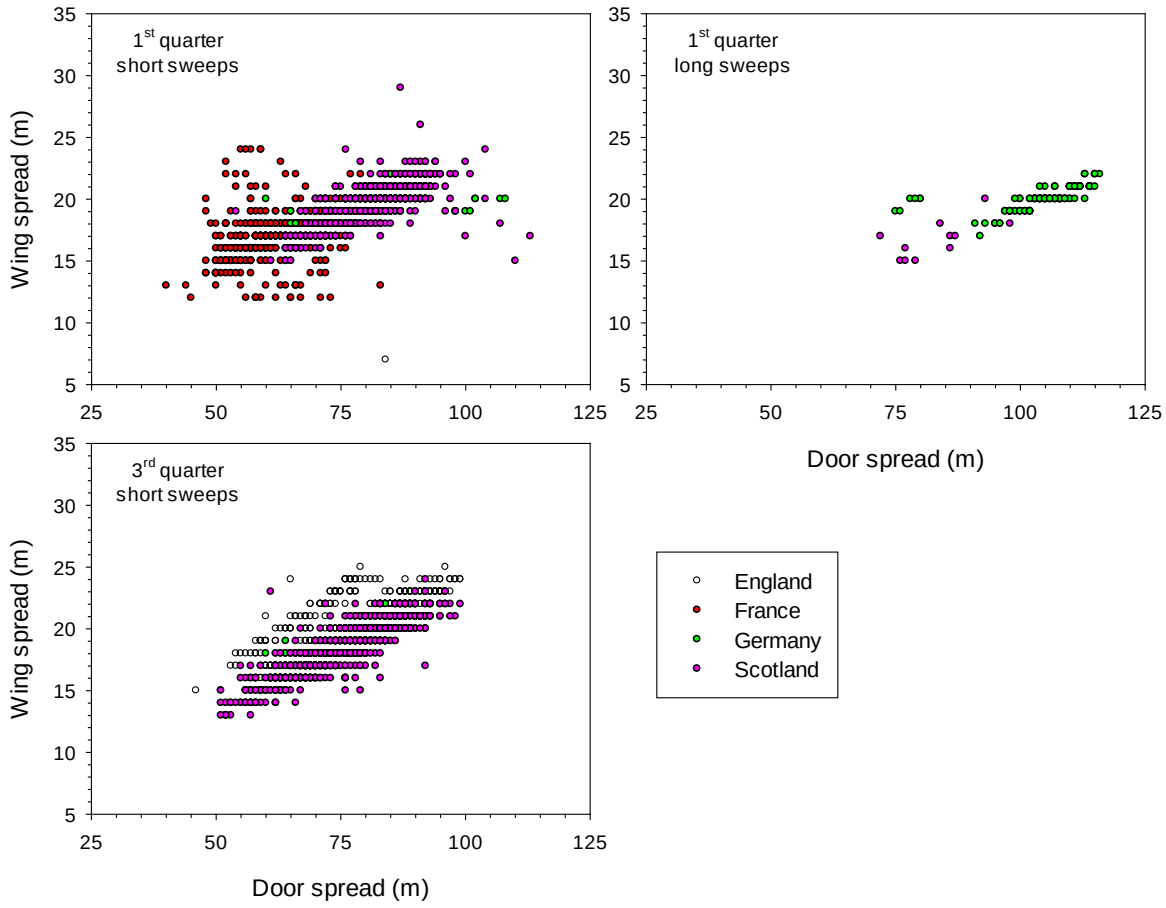


Figure 8.5. Comparison of GOV door and wing spread by country and quarter, 1st quarter NS-IBTS 2000 – 2013 and 3rd quarter NS-IBTS 2000 – 2012.

The need of using a standardized sampling unit becomes even more evident in case of technical changes as for example when changing the vessel as it happened to Sweden. In 2011 in fact Sweden was forced to use an alternative vessel as asbestos was discovered in the previously used R.V. *Argos*. Therefore, the smaller R.V. *Mimer* was employed to carry out a scaled-down spring survey program in 2011 during the first quarter, while the Danish vessel R.V. *Dana* was chartered from the third quarter in 2011 onwards. Figure 8.6 shows a comparison of the area swept by the three vessels, calculated using door spread and towed distance.

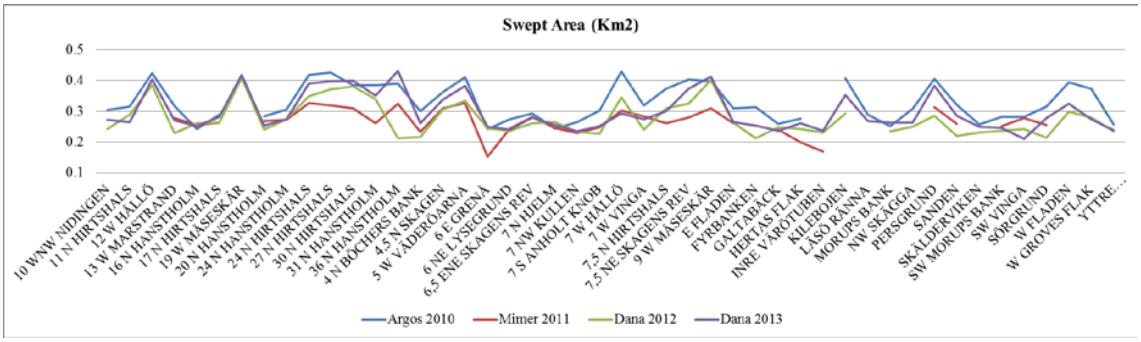


Figure 8.6. Differences in swept-area (km²) for each single station during the Swedish 1st quarter IBTS from 2010 to 2012 using three different vessels. The x-axis shows all sampled stations (fixed fishing positions in each of the surveys).

The figure shows that different vessels, due to changes in gear component and rigging procedures, produced different swept-areas, although they ought to be equal. In same case is the distance towed that differences consistently between years, but in general is the spreading of the doors that causes the shown dissimilarities. This endorses how changes in trawl parameters and the obvious consequent effect on sampling unit need to be taken into consideration when calculating the indices and not overlooked calculating the cpue simply as numbers/hour.

9 ToR e. (i) Compile status quo, report and propose ways forward in standardization, on the different materials and specifications of the GOVs and gear currently used by the IBTS participants. (ii) Analyse and report on the effect of variable sweep length and standardization on the uses in the IBTS. (ToR e – multiannual, year 1)

9.1

9.2 Compile status quo and report on ways forward in standardization

A survey trawl is a complex system which is constructed from a wide variety of components. Historically institutes have either ordered the standard net and associated fishing components from a netmaker or have them all or part constructed within their own net stores. However, a standard survey trawl can be in service for a considerable period of time and therefore this can often lead to "modifications" creeping in that may alter the performance of the gear. Furthermore, over time alterations can be made to how a survey trawl is deployed such as warp to depth ratios, the use of long/short sweeps or introduction of a new survey vessel. Also problematic are changes in materials used in a survey trawls construction due to components becoming unavailable because they are no longer manufactured and the effect this might have on the catchability of the gear.

To allow an evaluation of the differences between survey gears currently being used by IBTS participants, a detailed survey gear comparison questionnaire has been created (Annex 5 – GOV Specification Form). The comparison survey covers net and groundgear construction, wire rig/otterboard specifications and warp to depth scope ratios. A deadline has been set for return of the completed tables by 18 December 2013. The information will be collated and differences in standardization identified and reported back to the IBTSWG meeting in 2014.

9.3 The effect of variable sweep length and its standardization within IBTS

The results from catch comparison trials carried out by Marine Scotland Science to assess the effect of long (97m) and shorts (47m) sweeps on GOV catchability was presented (Rob Kynoch) to the group (Annex 7 – WD 1). The main aim of the trials were to assess GOV catchability using the short sweeps in a water depth range (130m-145m) significantly deeper than recommend in the IBTS survey manual. The same GOV trawl was used throughout rigged with a rock-hopper groundgear (D Rig), which is the same gear used for Scottish groundfish surveys west of 4°. A total of 22 paired hauls were completed using the alternate haul method. Both sweep configurations were towed at similar towing speeds and all paired haul-sets with the same warp to depth ratio.

Results showed the long sweep configuration increase otterboard spread by ~25%. No significant differences were found between the two sweep gears in terms of headline height, wingend spread or bottom contact. There was no indication of over-spreading by the short sweep gear but it was suggested this could be due in-part to the weight of the groundgear used (D Rig, 2180kg in air). Catch rates per m otterboard swept-area were similar for whiting (39) but less for haddock (-5.73), cod (-

0.75) and saithe (-2.26) for the long sweep gear. The final Marine Scotland report on these trials is due for publication by June 2013.

The effect of sweep length, which has been observed here, was associated with a net rigged with the groundgear D, much heavier than the standard groundgear A used in the North Sea survey in the majority of cases. However, given the large affect seen here, IBTSWG strongly suggests to explore in another analogous experiment the effect of altering sweep length when employing groundgear A.

10 Provide a response in terms of a joint annex in the reports from IBTSWG and WGBEAM, on maximizing the use of available sources of data for monitoring of biodiversity. (ToR f – Reported to ICES, 9 May 2013)

Several ICES Expert Groups — including IBTSWG — have in been asked to respond to the OSPAR Request (2013-4):

Maximize the use of available sources of data for monitoring of biodiversity: The purpose of this request is to seek ICES advice on the potential sources of data and information that may be available to support the monitoring and assessment of biodiversity in relation to commitments under MSFD so as to maximize efficiencies in the use of available resources, for example where efficiencies could be made to identify where there are monitoring programmes or data sources that can deliver multiple indicators, which may relate to different Descriptors, (e.g. The Data Collection Framework could be used to implement D3 and D1 indicators), or where with a small additional effort existing monitoring could be amplified to deliver a broader set of data. Advice would be sought as to 1) the quality of these potential data sources and how they could be used, including but not limited to the relevance of outcomes identified in chapter 8 of the ICES MSFD D3+ report to Descriptors 1, 4 and 6.

IBTSWG and WGBEAM 2013 approached this task, applying the following steps:

a) Selecting MSFD indicators defined in the EU COM Decision 477/2010, which are related to biodiversity issues. These are primarily, but not exclusively, the indicators listed under Descriptor 1.

b) Identifying as far as possible analogous indicators in the OSPAR terminology in OSPAR document BDC 13/4/2-E from February, 2013.

c) Determining data availability through the IBTSurveys in their present form.

d) Identifying opportunities for additional data collection or analyses, which would lead to improved data availability for MSFD reporting, but would require additional effort during the IBTS surveys themselves or after the surveys for sample and data analyses ashore.

The results of the stepwise process described above are summarized in Tables A.8.1. and A.8.2 in Annex 8.

11 Revisions to the work plan and justification

Suggested ToRs for 2014

ToR	Description	Background	Science Plan topics addressed	Duration	Expected Deliverables
a	Coordination and reporting of North Sea and Northeastern Atlantic surveys, including appropriate field sampling in accordance to the EU Data Collection Framework	Intersessional planning of Q1- and Q3- surveys; communication of coordinator with cruise leaders; combing the results of individual nations into an overall survey summary.	113, 121, 141, 144, 161, 162, 173, 211, 251, 252, 311, 321	Recurrent annual update	1) Survey summary including collected data and description of alterations to the plan, to relevant assessment-WGs (WGHMM, WGCSE, WGNEW, WGNSSK, HAWG, WGDEEP, WGEF, WGEEL, WGCEPH, WGHANSA) and SCICOM. 2) Indices for the relevant species to assessment WGs (see above) 3) Planning of the upcoming surveys for the survey coordinators and cruise leaders.
b	Review IBTS manuals and consider additional updates and improvements in survey design and standardization	Intersessional activity, ongoing in order to improve survey quality	161, 162, 321	Permanently ongoing	Updated version of survey manual, whenever substantial changes are made (intersessionally)
c	Address DATRAS-related topics in cooperation with DUAP: data quality checks and the progress in re-uploading corrected datasets, quality checks of indices calculated, and prioritizing further developments in DATRAS. Step 2: Adressing action points as listed in IBTSWG report 2013, Action List.	Issues with data handling, data requests or challenges with re-uploading of historical or corrected data to DATRAS have been identified and solutions are being developed	161, 162, 321	Multi-annual activity, supported by WKDATR workshop in January of 2013 to solve issues with highest priorities;	Prioritized list of issues and suggestion for solutions and for quality checking routines, as well as definition of possible new DATRAS products, submitted to DATRAS group at ICES (Compare Action List in 2013 report). Once data quality control routines are estabished, annual check of recent survey data.

d	Produce a swept-area-based index (instead of haul time-based index) to be explored in collaboration with the WGISDAA	Swept-area is suggested as an alternative to haul time, because it would remove possible bias resulting from different riggings or gear specifications. In order to evaluate the effect changing to new indices, IBTSWG intends to liase with relevant stock coordinators or assessment groups at ICES.	141, 144	3 years	Manuscript for paper or CRR, analysing the potential advantages of moving to swept-area-based standardization. To be presented to assessment groups for evaluation by 2015.
e	Compile status quo, report and propose ways forward in standardization, on the different materials and specifications of the GOVs and gears currently used by the IBTS participants. Analyse and report on the effect of variable sweep length and standardization on the uses in the IBTS.	Some aspects of the gear applied in the surveys are not required to be standardized. The effect of these variations are to be evaluated. Partly, different standards for sweep lengths have been applied in Q1 vs. Q3 surveys. (For this ToR, IBTS seeks support from gear technology experts and welcomes their contribution.)	141,144	3 years	Technical paper / manuscript.
f	Ensure that the most recent versions of each survey manual is submitted to the Series of ICES Survey Protocols (SISP)	The Series of ICES Survey Protocols (SISP) is an online, web-accessible series of ecosystem (fishery) survey manuals, covering the protocols and procedures used in ICES coordinated fisheries and ecosystem surveys, including trawl, acoustic, and ichthyoplankton surveys (http://www.ices.dk/products/surveyprotocols.asp). The aim is to have all ICES coordinated surveys allocated an ISSN number and become openly available.		As appropriate	Updates of SISP.

Revised Work plan

Year 1 (2013)	Datras Workshop, adjustment of Quality-checking Routines (ToR c); laise with stock coordinators and assessment groups, evaluate data availability for gear parameters in Datras and in national databases (ToR d); Compile status quo, Seek and collate input from gear experts (ToR e); Evaluate output from WKECES 2012 (ToR f).
Year 2	Evaluate the effect of changing to swept-area-based indices for additional examples/ stocks, particularly linked to WGISDAA and benchmark process (ToR d). Continue analyses of different GOV configurations (ToR e).

Year 3	Continue to evaluate the effect of chaning to swept-area-based indiced for additional examples/ stocks (ToR d). Continue analyses of different GOV configurations (ToR e).
Recurrent annual activity	Updates for ToRs a and c. Additionally: ToRs a and b ongoing intersessionally.

12 Next meetings (Interim reports only)

The next meeting of the IBTSWG will take place in Hamburg, Germany from 31 March to 4 April 2014.

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Annex 1: List of participants

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Annex 2: IBTSWG 2013 Agenda

International Bottom Trawl Survey Working Group (IBTSWG) 2013

Chair: Anne Sell

Meeting starts on Monday 08 April at 9.00 a.m.

Meeting closes on Friday 12 April around 16.30 p.m.

Venue: IPMA – Algés, Avenida de Brasília (Praia de Alges), 1449-006 Lisboa

MONDAY, 8.4.

9:00	Start, setting up IT	*Plenary (Pl)*	
9:30	Welcome, adoption of preliminary agenda, appoint-	*Pl*	
10:00	**ToR b** - IBTS Manuals	*Pl*	
	External review of IBTS-NS manual, VIII	***Presentation***	***Anne***
	Feedback from plenary, definition of work needed	*Pl*	
11:00	COFFEE		
11:30	(Feedback continued if needed)		
	Status quo of manual of southwestern waters	***Presentation***	***Fran***
	Feedback from plenary, definition of work needed	*Pl*	
13:00	LUNCH		
14:30	**ToR e** - Status quo of gears used	*Pl*	
	Effect of sweep length on GOV catches	***Presentation***	***Rob***
	Discussion in plenary, definition of information		
16:00	COFFEE		
16:30	Time to prepare contributions for ToRs b and e	*Subgroups*	
Tuesday, 9.4.			
9:00	**ToR c** - DATRAS Workshop	*Pl*	
	Summary of outcome & suggestions	***Presentation***	***Ingeborg***
	DATRAS developments in 2012 and tasks for 2013	***Presentation***	***Vaishav***
	Feedback from plenary, planning of further steps	*Pl*	
10:30	COFFEE		
11:00	Work on contributions to ToRs b, c, e	*Subgroups*	
13:00	LUNCH		
14:30	Documentation of Marine Litter	***Presentation***	***Ralf***
	Plenary: Discussion of requirements for data report-	*Pl*	
16:00	COFFEE		
16:30	Discussion of pending project proposals which may	***Introduction,***	***Ralf / Anne***
	Feedback from plenary		
	Suggestion for gear catalogue	***Presentation***	***Rob***

Wednesdsday, 10.4.			
9:00	**ToR d** - Swept area-based indices		
	Differences in door spread; Suggestions for swept	***Presentation***	***Kai***
	Feedback from plenary	*Plenary*	
10:30	COFFEE		
11:00	**ToR a** - Survey coordination		
	Discussion of any issues and possible (new) require-	*Plenary*	*Area coordinators*
	Experiences with staff exchange	***Presentation***	***Yves***
	Collation of information on past surveys; arrange-	*Subgroups*	*Led by area coordina-*
13:00	LUNCH		
14:30	**ToR f** - MSFD		
	Discussion of possible approaches to this ToR; evalu-	*Plenary*	*Led by Anne, Brian*
	Work on text for ToRs f and d	*Subgroups*	
16:00	COFFEE		
16:30	Work on contributions to various ToRs	*Subgroups*	
Thursday, 11.4.			
9:00	Update for **ToR c**; presentation of draft text for	*PI*	*ToR lead*
	Update for **ToR e** (Status quo of gears)	*PI*	*ToR lead*
	Update for **ToR b** (IBTS manuals)	*PI*	
	Asking IBTSWG to approve new MIK manual	*PL*	*Anne*
10:30	COFFEE		
11:00	Work on ToRs	*Subgroups*	
13:00	LUNCH		
14:30	Update for **ToR a** (Coordination)	*PI*	
	Update for **ToR d** (Swept area-indices)	*PI*	
	Update for **ToR f** (MSRL, OSPAR Request)	*PI*	
16:00	COFFEE		
16:30	Work on ToRs	*Subgroups*	
Friday, **12.4.**			
09:00	Action Points and Recommendations		
10:30	COFFEE		
11:00	Presentation Inter-calibration	***Presentation***	***Fran***
13:00	LUNCH		
14:30	Presentation of any modified text for report	*Plenary*	
15:00	Presentation of Camanoc survey	***Presentation***	***Yves***
15:30	Any other business		

Annex 3: Recommendations

Recommendation	Adressed to
1. IBTSWG recommends to create one exchange format for (re)submitting IBTS data for years before 2004, and another one for years from 2004 onwards; field ranges might vary between both sets.	ICES Data Centre
2. IBTSWG recommends that data submitters flag non-standard stations or non-standard gear by using haul validity = "P". It is recommended that the ICES Data Centre creates a remark field in which data submitters enter the details of why the respective dataset is not standard, and asks data submitters for the respective entries. .	ICES Data Centre
3. IBTSWG recommends to implement, for calculating towed distances, the algorithm to be developed by IBTSWG (compare IBTSWG report 2013, Section 7.3)	ICES Data Centre
4. IBTSWG recommends to insert two new columns in the new "flat files" for calculated door spread and wing spread, in order to allow calculation of swept-area. Checking to be implemented during screening of files during upload (compare IBTSWG report 2013, Section 7.3.3)	ICES Data Centre
5. IBTSWG recommends to evaluate where gear details such as the length of an additional adjuster chain in the GOV groundgear could be stored, and to investigate whether the HH field "Rigging" should be utilized for this purpose .	ICES Data Centre
6. IBTSWG recommends that WGALES gives advice on the request from several working groups to accompany MIK plankton samling by sampling with an additional fine-mesh "MIKkey" net to obtain samples of fish eggs (mainly cod and plaice).	WGALES
7- IBTSWG recommends that Ifremer present the survey proposal, addressing the points outlined in Section 5.3.5, at WGISDDA and specifically address the issues of: (1) Pro-ducing indices for ICES area VIIde, where indices have historically not been usable. And (2) Considering that VIIde is of relevance to both North Sea and Celtic Sea stocks and respective working groups, a communication from both groups on how data could be integrated into assessments from either or both areas..	Ifremer; CAMANOC survey leaders; WGISDAA

Annex 4: Action List

Nr	Description	ToR (2013)	Who	When	Status
1	Use bottom contact sensors on GOV during all surveys	ToRs a, e (2013)	All survey leaders	Whenever possible	Bottom contact sensors have been applied by some partners
2	Create uniform plots on gear parameters for survey summaries; using e.g. R	ToR a (2013)	Francesca Vitale, David Stokes, Ralf van Hal	Before IBTSWG 2014	R script completed to be applied for summaries in 2014 report (Ralf van Hal)
3	Produce plots on gear parameters to be included in national survey summaries (compare #2)	ToR a (2013)	All survey leaders	Before IBTSWG 2014	
4	Check effect of changes in gear utilization in 2012 Q3 hauls and if significant changes are found report to WGNSSK	ToR a (2013)	SWE	Before WGNSSK meeting	
5	Draft a plan for permanent exchange of rectangles between NL and DK in Q1; communicate planned changes in Q1 to relevant WGs	ToR a (2013)	Q1 survey coordinator	Before Q1 2014	
6	Inform chair of WGNSSK about future changes for 2013, regarding e.g. swapping of rectangles between partners or change in effort of individual partners	ToR a (2013)	IBTSWG Chair, survey coordinators	As soon as possible and whenever appropriate	
7	Members of IBTSWG to start a discussion with gear technologists and survey experts at Ifremer, in order to help preparation of a survey proposal to be presented at WGISDDA.	Section 5.3.5	IBTSWG members - gear experts	As soon as possible	

Nr	Description	ToR (2013)	Who	When	Status
8	Complete and agree on North Sea IBTS manual updates in response to reviewer's comments and submit revised version to Nils Olav Handegard/WKESST for SISP	ToR b (2013)	IBTSWG, lead: Brian Harley, Anne Sell	By May 31, 2013	Under revision
9	Agree on draft North Sea MIK manual, if possible ask for review by relevant ichthyoplankton experts, and submit to Nils Olav Handegard/WKESST for SISP	ToR b (2013)	IBTSWG to comment on present version, lead: Matthias Kloppmann	By June 30, 2013	Under revision
10	Complete and agree on Northeastern Atlantic IBTS manual and submit to Nils Olav Handegard/WKESST for SISP	ToR b (2013)	Fran Velasco (lead for southern area), with contribution for northern area from relevant survey leaders	By June 30, 2013	Final draft
11	Develop suggestion for mandatory elements for survey manuals, overall and present to Nils Olav Handegaard for WKESST	ToR b (2013)	IBTSWG, Anne Sell to collect and forward input	By June 30, 2013	
12	Check all information listed in Section 7.2 [Checking combination of datatype and subfactor] and change in DATRAS, by resubmitting the data.	ToR c (2013)	By country responsible for listed items	As soon as possible	
13	Cross-check the distance, speed and haul duration information for the complete DATRAS HH exchange file dataset, and resubmit data where appropriate.	ToR c (2013)	All countries	As soon as possible	

Nr	Description	ToR (2013)	Who	When	Status
14	Create table how observed values of towed distance are being produced in each country's datasets.	ToR c (2013)	All countries	Before IBTSWG 2014	
15	Resubmit files with the standard survey speed following the manual where GroundSpeed has been reported with "-9"	ToR c (2013)	All countries where applicable		
16	Resubmit 1997 and 2004-2013 with GroundSpeed filled in, and with SpeedWater "-9"	ToR c (2013)	Norway	ASAP, before IBTSWG 2014	
17	Replace calculated towing distance in DATRAS by either the observed distance or "-9"	ToR c (2013)	All countries submitting calculated distance to DATRAS		
18	Compare the ICES Data Centre algorithm used for calculating distance with the algorithm used by Dave Stokes; consider additional field in "flat file".	ToR c (2013)	Vaishav Soni and Dave Stokes	ASAP	
19	Before calculating a swept-area-based index, an analysis of the variables listed in Section 7.3.4 [Swept-area calculation: what should be checked] should be done, in order to check if all information is available to calculate the swept-area	ToR c (2013)	All countries	ASAP, latest to be presented at the 2014 meeting	

Nr	Description	ToR (2013)	Who	When	Status
20	In cases, where no measured door spread and/or wing spread data are available, supply ICES Data Centre with one (or more) algorithms (only if necessary by country, gear type) to do so, including clear Excel examples for parts of the dataset, and including narrative text for documentation purposes.	ToR c (2013)	All countries	Before 2014 IBTSWG	
21	Provide a list of length-weight relationships for individual species to ICES Data Centre to be implemented in quality control routines for CatCatchWght data.	ToR c (2013)	IBSTWG, led by Brian Harley	Before 2014 IBTSWG	Various functions exist. Compare national databases
22	Supply ICES Data Centre with polygons of aggregation areas other than StatRec.	ToR c (2013)	IBTSWG: Scottish partners for North Sea Q1 and Q3 surveys. Northeastern Atlantic survey leaders for the respective survey areas.	By Dec. 31, 2013	
23	Review of the reference tables used in indices calculations	ToR c (2013)	Brian Harley	Before 2014 IBTSWG	
24	Reporting new species which code is not present in WoRMS	ToR c (2013)	The Data Information Group (DIG)- (Vaishav/Ingeborg).	As soon as possible and as needed	
25	Check option to utilize the column "rigging" in HH tables to report gear GOV rigging details, specifically the length of a possible adjustment chain in the format specified in section: xxxx; check with Data Centre	ToR c (2013)	Irene Huse	Before IBTSWG 2014	

Nr	Description	ToR (2013)	Who	When	Status
26	Start organization of second workshop of WKDATR for data submitters to be held in 2014	ToR c (2013)	IBTSWG; with support from ICES secretariat and Data Centre	By end of 2013	
27	Fill in gear details table provide by Rob Kynoch	ToR e	All countries	18 December 2013	
28	IBTSWG suggests and supports trials of one vessel with long and short sweep lengths, to be repeated with groundgear A (analogous to trials presented by Rob Kynoch, compare working document WD1 in Annex 7)	ToR e	IBTSWG	As soon as possible	
29	Submit draft contribution to ToR f for feedback to Claus Hagebro at ICES	ToR f (2013)	Anne Sell	April 15	Final draft submitted after feedback from Claus Hagebro; 09 May 2013

Annex 5: GOV Specification Form

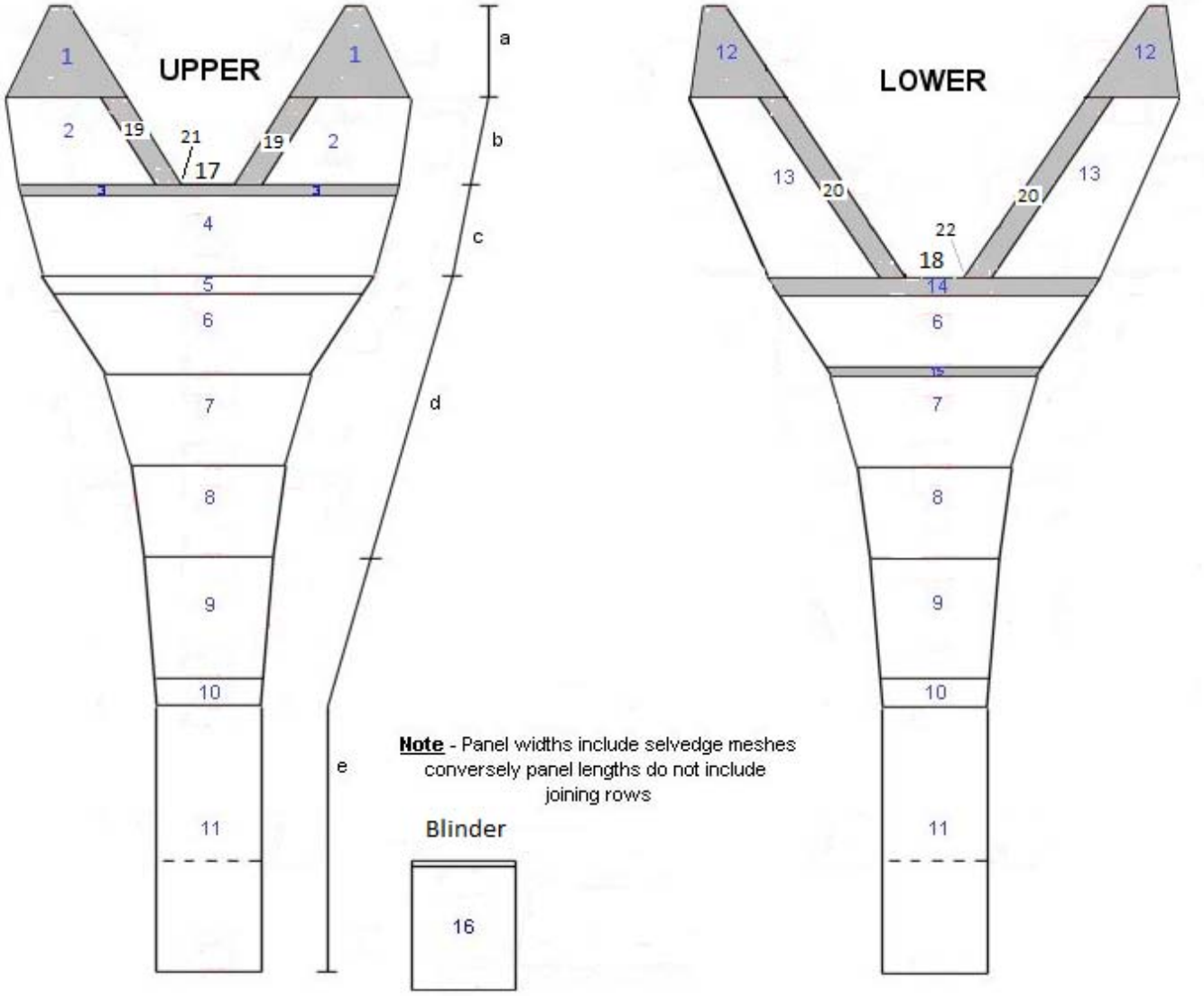
Annex 5 GOV Specification Form

In support of the work toward ToR e of IBTSWG 2013, all countries participating in the IBTS applying a GOV net are requested to fill in the following forms based on the currently used gear. The goal is to achieve an overview of standards and possible differences in rigging details between national surveys.- Please send the filled-in forms latest by December 18, 2013 to Rob Kynoch (R.J.Kynoch@marlab.ac.uk) and Anne Sell (anne.sell@ti.bund.de). **The MS WORD version of this table is available on the IBTSWG Sharepoint under Report 2013/ 2013 Gear Comparison Table- WORD Version.**

!! Please do not change any of the column/row headers. If you wish to supply additional/deviating information, please use comments box at the end of the document !!

TORe	
Compile status quo, report and propose ways forward in standardization, on the different materials and specifications of the GOVs and gears currently used by the IBTS participants. Analyze and report on the effect of variable sweep length and standardization on the uses in the IBTS.	Some aspects of the gear applied in the surveys are not required to be standardized. The effect of these variations are to be evaluated. Partly, different standards for sweep lengths have been applied in Q1 versus Q3 surveys. (For this ToR, IBTS seeks support from gear technology experts and welcomes their contribution.)

CONTENTS



GOV net diagram detailing netting panel position for trawl component inputs into table 1.

Note: All items and parameters highlighted in **red** have been identified as critical to the catchability of the GOV and are therefore required.

Table 1 Description - Trawl sections (see net plan for each item position)	No of	Number of meshes across top edge	Number of Meshes across lower edge	Cutting rate left side	Cutting rate right side	netting panel meshes deep	Mesh size (mm)	Double or single twine	Twine construction PA – Nylon PE- Polyethylene	Nominal twine diameter (mm)	Twine runnage (m/kg)
TOP PANEL											
1 - Upper wing tips - 1st wing section											
2 - Upper wings - 2nd wing											
17 - Bosom/centre meshes											
3 - Upper strengthening strip											
4 - Top square (cover)											
5 - Top joining strip											
Kite skirt/netting											
If no kite skirt/netting used then describe now rear kite attached to top panel:											
LOWER PANEL											
12 - Lower wing tip – 1st wing section											
13 - Lower wing tip – 2nd wing section											
18 - Bosom/centre meshes											
14 - Lower joining strip											
TRAWL TOP/LOWER PANELS											
6 - 1ST top/lower panels											
15 - *Tearing strip (if applicable)											
7 - 2nd top/lower panels											
8 - 3rd top/lower panels											
9 - 4th top/lower panels											
10 - 5th top/lower panels											
11 - Straight section											
16 - Small mesh liner (Blinder)											
Note – all counts across netting panels are total meshes across & should include selvedge meshes.											

ADDITIONAL CONSTRUCTION INFO	NUMBER OF MESHES GATHERED	MESH SIZE (MM)	NOMINAL TWINE DIAMETER (MM)	TWINE RUNNAGE (M/KG)	DOUBLE OR SINGLE TWINE
21 - Top panel quarter meshes/drop meshes					
22 - Lower panel quarter meshes/drop meshes					

GUARD MESHES (IF APPLICABLE)	WHICH WING SECTION	NO OF MESHES ACROSS TOP EDGE	NO OF MESHES ACROSS LOWER EDGE	NOMINAL TWINE DIAMETER (MM)	TWINE RUNNAGE (M/KG)	DOUBLE OR SINGLE TWINE
19 - Top wings						
20 - Lower wings						

- Note – If tearing strip rigged at different position or more than 1 inserted then enter as new line between relevant panel sections

Table 2 Description – TRAWL ROPING AND FRAMELINES	Length (m)	Diameter (mm)	weight (kg/100m)	Material(wire, rope or combination)	structure (No of strands & core material)	DOES MID BRIDLE EXTENSION INCOPORATE ADJUSTER CHAIN		
						YES/NO	ADJUSTMENT	
BOLT & SELVEDGE ROPING							MIN (MM)	MAX (MM)
a) Middle bridle extension								
b) Bolt rope 1st section								
c) Bolt rope 2nd section								
d) 1nd selvedge strengthening rope								
e) If applicable 2nd selvedge strengthening rope								
*Note – Item letters a to d taken from survey manual net plan and e Marine Scotland MarLab net plan .								
FRAME ROPES								
Headline								
Footrope								
Upper wingline								
Lower wingline								

TABLE 3
DESCRIPTION –GROUND GEAR CONSTRUCTION

	No OF SECTIONS	LENGTH (M)	DICS, BOBBIN OR HOPPER DIAMETER (MM)	MOUNTED ONTO		WEIGHT IN AIR (KG)	WEIGHT IN WATER (KG)	CONNECTED TO FISHINGLINE		IF HOPPERS OR BOBBINS SPACER		ANY HALF BOBBINS ADDED TO RUBBER LEG SECTIONS	
				WIRE OR CHAIN	*DIAMETER (MM)/(S/M/L)			CHAIN OR ROPE	LENGTH OF CONNECTOR (MM)	WIDTH (MM)	DIAMETER (MM)	No	DIA.
GROUND GEAR A													
Bosom section	1												
Quarter section	2												
Wing section	6												
TOTAL LENGTH INCLUDING CONNECTORS													
GROUND GEAR B													
Bosom section	1												
Quarter section	2												
Wing section	6												
TOTAL LENGTH INCLUDING CONNECTORS													
GROUND GEAR D or alternative													
Bosom section	1												
Quarter section	2												
Wing section	6												
TOTAL LENGTH INCLUDING CONNECTORS													

***Note – if mounted onto chain indicate if short (s), mid (m) or long (l) link chain**

ADJUSTER CHAIN ASSEMBLY or ALTERNATIVE IF DIFFERENT	CHAIN DIA (MM)	SPHERICAL BOBBIN		FIXED LENGTH IF NOT ADJUSTED (MM)	IF LENGTH ADJUSTED		
		DIA (MM)	WEIGHT IN AIR (KG)		MIN LENGTH (M)	MAX LENGTH (M)	Reason for adjustment (hard/soft ground or other)
Ground gear A							
Ground gear B							
Ground gear D							

Table 4 Description – FLOTATION AND KITE	DIAMETER (MM)	BUOYANCY (KGF)	DISTRIBUTION AROUND HEADLINE		TOTAL NUMBER OF FLOATS
			No in centre	No down wings	
FLOATS – STANDARD RIG					
FLOATS – ADDITIONAL ADDED INSTEAD OF KITE					
KITE (IF USED)	DIMENSIONS LENGTH(M) x WIDTH(M)		INTERGRATED FLOATATION		
			NUMBER	DIAMETER (MM)	BUOYANCY (KGF)
	X				

Table 5 Description – WIRE RIG AND OTTERBOARDS WIRE RIG	LENGTH (M)	DIAMETER (MM)	WEIGHT (KG/100M)	MATERIAL (WIRE, ROPE OR COMBINATION)	STRUCTURE (NO OF STRANDS & CORE MATERIAL)	IF BOTH LONG/SHORT SWEEPS USED INDICATE	
						DEPTH SWEEPS CHANGED (M)	MAX DEPTH FISHED (M)
Warp							
Upper backstrop							
Lower backstrop							
Backstrop extension							
Short sweep							
Long sweep – (IF NOT USED ENTER n/a FOR LENGTH)							
LENGTH OF CONNECTORS BETWEEN SWEEP & BRIDLE (CONNECTORS, SHACKLES & TRIANGLES ETC)							
LOWER BRIDLE							
UPPER BRIDLE 1ST SECTION							
UPPER BRIDLE 2ND SECTION							
MIDDLE BRIDLE							
LENGTH OF CONNECTORS BETWEEN 1ST UPPER BRIDLE AND MID/2ND UPPER BRIDLE							

OTTERBOARDS	MAKE	MODEL NUMBER	SURFACE AREA (M^2)	WEIGHT IN AIR (KG)		MEASURED OR ESTIMATED ANGLE OF ATTACK (Deg)
ADDITIONAL OTTERBOARD RIGGING INFO	[1]WARP ATTACHMENT POINT (TOWING POINT)			[2]BACKSTROP ATTACHMENT POINT/BRACKET		
	NUMBER OF OPTIONS	UPPER or LOWER	HOLE USED	NUMBER OF ATTACHMENT HOLES	*HOLE USED	
Morgere polyvalent oval otterboards						
Other design -						

Note – (1) towing point holes should be counted from leading edge of the otterboard. (2) backstrop attachment holes should be counted from the rearmost edge of the otterboard.

TABLE 6 DESCRIPTION - WARP TO DEPTH RATIOS DEPTH RANGE (M)	RANGE OF DEPTHS (M)	WARP TO DEPTH RATIO (SCOPE RATIO)
1		
2		
3		
4		
5		
Note – If more depth ranges required add extra rows		

COMMENTS: (PLEASE FILL IN ADDITIONAL INFORMATION AS NEEDED)
1
2
3
4
5

Annex 6: Maps

Annex 6 Maps of species distribution in 2012

WARNING: the original version of Maps of species distribution in 2011, issued as Annex 6 of the IBTSWG 2012 report, presented maps produced based on a CPUE per Length per haul set of data, which contained duplicate data sets for the North Sea Survey. This problem was solved and a corrected version was uploaded to ICES Library, check the version you have of the 2011 maps before comparing results.

Table A.6.1. Species for which distribution maps have been produced, with length split for pre-recruit (0-group) and post-recruit (1+ group) where appropriate. The maps cover all the area encompassed by surveys coordinated within the IBTSWG (North Sea and North-eastern Atlantic Areas).

Scientific	Common	Code	Fig No	Length Split (<cm)
Clupea harengus	Herring	HER	6-7	17.5
Gadus morhua	Atlantic Cod	COD	2-3	23
Galeorhinus galeus	Tope Shark	GAG	32	
Lepidorhombus boscii	Four-Spotted Megrim	LBI	16-17	19
Galeus melastomus	Blackmouthed dogfish	DBM	40	
Lepidorhombus whiffiagonis	Megrim	MEG	14-15	21
Leucoraja naevus	Cuckoo Ray	CUR	30	
Lophius budegassa	Black-bellied Anglerfish	WAF	20-21	20
Lophius piscatorius	Anglerfish (Monk)	MON	18-19	20
Merlangus merlangius	Whiting	WHG	24-25	20
Melanogrammus aeglefinus	Haddock	HAD	4-5	20
Merluccius merluccius	European hake	HKE	8-9	20
Micromesistius poutassou	Blue whiting	WHB	26-27	19
Mustelus asterias	Starry Smooth Hound	SDS	33	
Mustelus mustelus	Smooth Hound	SMH	34	
Nephrops norvegicus	Norway Lobster	NEP	28	
Pleuronectes platessa	European Plaice	PLE	22-23	12
Raja clavata	Thornback ray (Roker)	THR	35	
Raja microocellata	Painted/Small Eyed Ray	PTR	36	
Raja montagui	Spotted Ray	SDR	37	
Raja undulata	Undulate Ray	UNR	38	
Scomber scombrus	European Mackerel	MAC	12-13	24
Scyliorhinus canicula	Lesser Spotted Dogfish	LSD	29	
Scyliorhnus stellaris	Nurse Hound	DGN	39	
Sprattus sprattus	European sprat	SPR	41	
Squalus acanthias	Spurdog	DGS	31	
Trachurus picturatus	Blue Jack Mackerel	JAA	43	
Trachurus trachurus	Horse Mackerel (Scad)	HOM	10-11	15
Trisopterus smarkii	Norway pout	NPO	42	

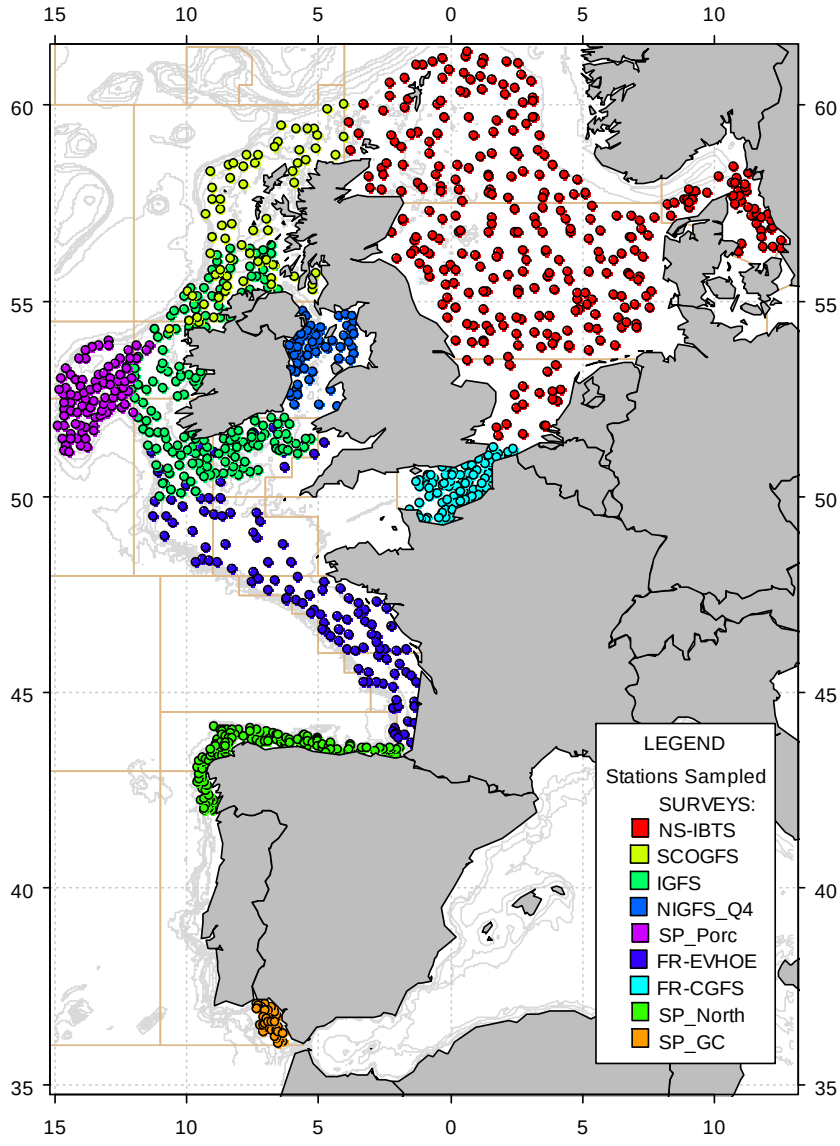


Figure A.6.1. Station positions for the IBTSurveys carried out in the North Eastern Atlantic and North Sea area in summer/autumn of 2012. Quarters 3 and 4

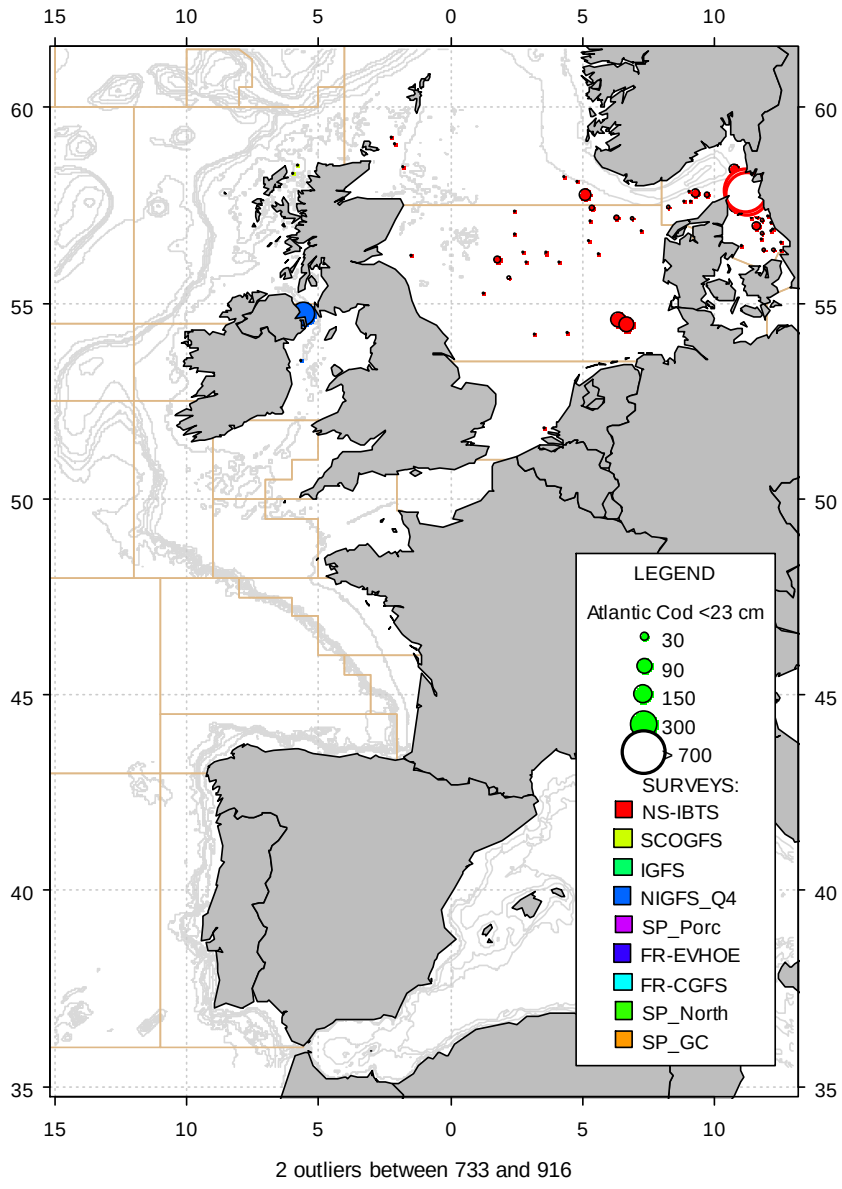


Figure A.6.2. Catches in numbers per hour of 0-group Cod, *Gadus morhua* (<23cm), in summer/autumn 2012 IBTSurveys. The catchability of the different gears used in the NeAtl surveys is not constant; therefore the map does not reflect proportional abundance in all the areas but within each survey.

