

# ICES WGBEAM REPORT 2014

SCICOM STEERING GROUP ON ECOSYSTEM SURVEYS SCIENCE AND TECHNOLOGY

ICES CM 2014/SSGESST:09

REF. SCICOM & ACOM

## Report of the Working Group on Beam Trawl Surveys (WGBEAM)

6–9 May 2014

Hamburg, Germany



**ICES**

International Council for  
the Exploration of the Sea

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l'Exploration de la Mer

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Recommended format for purposes of citation:

ICES. 2015. Report of the Working Group on Beam Trawl Surveys (WGBEAM), 6-9 May 2014, Hamburg, Germany. ICES CM 2014/SSGESST:09. 168 pp.

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## Executive summary

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The meeting of the Working Group on Beam Trawl Surveys (WGBEAM) took place from 6–9 May 2014 in Hamburg, Germany. The meeting attended by 10 people representing six countries and the ICES Data Centre, and chaired by Kelle Moreau, Belgium. Data from nine offshore and seven inshore surveys were discussed (all surveys under WGBEAM coordination).

WGBEAM 2014 provided standard output under the form of updated abundance index time-series for sole and plaice in the offshore and inshore beam trawl surveys, and progressed on the revision of the combined inshore indices for sole and plaice (with focus on the German contribution to these indices). In addition, the annual output on spatial sampling coverage and the distribution of a selection of fish species was updated. Further attention was directed towards the analysis of changes in mean length-at-age for sole and plaice in the North Sea and the Eastern English Channel.

In relation to DATRAS, the currently programmed index calculation methods were compared with the English and German methods, and calculated data products from DATRAS (for both assessments and WGBEAM) were further developed.

Updated maps were included in the offshore beam trawl manual.

In response to specific requests made to WGBEAM 2014, the group updated the SSGIEOM survey list and composed an overview detailing the usefulness of beam trawl surveys for biodiversity studies, and reflected on the new Marine Litter reporting format and the relevance of beam trawl survey data for the effect of pulse fishing.

Finally, a joint session with WGCran led to plans for overlapping tows of the Dutch and German D(Y)FS from 2014 onwards.



Participants of WGBEAM 2014, from left to right: Gérard Biais, Loes Bolle, Ingeborg de Boois, Robert Bush, Vaishav Soni, Giuseppe Scarcella, Brian Harley, Holger Haslob, Kelle Moreau and Kay Panten.

## 1 Administrative details

**Working Group name**

Working Group on Beam Trawl Surveys (WGBEAM)

**Year of Appointment**

2014

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

1

**Chair(s)**

Kelle Moreau, Belgium

**Meeting venue**

Hamburg, Germany

**Meeting dates**

6–9 May 2014

## 2 Terms of Reference a) – e)

### 2.1 Multi-annual Terms of Reference

**2013/2MA/SSGESST05** The **Working Group on Beam Trawl Surveys (WGBEAM)**, chaired by Kelle Moreau, Belgium, will meet in Hamburg, Germany, 6–9 May 2014, to work on ToRs and generate deliverables as listed in the Table below.

WGBEAM will report on the activities of 2014 by 10 July 2014 to SCICOM, WGISUR and ACOM.

**ToR descriptors**

ToR	Description	Background	Science Plan topics addressed	Duration	Expected Deliverables
a	Tabulate, report and evaluate population abundance indices by age-group for sole and plaice and other species if required in the North Sea, Division VIIa and Divisions VII-d-g, taking into account the key issues involved in the index calculation.	Required to support indices for assessments	113, 121, 141, 144, 161, 162, 173, 211, 251, 252, 311, 321	Annually	WG report chapter



b	Further coordinate and standardize offshore and coastal beam trawl surveys in the North Sea and Divisions VIIa, VIId-g, VIIa-b and the Adraitic, and update and publish a the standard as a SISP protocol.	Required to ensure consistent approach within and between areas to meet EU directives.	113, 121, 141, 144, 161, 162, 173, 211, 251, 252, 311, 321	Annually	WG report chapter inshore manual offshore manual database (DATRAS)
c	Analyse the changes in mean length-at-age for sole in the North Sea, English Channel, Bristol Channel and Irish Sea.	a). The large WGBEAM dataset has the potential to elucidate temporal and spatial changes in population parameters. b). Indices are being used by assessments working groups and any changes to age structure of species of interest need to be investigated.	145	Expected output in 2015	WGBEAM 2014 update and ultimately ASC presentation
d	Provide index calculations based on DATRAS for plaice and sole for the North Sea.	Required to support indices for assessments	141, 143, 144	2 years for sole 3 years for plaice	Provision of new indice series to WGNSSK
e	Assess the opportunities for providing plaice and sole index calculations based on DATRAS for all other areas.	Required to support indices for assessments	141, 143, 144	3 years	Provision of new index series to relevant WGs

## 2.2 Review of WGBEAM 2013 recommendations and actions

### *Recommendations*

1. To change the *AphiaID* for *Crossaster* into 123336 and to change the scientific names of *Leptasterias muelleri*, *Phycidae* and *Loligo forbesii* in the correct names.

The recommended changes have been made by the ICES Data Centre.

2. It is recommended that ICES Data Centre adds an extra column to the Exchange file containing the accepted WoRMS coding or the accepted scientific name for all data stored in DATRAS so data downloaders do not have to work with two different taxonomic coding systems.

During WGBEAM 2014, the extra column containing the accepted WoRMS codes has been added to the Exchange files by the ICES Data Centre for all data stored in DATRAS.

3. To create the "flat file" proposed by WKDATR (see Section 4.2.4 of WKDATR 2013 report) as soon as possible.

The flat file was not yet created prior to WGBEAM 2014, as the ICES Data Centre was still waiting for info from the IBTSWG on the required structure of this file. WGBEAM however, feels that we do not need to wait for that, and can proceed with creating the 'BTS flat file'.

*4. To change the codes for the unaccepted names to the accepted name codes for the species in the BTS and BTS-VII dataset.*

The ICES Data Centre (see recommendation 2 above) carried out this recommendation.

*5. As the differences in coding (TSN vs. WoRMS, accepted codes vs. unaccepted codes) might not only influence DATRAS but also other databases hosted by ICES, it is recommended that ICES Data Centre and DIG define the most suitable way for ICES Data Centre, data-submitters and data-users to cope with the frequent updates of WoRMS.*

Has been ensured by ICES Data Centre.

*6. WGBEAM feels we have an important role to play in the MSFD but there seems to be little guidance available. It is recommended that SCICOM provide opportunities for cooperation in the development of MSFD related issues.*

As ACOM-alternate for Belgium, Kelle Moreau made sure that the BTS was well represented in the ACOM advice (2013) addressing the "OSPAR special request on maximizing the use of available sources of data for monitoring of biodiversity". WGBEAM however did not receive further specific guidance from SCICOM regarding opportunities for cooperation in the development of MSFD related issues.

*7. WGBEAM recommends that if time and weather allows, overlapping hauls should be carried out by countries operating in the same area.*

We all agree with the principle, and try to realize this as opportunities arise.

*8. The current products for the BTS and BTS-VIIa at datras.ices.dk have not been validated by WGBEAM, and are in some cases incorrect. WGBEAM recommends that the current products should be removed from the DATRAS webpage and be replaced by new products as proposed below.*

The unvalidated and/or erroneous products have been removed from the DATRAS webpage, and progress has been made with respect to the calculation methods intersessionally. For some products, this process has been finalized during WGBEAM 2014 (see Section 5.6.4).

*9. WGBEAM recommends that the Methods Working Group (WGMG) decides on the format of survey sampling variance required for use at assessment working groups. If possible the methodology to calculate this variance should also be produced.*

This recommendation has not been addressed, and will be repeated. As the format of survey sampling variance depends on the survey design, stratification, etc., WGBEAM acknowledges that there is probably no 'one-size-fits-all'-solution for this difficult issue. Currently, weighted standard deviations can be calculated, but these do not seem to be used by anybody.

### ***Actions***

1. Cross-check the distance and duration information for the complete offshore dataset in DATRAS, and resubmit data where appropriate.
2. Resubmit files containing -9 for Ground Speed with the standard survey speed following the manual.
3. Mismatching information on datatype and subfactor should be checked by the country responsible and changed as soon as possible in DATRAS, by resubmitting the data.

These three actions are ongoing for all countries that currently have beam trawl survey data in DATRAS (ENG, GFR and NED).

4. All countries to upload all species caught during the beam trawl surveys, if necessary by resubmitting files from earlier years.

Ongoing for ENG, GFR and NED. BEL and FRA have no data in DATRAS yet and should first focus on the fish data, files including other species will be resubmitted at a later stage for these countries.

5. During WGBEAM 2014, Germany reconsider which areas are included in the German DYFS indices and update appropriately.
6. Reconsider not applying area-based weighting for the German DYFS indices.
7. Revise the combined inshore indices using the revised German indices.

Actions 5–6 have been addressed during WGBEAM 2014, and the work is to be continued at WGBEAM 2015 (see Section 5.1.2.3–4).

### ***Actions related to index calculations BTS from DATRAS, carry out before 1/2/2014.***

1. Send the selection of rectangles for which an index has to be created to ICES Data Centre.

This action, that was relevant to ENG, was carried out.

2. Provide allocation of statistical rectangles to ALK areas of Dutch index calculation to England, Germany and Belgium.

Completed by NED.

3. Apply the current calculation to:
  - a. the Dutch BTS data for plaice and sole for the full time-series and compare with Dutch index series. Differences due to data should be solved by resubmitting data and differences due to different data selection might be solved by fine-tuning the current code.
  - b. the English BTS data for plaice and sole and compare with the English index series. Differences due to data should be solved by resubmitting data. Differences not caused by differences in data should be discussed during WGBEAM 2014, to see the impact of the differences.
  - c. to the German BTS data and send the data to TI for review.
  - d. to the Belgian BTS data if uploaded in DATRAS and send the data to ILVO for review.

Important progress has been made with respect to the calculation of Dutch BTS indices for North Sea sole (and initiated for plaice), English BTS indices for North Sea sole (and initiated for plaice, and for both species in the other areas with English BTS), and German BTS indices for North Sea sole from DATRAS. Differences between nationally constructed indices and indices calculated from DATRAS have been partially solved, and the remaining differences were discussed during WGBEAM 2014. This action is to be continued in 2015.

## 2.3 Review of other recommendations to WGBEAM 2014

1. WGEF 2013: *An improved knowledge of the spatial distribution and movements of demersal elasmobranchs is required to better understand stock units and so aid in the assessment process. Hence, WGEF recommends that PGCCDBS, WGBEAM and IBTSWG consider whether a tag-and-release programme could be implemented on selected, existing scientific trawl surveys. In the first instance, such a programme could usefully be introduced for the following four species: tope *Galeorhinus galeus*, small-eyed ray *Raja microocellata*, blonde ray *Raja brachyura* and undulate ray *Raja undulata*.*

All countries carrying out beam trawl surveys in the ICES Areas are willing and able to implement tag-and-release programmes on their surveys, although national legislation sometimes complicates such activities (e.g. need for special permits, obligation to sedate animals before tagging). Additionally, the species mentioned are also very rare to absent in some of the areas covered by beam trawl surveys. FRA reports very low catch rates of rays on the ORHAGO-survey, and almost no returns from the survey in their undulate ray tagging programme in the Bay of Biscay (more returns from commercial longline fisheries). WGBEAM would like to receive guidance by WGEF on the required numbers of individuals that should be tagged to ensure that scientifically meaningful programmes can be set up (all for rare species that are only caught incidentally? maximum numbers?). Most WGBEAM countries have already engaged in tagging of demersal elasmobranchs in the past, but up to date no overview has been compiled. Detailed information on these programmes will be collated at WGBEAM 2015 for the attention of WGEF.

2. WKMSSEL 2013: *From now onward, analyse maturity stage data according to the scales herein proposed in order to validate its application for stock assessment modelling (see chapter 7 for more details).*

All beam trawl surveys are carried out in the period late July – November. The WGBEAM countries stopped collecting maturity information for most species on these surveys as reliable macroscopic maturity staging can only be done from two to three months prior to spawning till the spawning season (WKMSSEL 2013 and WKMSSTB 2012). For most species for which biological data are being collected at the beam trawl survey, the survey timing is outside the defined period. Exceptions apply to summer spawners as lemon sole, and to the French and Italian/Croatian survey that both take place in November.

For elasmobranch species, the proposed maturity scales encompass that female elasmobranchs have to be killed to study their ovaries, oviductal glands and uteri, and as many elasmobranch species have a PET-status WGBEAM is reluctant to add routine maturity staging of elasmobranchs following the WKMSSEL-scales to the on-board protocols for beam trawl surveys. A third issue is that the maturity field in the trawl survey database DATRAS is currently configured for 4-stage maturity scales. Maturity scales consisting of more than 4 stages, or with subdivisions of certain stages, cannot be reported to DATRAS unless WKMSSEL (or WGEF) informs the ICES Data Centre that it should be made possible to report more than 4 different maturity stages.

3. WGISDAA 2013: *Survey planning groups should refer problems with design or index calculation to WGISDAA.*

WGBEAM has already reported some index-related issues to WGISDAA in the past, but never received a clear response. It is acknowledged that WGISDAA had very few participants in recent years, and that more detailed information (working documents) needs to be sent in order to be discussed.

4. *WKESST 2013*: The survey expert groups need to develop an implementation plan for the development of the survey protocols (See Section 4.8 in the 2013 WKESST report).

See Section 5.2.3.

## **2.4 Other requests to WGBEAM 2014**

### **2.4.1 Joint WGBEAM – WGCran session**

In response to a WGCran request, WGBEAM 2012 recommended that a power analysis should be carried out to identify the number of hauls needed to investigate the differences in brown shrimp abundances between the German and Dutch inshore survey gears. This power analysis was intended to be carried out intersessionally in collaboration with WGCran and to be presented at WGBEAM in 2013, but was not performed. Therefore, WGBEAM and WGCran met back-to-back in Hamburg, Germany in 2014, to allow key members of both groups to concentrate on this issue as a matter of priority.

A brief summary of the outcomes of the joint WGBEAM – WGCran session can be consulted in Section 5.6.1.

### **2.4.2 SSGIEOM survey list**

WGBEAM was requested to complete the SSGIEOM survey document, listing all surveys under WGBEAM coordination and the fish stocks for which these delivers assessment indices. See also Section 5.6.2.

### **2.4.3 ACOM Biodiversity request**

ACOM requested the ICES Data Centre what data are available in DATRAS in relation to the MSFD Descriptors 1, 4 and 6 on Biodiversity. The Data Centre collected some figures from DATRAS, and subsequently requested confirmation from the national survey experts that the information is indeed reflecting the way sampling has been conducted in the past and now. For the beam trawl surveys, the survey experts (all WGBEAM attendees) decided to collate the information during the 2014 WGBEAM meeting with respect to the following questions:

- Are all species that are documented during the surveys reported to DATRAS (for both current and historical data)?
- Are all species records available in the national institutes?

Additionally, a specification of ‘all species’, as interpreted by the group, was requested.

The WGBEAM 2014 response to this request can be found in Section 5.6.3.

### **2.4.4 DATRAS data products**

Following up on WGBEAM 2013, the original standard BTS and BTS VIIa products were removed from the DATRAS webpage. WGBEAM decided on the standard products that should be available for different user groups. More information can be found in Section 5.6.4.

### **2.4.5 Marine litter**

WGBEAM was asked by ICES Data Centre (Marilynn Sorensen) to provide feedback on the reporting format for litter information.

The MSFD national monitoring programmes have to be established in autumn 2014, and litter collection will most likely be put onto existing monitoring programmes. Currently, during the English, Belgian, German and Dutch (only Tridens) offshore beam trawl surveys information on litter from fish trawls (macro-litter) is being collected. See Section 5.6.5.

#### **2.4.6 Relevance of survey data for the effects of pulse fishing in the south-western North Sea**

As pulse fishing has been introduced in the Dutch North Sea commercial beam trawl fleet since 2011, WGBEAM was requested to reflect on the relevance of survey data for the effects of pulse fishing in the Southwestern North Sea. This request is addressed in Section 5.6.6.

### **3 Summary of Work plan**

**Table 3.1 Summary of WGBEAM workplan.**

Year 1	Annual standard outputs for a,b. Continue analysis for ToR c,d,e.
Year 2	Annual standard outputs for a,b. Continue analysis for ToR c,d,e sole index output for North Sea.
Year 3	Annual standard outputs for a,b. Combine analysis for previous year and report ToR c.

### **4 List of Outcomes and Achievements of the WG in this delivery period**

- Update and interpretation of abundance index time-series for sole and plaice in offshore and inshore beam trawl surveys
- Progress on the revision of the combined inshore indices for sole and plaice regarding the German part of these indices (area-expansion, area-weighting)
- Overview of results from 2013 offshore and inshore beam trawl surveys
- Update of offshore beam trawl manual
- Analysis of the changes in mean length-at-age for sole and plaice in the North Sea and the Eastern English Channel
- Comparison of DATRAS index calculation methods (based on Dutch method) with English and German index calculation methods
- Joint session with WGCRAN lead to plans for comparative tows of the Dutch and German D(Y)FS in 2014 (and later)
- Response to recommendations from WGISDAA, WKDATR, WKMSSEL and WKESST
- Response to requests from SSGIEOM (update of survey list) and ACOM (info on usefulness of beam trawl surveys for biodiversity studies)
- Progress on creation of data products from DATRAS
- Feedback on new Marine Litter reporting format and relevance of beam trawl survey data for the effect of pulse fishing

## 5 Progress report on ToRs and workplan

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### 5.1 Tabulate, report and evaluate population abundance indices by age-group for sole and plaice and other species if required in the North Sea, Division VIIa and Divisions VIId–g, taking into account the key issues involved in the index calculation (ToR a)

#### 5.1.1 Abundance indices by age-group for plaice and sole for the offshore surveys

Figures 5.1.1.1–5.1.1.2 and Tables 5.1.1.1–5.1.1.2 in Annex 5 present the abundance indices by age for sole and plaice from each of the offshore survey areas separately, updated with the indices for 2013.

The revision history until 2012 can be found in the WGBEAM 2013 report (ICES, 2013) and preceding WGBEAM reports.

##### 5.1.1.1 Sole

##### North Sea – Subarea IV

Time-series trends for sole in the North Sea, based on the Netherlands Isis offshore survey, are shown in Figure 5.1.1.1a in Annex 5.3. This survey indicates that recent year classes have been mainly poor with eight of the year classes in the latest decade (2003–2012) below the long-term arithmetic mean at all ages. The 2009-year class, with an above average number of one year olds in 2010 for the first time since 1997, appears clearly at age 4+ in 2013 with above average numbers at this age only for the second time since 2000. Also the year class 2010, characterized by numbers-at-age 1 slightly above average in 2011, lives on in the population and becomes visible at age 3 in 2013 (above average for the third time since 2000). The number of one year olds in 2013 however (year class 2012), was below the long-term average and among the lowest values ever recorded. The spatial coverage of the Netherlands Tridens survey makes it unsuitable for monitoring sole abundance.

Time-series trends for sole in the Southern North Sea, based on the UK offshore survey, are depicted in Figure 5.1.1.1b in Annex 5.3. In addition, the number of one-year olds was below the long-term mean in 2013 but double of the value observed in 2012. The year classes 2009 and 2010 seem less strong in this part of the North Sea compared to the Dutch Isis survey area, both being around average at age 1 but below average at age 2. The 2010-year class however does appear above average at age 3 in 2013, with the highest value observed in the series.

##### Western Waters – Subarea VII

The indices for sole from area VII stocks are summarized in Figure 5.1.1.1c-f in Annex 5.3.

##### Division VIId

After three years (2009–2011) during which the relative abundance of sole in the Eastern English Channel was either at or above the time-series averages across all age groups, this trend did not continue in 2012 and in 2013, when the numbers of one and two year olds were far below the long-term averages, with the number of one year olds (the incoming year class 2012) being the second lowest of the time-series. The 3 year olds have increased in abundance in 2013 to the highest value observed in the entire

time-series, creating the perception that the relatively good 2010-year class is still present in the population. The relative good 2009-year class now appears in the 4+ group, presenting the highest value observed in this dataserie. The relative abundances for the 1 – 3 age groups have been quite variable over time, what can often be attributed to strong 1 group recruitments that can be followed through from one year to the next.

#### **Division VIIe**

In the Western English Channel, sole basically shows the same trends as observed in the Eastern English Channel. In this Division, relative abundances for 2013 are below the time-series averages for ages 1 to 3, with the number of one year olds (incoming year class 2012) being the second lowest of the series in this case. The 3 year olds have decreased in abundance in 2013 compared to the exceptionally large number of 2011, and are below the long-term average. The large numbers in the 4+ group in 2013 (around the highest value ever observed), and the preceding large numbers of three year olds in 2012 and two year olds in 2011, can be less easily explained as the recruitment-at-age one (2008 year class) was not higher than in the surrounding years in 2009. The phenomenon of group 1 peaks not following through at older ages in the subsequent years has been noticed before in this area, namely with respect to the good incoming year classes 1995 and 2002 (visible at age 1 in 1996 and 2003 respectively).

#### **Division VIIf**

The relative abundances the age groups 2 and 4+ of sole in the Bristol Channel are above time-series averages in 2013. The abundance of the 3 group is below the long-term average, which reflects the low 2 group abundance recorded in 2012 that was also visible at age 1 in 2011 (the relative poor year class 2010). The abundance of the 4+ group in 2013 was around the same level of the value recorded in 2004 (being the sixth highest value of the time-series), although this 2008 year class was not picked up as exceptionally strong at age 1 in 2009. The incoming recruitment-at-age 1 in 2013 was below the long-term average.

#### **Division VIIa**

Of all VII sole stocks, sole in the Irish Sea is clearly in the worst shape according to the beam trawl survey carried out in this Division. In 2013, the abundances have been below the time-series means for all age groups, as observed since 2005. The small increase documented for the age 1 group in 2011 meant a small increase at age 3 in 2013, but all cited values are far below the long-term averages. The numbers for the 4+ group however remain more or less stable at the low 2005–2012 level. As for most other sole stocks, peaks in the abundance of 1 groups can generally be tracked through to following years.

#### **Northern Adriatic Sea**

Figure 5.1.1.1g in Annex 5.3 shows the time-series trends in sole for the Northern Adriatic Sea, based on the SoleMon offshore beam trawl surveys. Although sole otoliths were collected since 2007, for financial constraints it was not possible to analyse these for the age. So age slicing, based on von Bertalanffy parameters (Linf: 39.6; k: 0.44, t0: -0.46), was carried out using LFDA 5.0.

This survey indicates that the 2013 age 0 group of sole in the Northern Adriatic has been the highest ever observed in the time-series (the abundances at this age have only been substantially below the mean in 2006, 2008 and 2010). At age 1, the 2013 cruise yielded the highest index value of the time-series and the abundance was also above



the long-term arithmetic mean for age 2. Age-groups 3–4+ showed lower values than the averages for these ages in 2013, in particular abundance of the 4+ group now dropped to the lowest value ever observed. Cohorts can be tracked relatively well over consecutive years in this survey.

#### **Division VIIIab**

The ORHAGO survey time-series trends of age group abundances of sole in the Bay of Biscay (Figure 5.1.1.1h in Annex 5.3) is marked by the arrival of an above the average year class in 2008 at age 1. The yearly advance in age of this 2007-year class can be followed from age 1 to 3. This year class has also a large contribution to 4+ age group in 2012 and 2013. The lower than average abundance of this year class at age 4, and consecutively the low 4+ group in 2011 is then surprising. The 2009 year is also slightly above the average from age 1 to 4. However, year class 2000 and 2011 abundance are both below the average and both the lower in the time-series at age 2. The succession of two consecutive low year classes after strong ones few years before appears to be a new pattern for this stock which shows a rather stable trend in recruitment-at-age 2, from 1984 onwards, according to XSA estimates.

#### **5.1.1.2 Plaice**

##### **North Sea – Subarea IV**

Figures 5.1.1.2a and 5.1.1.2b in Annex 5.4 show trends in the indices for North Sea plaice from the Netherlands Isis and Tridens surveys. The Isis survey covers mainly the southern North Sea, whereas the Tridens extends substantially further north and west.

The Isis survey indicates that recruitment has been below average in most years since the strong 2001-year class became apparent as one year olds in 2002. In 2013, as detected in 2009 and 2011, the observed number of one year olds was higher than the long-term mean. The Tridens survey confirmed the strong 2001-year class, but also documented a series of six consecutive incoming year classes that were above average from 2007 onwards, including 2013. This pattern is visible at all ages in this survey, and the cohorts can be tracked over time really well. In the inshore Isis survey, this was only the case to a lesser extent, with above average abundances since 2007 only for age 4+. The combined Isis-Tridens index (Figure 5.1.1.2c in Annex 5.4) shows above average numbers-at-ages 1–4+ in 2013, with an increasing trend since the beginning of the 21st century for ages 3 and 4+. It is not clear where the larger numbers of four year olds in 2007–2009 come from in the Tridens and combined indices.

The population abundance series for plaice from the UK offshore survey (depicted in Annex 5.4, Figure 5.1.1.2d), tells a different story for the Southern North Sea. Here, the high incoming year classes 2006 and 2007 are apparent as the biggest in recent years. Consistent with the Dutch surveys is that also the above average incoming year class 2010 (one year olds in 2011) was picked up at age 3 in 2013. Differently from Dutch surveys the number of incoming recruits at age 1 (year class 2012) dropped below the long-term average as previously observed in 2012.

##### **Western Waters – Subarea VII**

The indices for plaice from area VII stocks are summarized in Figure 5.1.1.2e-h in Annex 5.4.

#### **Division VIId**

After a period in which the relative abundances have steadily increased for all age groups over 4–5 consecutive years, this trend was only continued for age 3 in 2013 and stopped for all the other ages in 2012 followed by an increase in 2013, with the exception of age 2. The abundance at age 1 after the dropping observed in 2012, is again in 2013 above the long-term arithmetic mean (year class 2012), the abundances at ages 3 and 4+ are the highest values observed in the time-series respectively as a result of the good year classes 2009 and 2010. Cohorts can be generally well tracked into all or some of the following years in this survey.

#### **Division VIle**

As for the VIId plaice stock, the relative abundance in VIle for all age groups has increased in the last few years (2008–2011), but stopped doing so for ages 1 and 2 in 2012 and 2013, and for age 3 only for 2013. The number of one year olds was the lowest ever of the time-series in this year, and the drop in numbers of 2 year olds is quite clear. On the other hand, the abundances at 4+ was the highest of the time-series in 2013. This can be easily understood as a continuation of the good year class 2009. Before these recent years, the correlation of year groups from one year to the next was poor in this survey.

#### **Division VIIf**

The relative abundance at age 1 increased considerably for plaice in the Bristol Channel in 2013, reaching value similar to what were observed in 2010 and 2011. Such good year classes 2009 and 2010 can be tracked over the years, and produce time-series peaks of 3 and 4+ year olds in 2013. The numbers in the 4+ group are the highest of the entire time-series. Before that, this age group consistently numbered around the mean average abundance of the time-series. Earlier in the survey history, abundance peaks of age 1 fish could not always be tracked over the following years as well as in recent years.

#### **Division VIIa**

The age 1 abundance of plaice in the Irish Sea in 2013 was at the level of long-term average. Since 2002–2003 the abundance figures have remained relatively constant for all age groups (with a lower value for age 1 in 2005–2006 as the main exception), and noticeably above those recorded for the years prior to this date. As opposed to sole in this area, plaice in VIIa seems to be characterized by a healthy stock status, with numbers for the 4+ group in 2010–2013 being the highest of the time-series. Cohorts can be tracked relatively well over consecutive years in this survey.

### **5.1.2 Abundance indices by age-group for plaice and sole for the inshore surveys**

The Belgian Demersal Young Fish Survey (DYFS), the German DYFS and the Dutch Demersal Fish Survey (DFS) together cover most of the coastal and estuarine waters along the continental coast from the French-Belgian border to Esbjerg in Denmark. All these surveys were initiated in the 1970s.

Up to 2010, the three continental surveys and the UK Young Fish Survey (YFS) were combined into international inshore indices for 0 and 1 group plaice and sole. Due to termination of the UK YFS and the spring survey of the German DYFS, the combined 0 group indices are now calculated using Belgian, Dutch and German data, and the combined 1-group indices using Belgian and Dutch data only. The Dutch, and hence

the combined indices, are calculated from 1990 onwards, mainly due to a change in the survey design of the Dutch DFS in 1990. For the WGBEAM 2014 meeting, the Belgian data of the 2013 inshore survey were not readily available. Therefore, a 10 years average of the Belgian time-series (2003 – 2012) was used instead to update the index for 2013.

The Dutch Sole Net Survey (SNS) was initiated in 1970 and samples transects further offshore than the other inshore surveys. The SNS survey area overlaps with those of the Dutch DFS and BTS-Isis.

WGNSSK uses the SNS indices and the combined inshore indices for recruitment estimates of the North Sea plaice and sole stocks. The SNS indices are also used as tuning fleet in the XSA models. The combined inshore indices are considered to be suitable for 0 group plaice and sole, but less suitable for 1 group sole and especially for 1 group plaice, because of the spatial coverage of the survey in relation to the spatial distribution of these age groups. The SNS is considered to be suitable for plaice and sole age groups 1 to 4.

The abundance indices are presented in Annex 6. The combined inshore indices and the SNS indices are plotted for 1990 to 2013 in Figures 1 and 2 in Annex 6 respectively.

#### **5.1.2.1 Sole**

The combined inshore indices for 0 and 1 group sole in 2013 were above average for both age groups (Annex 6, Figure 1 two lower panels). The combined inshore index for 0 group sole was the highest compared to the previous ten years. For 1 group sole the 2013 combined inshore index showed a strong increase and is 75% higher compared to 2012.

The clear increase in abundance observed for age group 1 sole in the combined inshore index was not detected by the SNS survey. The SNS index only showed a slight increase in sole age group 1 abundance. For both age group 1 and age group 2 the observed SNS abundance indices are below the average, while the observed values for age group 3 and 4 are well above average.

#### **5.1.2.2 Plaice**

The combined inshore indices for 0 and 1 group plaice 2013 were below average as in previous years. Compared to 2012, the abundance indices have only decreased slightly for 0 group plaice, and only increased slightly for 1 group plaice. Overall, the combined inshore indices for 0 and 1 group plaice are below average on a rather stable level for the last years.

The SNS plaice index for age group 1 plaice was above average and showed an increase compared to 2012. A decrease was observed in abundance for age group 2, while the abundance indices for age groups 3 and 4 showed an increase and were well above average.

#### **5.1.2.3 Revision of the inshore indices**

There were no revisions to the international index calculation of the inshore indices in 2014.

The revision process of the German DYFS index is still ongoing (see Annex 6.3). Hence, it was decided to keep the old time-series for the time being and to realize the revision

of the index time-series in WGBEAM 2015. Preliminary results of index calculation are displayed in Figure 5.1.2.3.

Revision history overview: The termination of the UK YFS necessitated revision of the combined inshore indices in 2011. Furthermore, the combined 1-group indices had not been calculated since 2005 because of the termination of the German DYFS spring survey. In 2012, surface areas by depth class were re-estimated for the Belgian survey area (WGBEAM, 2013).

The effects of the above-mentioned changes were examined in the 2013 report of WGBEAM (ICES 2013).

The following issues were identified during WGBEAM 2014:

- 1) Include area 414 in the German DYFS index.
- 2) Area based weighting of German DYFS index.
- 3) Update area weighting factor for the combined inshore index.

The revision process is still ongoing. Hence, it was decided to keep the old time-series for the time being and to realize the revision of the index time-series in WGBEAM 2015. Preliminary results of index calculation are displayed in Figure 5.1.2.3.

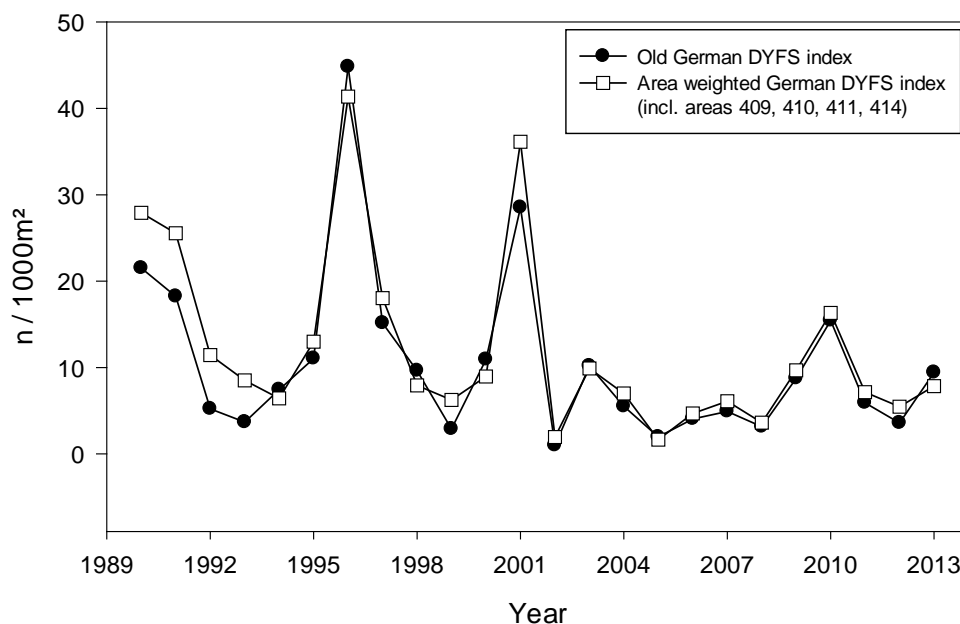


Figure 5.1.2.3. Preliminary results of index revision. Comparison between old and preliminary revised German DYFS index.

#### 5.1.2.4 Evaluation of the (combined) inshore indices

The evaluation needs for the German DYFS indices is described in Annex 6.3. Based on these considerations, WGBEAM recommends the following actions:

- 1) Continue scrutinizing the areas and area weighting in the German DYFS indices calculation and update appropriately before WGBEAM 2015.
- 2) Revise the combined inshore indices using the revised German indices.
- 3) Include area 414 in the German DYFS index.

- 4) Area based weighting of German DYFS index.
- 5) Update area weighting factor for the combined inshore index.

## 5.2 Further coordinate and standardize offshore and coastal beam trawl surveys in the North Sea and Divisions VIIa, VIId–g, VIIa–b and the Adriatic, and update and publish the standard as a SISP protocol (ToR b).

### 5.2.1 Results of 2013 surveys

#### 5.2.1.1 Offshore beam trawl surveys

##### 5.2.1.1.1 Participation and coverage of the area

Nine surveys were carried out, covering the North Sea, VIId, VIIe, VIIf, VIIa, VIIa, VIIb and the Northern Adriatic Sea. The participating vessels and time of the surveys are listed in Table 5.2.1.1.

The coverage of the area by each of the participating countries' surveys and the number of stations sampled in 2013 are shown in Annex 7.1.

Distribution plots for the offshore survey fish species and numbers per hour, by ICES Division, are presented in Annex 7.2. The distribution of Rajidae in the North Sea and Celtic Sea, as recorded from the offshore beam trawl survey catches, can be consulted in Annex 7.3.

**Table 5.2.1.1. Overview of surveys during 2013.**

Country	Vessel	Area	Dates	Gear
Belgium	Belgica	southern North Sea	26 Aug – 6 Sep	4m beam
England	Endeavour	VIId, IVc	11 – 24 July	4m beam + flip-up rope
England	Endeavour	VIIa, VIIf	12 Sept – 3 Oct	4m beam + flip-up rope
England	Carhelmar	VIIe	13 – 13 Oct	4m beam + flip-up rope
France	Gwen Drez	VIIIa, VIIIb	9 Nov – 3 Dec	4m beam
Germany	Solea	German Bight	17 – 28 Aug	7m beam
Italy/Slovenia	G. Dallaporta	Northern Adriatic Sea	30 Nov – 17 Dec	3.5m beam
Netherlands	Tridens	Central North Sea	19 Aug – 12 Sep	8m beam + flip-up rope
Netherlands	Isis	Southern North Sea	5 Aug – 6 Sep	8m beam

##### 5.2.1.1.2 Survey results

A summary of each survey is to be found in Annex 8.

The Belgian offshore survey successfully fished 60 from 62 stations, one tow deemed invalid due to gear damage and one other was not fished due to other commercial fishing activity being present along the tow.

The English eastern English Channel and southern North Sea (VIId, IVc) survey was completed, with 85 stations fished although it was not possible to attempt 3 stations

due to static gear and 1 station was invalid due to the tow duration being under 15 minutes, this tow was not repeated. Both of the other two English offshore surveys, the Irish Sea and Bristol Channel (VIIa, VIIf) survey was successfully completed, although it was necessary to move 2 stations a small distance in order to clear underwater obstructions and by the construction of new wind farms. In total 116 tows were fished and classed valid, made up from 107 standard and 9 additional. The Western English Channel (VIIe) completed all of the desired 58 stations. This is last year of the survey at it has been cut due budgetary constraints.

The French survey completed 53 tows, 49 standard indices and 3 additional tows plus 1 replicate. Unlike previous surveys, no night-time fishing was undertaken.

For the German offshore survey fished 63 stations.

The Dutch offshore surveys, is carried out by two vessels (“Tridens” and “Isis”). The Tridens survey completed 69 tows; bad weather meant three tows were dropped. Isis fished all 80 tows even with encountering bad weather and technical issues during the survey.

The Adriatic survey completed 65 from a total of 67, 18 tows were reduced from the 30 minutes to mitigate the gear damage or from large catches of benthos.

#### 5.2.1.2 Inshore beam trawl surveys

##### 5.2.1.2.1 Participation and coverage of the area

The inshore surveys in the North Sea are carried out by Belgium (Demersal Young Fish Survey-DYFS), Germany (DYFS) and the Netherlands (Demersal Fish Survey-DFS).

The Sole Net Survey (SNS), which is carried out by the Netherlands in the North Sea, is classified as an inshore survey, but ‘nearshore’ may be more appropriate because the area covered is further offshore than the other inshore surveys.

The participating vessels and timing of the cruises are listed in Table 5.2.1.2. Details on areas covered by country are given in Annex 4.2.

**Table 5.2.1.2. Overview of surveys during 2013.**

Country	Vessel	Area	Dates	Gear
Netherlands	Isis	Southern North Sea	5 Aug – 6 Sep	8m beam
Belgium	Simon Stevin	Belgian coastal zone	9 Sep – 19 Sep	6 m shrimp trawl
Germany	BK3 Clupea	German Bight and German Wadden Sea	27 Aug – 30 Sept	3 m shrimp trawl
Netherlands (SNS)	Tridens	Dutch coastal zone	1 Oct – 7 Oct	6 m beam trawl
Netherlands	Schollevaar	Scheldt estuary	7 Sep – 19 Sep	3 m shrimp trawl
Netherlands	Stern	Dutch Wadden Sea	26 Aug – 26 Sep	3 m shrimp trawl
Netherlands	Isis	Dutch coastal zone and German Bight	25 Sep – 30 Aug	6 m shrimp trawl

##### 5.2.1.2.2 Survey Results

A summary of each of the surveys is to be found in in Annex 10.

Belgium got a new research vessel “Simon Stevin”. It replaces the formerly used vessel “Broodwinner”. During the inshore survey, all 33 stations were carried out and all stations were valid.

The German inshore survey did not face any difficulties. Since 2012, the survey area outside the island chain was intensified by using RV ‘Clupea’ in addition to chartered cutters. In 2013, Germany starts age determination on plaice, sole, dab, turbot, brill and flounder.

The Netherlands carried out all planned inshore surveys without any problems.

## 5.2.2 Coordination and standardization of beam trawl surveys

### 5.2.2.1 Offshore beam trawl surveys

#### 5.2.2.1.1 Timing and area coverage

Annex 4.1 lists the offshore surveys together with the geographic area covered, the gear used and date started.

As in previous years, WGBEAM recommends that if time and weather allows, overlapping hauls should be carried out by countries operating in the same area. In 2013, no overlapping hauls were carried out due to time constraints, other priorities and budgetary constraints.

Table 5.2.2.1. Timing of the surveys in 2014.

Country	Vessel	Area	Dates	Gear	Contact
Belgium	Belgica	southern North Sea	25 Aug – 5 Sep	4m beam	<a href="mailto:kelle.moreau@ilvo.vlaanderen.be">kelle.moreau@ilvo.vlaanderen.be</a>
UK	Cefas Endeavour	VIIId, IVc	17 Jul – 21 Jul	4m beam	<a href="mailto:sally.songer@cefas.co.uk">sally.songer@cefas.co.uk</a> Cc: <a href="mailto:robert.bush@cefas.co.uk">robert.bush@cefas.co.uk</a>
UK	Cefas Endeavour	VIIIfg, VIIa	9 Sep – 29 Sep	4m beam	<a href="mailto:ian.holmes@cefas.co.uk">ian.holmes@cefas.co.uk</a> Cc: <a href="mailto:robert.bush@cefas.co.uk">robert.bush@cefas.co.uk</a>
UK	Cefas Endeavour	English Channel	11 Feb – 10 Mar	2x 4m beam	<a href="mailto:Sven.Kupschus@cefas.co.uk">Sven.Kupschus@cefas.co.uk</a> Cc: <a href="mailto:robert.bush@cefas.co.uk">robert.bush@cefas.co.uk</a>
France	Antea	VIIIa, VIIIb	5 Nov – 28 Nov	4m beam	<a href="mailto:yann.coupeau@ifremer.fr">yann.coupeau@ifremer.fr</a> Cc: <a href="mailto:Gerard.Biais@ifremer.fr">Gerard.Biais@ifremer.fr</a>
Germany	Solea	German Bight	11 Aug – 25 Aug	7m beam	<a href="mailto:kay.panten@ti.bund.de">kay.panten@ti.bund.de</a>
Adriatic (Italy-Slovenia)	G. Dallaporta	North Adriatic Sea (GSA 17)	11 Nov – 1 Dec	2x 3.5m modified beam	<a href="mailto:giuseppe.scarcella@an.ismar.cnr.it">giuseppe.scarcella@an.ismar.cnr.it</a>
Netherlands	Tridens	central North Sea	18 Aug – 12 Sep	2x 8m beam + flip-up rope	<a href="mailto:ingeborg.deboois@wur.nl">ingeborg.deboois@wur.nl</a>
Netherlands	Isis	southern North Sea	4 Aug – 5 Sep	2x 8m beam	<a href="mailto:Ronald.bol@wur.nl">Ronald.bol@wur.nl</a> Cc: <a href="mailto:ingeborg.deboois@wur.nl">ingeborg.deboois@wur.nl</a>

#### 5.2.2.1.2 Staff Exchanges

No staff exchanges are planned for the 2014 offshore surveys.

#### 5.2.2.1.3 Other issues

All of the offshore surveys that have the staff and resources to collect information on litter in the catch are now doing so. The appropriate form is available in Annex 15 of WGBEAM 2013.

#### 5.2.2.2 Inshore beam trawl surveys

##### 5.2.2.2.1 Timing and area coverage

Annex 4.2 lists the inshore surveys together with the geographic area covered, the gear used and the date started.

Table 5.2.2.2. Timing of the surveys in 2014.

Country	Vessel	Area	Dates	Gear	Contact
Belgium	Simon Stevin	Belgian coastal zone	8 – 17 Sep	6 m shrimp trawl	<a href="mailto:Iurgen.Bossaert@ilvo.vlaanderen.be">Iurgen.Bossaert@ilvo.vlaanderen.be</a> Cc: <a href="mailto:kelle.moreau@ilvo.vlaanderen.be">kelle.moreau@ilvo.vlaanderen.be</a>
Germany	Chartered vessels + RV Clupea	German Bight and German Wadden Sea	31 Aug – 2 Oct	3 m shrimp trawl	<a href="mailto:Holger.haslob@ti.bund.de">Holger.haslob@ti.bund.de</a> Cc: <a href="mailto:Volker.siegel@ti.bund.de">Volker.siegel@ti.bund.de</a>
Netherlands (SNS)	Isis	Dutch coastal zone	8 – 19 Sep	6 m beam trawl	<a href="mailto:Hanz.wiegerinck@wur.nl">Hanz.wiegerinck@wur.nl</a> Cc: <a href="mailto:Loes.bolle@wur.nl">Loes.bolle@wur.nl</a>
Netherlands	Schollevaar	Scheldt estuary	1 – 19 Sep	3 m shrimp trawl	<a href="mailto:Andre.dijkman@wur.nl">Andre.dijkman@wur.nl</a> Cc: <a href="mailto:Loes.bolle@wur.nl">Loes.bolle@wur.nl</a>
Netherlands	Stern	Dutch Wadden Sea	25 Aug – 26 Sep	3 m shrimp trawl	<a href="mailto:Marcel.devries@wur.nl">Marcel.devries@wur.nl</a> Cc: <a href="mailto:Loes.bolle@wur.nl">Loes.bolle@wur.nl</a>
Netherlands	Isis	Dutch coastal zone and German Bight	23 Sep – 31 Oct	6 m shrimp trawl	<a href="mailto:Thomas.pasterkamp@wur.nl">Thomas.pasterkamp@wur.nl</a> Cc: <a href="mailto:Loes.bolle@wur.nl">Loes.bolle@wur.nl</a>

The UK survey ceased in 2010.

#### 5.2.2.2.2 Staff exchanges

No staff exchanges are planned for the 2014 surveys.

#### 5.2.3 Beam trawl survey manuals

During WGBEAM 2014, the focus was mainly on the offshore manual. Work on the inshore manual will be continued after review of offshore manual.



### **5.2.3.1 Update of offshore manual maps**

The maps in the offshore beam trawl manual have been updated during WGBEAM 2014.

### **5.2.3.2 Gear drawings / tables**

No progress has been made regarding the creation of gear drawings and accompanying technical tables during WGBEAM 2014. Unfamiliarity with naming conventions for gear parts/elements in non-native languages makes describing these difficult for the technical staff of several WGBEAM member countries. The creation of these drawings and their inclusion in the manual will be discussed further in future WGBEAM meetings and intersessionally, but shouldn't hold the group from submitting the manual to SSGIEOM for review.

### **5.2.3.3 Publication of offshore manual as SISP Protocol**

WGBEAM 2014 feels that the offshore BTS manual is in a state that allows review, and will send it in for this purpose (see Action 6).

## **5.3 Analyse the changes in mean length-at-age for sole in the North Sea, English Channel, Bristol Channel and Irish Sea (ToR c)**

Previously (WG 2012–2013), changes in length-at-age by sex were examined for sole in two Dutch surveys (BTS-Isis and SNS). Mean length-at-age was calculated by combining catch data and biological sampling data. This analysis revealed a general decline in length-at-age for sole during the last decade(s). A quick-scan of biological sampling data only (DATRAS CA data, April 2013) showed similar trends for sole collected during the English BTS in ICES areas IV and VIIId combined. Examination of spatial distribution by sex, age and year for sole in the Dutch BTS-Isis survey indicated that the observed trends in length-at-age were not related to changes in spatial distribution at age.

This year we analysed all BTS data available in DATRAS for ICES areas IV and VIIId, for plaice and sole. Originally, this ToR only referred to sole, but we decided to include plaice to widen the scope of this study. The calculation method previously applied to the Dutch data (i.e. combining catch data and biological sampling data) is considered to be the best approach to calculate population means. Therefore, this method was now applied to all data. A GAM model was fitted (by species, age group and sex) to describe the trends over time and to investigate differences between areas. The results and more details on the methods are presented in Annex 11.

The main goal of this study is to examine consistency of trends across areas and species, to enable formulation and evaluation of hypotheses on the causal factors underlying trends in length-at-age. The analyses will therefore be elaborated to the BTS data for ICES areas VIIa and VIIIf, which are currently available in DATRAS. Furthermore, if the Belgian BTS data for ICES area IV and the English BTS data for ICES area VIIe become available in DATRAS before the next WGBEAM meeting, then these surveys will be included as well. The statistical modelling will be optimized in consultation with statisticians. A literature review will be carried to aggregate knowledge and hypotheses on changes in length-at-age.

## **5.4 Provide index calculations based on DATRAS for plaice and sole for the North Sea (ToR d)**

During WGBEAM 2014, the UK BTS North Sea plaice and sole indices as well as the German sole and plaice indices were produced, using DATRAS data and the method that is used to calculate the Dutch offshore indices.

### **5.4.1 English BTS (North Sea) index calculation comparison with the DATRAS method for plaice and sole**

It was noted that the two methods (UK and DATRAS) would combine the ALKs used in the calculations in slightly different ways; the UK combines ALK by rectangle and applies these to rectangle based length distributions to calculate the age compositions and then combines to the whole area, whereas the DATRAS (Dutch) method combines the ALKs for the whole areas first and then applies this to the length distributions. Due to this, small changes in the indices would be expected.

The comparisons between the two methods were to ensure that the trends were consistent throughout the time-series, so that the new method could be used for future index calculations.

Figures 1a and 1b in Annex 12 show the plots comparing the plaice indices by year, and the trends are identical in all but two years (2004 and 2005). For 2004, it was due to two factors; additional stations being fished and used in the original Cefas index calculation and an incomplete times-series of age data being imported to DATRAS; this will be remedied by Cefas as soon as possible. For 2005, the trend was very similar but the magnitude of the change of the 2 year olds was due to the fact that the historic index calculation did not exclude additional stations (the primary station list consists of 15 stations, in 2004 and 2005 additional stations were fished and they were all used in the calculation of the indices in those years).

This exercise has highlighted two very important issues:

- 1 ) That the new method available in DATRAS to calculate the UK BTS index works and is a robust method to calculate the indices, and
- 2 ) That this is another tool that can be used to quality assure the data in DATRAS. It has highlighted two issues that may not have been picked up otherwise, given the historic nature of the data outputs.

The results for the sole were extremely similar with only the 2004 index being significantly different for the same reason as above (Figures 2a and 2b in Annex 12). It is interesting that the additional stations fished in 2005 and included in the index calculation had no effect on the sole index in 2005, when they had such an effect on the plaice. This may be due to the large numbers of sole caught across the index area and the relatively small impact a few additional lengths and otoliths would have on the whole.

### **5.4.2 German BTS (North Sea) index calculation comparison with the DATRAS method for plaice**

The area (German Bight) covered by the German BTS is overlapping with part of the Dutch Isis BTS and with a part of the Tridens BTS. Sole is not often caught in that area. The newly calculated preliminary indices were compared with the Dutch indices for the Isis BTS and Tridens BTS (Figure 3 in Annex 12).

The most important figures are age groups 3, 4 and 5 as those age groups are most abundant in the German Bight. The patterns for all surveys are similar, although the numbers per age group vary as a result of the spatial coverage of the survey and the distribution pattern of plaice. Data for 2003 and 2013 will be made available intersessionally. Checks of the underlying data for the index calculations will be carried out by Germany in collaboration with ICES Data Centre intersessionally. Data prior to 2003 are available in the national database but still have to be put into DATRAS format. From this exercise however, it seems that the German survey can provide reliable abundance estimates, and it is worthwhile adding the historic data to DATRAS as well.

## **5.5 Assess the opportunities for providing plaice and sole index calculations based on DATRAS for all other areas**

To be carried out during WGBEAM 2015–2016.

## **5.6 Other requests and actions**

### **5.6.1 Outcomes of the joint WGBEAM – WGCAN session**

Several options were discussed how WGCAN and WGBEAM could proceed on the improvement of survey design to match with the requirements of the brown shrimp swept-area biomass estimate and to derive correction factors for the use of different gears. In a first step, more simultaneously collected data need to be compiled (side-by-side fishing of Dutch and German survey vessels), but such actions are difficult to plan as extra shiptime and the associated funds are not available, and opportunities for overlapping tows during the regular surveys are subject to constraints imposed by weather conditions and technical difficulties. Also the option of a dedicated EUROFLEETS project was discussed, but it appears that currently no call for projects is open.

### **5.6.2 SSGIOM survey list**

WGBEAM was requested to complete the SSGIOM survey document, listing all surveys under WGBEAM coordination and the fish stocks for which these deliver assessment indices. This was carried out and the information passed on to the SSGIOM Chair.

### **5.6.3 ACOM Biodiversity request**

To provide ACOM and the ICES Data Centre with the most useful biodiversity information, WGBEAM collated its responses to the questions regarding the species that are documented on offshore surveys, uploaded to DATRAS and/or are available in national databases in Annex 13, with additional information on the species that are documented during these surveys and the years in which certain species groups were added to the on-board protocols. This is especially relevant to benthos, that was often not documented in the early years of surveys, but added to the standard practises more recently. A distinction between stations where all benthos or a selection of benthos species is documented is also made, and it is also mentioned when only absence/presence is recorded without information on numbers, length/width measurements and/or weights.

To reliably assess biodiversity trends in the context of the MSFD Descriptors 1, 4 and 6, one should only compare years that are characterized by a stable sampling coverage. Therefore, data users also need to know when stable sampling coverage was reached

in the different surveys, so this information was also added to the table in Annex 13. However, a potential pitfall still exists within periods with stable sampling coverage, as identification skills keep improving over time. Therefore numbers of species sometimes grow over time without reflecting an increasing biodiversity.

In the interpretation of WGBEAM, 'all species' always means 'all species caught'.

#### 5.6.4 DATRAS data products

When the upload facility for BTS-VIII and the inshore surveys is ready, and data are uploaded, the output products from 3 can be made available for the next WGBEAM meeting.

The full description of the products is in Annex 14.

When the upload facility for BTS-VIII and the inshore surveys is ready, and data is uploaded, the output products from 3 can be made available for the next WGBEAM meeting. For the output to be calculated by ICES Data Centre, a formal data product request has to be done.

##### 1. Standard products from DATRAS input:

Update frequency: continuous

Information type: flexible (always use most recent data)

Data used: all available in DATRAS

Timing: always

Location: on the DATRAS webpage, where people also can download the Exchange file

Products: ALK for all species, SMALK for all species, cpue per length per haul (numbers/km<sup>2</sup>), cpue per haul per species (numbers/km<sup>2</sup>)

WGBEAM decided only to provide data up to the haul level because users themselves should decide how to combine the different gears. As long as WGBEAM does not have a well-developed protocol for this, the group feels it should be clear to all users that one has to be aware of the different characteristics of the surveys.

##### 2. Results from the BTS index

###### a. Frequency: once per year

Information type: fixed (so: no updates throughout the year)

Data used: only the WGBEAM approved indices and related products as used in the assessment groups. In 2014 and 2015: sole and plaice in the North Sea for Netherlands (Tridens and Isis), and England and in VIId.

Timing: prior to WGNSSK (depending on the WGNSSK deadlines)

Location: on the DATRAS webpage, the file marked with \* will be added to the Indices download and won't be available as separately downloadable products.

NB: before the information can be made available:

- fine-tuning of Dutch index to be done
- English index calculations for IVa have to be approved by Cefas
- Documentation on index calculation.

Products: Indices, SD, Age\_composition, ALK, Combined\_HHHL

###### b. Frequency: continuous

Information type: flexible (always latest data available)

Data used: all index calculations for available data

Timing: always available

Location: at DATRAS webpage, only available on login

Products: all 'in-between' products as produced by current DATRAS index calculation

### 3. **Internal WGBEAM products for survey summary**

Frequency: continuous

Information type: flexible

Data used: all available of the last survey year (in 2015: all data for 2014)

Timing: always available

Location: at DATRAS webpage, only available on login

Products: Time schedule by week, Overview of hauls carried out, Biological sampling: ages, Biological sampling: not aged, Map with hauls by gear

Additional products for survey summary sheets by WGBEAM: distribution plots of target species by age group, distribution plots of species.

#### 5.6.5 **Marine Litter**

WGBEAM discussed the request by ICES Data Centre to provide feedback on the reporting format for litter information, focusing on the selection below.

Data collections:

- Seabed litter
- Litter in biota – entanglement, ingestion, nests

WGBEAM interpreted the questions as 'Can everything that we currently put into the litter spreadsheet, be stored in the proposed format?'. WGBEAM does not see it as its role to decide whether or not the information is sufficient for an assessment, as the group assumes this will be done by litter experts and not by beam trawl survey experts.

Questions from ICES Data Centre, and the WGBEAM responses:

1. Does the litter record cover the needs of the groups? If not what is missing for an assessment?

WGBEAM: As far as we can see, all information currently stored in the litter spreadsheet can be put into the current format.

There is a strong request by WGBEAM to establish a link with DATRAS based on the DATRAS unique key information. Currently, the litter recording sheet used on the fish trawl surveys does only contain fields for cruiseid, station and date. It does not contain information on the station characteristics such as position, water depth, weather conditions, sea state, nor on haul characteristics such as trawl duration and distance towed. This is all stored with the fish data. As none of the countries currently stores the litter information in a database, it will be hand-work to connect the station and haul information to the litter information.

2. Is number of entangled biota sufficient or is taxonomy needed?

WGBEAM: it is recommended to provide the options to report on the number of entangled biota and add taxonomic information, although these fields should be classified as ‘optional’.

3. Do attached macro-organisms need to be itemized or is presence “Yes/No” sufficient?

WGBEAM: it is often hard to decide on the number of attached organisms because often colonial species like bryozoans and hydrozoans are attached to the litter. It should be clear what has to be filled in. It is recommended to provide an option to add taxonomic information (more than one species per litter item occurs quite regularly), although the field should be classified as ‘optional’.

4. Is state of litter needed? Is “Yes/No” sufficient?

WGBEAM: we don’t collect information on the state of litter. If there is a field for it, it should be optional. WGBEAM however wonders what Yes/No with respect to state would mean, as the group expects a classification system for the state of litter.

5. Is Polymer type sufficient – especially for microplastics?

WGBEAM: no distinction in polymer type is being made during the fish trawl surveys, so this field should be classified as optional.

Other comments by WGBEAM:

- The data collection requires the registration of surface of the litter item. As the majority (in numbers) of the litter from fish trawls consists of monofilamentous fishing line, it is often not possible to provide that information. Length of the rope is possible.
- WGBEAM didn’t look into detail at the litter types, as the group assumed the current sheet is known and incorporated by ICES Data Centre, and new litter categories always can be added when necessary.

#### **5.6.6 Relevance of survey data for the effects of pulse fishing in the South-western North Sea**

Since 2011 the pulse fishery has been introduced in the Dutch North Sea commercial beam trawl fishing fleet (see text box).

Flatfish fishery: the beam trawl 12-18m, 24-40m and over 40m segments (from: STECF 2013)

The introduction of the pulse fishery: In 2011, some 20 vessels were allowed by the ministry to invest in pulse technique. Permits were given on a temporary basis. The economic performance of these vessels in 2011 was encouraging and is expected that results will become better generally for this part of the fleet. It is still uncertain whether the temporary permits will be transformed into permanent permits. In 2012 an additional 20 vessels were allowed to invest in pulse technique and those entrepreneurs started fishing in 2012 using a temporary permit. In addition to that, other fishermen applied for permits (around 40) but until now (2013) they are still not allowed to use the pulse technique. Economic reasons, ecologic reasons as well as societal reasons (Natura 2000, discard ban, market requirements, responsible fisheries) force fishermen more and more to innovate and to invest in more sustainable and economic viable flatfish fishing techniques (as an alternative for beam trawl). Saving fuel and costs (up to 50%), less discarding and less impact on the seabed are the most important advantages of using pulse technique to catch flatfish.

Over the last years, much effort has been spent on the effect of pulse fisheries on the species caught (e.g. van Marlen *et al.*, 2009; de Haan *et al.*, 2008; 2009; 2011) and on the effectiveness of the pulse trawls compared to the traditional beam trawls (e.g. Van Marlen *et al.*, 2014; 2006; 2005).

No studies show the spatial change of fishing effort in the North Sea due to the shift from traditional gears to pulse trawls. It is however known that pulse fishing resulted in a change in fishing effort in the southwestern North Sea (pers. comm. A. Rijnsdorp, N. Hintzen, B. Harley). Survey catches from fisheries independent beam trawl surveys can provide valuable information on the effect of this change on flatfish abundance.

In the area West of 2°E and south of 54°N, offshore beam trawl surveys are carried out by England and Belgium. The data from the Belgian survey are currently not yet stored in any database. The only place where the data are currently available is the historic dataset kept by WGBEAM. This dataset is only updated with DATRAS extractions, and so, survey data from Belgium is missing since 2012. The English data are stored in the Cefas database and in the ICES trawl database DATRAS.

In the rest of the North Sea, Netherlands and Germany conduct fisheries independent beam trawl surveys. The data of those surveys are stored in national databases (IMARES, TI) as well as in the ICES database DATRAS.

Given the anecdotal decline in catch rates of 0 and 1 group sole in the North Sea, and given the Thames area is an important nursery ground for the stocks of North Sea sole and other species (thornback ray and plaice) there is a need for fisheries independent data to be collected in the area. Up to 2010, an inshore survey was carried out by Cefas (UK England) in the Thames estuary. This survey was stopped after 2010 for financial reasons. At this time there is no current information available about juvenile flatfish in the southwestern North Sea inshore area and it is impossible to observe any potential effect from a shift in fishing effort or other factors.

## 6 Revisions to the work plan and justification

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No changes to the ToRs and the work plan were made.

## 7 Next meeting

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The Working Group on Beam Trawl Surveys (WGBEAM) will meet in Leuven, Belgium, 14–17 April 2015, to continue working on the multi-annual ToRs and generate deliverables as outlined in the work plan (see Section 2.1).

WGBEAM will report on the activities of 2015 by 1 June 2015 to SCICOM, WGISUR and ACOM.

## 8 References

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## Annex 1: List of participants

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## **Annex 2: Agenda WGBEAM 2014, 6–9 May 2014, Hamburg, Germany**

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**Tuesday 6 May, start 9:30**

**am**

1. Welcome and Logistics
2. Terms of Reference / Agenda
3. Update on SSGIEOM
4. Update on other survey WGs (IBTSWG / WGISUR / “WKASP” / ...)
5. Working documents ?
6. Review of WGBEAM 2013 recommendations and actions
7. ICES Datacentre issues ? (products / inshore database / ...)

**pm**

14:00 – 16:00 Joint session with WGCAN

16:30 – 17:00 Report structure and chapter responsibilities

**Contents / Executive summary**

**Kelle**

**Chapter 1 Administrative details**

**Kelle**

**Chapter 2 Terms of Reference**

**Kelle**

**Section 2.1 ToRs 2014**

**Section 2.2 Review of WGBEAM 2013 recommendations and actions**

**Section 2.3 Review of other recommendations to WGBEAM 2014**

**Section 2.4 Other requests to WGBEAM 2014**

**Chapter 3 Summary of work plan**

**Kelle**

**Chapter 4 List of outcomes and achievements of the WG in 2014**  
**Kelle** (end of meeting)

**Chapter 5 Progress report on ToRs and work plan**

**Section 5.1 ToR a** Tabulate, report and evaluate population abundance indices by age-group for sole and plaice and other species if required in the North Sea, Division VIIa and Divisions VIIId-g, taking into account the key issues involved in the index calculation.

Section 5.1.1. Abundance indices by age-group for plaice and sole for the offshore surveys **Giuseppe**

5.1.1.1 Sole

5.1.1.2 Plaice

*Text in main report – tables and figures in annex*

Section 5.1.2. Abundance indices by age-group for plaice and sole for the inshore surveys **Holger (/ Loes)**

5.1.2.1 Sole

## 5.1.2.2 Plaice

## 5.1.2.3 Evaluation of the combined inshore indices

*Reflection on*

- 1) which areas are included in the German DYFS indices,
- 2) and whether or not to apply area-based weighting for the German DYFS indices.
- 3) If relevant and feasible within this meeting : revise the combined inshore indices using the revised German indices. If decided not to change anything or not feasible within this week, prepare road map for future progress.

*Text in main report – tables and figures in annex*

**Section 5.2 ToR b** Further coordinate and standardize offshore and coastal beam trawl surveys in the North Sea and Divisions VIIa, VIIId-g, VIIIa-b and the Adriatic, and update and publish the standard as a SISP protocol.