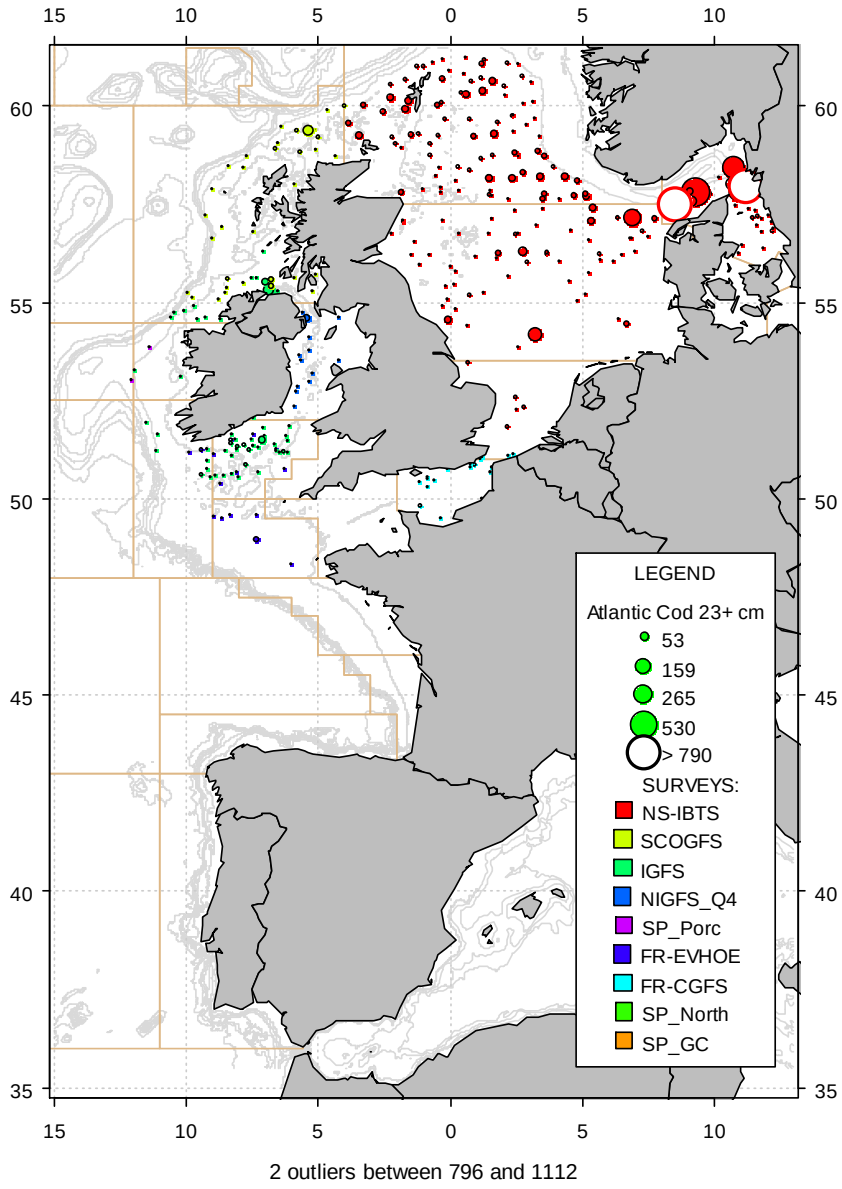


Figure A.6.3. Catches in numbers per hour of 1+ cod, *Gadus morhua* (≥23cm), in summer/autumn 2012 IBTSurveys. The catchability of the different gears used in the NeAtl surveys is not constant; therefore the map does not reflect proportional abundance in all the areas but within each survey.

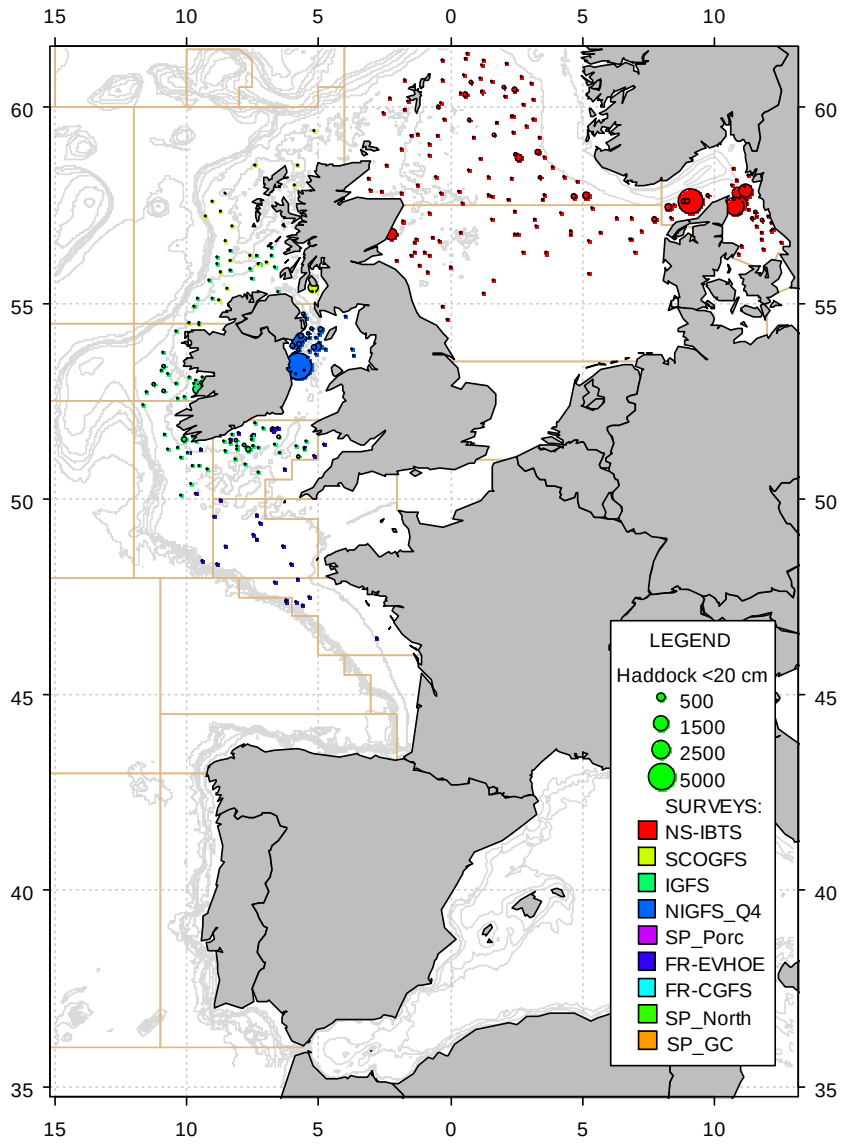


Figure A.6.4. Catches in numbers per hour of 0-group haddock, *Melanogrammus aeglefinus* (<20cm), in summer/autumn 2012 IBTSurveys. The catchability of the different gears used in the NeAtl surveys is not constant; therefore the map does not reflect proportional abundance in all the areas but within each survey.

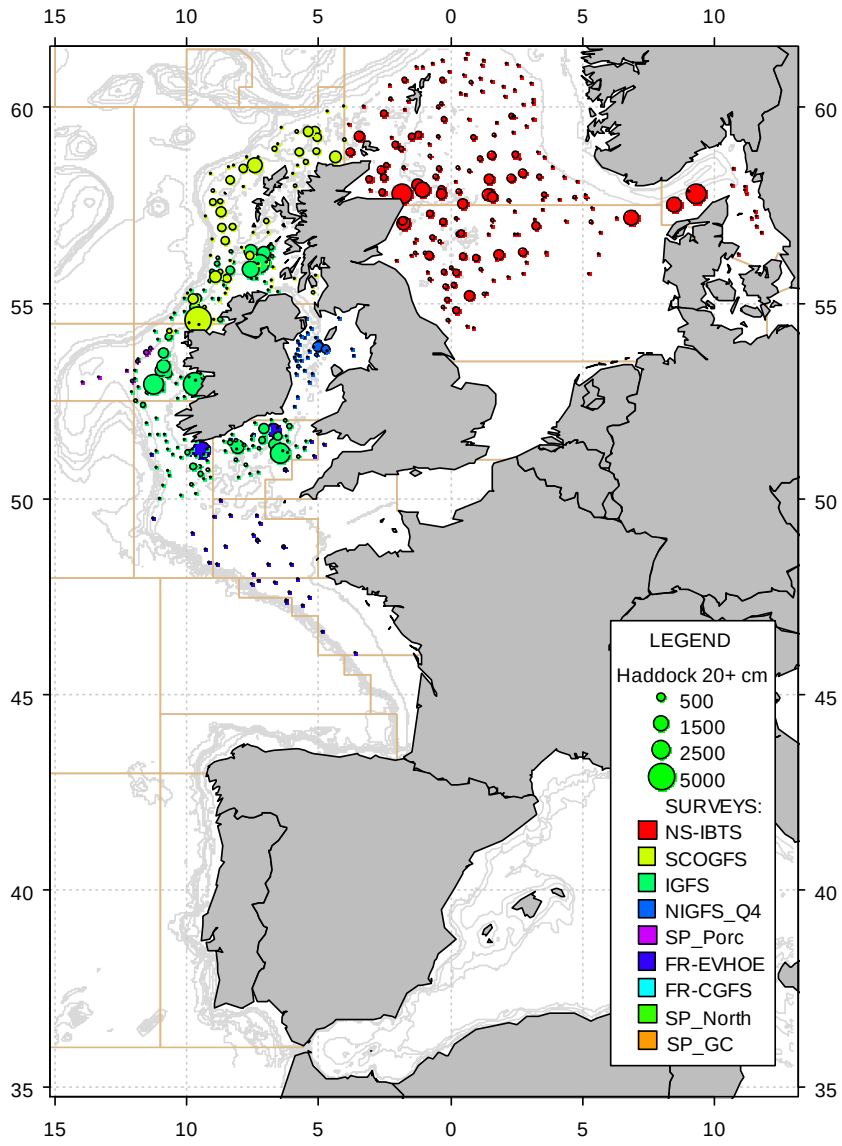


Figure A.6.5. Catches in numbers per hour of 1+ group haddock, *Melanogrammus aeglefinus* (≥20cm), in summer/autumn 2012 IBTSurveys. The catchability of the different gears used in the NeAtl surveys is not constant; therefore the map does not reflect proportional abundance in all the areas but within each survey.

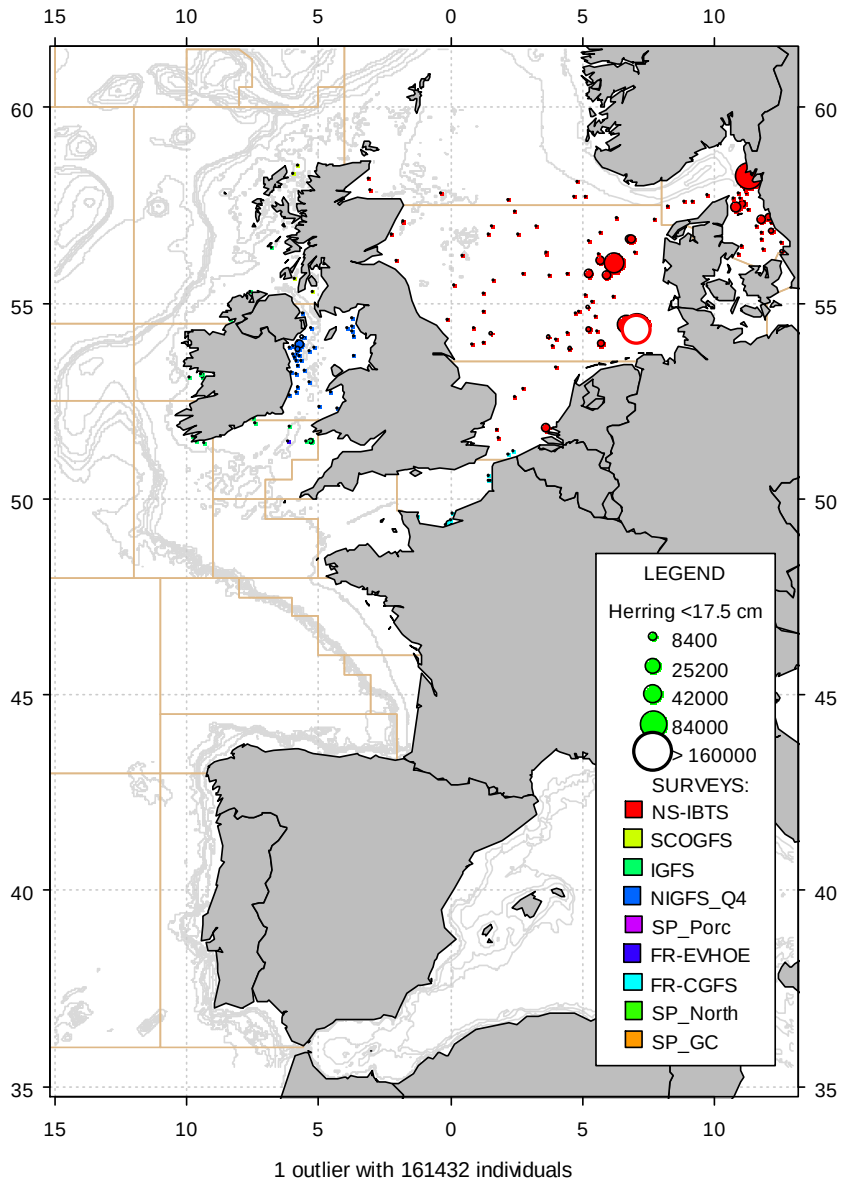


Figure A.6.6. Catches in numbers per hour of 0-group herring, *Clupea harengus* (<17.5 cm), in summer/autumn 2012 IBTSurveys. The catchability of the different gears used in the NeAtl surveys is not constant; therefore the map does not reflect proportional abundance in all the areas but within each survey.

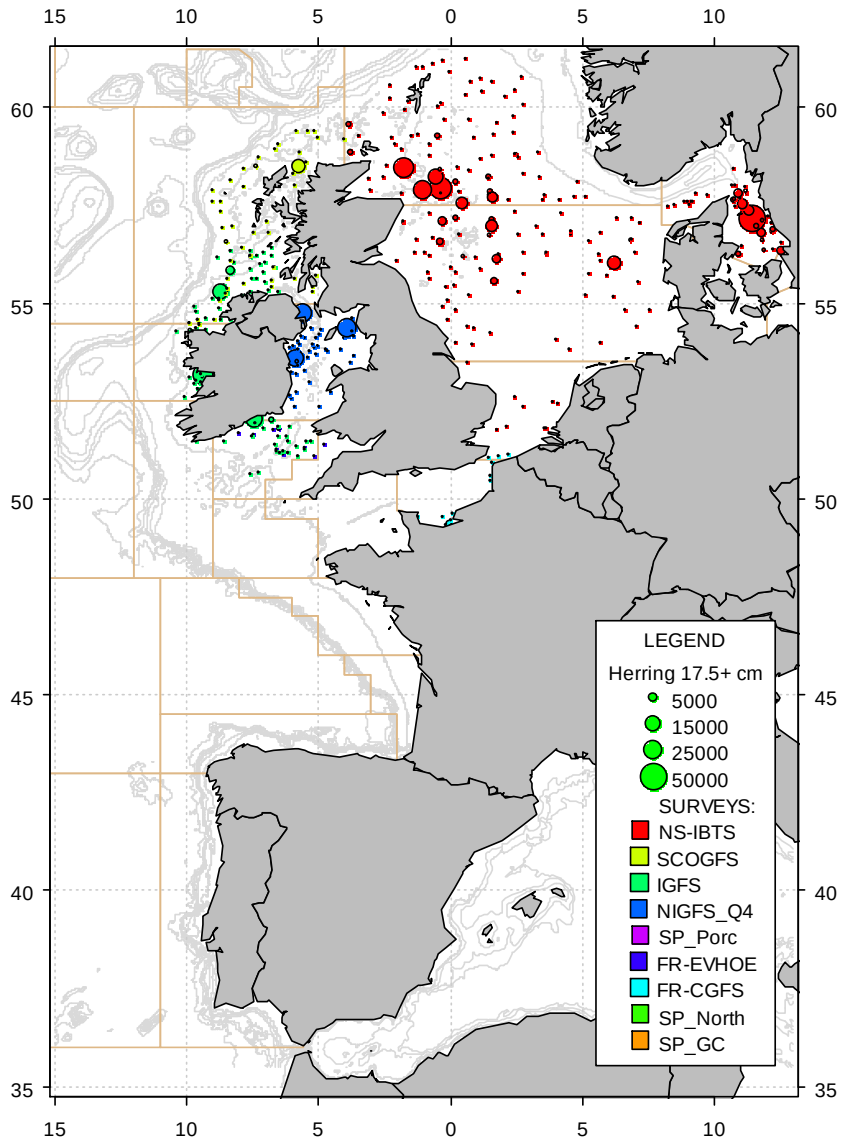


Figure A.6.7. Catches in numbers per hour of 1+ group herring, *Clupea harengus* (≥17.5 cm), in summer/autumn 2012 IBTSurveys. The catchability of the different gears used in the NeAtl surveys is not constant; therefore the map does not reflect proportional abundance in all the areas but within each survey.

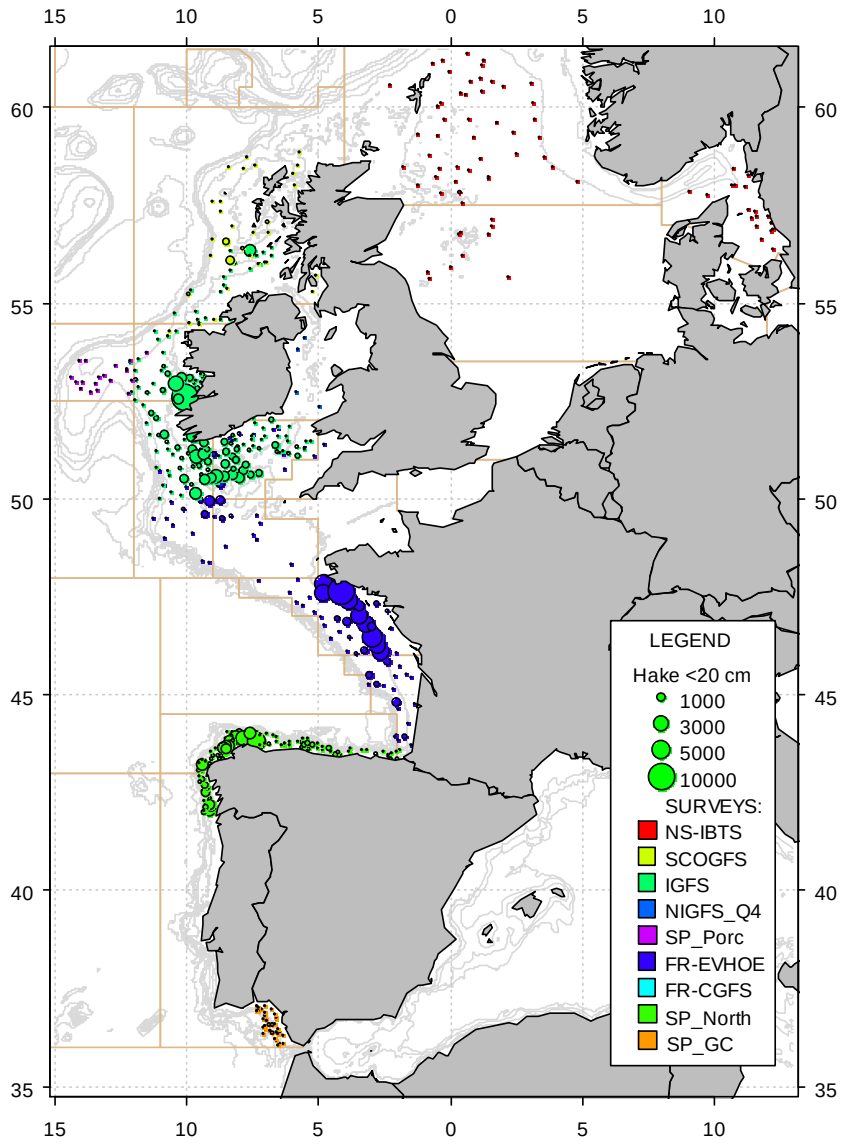


Figure A.6.8. Catches in numbers per hour of 0-group Europan hake, *Merluccius merluccius* (<20cm), in summer/autumn 2012 IBTSurveys. The catchability of the different gears used in the NeAtl surveys is not constant; therefore the map does not reflect proportional abundance in all the areas but within each survey.

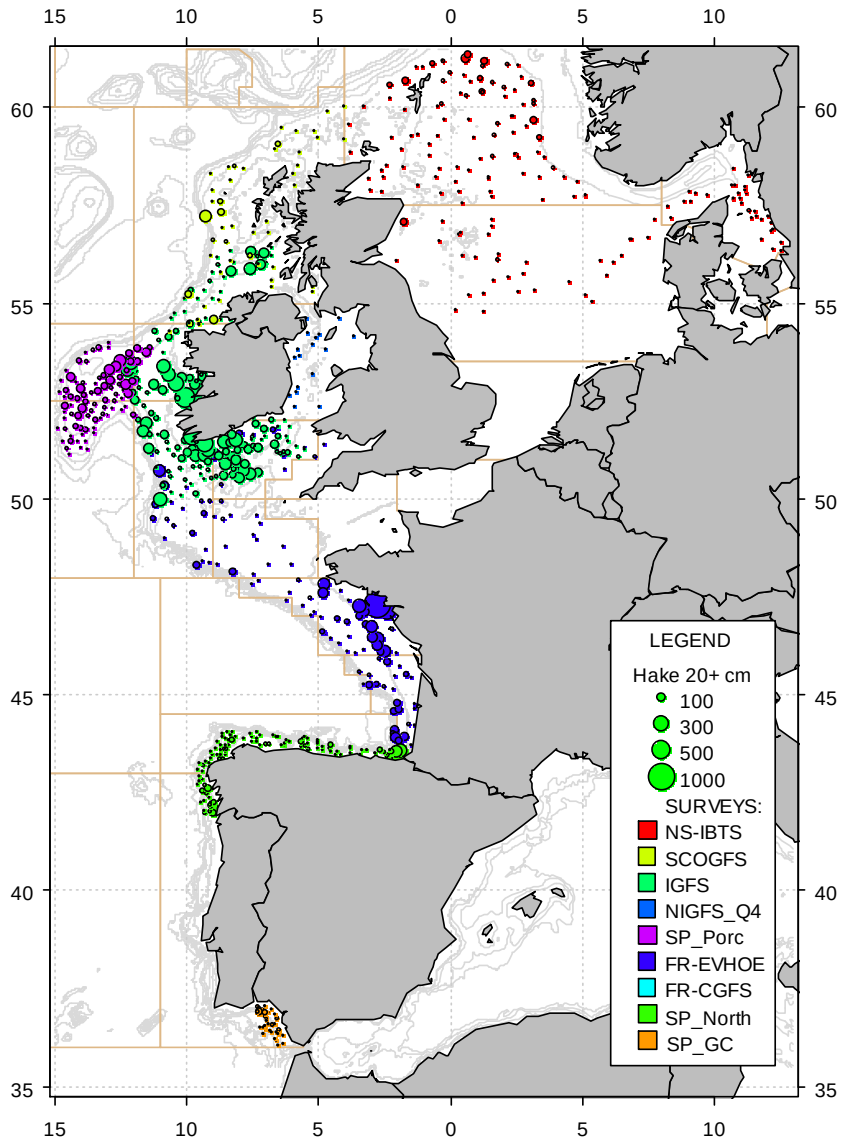


Figure A.6.9. Catches in numbers per hour of 1+ group hake, *Merluccius merluccius* (≥20cm), in summer/autumn 2012 IBTSurveys. The catchability of the different gears used in the NeAtl surveys is not constant; therefore the map does not reflect proportional abundance in all the areas but within each survey.

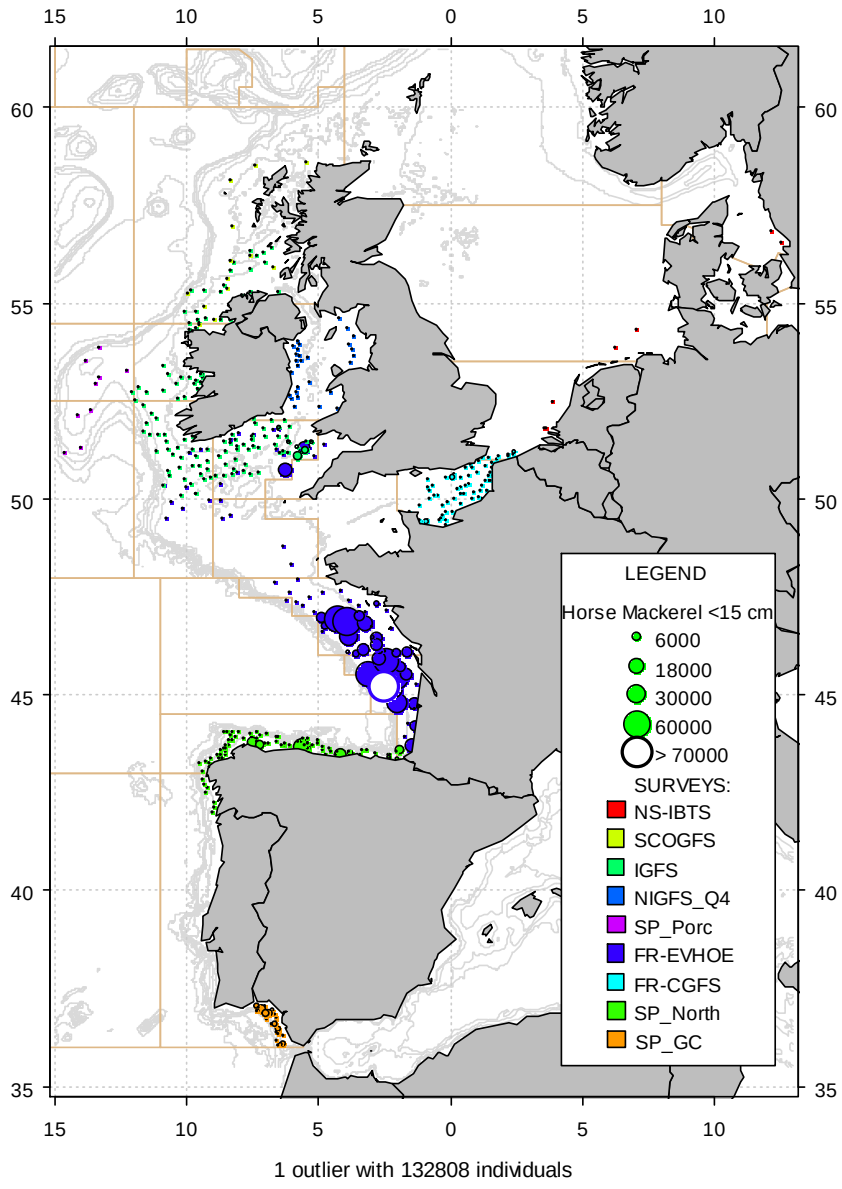


Figure A.6.10. Catches in numbers per hour of 0-group horse mackerel, T*rachurus trachurus* (<15 cm), in summer/autumn 2012 IBTSurveys. The catchability of the different gears used in the NeAtl surveys is not constant; therefore the map does not reflect proportional abundance in all the areas but within each survey.

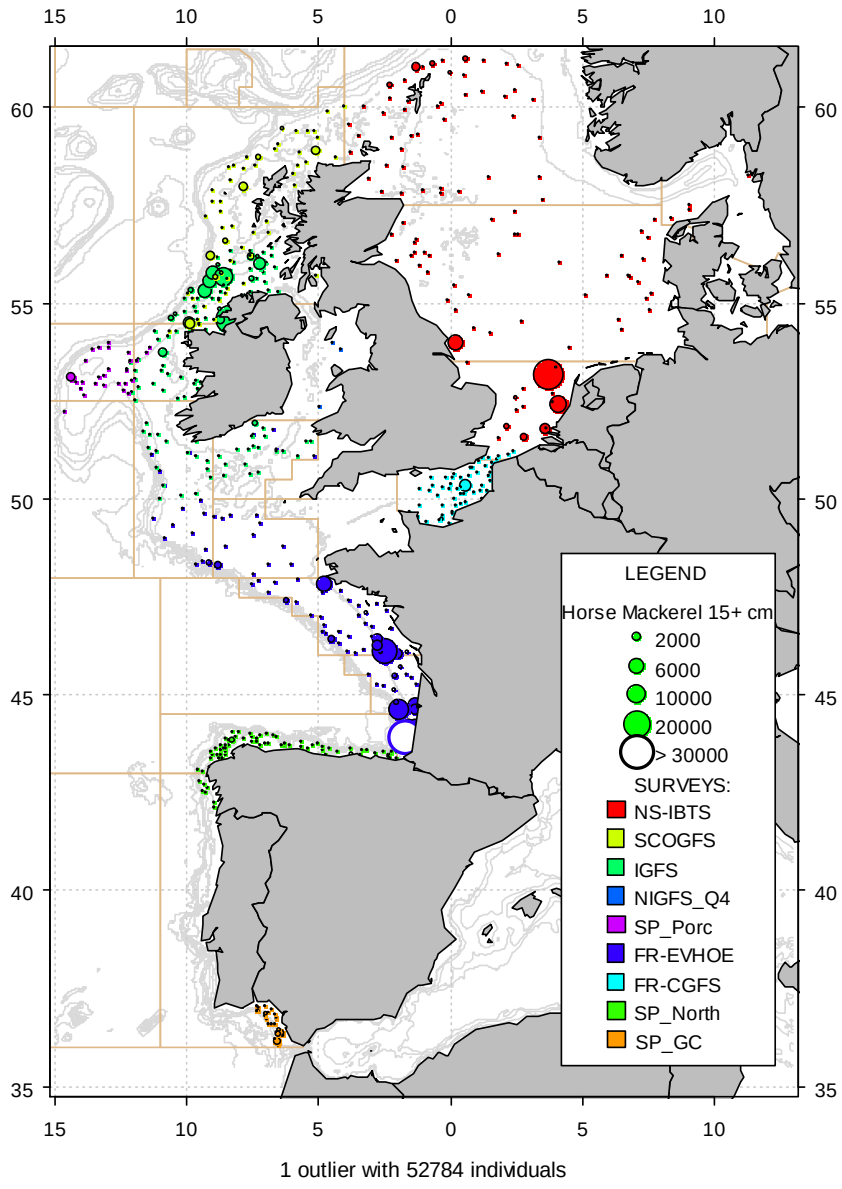


Figure A.6.11. Catches in numbers per hour of 1+ group horse mackerel, *Trachurus trachurus* (≥ 15 cm), in summer/autumn 2012 IBTSurveys. The catchability of the different gears used in the NeAtl surveys is not constant; therefore the map does not reflect proportional abundance in all the areas but within each survey.

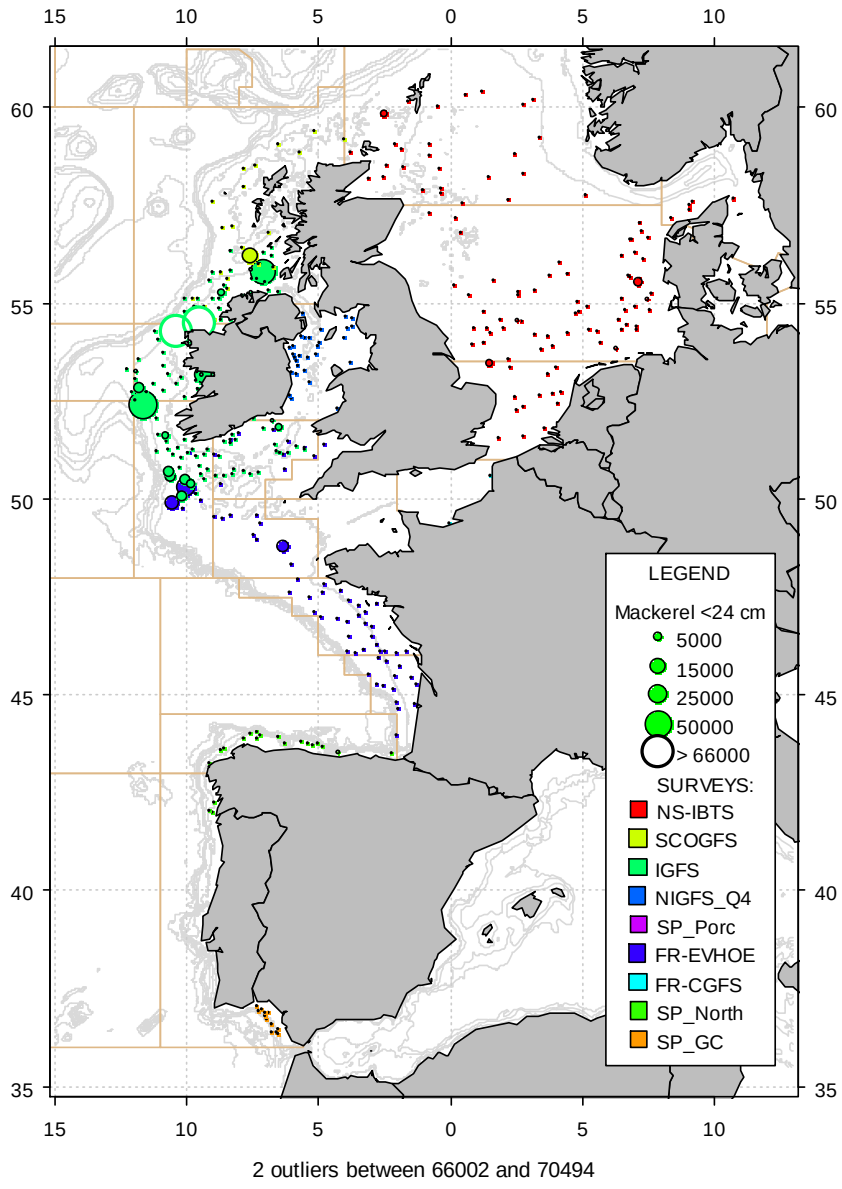


Figure A.6.12. Catches in numbers per hour of 0-group mackerel, *Scomber scombrus* (<24 cm), in summer/autumn 2012 IBTSurveys. The catchability of the different gears used in the NeAtl surveys is not constant; therefore the map does not reflect proportional abundance in all the areas but within each survey.

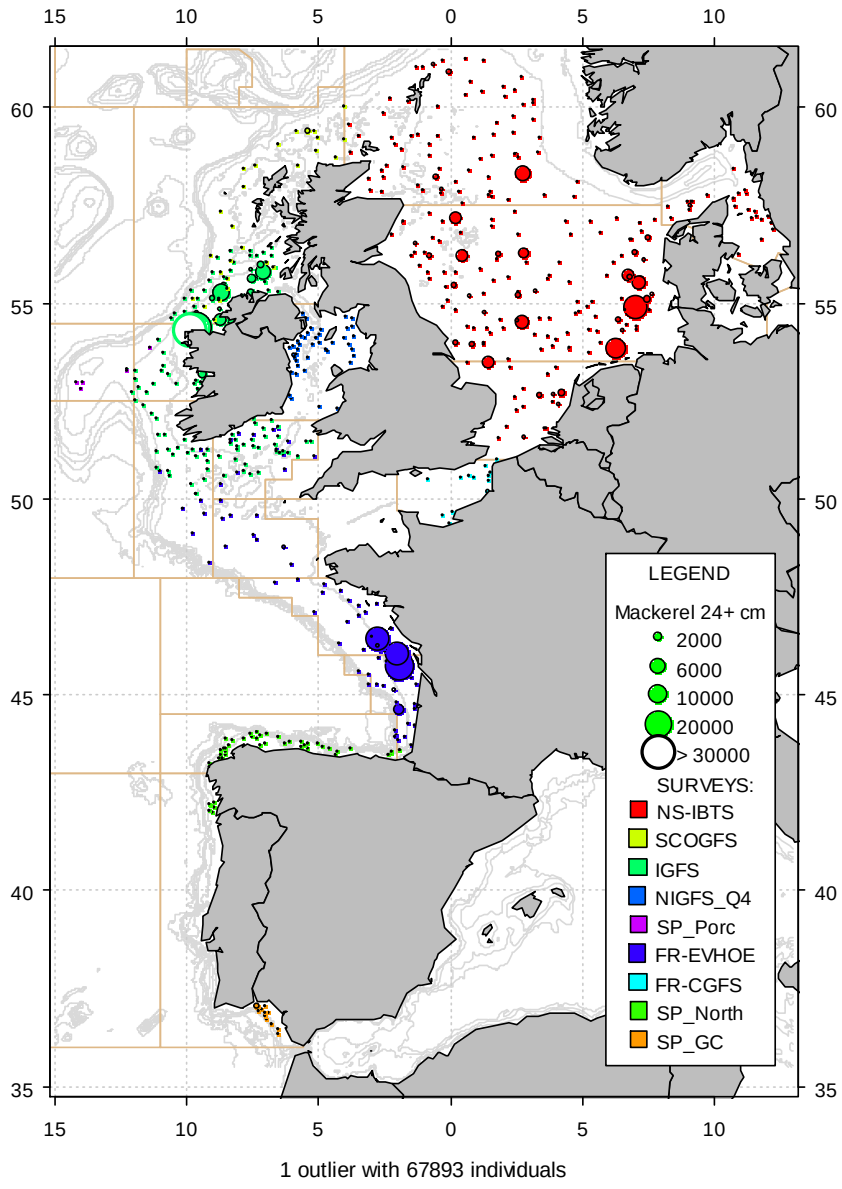


Figure A.6.13. Catches in numbers per hour of 1+ group mackerel, *Scomber scomrus* (≥24 cm), in summer/autumn 2012 IBTSurveys. The catchability of the different gears used in the NeAtl surveys is not constant; therefore the map does not reflect proportional abundance in all the areas but within each survey.

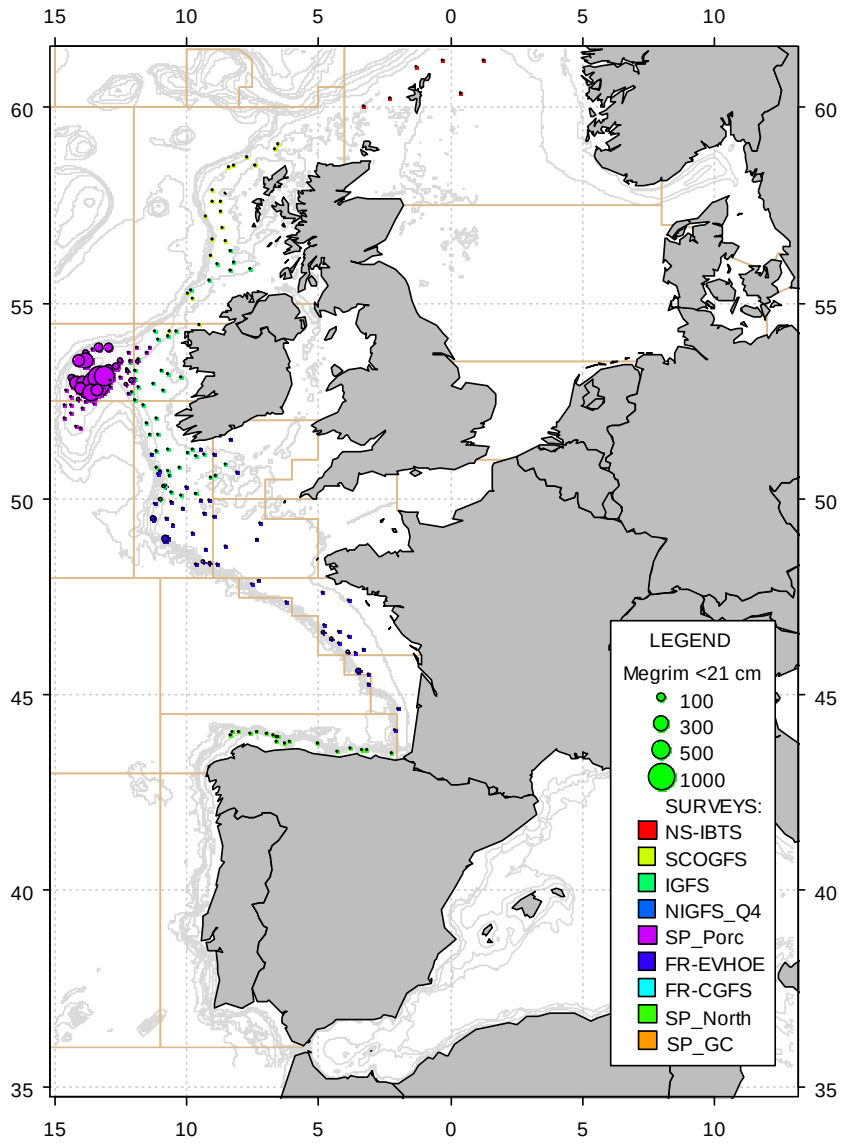


Figure A.6.14. Catches in numbers per hour of megrim recruits, *Lepidorhombus whiffiagonis* (<21 cm), in summer/autumn 2012 IBTSurveys. The catchability of the different gears used in the NeAtl surveys is not constant; therefore the map does not reflect proportional abundance in all the areas but within each survey.