## Section 5.2.1 Results of 2013 surveys

5.2.1.1 Offshore beam trawl surveys **Rob**

5.2.1.1.1 Participation and coverage of the area

5.2.1.1.2 Survey Results

*Check last year's report for examples/templates*

*+ collate survey summary sheets to be put in an annex "Survey summary sheets offshore surveys per country"*

5.2.1.2 Inshore beam trawl surveys **Kay**

5.2.1.2.1 Participation and coverage of the area

5.2.1.2.2 Survey Results

*Check last year's report for examples/templates*

*+ collate survey summary sheets to be put in an annex "Survey summary sheets offshore surveys per country"*

## Section 5.2.2 Coordination and standardization of beam trawl surveys

5.2.2.1 Offshore beam trawl surveys **Gérard**

5.2.2.1.1 Timing and area coverage

*Check last year's report for examples/templates*

5.2.2.1.2 Staff exchanges

*Only if there are any plans.*

5.2.2.2 Inshore beam trawl surveys **Gérard**

	5.2.2.2.1	Timing and area coverage
	5.2.2.2.2	Staff exchanges
Section 5.2.3	Beam trawl survey manuals	
	General intro : focus in 2014 on offshore manual, progress on inshore manual to be continued after review of offshore manual	
	5.2.3.1	Update of offshore manual maps Brian
	5.2.3.2	Gear drawings / tables Ingeborg/Rob
	5.2.3.3	Publication of offshore manual as SISP Protocol Kelle
Section 5.3	ToR c	Analyse the changes in mean length-at-age for sole in the North Sea, English Channel, Bristol Channel and Irish Sea. Loes / Giuseppe
Section 5.4	ToR d	Provide index calculations based on DATRAS for plaice and sole for the North Sea. Vaishav/Ingeborg/Brian
Section 5.5	ToR e	Assess the opportunities for providing plaice and sole index calculations based on DATRAS for all other areas. Vaishav/Ingeborg/Brian
Section 5.6	Other requests and actions	
	5.6.1	Outcomes of the joint WGBEAM – WGCRAN session Kelle
	5.6.2	SSGIEOM survey list Ingeborg
	5.6.3	ACOM Biodiversity request Kelle
	5.6.4	DATRAS data products Ingeborg/ Vaishav
	5.6.5	Marine litter Ingeborg
	5.6.6	Relevance of survey data for the effects of pulse fishing in the Southwestern North Sea Ingeborg/Brian
Chapter 6	Revisions to the work plan and justification	
Chapter 7	Next meeting	
Chapter 8	References	
Annexes		
17:00	presentation on DATRAS upload status and data products calculation status Vaishav	
Chapter work		

**Wednesday 7 May, start 9:00****am**

Plenary session:

1. Recommendations WGEF / WKMSSEL / WGISDAA / WKESST
2. SSGIEOM survey list
3. Any problems with chapter work so far?

**pm**

Plenary session:

1. Presentation on data products
2. Presentation on marine litter
3. Any problems with chapter work so far?

Ingeborg  
Vaishav

continue subgroups / chapter work

**Thursday 8 May, start 9:00****am**

plenary presentation of subgroups / finished chapters

incorporate new material in manuals

revisit WGCRAN?

continue chapter work

**pm**

continue chapter work

plenary presentation of subgroups / finished chapters

**Friday 9 May, start 9:00****am**

Date and venue of next meeting

Recommendations

Text checking

13:00 finish

### Annex 3: Recommendations and actions

Recommendation	Adressed to
1. To create the “WGBEAM flat file” proposed by WKDATR (see Section 4.2.4 of WKDATR 2013 report) as soon as possible.	ICES Data Centre
2. WGBEAM recommends that if time and weather allows, overlapping hauls should be carried out by countries operating in the same area.	All WGBEAM countries
3. WGBEAM and WGCAN	NED, GFR
a) jointly recommend that NED and GFR carry out side-by-side or overlapping hauls during their Q3 inshore beam trawl surveys in the context of gear comparisons, mainly to investigate differences in catchability for brown shrimp.	
b) Power analysis	WGCAN - WGBEAM
4. WGBEAM recommends that the Methods Working Group (WGMG) decides on the format of survey sampling variance required for use at assessment working groups. If possible the methodology to calculate this variance should also be produced.	WGMG
5. WGBEAM recommends that WGEF provides guidance on the required numbers of tope, small-eyed ray, blonde ray and undulate ray that should be tagged to ensure that scientifically meaningful tagging programmes can be set up.	WGEF
6. WGBEAM recommends that ICES Data Centre develops the procedures to generate survey summary information for beam trawl surveys following the format developed by IBTSWG 2014.	ICES Data Centre
7. WGBEAM recommends that ILVO gives priority to the import of beam trawl survey data in their own database and the transmission to the ICES database DATRAS.	ILVO (Kelle Moreau and Els Torreele)
8. WGBEAM recommends that England re-investigates the possibility for an inshore survey in the Thames area, so there is improved monitoring of this ecologically important area.	UK-England (Matt Elliot)



<b>ACTION</b>	<b>Adressed to</b>
1. Continue cross-checking of distance and duration information for the complete offshore dataset in DATRAS, and resubmit data where appropriate.	ENG, GFR, NED
2. Continue resubmission of files containing -9 for GroundSpeed, replacing this code with the standard survey speed following the manual.	ENG, GFR, NED
3. Continue checks for mismatching information on datatype and subfactor and change errors as soon as possible in DATRAS, by resubmitting the data.	ENG, GFR, NED
4. Continue uploading all species caught during the beam trawl surveys, if necessary by resubmitting files from earlier years.	Resubmission: ENG, GFR, NED Submission: BEL, FRA
5. Summarize all information on tag-and-release programmes for demersal elasmobranchs that have been carried out on beam trawl surveys so far. WGBEAM Chair to liaise with WGEF Chair on the required information, and to collate this information for the attention of WGEF. + continue	All WGBEAM countries, Kelle Moreau
6. Present updated survey list to SSGIEOM-Chairs.	Kelle Moreau
7. Present Annex 13 (table) and text (Section 5.6.3) with information on species collected during beam trawl surveys, stored in national databases, and uploaded to DATRAS, to the ICES Data Centre.	Kelle Moreau
8. Include updated maps and send offshore BTS manual to SSGIEOM-Chairs for review in the process towards publication in the SISP-series.	Brian Harley/Kelle Moreau
9. Present WGBEAM response to the marine litter request to the ICES Data Centre (Marilynn Sorensen/Vaishav Soni)	Kelle Moreau

**ACTIONS RELATED TO INDEX CALCULATION BTS FROM DATRAS, CARRY OUT BEFORE 1/02/15.**

	<b>Adressed to</b>
1. Continue scrutinizing the differences between nationally constructed indices and indices calculated from DATRAS (for ENG, GFR, NLD), and continue solving the differences by resubmitting data and/or fine-tuning the current codes. Remaining differences should be discussed during WGBEAM 2015, to see the impact of the differences.	ICES Data Centre, ENG, GFR, NLD, WGBEAM 2015
2. Apply the current index calculation to a) the German BTS data and send the data to TI for review, b) the Belgian BTS data if uploaded in DATRAS and send the data to ILVO for review.	ICES Data Centre, GFR, BEL
3. Formal data product request to ICES Data Centre regarding output calculations for VIII offshore survey and all inshore surveys.	Ingeborg de Boois
4. Fine-tuning of Dutch index before information can be made available to assessment groups.	Ingeborg de Boois
5. English index calculations for IVa have to be approved by Cefas.	Brian Harley
6. Compose documentation on index calculations.	Vaishav Soni/Ingeborg de Boois

## **Annex 4: Details on offshore and inshore beam trawl surveys**

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### Annex 4.1: Details of the offshore beam trawl surveys currently undertaken by each country

	Belgium	France	Germany	Adriatic	Netherlands	Netherlands	UK	UK	UK
Survey area:	IVb and c west	VIIIab	IVb east	North Adriatic Sea (GSA 17)	IVb and c east	Central N Sea	VIId	VIIe	VIIa, f and g
Year survey started:	1992	2007	1991	2005	1985	1996	1988	1988	1988
Dates:	August	November	mid August	November	August-early September	mid August-mid September	late July	late September/early October	September
Usual start date	week 33	Week 44	week 32	Week 45	week 32/33	week 34	week 30	week 39/40	Week 36/37
Number of survey days	10	35	13	18	20	16–20	15	8	21–24
Ship:	RV Belgica	RV Gwen Drez	RV Solea #	RV G. Dallaporta	RV Isis	RV Tridens	RV Cefas Endeavour ##	MFV Carhelmar	RV Cefas Endeavour
Ship length:	50 m	24.5 m	42 m	35.7 m	28 m	73.5	73 m	22 m	73 m
Beam trawl length:	4 m	4 m	7 m	3.5 m	8 m	8 m	4 m	4 m	4 m
Number of beams fished:	1	1	2	2	2	2	1	2	1
Number of beams sorted:	1	1	1	2	1	1	1	2	1
Trawl duration (min):	30	30	30	30	30	30	30	30	30
Tow speed (knots):	4	5	4	5.5	4	4	4	4	4
Codend stretched mesh (mm):	40	20	80 Liner: 40 mm	40	40	40	75 Liner: 40 mm	75 Liner: 40 mm	75 Liner: 40 mm
Number of ticklers:	0	10	5	0	8	8	0	0	0
Gear code:	BT4M		BT7	Rapido	BT8	BT8F	BT4FM	BT4FM	BT4FM
Attachment:	*	(none)	(none)	(none)	(none)	**	*	*	*
Station positions:	fixed	Fixed	pseudo-random	Fixed	pseudo-random	pseudo-random	Fixed	fixed	Fixed
Av No stns/yr	53	120	63	67	88	63–73	100	57	94
Benthos sampling since:	1992	2007	1992	2005	1985	1996	1991	1992	1992

# new vessel since 2004; previously 35m, ## Corystes (53 m) in 2009 replaiced by Cefas Endeavour, \* chain mat and flip-up rope, \*\* flip-up rope only.



**Annex 4.2 continued: Inventory of the inshore beam trawl surveys.**

Country	Germany (DYFS)		
Geographical Area	NiedersachsenWadden Sea +Elbe Estuary	Schlesweig-Holstein Waddensea	Coastal Area outside the island chain
Ship	Chartered vessels	Chartered vessels	Clupea
ship size (m)	12–16m	12–18m	28m
Date started	1972	1974	2012
Sampling Period	Apr/May ('74–'04) Sept/Oct	Apr/May ('74–'04) Sept/Oct	Sept/Oct
Usual Start date	15 Sept	5 Sept	15 Sept
Number of days per period	5	5 – 7	14
Beam trawl type	3m shrimp trawl	3m shrimp trawl	3m shrimp trawl
Tickler Chains	0	0	0
Mesh size net	32mm	32mm	32mm
Mesh size codend	18mm	18mm	18mm
Speed fished	3 knots	3 knots	3 knots
Time Fished	15 min	15 min	15 min
Approx. number of stations per year	75	75	85
Target species	0–1 group sole and plaice	0–1 group sole and plaice	0–1 group sole and plaice
Catch rate and LF distribution	All fish species Crangon	All fish species Crangon	All fish species Crangon
Catch rate	Epibenthos (quantity)	Epibenthos (quantity)	Epibenthos (quantity)
Age data for plaice and sole	Since 2013	Since 2013	Since 2013

## Annex 5: Population abundance indices for sole and plaice, offshore surveys

### Annex 5.1: Tables of catch rate of sole from Netherlands and UK surveys in the North Sea and VII a, d, e and f

#### a) Netherlands: sole (N.hr<sup>-1</sup>/8m trawl) North Sea (IV) RV "Isis".

Year/Age	0	1	2	3	4	5	6	7	8	9	10+
1985	0.000	7.031	7.121	3.695	1.654	0.688	0.276	0.000	0.000	0.000	0.000
1986	0.000	7.168	5.183	1.596	0.987	0.623	0.171	0.158	0.000	0.018	0.052
1987	0.041	6.973	12.548	1.834	0.563	0.583	0.222	0.228	0.058	0.000	0.022
1988	0.000	83.111	12.512	2.684	1.032	0.123	0.149	0.132	0.103	0.014	0.126
1989	0.490	9.015	68.084	4.191	4.096	0.677	0.128	0.242	0.000	0.051	0.034
1990	0.019	37.839	24.487	21.789	0.778	1.081	0.770	0.120	0.115	0.025	0.048
1991	0.815	4.035	28.841	6.872	6.453	0.136	0.135	0.063	0.045	0.013	0.059
1992	0.024	81.625	22.284	10.449	2.529	3.018	0.090	0.162	0.078	0.020	0.077
1993	0.018	6.350	42.345	1.338	5.516	3.371	6.199	0.023	0.084	0.053	0.061
1994	2.172	7.660	7.121	19.743	0.124	1.636	0.088	0.983	0.009	0.000	0.008
1995	0.429	28.125	8.458	6.268	5.129	0.363	0.805	0.316	0.734	0.039	0.036
1996	0.161	3.975	7.634	1.955	1.785	2.586	0.326	0.393	0.052	0.264	0.055
1997	0.542	169.343	4.919	2.985	0.739	0.710	0.380	0.096	0.035	0.042	0.055
1998	0.371	17.108	27.422	1.862	1.242	0.073	0.015	0.391	0.000	0.000	0.000
1999	6.338	11.960	18.363	15.783	0.584	1.920	0.310	0.218	0.604	0.003	0.310
2000	0.190	14.594	6.144	4.045	1.483	0.263	0.141	0.060	0.007	0.150	0.069
2001	9.200	7.998	9.963	2.156	1.564	0.684	0.074	0.037	0.028	0.000	0.163
2002	5.908	20.989	4.182	3.428	0.886	0.363	0.361	0.032	0.069	0.000	0.052
2003	0.321	10.507	9.947	2.459	1.670	0.360	0.187	0.319	0.000	0.020	0.000
2004	0.685	4.192	4.354	3.553	0.644	0.626	0.118	0.070	0.073	0.000	0.012
2005	0.083	5.534	3.395	2.377	1.303	0.167	0.171	0.077	0.047	0.000	0.018
2006	0.060	17.089	2.332	0.278	0.709	0.479	0.151	0.088	0.000	0.007	0.030
2007	0.714	7.498	19.504	1.464	0.565	0.315	0.537	0.031	0.009	0.000	0.024
2008	3.092	15.247	9.062	12.298	1.313	0.222	0.279	0.202	0.028	0.047	0.000
2009	4.911	15.950	4.999	2.858	4.791	0.252	0.124	0.272	0.079	0.000	0.000
2010	2.462	54.811	10.707	2.027	0.774	1.252	0.143	0.122	0.005	0.027	0.089
2011	2.228	26.166	17.387	4.006	1.094	0.778	0.828	0.013	0.000	0.141	0.027
2012	1.089	5.149	18.212	8.863	1.692	0.764	0.257	0.229	0.046	0.000	0.043
2013	0.381	6.844	3.558	12.566	5.385	0.871	0.197	0.105	0.078	0.019	0.082

**b) United Kingdom: sole (total numbers per km towed) Southern North Sea (IVc).**

<b>Year/Age</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10+</b>
1995	0.53	41.6	86.43	17.13	16.1	9.81	5.19	0.86	0.78	0	0.43
1996	3.33	75.48	52.47	22.89	8.98	8.33	8.77	1.3	1.81	0.73	2.22
1997	4.49	70.49	63.17	19.81	9.34	5.56	3.52	7.1	1.77	1.77	0.97
1998	7.91	10.59	63.34	15.71	1.77	0.89	0.86	0	0.44	0	0.22
1999	8.96	103.75	18.49	24.53	9.36	0.86	0.3	1.09	0.59	1.56	0.99
2000	3.22	192.51	157.89	15.03	14.08	7	2.6	0.67	0.37	0.91	3.01
2001	5.87	91.45	174.9	45.7	2.99	4.57	1.83	0.82	0.63	0.24	1
2002	2.22	125.78	47.31	33.28	21.97	3.61	4.39	1.79	0.9	1.15	2.38
2003	0.91	69.91	129.31	16.26	23.56	14.71	0.77	6.43	1.52	0.86	2.5
2004	24.63	58.65	57.77	50.15	12.46	10.14	8.58	0.65	2.15	1.15	3
2005	37.64	107.01	55.54	19.82	37.68	3.29	10.42	5.63	0.56	1.2	4.64
2006	7.02	202.5	82.19	20.64	14.03	35.2	6.72	9.17	5.34	0.36	3.83
2007	9.41	40.71	77.34	19.25	4.4	2.78	11.41	0.94	2.19	1.08	0.96
2008	1	98.84	59.97	39.34	13.45	0.63	3.41	10.73	2.55	1.79	1.32
2009	1.01	35.21	82.39	58.21	56.85	12.23	1.99	3.39	10.18	6.27	5.23
2010	1.43	77.97	67.96	24.52	22.62	17.47	7.01	2.16	3.34	1.36	1.97
2011	5.43	89.66	51.75	15.66	4.40	7.94	4.01	1.13	0.77	0.43	1.60
2012	0	26.85	58.22	30.93	9.05	3.47	3.85	5.61	1.07	0.27	2.52
2013	0	61.51	49.46	84.92	25.12	7.75	3.24	2.73	6.05	0	0.67

c) United Kingdom: sole (N.hr<sup>-1</sup>/8m trawl) Eastern Channel (VIlId).

Year/Age	0	1	2	3	4	5	6	7	8	9	10+
1988		8.2	14.2	9.9	0.8	1.3	0.6	0.1	0.1	0.2	0.2
1989		2.6	15.4	3.4	1.7	0.6	0.2	0.2	0	0	0.7
1990		12.1	3.7	3.4	0.7	0.8	0.2	0.1	0.2	0	0
1991		8.9	22.8	2.2	2.3	0.3	0.5	0.1	0.2	0.1	0.1
1992		1.4	12	10	0.7	1.1	0.3	0.5	0.1	0.2	0.6
1993		0.5	17.5	8.4	7	0.8	1	0.3	0.2	0	0.4
1994		4.8	3.2	8.3	3.3	3.3	0.2	0.6	0.1	0.3	0.3
1995		3.5	10.6	1.5	2.3	1.2	1.5	0.2	0.3	0.2	0.3
1996		3.5	7.3	3.8	0.7	1.3	0.9	1.1	0.1	0.5	0.4
1997		19	7.3	3.2	1.3	0.2	0.5	0.4	0.9	0	0.7
1998		2	21.2	2.5	1	0.9	0.1	0.3	0	0.1	0.3
1999		28.14	9.44	13.17	2.51	1.73	1.28	0.16	0.93	1.07	0.47
2000		10.49	22.03	4.15	4.24	1.03	0.58	0.28	0.03	0.24	1.2
2001		9.09	21.01	8.36	1.2	1.91	0.54	0.57	0.35	0.04	1.01
2002		31.76	11.42	5.42	3.45	0.27	0.71	0.44	0.09	0	0.56
2003		6.47	28.48	4.13	2.46	1.58	0.3	0.39	0.2	0.07	0.52
2004		7.35	8.49	7.71	1.57	1.45	0.99	0.2	0.44	0.21	0.57
2005		25	5.04	2.86	3.47	1.63	1.02	0.66	0.06	0.31	0.35
2006		6.3	29.18	2.83	1.99	1.95	0.34	0.44	0.57	0	0.34
2007		2.14	21.86	12.9	1.22	0.8	1.2	0.32	0.17	0.59	1.02
2008		2.86	6.46	7.24	4.82	0.25	0.49	0.38	0.27	0.24	0.2
2009		30.54	13.33	5.44	4.34	3.76	0.37	0.2	0.31	0.23	0.48
2010		15.9	30.12	5.32	1.66	2.82	2.38	0.35	0.16	0.55	0.31
2011		11.92	23.54	11.56	1.25	0.57	2.56	0.60	0.16	0.21	0.06
2012		1.75	9.14	6.47	3.36	0.87	0.39	0.65	0.52	0	0.65
2013		0.78	9.20	15.54	8.91	2.95	1.35	0.37	0.97	0.75	0.10



d) United Kingdom: sole (total numbers for 2\*4m beam trawl) Western Channel (Vlle).

Year/Age	0	1	2	3	4	5	6	7	8	9	10+
1989	0	5	56	120	107	34	40	17	5	7	12
1990	0	23	52	76	31	24	7	15	3	6	11
1991	0	11	231	79	51	23	21	5	17	4	15
1992	0	5	140	316	44	36	12	7	5	11	11
1993	0	5	54	115	105	14	10	9	3	3	10
1994	0	6	47	106	62	44	5	5	2	3	7
1995	0	14	37	44	42	26	31	4	5	5	13
1996	0	28	112	67	25	32	20	17	3	2	9
1997	0	11	130	126	43	14	16	13	14	5	15
1998	0	11	141	114	76	22	10	14	6	8	11
1999	0	11	97	128	47	23	8	4	4	4	17
2000	0	12	136	70	52	23	16	5	3	5	9
2001	0	9	197	162	52	31	12	12	4	1	7
2002	0	6	37	113	48	27	6	3	2	0	12
2003	0	23	124	78	56	28	6	1	1	2	4
2004	0	16	110	120	24	15	10	16	9	4	4
2005	0	8	110	39	53	12	12	6	2	4	4
2006	0	5	120	95	26	37	10	7	9	0	5
2007	0	7	188	135	50	11	23	3	3	1	4
2008	0	10	85	158	77	40	2	14	3	6	7
2009	0	11	104	126	96	49	13	13	12	1	8
2010	0	20	175	154	84	59	31	20	7	12	14
2011	0	9	156	231	62	39	25	24	8	2	4
2012	0	3	47	162	125	40	27	13	3	6	9
2013	0	4	36	100	106	80	21	9	6	3	4

e) United Kingdom: sole (total numbers for 4m beam trawl) Bristol Channel (VIIIf).

Year/Age	0	1	2	3	4	5	6	7	8	9	10+
1993	3	201	379	51	23	1	2	2	1	1	2
1994	1	407	473	121	17	9	8	0	0	2	2
1995	31	142	255	60	13	7	14	1	1	1	4
1996	3	178	251	64	27	7	3	4	1	3	3
1997	37	498	207	21	13	14	5	3	6	0	4
1998	104	885	472	57	11	9	5	2	1	5	5
1999	29	2922	297	38	16	7	4	5	1	0	9
2000	16	1086	1608	37	26	6	0	2	1	1	4
2001	26	449	711	307	23	9	6	2	0	2	8
2002	9	786	283	151	121	14	7	2	3	0	4
2003	14	465	628	55	30	56	9	3	3	0	1
2004	64	860	434	99	15	22	42	4	3	0	5
2005	44	407	267	38	16	7	5	17	1	2	0
2006	13	324	238	47	16	8	0	2	12	0	1
2007	108	424	128	51	16	8	7	3	4	13	3
2008	6	1232	124	15	18	7	9	4	3	5	8
2009	1	604	377	29	8	10	4	3	3	2	11
2010	19	101	558	144	20	2	7	9	4	2	8
2011	22	596	62	163	82	8	2	7	3	0	6
2012	16	643	274	9	63	28	1	1	1	3	10
2013	11	331	614	51	16	29	18	1	6	1	7

f) United Kingdom: sole (total numbers for 4m beam trawl) Irish Sea (VIIa).

Year/Age	0	1	2	3	4	5	6	7	8	9	10+
1993	0	78	320	158	208	28	16	5	14	39	27
1994	0	62	431	193	95	128	43	10	11	6	36
1995	24	246	154	253	110	30	67	12	5	5	24
1996	4	886	126	32	76	46	23	31	8	2	11
1997	5	1158	577	72	24	55	27	16	30	7	10
1998	2	539	716	292	18	6	24	23	5	18	9
1999	3	385	293	255	203	29	8	26	5	6	21
2000	0	354	464	147	219	91	13	2	13	6	24
2001	1	91	284	192	65	96	64	6	3	12	11
2002	0	205	61	121	126	42	79	49	2	1	19
2003	0	242	210	51	97	81	40	43	26	1	13
2004	0	406	240	119	27	77	45	41	17	19	11
2005	0	53	165	69	25	13	35	25	4	6	17
2006	0	107	110	90	45	36	9	16	15	10	20
2007	0	125	93	49	57	41	11	4	6	12	22
2008	0	126	125	60	21	43	23	6	2	9	17
2009	0	57	150	68	39	23	30	12	7	1	16
2010	0	25	59	73	37	16	5	10	9	3	6
2011	0	89	35	62	68	35	12	4	13	6	11
2012	0	21	49	17	46	29	12	9	2	6	13
2013	8	75	57	37	21	33	18	21	9	1	9

## Annex 5.2: Tables of catch rate of plaice from Netherlands and UK surveys in the North Sea and VII

### a) Netherlands: plaice (N.hr<sup>-1</sup>/8m trawl) North Sea (IV) RV "Isis".

Year/Age	0	1	2	3	4	5	6	7	8	9	10+
1985	595.271	136.759	173.893	36.059	10.997	1.273	0.973	0.336	0.155	0.091	0.229
1986	9.303	667.441	131.704	50.173	9.208	3.780	0.400	0.418	0.147	0.070	0.188
1987	44.126	225.822	764.186	33.841	4.880	1.842	0.607	0.252	0.134	0.078	0.186
1988	29.623	680.173	146.993	182.312	9.991	2.810	0.814	0.458	0.036	0.112	0.254
1989	31.862	467.877	319.272	38.660	47.305	5.850	0.833	0.311	0.661	0.132	0.075
1990	27.000	185.344	146.071	79.339	26.351	5.469	0.758	0.189	0.383	0.239	0.198
1991	152.176	291.378	159.424	33.955	13.569	4.313	5.659	0.239	0.204	0.092	0.107
1992	26.814	360.890	174.526	29.253	5.961	3.748	2.871	1.186	0.346	0.050	0.089
1993	74.272	188.988	283.400	62.783	8.272	1.128	1.130	0.584	0.464	0.155	0.071
1994	284.479	193.260	77.139	34.458	10.586	2.667	0.600	0.800	0.895	0.373	0.030
1995	108.101	265.634	40.618	13.218	7.527	1.110	0.806	0.330	1.051	0.202	0.119
1996	222.510	310.287	206.883	21.469	4.470	3.134	0.838	0.044	0.161	0.122	0.110
1997	65.515	1046.845	59.241	17.180	2.670	0.257	0.358	0.157	0.111	0.000	0.031
1998	255.654	347.575	402.657	44.960	8.294	1.224	0.339	0.149	0.213	0.072	0.081
1999	257.559	293.253	121.551	171.254	3.391	1.956	0.127	0.130	0.027	0.030	0.079
2000	209.293	267.473	69.252	29.349	22.359	0.570	0.162	0.502	0.027	0.012	0.052
2001	807.932	206.531	72.236	17.840	9.174	8.716	0.270	0.131	0.038	0.040	0.170
2002	248.356	519.224	44.475	14.901	4.991	2.539	1.321	0.085	0.128	0.000	0.092
2003	225.619	132.754	159.120	10.057	5.550	1.426	1.133	0.638	0.111	0.096	0.018
2004	197.940	233.707	39.623	61.912	6.152	2.464	1.492	0.952	2.842	0.000	0.012
2005	270.775	163.046	66.176	6.759	12.790	1.084	1.164	0.290	0.152	0.492	0.041
2006	250.800	128.615	36.385	18.115	2.982	5.890	0.867	0.757	0.040	0.269	0.387
2007	298.086	311.997	67.169	19.707	14.416	2.942	6.085	0.684	0.831	0.156	0.651
2008	387.592	221.567	120.728	30.108	9.075	7.205	0.618	1.715	0.292	0.229	1.046
2009	555.472	408.995	105.222	45.975	13.013	4.029	3.474	0.574	2.128	0.278	0.929
2010	814.363	261.097	84.254	34.244	20.178	4.662	2.162	3.464	0.207	2.547	1.232
2011	323.428	486.157	148.217	55.305	20.065	12.903	3.945	2.243	2.263	0.232	0.906
2012	454.620	241.840	191.502	58.067	20.904	12.638	5.594	1.787	0.494	1.695	0.789
2013	336.300	449.774	113.177	90.493	27.004	10.642	5.824	1.497	1.519	1.082	1.935

**b) Netherlands: plaice (N.hr<sup>-1</sup>/8m trawl) North Sea (IV) RV “Tridens”.**

Year/Age	0	1	2	3	4	5	6	7	8	9	10+
1996	-	1.643	6.021	4.451	2.903	2.039	1.566	0.721	0.415	0.190	0.468
1997	-	0.221	7.119	9.127	3.252	2.105	1.523	0.401	0.819	0.354	0.429
1998	-	0.228	32.249	9.572	4.874	2.202	1.274	0.929	0.762	0.304	0.540
1999	0.054	2.692	7.711	35.228	5.558	2.498	1.928	0.633	0.761	0.309	0.331
2000	0.043	4.795	13.445	12.910	16.957	2.882	1.716	0.933	0.805	0.218	0.530
2001	0.178	2.154	8.612	9.901	6.681	7.360	1.055	0.592	0.418	0.505	0.543
2002	-	18.553	12.912	9.541	6.411	4.181	4.420	0.743	0.741	0.394	0.933
2003	0.338	3.975	41.692	13.378	9.059	5.077	2.806	3.920	0.703	0.740	1.562
2004	0.014	5.985	15.784	31.488	9.430	4.316	2.439	1.242	2.500	0.409	1.405
2005	0.043	6.876	23.366	12.234	17.672	2.824	6.871	1.565	0.567	3.574	2.482
2006	0.236	6.725	32.192	25.727	11.367	10.918	1.985	3.897	0.864	0.723	3.262
2007	-	26.571	23.735	19.551	23.175	4.900	10.147	1.974	3.786	0.323	5.471
2008	-	17.467	50.462	25.585	18.392	18.974	6.243	12.747	2.657	6.749	8.411
2009	0.116	12.110	41.685	43.331	19.126	12.052	11.768	3.081	10.119	1.567	8.025
2010	0.644	26.180	35.716	34.561	30.093	13.412	5.695	12.234	2.744	6.362	7.706
2011	0.174	41.881	71.478	41.593	28.462	31.670	14.284	5.501	11.881	1.172	12.890
2012	0.000	12.898	87.806	65.988	32.006	19.318	16.038	7.147	3.630	8.635	8.989
2013	0.000	15.063	48.685	63.138	39.968	25.028	14.233	10.973	4.235	2.959	12.472

**c) Netherlands: plaice (N.hr<sup>-1</sup>/8m trawl) North Sea (IV) Combined with gear correction (RV “Isis” and RV “Tridens”).**

Year/Age	0	1	2	3	4	5	6	7	8	9	10+
1996	102.136	143.896	99.623	13.280	4.266	3.035	1.653	0.676	0.442	0.214	0.457
1997	24.190	386.840	28.679	14.886	4.010	2.042	1.538	0.428	0.797	0.327	0.407
1998	96.333	131.191	177.631	25.463	7.266	2.500	1.355	0.955	0.808	0.323	0.549
1999	100.264	116.989	53.597	96.348	6.493	3.005	1.926	0.659	0.756	0.314	0.355
2000	81.459	108.393	38.887	22.880	23.680	3.017	1.725	1.113	0.797	0.219	0.526
2001	297.375	80.296	39.788	15.695	8.754	9.300	1.079	0.624	0.420	0.511	0.602
2002	87.786	217.276	26.709	14.029	7.616	4.794	4.643	0.754	0.765	0.385	0.943
2003	87.985	53.579	94.429	15.858	10.305	5.361	3.081	4.007	0.732	0.760	1.534
2004	80.357	101.411	30.306	51.218	11.212	4.961	2.885	1.538	3.402	0.391	1.347
2005	106.916	70.845	45.646	13.806	20.392	3.035	6.942	1.568	0.571	3.570	2.435
2006	97.992	54.855	42.922	29.187	11.748	12.052	2.106	3.938	0.844	0.767	3.258
2007	115.922	139.391	44.429	24.594	26.579	5.681	11.685	2.091	3.947	0.364	5.558
2008	143.963	98.909	89.736	33.838	20.735	20.605	6.330	13.054	2.727	6.718	8.618
2009	219.268	170.840	76.528	54.059	21.482	12.834	12.192	3.139	10.254	1.585	7.941
2010	326.437	144.792	69.544	47.943	40.349	17.914	6.845	15.841	3.179	8.306	8.876
2011	120.520	226.465	125.987	58.138	32.752	33.174	15.090	5.808	11.940	1.124	12.808
2012	178.353	118.441	149.626	79.759	35.864	22.166	16.393	7.216	3.544	8.696	9.044
2013	132.569	192.771	90.454	90.344	46.710	27.597	15.369	11.273	4.523	3.224	12.740

d) United Kingdom: plaice (total numbers per km towed) Southern North Sea (IVc).

Year/Age	0	1	2	3	4	5	6	7	8	9	10+
1999	1.5	24.45	2.51	3.79	0.50	0	0	0	0	0.25	0
2000	13.25	26.33	3.68	0.25	2.92	0.33	0	0	0	0	0
2001	23.00	48.10	21.90	0.50	0.50	0.25	0	0	0.25	0	0
2002	1.07	42.40	1.87	1.07	0	0	0.27	0	0	0	0
2003	11.29	28.08	31.69	0.94	0.24	0.24	0	0.47	0	0.24	0
2004	0.95	6.29	0.95	1.33	0	0	0	0	0.19	0	0
2005	1.31	25.85	9.49	0.36	0.44	0	0	0	0	0.36	0
2006	2.49	16.02	1.72	0.22	0	0	0	0	0	0	0
2007	0.35	13.46	3.6	0.42	0.05	0	0.24	0	0	0	0
2008	0.80	66.24	11.07	1.60	0	0.80	0.80	0	0	0	0
2009	7.87	44.73	9.6	1.6	0	0	0	0	0	0	0
2010	4.86	18.72	4.27	0.57	0.29	0	0	0	0	0	0
2011	9.14	36.76	6.27	1.10	0	0	0	0	0	0	0
2012	0.53	9.54	8.94	1.93	0.80	0	0.53	0	0	0	0
2013	10.13	16.74	2.83	1.32	1	0.27	0	0	0	0	0

e) United Kingdom: plaice (N.hr<sup>-1</sup>/8m trawl) Eastern Channel (VIIId).