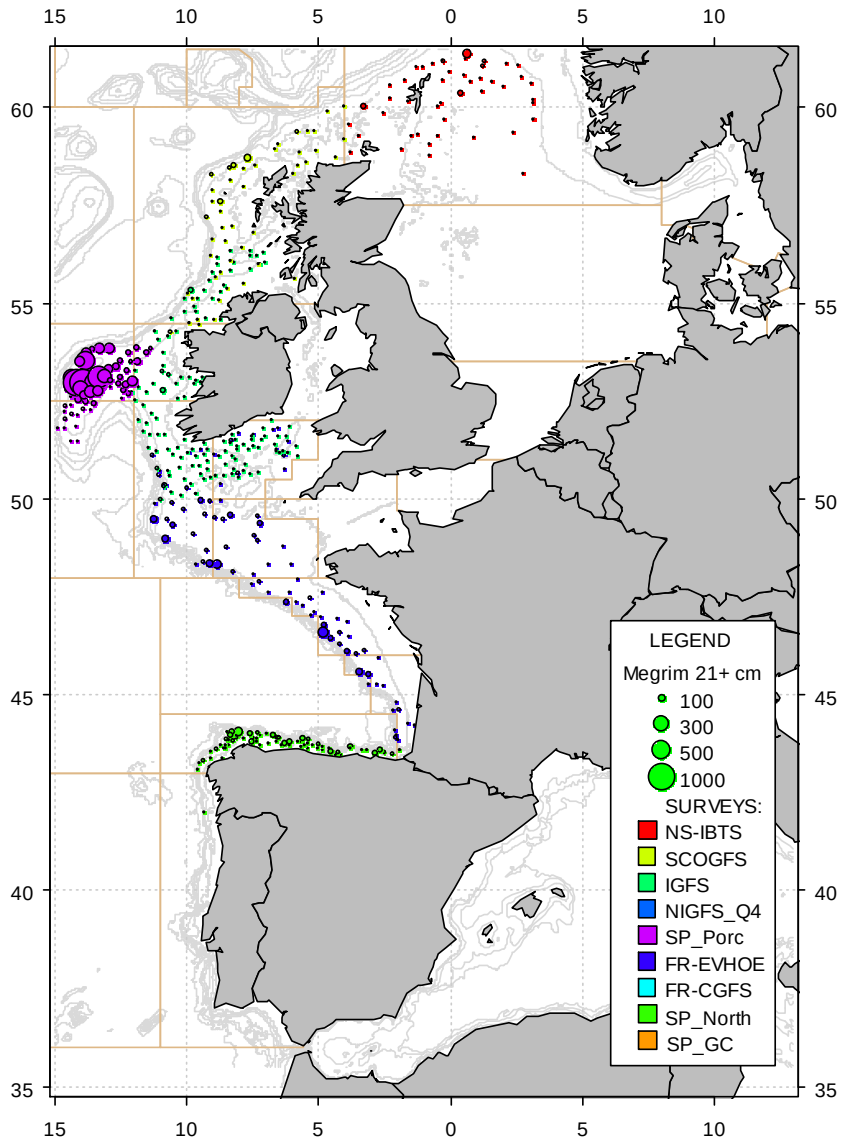


Figure A.6.15. Catches in numbers per hour of 2+ group megrim, *Lepidorhombus whiffiagonis* (≥21cm), in summer/autumn 2012 IBTSurveys. The catchability of the different gears used in the NeAtl surveys is not constant; therefore the map does not reflect proportional abundance in all the areas but within each survey.

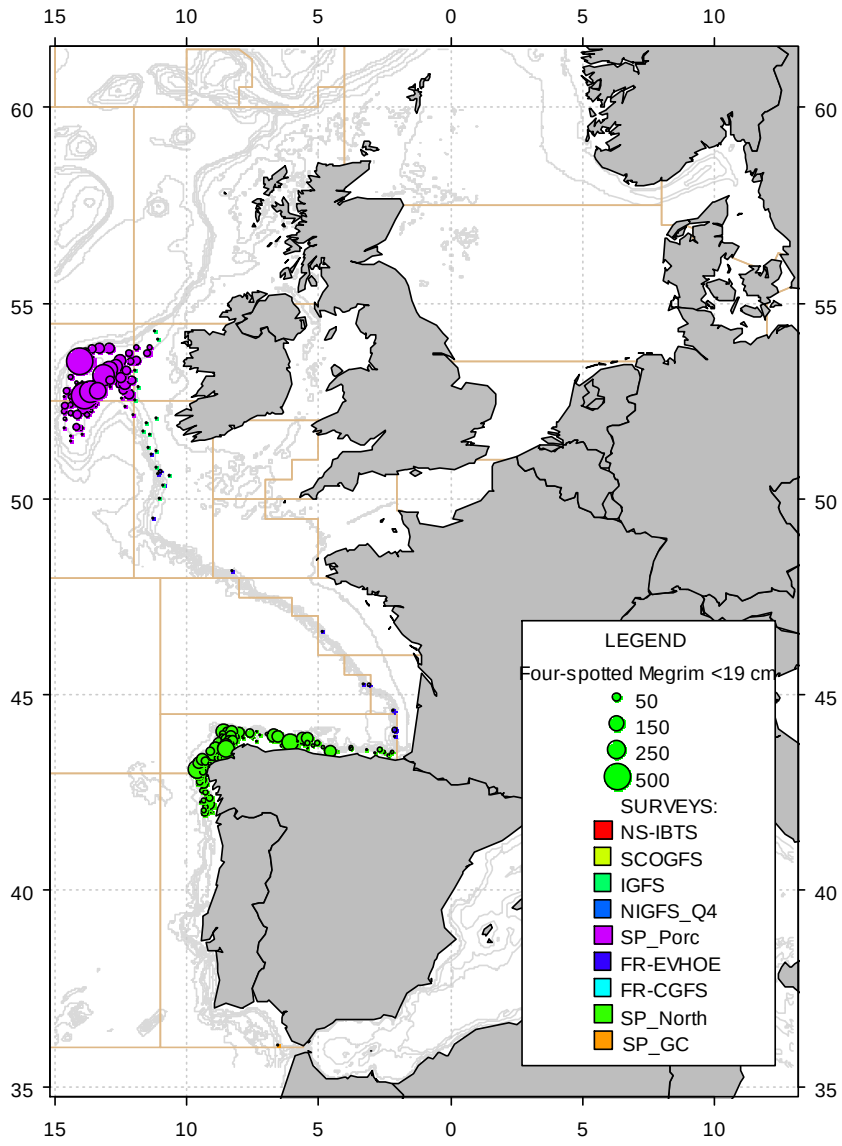


Figure A.6.16. Catches in numbers per hour of recruits of four-spotted megrim, *Lepidorhombus boscii* (<19 cm), in summer/autumn 2012 IBTSurveys. The catchability of the different gears used in the NeAtl surveys is not constant; therefore the map does not reflect proportional abundance in all the areas but within each survey.

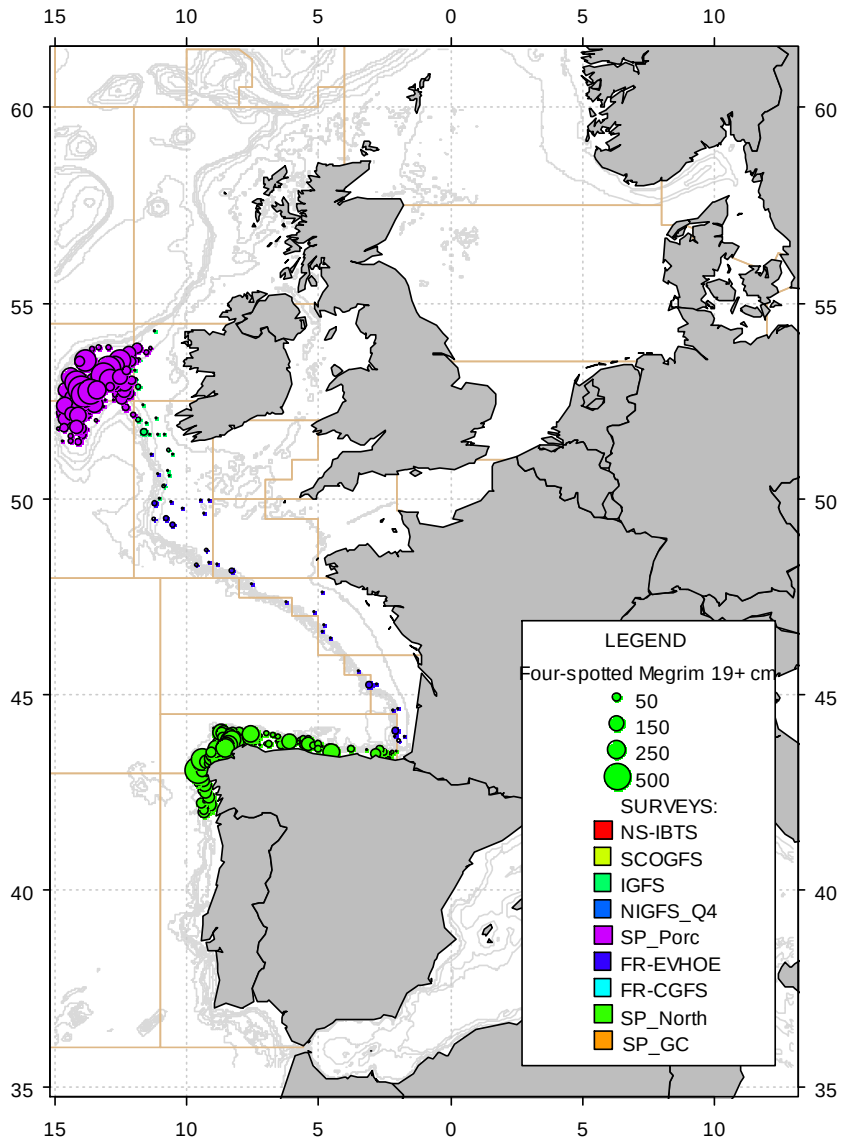


Figure A.6.17. Catches in numbers per hour of 2+ group four-spotted megrim, *Lepidorhombus boscii* (≥19 cm), in summer/autumn 2012 IBTSurveys. The catchability of the different gears used in the NeAtl surveys is not constant; therefore the map does not reflect proportional abundance in all the areas but within each survey.

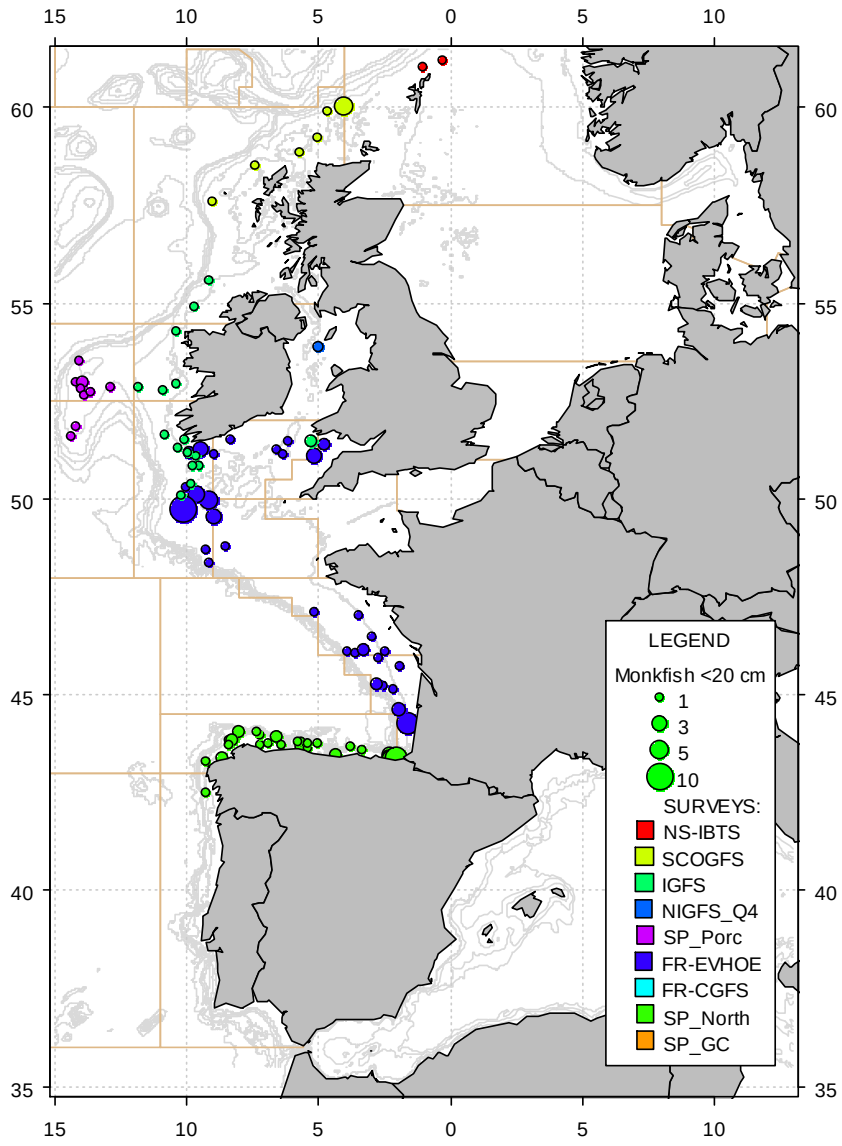


Figure A.6.18. Catches in numbers per hour of 0-group monkfish, *Lophius piscatorius* (<20 cm), in summer/autumn 2012 IBTSurveys. The catchability of the different gears used in the NeAtl surveys is not constant; therefore the map does not reflect proportional abundance in all the areas but within each survey.

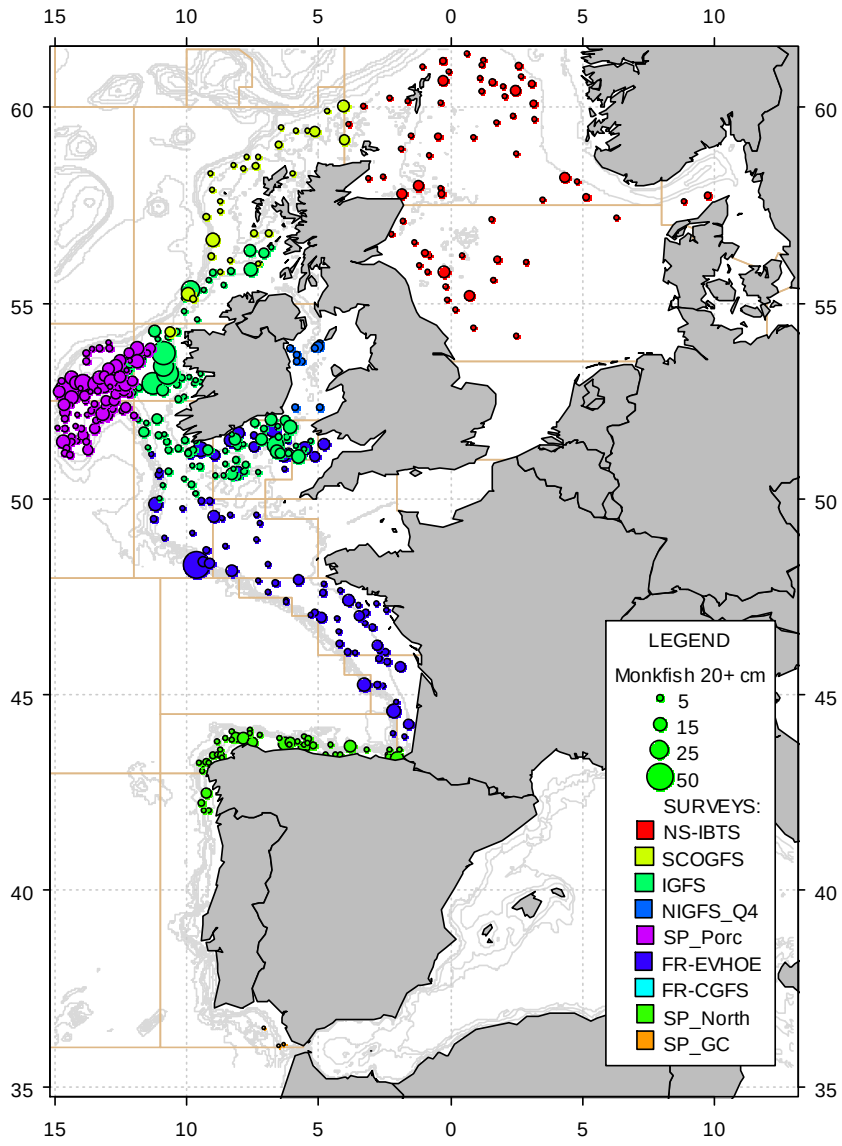


Figure A.6.19. Catches in numbers per hour of 1+ group monkfish, *Lophius piscatorius* (≥20 cm), in summer/autumn 2012 IBTSurveys. The catchability of the different gears used in the NeAtl surveys is not constant; therefore the map does not reflect proportional abundance in all the areas but within each survey.

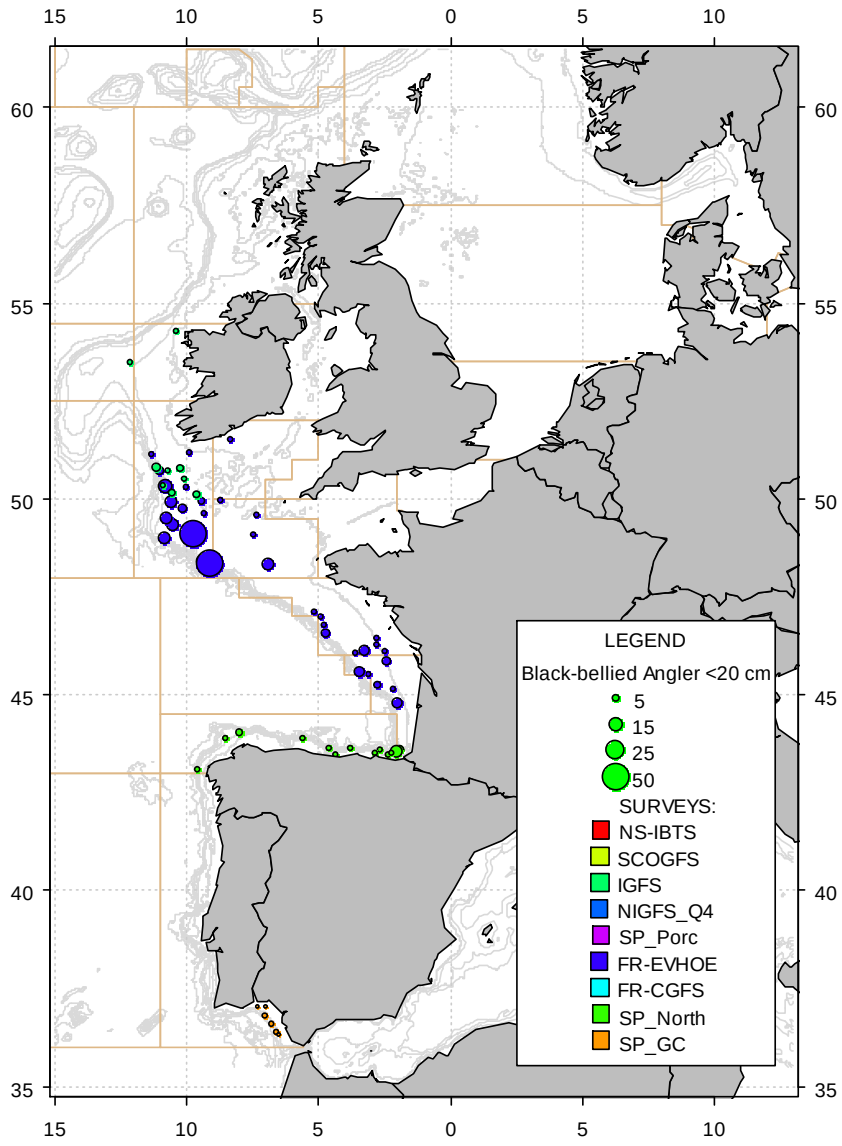


Figure A.6.20. Catches in numbers per hour of 0-group black-bellied anglerfish, *Lophius budegassa* (<20 cm), in summer/autumn 2012 IBTSurveys. The catchability of the different gears used in the NeAtl surveys is not constant; therefore the map does not reflect proportional abundance in all the areas but within each survey.

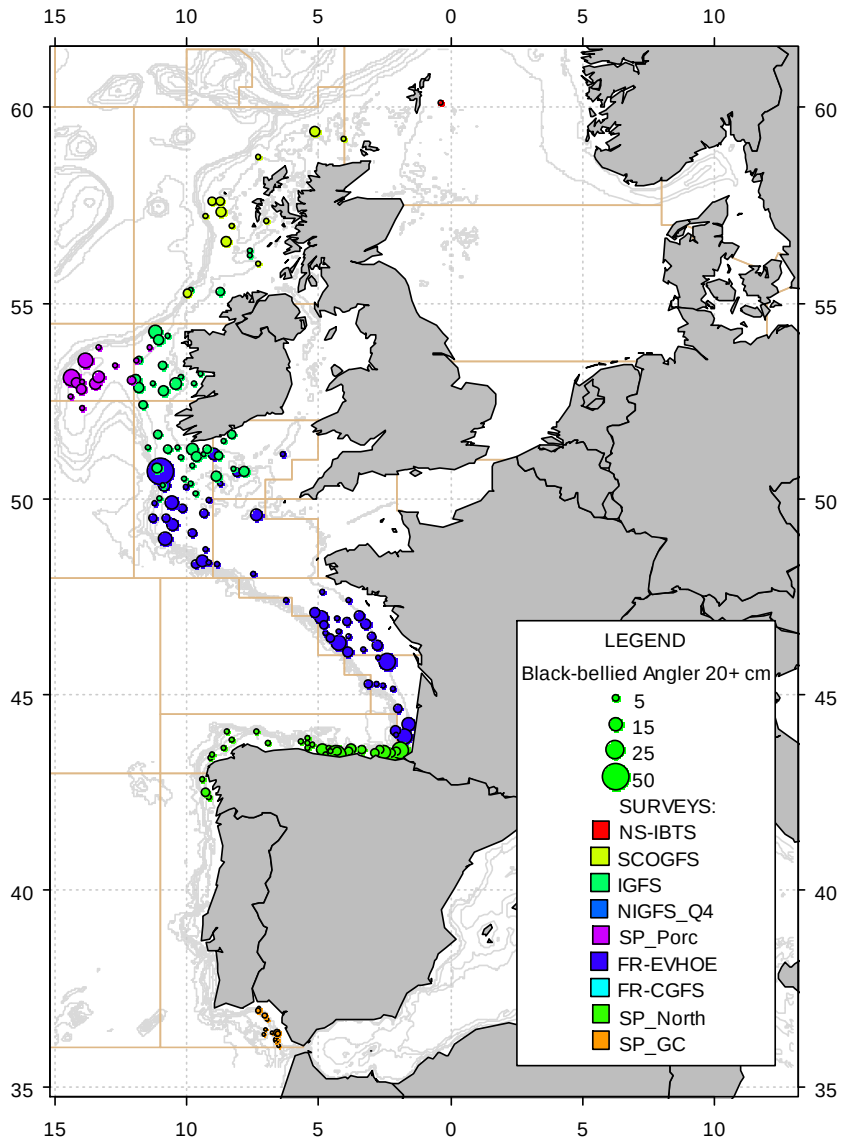


Figure A.6.21. Catches in numbers per hour of 1+ group black-bellied anglerfish, *Lophius budegassa* (≥20 cm), in summer/autumn 2012 IBTSurveys. The catchability of the different gears used in the NeAtl surveys is not constant; therefore the map does not reflect proportional abundance in all the areas but within each survey.

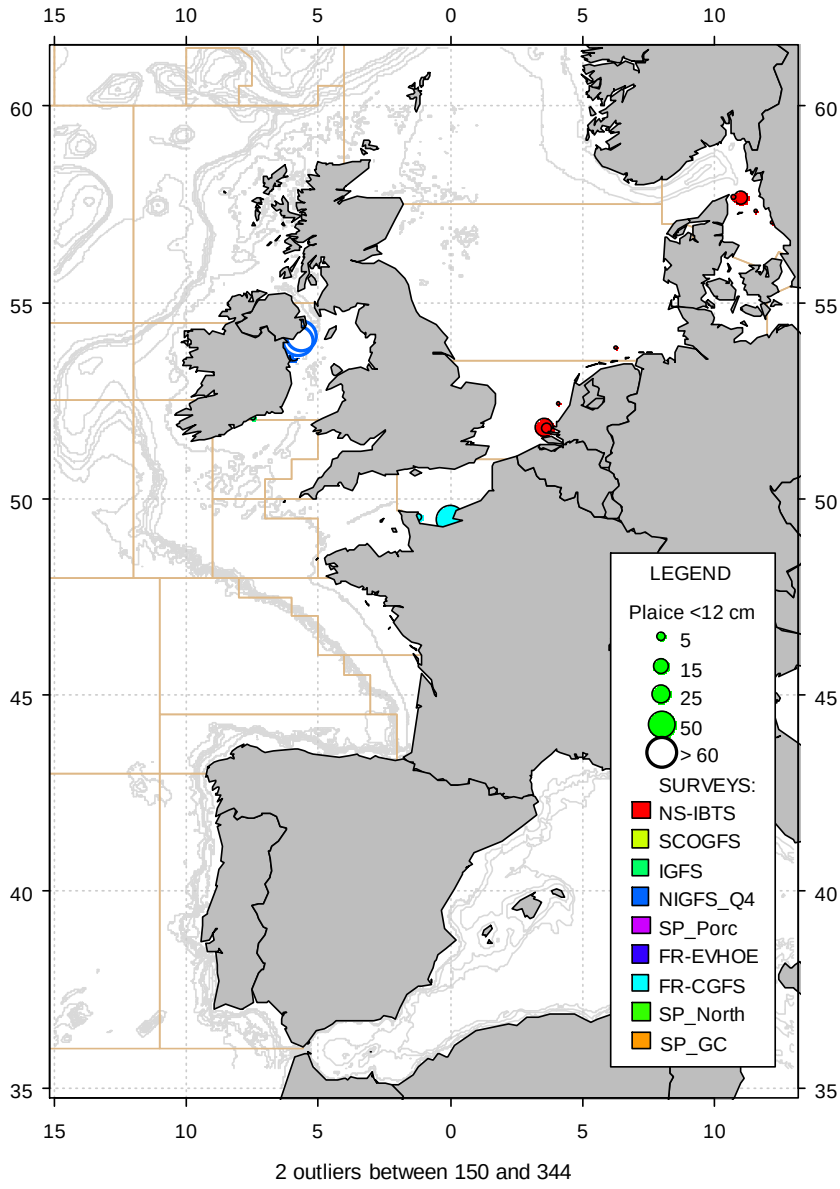


Figure A.6.22. Catches in numbers per hour of 0-group plaice, *Pleuronectes platessa* (<12 cm), in summer/autumn 2012 IBTSurveys. The catchability of the different gears used in the NeAtl surveys is not constant; therefore the map does not reflect proportional abundance in all the areas but within each survey.

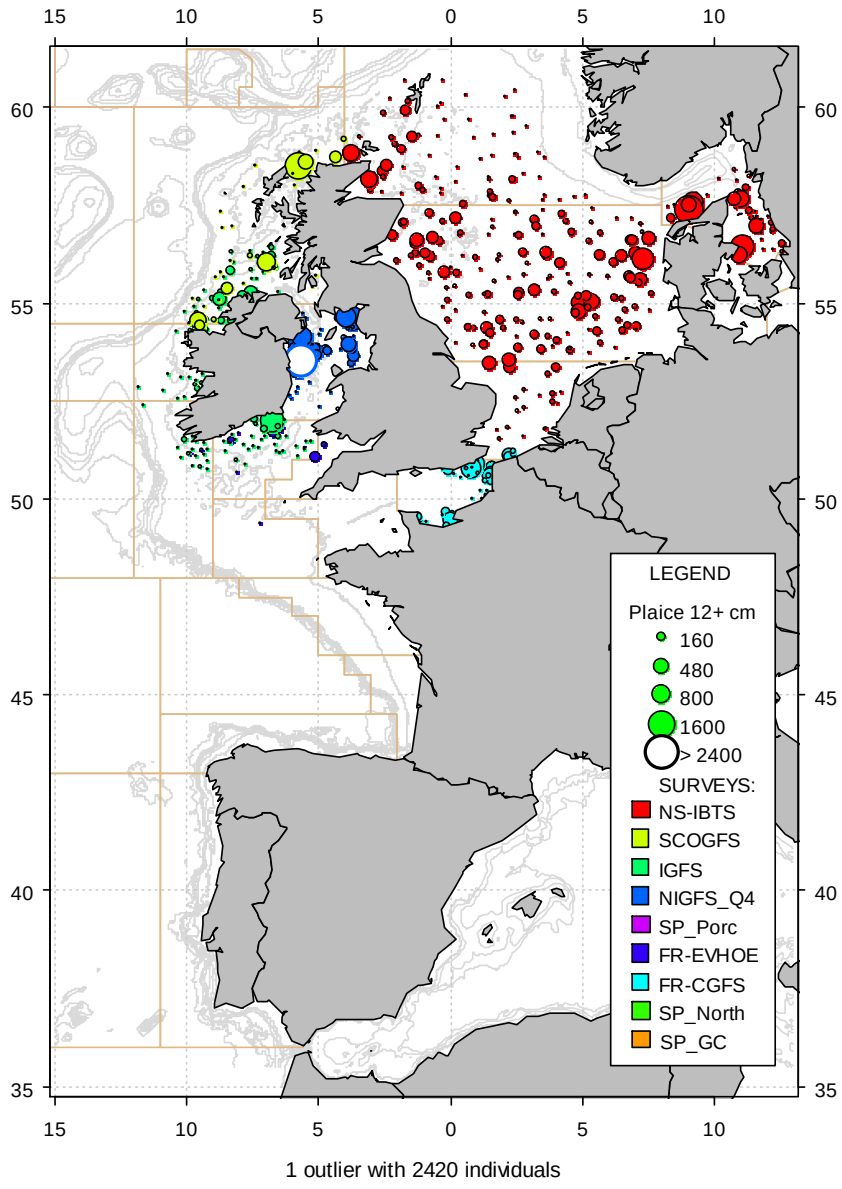


Figure A.6.23. Catches in numbers per hour of 1+ group plaice, *Pleuronectes platessa* (≥12 cm), in summer/autumn 2010 IBTSurveys. The catchability of the different gears used in the NeAtl surveys is not constant; therefore the map does not reflect proportional abundance in all the areas but within each survey.

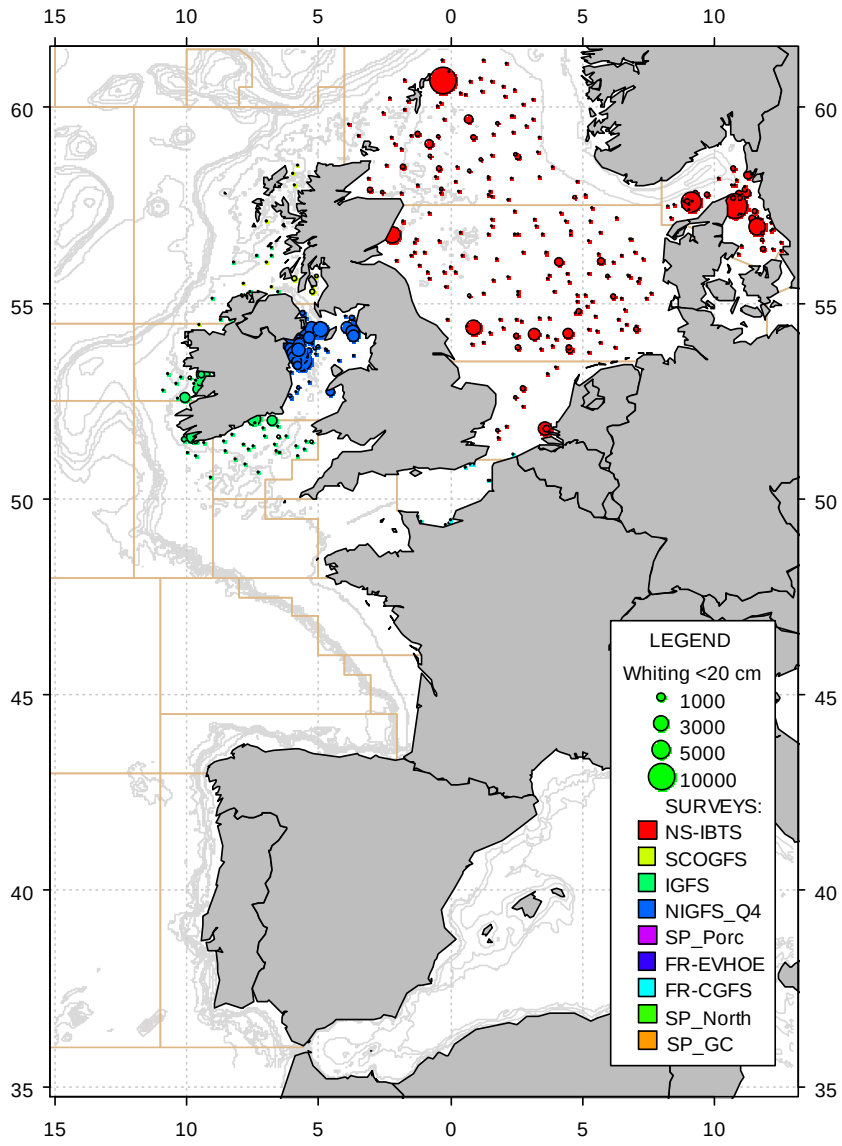


Figure A.6.24. Catches in numbers per hour of 0-group whiting, *Merlangius merlangus* (<20 cm), in summer/autumn 2012 IBTSurveys. The catchability of the different gears used in the NeAtl surveys is not constant; therefore the map does not reflect proportional abundance in all the areas but within each survey.

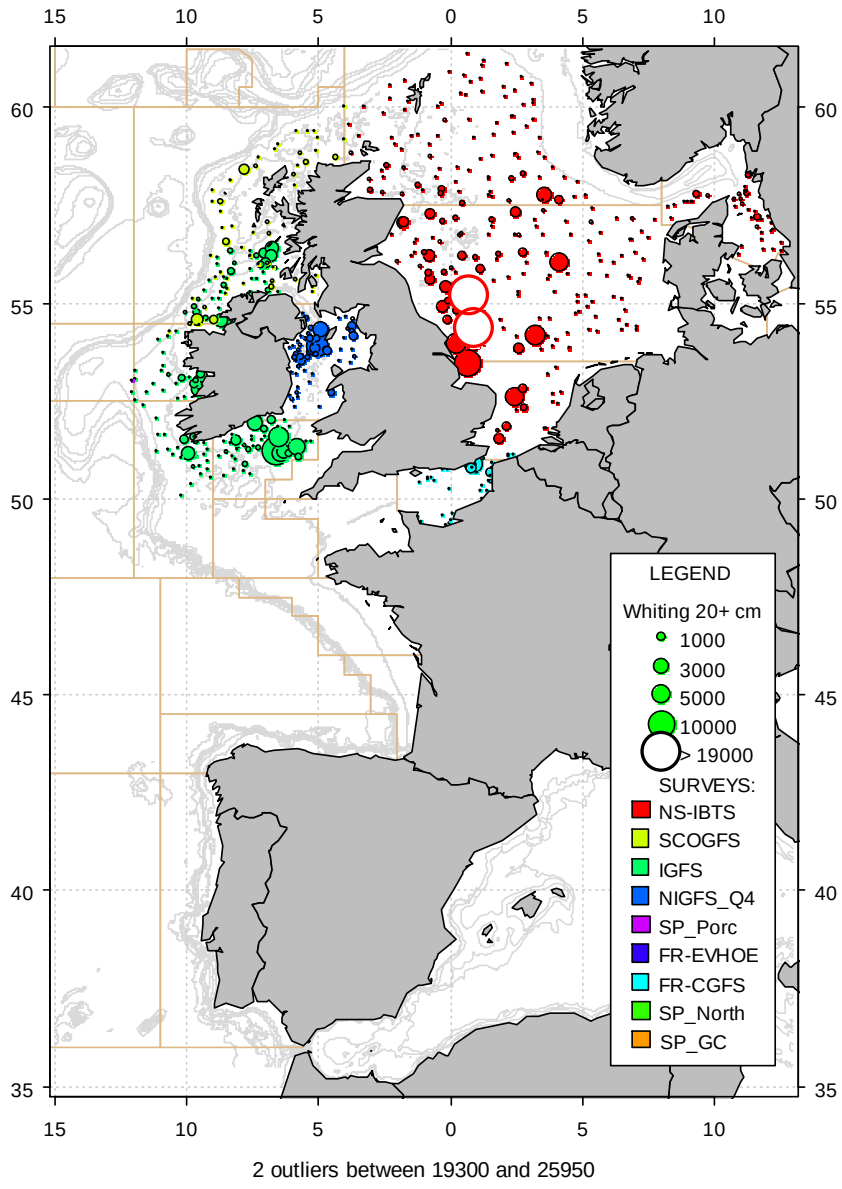


Figure A.6.25. Catches in numbers per hour of 1+ group whiting, *Merlangius merlangus* (≥20 cm), in summer/autumn 2012 IBTSurveys. The catchability of the different gears used in the NeAtl surveys is not constant; therefore the map does not reflect proportional abundance in all the areas but within each survey.

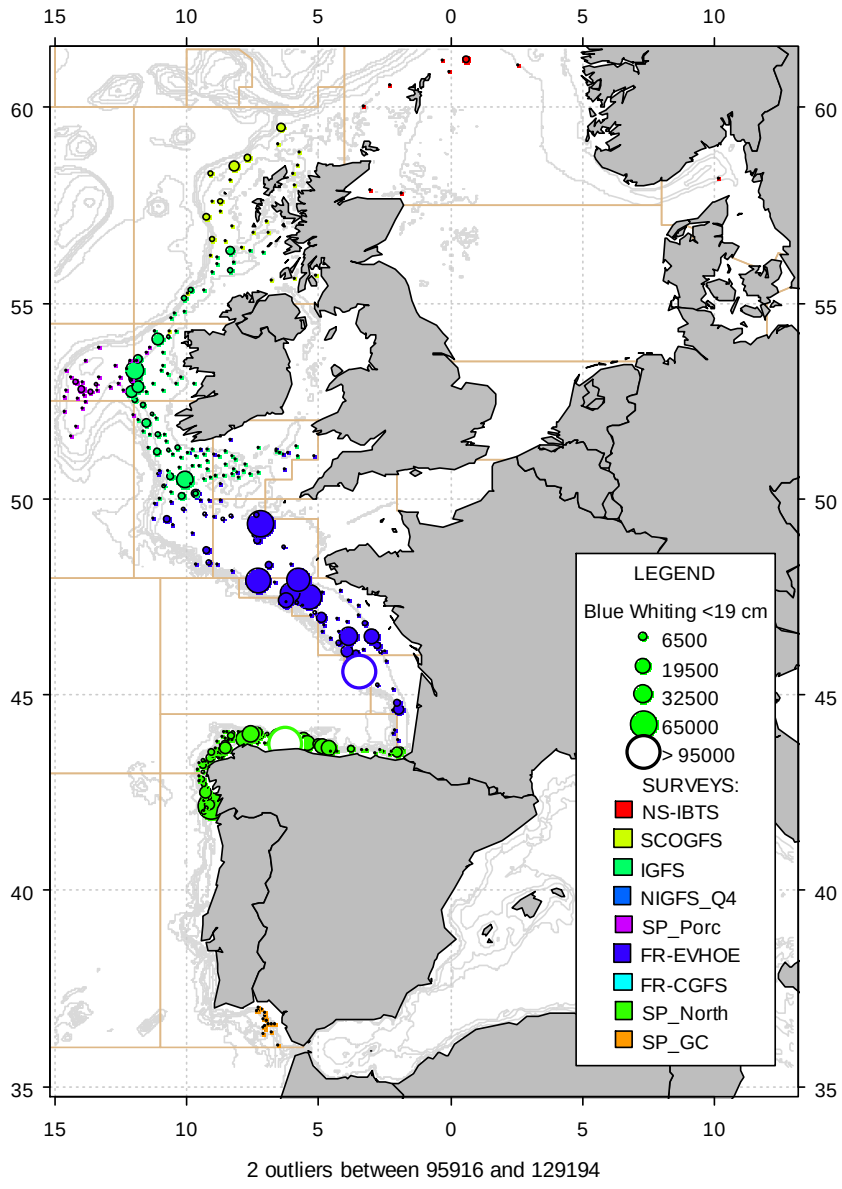


Figure A.6.26. Catches in numbers per hour of 0-group blue whiting, *Micromesistius poutassou* (<19 cm), in summer/autumn 2012 IBTSurveys. The catchability of the different gears used in the NeAtl surveys is not constant; therefore the map does not reflect proportional abundance in all the areas but within each survey.

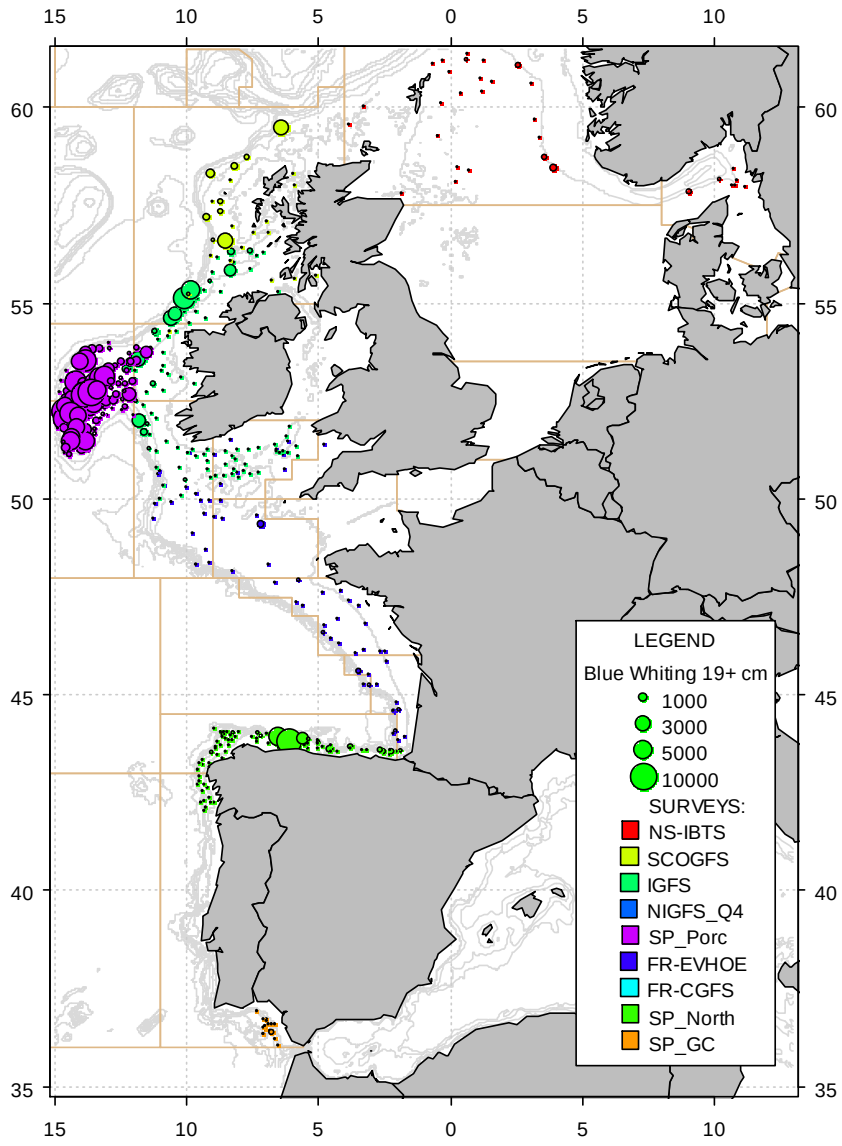


Figure A.6.27. Catches in numbers per hour of 1+ group blue whiting, *Micromesistius poutassou* (≥19 cm), in summer/autumn 2012 IBTSurveys. The catchability of the different gears used in the NeAtl surveys is not constant; therefore the map does not reflect proportional abundance in all the areas but within each survey.