Year/Age	0	1	2	3	4	5	6	7	8	9	10+
1988		26.5	31.3	43.8	7	4.6	1.5	0.8	0.7	0.6	1.2
1989		2.3	12.1	16.6	19.9	3.3	1.5	1.3	0.5	0.3	1.7
1990		5.2	4.9	5.8	6.7	7.5	1.8	0.7	1	0.8	0.4
1991		11.8	9.1	7	5.3	5.4	3.2	1.2	1	0.1	1.2
1992		16.5	12.5	4.2	4.2	5.6	4.9	3.4	0.7	0.5	0.7
1993		3.2	13.4	5	1.7	1.9	1.6	2	2.8	0.4	0.6
1994		8.3	7.5	9.2	5.6	1.9	0.8	0.9	1.8	1.2	0.8
1995		11.3	4.1	3	3.7	1.5	0.6	0.6	1.3	0.8	0.8
1996		13.2	11.9	1.3	0.7	1.3	0.9	0.4	0.3	0.4	2.8
1997		33.1	13.5	4.2	0.6	0.3	0.3	0.2	0.2	0.2	1.9
1998		11.4	27.3	7	3.1	0.3	0.2	0.2	0.1	0	1
1999		11.3	14.1	15.9	2.9	1	0.2	0.1	0.3	0.1	0.9
2000		13.2	21	14.4	13.8	3.5	0.9	0.6	0.2	0.4	1.5
2001		17.9	13	10	7.1	10.9	1.9	0.5	0.3	0.2	1
2002		20.7	15.9	7.7	3.5	1.8	3.5	0.7	0.1	0.1	0.6
2003		6.2	22.8	6	2.9	1.6	0.8	1.8	0.6	0.1	0.3
2004		36.2	15	13.2	3.4	0.9	0.2	0.7	1.2	0.2	0.2
2005		10.8	31.2	13.8	10.3	2.9	1.2	0.8	0.4	0.9	0.7
2006		17.2	16.1	9.2	3.3	2.6	0.8	0.6	0.3	0.1	0.5
2007		42.6	18.8	8.7	3.9	1.7	2	0.8	0.3	0.1	1.1
2008		30.3	26.5	7.2	3	2.3	1.1	0.5	0.4	0.1	0.3
2009		71.6	42.9	19.1	5.7	3.2	2.2	0.8	1.2	0.4	1.3
2010		65.25	63.83	17.27	8.9	3.04	1.9	1.38	0.3	0.36	0.89
2011		105.55	95.31	35.70	9.25	6.68	2.82	1.40	0.19	0.57	0.95
2012		23.23	76.07	45.26	12.73	3.53	1.61	0.42	0.41	0.43	0.12
2013		34.33	59.27	87.99	45.47	10.58	3.54	1.03	1.37	0.14	0.20

f) United Kingdom: plaice (total numbers for 2\*4m beam trawl)  
Western Channel (Vlle).

Year/Age	0	1	2	3	4	5	6	7	8	9	10+
1989	0	31	70	281	188	23	11	14	8	6	18
1990	0	25	38	220	87	75	2	6	1	6	7
1991	2	22	27	63	79	62	41	9	0	1	3
1992	0	152	44	72	24	40	20	17	3	5	4
1993	0	21	70	60	24	13	25	13	11	2	2
1994	0	34	32	98	30	10	2	9	13	8	2
1995	0	50	46	45	48	12	4	5	6	1	4
1996	1	33	106	30	17	25	5	1	3	7	8
1997	0	53	122	197	24	6	12	7	1	1	7
1998	0	81	125	125	85	9	6	7	4	0	3
1999	1	38	44	182	53	30	3	2	6	4	2
2000	0	47.93	62.76	125.38	178.56	38.11	22.18	1.08	2.00	0	5.00
2001	20.50	31.88	63.69	50.99	111.35	97.44	24.54	12.61	0	3.00	5.00
2002	0	138.00	101.55	86.58	23.20	23.47	39.87	5.33	2.00	0	2.00
2003	0	28.83	137.32	59.84	50.14	4.50	18.06	27.08	7.22	0	2.00
2004	0	11.00	32.50	59.84	23.00	10.00	3.00	1.00	10.00	0	4.00
2005	1.50	30.43	75.41	90.88	69.82	12.88	3.20	2.67	5.25	2.20	2.75
2006	0.00	55.00	102.40	103.05	30.39	31.19	2.67	3.80	0.00	4.50	2.00
2007	0.00	37.00	91.15	120.53	33.79	27.03	6.00	5.50	0.50	2.50	4.00
2008	0.00	14.92	145.77	67.61	30.87	12.00	7.83	9.50	3.50	1.00	4.00
2009	3.00	16.17	156.37	213.65	29.13	14.63	10.94	8.00	4.61	1.00	2.50
2010	14.00	184.25	350.81	224.27	112.75	31.05	15.05	16.50	1.00	3.33	4.00
2011	0	207.99	578.76	351.47	94.41	54.86	8.75	8.27	3.00	1.00	6.50
2012	0	16.24	235.46	577.44	188.21	47.22	44.14	19.35	6.07	5.00	6.88
2013	10.00	8.23	102.88	379.14	397.31	176.37	77.90	20.88	4.79	6.50	1.00



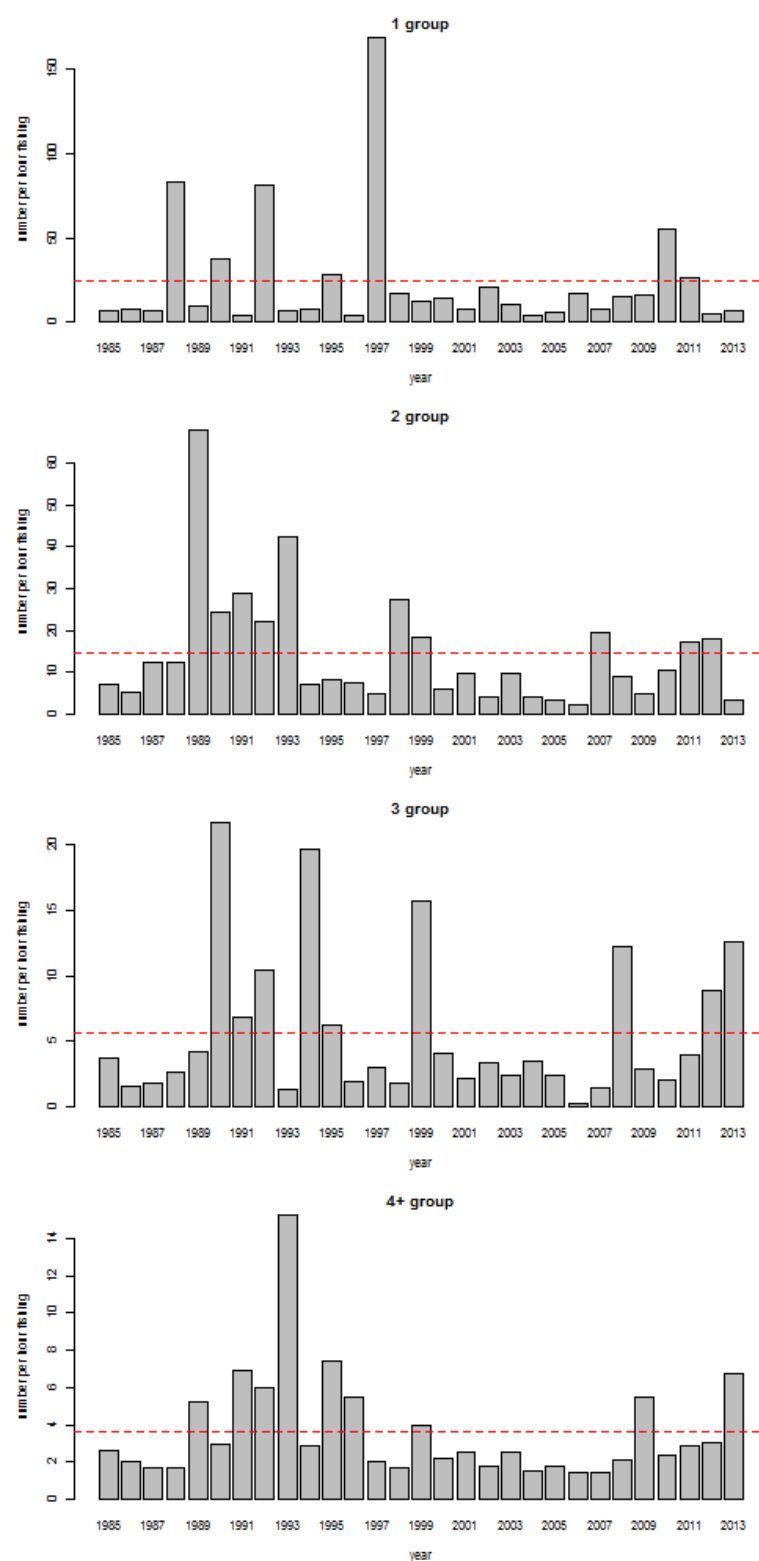
**g) United Kingdom: plaice (total numbers for 4m beam trawl) Bristol Channel (VIIIf).**

<b>Year/Age</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10+</b>
1993	4	121	107	43	2	5	0	1	0	0	0
1994	150	131	39	19	10	1	0	0	0	0	0
1995	1	275	103	19	3	8	2	0	0	2	0
1996	10	265	342	37	1	3	1	0	0	0	0
1997	8	259	117	40	5	2	2	1	0	0	0
1998	6	273	145	54	10	2	1	0	0	0	1
1999	192	181	94	34	23	8	0	0	2	0	0
2000	100	403	75	37	8	7	0	1	0	0	0
2001	42	251	185	19	10	5	4	2	0	0	0
2002	1	162	208	95	7	7	2	4	1	0	0
2003	72	117	95	72	26	3	2	1	1	2	0
2004	188	297	38	31	15	3	1	1	3	0	2
2005	3	228	89	25	10	13	3	1	0	0	1
2006	96	102	121	41	11	2	11	0	3	1	0
2007	41	178	109	56	18	2	3	1	2	1	0
2008	7	167	257	57	19	6	1	3	0	0	1
2009	222	192	66	93	25	13	5	2	0	1	0
2010	170	393	105	31	47	8	5	1	0	1	2
2011	10	433	353	63	24	27	18	3	3	1	0
2012	19	173	506	116	29	12	18	7	2	0	0
2013	83	395	159	211	54	9	6	10	4	2	0

**h) United Kingdom: plaice (total numbers for 4m beam trawl) Irish Sea (VIIa).**

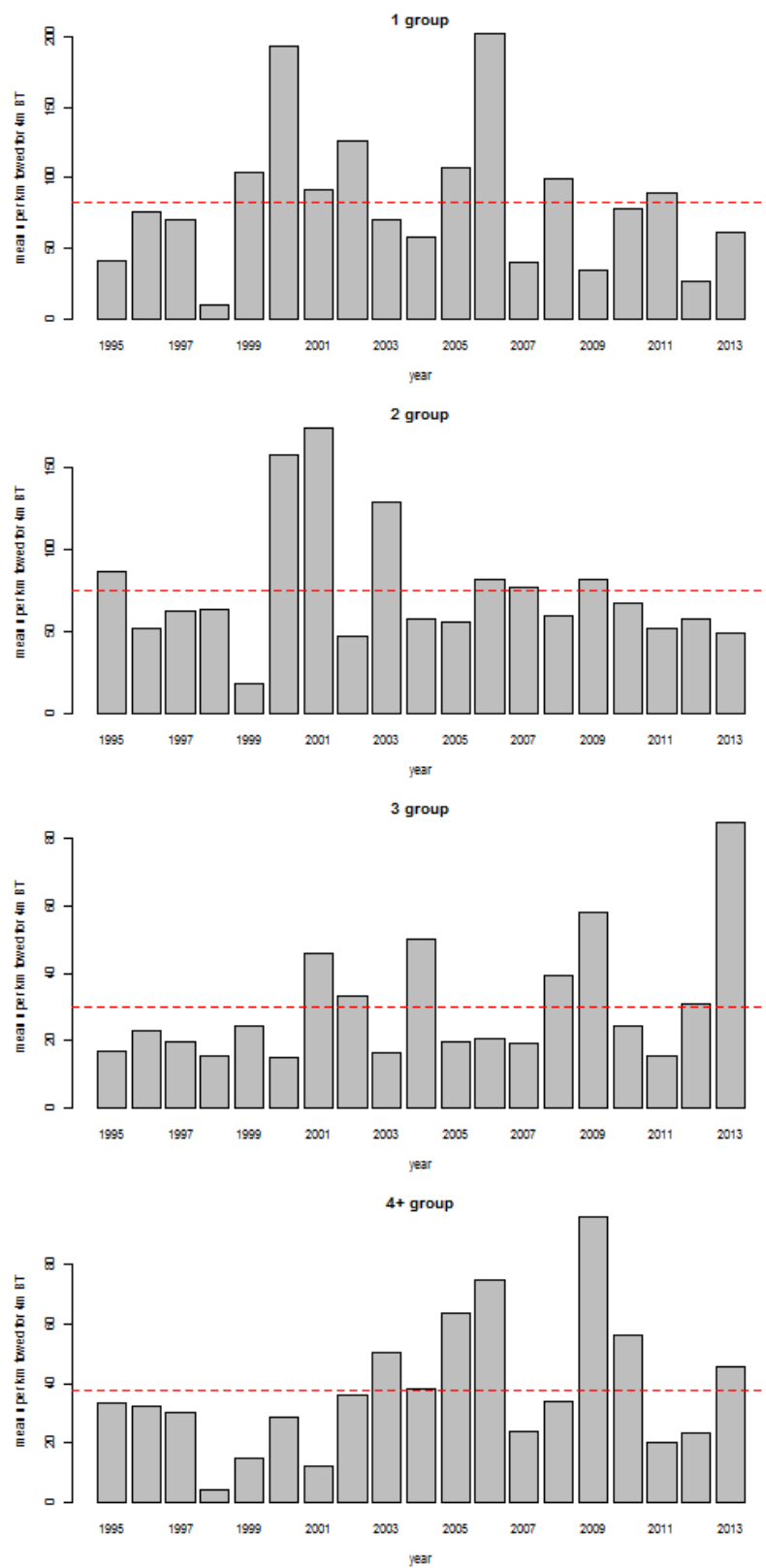
<b>Year/Age</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10+</b>
1993	7	1007	836	111	90	11	5	9	2	1	6
1994	100	736	642	339	63	29	12	16	9	2	9
1995	281	1283	387	179	84	16	18	0	1	3	8
1996	105	1701	601	124	74	49	9	11	1	2	8
1997	31	1363	668	322	65	50	23	8	7	0	7
1998	169	1167	767	212	95	34	23	14	3	1	7
1999	180	1189	965	344	113	38	17	7	7	4	0
2000	132	2112	659	298	141	73	22	7	3	3	5
2001	249	1468	663	218	130	89	28	10	7	6	4
2002	16	1734	1615	647	243	79	51	16	17	5	7
2003	258	1480	1842	827	296	122	62	39	10	4	4
2004	218	1816	1187	1184	404	261	57	57	14	4	3
2005	288	869	1295	666	499	297	111	17	17	9	11
2006	485	1120	840	722	411	178	83	59	16	15	6
2007	186	2667	1255	525	417	196	95	45	37	6	10
2008	439	1293	1900	619	339	244	76	55	33	5	0
2009	150	1460	1083	1225	310	189	251	65	31	20	13
2010	499	1912	1431	600	460	187	142	98	61	35	35
2011	232	2213	1432	663	315	347	122	101	87	71	74
2012	320	1964	1796	660	319	156	148	137	84	100	84
2013	689	1526	1694	1010	487	313	152	157	95	96	98

### Annex 5.3: Figures of catch rate of sole from Netherlands and UK surveys in the North Sea and VII a, d, e and f.



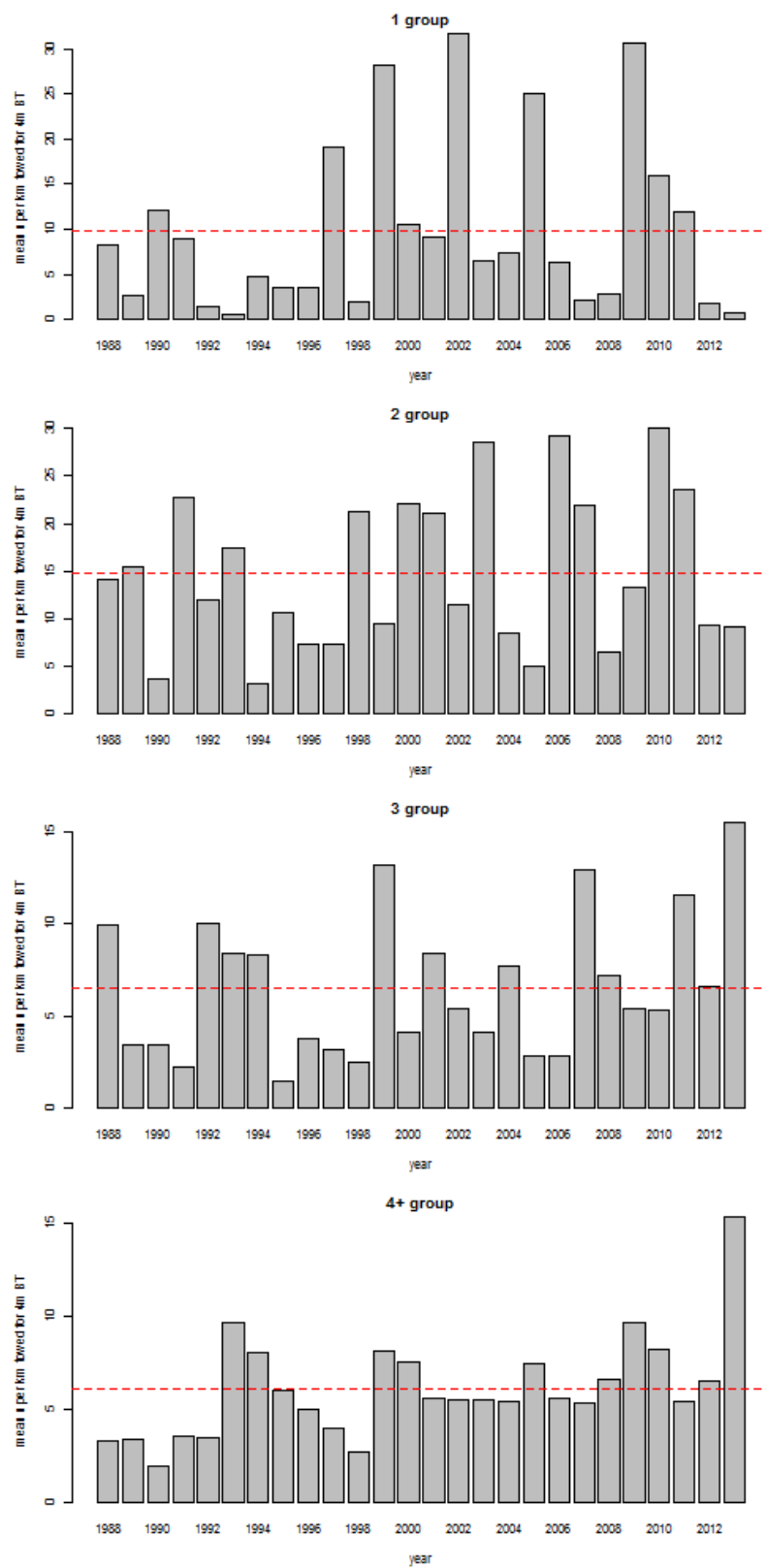
a) Netherlands: sole (N.hr<sup>-1</sup>/8m trawl) North Sea (IV) RV "Isis".

Figure 5.1.1.1. Catch rate of sole from Netherlands and UK surveys in the North Sea and VII d, e, f and a. (Horizontal line=long-term mean for the period presented).



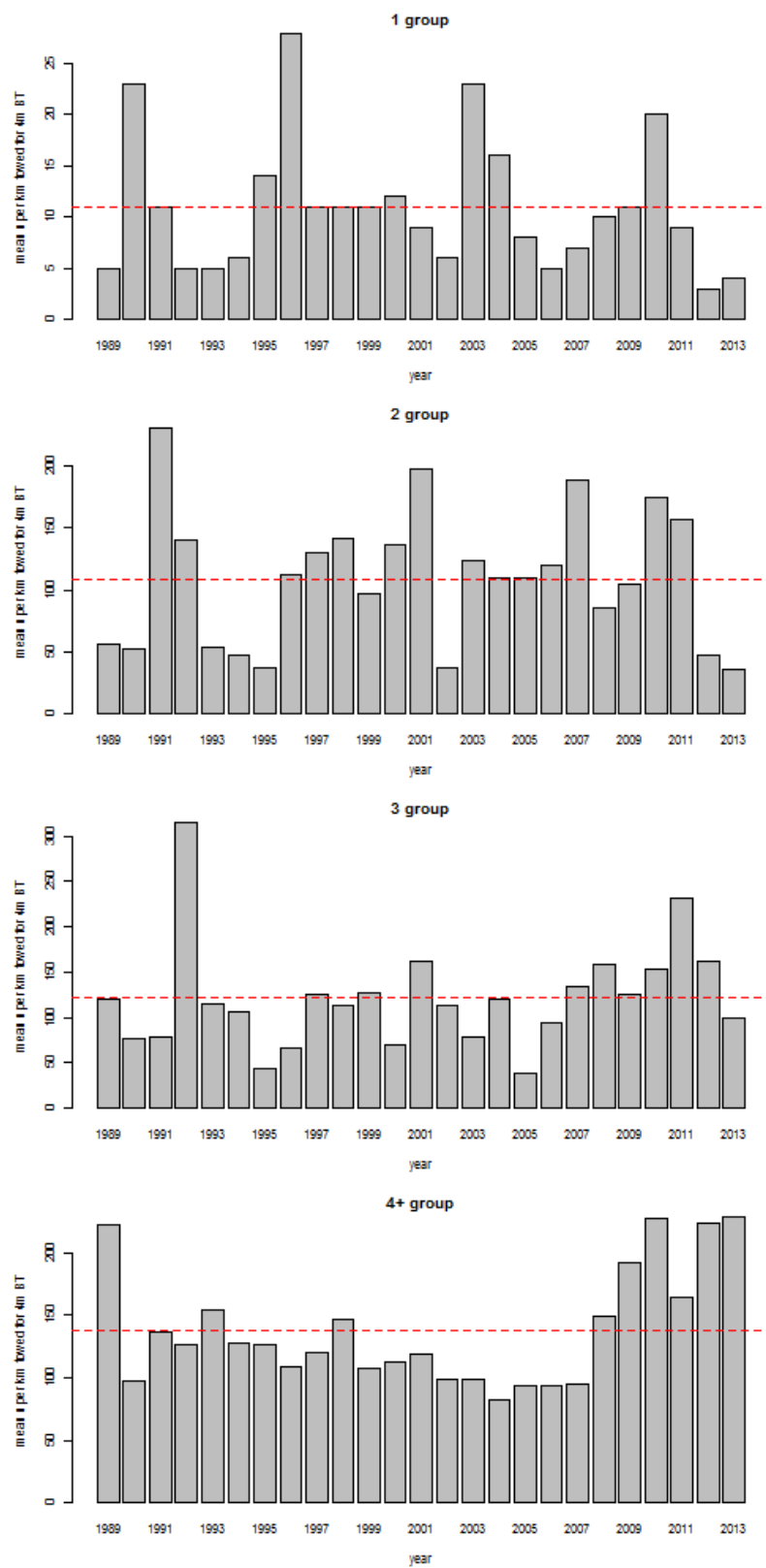
b) UK: Sole (mean numbers per km towed for 4m beam trawl) Southern North Sea (IVc).

Figure 5.1.1.1. Continued.



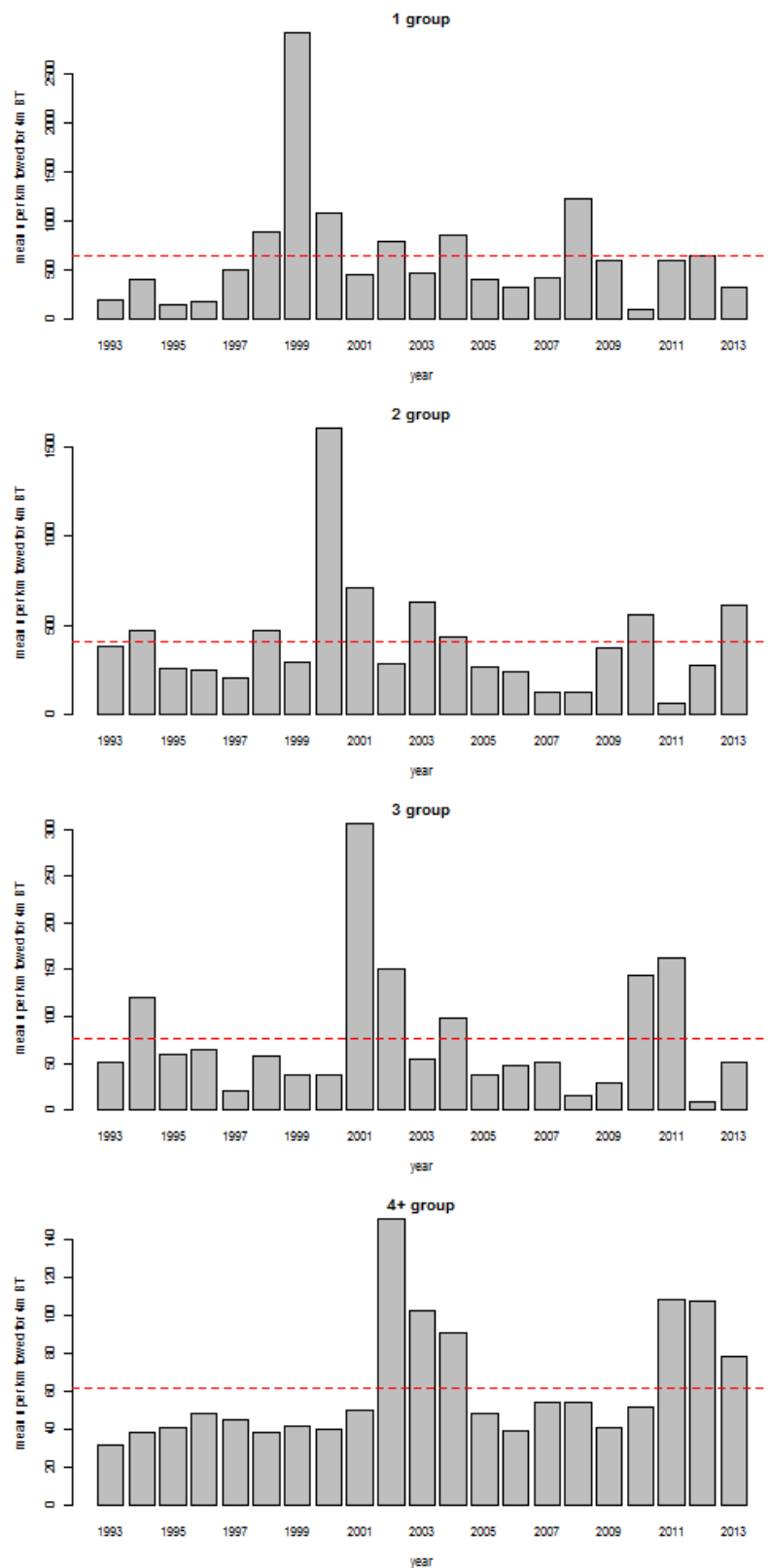
c) UK: Sole ( $N \cdot hr^{-1/8m}$  beam) Eastern English Channel (VIId).

Figure 5.1.1.1. Continued.



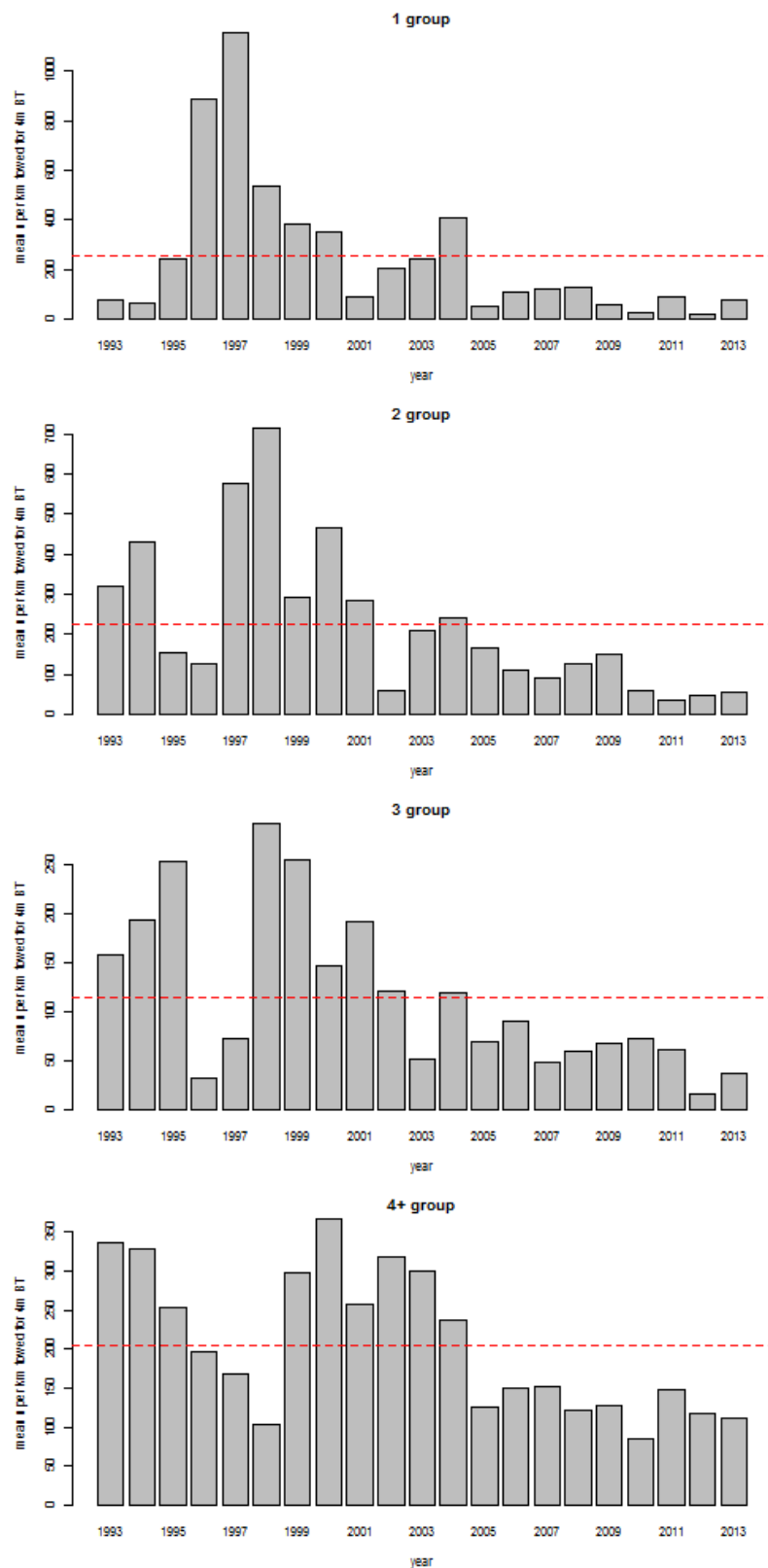
d) UK: Sole (mean numbers per km towed for 2\*4m beam trawl) Western English Channel (VIIe).

Figure 5.1.1.1. Continued.



e) UK: Sole (mean numbers per km towed for 4m beam trawl) Bristol Channel (VIIf).