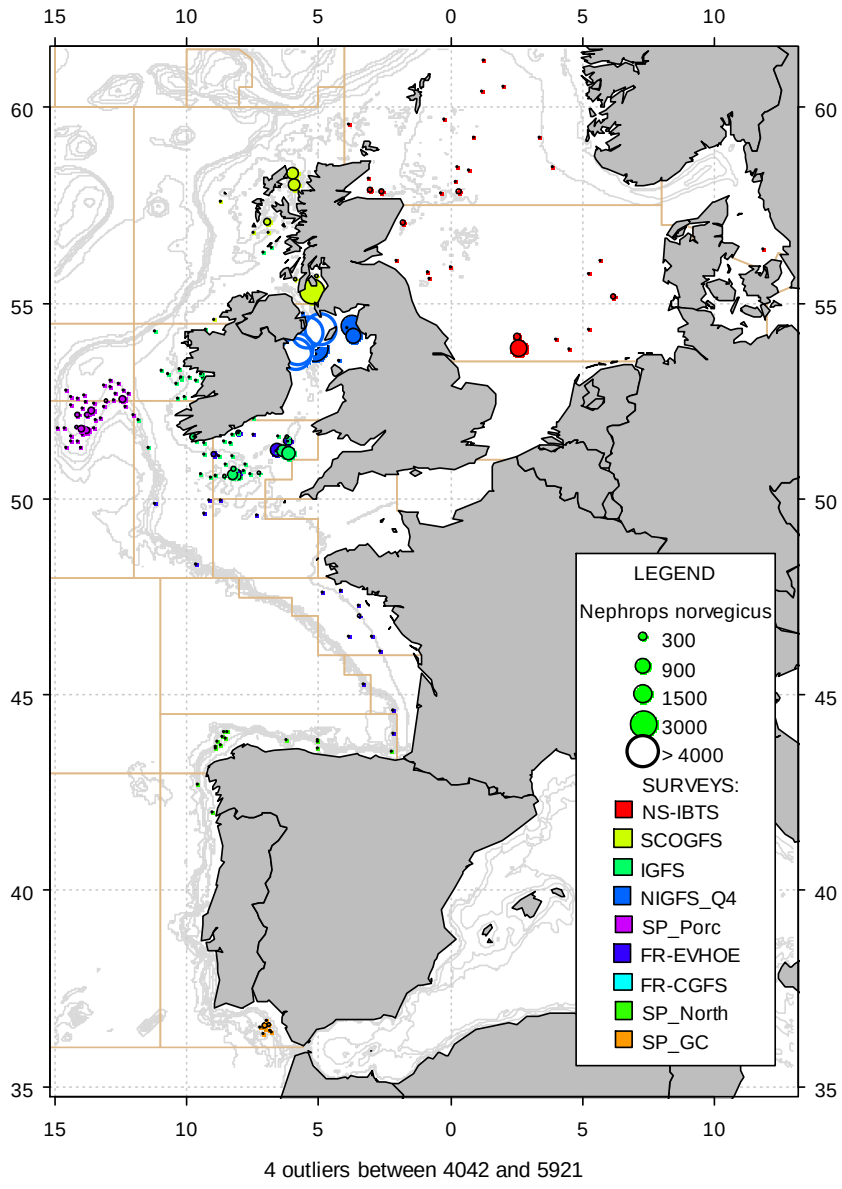


Figure A.6.28. Catches in numbers per hour of Norway lobster, *Nephrops norvegicus*, in summer/autumn 2012 IBTSurveys. The catchability of the different gears used in the NeAtl surveys is not constant; therefore the map does not reflect proportional abundance in all the areas but within each survey.

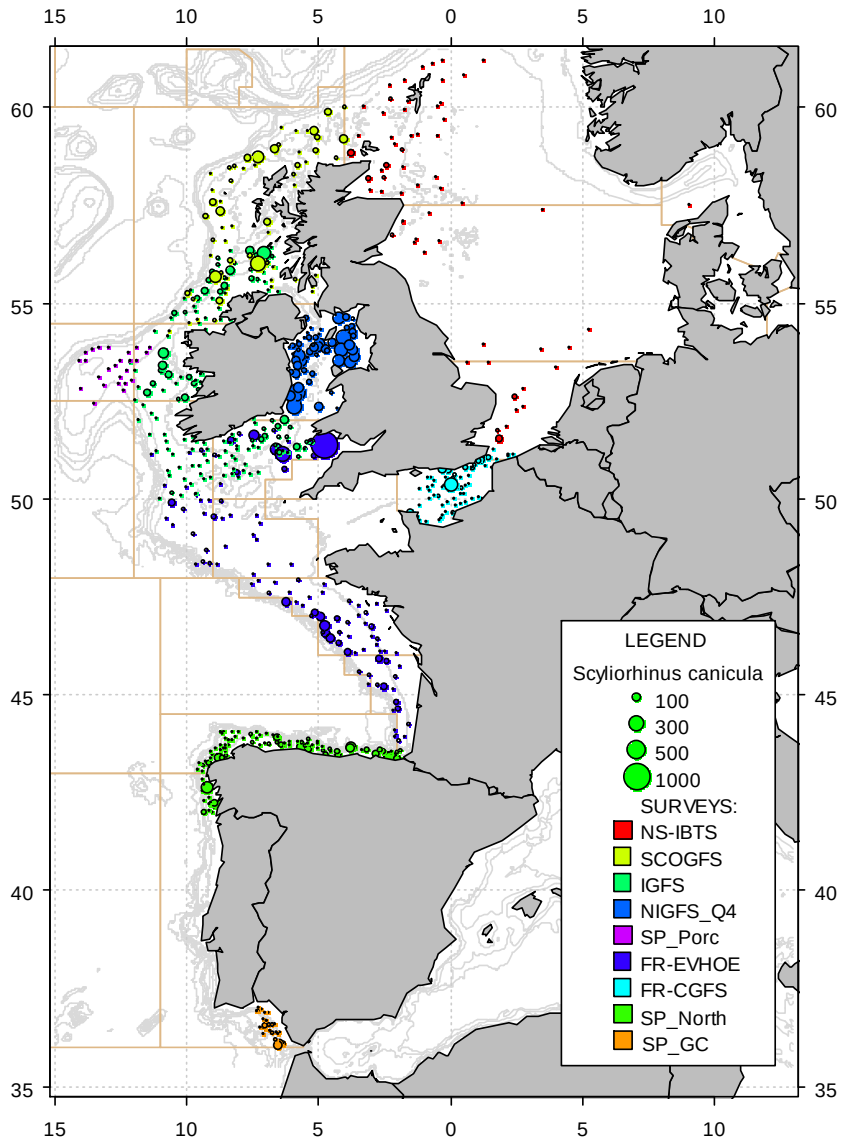


Figure A.6.29. Catches in numbers per hour of lesser spotted dogfish, *Scyliorhinus canicula*, in summer/autumn 2012 IBTSurveys. The catchability of the different gears used in the NeAtl surveys is not constant; therefore the map does not reflect proportional abundance in all the areas but within each survey.

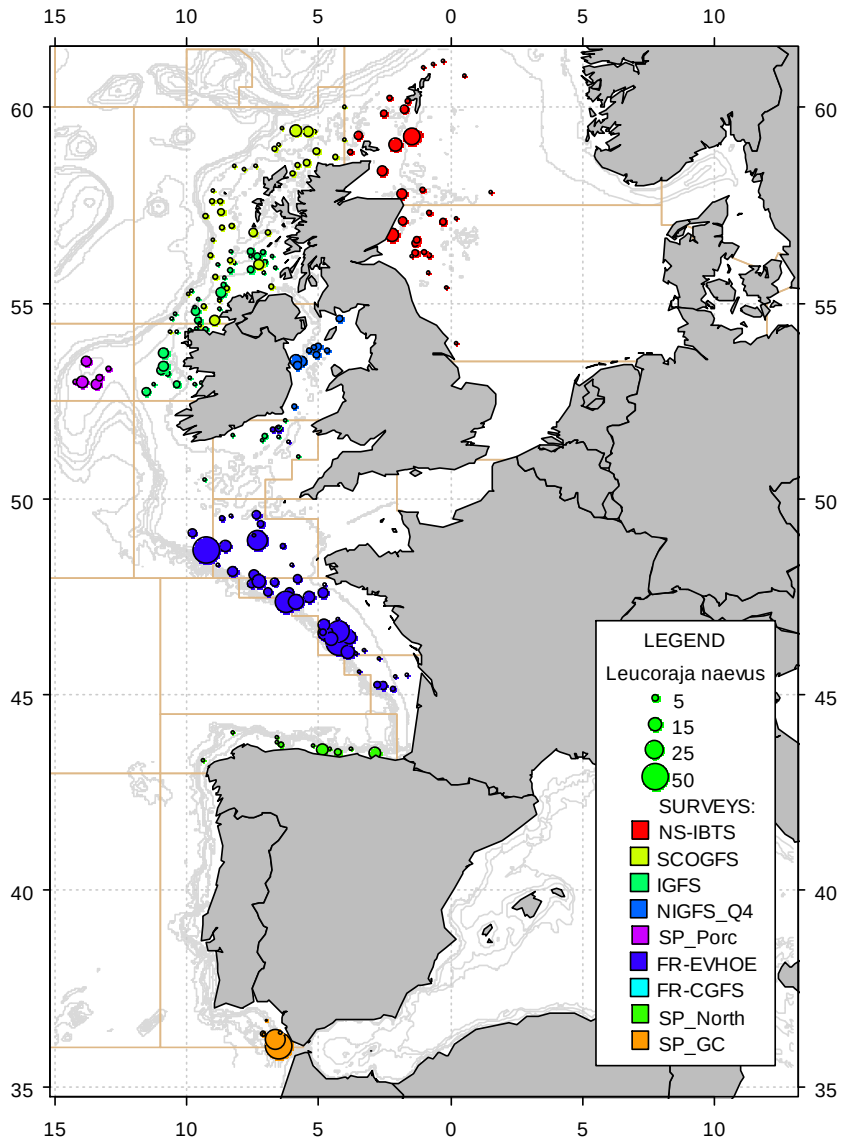


Figure A.6.30. Catches in numbers per hour of cuckoo ray, *Leucoraja naevus*, in summer/autumn 2012 IBTSurveys. The catchability of the different gears used in the NeAtl surveys is not constant; therefore the map does not reflect proportional abundance in all the areas but within each survey.

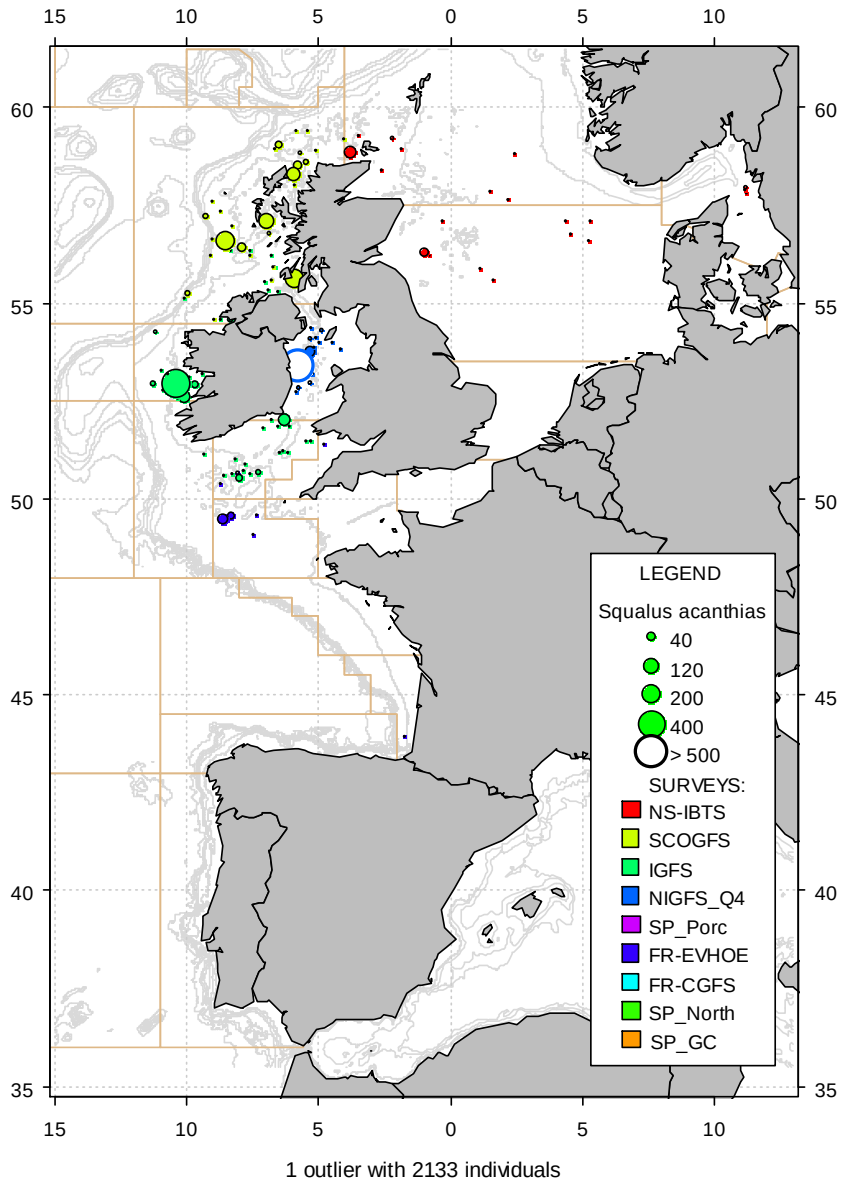


Figure A.6.31. Catches in numbers per hour per hour of spurdog, *Squalus acanthias*, in summer/autumn 2012 IBTSurveys. The catchability of the different gears used in the NeAtl surveys is not constant; therefore the map does not reflect proportional abundance in all the areas but within each survey.

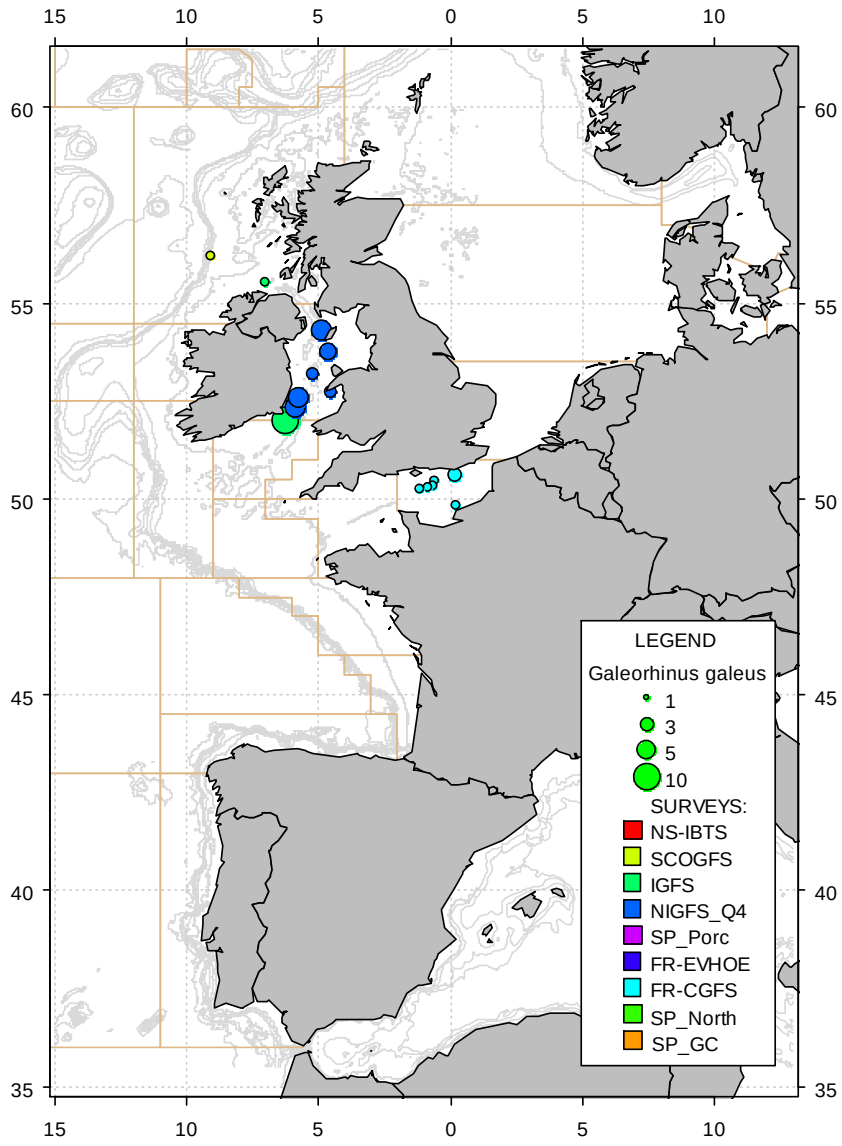


Figure A.6.32. Catches in numbers per hour per hour of tope, *Galeorhinus galeus*, in summer/autumn 2012 IBTSurveys. The catchability of the different gears used in the NeAtl surveys is not constant; therefore the map does not reflect proportional abundance in all the areas but within each survey.

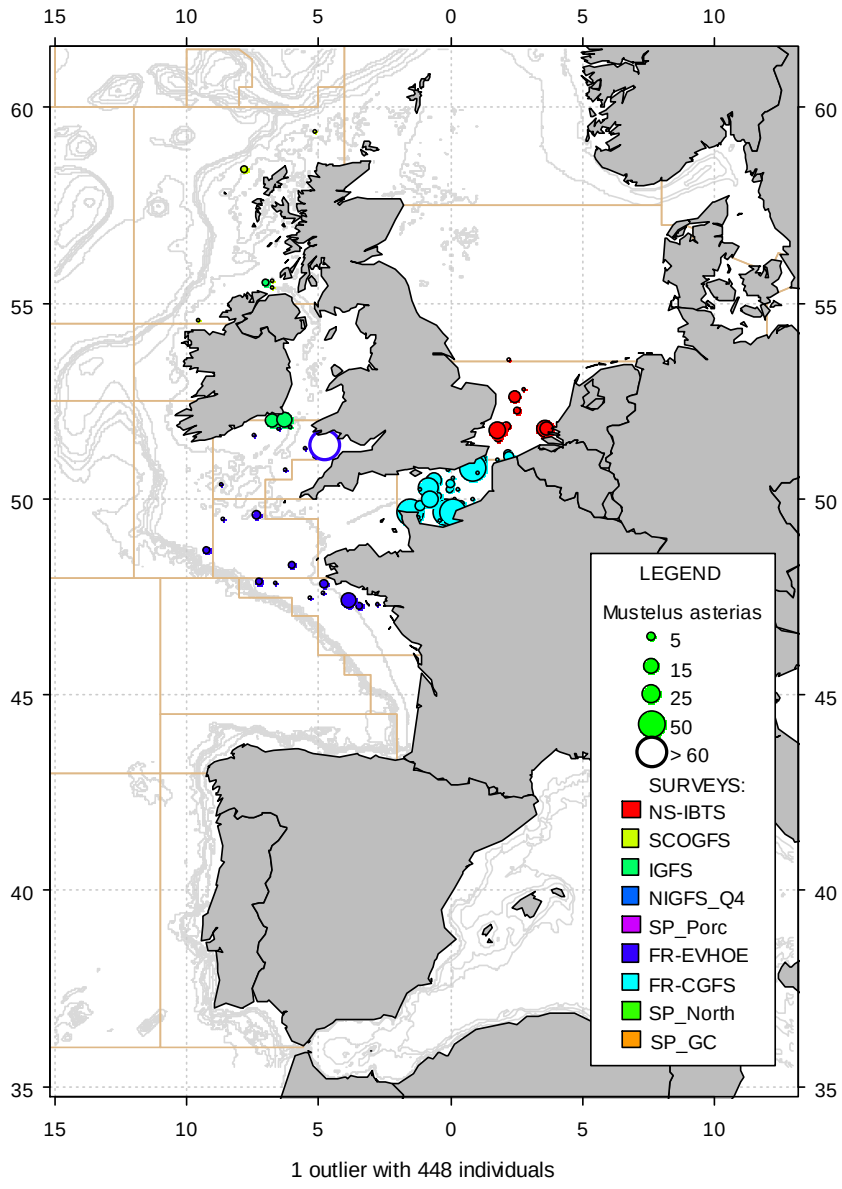


Figure A.6.33. Catches in numbers per hour per hour of smooth hound, *Mustelus asterias*, in summer/autumn 2012 IBTSurveys. The catchability of the different gears used in the NeAtl surveys is not constant; therefore the map does not reflect proportional abundance in all the areas but within each survey.

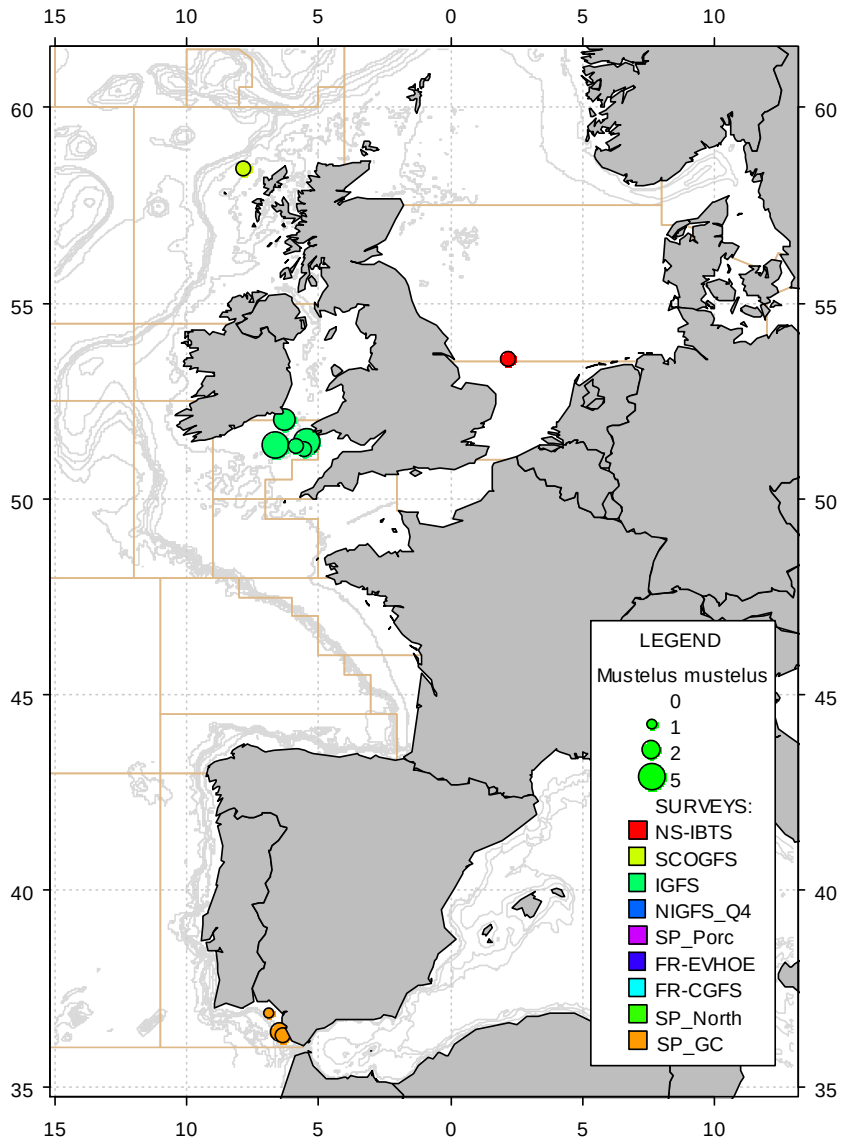


Figure A.6.34. Catches in numbers per hour per hour of smooth hound, *Mustelus mustelus*, in summer/autumn 2012 IBTSurveys. The catchability of the different gears used in the NeAtl surveys is not constant; therefore the map does not reflect proportional abundance in all the areas but within each survey.

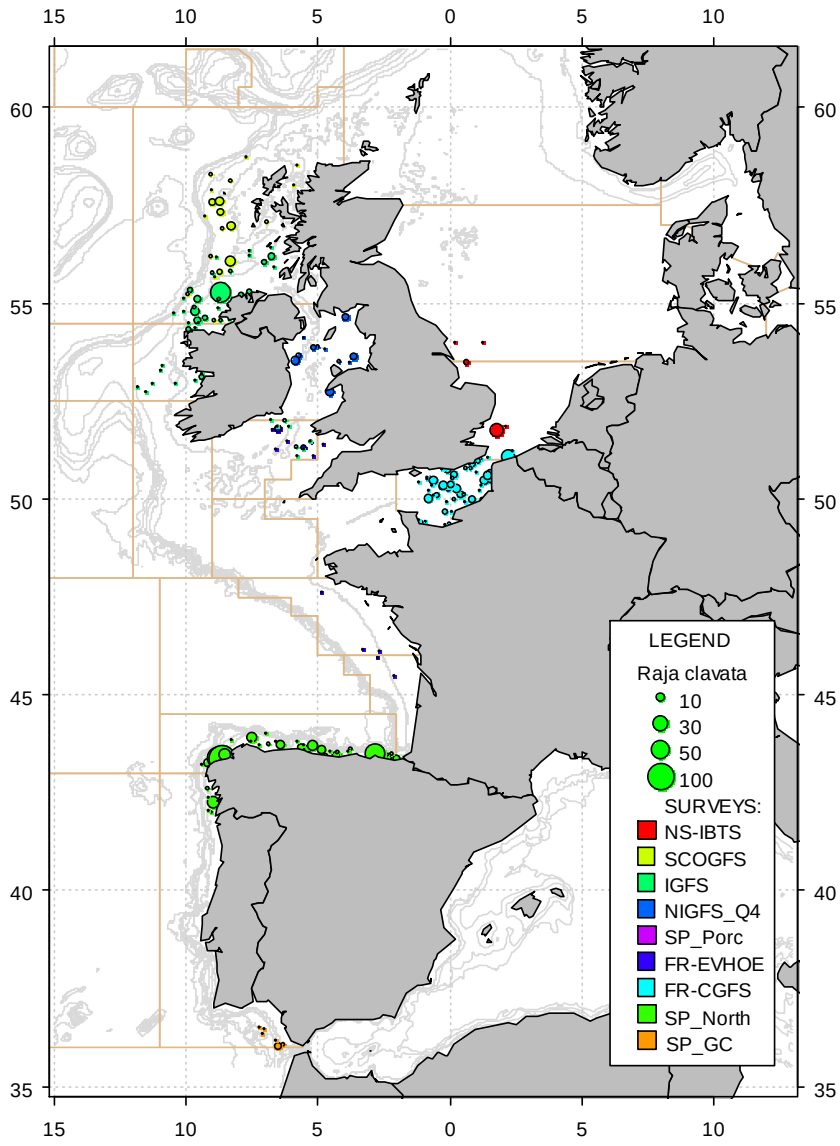


Figure A.6.35. Catches in numbers per hour per hour of thornback ray, *Raja clavata*, in summer/autumn 2012 IBTSurveys. The catchability of the different gears used in the NeAtl surveys is not constant; therefore the map does not reflect proportional abundance in all the areas but within each survey.

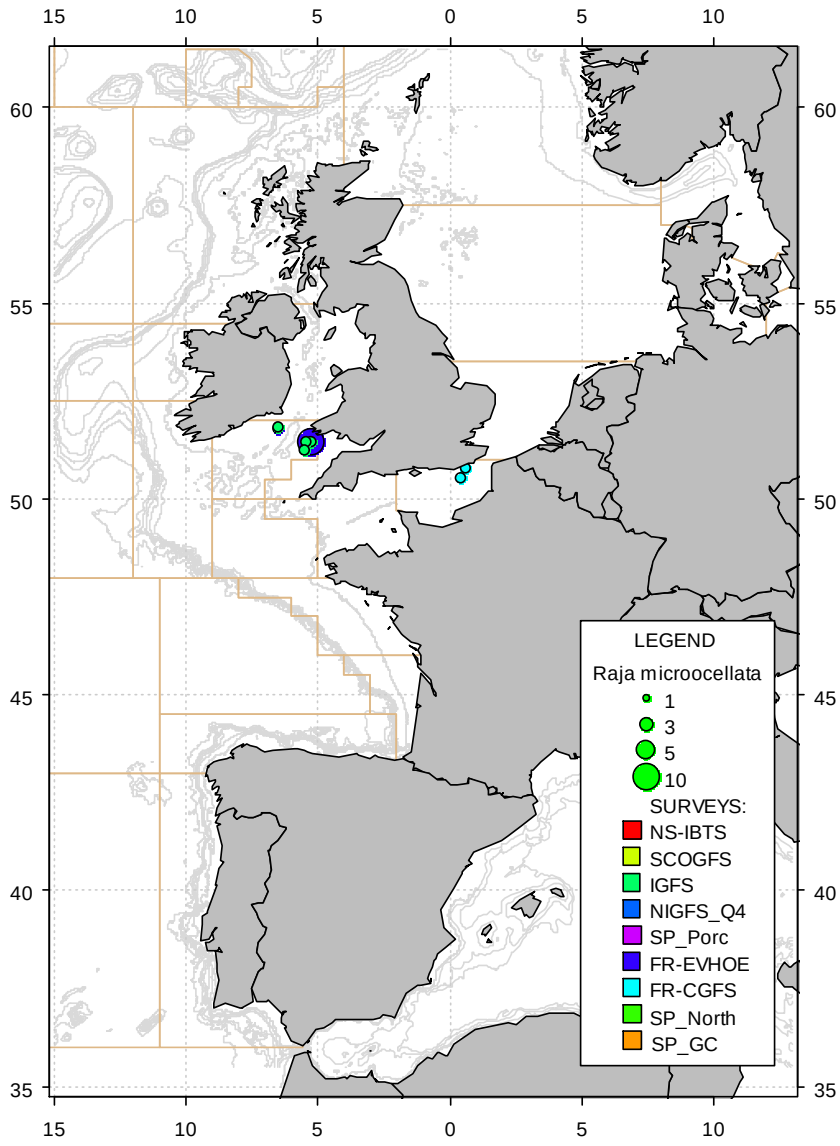


Figure A.6.36. Catches in numbers per hour per hour of small eyed ray, *Raja microocellata*, in summer/autumn 2012 IBTSurveys. The catchability of the different gears used in the NeAtl surveys is not constant; therefore the map does not reflect proportional abundance in all the areas but within each survey.

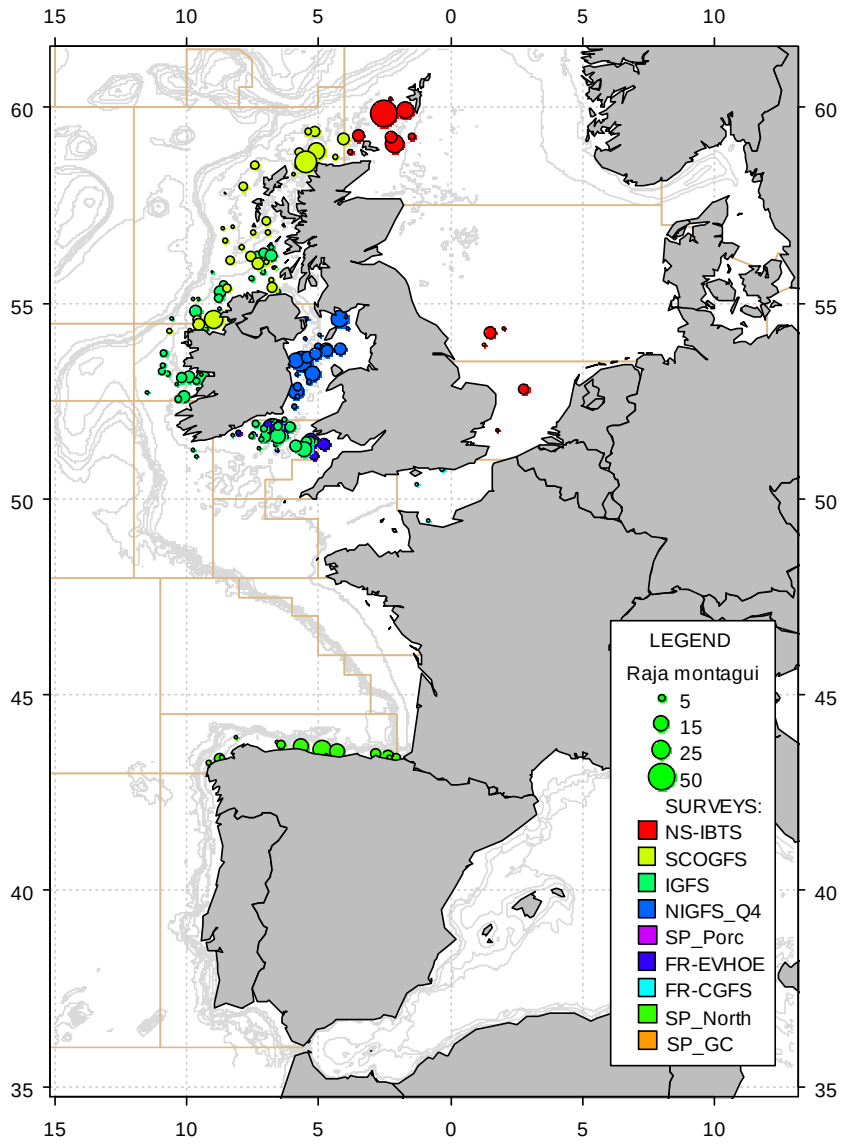


Figure A.6.37. Catches in numbers per hour per hour of spotted ray, *Raja montagui*, in summer/autumn 2012 IBTSurveys. The catchability of the different gears used in the NeAtl surveys is not constant; therefore the map does not reflect proportional abundance in all the areas but within each survey.

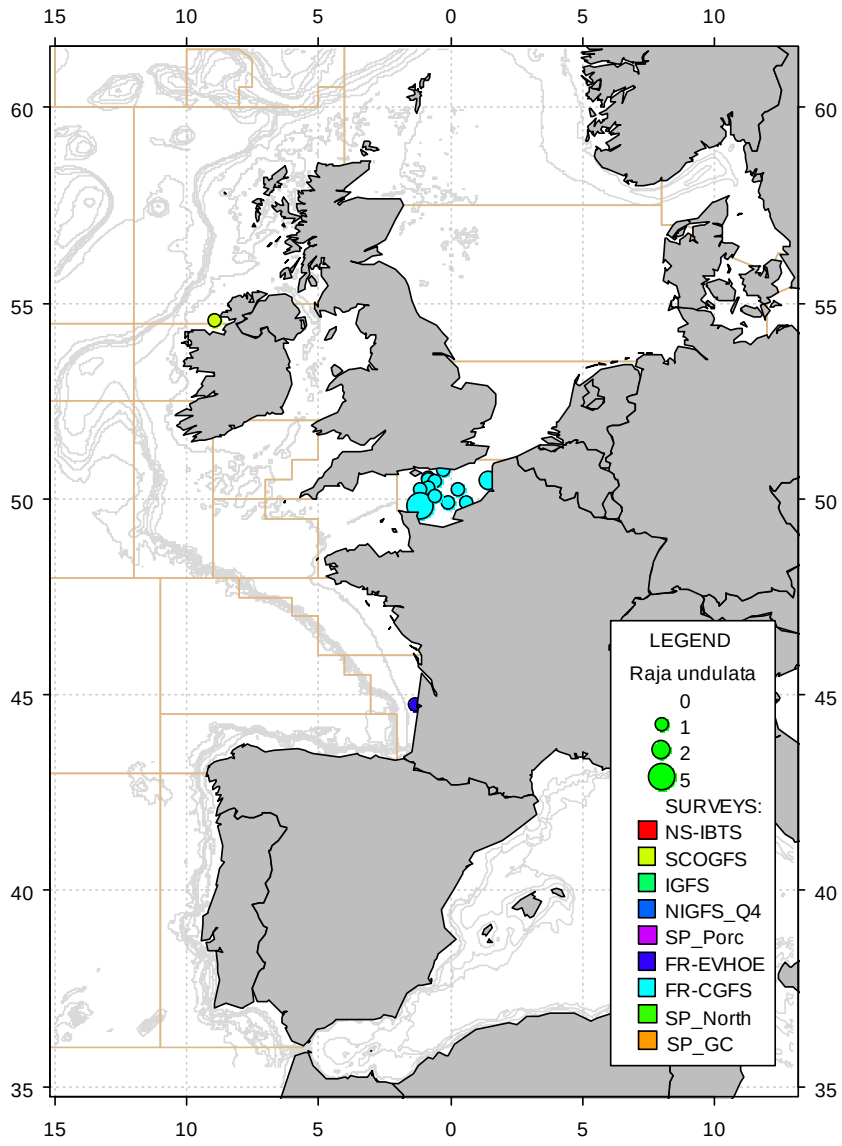


Figure A.6.38. Catches in numbers per hour per hour of undulate ray, *Raja undulata*, in summer/autumn 2012 IBTSurveys. The catchability of the different gears used in the NeAtl surveys is not constant; therefore the map does not reflect proportional abundance in all the areas but within each survey.

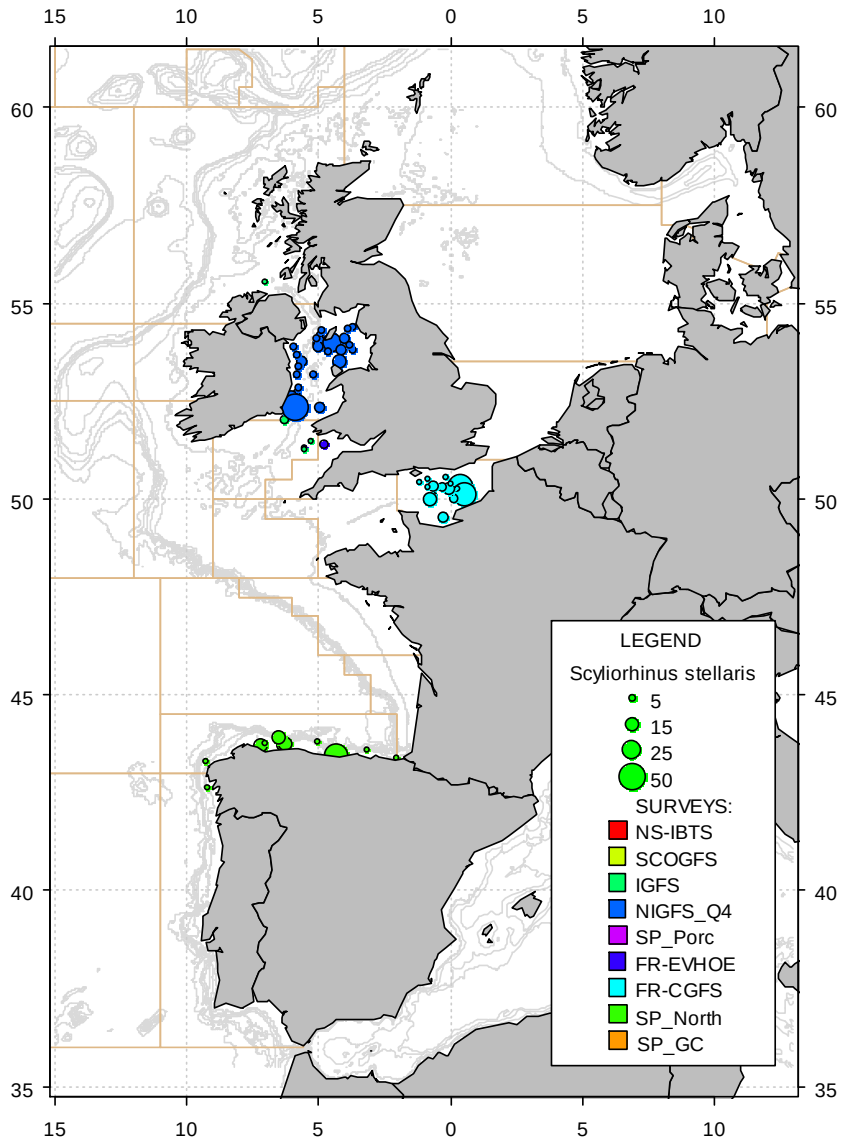


Figure A.6.39. Catches in numbers per hour per hour of nurse hound, *Scyliorhinus stellaris*, in summer/autumn 2012 IBTSurveys. The catchability of the different gears used in the NeAtl surveys is not constant; therefore the map does not reflect proportional abundance in all the areas but within each survey.

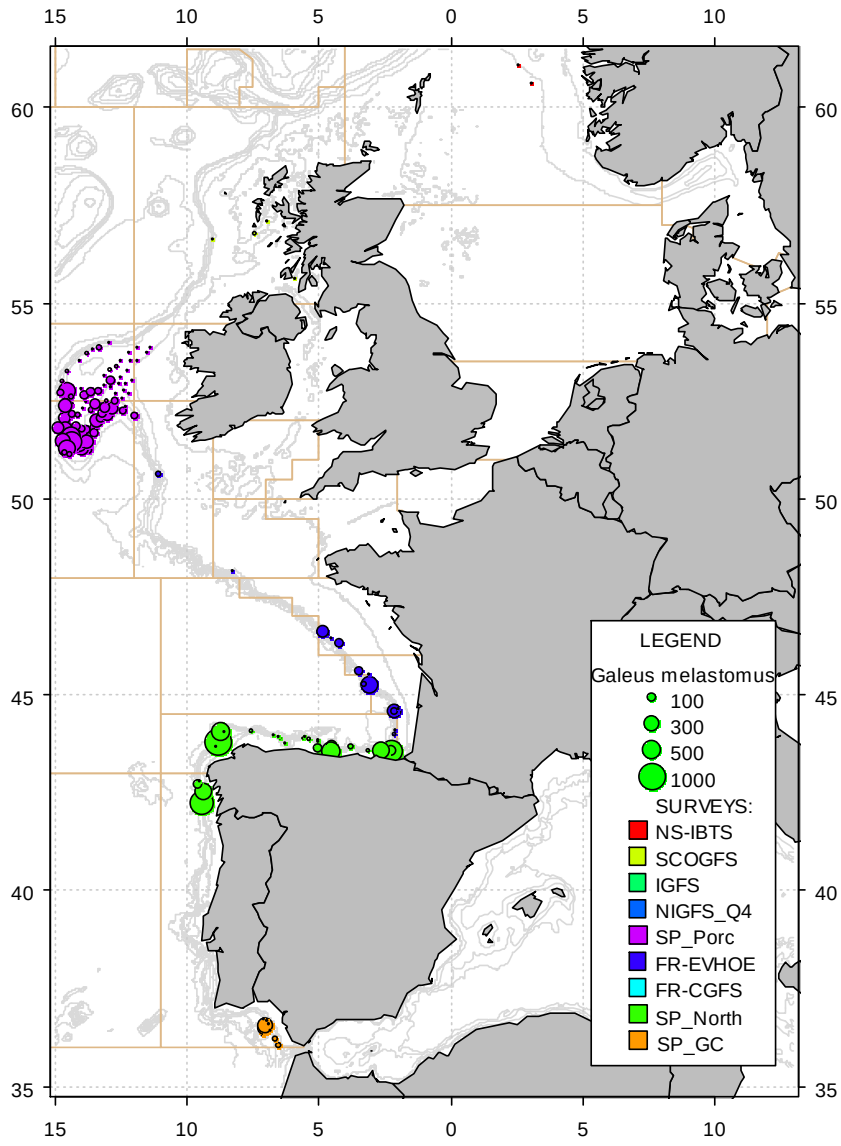


Figure A.6.40. Catches in numbers per hour per hour of Blackmouthed dogfish, *Galeus melastomus*, in summer/autumn 2012 IBTSurveys. The catchability of the different gears used in the NeAtl surveys is not constant; therefore the map does not reflect proportional abundance in all the areas but within each survey.

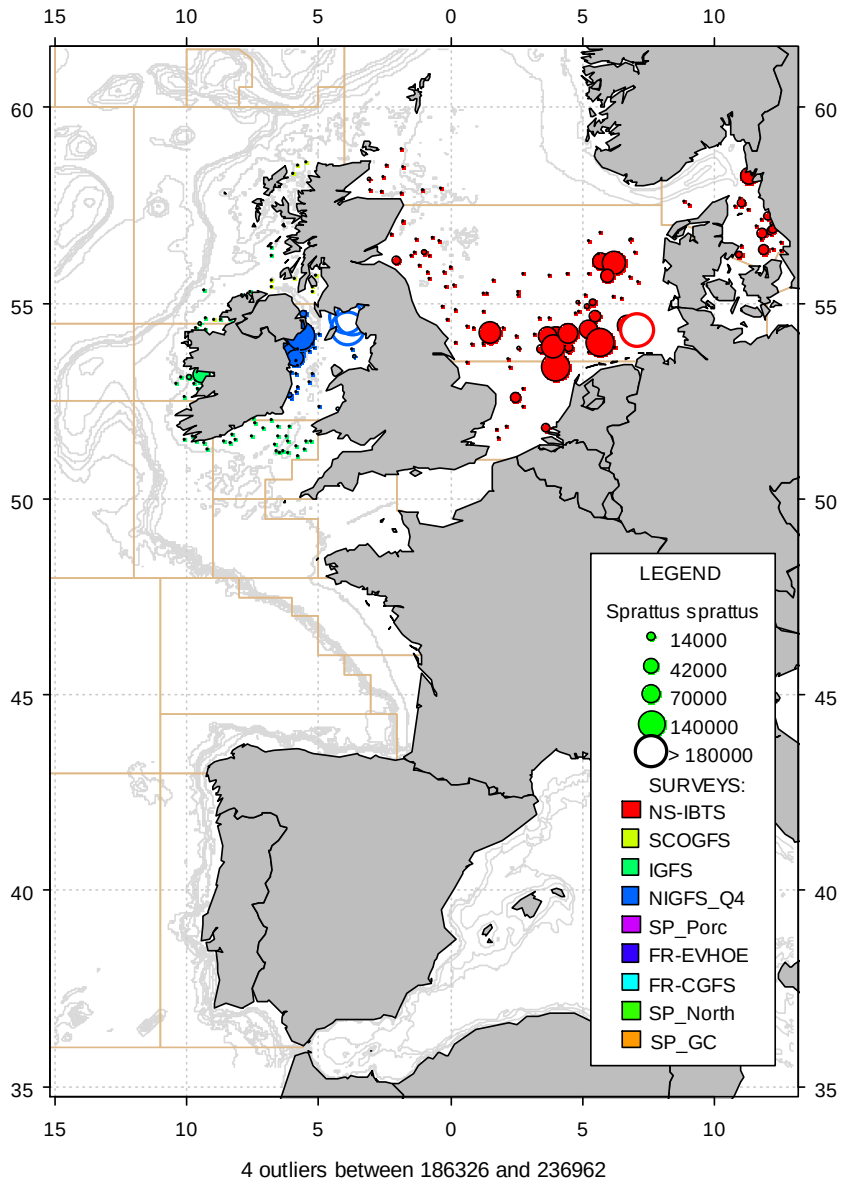


Figure A.6.41. Catches in numbers per hour per hour of European sprat, *Sprattus sprattus*, in summer/autumn 2012 IBTSurveys. The catchability of the different gears used in the NeAtl surveys is not constant; therefore the map does not reflect proportional abundance in all the areas but within each survey.