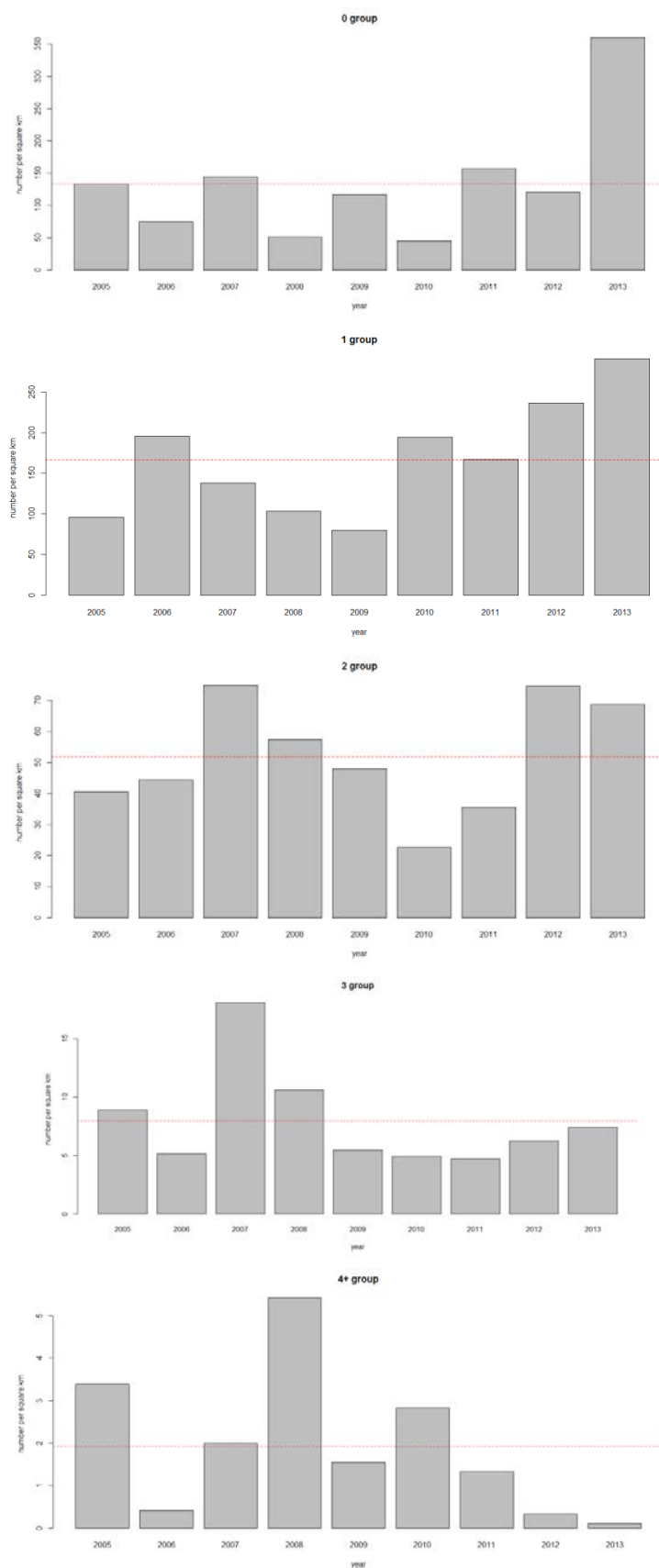
Figure 5.1.1.1. Continued.



f) UK: Sole (mean numbers per km towed for 4m beam trawl) Eastern Irish Sea (VIIa).

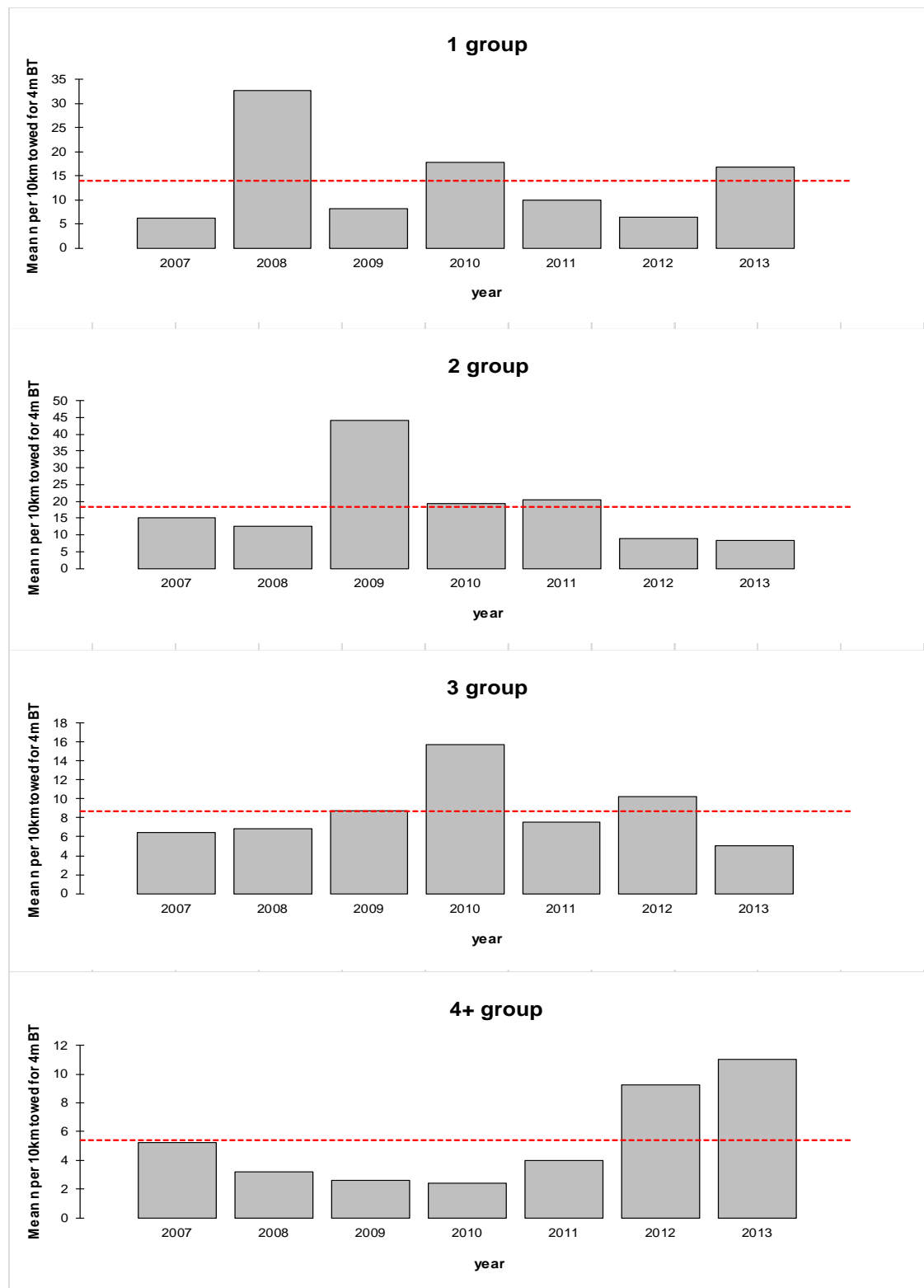
Figure 5.1.1.1. Continued.





g) Italy: Catch rate of sole from the Adriatic beam trawl survey. (horizontal line = long-term mean for the period presented).

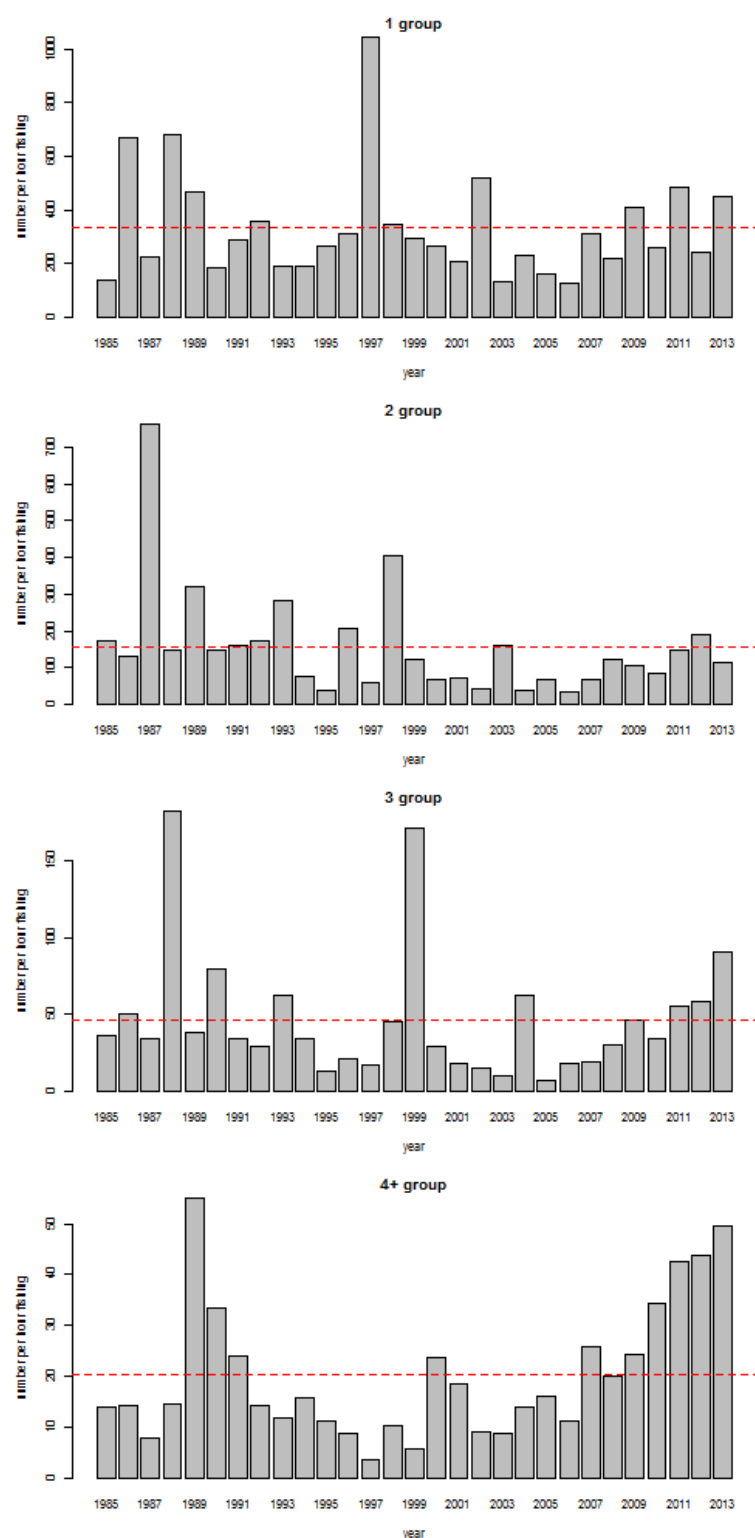
**Figure 5.1.1.1. Continued.**



h) France: Catch rate of sole from French survey in the Bay of Biscay. (mean numbers per 10km towed for 4m beam trawl; Horizontal line=long term mean for the period presented).

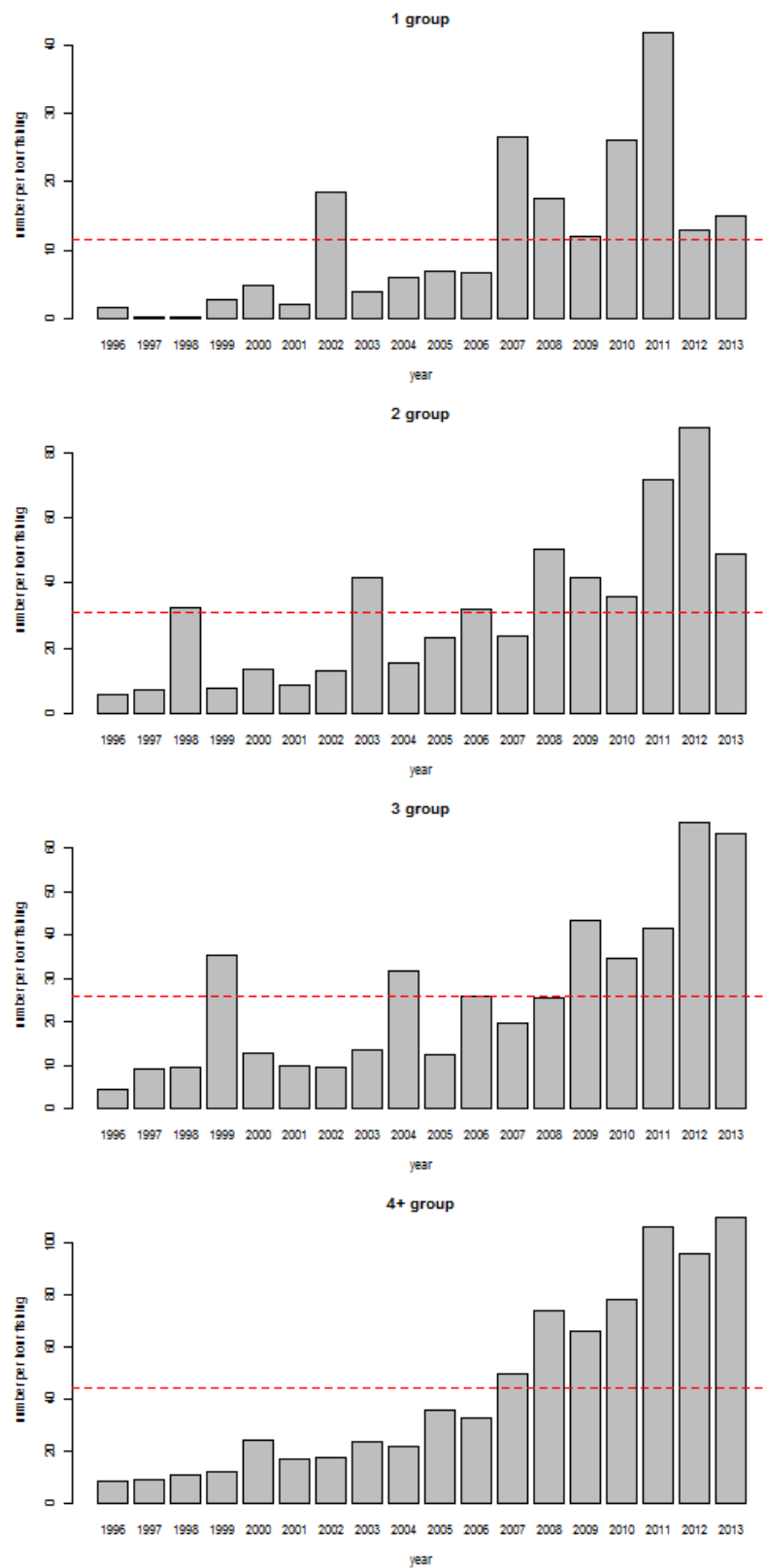
Figure 5.1.1.1. Continued.

## Annex 5.4: Figures of catch rate of plaice from Netherlands and UK surveys in the North Sea and VII a, d, e and f



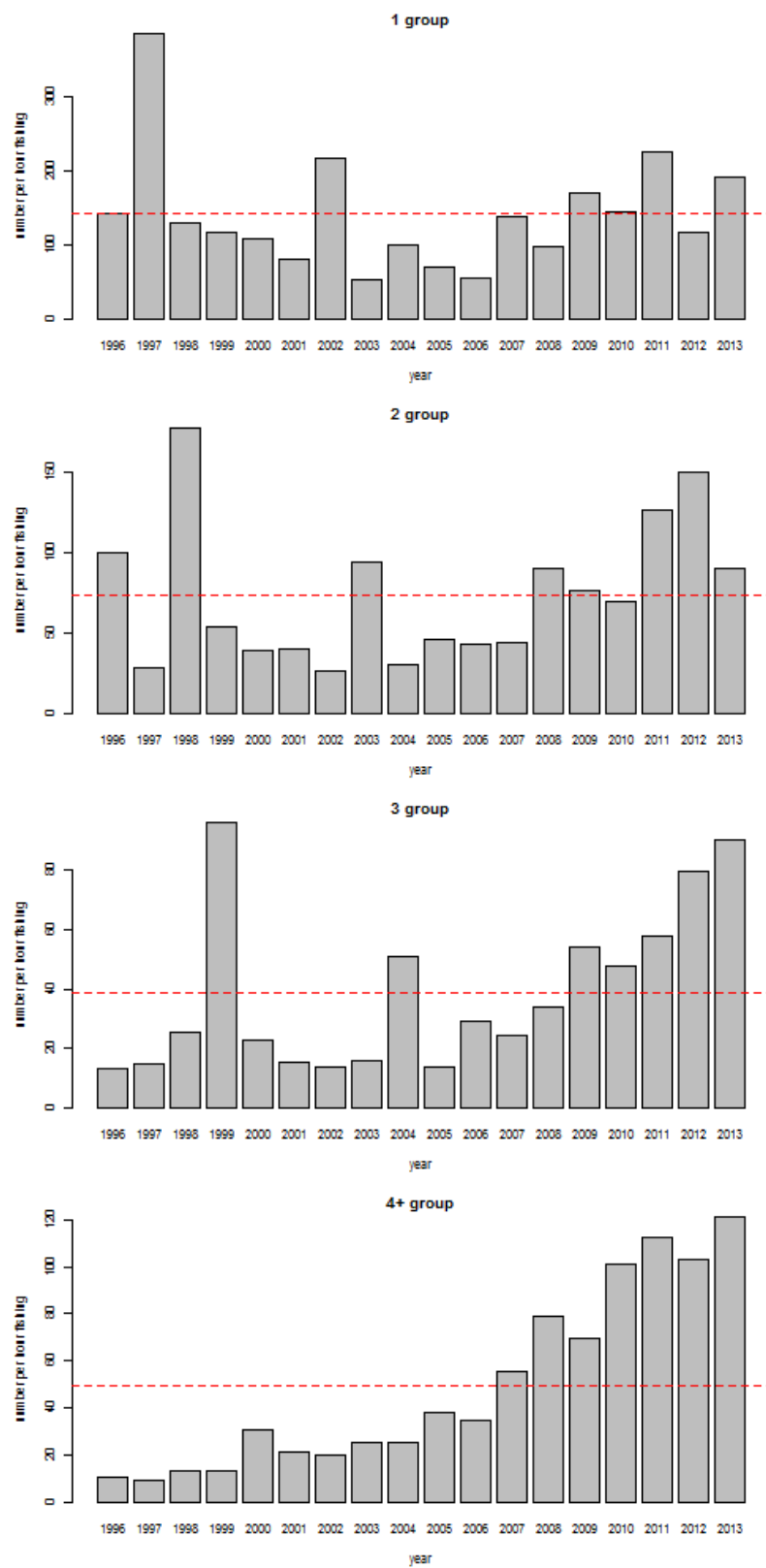
(a) Netherlands: plaice ( $N \cdot hr^{-1}/8m$  trawl) North Sea (IV) RV "Isis".

Figure 5.1.1.2. Catch rate of plaice from Netherlands and UK surveys in the North Sea and VII d, e, f and a. (Horizontal line=long-term mean for the period presented).



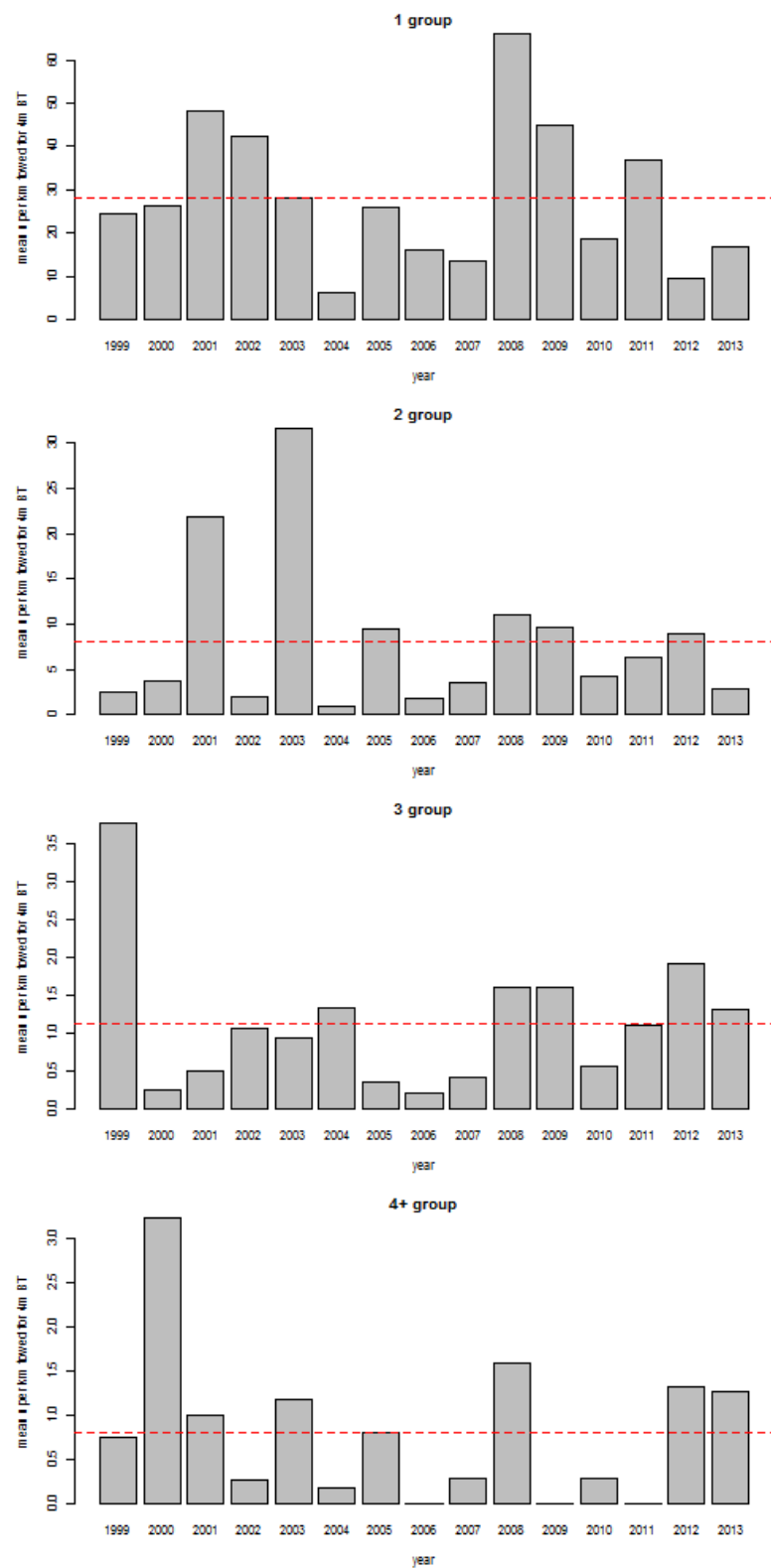
(b) Netherlands: plaice ( $N \cdot hr^{-1/8m}$  trawl) North Sea (IV) RV "Tridens".

Figure 5.1.1.2. Continued.



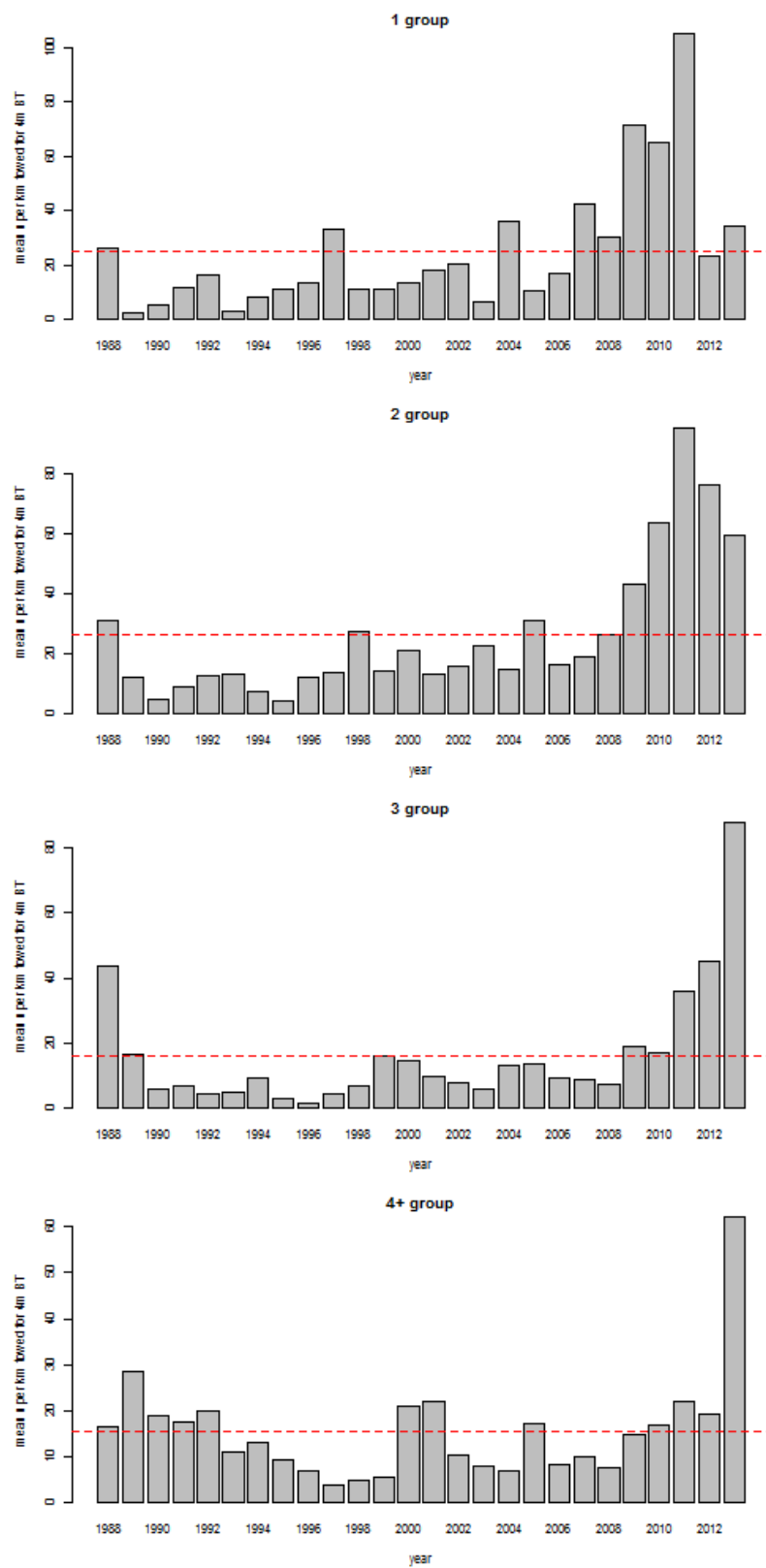
(c) Netherlands: plaice ( $N \cdot hr^{-1} / 8m$  trawl) North Sea (IV) RV "Isis" and RV "Tridens".

Figure 5.1.1.2. Continued.



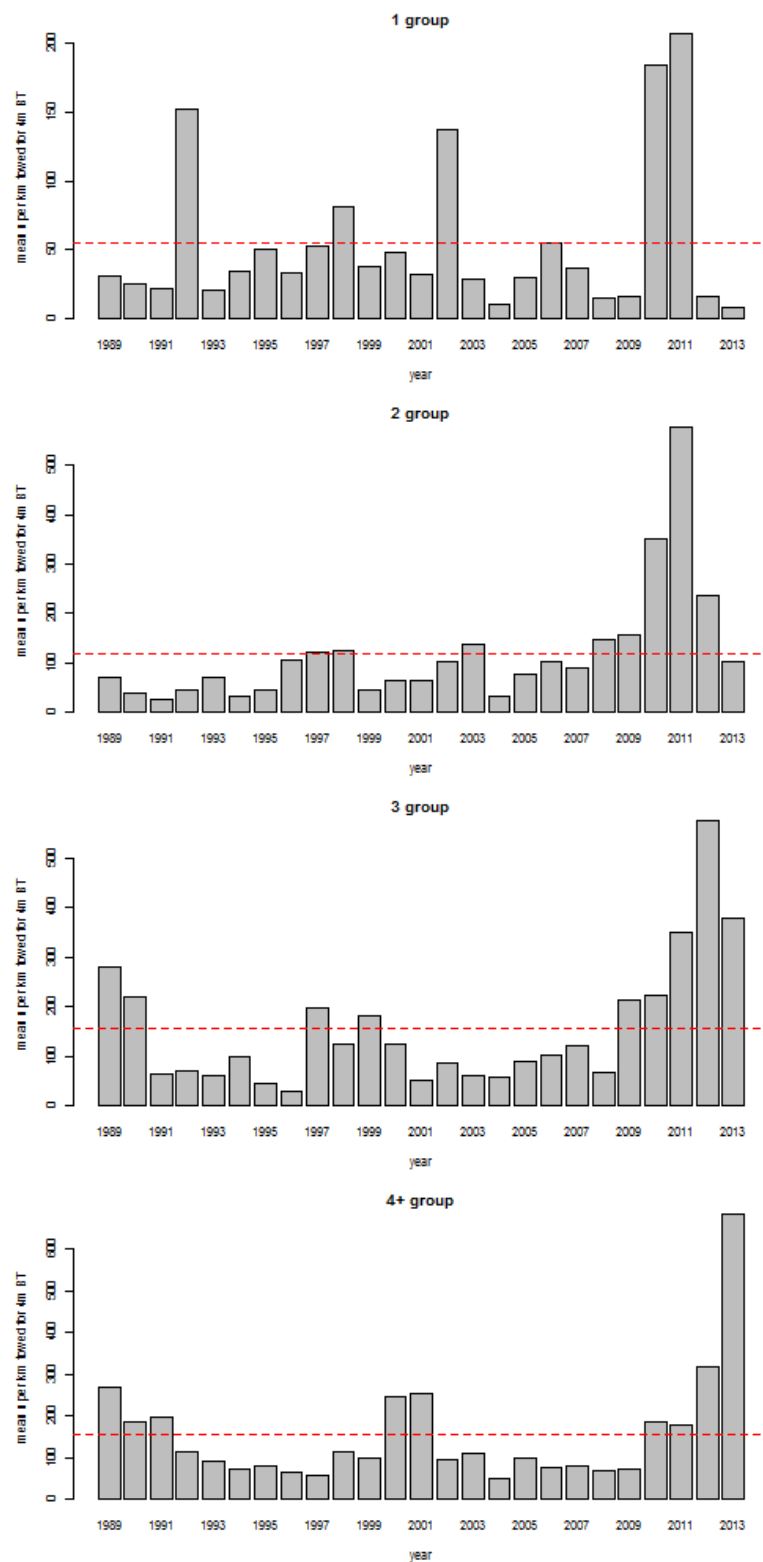
(d) UK: plaice (mean numbers per km towed for 4m beam trawl) Southern North Sea (IVc).

Figure 5.1.1.2. Continued.



(e) UK: plaice ( $N \cdot hr^{-1} / 8m$  beam trawl) Eastern English Channel (VIIId).