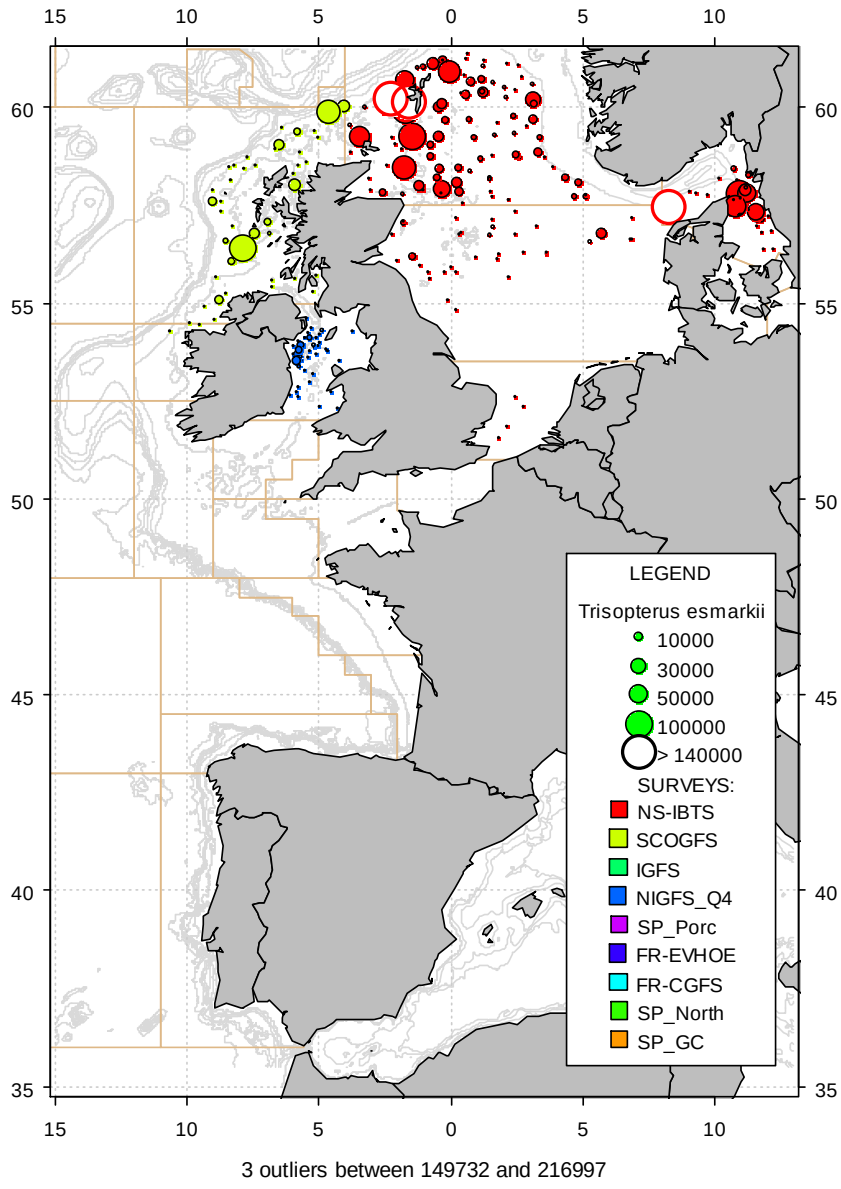


Figure A.6.42. Catches in numbers per hour per hour of Norway pout, *Trisopterus esmarkii*, in summer/autumn 2012 IBTSurveys. The catchability of the different gears used in the NeAtl surveys is not constant; therefore the map does not reflect proportional abundance in all the areas but within each survey.

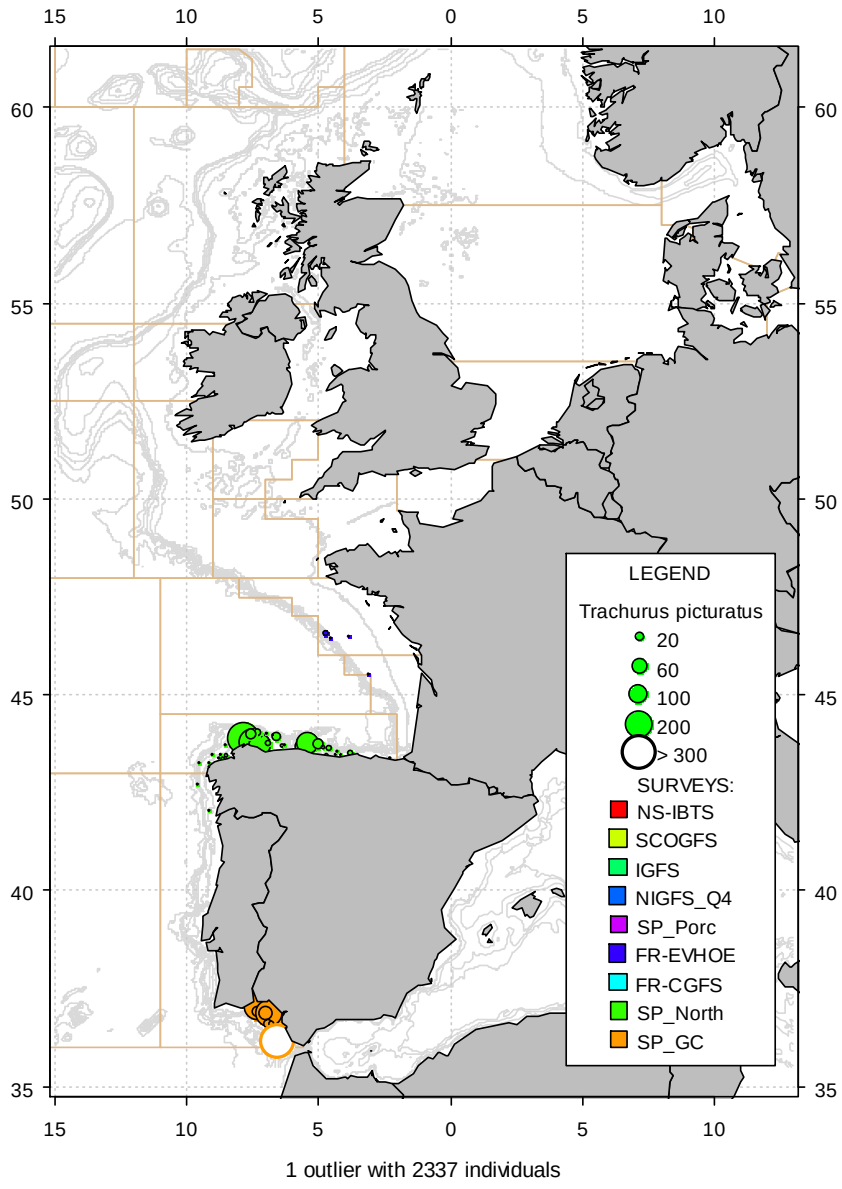


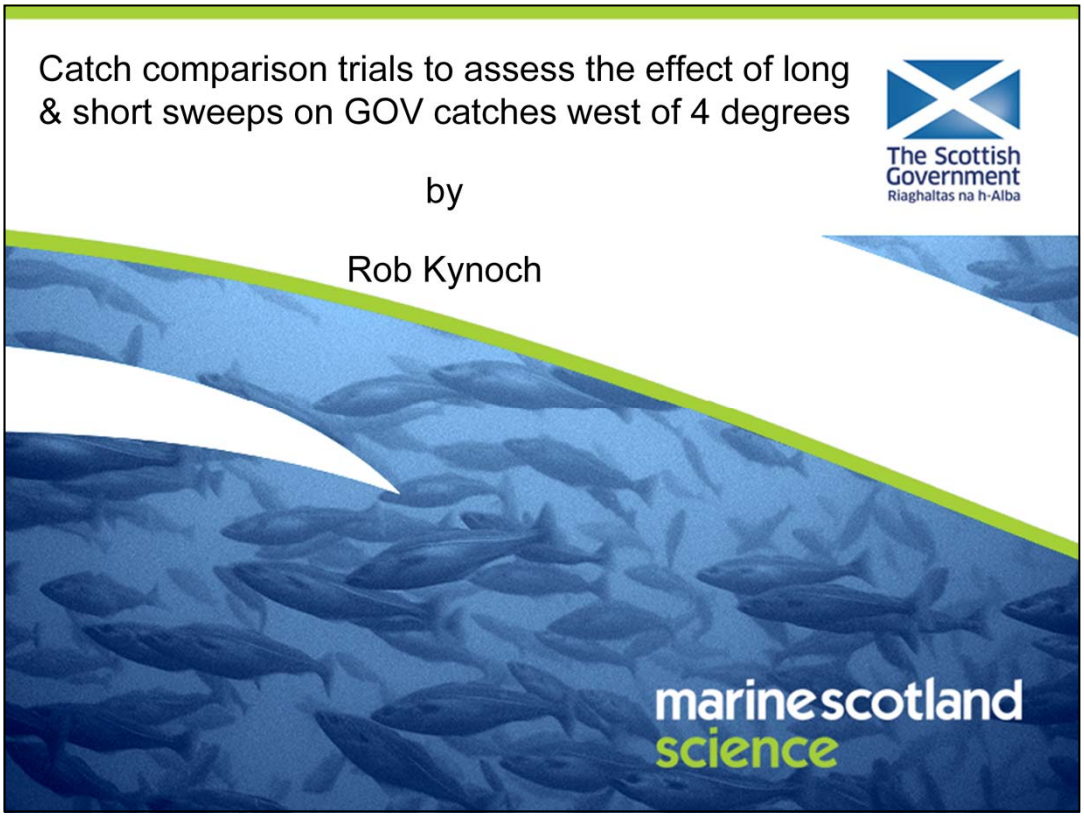
Figure A.6.43. Catches in numbers per hour per hour of blue jack mackerel, *Trachurus picturatus*, in summer/autumn 2012 IBTSurveys. The catchability of the different gears used in the NeAtl surveys is not constant; therefore the map does not reflect proportional abundance in all the areas but within each survey.

Annex 7: Working Documents

Working documents presented to the International Bottom Trawl Survey Working Group (IBTSWG) during the 2013 meeting.

These Working Documents have not been peer-reviewed by IBTSWG and should therefore not be interpreted as the view of the Group. The Working Documents are appended for information only.

WD 1: Robert Kynoch:	Sweep Length Effect
WD 2: Francisco Velasco:	Inter-calibration
WD 3: Ralf van Hal:	Marine Litter
WD 4: Yves Verin	Staff Exchange Report
WD 5 Yves Verin	CAMANOC Survey


Catch comparison trials to assess the effect of long & short sweeps on GOV catches west of 4 degrees
by
Rob Kynoch
The Scottish Government
Riaghaltas na h-Alba
marinescotland science

Background

marinescotland science

- Pre-2011 only short sweeps (47m) used west of 4^0.
- From 2011 new survey design adopted for Scottish surveys west of 4^0 (Scottish western coast & Rockall).
- To standardise with Irish groundfish surveys long sweeps (97m) to be used in depths >80m.
- Also new Rockhopper ground gear introduced (D rig) & strengthening around trawl mouth.

Main aim of gear trials

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- To compare efficiency of long & short sweeps in water depths deeper than would normally be recommended for shorter sweeps.

- Note:
  - IBTS recommends short sweeps in depths <70m and long sweeps in deeper water.
  - Water depths encountered on Scottish surveys down to 500m.
  - Scope ratio (Warp/depth) adjusted to maintain gear geometry.

Material & methods

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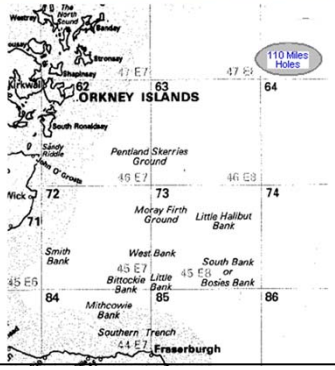
- Trials conducted aboard FRV Scotia during November 2011.
- Catch comparison using alternate haul method.
- All hauls made in ('110 Miles Holes') North Sea - approx 95nmiles NE Fraserburgh
- Water depths encountered ranged between 130m to 145m.



Material & methods

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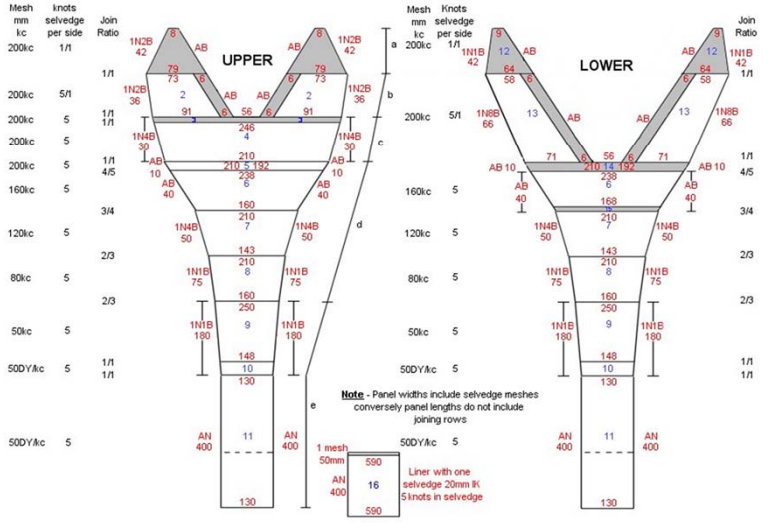
- Towing speed (3.4kts►3.7kts) and warp/depth ratios as per standard survey protocols for Scottish IBTS surveys.
- Gear measurements:
  - Scanmar spreads (doors/wings) & headline height.
  - Bottom contact @ ground gear centre.

GOV trawl gear

marinescotland science

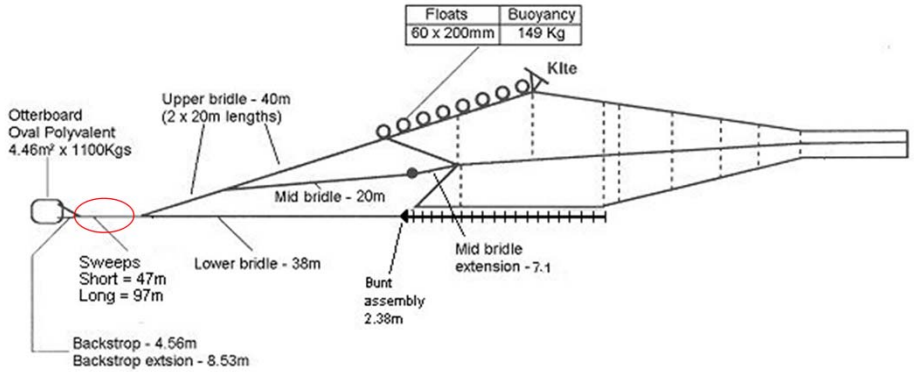
- The same GOV trawl used throughout supplied by Marine Lab Netstore.



GOV trawl gear

marinescotland science

- Rigged with Ground gear D (Rockhoppers)
  - Incorporates 400mm, 350mm & 300mm discs.
  - Total weight in air 2180kg.
- The same otterboard, backstrop & bridle rig used for both.



The same trawl and wire rig was used for both gear configurations with the exception of the single sweep (highlighted in the red circle). The long (test) sweep was 97m in length and short (control) sweep was 47m in length.

Experimental design

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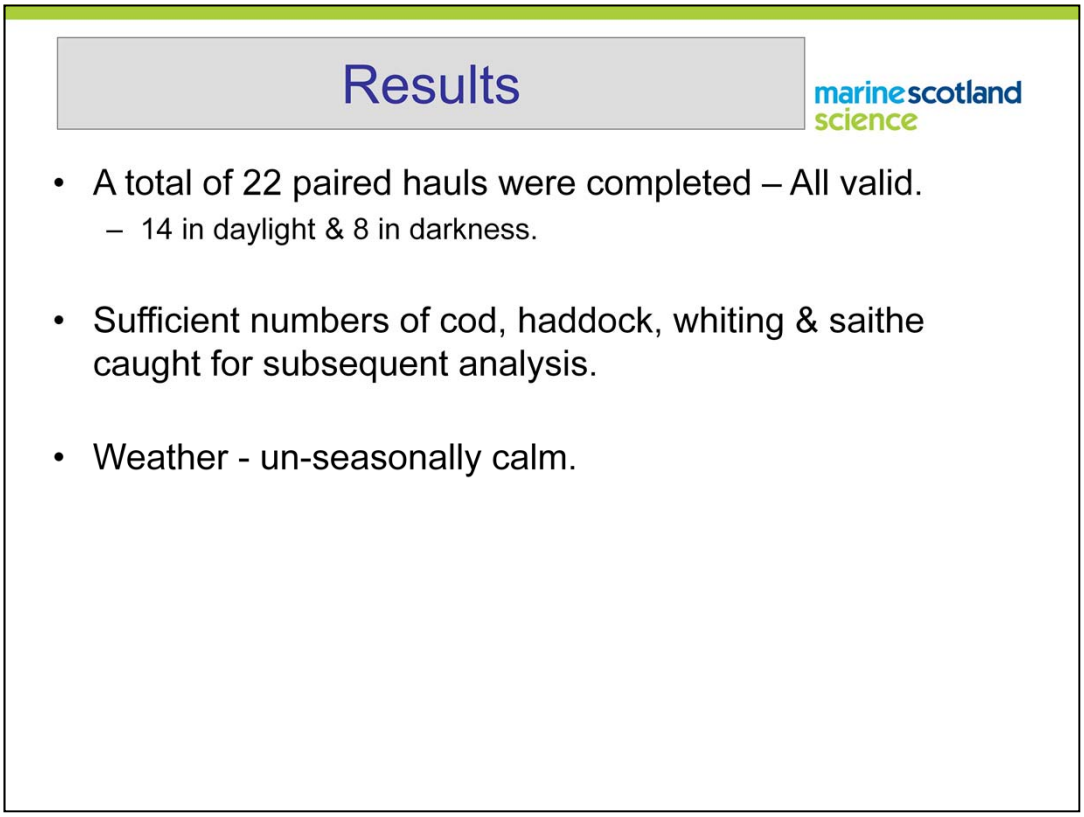
- Haul procedure the same throughout the trials:
  - Paired hauls - 30 minute duration.
  - After 1st haul completed vessel steamed back and shot 2nd haul along same track ►Between 81-97 mins from KO to BU.
  - To minimise bias the order of deployment was alternated.
  - No hauls were made during dawn or dusk only darkness & daylight.
  - All species were measured to the nearest 1.0cm below & no sub-sampling.



Subsequent analysis indicates no significance between darkness and daylight hauls but this is probably due to insufficient hauls to detect a difference.

Results – Gear geometry

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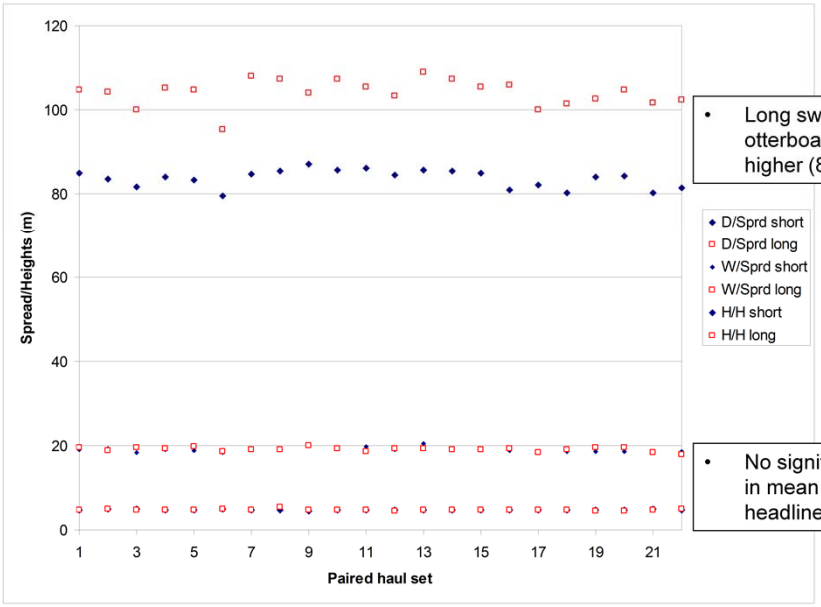


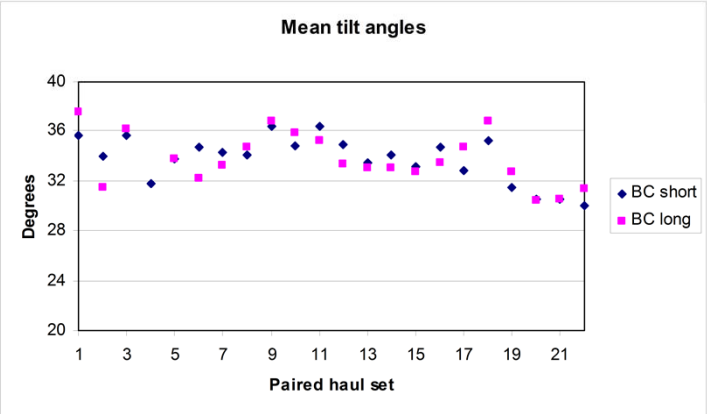
- Long sweep gear – mean otterboard spreads ~25% higher (83m ►104m)

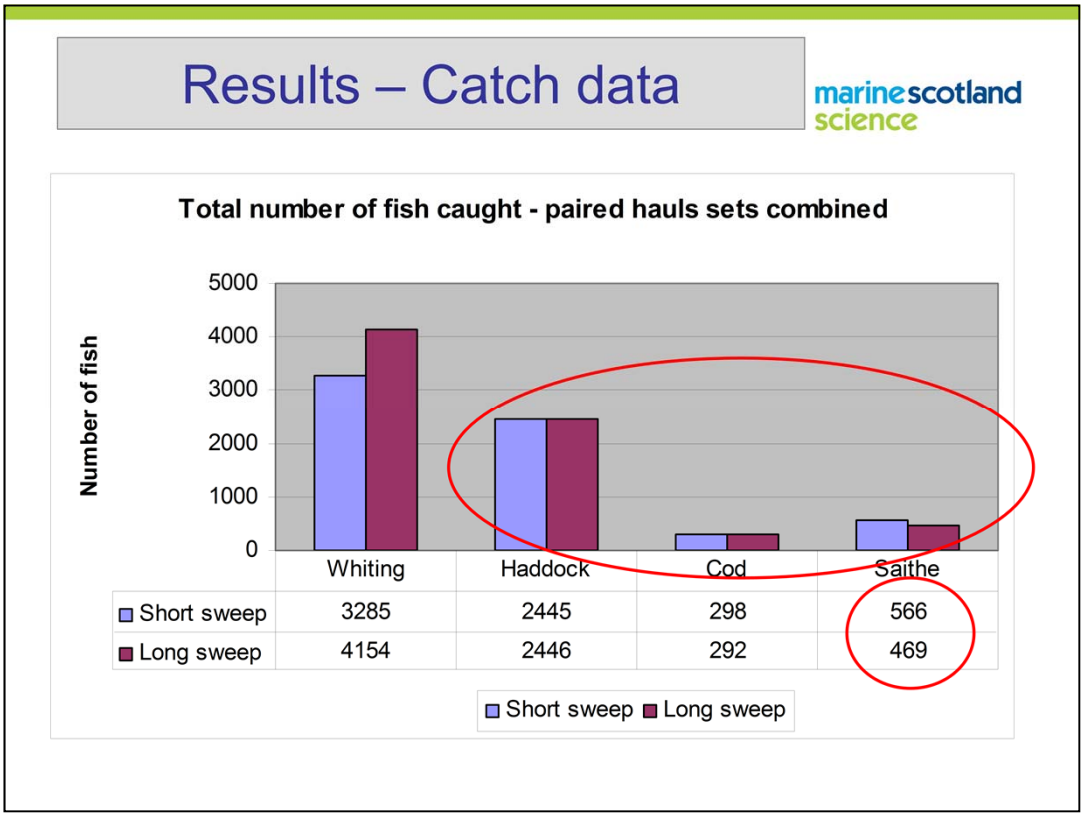
- No significant differences in mean wing spreads or headline heights

Results – Gear geometry

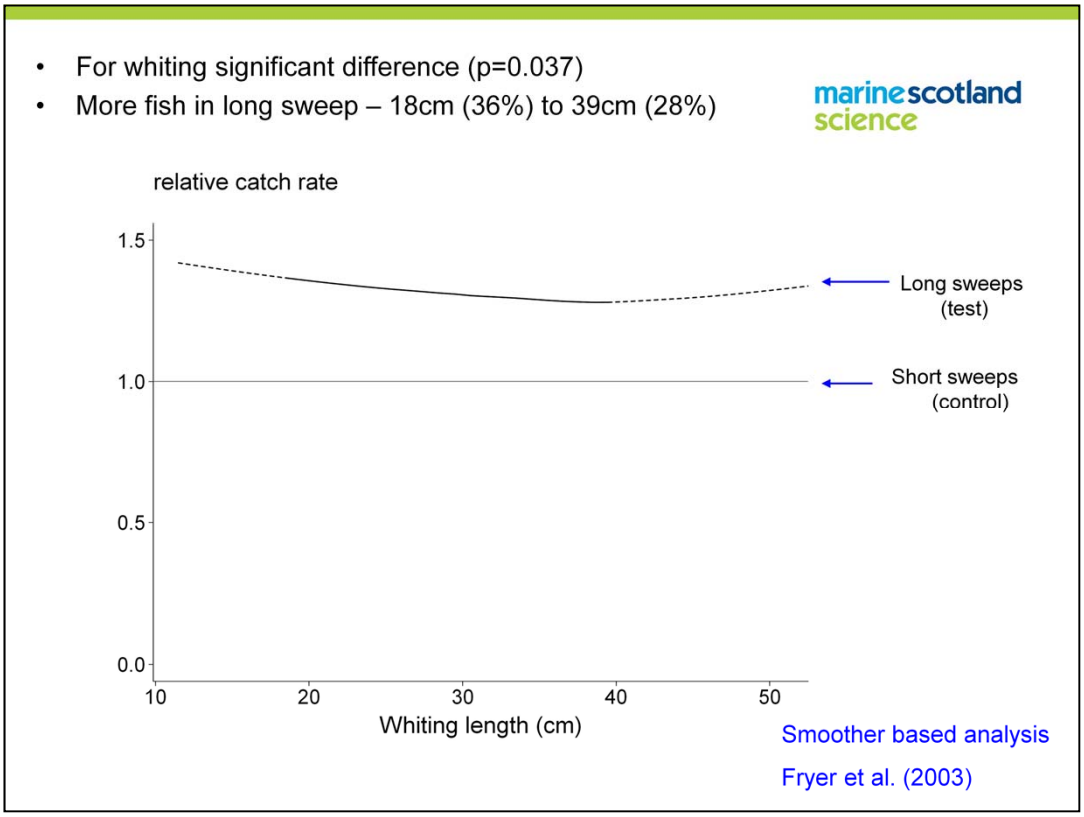
marinescotland science

- No significant difference in mean tilt angles
  - Ranged from 30 – 38 degrees





As would be expected with and increase in door swept area there was a significant more whiting caught by the long sweep gear. However, for the other three species there was no significant difference in numbers caught (circled in red) between the two gears. It was highlighted the higher numbers of saithe retained by the short sweep gear was significantly influenced by two hauls.



The data were analysed using the smoother based methodology described by Fryer et al. (2003).

Analysis completed in 3 stages:

A smoother was used to model the log relative catch rate of the two gears for each pair.

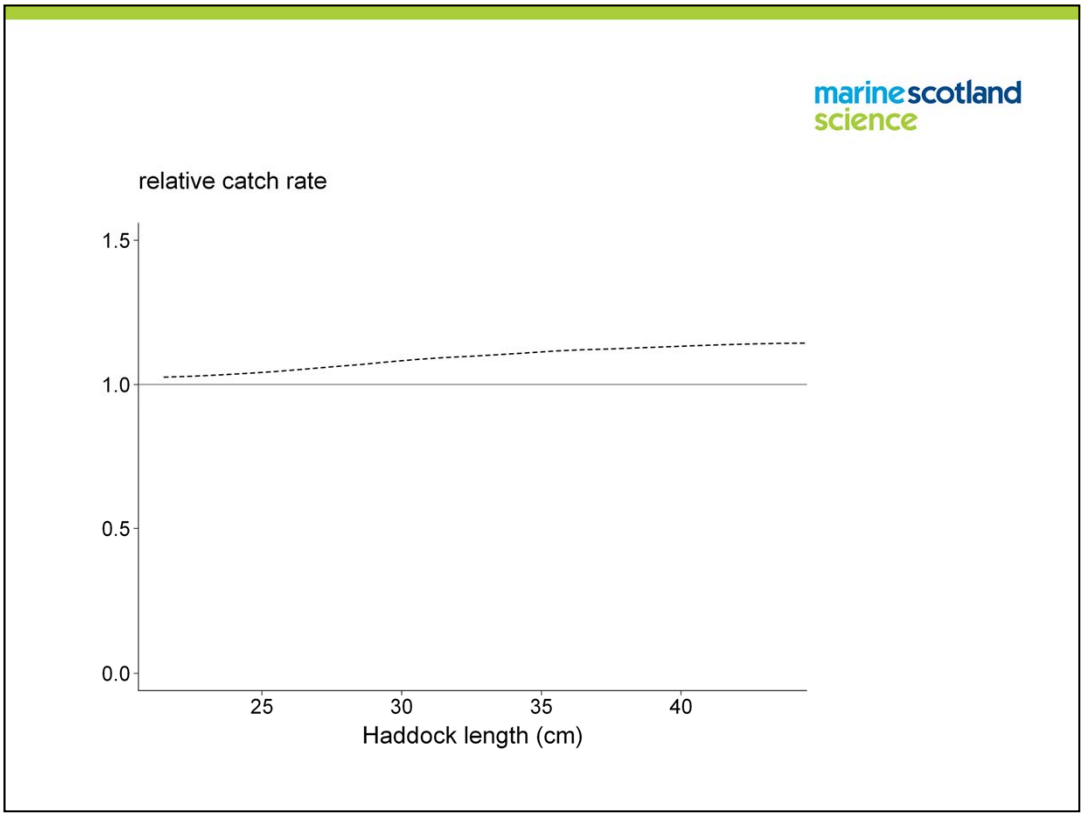
The fitted smoothers were combined over pairs to estimate the mean log relative catch for each gear.

Bootstrap hypothesis tests using the statistic Tmax were used to assess if the mean log relative catch rates depended on the gear fished and compare the mean log relative catch rates to zero.

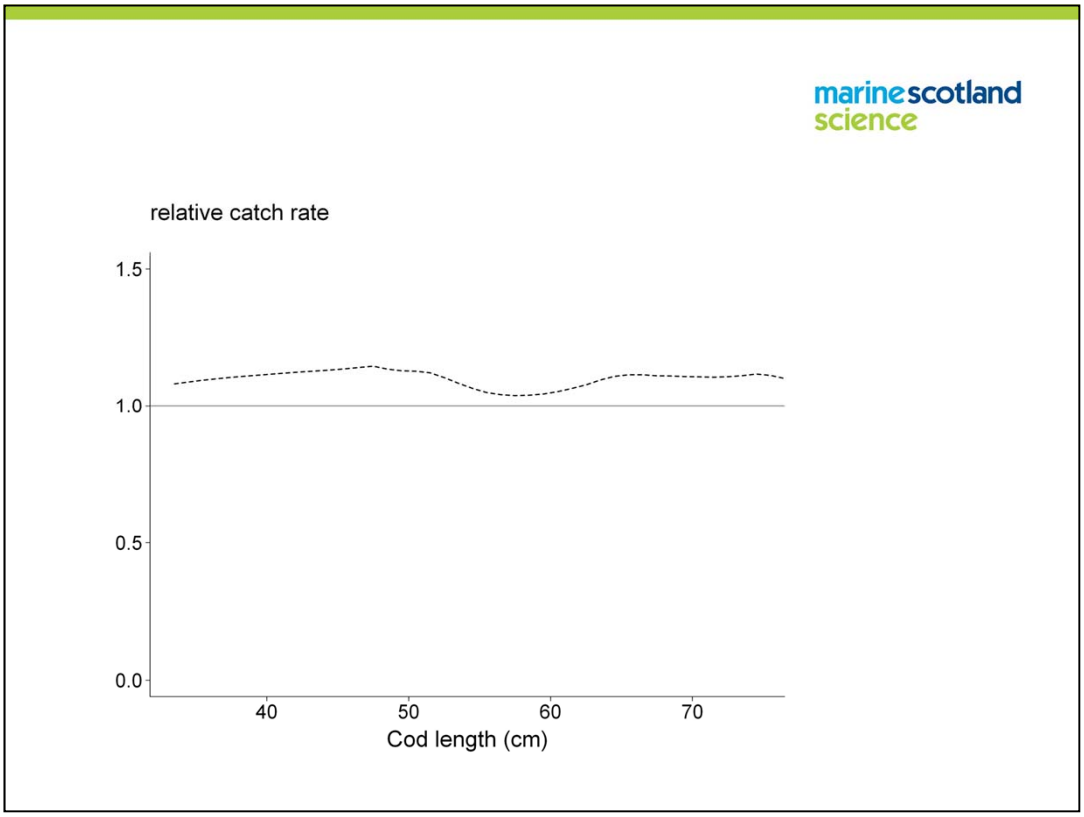
Relative catch rates are shown as proportion of fish retained in long sweep gear (test) in comparison to the short sweep gear (control).

A value of <1 indicates test caught less fish at that length
A values >1 indicates more fish were caught in test gear.
A dashed line indicates no significance
A solid line indicates point-wise significance @ 5% level.

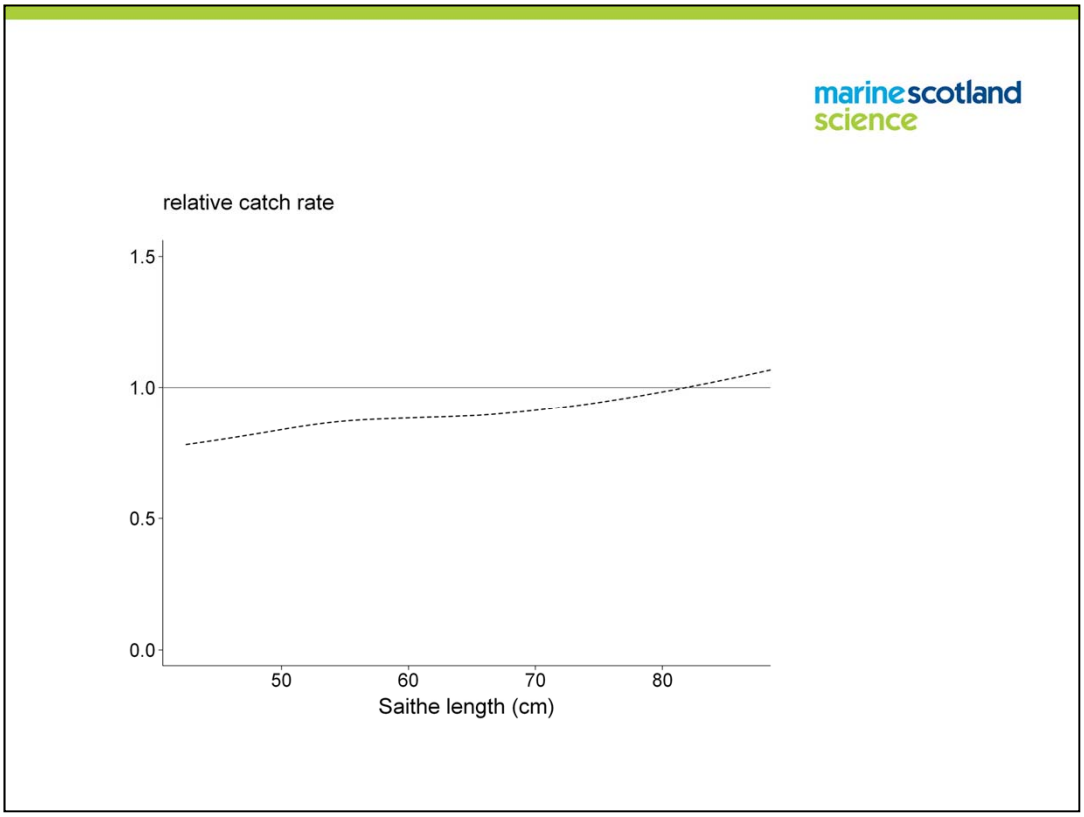
Significant difference for whiting, long sweep gear caught more fish.



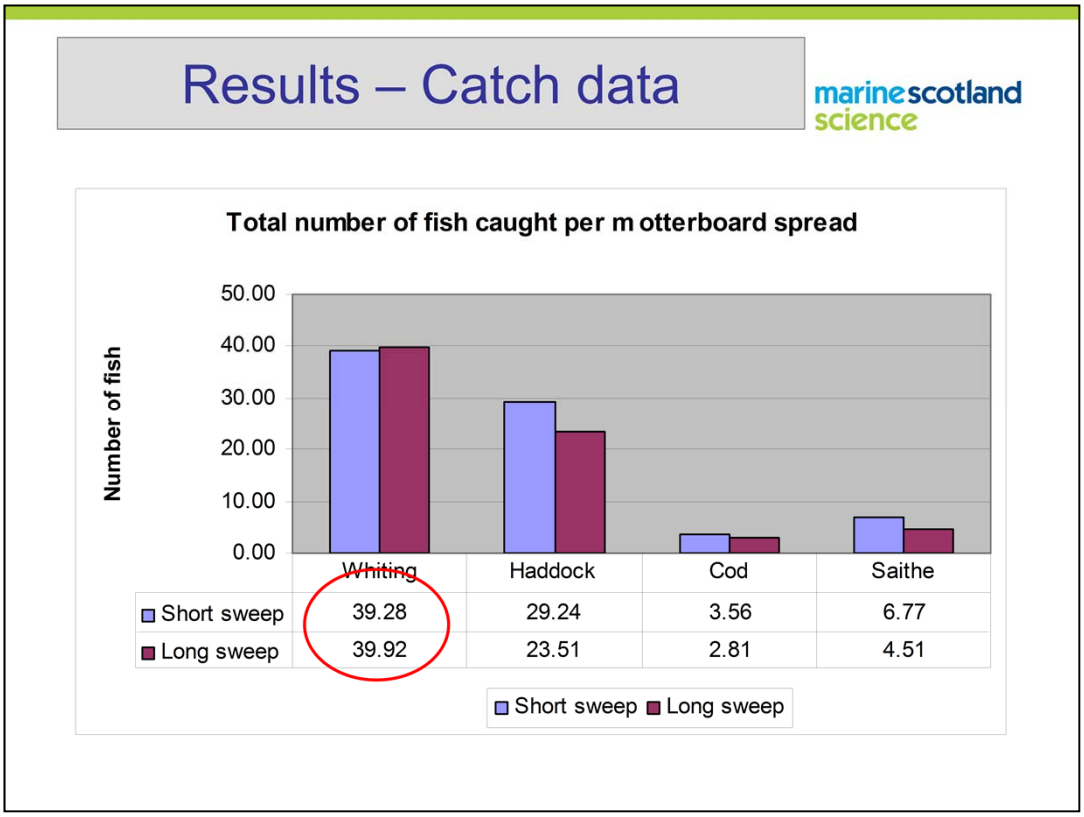
No significant difference for haddock between the two gears.



No significant difference in cod between the two gears.



No significant difference in saithe between the two gears.



When considering numbers of fish caught per m door swept area for whiting the same number are caught by both gears (highlighted in red). However, for haddock, cod and saithe the short sweep gear has retained more than the long sweep gear.

Thoughts/Discussions

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- Otterboard spread higher for long sweep gear ~25%.
- Wing spread, headline height & bottom contact no indication of overspreading by the short sweep gear
- Ground gear D is 2180kg in air so provides greater drag & therefore prevents overspreading (Note NS Rig A ~900kg)
- Calculated sweep angles
  - 15°-17° for long sweep gear
  - 18°-21° for short sweep gear

Thoughts/Discussions

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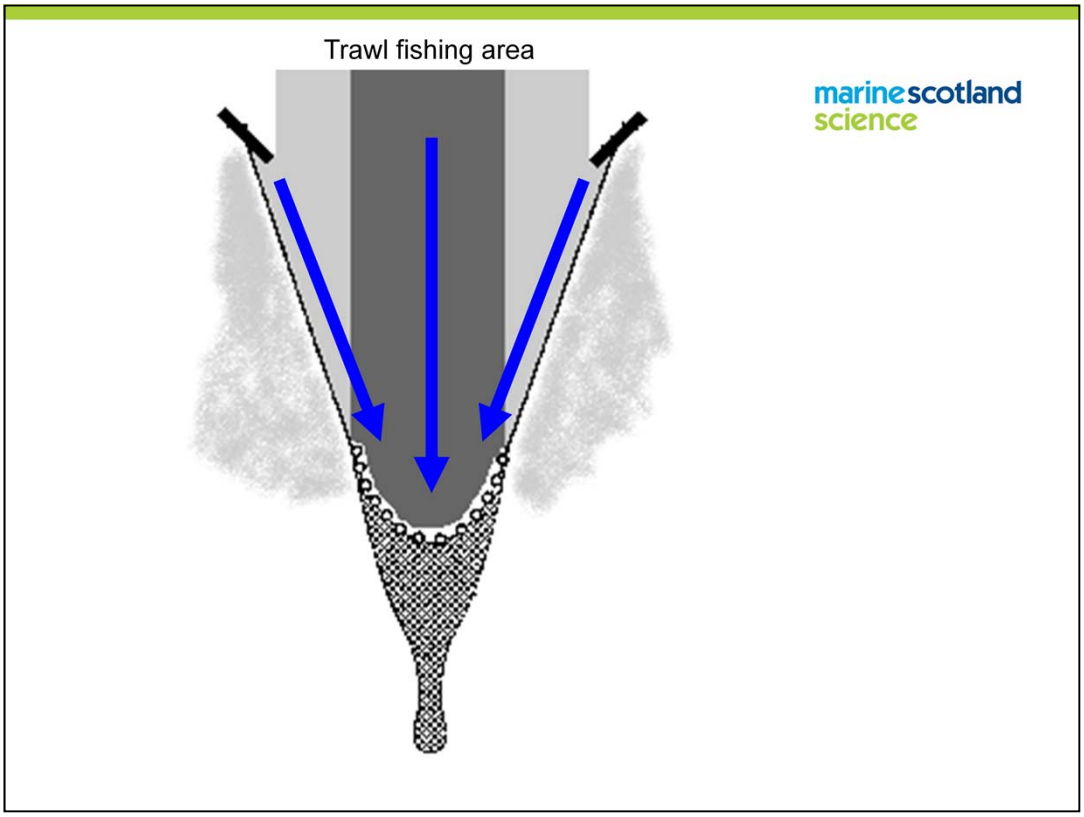
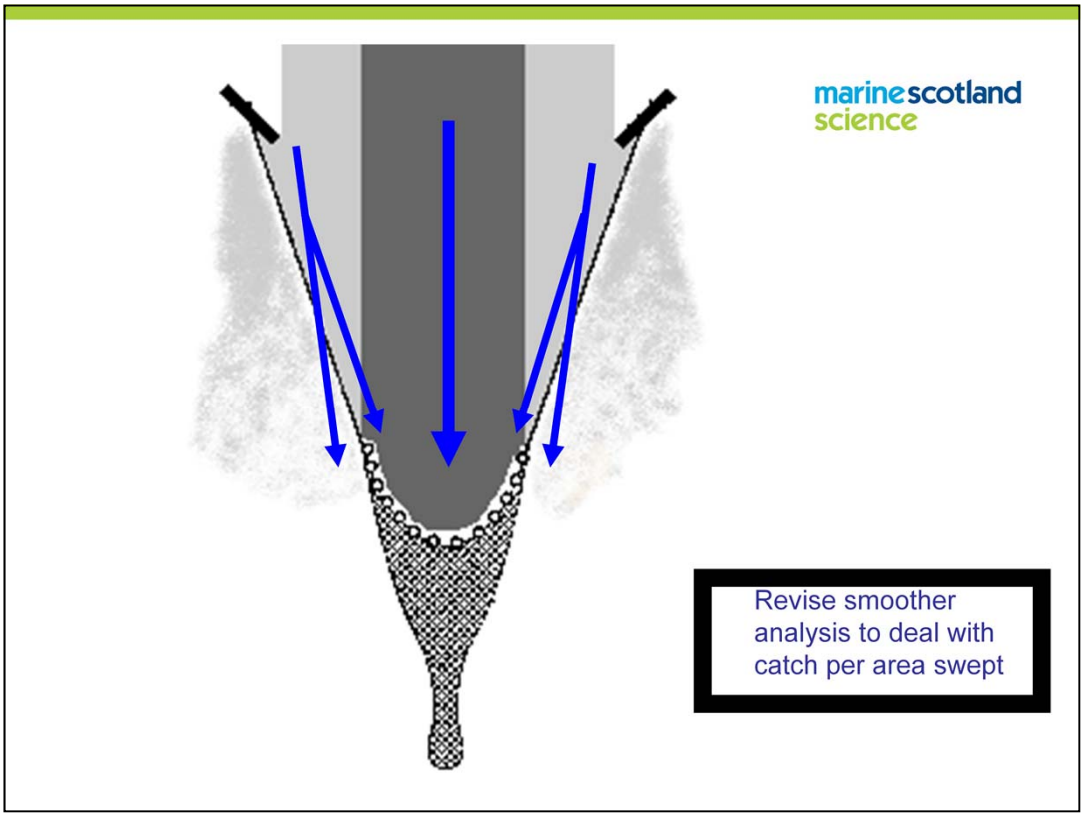
- Increased otterboard swept area = more fish
- **Whiting appear to fit the scenario (39 fish per m swept)**

But in our trials

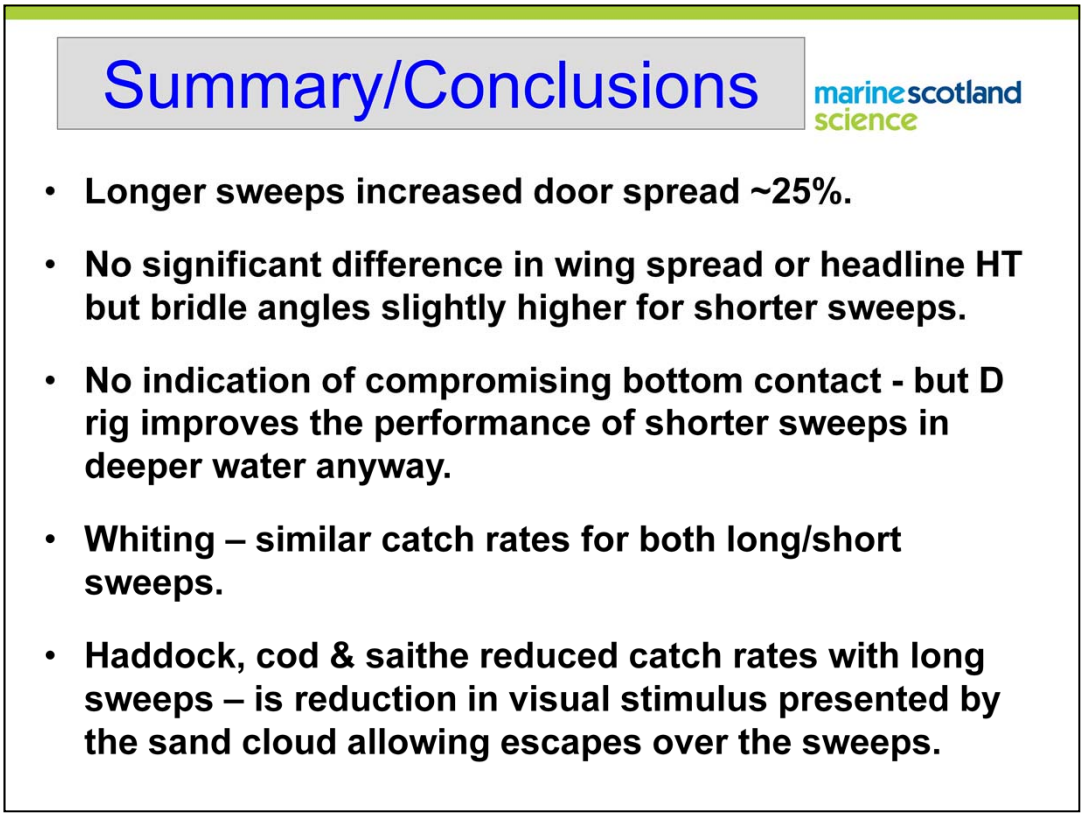
- **Haddock, cod and saithe did not**



The diagram indicates the active fishing region of a groundfish trawl. The lighter grey areas indicate the bridle fishing area where fish are herded into the net fishing area (dark grey).