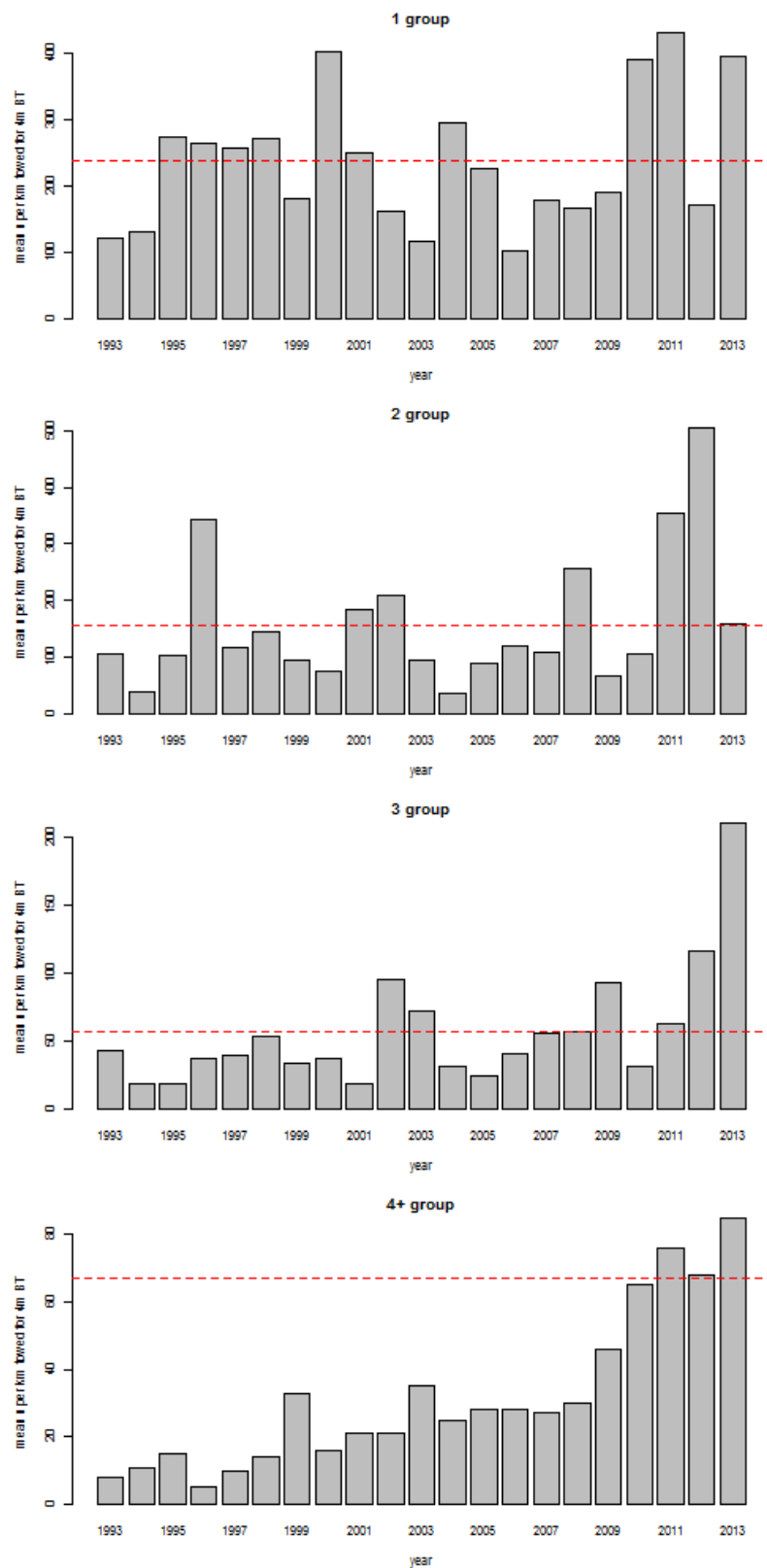
Figure 5.1.1.2. Continued.



(f) UK: plaice (mean numbers per km towed for 2\*4m beam trawl) Western English Channel (VIIe).

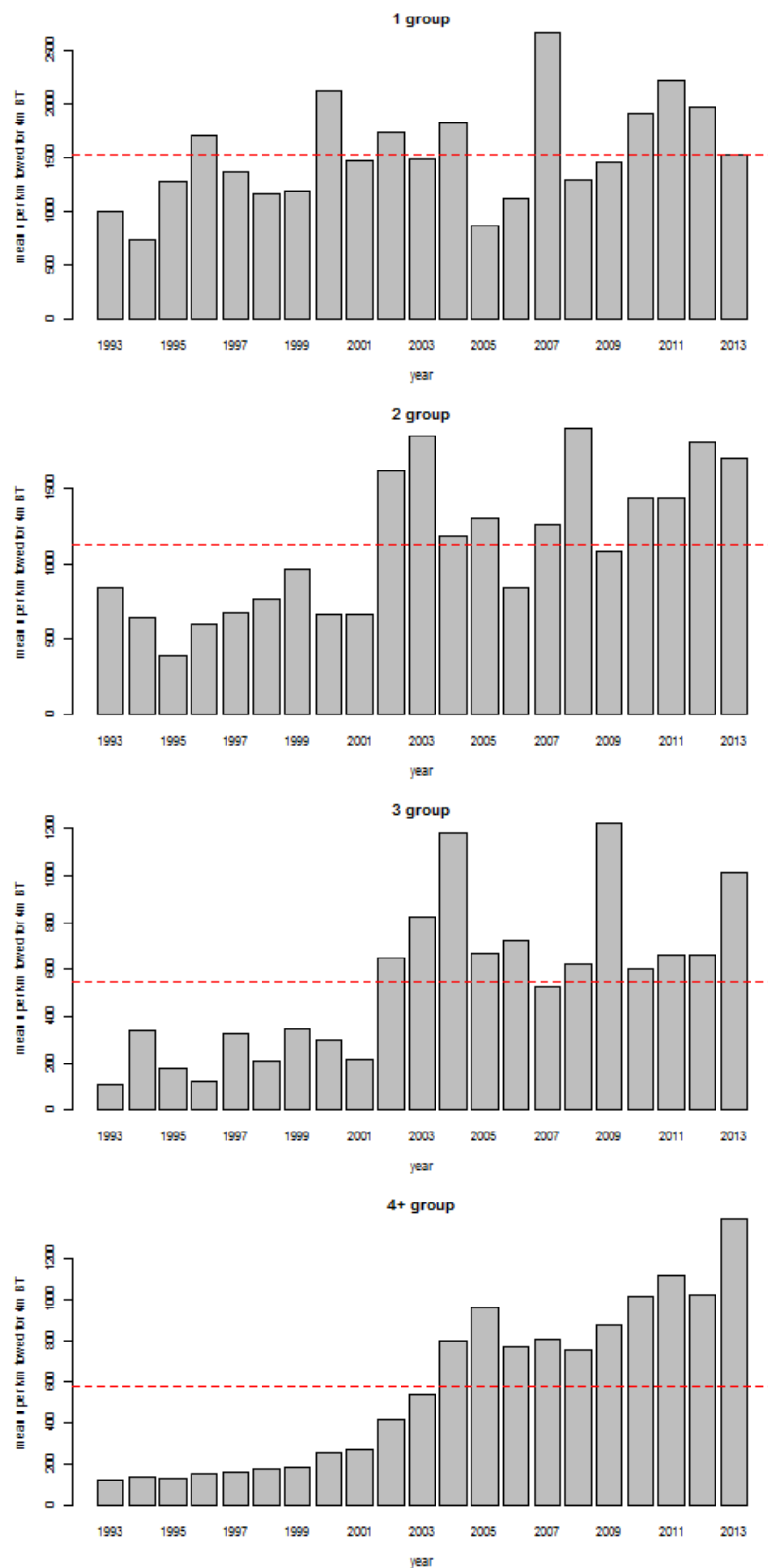
Figure 5.1.1.2. Continued.





(g) UK: plaice (mean numbers per km towed for 4m beam trawl) Bristol Channel (VIIIf).

Figure 5.1.1.2. Continued.



h) UK: plaice (mean numbers per km towed for 4m beam trawl) Eastern Irish Sea (VIIa).

Figure 5.1.1.2. Continued.

## Annex 6: Population abundance indices for sole and plaice, inshore surveys

### Annex 6.1: Indices from the D(Y)FS inshore beam trawl surveys.

a) Plaice abundance indices in numbers per 1000m<sup>2</sup> (national) or numbers\*10<sup>6</sup> (combined).

	Plaice, age 0				Plaice, age 1		
	nl	be	de	combined	nl	be	combined
Raising	11.007	1.472	1.919		11.007	1.472	
Gear correction	1	1.22	1.22		1	1	
1990	34.515	2.482	23.590	439.593	5.518	1.256	62.588
1991	25.489	1.155	21.240	332.358	4.633	0.170	51.251
1992	15.326	0.315	4.720	180.310	4.066	0.182	45.020
1993	18.860	0.198	3.860	216.990	2.362	0.121	26.178
1994	23.898	1.306	7.710	283.438	0.636	0.292	7.432
1995	10.623	2.623	10.440	146.076	0.789	0.724	9.749
1996	45.345	12.648	41.770	619.615	0.426	0.198	4.985
1997	16.584	4.273	16.670	229.243	3.729	3.448	46.119
1998	*	2.763	8.110	*	*	1.543	*
1999	*	1.136	2.940	*	*	1.624	*
2000	8.953	1.290	10.280	124.926	0.162	0.949	3.185
2001	22.353	1.572	27.470	313.175	0.136	0.630	2.422
2002	10.013	5.609	1.120	122.907	0.088	4.685	7.861
2003	19.197	3.224	9.200	238.626	0.257	1.210	4.607
2004	9.787	4.463	4.700	126.738	0.592	1.999	9.455
2005	6.589	3.942	2.680	85.880	0.155	0.264	2.100
2006	14.230	1.117	3.997	167.988	0.143	0.690	2.585
2007	7.074	4.298	5.410	98.253	0.129	0.236	1.770
2008	10.691	3.796	2.230	129.710	0.067	0.657	1.708
2009	9.757	7.402	9.050	141.870	0.138	0.311	1.981
2010	12.807	1.182	15.600	179.615	0.073	0.501	1.537
2011	6.897	2.182	5.610	92.963	0.329	2.778	7.713
2012	15.191	3.057	3.600	181.122	0.111	1.691	3.713
2013	12.37	3.466	9.423	164.44	0.267	1.034	4.46

b) Sole abundance indices in numbers per 1000m<sup>2</sup> (national) or numbers\*10<sup>6</sup> (combined).

	Sole, age 0				Sole, age 1		
	nl	be	de	combined	nl	be	combined
Raising	11.007	1.472	1.919		11.007	1.472	
Gear correction	1	1.59	1.59		1	1.9	
1990	0.440	0.356	0.230	6.381	0.119	0.045	1.435
1991	14.521	2.168	0.870	167.563	0.015	0.005	0.184
1992	0.755	0.160	0.190	9.266	0.344	0.350	4.771
1993	1.263	0.450	0.120	15.324	0.024	0.024	0.335
1994	1.817	0.687	0.150	22.063	0.015	0.106	0.457
1995	0.284	1.568	0.090	7.065	0.075	0.084	1.065
1996	2.454	4.949	0.550	40.272	0.013	0.418	1.306
1997	2.141	1.400	0.030	26.940	0.248	0.804	4.981
1998	*	3.476	0.180	*	*	2.336	*
1999	*	2.310	0.100	*	*	0.506	*
2000	0.716	0.535	0.120	9.504	0.036	0.086	0.636
2001	2.648	9.452	0.050	51.424	0.032	0.687	2.269
2002	2.426	13.386	0.180	58.583	0.087	4.060	12.307
2003	0.618	1.498	0.100	10.609	0.087	0.479	2.298
2004	0.589	10.516	0.050	31.252	0.030	2.235	6.585
2005	2.245	5.665	0.990	40.987	0.032	1.240	3.819
2006	1.037	0.341	0.115	12.567	0.126	2.297	7.813
2007	0.863	1.739	0.050	13.727	0.013	0.226	0.776
2008	0.970	0.434	0.024	11.768	0.011	0.059	0.292
2009	1.224	5.519	0.310	27.332	0.035	1.873	5.620
2010	2.245	7.724	0.024	42.862	0.059	1.439	4.673
2011	0.981	0.477	0.070	12.130	0.143	0.900	4.088
2012	0.915	0.428	0.050	11.226	0.012	0.269	0.880
2013	3.458	3.434	0.723	48.307	0.035	1.102	3.473

\* No valid survey.

## Annex 6.2: Indices from SNS inshore beam trawl survey.

### a) Plaice abundance indices in numbers per 100 hours fished.

	Plaice			
	age group			
	1	2	3	4
1970	9311.368	9731.527	3272.977	769.727
1971	13538.483	28163.543	1414.688	100.825
1972	13206.903	10779.712	4477.829	89.111
1973	65642.504	5133.332	1578.221	461.359
1974	15366.398	16508.939	1128.838	160.004
1975	11628.230	8168.365	9556.302	65.238
1976	8536.534	2402.627	868.236	236.317
1977	18536.699	3423.843	1737.311	589.947
1978	14011.969	12678.032	345.465	134.778
1979	21495.430	9828.822	1574.911	161.222
1980	59174.156	12882.339	490.655	180.434
1981	24756.155	18785.306	834.420	38.321
1982	69993.328	8642.029	1261.036	87.857
1983	33974.181	13908.624	249.374	70.965
1984	44964.544	10412.798	2466.902	41.667
1985	28100.547	13847.837	1597.696	328.037
1986	93551.910	7580.403	1152.144	144.873
1987	33402.438	32991.107	1226.651	199.582
1988	36608.576	14421.140	13153.247	1350.132
1989	34276.253	17810.152	4372.837	7126.431
1990	25036.611	7496.000	3160.028	816.139
1991	57221.278	11247.222	1517.833	1076.833
1992	46798.224	13841.786	2267.598	612.976
1993	22098.315	9685.589	1006.278	97.778
1994	19188.431	4976.550	855.907	75.944
1995	24766.964	2796.381	381.327	96.994
1996	23015.391	10268.227	1185.155	44.714
1997	95900.889	4472.700	496.633	31.667
1998	33665.689	30242.247	5013.857	49.667
1999	32951.262	10272.083	13783.060	1058.214
2000	22855.018	2493.389	891.444	982.556
2001	11510.524	2898.476	370.167	175.833
2002	30809.227	1102.715	264.641	65.242
2003	*	*	*	*
2004	18201.602	1349.703	1080.686	50.778
2005	10118.405	1818.912	141.881	365.524
2006	12164.222	1570.978	384.722	52.444
2007	14174.543	2133.911	139.537	51.852
2008	14705.767	2700.438	464.129	178.500
2009	14860.033	2018.683	492.452	38.333
2010	11946.907	1811.517	529.338	55.476
2011	18348.596	1142.515	308.193	74.696
2012	5893.440	2928.552	681.524	82.000
2013	15394.878	3021.319	1638.492	427.603

\* No survey.

## b) Sole abundance indices in numbers per 100 hour fishing.

	Sole			
	age group			
	1	2	3	4
1970	5410.280	734.377	237.695	35.444
1971	902.697	1831.076	113.370	2.857
1972	1454.685	272.270	148.553	0.000
1973	5587.152	935.259	83.810	37.303
1974	2347.930	361.429	65.159	0.000
1975	525.425	864.480	176.960	17.500
1976	1399.429	73.556	229.111	26.667
1977	3742.944	776.101	103.838	43.091
1978	1547.714	1354.661	294.069	28.000
1979	93.778	408.273	300.838	76.889
1980	4312.889	88.889	109.333	61.333
1981	3737.200	1413.052	49.970	20.000
1982	5856.463	1146.204	227.778	6.667
1983	2621.143	1123.325	120.579	39.857
1984	2493.111	1099.911	318.322	74.433
1985	3619.435	715.602	167.074	49.333
1986	3705.063	457.607	69.235	31.429
1987	1947.852	943.704	64.815	21.333
1988	11226.667	593.833	281.611	81.533
1989	2830.744	5004.997	207.558	53.131
1990	2856.167	1119.500	914.250	100.444
1991	1253.620	2529.104	513.839	623.854
1992	11114.014	144.405	360.410	194.857
1993	1290.778	3419.571	153.778	212.778
1994	651.778	498.251	934.097	10.222
1995	1362.100	223.672	142.848	411.134
1996	218.359	349.085	29.600	35.533
1997	10279.333	153.630	189.819	26.470
1998	4094.611	3126.374	141.713	98.730
1999	1648.854	971.782	455.612	10.000
2000	1639.173	125.883	166.278	118.000
2001	970.310	655.357	106.667	35.476
2002	7547.460	379.044	195.300	0.000
2003	*	*	*	*
2004	1369.505	624.376	393.032	68.889
2005	568.083	162.917	124.000	0.000
2006	2726.417	117.083	25.000	30.000
2007	848.642	910.988	33.333	39.506
2008	1259.119	258.548	325.333	0.000
2009	1931.598	344.354	61.667	102.667
2010	2636.933	237.131	67.114	42.202
2011	1247.967	883.867	211.333	111.833
2012	226.576	159.476	54.000	18.000
2013	967.400	426.616	490.472	179.267

\* No survey.

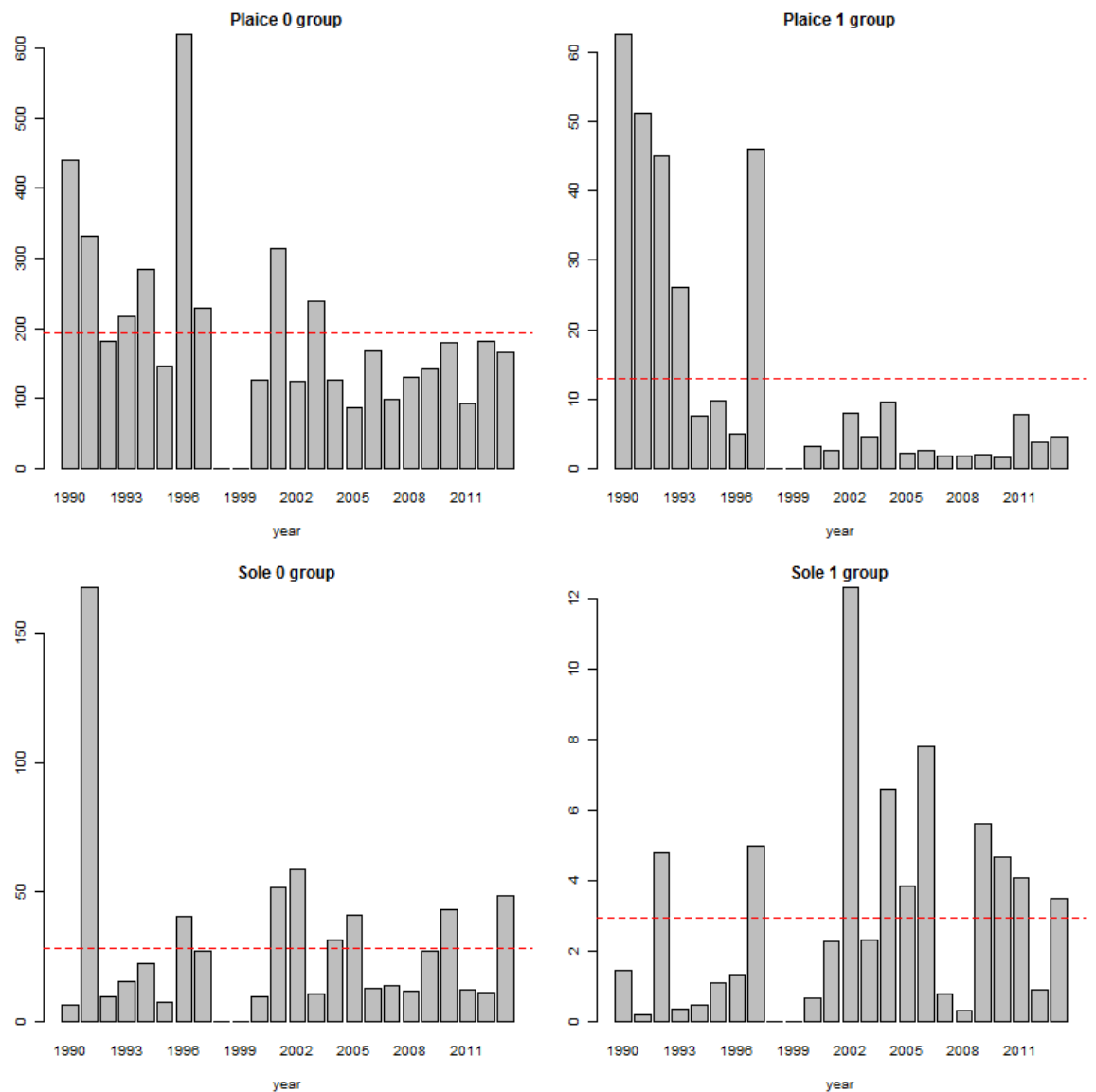
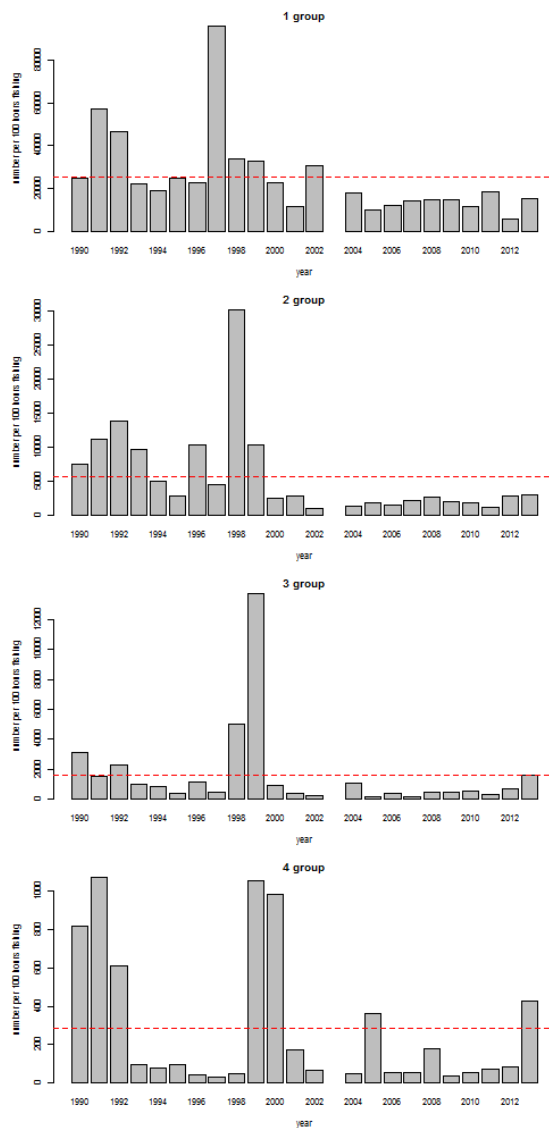


Figure 1. Combined inshore indices for 0 and 1 group plaice and sole. The horizontal line is the long-term mean for the period presented. The indices were declared invalid in 1998 and 1999, due to insufficient coverage of the Dutch survey area and are not displayed.





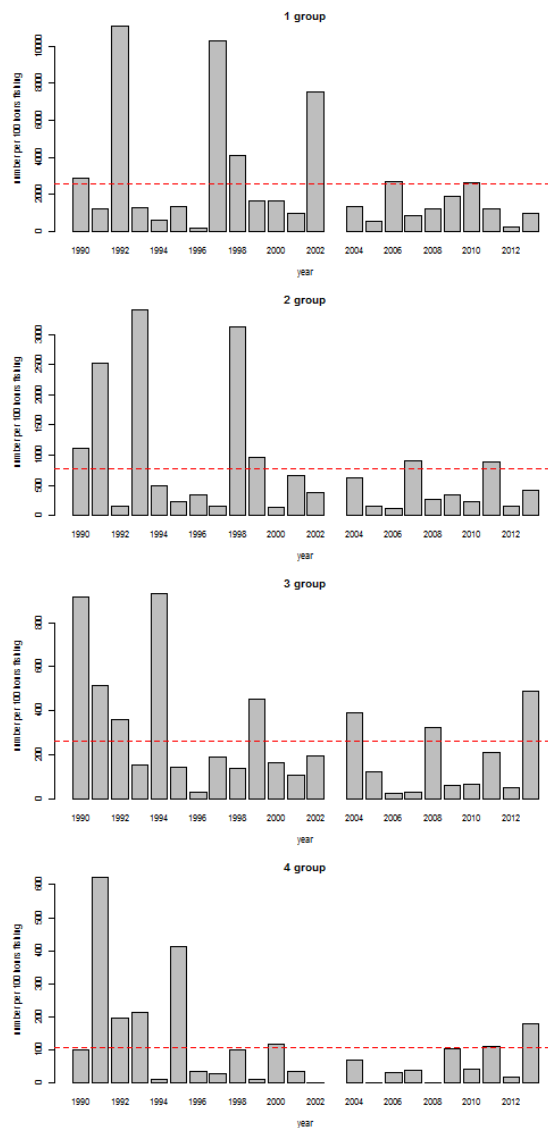


Figure 2. SNS indices for 1 – 4 group plaice (left) and sole (right), in numbers per 100 hours fishing. The horizontal line is the long-term mean for the period presented.

### Annex 6.3: Evaluation of the (combined) inshore indices

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The Dutch DFS and Belgian DYFS are calculated using area-based weighting factors, whereas no weighting was applied for the calculation of the German DYFS indices so far. Updated surface area estimates are available for all three surveys (WGBEAM 2013, Table 6.2.2.2).

The German DYFS areas 412 and 414 are not included in the index calculation, while these areas appear to have a good coverage since 1979 (WGBEAM 2013, Annex 10). Area 412 was not included into the index calculations so far because the surveys were partly conducted during night-time (from 1993 to 2007) which might have had a considerable effect on the index. This issue will be further evaluated. For Area 414 there were no obvious reasons known to the group why it was not included so far and it will be included in the next index update. Area 406 shows also a good coverage time-series period. However, a large part of its northern area was never sampled by the German DYFS in the past. Thus, the area surface for an area weighting procedure has to be re-estimated accordingly.

Since 2005 area 413 was included in the German DYFS campaign and apart of area 408 also all other areas have a good coverage since then. Therefore, it might be considered to create a new time-series from 2005 onwards taking all available German data into account.

Although area 408 was never properly sampled it is accounted for in the current area weighing factor for the German DYFS. This error is not supposed to have any large impact on the estimate of the combined inshore index, because the area is comparatively small and so is the area weighing factor for the whole German DYFS. However, this should be corrected for the next index update along with the revision for the German DYFS contribution.

Since 2012, the new German FRV “Clupea” is in operation and covers large parts of the German Bight coastline (Area 405 and 406). This additional coverage is seen by WGBEAM as a useful addition to the existing surveys and might have the potential to improve the 0 group and 1 group plaice and sole inshore abundance index in future. Additionally, it will improve the data availability of *Crangon crangon* abundance and distribution patterns for WGCAN.

Based on these considerations, WGBEAM recommends the following actions:

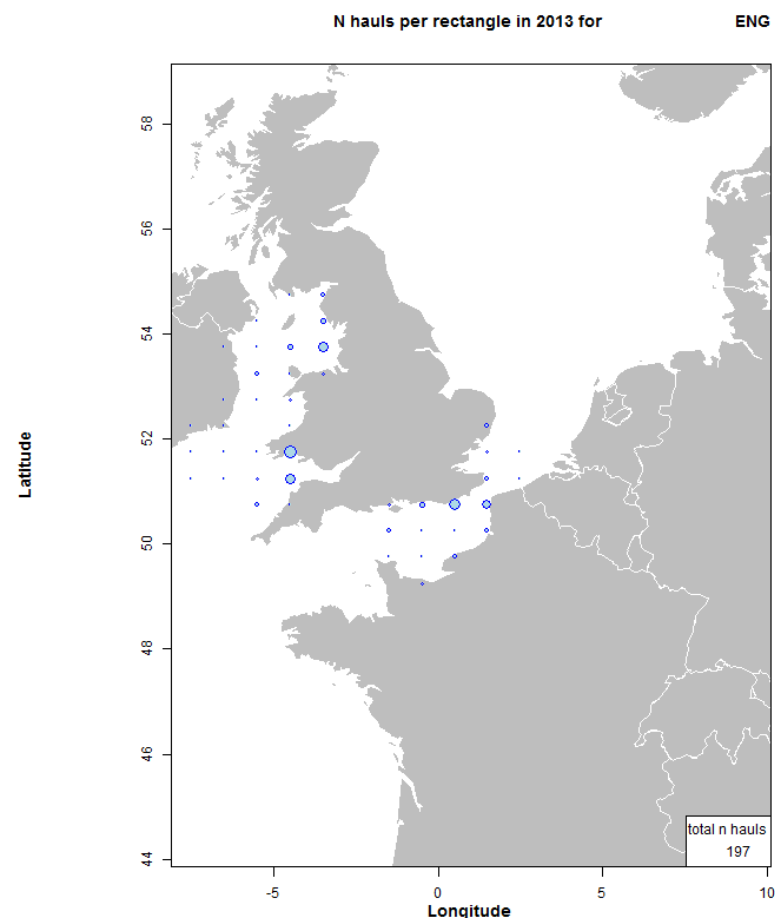
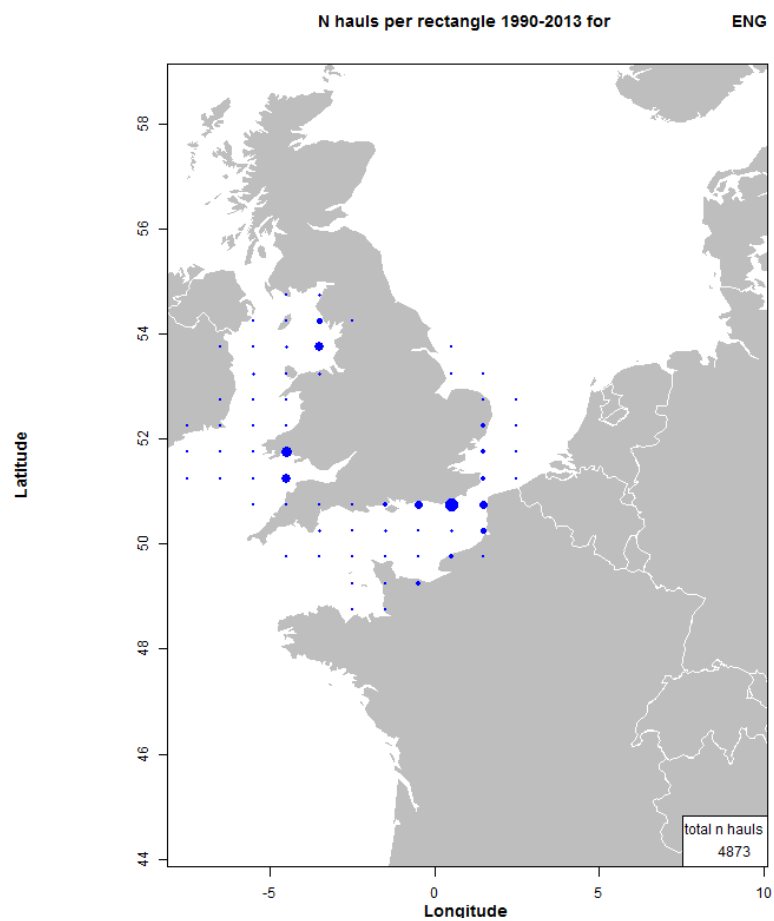
- 1) Continue scrutinizing the areas and area weighting in the German DYFS indices calculation and update appropriately before WGBEAM 2015.
- 2) Revise the combined inshore indices using the revised German indices.
- 3) Include area 414 in the German DYFS index.
- 4) Area based weighting of German DYFS index.
- 5) Update area weighting factor for the combined inshore index.