From these trials with longer sweeps the herding effect for cod, haddock and saithe appears to be breaking down. It would appear whiting are still herded into the net path by the long sweeps but for haddock, cod and saithe is the herding stimulus reduced and therefore they pass over the sweeps and avoiding the trawl.



Further analysis will be undertaken using the smooth technique but the confidence intervals are wide and if differences are small there may not be enough paired hauls to detect significant differences.

Working Document presented to the 2013 IBTS Working Group

Inter-calibration experiment between the *R/V Cornide de Saavedra* and the *R/V Miguel Oliver*

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1. Introduction

Bottom trawl surveys are one of the most important methods to study commercial fishing stocks, given that they provide information independent from the fishery. The data obtained within the bottom trawl surveys play an important role to calibrate single species assessment models, used as a tool for fisheries management, but also provide crucial information to understand the demersal and benthic faunal assemblages in the area covered. Nowadays bottom trawl surveys with long time series are used in the implementation and application of the European Marine Strategy Framework Directive, being especially important to determine criteria to define Good Environmental Status, and assess the evolution towards the GES achievement for the Marine Environment within the Programme Horizon 2020 as set by the European Union.

Spanish ground-fish survey on the northern Spanish Shelf has been organized and carried out every autumn by the Spanish Institute of Oceanography (IEO) since 1983, being the longest standardized bottom trawl time-series in Spanish waters. The survey has been performed annually but in 1987 on board the *R/V Cornide de Saavedra*, with standard protocols as defined by the IBTSWG, being the IEO and the SPNGFS one of the IBTS surveys on its western and southern areas since the mid-90s. Besides this survey provides abundant data for the PPC, and in the XXI Century has being co-financed by the EU within the DCF.

Nevertheless the vessel was built in 1972, and although it was refurbished in 1990, her equipment has become out of date and maintenance is increasingly more expensive. With views to substitute the *R/V Cornide de Saavedra* (CDS) by the new and modern *R/V Miguel Oliver* (MOL), an inter-calibration experiment with 60 paired hauls, covering the whole western area of the SPNGFS: namely Galician IXaN and VIIIcW ICES subdivisions. The aim of the present working document is to present the results of this calibration and prospects for the SPNGFS time series.

2. Material and methods

The inter-calibration plan was to perform two complete geographical sectors of the SPNGFS trawling with both vessels in parallel tows, (Figure 1) namely sectors Miño-Finisterre and Finisterre-Estaca, thus covering all depths strata of the survey (Figure 2). The gear used in both vessels was the standard Baca 44/60 m, with 200 m sweeps. All hauls were carried out during daylight at 3 knots and lasted 30 minutes except those deeper than 500 m that lasted 45 minutes following survey protocols. Vessels distance during the pair trawls was maintained at a distance of ca. 400 m, and boards were changed between hauls to avoid possible effects in trawling.

Following recommendations for inter-calibrations in ICES (2006) together with the change of vessel, the standard wooden doors used in SPNGFS survey were replaced by new polyvalent oval Thyborøn doors weighing 330 kg, since the traditional wooden doors are not built anymore and are more difficult to control and adjust during the fishing operations. Previous trials were carried out only with the MOL, to adjust the vessel-doors-gear to obtain the net geometry vertical and horizontal opening usually obtained during SPNGFS time series, that is to say vertical opening 2.2 ± 0.1 m and 18.1 ± 1.7 horizontal opening. During the intercalibration experiment gears were monitored in both vessels, but

with different systems, since the CDS used ScanMar monitoring system, while MOL has mounted SIMRAD ITI system. Besides doors distances were not logged in the CDS since the wooden doors do not have sensor holders. This difference in values logged forced to use the trigonometric conversion (1) between doors spread and wings opening to compare gear performance in both vessels.

$$W = {}^{D \times N}/_{D+S}, \quad (1)$$

being W the wing opening, D door spread, N the net length and S the sweeps length. Equation from what deriving wings opening from door spread is obvious. Differences in gear performed were compared with non parametric Mann-Whiney tests, since the number of paired hauls in each stratum were less than 20, and parametric test were not advisable. Data processing was done on board using CAMP 11 software while station tracking and vessel data capturing was done using PescaWin.2012 version.

Catch processing and sorting were done in both vessels following the IBTS manual procedures (ICES, 2010). Species were sorted to species level in the case of fish, crustaceans, molluscs and other species, each species catch was weighed and a representative sample of the catch was counted and length distribution sampled in the case of fish and crustaceans. While catch sorting and length distributions were done following the same protocols in both vessels, biological sampling, otoliths collection, CTDs and sediment sampling were only performed on the CDS. This vessel carried out the standard Data Collection Framework annual IBTS survey, while on board the MOL catch and performed the samplings were only done to obtain the necessary information to compare catches in biomass and number, and length distributions by sex.

Abundance index used was mean stratified catch per 30 minutes haul; these indices are independent for every stratum and are equivalent to the expected yield in each stratum. (2) mean stratified biomass and (3) Stratified Variance:

$$\bar{Y}_{st} = \frac{1}{A}\sum A_h \bar{Y}_h \quad (2) \qquad S^2_{(\bar{Y}_{st})} = \frac{1}{A^2}\sum \frac{A_h^2 S_h^2}{n_h}, \quad (3)$$

being A total area; A_h stratum h area; Y_h mean catch by haul in stratum h, n_h number of hauls in stratum h and S_h^2 variance in stratum h. (Cochran, 1971; Grosslein and Laurec, 1982).

To compare catches between both vessels the logarithm of the catch differences between both vessels using the quotient, that for equal catches would be 0 (log(1)=0), therefore the nil hypothesis would be:

$$H_0 : \sum \log\left({}^{Yst_{CDS}}/_{Yst_{MOL}}\right) = 0$$

That is tested for significance through parametric and non-parametric tests (Mann-Whitney test in most of the cases since samples are not representative to perform parametric tests).

Regarding the length distributions, the mean length and shape of the parametric stratified length distributions per depth in each vessel and depth strata were compared, besides GLM logistic curves are fitted to compare selection pattern in each vessel for the main species.

Differences in catch compositions and sampling of faunal assemblages are assessed using PCA, following the approach adopted on the IPROST project (Mahe et al. 2001), and also hierarchical cluster analysis of the catch-matrices in biomass and number per species and haul in each vessel.

PCA were applied to the matrix shown below:

Station / Species Vessel	Sp1.CDS	Sp1.MOL	Sp2.CDS	Sp2.MOL	Sp3.CDS	….
Haul 1	Catch wght or nbr					
Haul 2						
Haul 3						
…						
Haul 60						

These data matrices were re-scaled to reduce the effect of large catches of some species standardizing species (columns) by their mean catch, and then hauls (rows) are standardized by dividing by their standard deviation.

All calculations and plots were done using R (R Development Core Team, 2013).

3. Results

During the inter-calibration survey a total of 59 valid hauls were performed with both vessels, while one haul was invalid for the MOL, and it was not possible to repeat later since changing the gear and repairing damages on the wire required extra time that could not be lost to maintain the planned schedule, besides the nil haul was on the deepest strata that is not considered on standard stratification and therefore neither on the standard stratified abundance indices.

3.1. Gear performance

Figure 3 present the results of gear comparisons while Table 2 present the results of probabilities of the Mann-Whitney test of those comparisons, as mentioned above the change of gear on the MOL, posed an extra problem because it added an extra factor to the comparison (number of paired trawls ranged between 19 and 4 hauls), since significant differences (considered as significantly different when $p<0.1$) in gear performance within the same strata only were found for wings and door spread in depth strata C between the MOL3C and CDS1C (CDS1C: 19.89 m, MOL3C: 21.83), while differences between CDS1C and MOL2C (20.05 m) were not significant. Differences in stratum D were also significant ($p=0.075$) for wings and door spread Differences between both initial gears (CDS1 and MOL2), given that gear 3 was not used on stratum D, in any case only 4 hauls were performed and important differences in depth between both vessels occurred in one of the hauls that was on the edge of the shelf slope, with one of the vessels working around 616 m and the other at 558 m depth.

3.2. Catch comparisons

Figure 4 shows the differences in total catches between both vessels in all hauls. Catches were very similar on the first part of the survey before the gear change forced after the fast on haul 43. Within this first part there is a clear outlier on haul 39, the deep haul mentioned in the previous section, with an important catch of *Deania calcea* (387 kg) on MOL trawling deeper than 600 m that did not appear on CDS trawling ca. 550 m, excluding this haul mean total catches were very similar (CDS: 158.2 kg, MOL: 160.8 kg, $p_{t.test}= 0.94$). After the gear change catches were larger on the CDS in 15 of the 17 hauls performed (Mean total catches: CDS: 175.4 kg, MOL: 122.0 kg, $p= 0.32$).

Figure 5 shows the same type of result but comparing catches per species of main fish species (commercial and abundant species), in general results are the same as for total catches, with similar catches in both vessels except in the case of lesser argentine (*Argentina sphyraena*) and blue whiting (*Micromessistius poutassou*), with larger catches on CDS, and thick back sole (*Microchirus variegatus*) that had larger catches on MOL. Besides clear differences after the change of gear are evident on catches of dragonet (*Callionymus lyra*) and gurnard (*Eutrigla gurnardus*) with larger catches on MOL than on CDS after the gear change, or in hake or blue whiting with the opposite differences. These results suggest that the second gear used on MOL was catching more benthic fauna and less demersal-pelagic species.

These results are clearer on Figure 6 that summarizes the biomass catch comparisons results for the representative species caught on both vessels during the inter-calibration. In this figure *A. sphyraena*, the anemone *Calliactis parasitica*, the pandalid *Chlorotocus crassicornis* and the blackmouth dogfish *Galeus melastomus* presented larger catches in CDS than in MOL, while the dragonet, thick back sole, the curled octopus *Eledone cirrhosa*, and most species of sepiolids shown larger catches on MOL than on CDS. Besides also black belly angler (*Lophius budegassa*) had this same pattern but this species appeared only in six hauls with few large individuals, so this difference can be considered negligible, especially when monkfish (*L. piscatorius*) catches were similar on both vessels.

These results indicate that MOL, with the polyvalent doors, catches more benthic species than CDS, this later, on the other hand, samples better demersal species less close to the ground that are upper on the water column, nevertheless this behaviour seems to be incremented after the gear change on MOL.

3.3. Commercial species catch comparisons

Figures 7 to 9 (Figure 7-Figure 9) compare the catches in number and weight terms per depth strata of three of the main commercial species that use SPNGFS abundance indices on their assessment, namely hake, four-spot megrim and blue whiting. Hake catches per haul are shown in number (Figure 7 top panel) since catches in weight do not reflect the abundance of recruits, one of the main goals of SPNGFS. On the map a larger variability on VIIIc Division (stratum FE) than on IXa, and especially remarkable are the differences on the northern part close to A Coruña, with larger catches on CDS, that occurred after the gear change. Nevertheless in spite of these differences, the boxplots (Figure 7 bottom panel) show that splitting results per depth strata the differences are less appreciable in general with the exception of the deepest strata (>500 m) where catches are clearly larger on MOL, but it should be borne in mind that in this strata hake is usually larger and as shown by the smaller differences in number than in weight, and the catch of few large individuals is an event with high randomness.

Figure 8 presents four-spot megrim catches in each vessel per haul (top panel), and differences per depth strata (bottom panel), in the case of four-spot megrim results are remarkably similar.

Figure 9 shows the same results for blue whiting. Geographically (top panel) few big catches in either vessel bring the attention, as usually occurs with this species that appears in large shoals that can easily be captured in one vessel and missed on a vessel trawling within 400 meters. Nevertheless when observing the comparisons per strata (bottom panel), even with a higher variability (large inter-quartile range) that reflect the patchiness of the shoals, the medians are similar in most of the strata.

Other important commercial species as megrim, Norway lobster or anglers were not present on the catches to perform these comparisons though some conclusions can be drawn from length distributions or from the faunal assemblages.

3.4. Length distributions

Figure 10 to Figure 12 present area stratified length distributions of hake (per strata, Figure 10), four-spot megrim, blue whiting and scaldfish (Figure 11), and finally horse mackerel, lesser argentine, and monkfish on Figure 12. Most of the length distributions show the same peaks and distribution shapes. In the case of hake main differences are found on depth strata C (200-500 m, right panel on Figure 10) where the smaller individuals are less abundant in MOL than on CDS, though in both cases the mode is 13 cm, and mean close to 14 cm.

Four spot megrim shows a remarkable similar shape with peaks-modes marked at 7, 14 and 21 cm, on both vessels, though the smallest peak is more conspicuous on CDS than on MOL which had more individuals on the large peak (19-22 cm), but the overall image is analogous. Same results were found for blue whiting and scaldfish, with similar shapes and peaks on their length distributions (Figure 11)

Figure 12 presents a set of species with more overall differences between their length distributions. Horse mackerel (right panels) shows the same peak of small individuals with 7-8 cm, but more abundant on MOL, while CDS showed a group of large individuals (28-29 cm and 34-36 cm) whose abundance was halved on MOL catches. Lesser argentine is one of the species with more remarkable differences with catches that were a third larger on MOL than on CDS, however again the same peaks are evident on the length distribution, with two modes, namely 7-9 cm and 13-14 cm. Finally monkfish on Figure 12 right panel, in spite of its large length range (12-100 cm) also showed remarkably similar peaks on both vessels with a group of recruits 17-23 cm, another group 32-50 cm, and then the rest of the length distribution with some sparse large individuals.

Finally Figure 13 presents the comparisons of the selection curves in each vessel/gear using the stratified length catch for the whole sampling area on the species discussed above except monkfish whose large length range and scarcity prevents the use of this model. On all the species selection curves on both vessels present very similar shapes with almost identical curves on hake, blue whiting and lesser argentine, in this case in spite of the difference in abundance stated above, the logistic model selection pattern is almost equal.

3.5. Faunal fish assemblages sampling analysis

The PCA analysis of the matrix in numbers, using only the fish species, shows very similar ordination of the species on both vessels, with MOL and CDS species placed closely (Figure 14). A hierarchical cluster with the same matrix offers the same results (Figure 15), and identifying the 4 clusters, the most differentiated species is black mouth dogfish, that appears on both vessels concentrated on the deeper hauls. Then a second cluster is formed by silvery pout (*Gadiculus argenteus*), piper gurnard (*Trigla lyra*) and redfish (*Helicolenus dactilopterus*). A third group clusters other 7 species, that are always grouped together in both vessels. And finally on the fourth group, 12 species are clustered with only few species that are not clustered together by vessel, namely lesser spotted dogfish (*Scyliorhinus canicula*), bib (*Trisopterus luscus*), lesser argentine and spiny gurnard (*Lepidotrigla dieuzeidei*).

Similar results are obtained with weight data (Figure 16 and Figure 17) that include also the abundant cephalopods species, that are also grouped together in most of the cases with the exception of curled octopus (*E. cirrhosa*) that on MOL is split from the rest of a larger cluster that contains conger eel, silvery pout, four spot megrim and the flying squid together with curled octopus on CDS.

4. Conclusions

- Analysis of faunal assemblages done with both vessels, *Miguel Oliver* and *Cornide de Saavedra*, render similar image, and comparable results could be derived from these analysis.
- *Miguel Oliver*, with polyvalent doors seems to be more efficient in catching a few species closely related to the ground (e.g. cuttlefish species, or some flatfish species as thickback sole), while *Cornide de Saavedra* samples slightly better some more swimming species (e.g. argentine or some pandalids). These differences were reduced; however trials to compensate these effects will be done if possible in 2013 before next SPNGFS.
- Length distributions of abundant species show similar modes for recruitment, even in different depths (e.g. hake), or for more sparsely distributed species (e.g. monkfish).
- Main species assessed with this survey (hake, megrims and monkfish) do not present significant differences.
- Given that deriving inter-calibration factors for all the whole species set, the plan is to continue SPNGFS time series with the R/V *Miguel Oliver* and the new polyvalent doors, though special attention will be paid to test and verify the continuity of the time series.

5. Acknowledgments

It is necessary to thank R/V *Cornide de Saavedra* and R/V *Miguel Oliver* crews and the scientific teams in both vessels that made possible the inter-calibration survey. María Soto Ruiz also collaborated in the faunal assemblage analysis, besides her active participation on the survey. Thanks are also due to Antonio Punzón, who was the scientists on charge on the *Cornide de Saavedra*, and Crisanto Devesa and Manuel Riobo masters and skippers of *Miguel Oliver* and *Cornide de Saavedra* respectively.

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7. Tables

Table 1.- Number of paired hauls carried out in the intercalibration experiment by depth strata and sector.

Sector/ Strata		**Miño Finisterre**	**Finisterre Estaca**	**Total**
Strata Hauls	70-120 m	**4**	**4**	**8**
	121-200 m	**10**	**17**	**27**
	201-500 m	**5**	**15**	**20**
Total strata		**19**	**36**	**55**
Extra hauls	<70 m	**-**	**-**	
	>500 m	**2**	**2 (1 nul)**	**4**
Total		**21**	**38**	**59**

Table 2.- Probabilities of Mann Whitney test on the differences in vertical and wings opening between the vessels and gears (the three gears had the same design, but last one from a different manufacturer) used per depth strata. In bold: significant differences (<0.1). Only relevant comparisons (same strata in both vessels-gears) are presented

Differences in vertical opening p(Mann-Whitney test)						
	CDS1A	CDS1B	MOL2B	CDS1C	MOL2C	CDS1D
MOL2A	1					
MOL2B		1				
MOL3B		0.507	1			
MOL2C				1		
MOL3C				0.565	1	
MOL2D						1
Differences in wings spread: p(Mann-Whitney test)						
	CDS1A	CDS1B	MOL2B	CDS1C	MOL2C	CDS1D
MOL2A	0.461					
MOL2B		0.128				
MOL3B		1	1			
MOL2C				1		
MOL3C				**0.095**	0.128	
MOL2D						**0.075**
Differences in door spread: p(Mann-Whitney test)						
	CDS1A	CDS1B	MOL2B	CDS1C	MOL2C	CDS1D
MOL2A	0.465					
MOL2B		0.180				
MOL3B		1	1			
MOL2C				1		
MOL3C				**0.068**	**0.094**	
MOL2D						**0.075**

Keys used:
Vessels: CDS: *Cornide de Saavedra*, MOL: *Miguel Oliver*
Gears: 1 to 3, 1 only in CDS, 2 & 3 in MOL
Depth strata: A: 70-120 m, B: 120-200 m, C: 200-500 m, D: >500 m

8. Figures

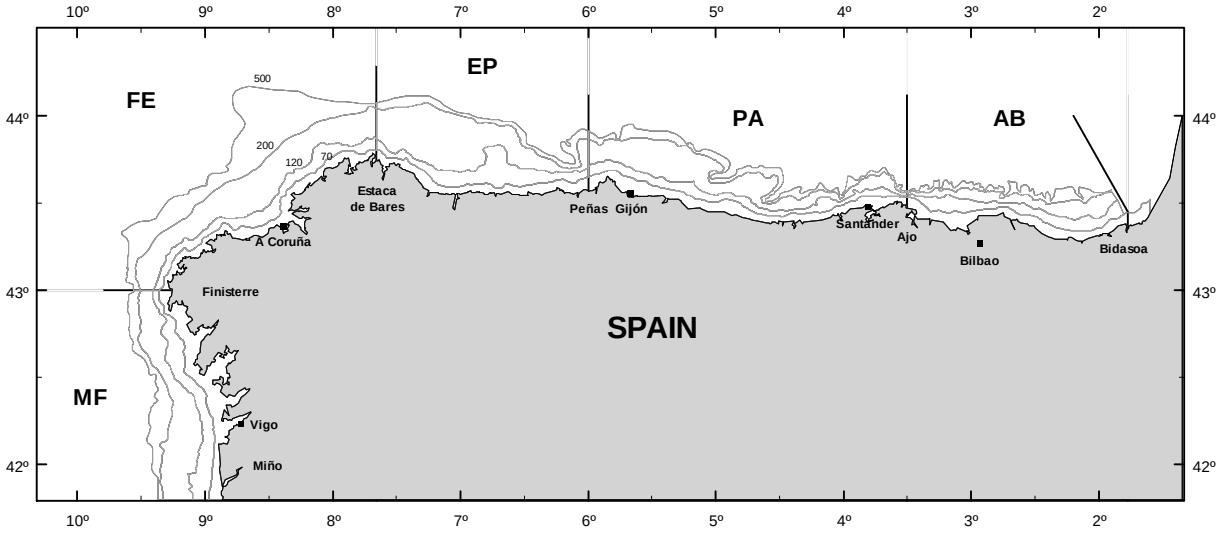

Figure 1.- Stratification used in SP-NGFS IBTS survey. Depth strata were a) shallower 70-120 m, b) 121 – 200 m and c) 201 – 500 m. Additional hauls are performed every years in grounds shallower and deeper than 70 and 500 m respectively. Only MF and FE sectors were covered during the intercalibration

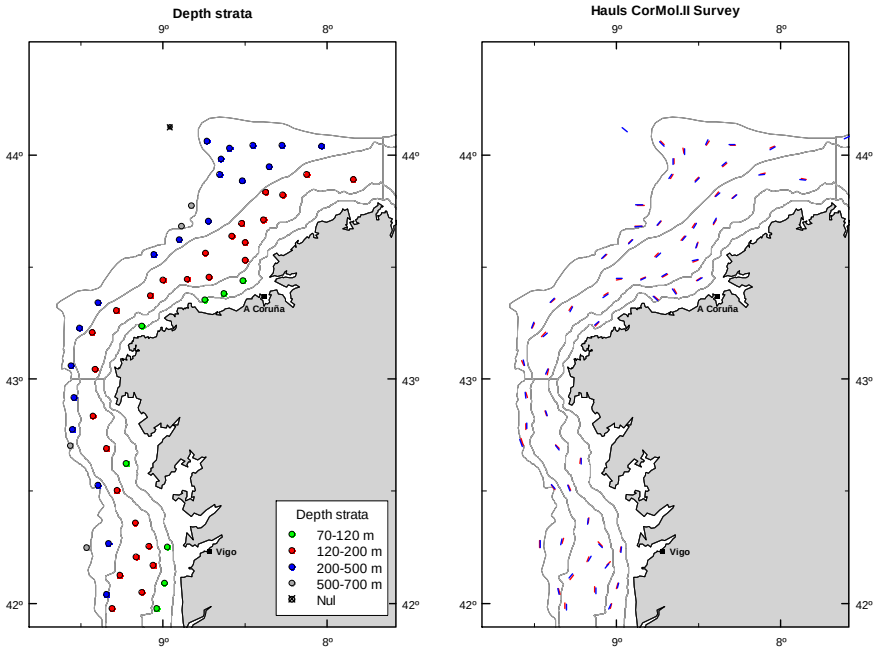

Figure 2. Paired hauls per depth strata done during the inter-calibration experiment between R/V Cornide de Saavedra and R/V Miguel Oliver

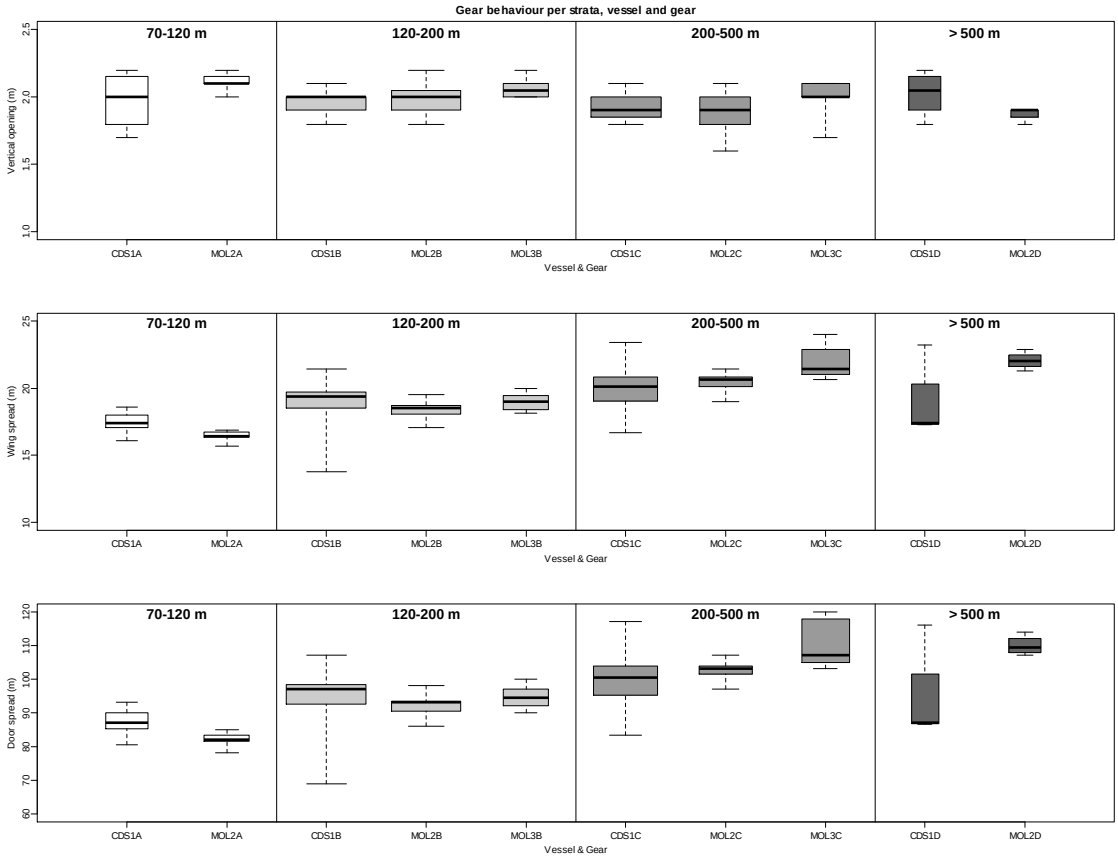

Figure 3. Variation of vertical opening, wings and door spread per haul along the hauls carried out in the inter-calibration survey

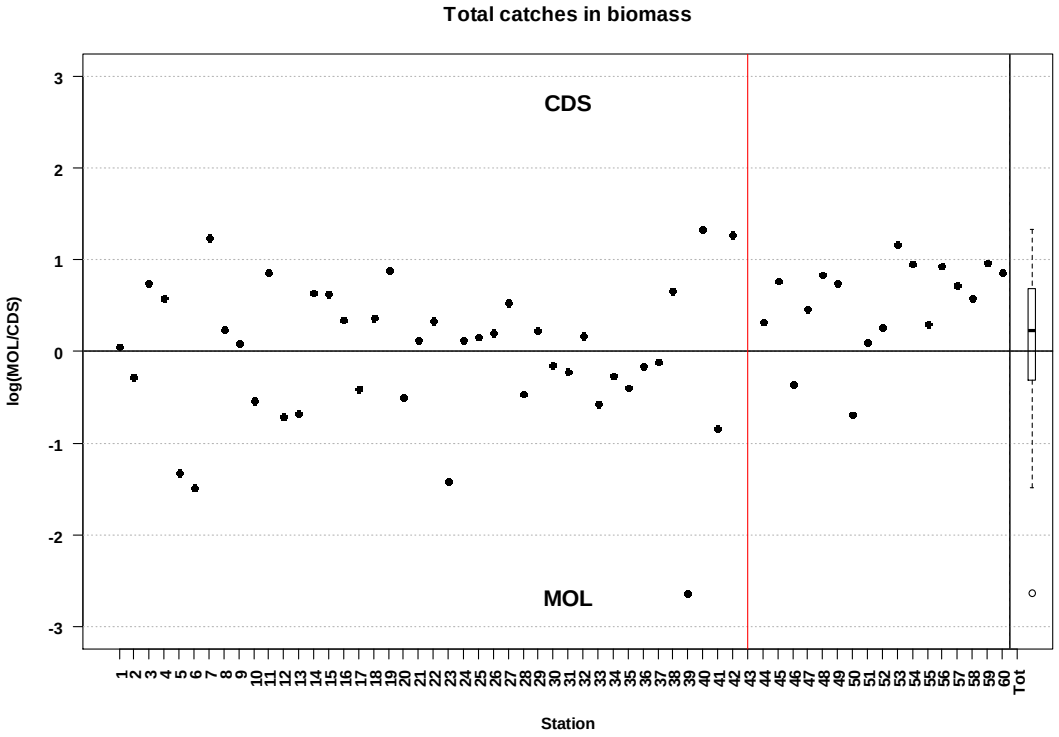

Figure 4. Differences in catches per haul between both vessels in logarithm scale. Data are shown as log(catch MOL/catch CDS). Positive catches, above 0, were larger on CDS, while negative ones were larger on MOL. The red line marks the invalid haul 43 with no catches on MOL. Boxplot shows variability along the survey

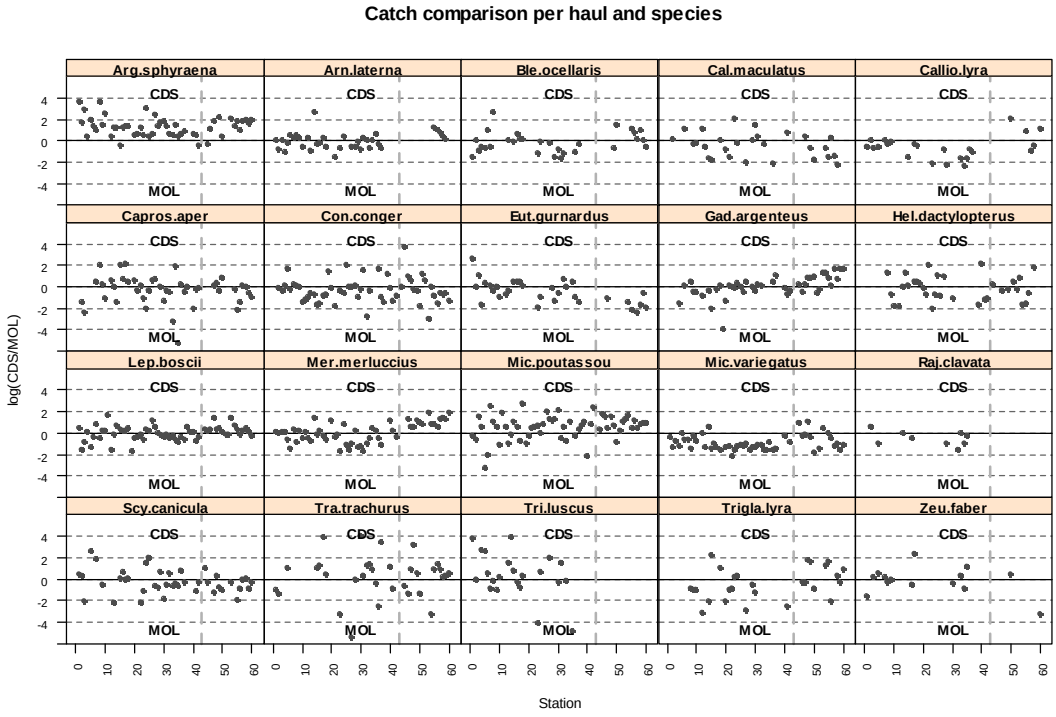

Figure 5. Differences in catches per main commercial and abundant fish species and haul between both vessels in logarithm scale. Data are shown as log(catch MOL/catch CDS). Positive catches, above 0, were larger on CDS, while negative ones were larger on MOL. The red line marks the invalid haul 43 with no catches on MOL

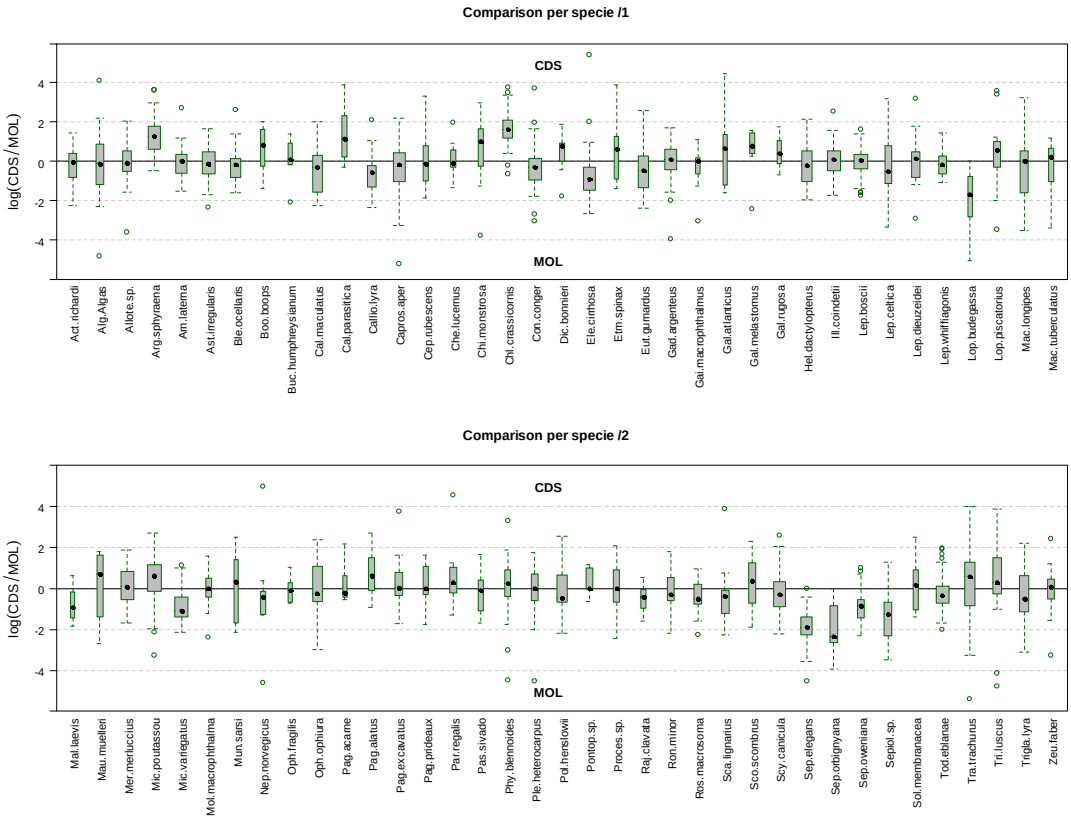

Figure 6. Differences in catches per species and haul between both vessels in logarithm scale. Data are shown as log(catch MOL/catch CDS). Positive catches, above 0, were larger on CDS, while negative ones were larger on MOL. Boxes represent the variability along the total survey, and box width is proportional to the number of hauls with presence of the species on both vessels. When the box does not intersect the 0-axis, significant differences in the catches between vessels were found.