## **Annex 7: Spatial distribution of sampling and fish species for the off-shore surveys**

### **Annex 7.1: Spatial sampling coverage per country, offshore surveys**

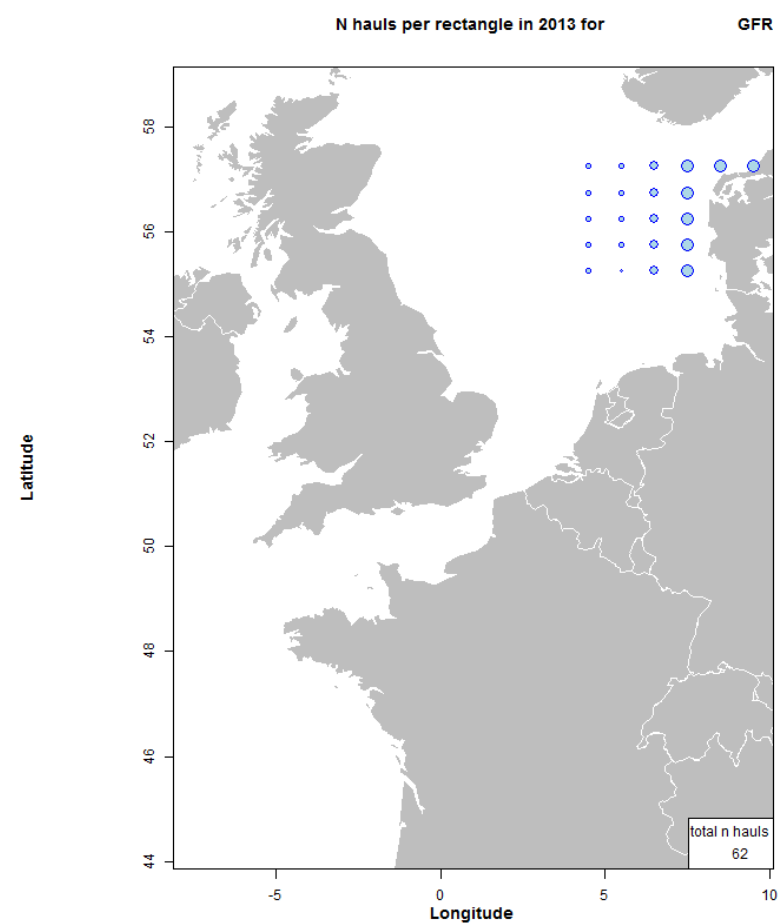
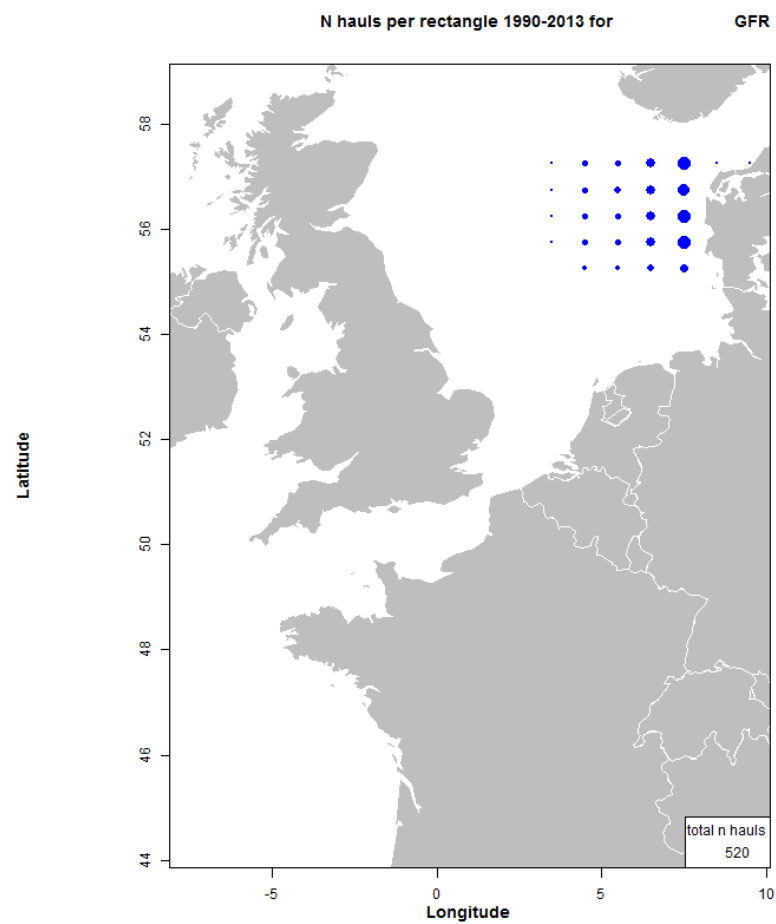
**Annex 7.1.1: Total number of offshore beam trawl hauls per rectangle for England**

Left plot time-series, right plot current year



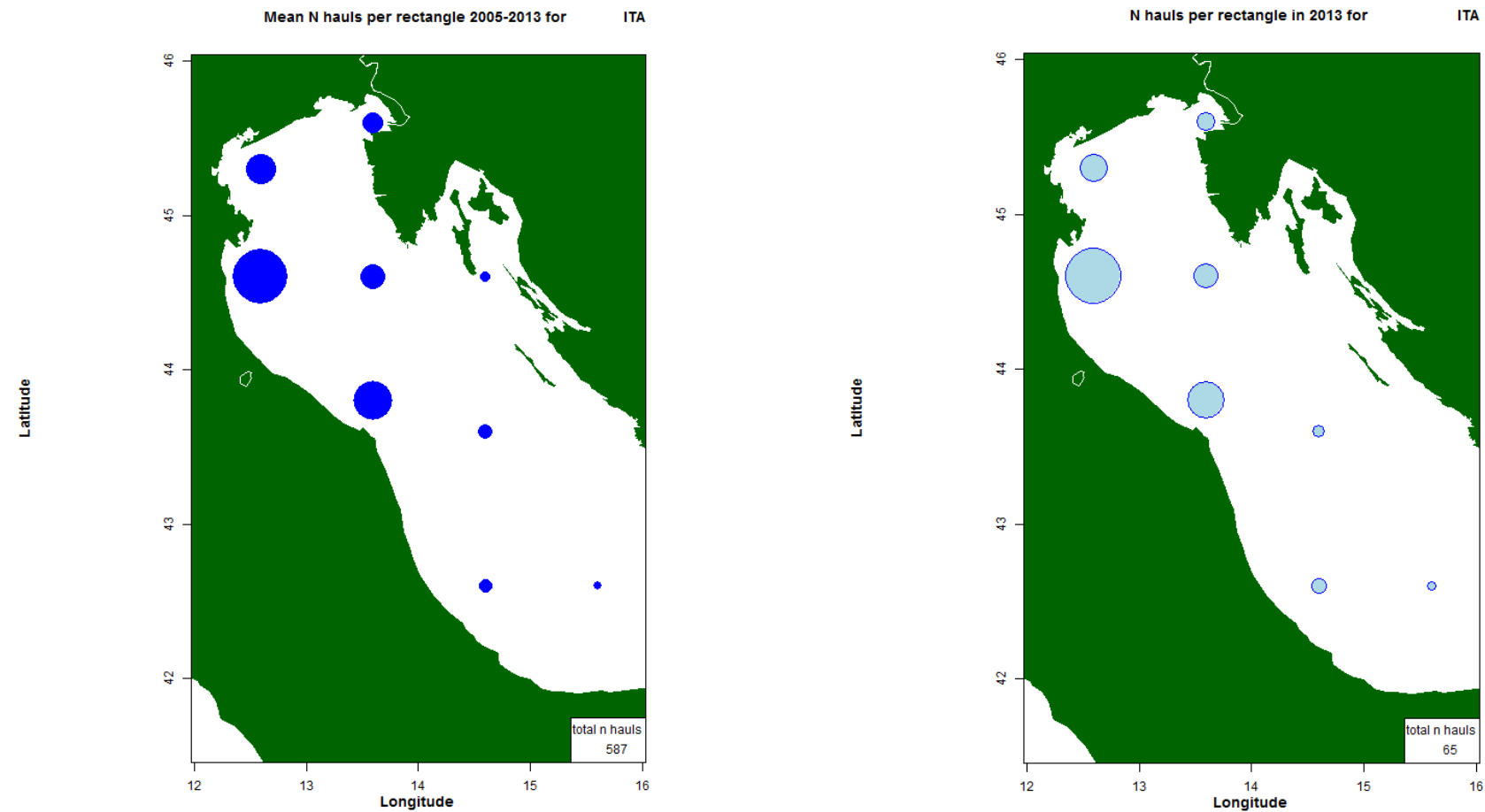
**Annex 7.1.2: Total number of offshore beam trawl hauls per rectangle for Germany**

Left plot time-series, right plot current year



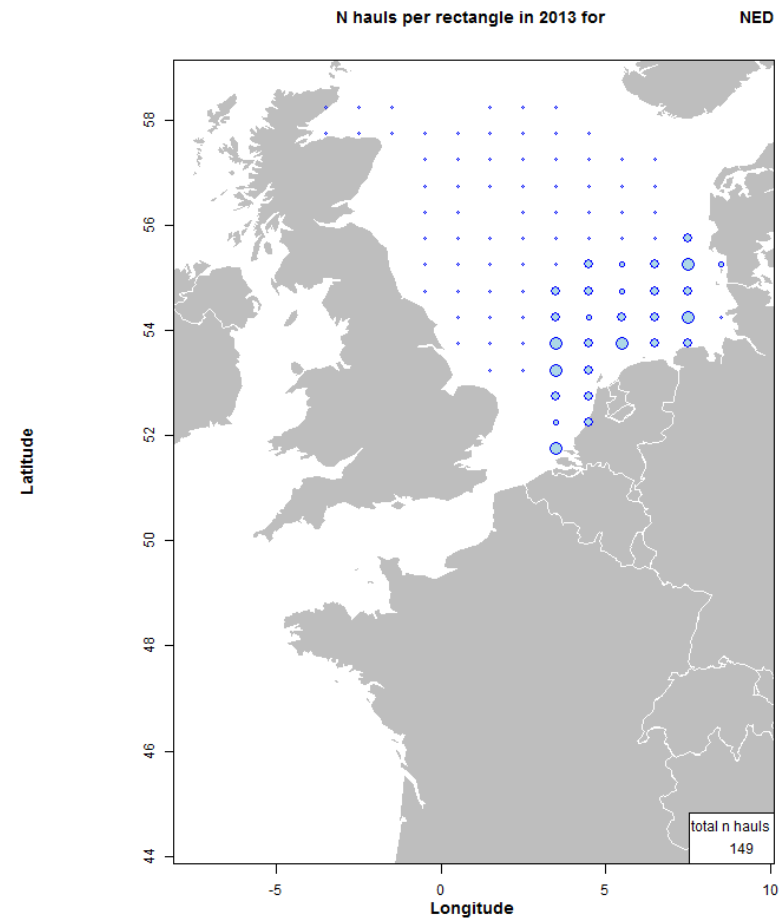
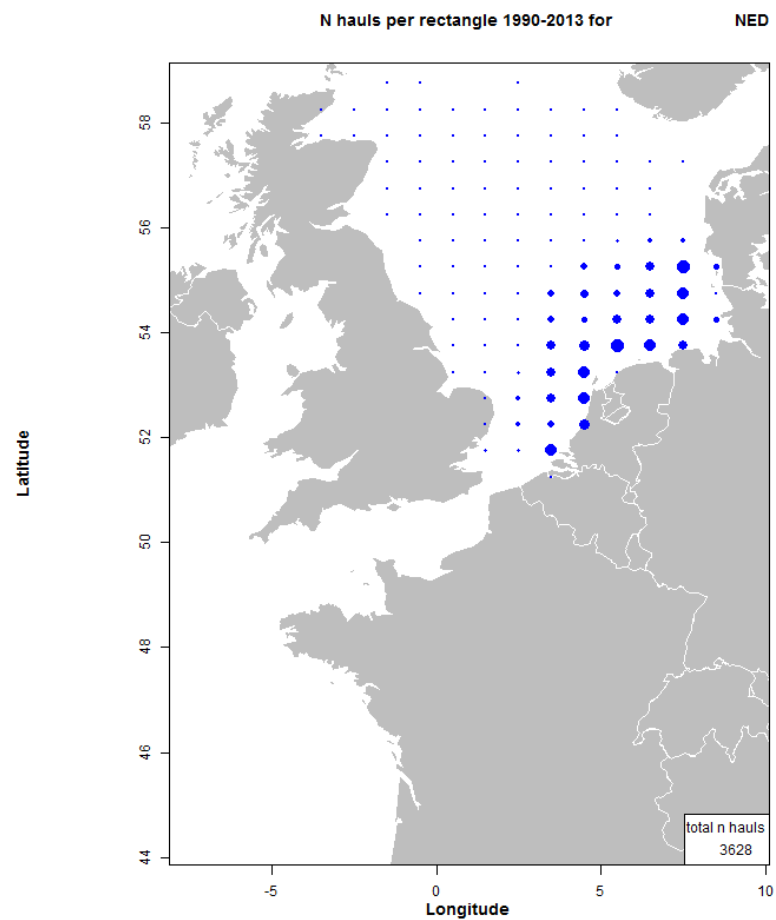
Annex 7.1.3: Total number of offshore beam trawl hauls per rectangle for Italy–Slovenia–Croatia

Left plot time-series, right plot current year



**Annex 7.1.4: Total number of offshore beam trawl hauls per rectangle for Netherlands**

Left plot time-series, right plot current year



## **Annex 7.2: Spatial distribution per species, offshore surveys**

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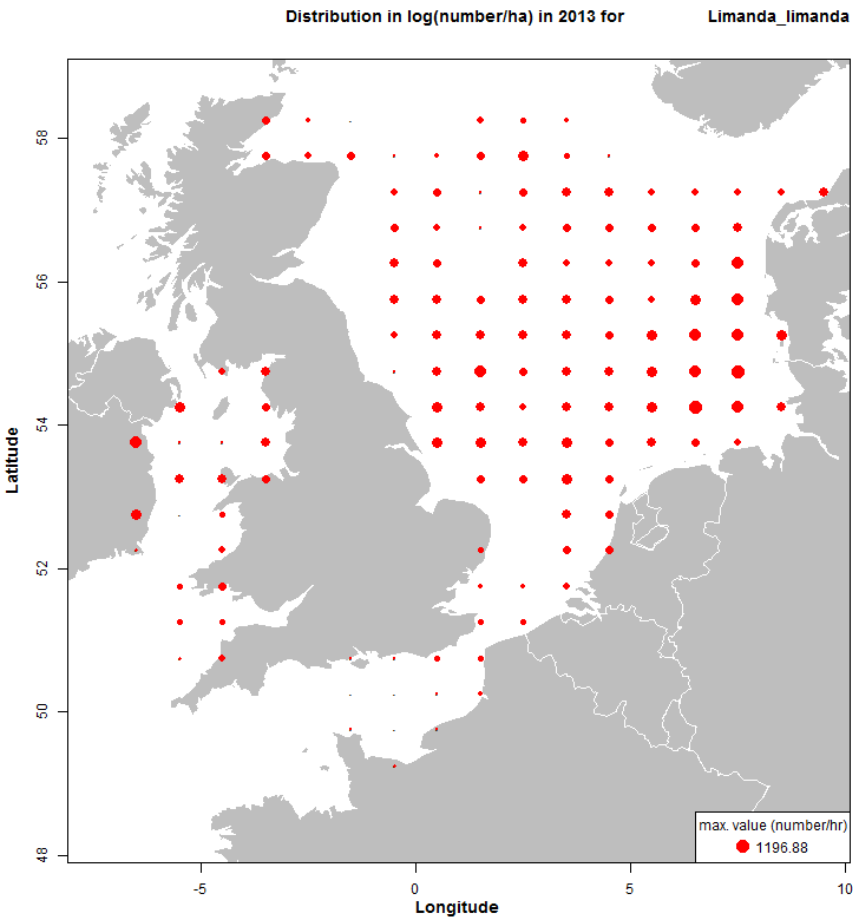
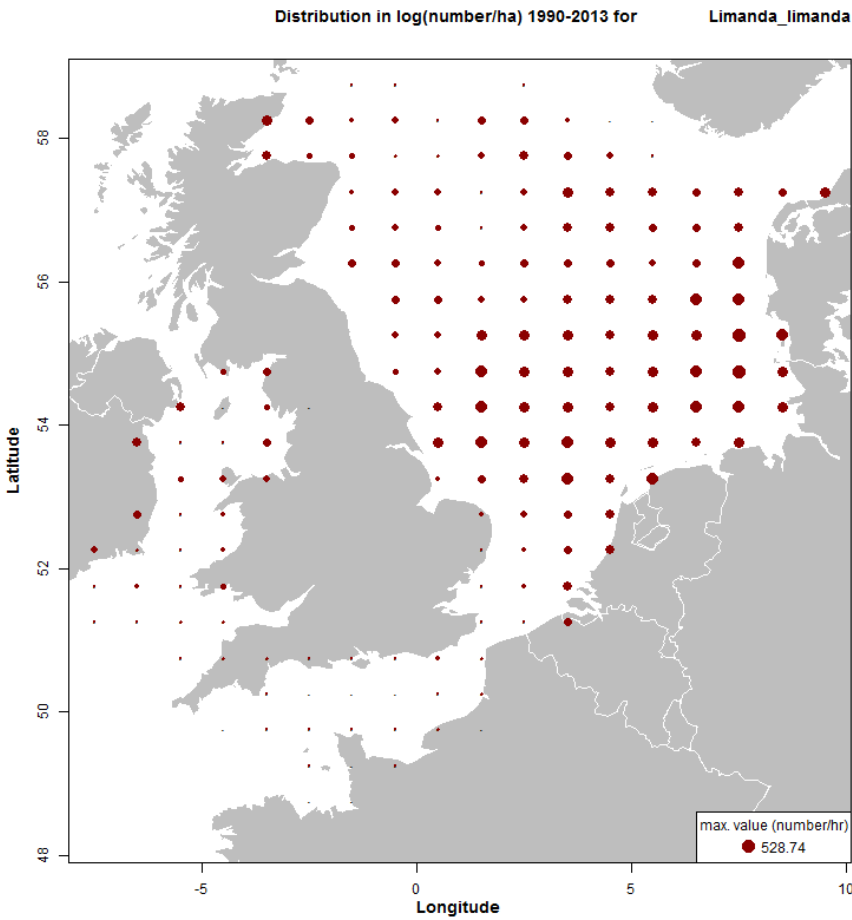
This annex shows distribution bubble plots of the main species caught throughout the beam trawl surveys by rectangle for all surveys combined. The left hand plot shows the mean catch in numbers per hour, raised to 8m-beam trawl, for the time-series. The right hand plot shows the data for the current year.



Annex 7.2.1: International offshore beam trawl survey 1990-2013

Catches are number/hr/8 m beam; left plot mean of time-series, right plot current year

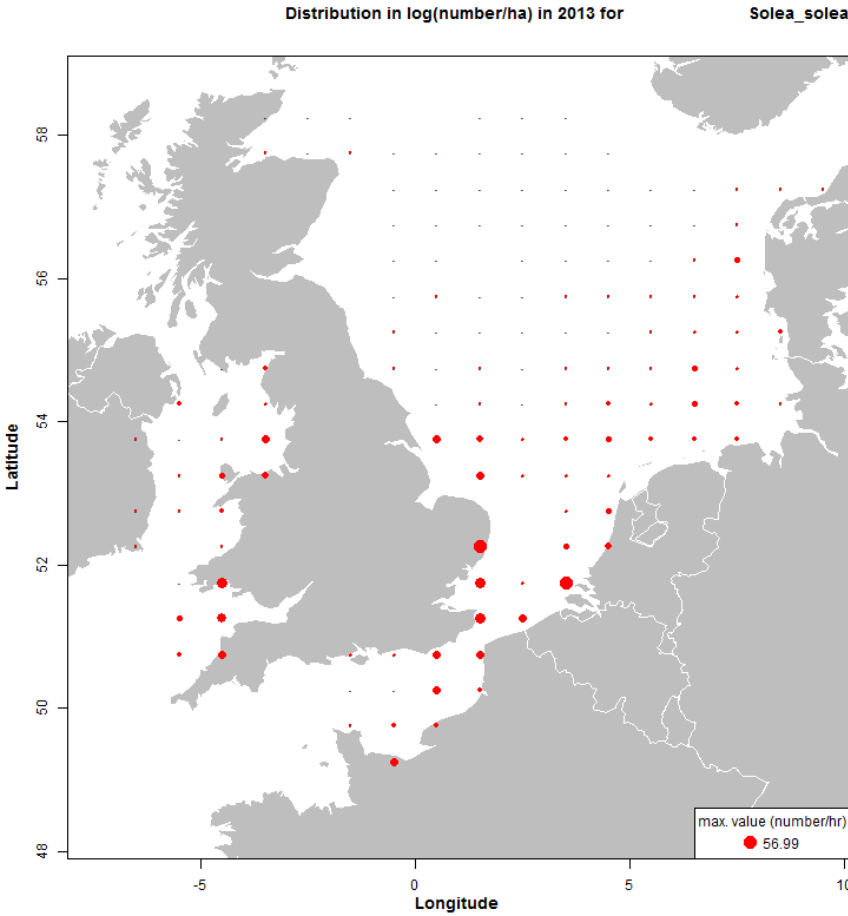
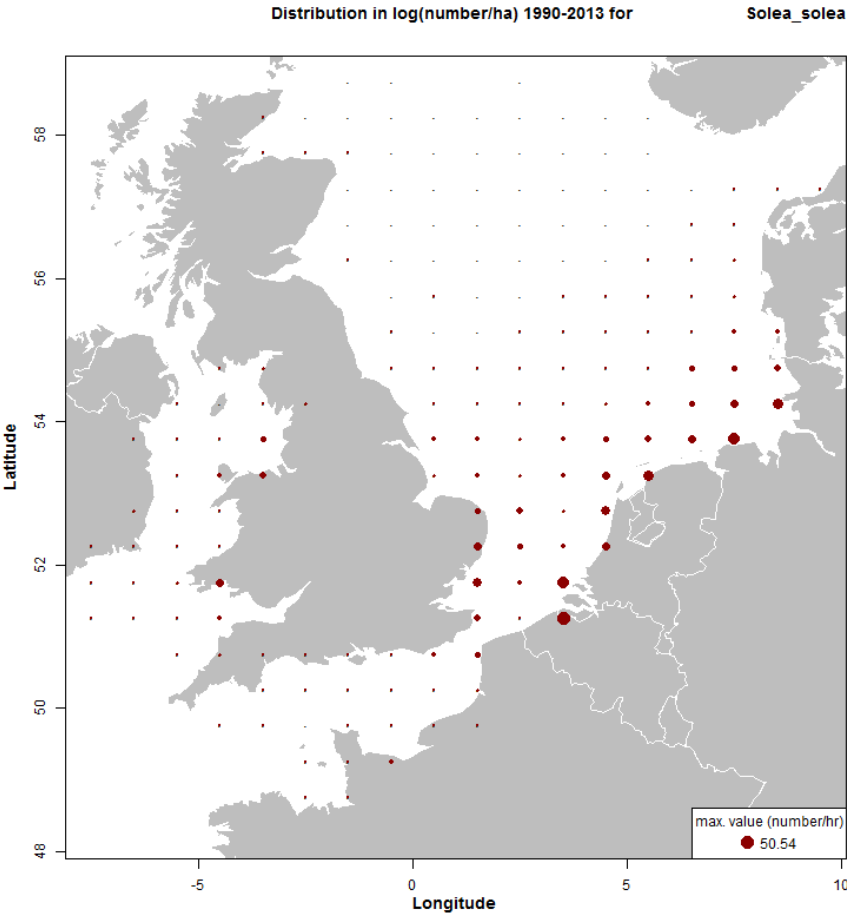
Dab



Annex 7.2.2: International offshore beam trawl survey 1990-2013

Catches are number/hr/8 m beam; left plot mean of time-series, right plot current year

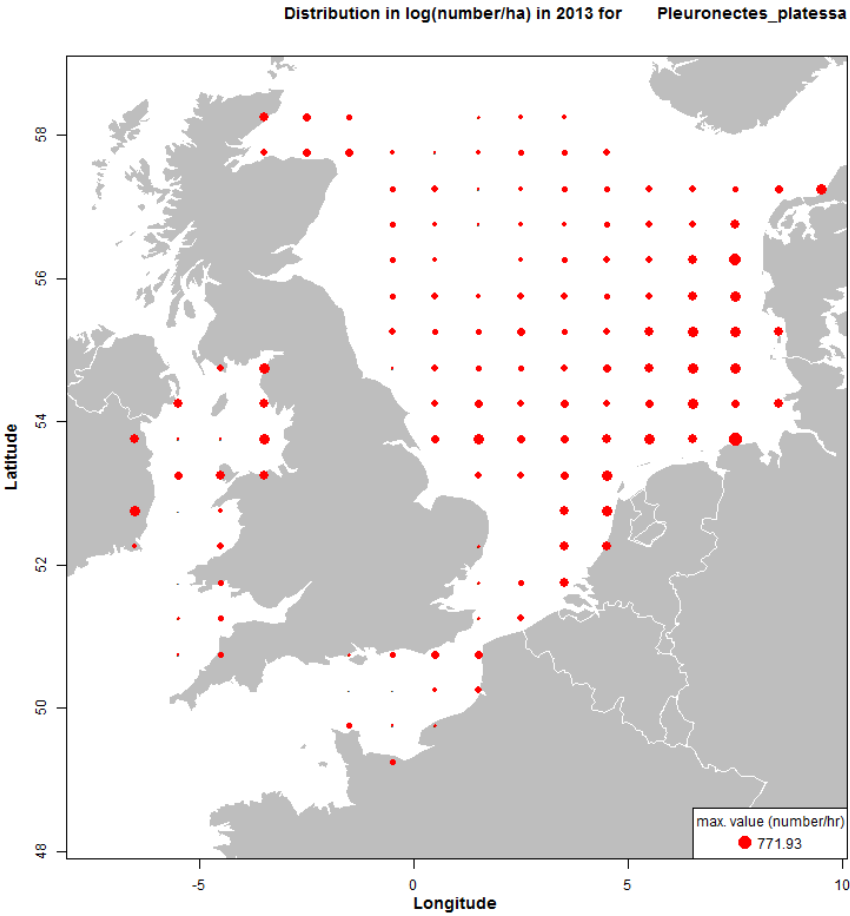
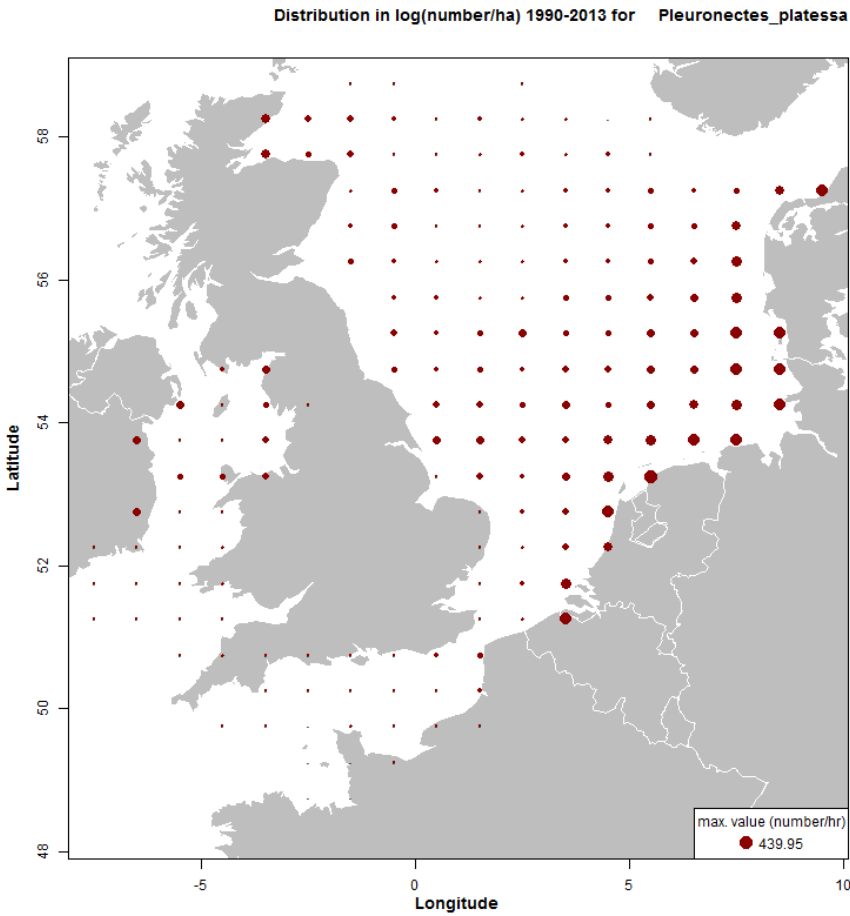
Sole



Annex 7.2.3: International offshore beam trawl survey 1990-2013

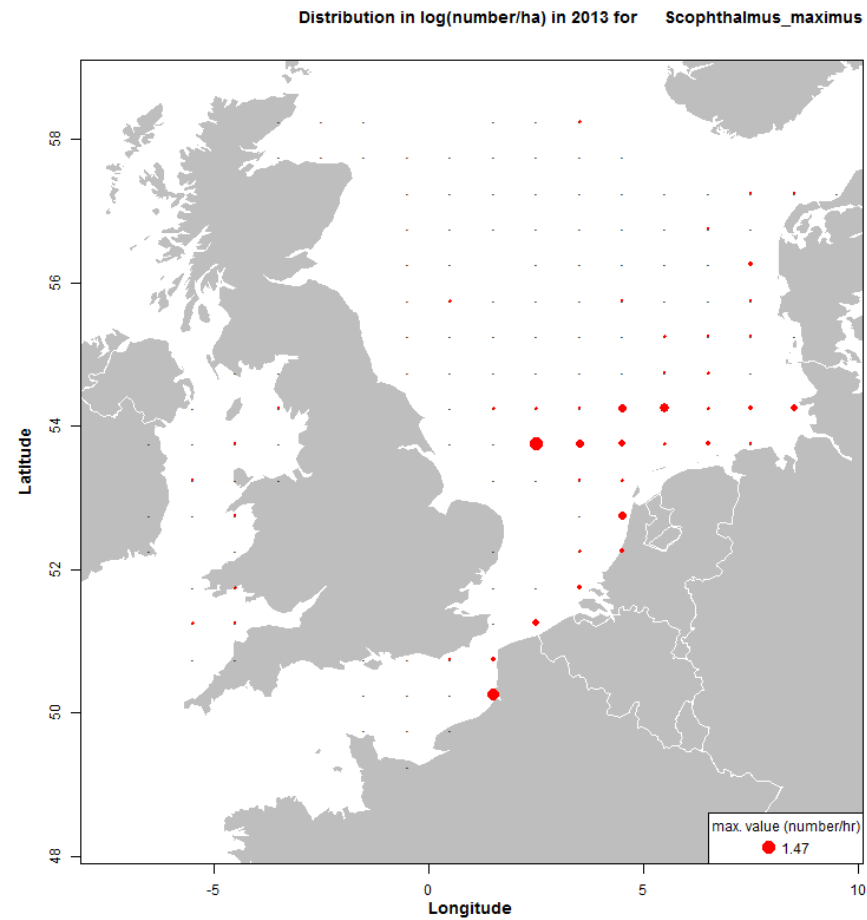
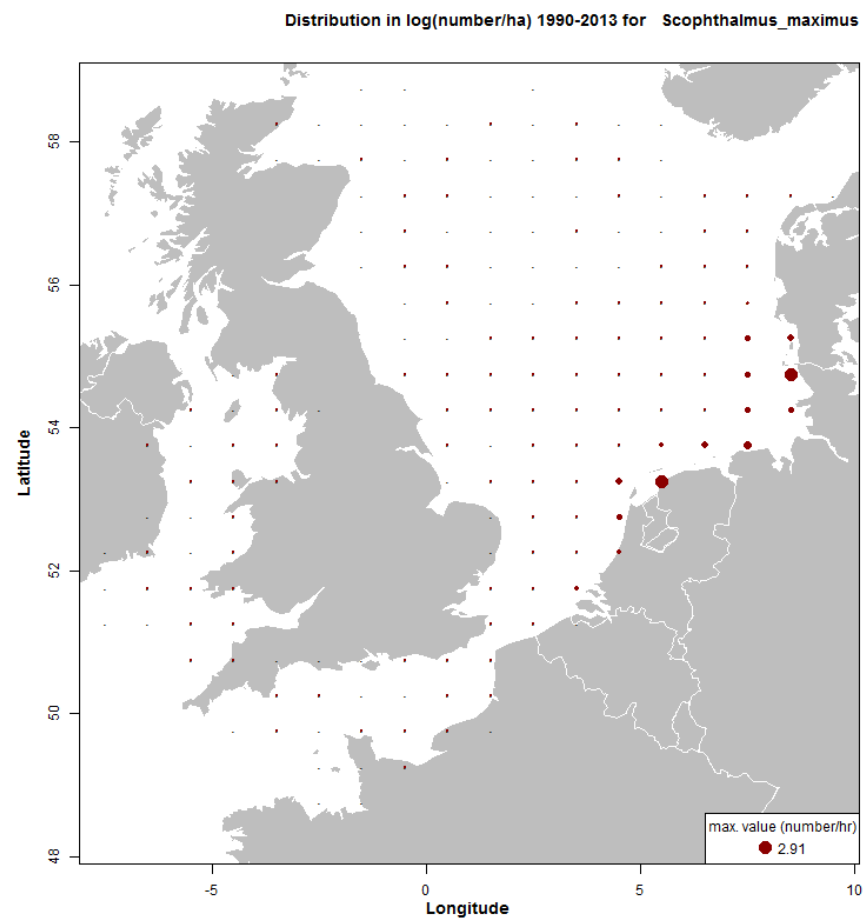
Catches are number/hr/8 m beam; left plot mean of time-series, right plot current year