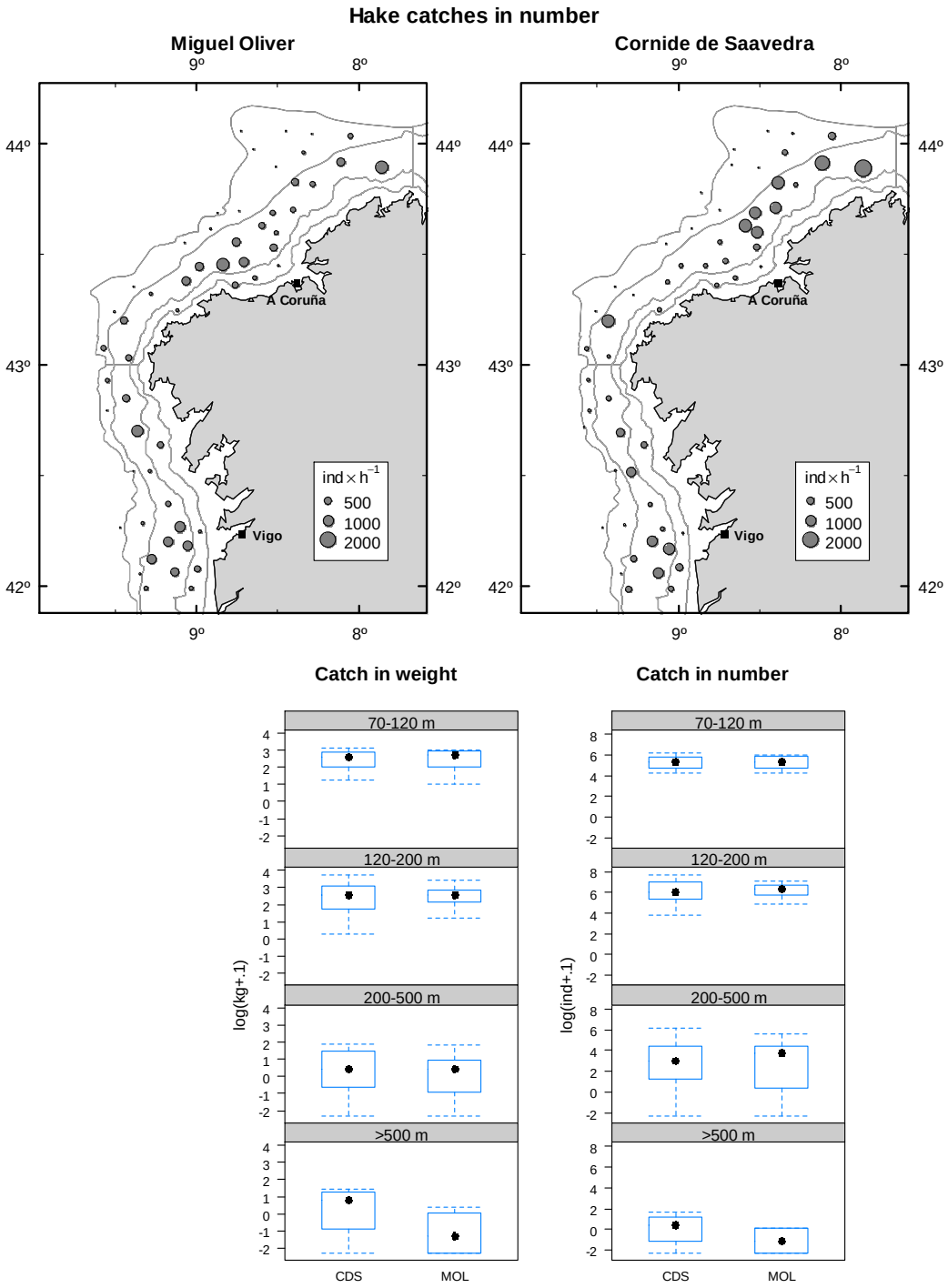

Figure 7. Top panel: map of hake catches in number in both vessels. Bottom panel: boxplots showing differences in hake catches per strata in weight and number (logarithm scale)

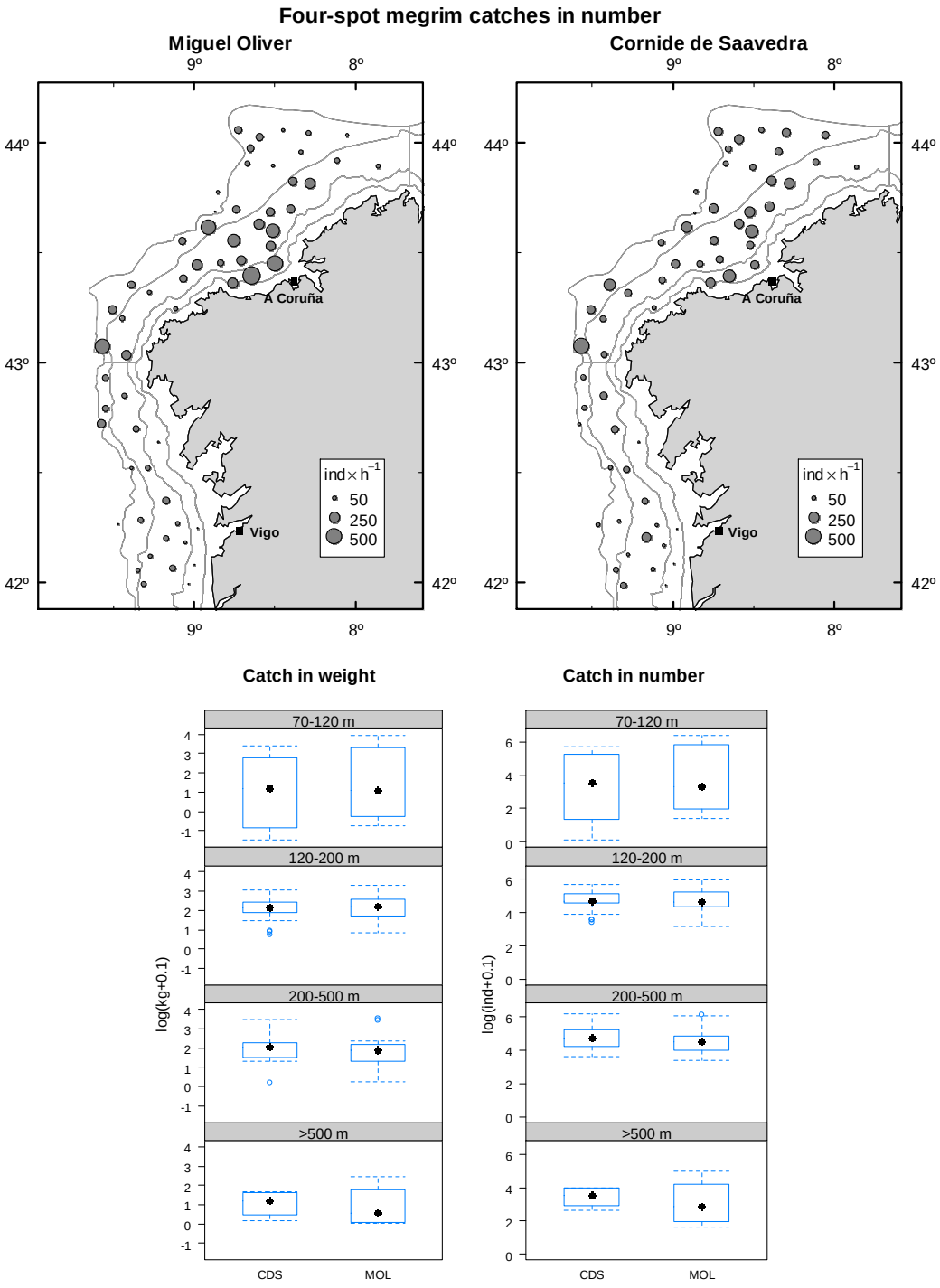

Figure 8. Top panel: map of four spot megrim (*L. boscii*) catches in number in both vessels. Bottom panel: boxplots showing differences in hake catches per strata in weight and number (logarithm scale)

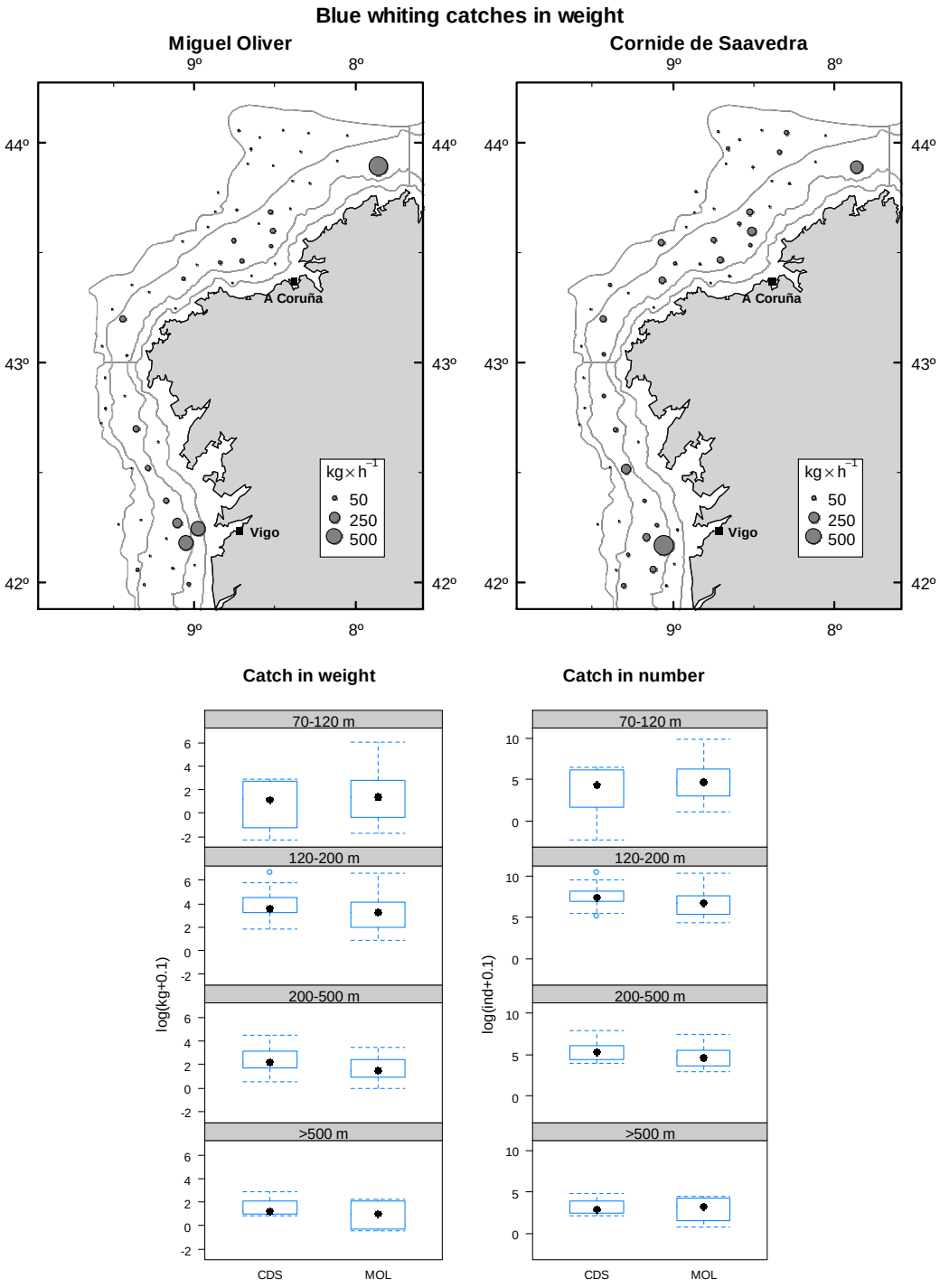

Figure 9. Top panel: map of blue whiting catches in number in both vessels. Bottom panel: boxplots showing differences in hake catches per strata in weight and number (logarithm scale)

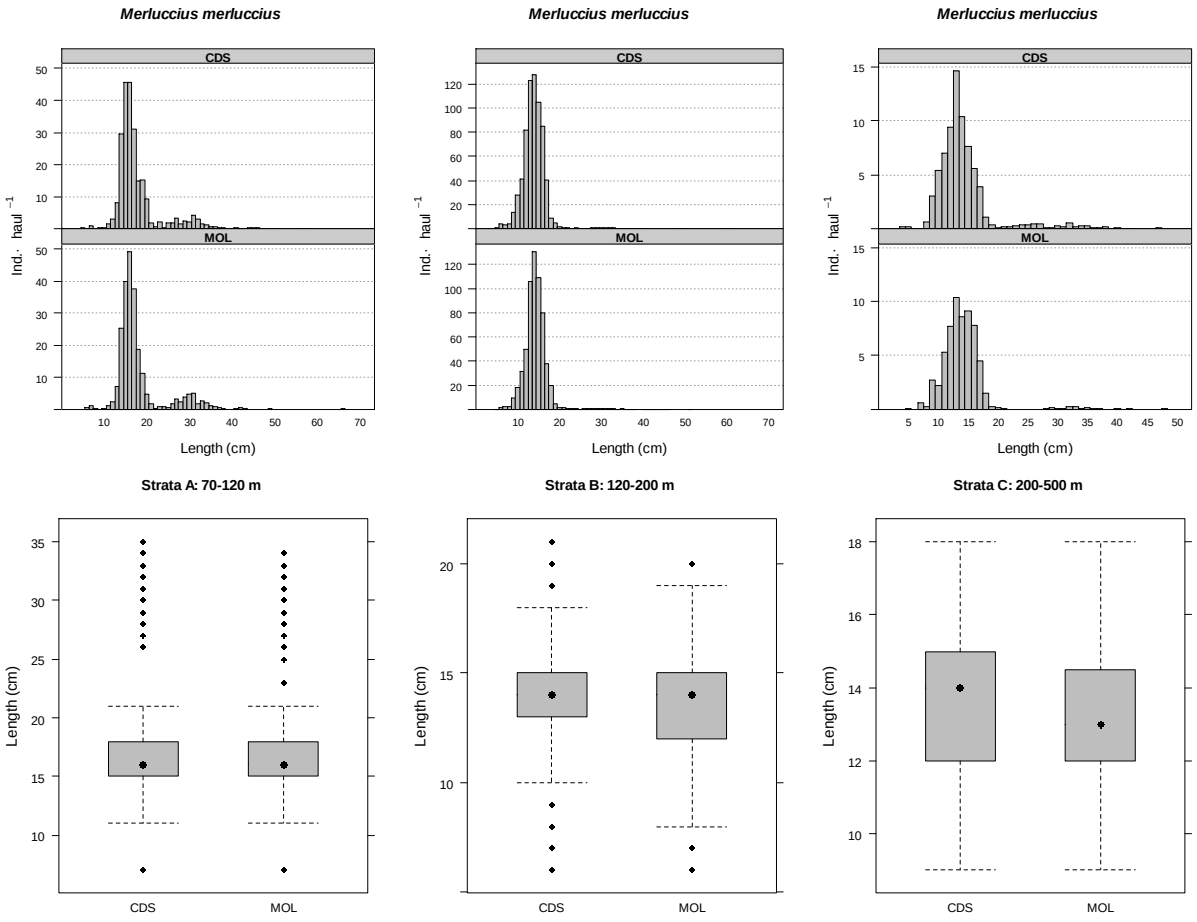

Figure 10. Top panel: hake stratified length distributions per strata. Bottom panel: boxplots showing the variability of hake stratified length distribution per strata. CDS: R/V *Cornide de Saavedra*, MOL: R/V *Miguel Oliver*

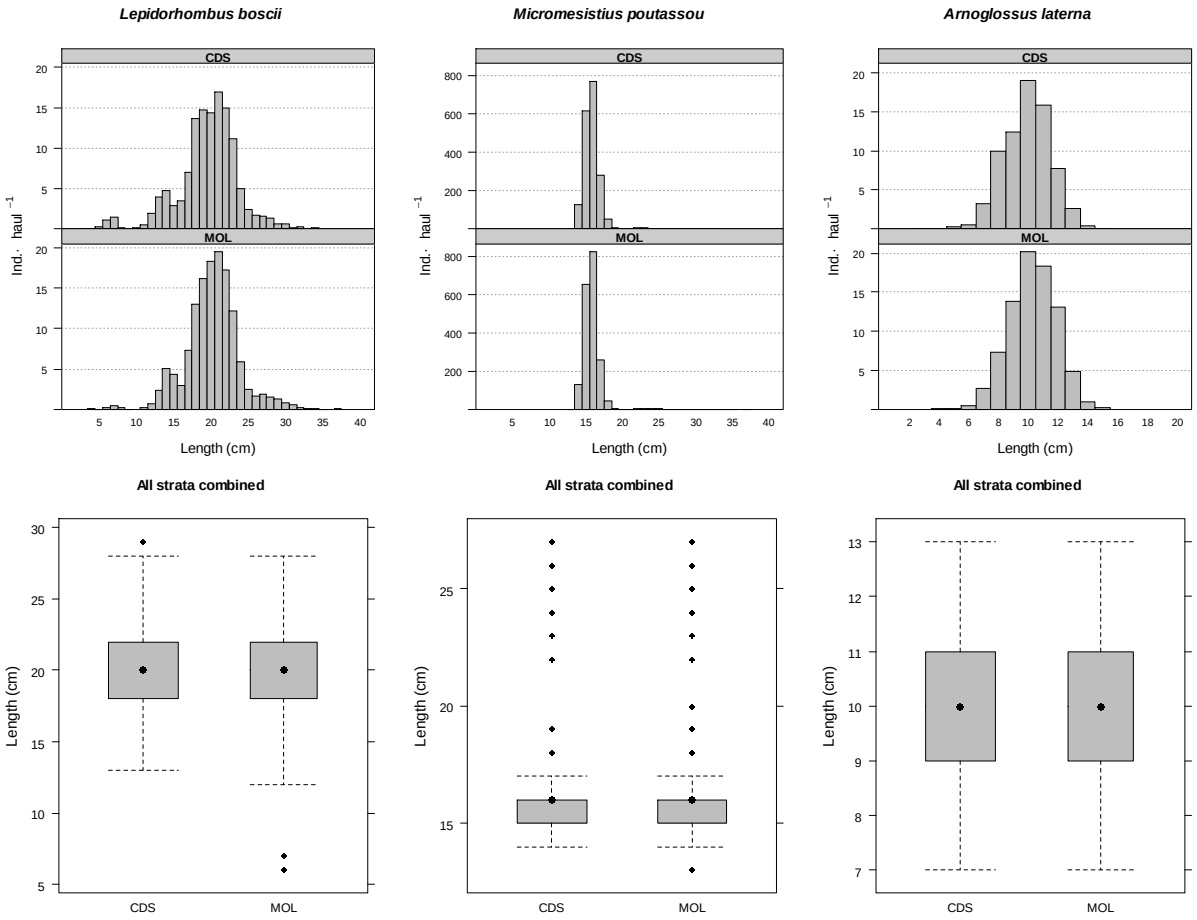

Figure 11. Top panel: stratified length distributions of *L. boscii* (left), *M. poutassou* (center) and *A. laterna* (right). Bottom panel: boxplots showing the variability of the same species stratified length distribution. CDS: R/V *Cornide de Saavedra*, MOL: R/V *Miguel Oliver*

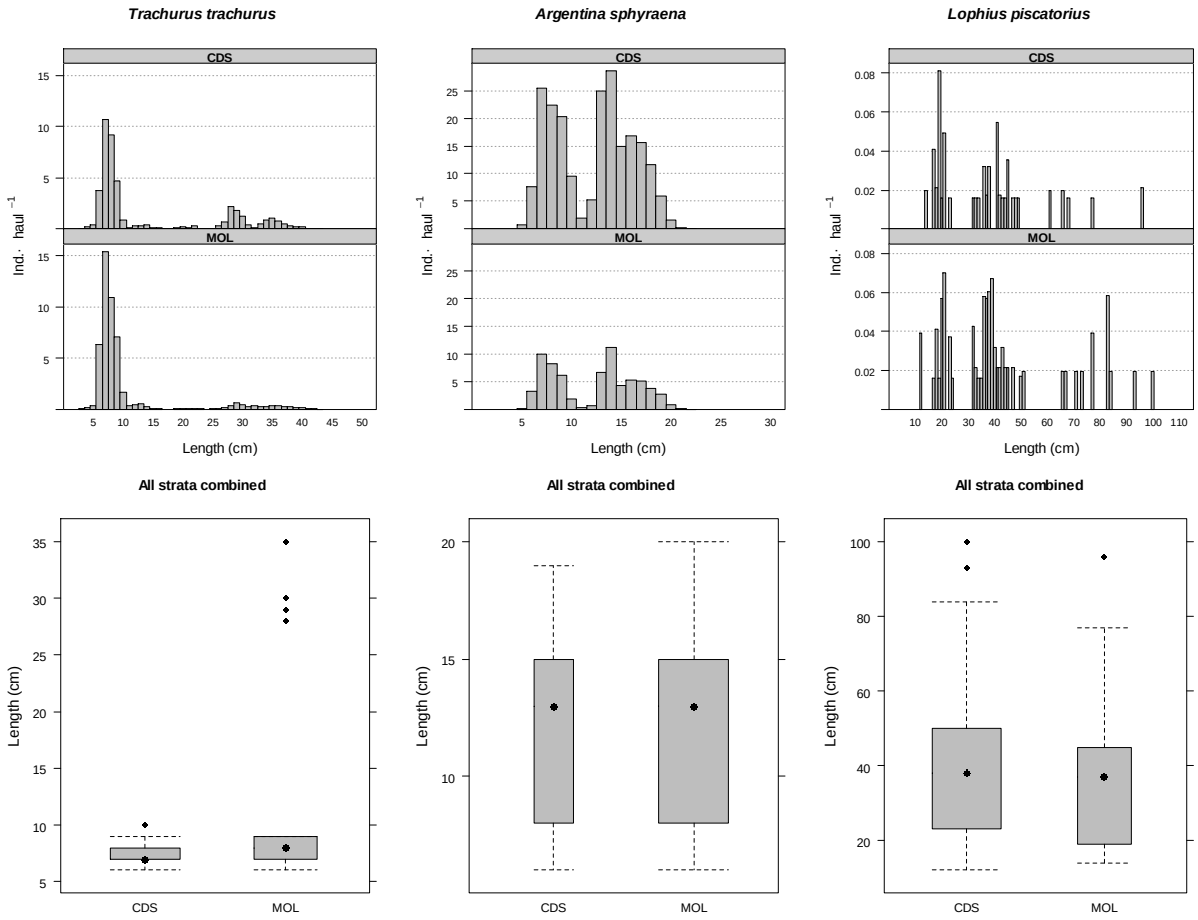

Figure 12. Top panel: stratified length distributions of horse mackerel (left), argentine (centre) and monkfish (right). Bottom panel: boxplots showing the variability of the same species stratified length distribution, width of the boxes is proportional to the number of fishes. CDS: R/V *Cornide de Saavedra*, MOL: R/V *Miguel Oliver*

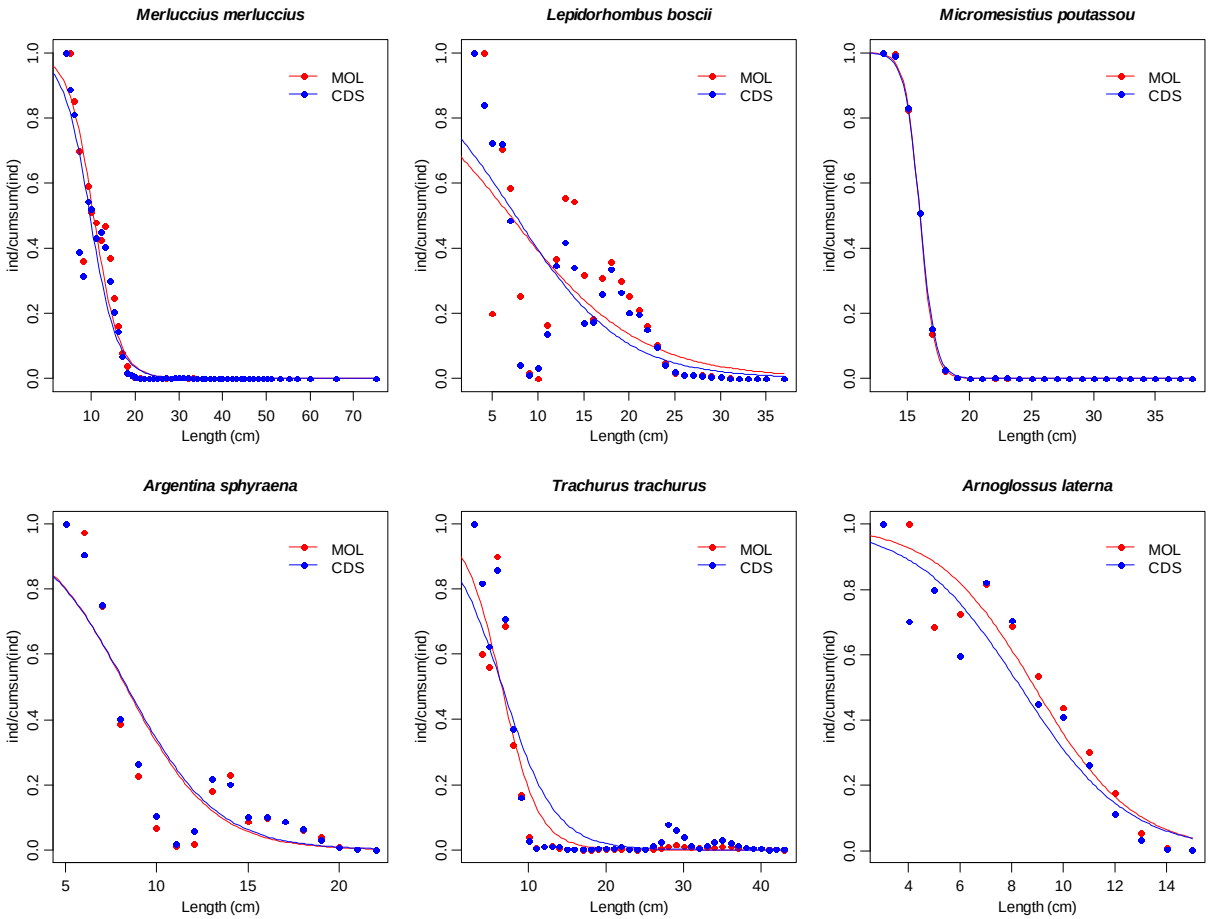

Figure 13. Selection per length in each vessel catch for hake, four spot megrim, blue whiting, lesser argentine, horse mackerel and scaldfish, including GLMs fitted to the selection curves in each vessel. CDS: R/V *Cornide de Saavedra*, MOL: R/V *Miguel Oliver*

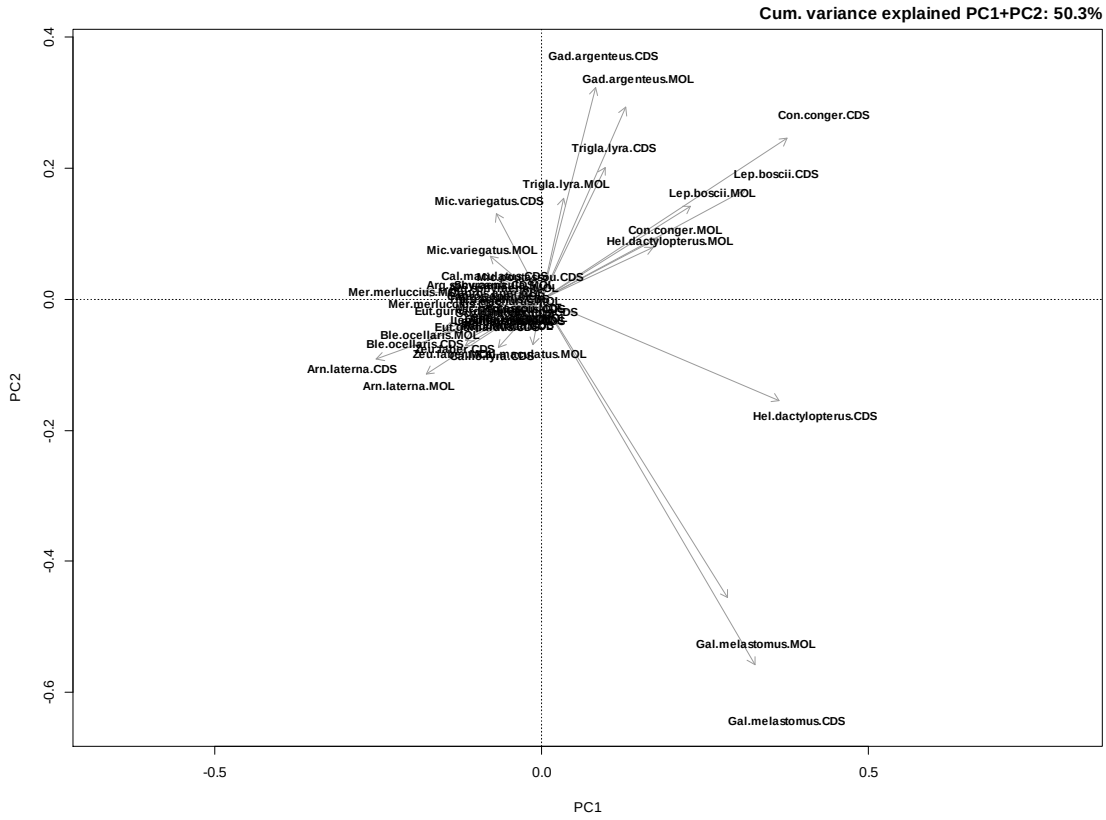

Figure 14. Biplot of the PCA analysis of the fish catches in number per vessel

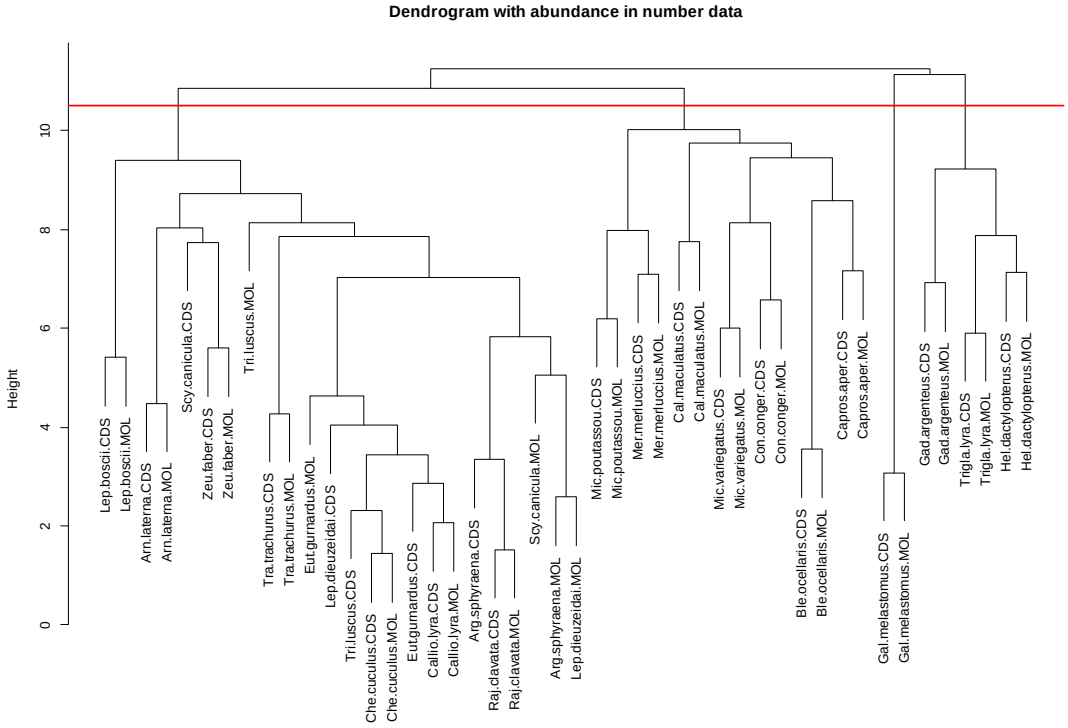

Figure 15. Hierarchical cluster analysis of fish catches in number per vessel

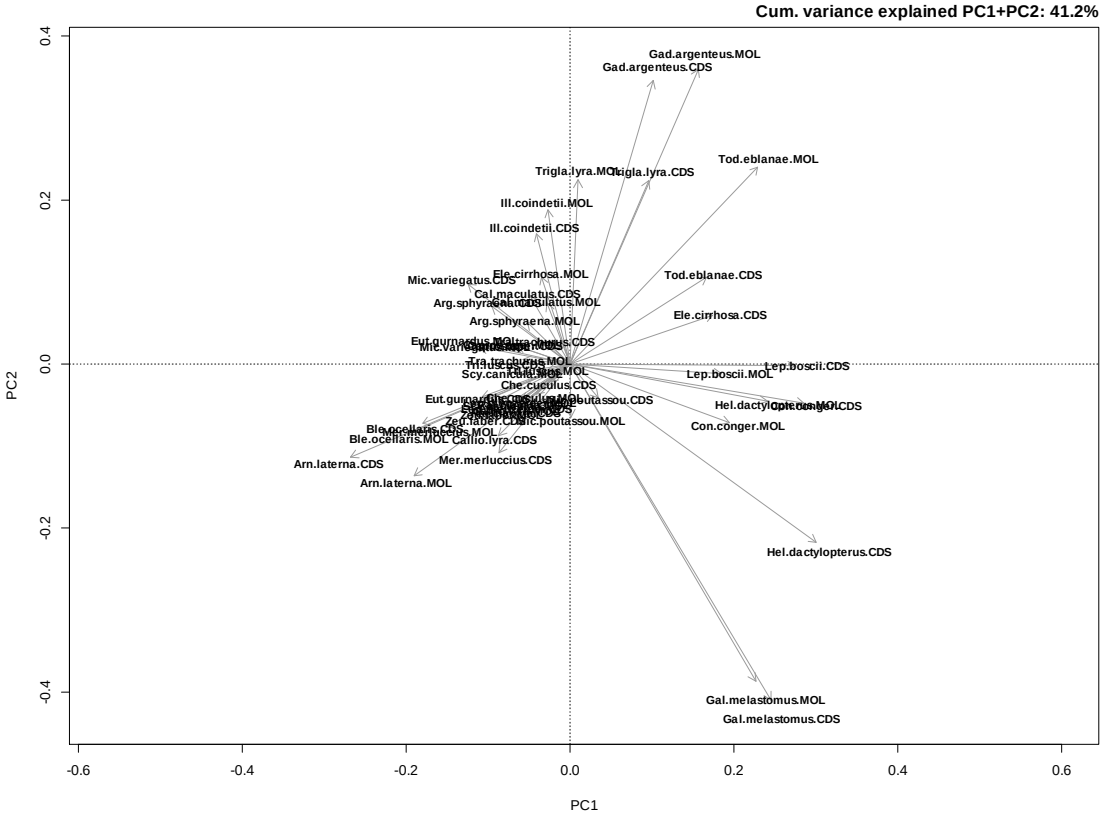

Figure 16. Biplot of the PCA analysis of fish and cephalopod catches in biomass per vessel

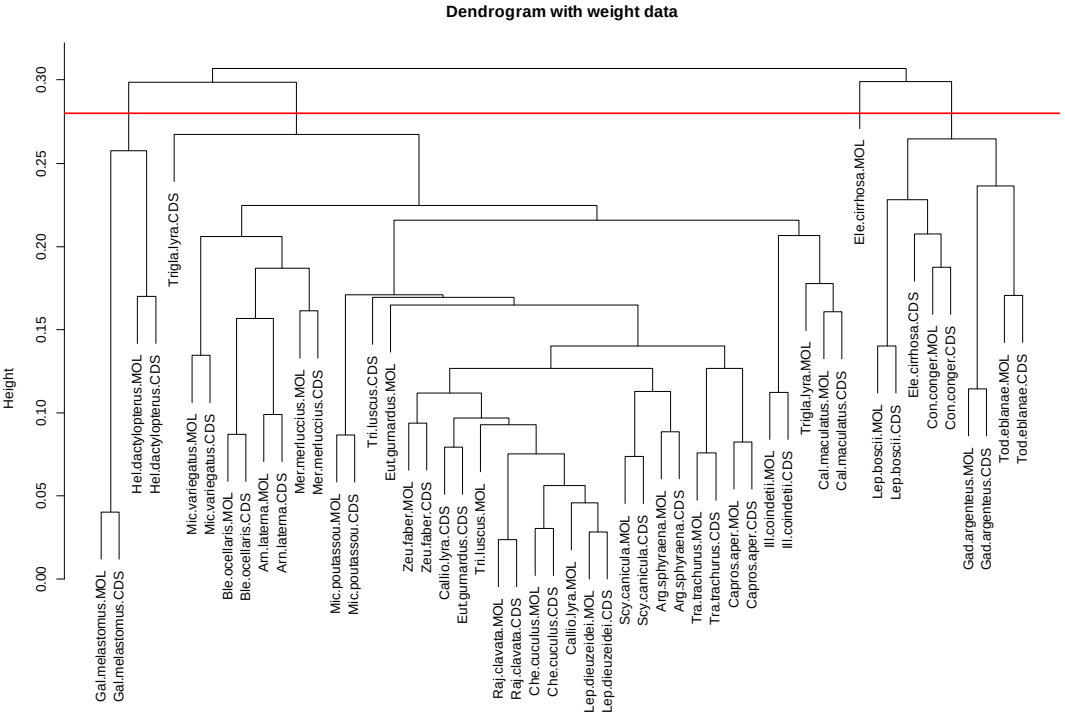

Figure 17. Hierarchical cluster analysis of fish and cephalopod catches in biomass per vessel

Working Document WD 3-2013. Marine litter in the Dutch, French and Norwegian IBTS Q1 2013.

Ralf van Hal (IMARES)

Introduction

Commissioned by Rijkswaterstaat, the Netherlands did a pilot project on marine litter in the catches of the Q1 IBTS. Sampling for marine litter is part of the IBTS manual (ref), however the intensity of sampling varies between countries. The Netherlands sampled only very limited in previous years and was able, owing to the pilot project, to intensify the sampling on the cruise in 2013. During the first three weeks an extra person participated solely to sample the marine litter. This extra person was able to thoroughly inspect the complete net on the deck for marine litter stuck in the net and was able to search the catch a second time for small pieces of litter unobserved during the regular search. The extra person also made it possible to make a description of each litter item and to make photos of all these items. Following the survey the collected data was analysed and reported to Rijkswaterstaat.

As Rijkswaterstaat was mostly interested in the Dutch part of the North Sea. The Dutch data was combined with the French data collected on the cruise with the Thalassa to have the full coverage of the Dutch part of the North Sea. Additional sources of data used in the analyses were data from the Dutch Beam Trawl Survey (BTS) 2012 and Norwegian IBTS Q1 2013 data.

During the IBTSWG 2013, a summary presentation is given on the results and on the recommendations formulised as a result of the pilot project. This working document is a written representation of the presentation given to the working group.

IBTS manual on Marine litter

The IBTS manual states: *Marine litter is one of the MSFD descriptors. With this in mind from 2011, all North Sea IBTS surveys are to collect data on marine litter captured in the GOV trawl. Annex 15, gives the sheet and description of the categories that need to be collected at each station. Once collected these data can be sent to each institutes marine litter co-coordinator or to WKMAL.*

The classification table in the manual (table 1) has far evolved since the first discussions on marine litter during IBTSWG 2010 (ref), when a classification of 7 groups was proposed.

Table 1: Classification of marine litter items and the related size categories (The International Bottom Trawl Survey Working Group 2012).

A: Plastic	B: Sanitary waste	C: Metals	Related size category
A1. Bottle	B1. diapers	C1. Cans (food)	A: <5*5 cm= 25 cm^2
A2. Sheet	B2. cotton buds	C2. Cans (beverage)	B: <10*10 cm= 100 cm^2
A3. Bag	B3. cigarette butts	C3. Fishing related	C: <20*20 cm= 400 cm^2
A4. Caps/ lids	B4. condoms	C4. Drums	D: <50*50 cm=2500 cm^2
A5. Fishing line (monofilamen	B5. syringes	C5. appliances	E: <100*100 cm= 10000 cm^2= 1 m^2
A6. Fishing line (entangled)	B6. sanitary towels/ tampon	C6. car parts	F: >100*100 cm = 10000 cm^2= 1 m^2
A7. Synthetic rope	B7. other	C7. cables	
A8. Fishing net		C8. other	
A9. Cable ties			
A10. Strapping band			
A11. crates and containers			
A12. other			
D: Rubber	**E: Glass/ Ceramics**	**F: Natural products**	**G: Miscellaneous**
D1. Boots	E1. Jar	F1. Wood (processed)	G1. Clothing/ rags
D2. Balloons	E2. Bottle	F2. Rope	G2. Shoes
D3. bobbins (fishing)	E3. piece	F3. Paper/ cardboard	G3. other
D4. tyre	E4. other	F4. pallets	
D5. glove		F5. other	
D6. other			

Dutch IBTS Q1 2013 results

The Dutch 2013 IBTS first quarter performed 60 hauls in total. In 56 of these hauls at least one litter item was found, meaning that only 4 hauls were without or at least no litter was found. In total 220 litter items were registered of which 147 were found during sampling on the belt and 73 were found attached in the net. This means that about a third of the litter items got stuck in the net or to the groundrope and was not emptied in the fish bin.

Category		number	%
A	Plastic	192	87
B	Sanitary waste	1	0.5
C	Metals	3	1.5
D	Rubber	3	1.5
E	Glass/Ceramics	7	3
F	Natural products	9	4
G	Miscellaneous	5	2

The plastic category (A) exists of 12 sub-categories, of which 11 were found. Crates/containers, sub-category A11, were not caught. Of the 11 plastic categories A2 was most dominant followed by A5 (Fishing line, monofilament) (figure 1).

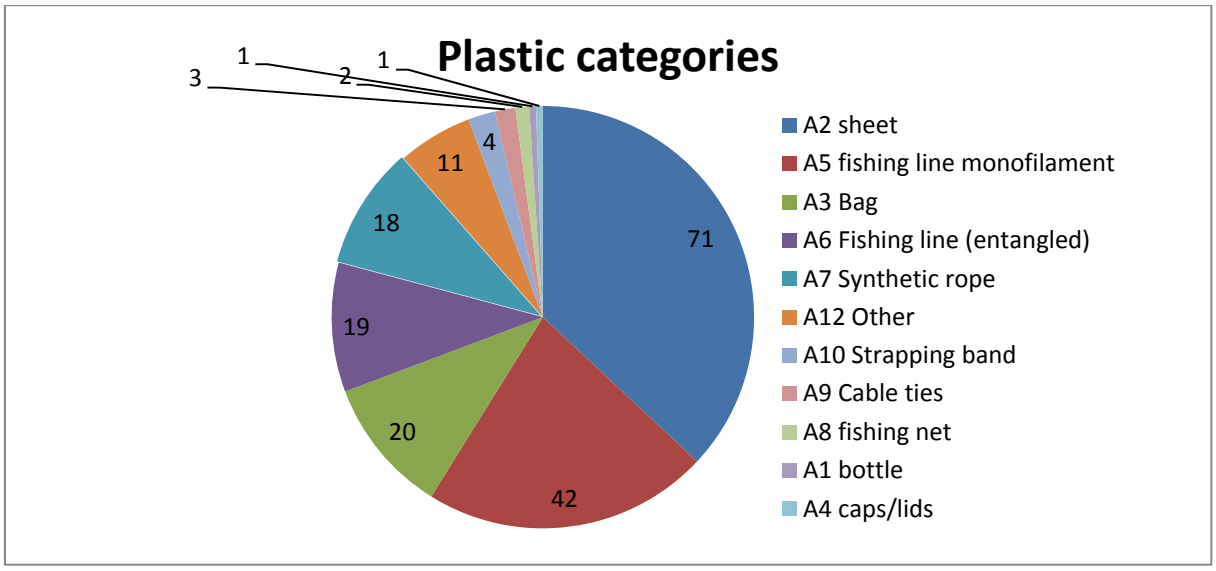

Figure 1.: Number of litter items per sub-category of Plastic in the Dutch IBTS Q1 2013.

About 33% of the litter items was taken from the net. Most of these items from the net were entwined in the ground rope. While some, mainly larger, items became stuck somewhere in the net. Looking in more detail at sub-categories level. 65% of the Bags (A3) were taken from the deck. Also from A2, A5 and A7 a quarter to nearly half of the items is collected from the net.

Sub-category	number of items Belt	number of items net	% in net
A2	42	29	41
A5	32	10	24
A7	15	4	21
A12	10	1	9
A6	10	8	44
A3	7	13	**65**
F1	5	1	17

French IBTS Q1 2013

The French did a larger number of hauls, in total 86. In these hauls they recorded 179 litter items. They however did not separate it by belt or net and they did not thoroughly checked the net in the same way the Dutch did.

The distribution of the items over the categories is very similar compared to the Dutch results as 86% was plastic (A). Looking at their description of the items, we however think that the French also recorded real natural products as branches and peat. This would reduce their number of natural products considered as marine litter.

Category		number	%
A	Plastic	154	86
B	Sanitary waste	3	2
C	Metals	2	1
D	Rubber	2	1
E	Glass/Ceramics	3	2
F	Natural products	11	6
G	Miscellaneous	4	2

Splitting the plastic in sub-categories gives a different picture than the Dutch results. Similar is that the sheet (A2) category is the most dominant. The largest differences are in Bag (A3), which is only a very small category in the French data. The other difference is that A6 and A7 are more dominant in the French data compared to the Dutch data. A part of the difference might be due to checking the net for litter. If the French haven't done this, the might have underestimated especially A3. Another part might me due to differences in categorizing the items especially the difference between monofilament (A5) or entangled monofilament (A6) or synthetic rope (A7). In total these tree sub-categories contained 80 items in the French, and 79 items in the Dutch data.

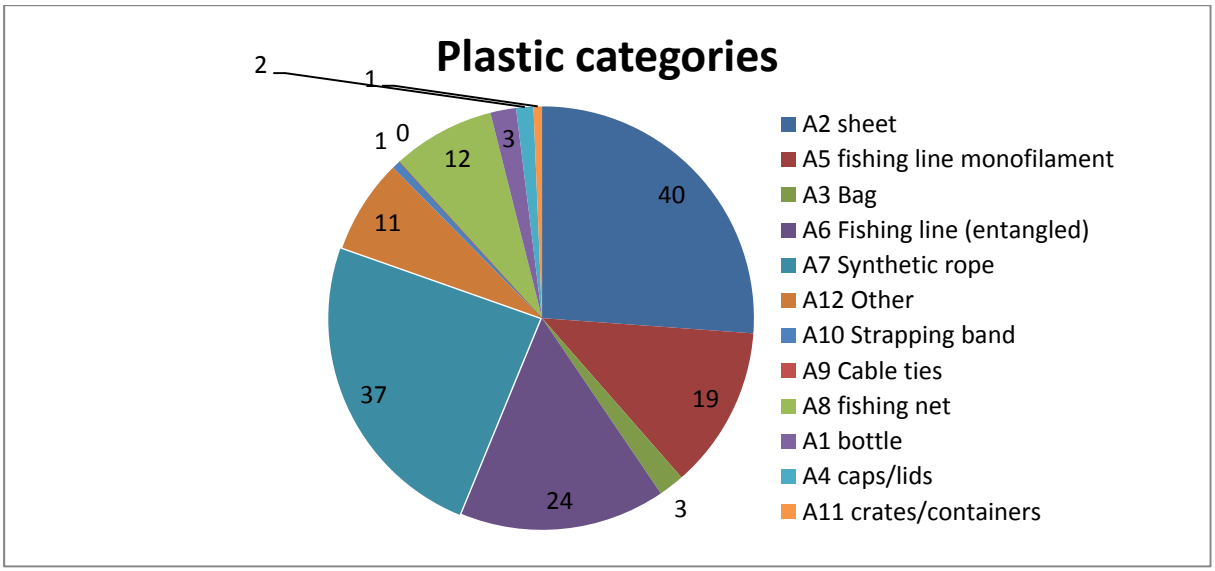

Figure 2.: Number of litter items per sub-category of Plastic in the French data.

Norwegian IBTS Q1 2013

The Norwegians recorded litter items in 25 of their 51 hauls, with a total of 52 items. Surprisingly, also in the Norwegian data 87% is plastic (A). This 86-87% seems to very consistent for the IBTS hauls. The Norwegians, fishing in different deeper part of the North Sea did catch a much smaller amount of items compared to the Dutch and French. They neither caught all the categories.

Category		number	%
A	Plastic	45	87
B	Sanitary waste	1	2
C	Metals	2	4
E	Glass/Ceramics	1	2
G	Miscellaneous	3	6

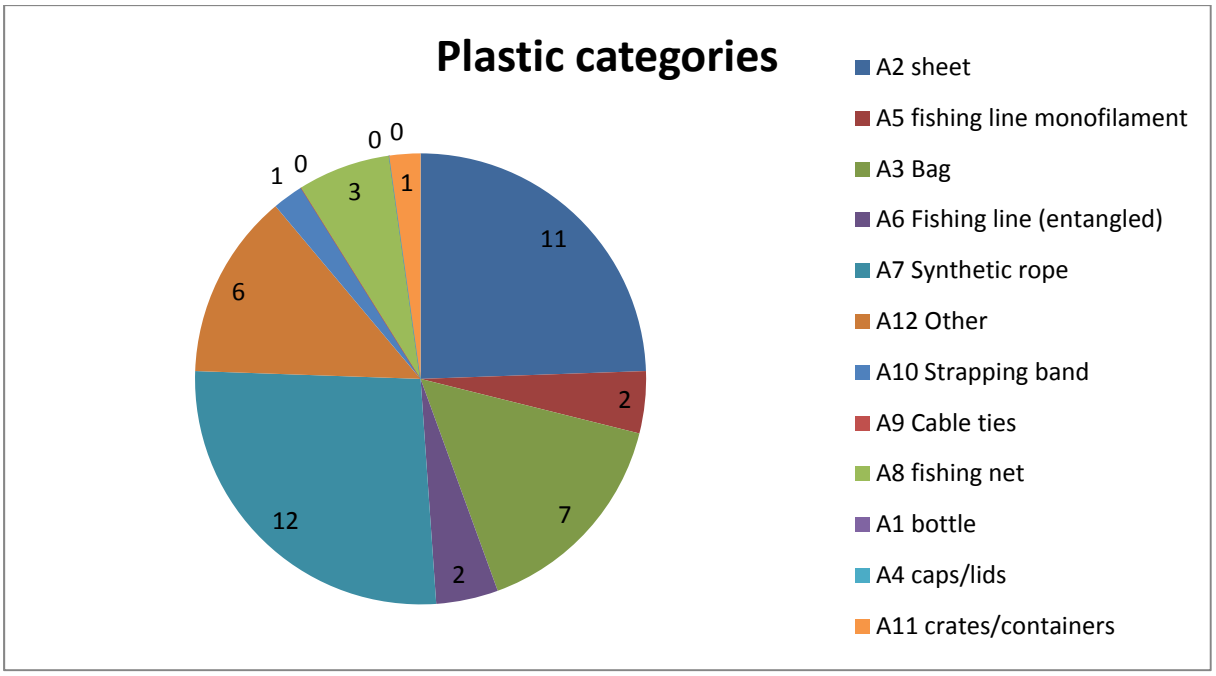

Figure 3.: Number of litter items per sub-category of Plastic in the Norwegian data.

Dutch Beam Trawl Survey (BTS)

In 74 hauls litter was sampled during the BTS in 2012. 6 hauls did not contain any litter items, or these were not recorded. All other hauls contained at least one litter item. The litter was again dominated by plastic (176, 61%), the dominance was however lower than in the IBTS samples. In the BTS besides plastic a reasonable number of Natural products (F) was found, which was dominated by processed wood. Followed by the category Miscellaneous, with most items in G3 (others) being items that could not be classified or contained multiple materials.

Category		number	%
A	Plastic	176	60
B	Sanitary waste	3	1
C	Metals	16	5
D	Rubber	17	6
E	Glass/Ceramics	10	3
F	Natural products	43	15
G	Miscellaneous	26	9

Splitting the plastic in sub-categories gives similar results, A2 sheets as most dominant litter item. In the BTS, the number of items assigned to A5 and A6 (fishing lines) is very small, while A7 synthetic rope is the second largest group. Reading some of the descriptions of litter items given in the BTS data it is very likely that a number of the items in A7 would have been placed in A5 if these had been caught during the Dutch IBTS 2013 survey.

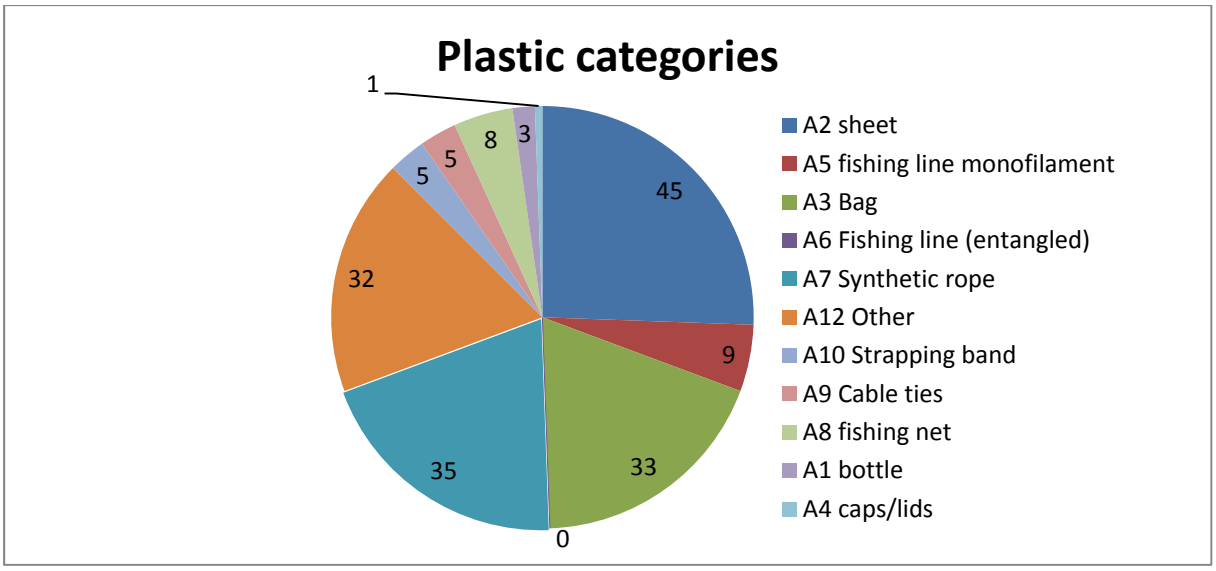

Figure 4.: Number of litter items per sub-category of Plastic in the Dutch BTS data.

Spatial distribution of the IBTS data

The French and the Dutch data are combined in a single distribution map (figure 5). The data is presented in number of items per km^2 (using calculated wingspread). This is the same measure as used by Maes (Maes 2013) on the data collected by CEFAS (Figure 6). The map by Maes shows a concentration of litter North of the Dutch Islands following the current up north to the Skagerrak. Some darker blue spots are found there in Dutch and French data as well. However we also see a concentration of blue to dark blue spots in front of the Scottish coast, while no such concentration is seen in the data by Maes. Both data sets show higher values in front of the Thames. In our data this is based on only a single haul with a lot of litter. This single dark blue spot is surrounded by the darkest green, hauls with the lowest amount of litter. Even though the spatial coverage is limited and it is only data from a single year. The survey seems to be able to show expected hotspots, among other the discharge area of the Thames, the Elbe and the Béthune.

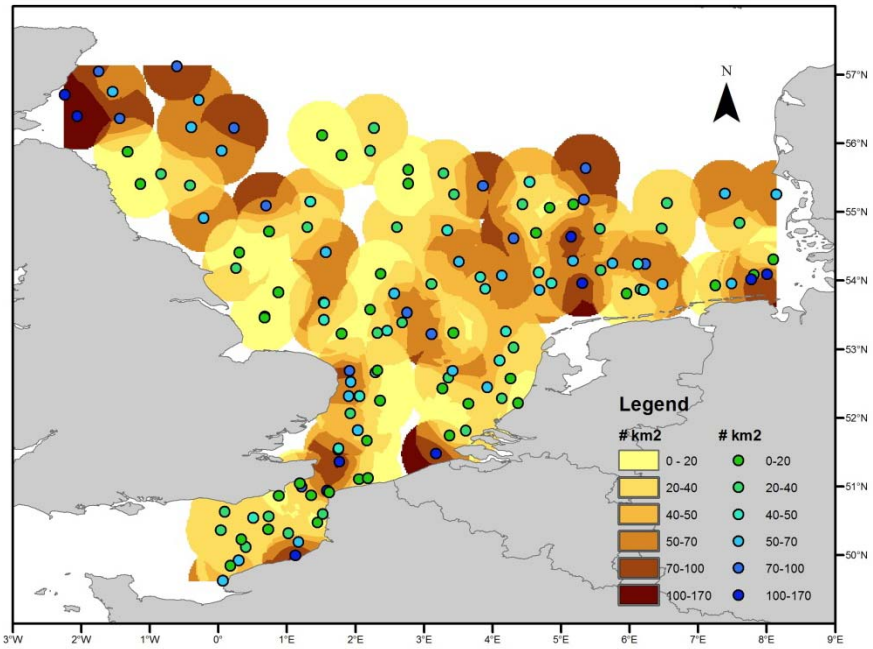

Figure 5. : Number of litter items in km^2 per haul in the Dutch and French IBTS of 2013. The underlying kriging map is very basic.

The kriging map underlying the haul data is very basic. A statistical approach by fitting a Variogram did not result in a sound solution. The variogram indicated that there is no spatial correlation. This is most likely caused by the large distances between the hauls, the expectation is that there is spatial correlation on a smaller spatial scale than present in the current data. It might also be related to the differences is the collection of the data between the French and the Dutch.

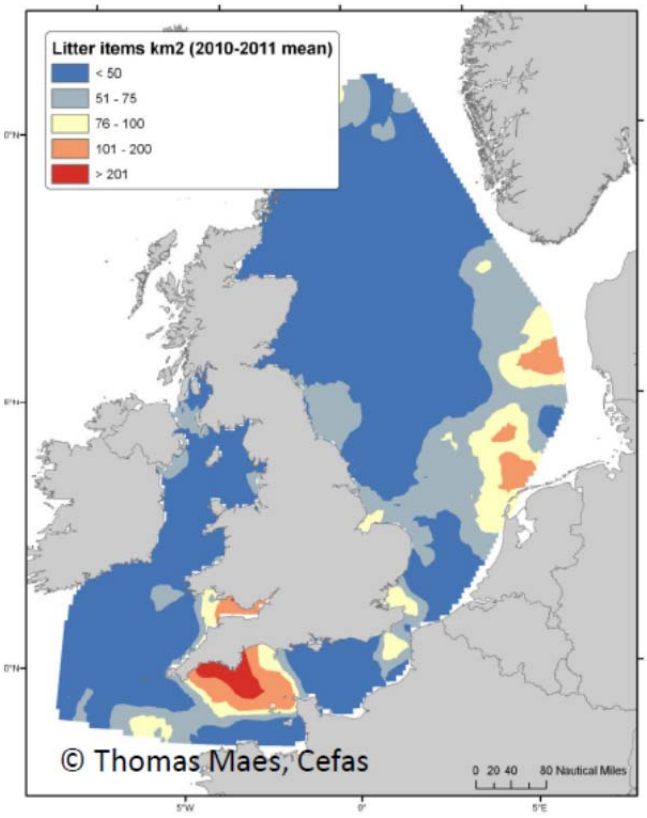

Figure 6. : Number of litter items in km² based on UK data 2010-2011 (Maes 2013).

Discussion and recommendations

This discussion contains a summary of the discussion in the report for Rijkswaterstaat and is extended with comments from the discussion following the presentation during the IBTSWG.

The larger picture of the results of marine litter collected during the surveys shows a consistent picture on the types of litter caught. Even though difference exists in gears etc. as discussed regarding the litter issues during IBTSWG 2012 (ref). Furthermore, even with a single year of data and the limited spatial coverage, the spatial analyses seem to be able to show hotspot areas.

In more detail there are clear differences between the different data sources. The feeling after studying the descriptions given by the different countries/surveys in their recording sheets is that a large part of these differences can be traced back to lack of clarity in the current guidelines. This leaves space for arbitrary choices in assigning an item to a specific category, differences in dealing with grouping of items, or the way the catch is sorted.

- Identification of items

  On category level there is a lack of clarity on how items should be assigned to the categories. It seems an easy thing, however in the field it is harder than it sounds. On category level for example it is unclear how to deal with items that consist of various materials. In some cases these were placed in G3 (miscellaneous, others), while in other cases these based on an arbitrary choice were placed in a category of one of the materials.

On sub-category levels, lack of clarity specifically exists between A2 plastic sheet and A3 plastic bags. The remark from the discussion following the presentation was to define A3 as: "*plastic bags, that still could function as such*". Parts that belonged to a plastic bag, will in that case be placed in the A2 plastic sheets.

Also the difference between plastic ropes, fishing gears, etc. (A5,A6,A7 and A8) is difficult. A6 fishing line entangled creates a second issue. As this means multiple items are grouped.

- grouping of items

If analysis on individual items are longed for, and particularly the spatial analysis on numbers per fished area, a clear definition of this is needed. A6 fishing line entangled by definition contains multiple items and can't be used on a similar level in analysis as A5 fishing line monofilament. My suggestion for this would be to make only a single category of this: Fishing line monofilament. And only report multiple items of this sources in a single haul if there is clearly a good reason for doing this. This should then be clear from the description given. The size category gives the opportunity to distinguish between a small amount or a large amount of monofilament lines in a specific haul.

For all other categories my suggestion would be to record all items separately. Except when items (for example glass pieces) clearly belong to a single source item.

- sorting the catch

The comparison between the number of items from the net and from the catch part shows that a significant part of the items is found stuck in the net and that the percentages of items stuck in the net differs between categories. Preferably this means that the whole net is searched and cleaned. However, this is not realistic, owing to the time need for this, in most cases. Even in the pilot situation with an extra person on board, clean the full net is nearly impossible. The second best, is to take the litter from the catch and only record large items (size category D and larger) from the net.

Problematic in this case, is that it hampers spatial analysis. When the net isn't clean thoroughly it is likely that litter items are taken to the next location and are found in the catch at a later stage at a different place.

Based on the description it was clear that litter of natural origin was recorded. These included among others branches and peat. WKMAL (ref 2010) already advised not to record these items as marine litter. If countries prefer to record these it is recommend to clearly describe these items, such that these can be excluded from analyses as preferred.

At the moment activities during the IBTS on marine litter are on a voluntary basis. All participants agree that time constrains limit them in executing the assignment as thorough as preferred. This creates differences between the countries but also within surveys of the same country. With large hauls there is less time to consider litter, the same happens in periods with a low number of staff on board. In cases other special request not related to the core practice of the survey, tradeoffs should be made and that case time spent on litter might be reduced. With this is mind it is advised to clearly document what is done. If this documentation is too limited the result might be that the effort spend on collecting litter items is wasted, as the analysis for which these data are collected can be done at all.

Registration of the items and related to that the storage of the data is also still an issue that needs to be resolved. The countries of which the data is presented here, register their data on the spreadsheet designed for it. However, there are still countries that only have the data registered on paper. This complicates sharing the data, but also reduces the security of long time storage.

For the long time storage an international database, in line with Datras, is still a wish. As discussed and decided the data, as it is non-biological data, can't be stored in Datras itself. However, discussion are on going with the datacenter on the creation of a separate database within ICES.

As long as there is no international database, CEFAS offers to collect and store these data. They also offer to digitalise the data if these are still on paper. As long as there is no international or open access database, some institutes are reluctant in handing over these data.

Summary:

- **Improve the guidelines on sorting the catch and the net for litter**
- **Improve the description of items belonging to each sub-category**
- **Decision needed if and how grouping of multiple items of the same type is done.**
- **As long as there are no common guidelines, record in detail the individual decisions made.**
- **Create an international database for storing these data.**

Reactions on the presentation by IBTSWG members.

The interest in marine litter is limited in the group and there is limited willingness to improve the guidelines. The main reaction it that this is not a role for the IBTSWG, but should be provided to the group by another group like WKMAL in past. At the moment, it is however unclear which group should provide in improved guidelines. ICES does not seems to have such group, outside ICES these might be MSFD GES Technical Subgroup on Marine Litter, or a group as OSPAR ICGML. However, as long as it deals with the actual work on board, first point of the summary, I think the IBTSWG should decide on this.

The time needed for collecting data on marine litter on board of the IBTS is limited. However, this is only the case, if it can be do when and how it suites. If the stricter guidelines come in practices, this will put more pressure on the available time and might result in the inability or unwillingness to collect the data.

Own suggestions for the manual, at least to be included in the Dutch manual as long as it isn't included in the international manual:

Collect all items from the catch and search the net on the deck for at least the items of size class D or larger. Collect the smaller items, but record these as items from the net. (Thus an extra column is added to the recording sheet.)

Register all items as individual pieces, unless they are clearly from a single source item (however include an extra column to the registration sheet to include the number of items). Assign each item to one of the sub-categories of the table in the IBTS manual. This table is extended with the suggestions below. In case, items exist out of multiple material record them as G3, and give a description of the various materials in the description column.

A1 Bottle: all drinking bottles, but also packaging like shampoo flask. Not included boxed juices.

A2 Sheet: all types of flexible plastic including parts of (garbage, chips) bags, candy wrappings.

A3 Bags: Shopping, garbage, chips, seal bags that could still be used as such.

A4 Caps\lids: Recorded separately if still attached to the bottle. However, combined with the bottle considered it as a single litter item. Register it as 0 in the newly included "number of items column".

A5 fishing line, monofilament: Combine all the monofilament lines as a single item. If possible to count the single lines include this value in the newly included "number of items column".

A6 fishing line, entangled: report this as single item. However if single monofilament lines are recorded, report A5 and A6 together or record A6 as 0 in the newly included "number of items column".

A7 synthetic rope: All plastic none monofilament single lines/ropes.

A8 fishing net: None monofilament fishing net.

A9 Cables ties

A10 Strapping band: All types of adhesive tapes, duct tapes, isolation tape.

A11 crates/containers: larger object as jerry canes, beer crates....

A12 others: all other plastics. In this case write an extensive description or make a picture.

Working Document WD 4-2013. Staff Exchange Report.

Yves Vérin (IFREMER)

RV Endeavour **North Sea IBTS 2012 -** 24 August to 8 September
Scientist in Charge: Sophy Mc Cully

Introduction

The ICES Bottom Trawl Survey working group recommends strongly staff exchanges as a valuable manner to standardize and improve experiences for the staff and the institutes involved in the surveys. These exercises facilitate the exchange of information, sampling skills and methodologies used by each country involved in the International Bottom Trawl surveys.

During the 2011 Q1 survey, the scientist in charge of the Q3 English NSIBTS survey has participated in the IBTS North Sea survey (NSIBTS) on the French Research Ship Thalassa, and a working document on this exchange was presented during the IBTSWG 2011 (*ICES CM 2011/SSGEST:06)*

In return, I was invited by CEFAS to participate to the 2012 quarter 3 survey carried out on the R/V Endeavour between the 8th of August and the 9th of September. This survey is generally conducted in two parts and I joined for the second one, betwen the 24th of August and the 9th of September, from Aberdeen to Lowestoft.

The RV Endeavour left Aberdeen the 25th of August for the Northern part of the North Sea to finish the IBTS samples in the area around Shetlands Islands. The last days of the cruise were devoted to fish again on some stations using a new polyurethan trawl in order to compare its efficency with the standard IBTS GOV bottom trawl.

For its survey, the Endavour covers a large area, from 51°30'N to 61°30' N and during the daylight hours the GOV trawl is deployed on average between three to four times per day.

The works done on the Endeavour and the Thalassa were fully explained and compared in details in the working document presented at the WG 2011 by Cefas.

The tables below come back only on the main differencies observed on the two vessels based on the 2011 Cefas report and observations during the Q3 cruise in August 2012. Remarks or improvements made on the Thalassa since Cefas exchange in IBTS Q1 2011 are also listed.

1. Fishroom :

R/V Endeavour	RV Thalassa
1.1. Team organization	
The team is generally composed of 5 to 6 scientists from CEFAS ; all have a good knowledge and experience of the work ; they participate to whole survey every years. The Scientist In Charge is well assisted by a scientist able to manage the survey in the same way.	In the fishroom, the team is composed of 8 to 10 people. One person is in charge of the fishroom and helped by 3 or 4 scientists who have a good experience of the survey. At the middle of the survey, all the team is replaced. (except the Scientist in Charge). There is more students or untrained persons

Conclusion of the visiting scientist: The team on Endeavour is well structured and does not change every year (or during the survey). Nevertheless, there is an improvement on the Thalassa since 2012, with a better organization and training courses for new persons.

R/V Endeavour	RV Thalassa

1.2. Sorting fish

The fishroom is at deck level with doors opening onto the deck, fish hopper and sorting tables outside (with a head covering). Fish are sorted manually. Baskets are handle and weighted manually. Weights are automatically recorded on the computer.	The fishroom is below deck level and thus sorting and processing the catch is enclosed. Conveyors facilitate fish manipulations. The whole catch is weighted automatically before being sorted on a conveyor. The sorted fish are weighted by species. With the help of conveyors, there are a few heavy baskets to handle.
	

Sorting methods are different and it seems easier on Thalassa; but the final result is the same. In case of big catches, different method is also used. On Endavour, all the catch is sorted at any time.
Weights by species are stored in the data base in the same way.

R/V Endeavour	RV Thalassa

1.3. Fish Measurement and otoliths samples

Measurement (all species) and otoliths samples are done in a separate room. Each person works alone at a workstation, placed with a large metal fish holder. All information (species, sample weight, fish length etc..) are recorded automatically using an electronic pen. When an otolith is required, the user has the otolith tray already placed onto their workstation. At the end of each species, the deckmaster comes and removes the otolith tray, provides the user with the next species, and a new otolith tray corresponding to that species. Benthos species are observed as present.	All species are measured by a team of two or three. Two of them measure, while one person records the lengths onto a paper record sheet. The necessary otolithing is also conducted at the workbenches, and with plastic worktops, cutting can take place directly on the bench. The length and otolith sheets are then taken into the dry lab where the catch records and lengths are entered onto a computer at the end of the station. All benthos are sorted into species, counted and weighed.
	

The system to measure and take otoliths on Endeavour is better than on Thalassa. There are six workstations, which is enough to measure all the species. It saves time and avoids errors : all information are recorded directly on the workstation.
The same work on Thalassa needs more people and more time. After being measured, fish data have to be recorded on software which it is a risk of errors. But, data are check twice and a specific software has been developed in order to improve data quality.

2. Bridge Management and Gear Deployment :

R/V Endeavour	RV Thalassa
The Scientist in charge is present on the bridge for the full deployment and duration of the trawl. The gear is deployed by a fishing skipper the SIC also watching out for potential fouling of the net. The Scientist in charge is responsible for monitoring the Scanmar readings throughout the tow, and the time duration begins once they are happy with the readings they are giving, they also give the command of when to haul the gear. Hauls parameters are recorded	The Captain has a long fishing experience and ensures the deployment of the gear. He decides according to the manual, how much warp to let out, and during the tow, and ensures the gear is fishing correctly. The scientist in charge is below the deck and has to records haul information on specific software. The bridge (the Captain) indicates by microphone when the haul starts and finishes. During fishing operations the scientist can follow trawl parameters. A software on the Thalassa (called Casino) records automatically every 30 seconds different information as well position, speed, etc… as trawl parameters or environmental data (surface temperature, surface salinity ec..). A GIS software combines these data with biological data (from the sorting room) and maps can be drawn regularly during the survey.

Since 2012, methods have been evolved on Thalassa. The captain follows the figure "warp out/door depth ratio" instead of "the Warp out/depth ratio" figure (in the IBTS Manual).
Concerning the standard GOV trawl, comparison were made (with photos) and according to fishermen on the Thalassa, the net used on Endeavour is similar to the one on Thalassa. Both seems follow the manual recommendations.

***

The main differencie between an IBTS cruise on the Endeavour and on the Thalassa lies in the in the sorting room organization. Firstly, the team which participates to the cruise every year has a very knowledge of the work. The infrastructure used for fish measurements in the fully automated laboratory is impressive, (contrarily to the sorting room on the open deck). The use of the software for measuring and taking fish otoliths facilitates the work and avoids errors. It is very easy to use and flexible: all information recorded can easily be corrected. This system is very interresting and should be installed on the Thalassa. After the survey, there were some contacts with CEFAS in order to adapt the workstations and the electronic system to measure fish. The project is still kept but it needs a complete revision of the informatic system on board and some founds to adapt it.

This experience was very interresting and allowed to compare the methods in order to try to standardize them. Since Cefas staff exchange in 2011 on the Thalassa (CEFAS Working document in ICES ICES CM 2012/SSGEST:03) and my own experience in August 2012, some parts of the works have improved on the Thalassa as :

- Fish are measured and otolithed at the same time and individual weights are taken.
- More flat fish are otolithed (Dab, for example)
- All data are recorded during the cruise (Untill 2012, otolith records were done at the laboratory). All of them are check twice before beeing scrutinized throught a specific software develloped for IBTS cruises.
- During gear deployment, a better use of the graphs manual is done since 2012
- Some training courses have been implemented at Ifremer for staff (species identification ...)

In conclusion, these staff exchanges were very useful (as well CEFAS participaion in 2011 as mine in 2012) and must continue to transfer knowledge and avoid disparity in protocols. I would like to thank the CEFES staff and crew of RV Endeavour for welcoming me onboard.

Working Document WD 5-2013. CAMANOC.

Yves Vérin (IFREMER)

Proposal for an ecosystem survey in the western English Channel (VIIe) (CAMANOC : CAmpagne MANche Occidentale).

During the 2012 IBTS working group in Lorient, a project for an ecosystem survey in the western English Channel in 2014 submitted by Ifremer (France) as been presented. This project is fully described in the Working document (Travers et al., ICES CM 2012/SSGESST:03).
A first survey will be carried out in September 2014, during zooplankton and larval bloom. All ecosystem components will be assessed in order to have a reference point of the ecosystem state.
1. To provide an overview of the ecosystem from the abiotic environment up to the top predators
2. To initiate a time-series of an "IBTS-type" survey for the western English Channel, which could be used at different levels (evolution of species of interest, providing some indices and parameters…) and in relation with the neighbour surveys EVOHE and NS-IBTS.

After this first survey in September 2014 where all ecosystem components will be assessed to have a reference point of the ecosystem state, it is planned to carry out an annual survey in October (Q4) for 15 days, linked with the current CGFS (Channel Ground Fish Survey) in the Eastern English Channel. Sampling effort on benthos will be lower, and only megafauna from the trawl will be sorted.

To sample fish community, a systematic sampling will be carried out with at least 3 or 4 hauls in each statistical rectangles (fig. 1) according to IBTS procedure (haul duration, speed etc.).
And during the 2013 IBTSWG meeting, the gear design was presented. It is planned to use a modified GOV gear, able to fish in this area were bottom are rough and uneven.
Intercalibration between the standard GOV and the CAMANOC net is planned in February 2014 after the IBTS Q1 survey. Same haul will be made using the different nets
Futhermore, intercalibration with the CGFS survey will be carried out on the overlaped area.

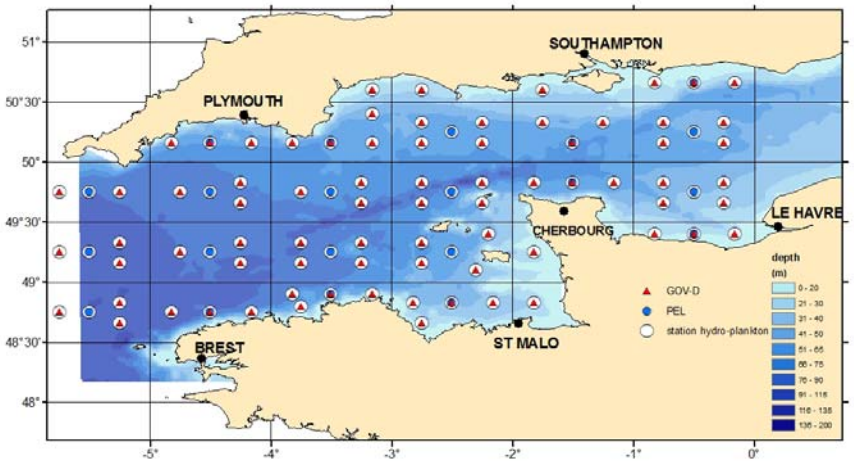

Figure 1 : GOV and pelagic trawls sampling. At least, 2 or 3 bottom trawl and 1 pelagic trawl in each statistical rectangles.

CAMANOC GOV net

It is a modified GOV gear, able to fish in this area were bottom are rough and uneven. Main changes are listed below :

- it is a plaited polyethylen net.
- wings are cut in the lower part in order to avoid dammage (figure 2).
- the rigging is a semi pelagic one (figure 3) and no kite will be intalled on the head line.
- the doors are "polyfoil" type : oval shape with the same lift as Polyvalent doors but with a lower weight.
- the groundrope is a double groundrope (figure 4) with larger rubber disk in lower section.

Mesh sizes are the same as the sandard IBTS

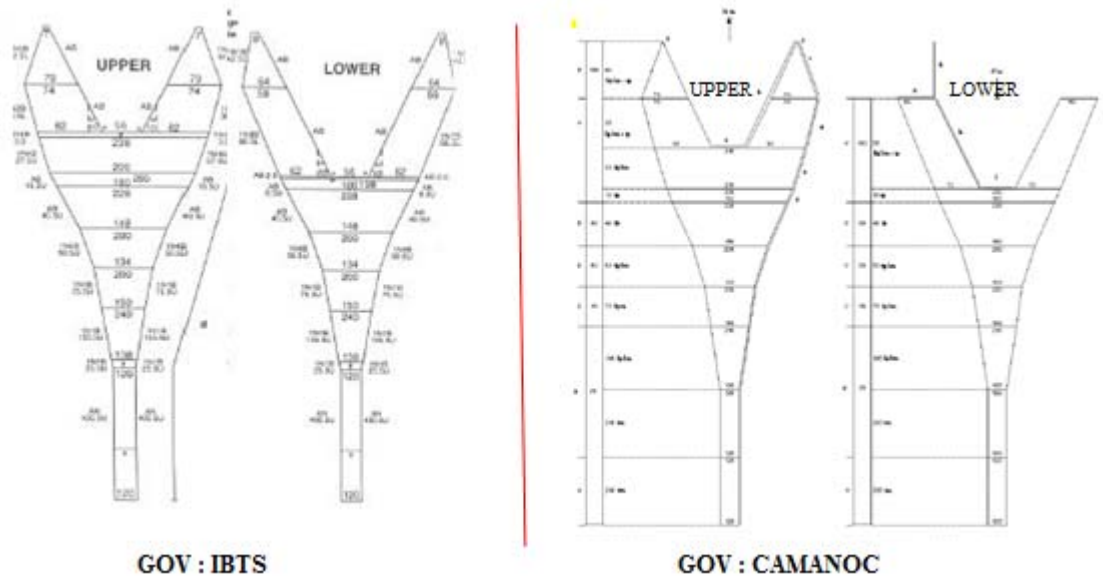

Figure 2 : CAMANOC net compared to the standard GOV net. It is a plaited polyethylen net (~4mm diameter) whithout wings in the lower part. Same size and mesh as the standard GOV.

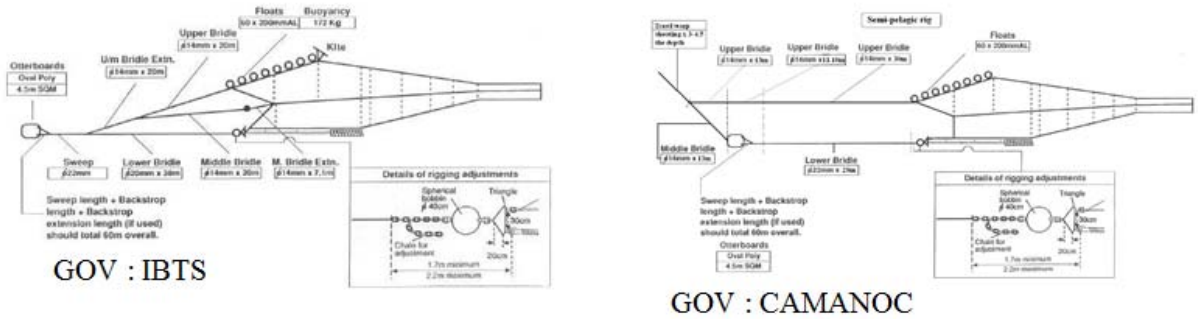

Figure 3 : semi-pelagic rigging. No kite on the headline. "Polyfoil" doors

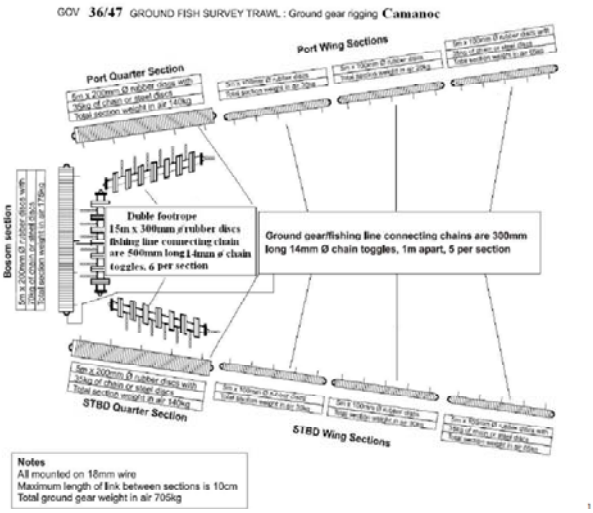

Figure 4 : Double groundrope (= 2 x IBTS GOV with larger rubber disk in lower section)

From this annual survey, indices may be used in the MSFD, for DCF biological sampling of fish, and as time series developed, they could be used for fish abundance indices in the 7E area for ICES WG. Data from this survey which will be send to the DATRAS database. Although no formal request have been made yet, the review of ICES working groups ToRs have highlighted a number of potential users for the data: WGCSE, WGNEW, WGCEP, WGWIDE, WGscallop, HAWG (data for sprat in the English Channel), WGHMM,WGEF,WGHANSA (sardine in the Western English Channel).

Several surveys cover adjacent areas at the same period of the year. The CGFS in October covers the Eastern English Channel and EVHOE in October/November, covers a part of the Celtic Sea and areas bordering the Western Channel. CAMANOC will complete the spatial covering and combined indices from all these surveys could help to solved migratory problems for some stocks. The survey will address issues concerning incomplete spatial coverage (and migratory interrogation) of stocks such as cod (Celtic sea – Western - Eastern channel), red mullet (western-eastern channel), cuttlefish (western-eastern channel winter migration), cephalopods juvenile index across the channel, rays and sharks (distribution patterns of threatened populations), sprat biology in the western English channel. There is also some questions about the size of the scallop grounds that may be addressed during the first CAMANOC survey where benthic dredging will also take place.

In terms of the gear, the modifications were introduced in the standard GOV net in order to adapt it to the rough bottom the Western Channel. The double groundrope was choosen because it seems more adapted than the rock-hopper type D gear with 16” disks to catch juveniles and mega-benthos. Because of it strength, it is regularly used by fishermen in this area. Furthermore, the rock-hopper type D is not believed to be well adapted to a number of areas of the Western English Channel due to the presence of boulders. The choice of a "new" groundrope" is a compromise to carry out a survey in an area where no fishery independant data is available until now.

Annex 8: Table: IBTSWG and WGBEAM reply to OSPAR Request

Table A.8.1 **Possible contributions of the ICES International Bottom Trawl Surveys and Beam Trawl Surveys to reporting under the MSFD, specifically with regard to biodiversity-related indicators. Indicators selected, based on nomenclature in EU-COM 477/2010 (left-hand column); matching OPSAR indicator ID (2nd column); distinction of core and candidate indicators as identified by OSPAR; IBTS / Beam Trawl data availability from surveys coordinated by the surveys expert groups.**

MSRL (EU-COM 477/2010) Indicator ID	**OSPAR** Indicator ID	**Name**	**OSPAR** Core/Cand.		**Data availability**					
					North Sea	**Northeastern Atlantic**	**Western UK Waters**	**France/Biscay**	**Adriatic**	**Inshore**
1.2.1	FC-1	Population abundance/biomass of a suite of selected species	Core	IBTS	No population estimates (see assessments for those). But abundance estimates per hour of various fish species. Accuracy is species-dependent.	No population estimates (see assessments for those). But abundance estimates per hour of various fish species. Accuracy is species-dependent.				
				WGBEAM	No population estimates (see assessments for those). Abundance (per square km) estimates for various fish species can be supplied. Accuracy is species-dependent.		No population estimates (see assessments for those). Abundance (per square km) estimates for various fish species can be supplied. Accuracy is species-dependent.	No population estimates (see assessments for those). Abundance (per square km) estimates for various fish species can be supplied. Accuracy is species-dependent.	No population estimates (see assessments for those). Abundance (per square km) estimates for various fish species can be supplied. Accuracy is species-dependent.	The area covered is spatially restricted but will give addtional information not available from other survey sources. Abundance (per square km) estimates for various fish species can be supplied. Accuracy is species-dependent.
4.2.1	FC-2; FW-3	OSPAR EcoQO for proportion of large fish (LFI)	Core	IBTS	Yes	Yes				
				WGBEAM	Yes - cut-off point and reference limit needs to be defined by survey		Yes - cut-off point and reference limit needs to be defined by survey	Yes - cut-off point and reference limit needs to be defined by survey	Yes	Yes - cut-off point and reference limit needs to be defined by survey
3.3.2	FC-3	Mean maximum length of demersal fish and elasmobranchs	Core	IBTS	Yes	Yes				
				WGBEAM	Yes		Yes	Yes	Yes	Yes
N.A. (related to 4.3.1)	FC-4	By-catch rates of Chondrichthyes	Candidate	IBTS	not relevant for surveys	not relevant for surveys				
				WGBEAM	not relevant for surveys		not relevant for surveys	not relevant for surveys	not relevant for surveys	not relevant for surveys
N.A. (related to 4.3.1)	FC-5	Conservation status of elasmobranch and demersal bony-fish species (IUCN)	Candidate	IBTS	No population estimates (see assessments for those). But abundance estimates per hour of various fish species. Accuracy is species-dependent.	No population estimates (see assessments for those). But abundance estimates per hour of various fish species. Accuracy is species-dependent.				
				WGBEAM	No population estimates (see assessments for those). Abundance (per square km) estimates for various fish species can be supplied. Accuracy is species-dependent.		No population estimates (see assessments for those). Abundance (per square km) estimates for various fish species can be supplied. Accuracy is species-dependent.	No population estimates (see assessments for those). Abundance (per square km) estimates for various fish species can be supplied. Accuracy is species-dependent.	No population estimates (see assessments for those). Abundance (per square km) estimates for various fish species can be supplied. Accuracy is species-dependent.	The area covered is spatially restricted but will give addtional information not available from other survey sources. Abundance (per square km) estimates for various fish species can be supplied. Accuracy is species-dependent.
1.3.1; 3.3.1	FC-6	Proportion of mature fish in the populations of all species sampled adequately in international and national fish surveys	Candidate	IBTS	Yes, for IBTS target species, but depending on species-specific maturation process and hence sampling time (quarter)	Yes, for IBTS target species, but depending on species-specific maturation process and hence sampling time (quarter)				
				WGBEAM	No - surveys outside of the spawning period and gear selectivity issues		No - surveys outside of the spawning period and gear selectivity issues	No - surveys outside of the spawning period and gear selectivity issues	No - surveys outside of the spawning period and gear selectivity issues	No - surveys outside of the spawning period and gear selectivity issues
1.1.1	FC-7	Distributional range of a suite of selected species	Candidate	IBTS	Yes	Yes				
				WGBEAM	Yes		Yes	Yes	Yes	Yes
1.1.2	FC-8	Distributional pattern within range of a suite of selected species	Candidate	IBTS	Yes, according to spatial resolution of the survey	Yes, according to spatial resolution of the survey				
				WGBEAM	Yes, according to spatial resolution of the survey		Yes, according to spatial resolution of the survey	Yes, according to spatial resolution of the survey	Yes, according to spatial resolution of the survey	Yes, according to spatial resolution of the survey
possibly related to 1.7.1 or 4.3.1	FW-4	Changes in average trophic level of marine predators (cf MTI)	Core	IBTS						
				WGBEAM	calculation of relative abundance is possible		calculation of relative abundance is possible	calculation of relative abundance is possible	calculation of relative abundance is possible	calculation of relative abundance is possible
1.7.1; 4.3.1	FW-7	Fish biomass and abundance of dietary functional groups	Candidate	IBTS	Biomass and abundance estimates per hour or distance fished of various fish species dependent on definition of dietarey functional groups	Biomass and abundance estimates per hour or distance fished of various fish species dependent on definition of dietarey functional groups				
				WGBEAM	Biomass and abundance estimates per square km of various fish species dependent on definition of dietary functional groups.		Biomass and abundance estimates per square km of various fish species dependent on definition of dietary functional groups.	Biomass and abundance estimates per square km of various fish species dependent on definition of dietary functional groups.	Biomass and abundance estimates per square km of various fish species dependent on definition of dietary functional groups.	Biomass and abundance estimates per square km of various fish species dependent on definition of dietary functional groups.
could be realted to 4.2.1; 4.3.1	FW-8	Changes in average faunal biomass per trophic level (Biomass Trophic Spectrum)	Candidate	IBTS	Data on biomass per haul for all fish species					
				WGBEAM	Data on biomass per haul for fish species and benthic organisms available for some surveys and some years		Data on biomass per haul for fish species and benthic organisms available for some surveys and some years		Data on biomass per haul for fish species and benthic organisms available for some surveys and some years	Data on biomass per haul for fish species available. Epi-benthic biomass aviable for some surveys
1.2.1	B-1	Species-specific trends in relative abundance of non-breeding and breeding marine bird species	Core	IBTS						
				WGBEAM						
1.1.2	B-6	Distributional pattern of breeding and non-breeding marine birds	Core	IBTS						
				WGBEAM						

Comment for all entries: Limited (like all survey data) by the catachbility of the gear for the species in question

Table A.8.2 **Possible contributions of the ICES International Bottom Trawl Surveys and Beam Trawl Surveys to reporting under the MSFD, specifically with regard to biodiversity-related indicators. Indicators selected, based on nomenclature in EU-COM 477/2010 (left-hand column); matching OPSAR indicator ID (2nd column); distinction of core and candidate indicators as identified by OSPAR; possible improvement of data availability in each of the survey areas if extra effort was allocated to the IBTS / Beam Trawl surveys, respectively.**

MSRL (EU-COM 477/2010) Indicator ID	OSPAR Indicator ID	Name	OSPAR Core/Cand.		Possible improvment with extra effort				Possible improvement with extra effort			
					North Sea		Northeastern Atlantic		Western UK Waters	France/Biscay	Adriatic	Inshore
1.2.1	FC-1	Population abundance/biomass of a suite of selected species	Core	IBTS	Abundance per swept area will be possible when CPUE data from IBTS are additionally given per swept area (presently per hour fished).	For some species, presently not always reported to species level (e.g. squids, gobies), species could be collected for taxonomic ID on shore.	Abundance per swept area will be possible when CPUE data from IBTS are additionally given per swept area (presently per hour fished).	For some species, presently not always reported to species level (e.g. squids, gobies), species could be collected for taxonomic ID on shore.				
				WGBEAM	improve precision of relative abundance estimate by use of co-variates				improve precision of relative abundance estimate by use of co-variates	improve precision of relative abundance estimate by use of co-variates	improve precision of relative abundance estimate by use of co-variates	improve precision of relative abundance estimate by use of co-variates
1.3.1; 3.3.1	FC-6	Proportion of mature fish in the populations of all species sampled adequately in international and national fish surveys	Candidate	IBTS	For additional species theoretically possible, but requires extra resources for acquisition of maturity data. Guidelines needed for maturity keys / spawning times	For additional species theoretically possible, but requires extra resources for acquisition of maturity data. Guidelines needed for maturity keys / spawning times.						
				WGBEAM	histological analysis at sea (ICES 2012;1 and 2012;2) during sampling of macro-scopic maturity sampling. And/or back calculating size at maturity from data collected during spawning season. For summer spawning species a validated maturty key				histological analysis at sea (ICES 2012;1 and 2012;2) during sampling of macro-scopic maturity sampling. And/or back calculating size at maturity from data collected during spawning season. For summer spawning species a validated maturty key	histological analysis at sea (ICES 2012;1 and 2012;2) during sampling of macro-scopic maturity sampling. And/or back calculating size at maturity from data collected during spawning season. For summer spawning species a validated maturty key	histological analysis at sea (ICES 2012;1 and 2012;2) during sampling of macro-scopic maturity sampling. And/or back calculating size at maturity from data collected during spawning season. For summer spawning species a validated maturty key	
possibly related to 1.7.1 or 4.3.1	FW-4	Changes in average trophic level of marine predators (cf MTI)	Core	IBTS	Samples for fish predators can be provided (for stomach analyses or tissue samples for stable isotope analysis); sample processing requires extra analytical effort.	Samples for fish predators can be provided (for stomach analyses or tissue samples for stable isotope analysis); sample processing requires extra analytical effort.						
				WGBEAM	Samples for fish predators can be provided (for stomach analyses or tissue samples for stable isotope analysis); sample processing requires extra analytical effort.				Samples for fish predators can be provided (for stomach analyses or tissue samples for stable isotope analysis); sample processing requires extra analytical effort.	Samples for fish predators can be provided (for stomach analyses or tissue samples for stable isotope analysis); sample processing requires extra analytical effort.	Samples for fish predators can be provided (for stomach analyses or tissue samples for stable isotope analysis); sample processing requires extra analytical effort.	Samples for fish predators can be provided (for stomach analyses or tissue samples for stable isotope analysis); sample processing requires extra analytical effort.
1.7.1; 4.3.1	FW-7	Fish biomass and abundance of dietary functional groups	Candidate	IBTS	Extra effort if individual fish weights of non-target species are needed	Extra effort if individual fish weights of non-target species are needed						
				WGBEAM	Extra effort if individual fish weights of non-target species are needed.				Extra effort if individual fish weights of non-target species are needed.	Extra effort if individual fish weights of non-target species are needed.	Extra effort if individual fish weights of non-target species are needed.	Extra effort if individual fish weights of non-target species are needed.
could be realted to 4.2.1; 4.3.1	FW-8	Changes in average faunal biomass per trophic level (Biomass Trophic Spectrum)	Candidate	IBTS								
				WGBEAM	full benthic sort and sampling possible with extra resource				full benthic sort and sampling possible with extra resource	full benthic sort and sampling possible with extra resource	full benthic sort and sampling possible with extra resource	full benthic sort and sampling possible with extra resource
1.2.1	B-1	Species-specific trends in relative abundance of non-breeding and breeding marine bird species	Core	IBTS	Yes, some vessels in IBTS may be able to take bird observers aboard (however, acoustic surveys or ichthyoplankon surveys may be advantageous for seabird observations).	Yes, some vessels in IBTS may be able to take bird observers aboard (however, acoustic surveys or ichthyoplankon surveys may be advantageous for seabird observations).						
				WGBEAM	Yes, some surveys in WGBEAM may be able to take bird observers aboard (however, acoustic surveys or ichthyoplankon surveys may be advantageous for seabird observations).				No	No	No	No
1.1.2	B-6	Distributional pattern of breeding and non-breeding marine birds	Core	IBTS	Yes, some vessels in IBTS may be able to take bird observers aboard (however, acoustic surveys or ichthyoplankton surveys may be advantageous for seabird observations).	Yes, some vessels in IBTS may be able to take bird observers aboard (however, acoustic surveys or ichthyoplankon surveys may be advantageous for seabird observations).						
				WGBEAM								