Plaice



**Annex 7.2.4: International offshore beam trawl survey 1990-2013**

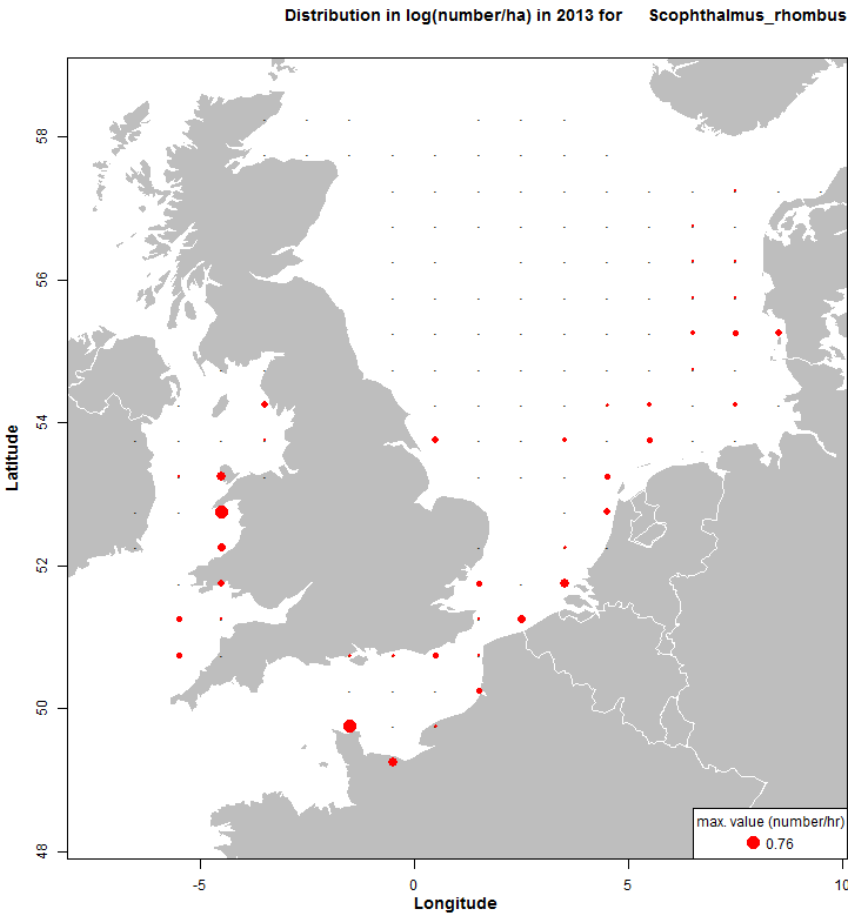
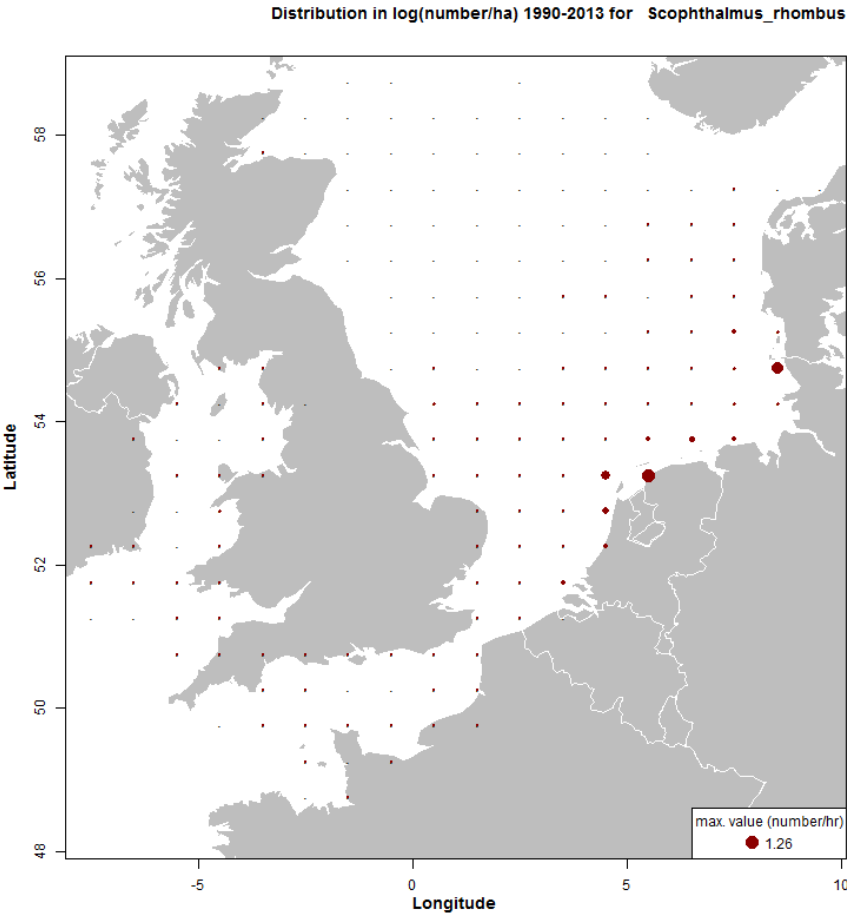
Catches are number/hr/8 m beam; left plot mean of time-series, right plot current year

**Turbot**

Annex 7.2.5: International offshore beam trawl survey 1990-2013

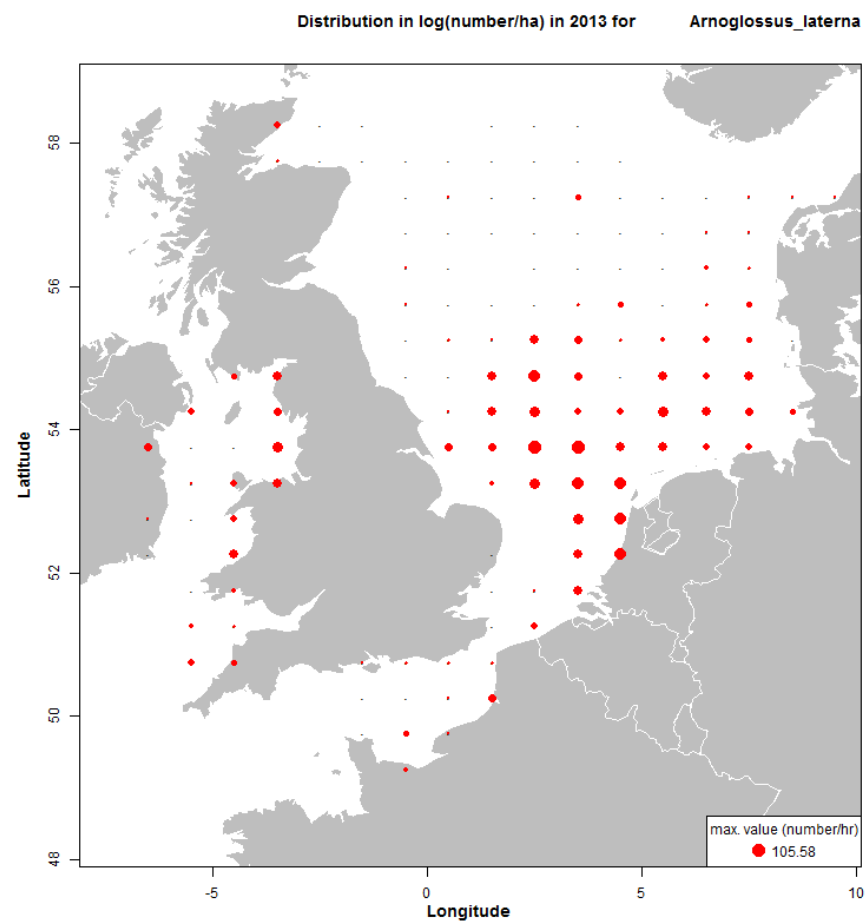
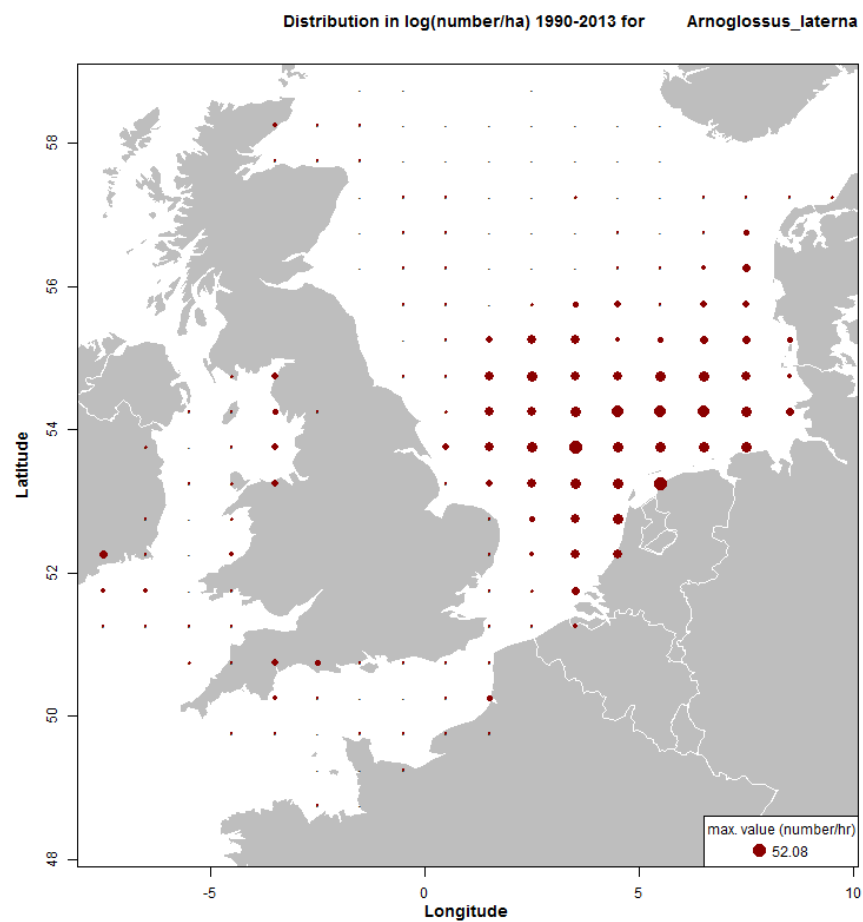
Catches are number/hr/8 m beam; left plot mean of time-series, right plot current year

Brill



**Annex 7.2.6: International offshore beam trawl survey 1990-2013**

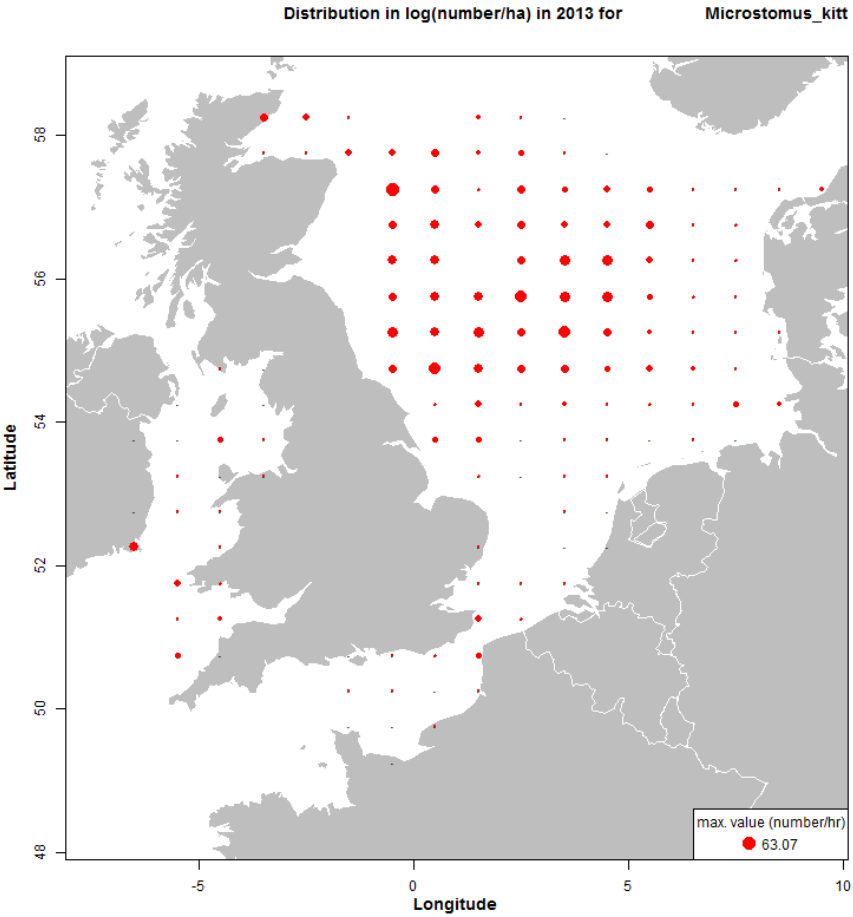
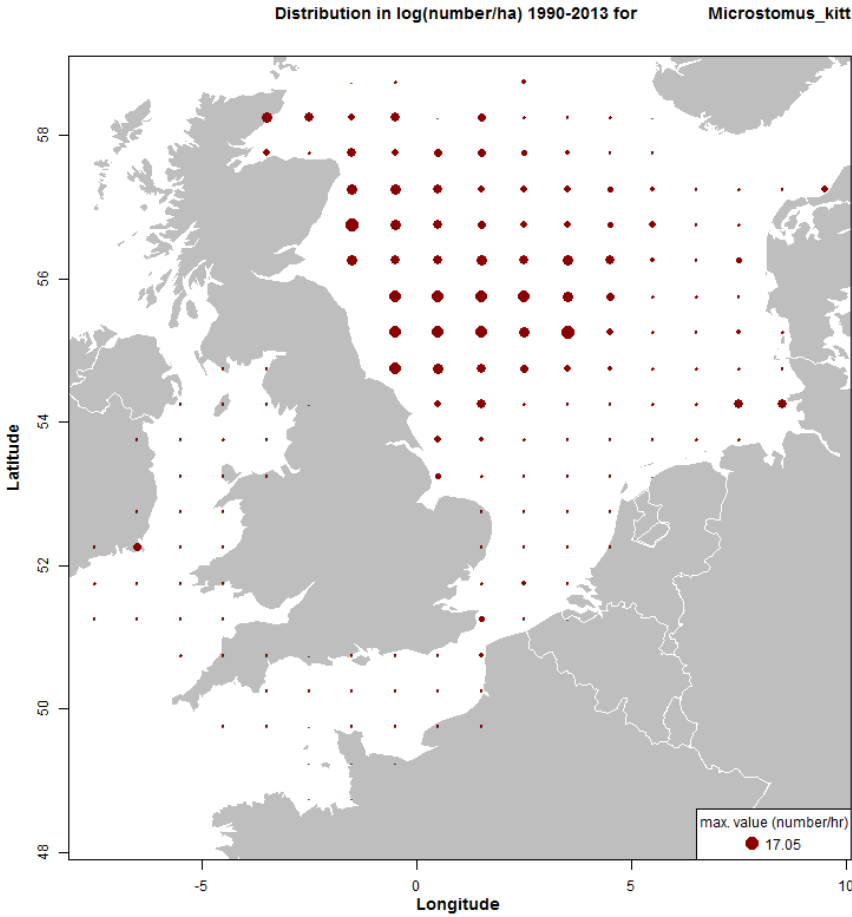
Catches are number/hr/8 m beam; left plot mean of time-series, right plot current year

**Scaldfish**

Annex 7.2.7: International offshore beam trawl survey 1990-2013

Catches are number/hr/8 m beam; left plot mean of time-series, right plot current year

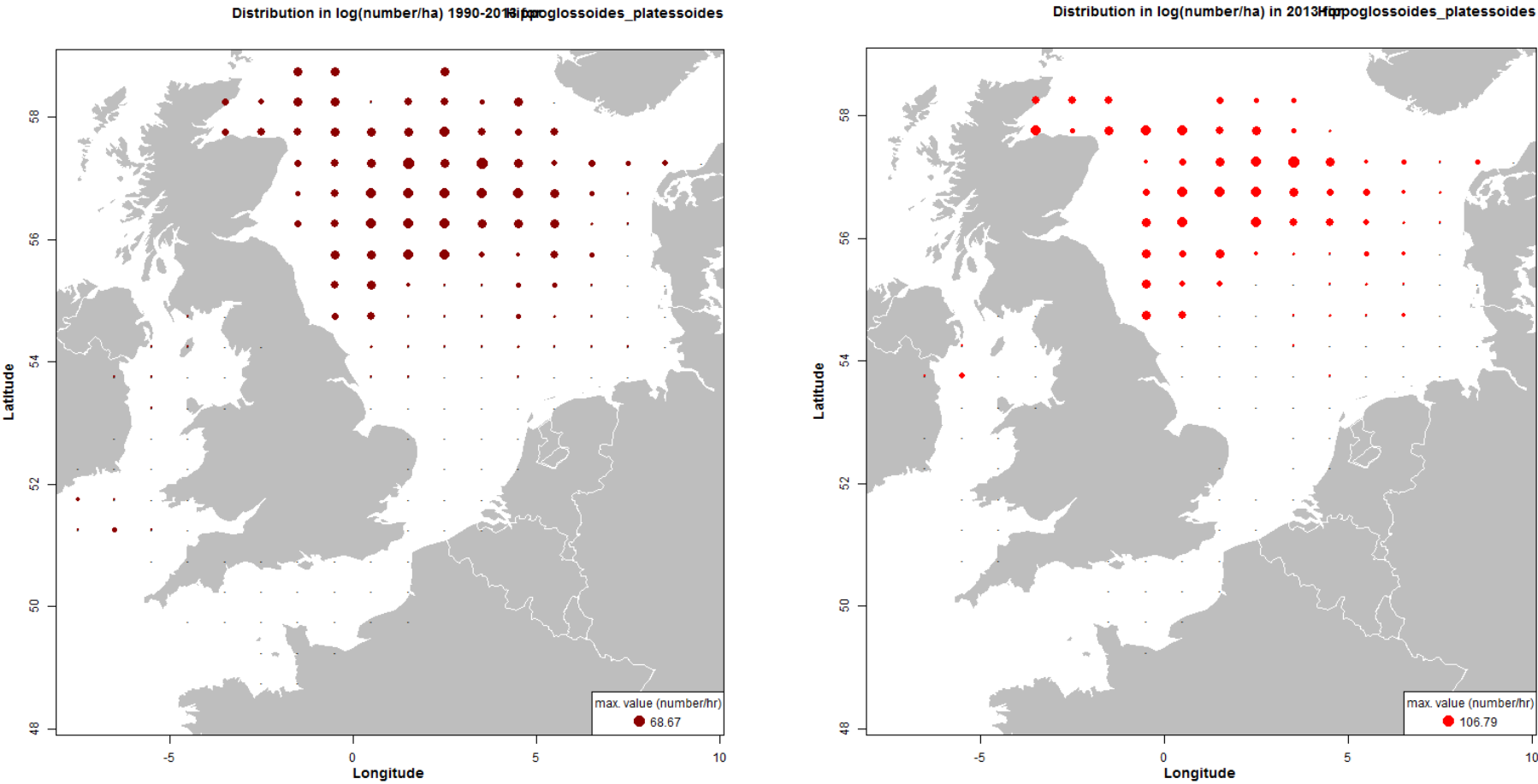
Lemon sole



Annex 7.2.8: International offshore beam trawl survey 1990-2013

Catches are number/hr/8 m beam; left plot mean of time-series, right plot current year

American plaice (long rough dab)

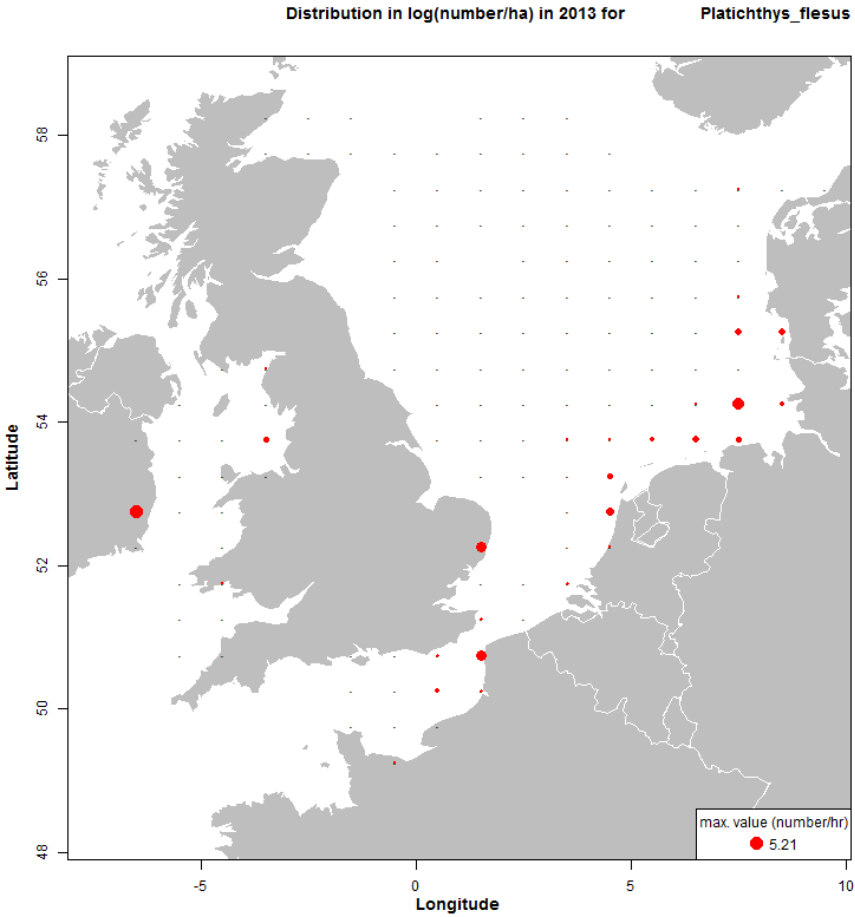
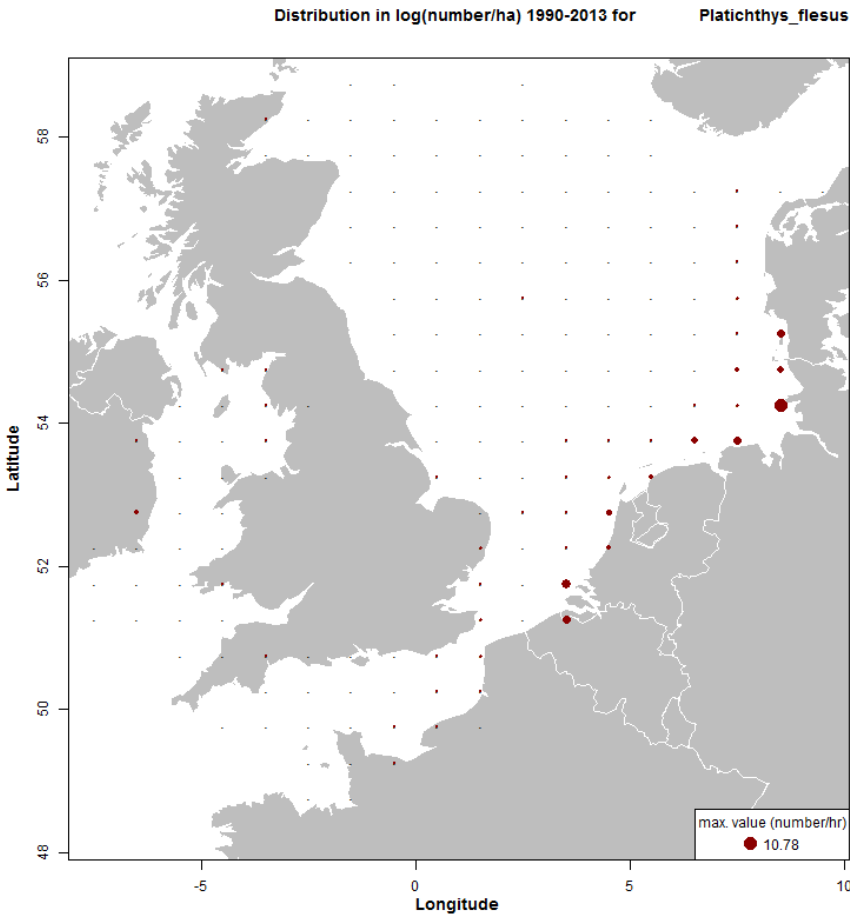




Annex 7.2.9: International offshore beam trawl survey 1990-2013

Catches are number/hr/8 m beam; left plot mean of time-series, right plot current year

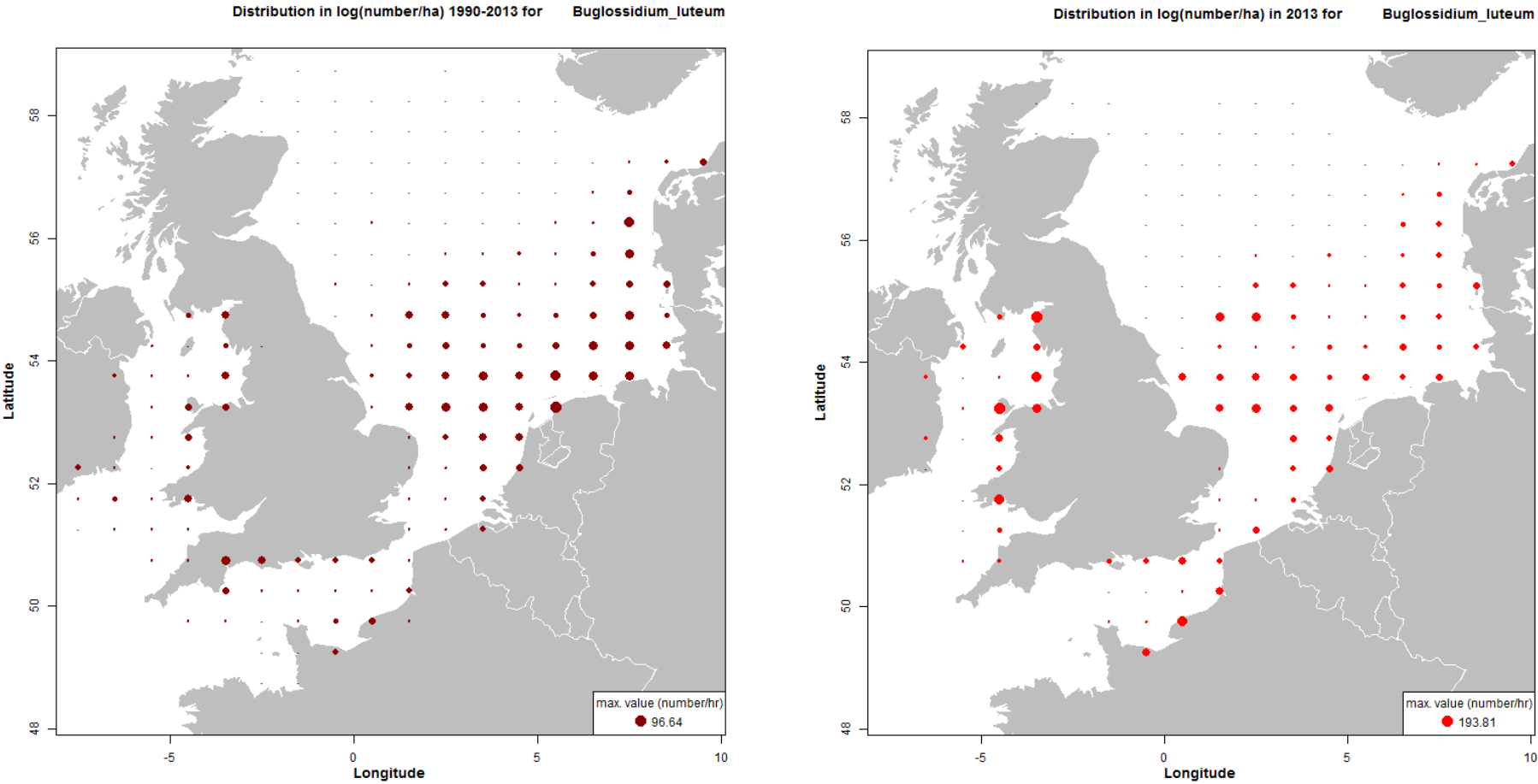
Flounder



Annex 7.2.10: International offshore beam trawl survey 1990-2013

Catches are number/hr/8 m beam; left plot mean of time-series, right plot current year

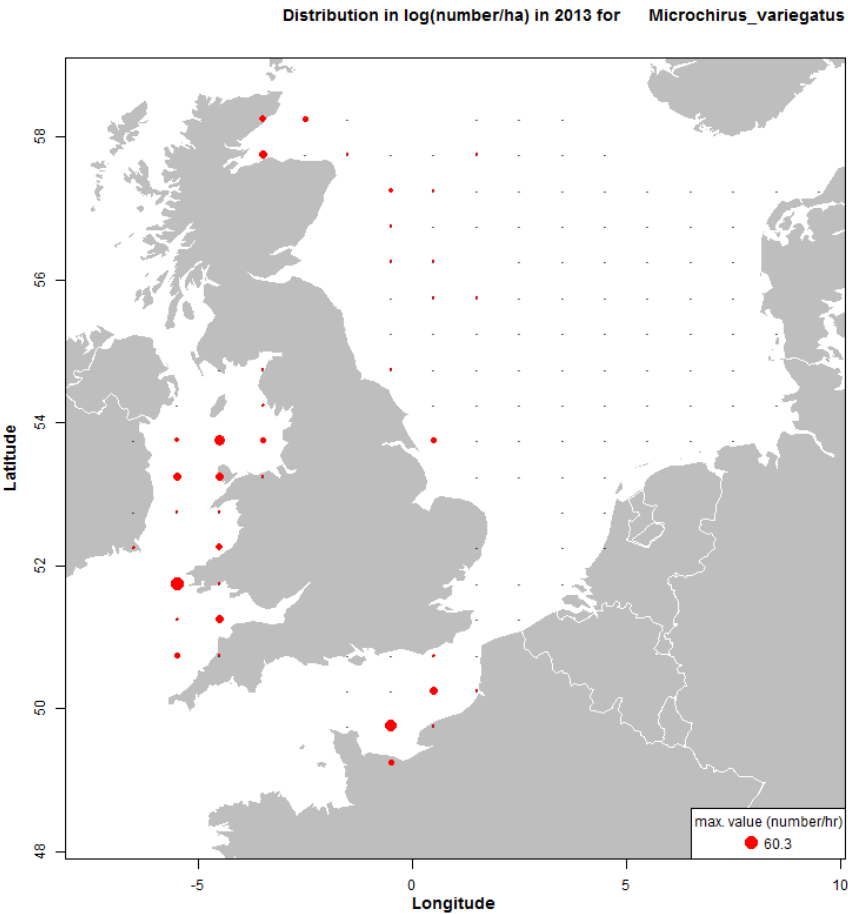
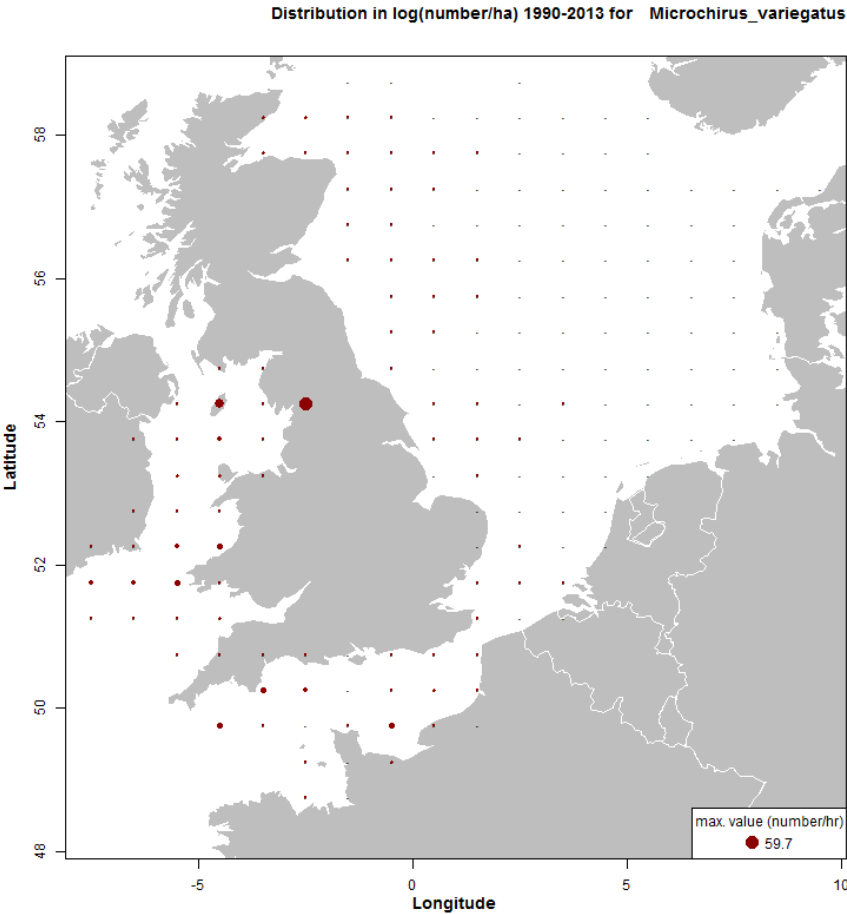
Solenette



Annex 7.2.11: International offshore beam trawl survey 1990-2013

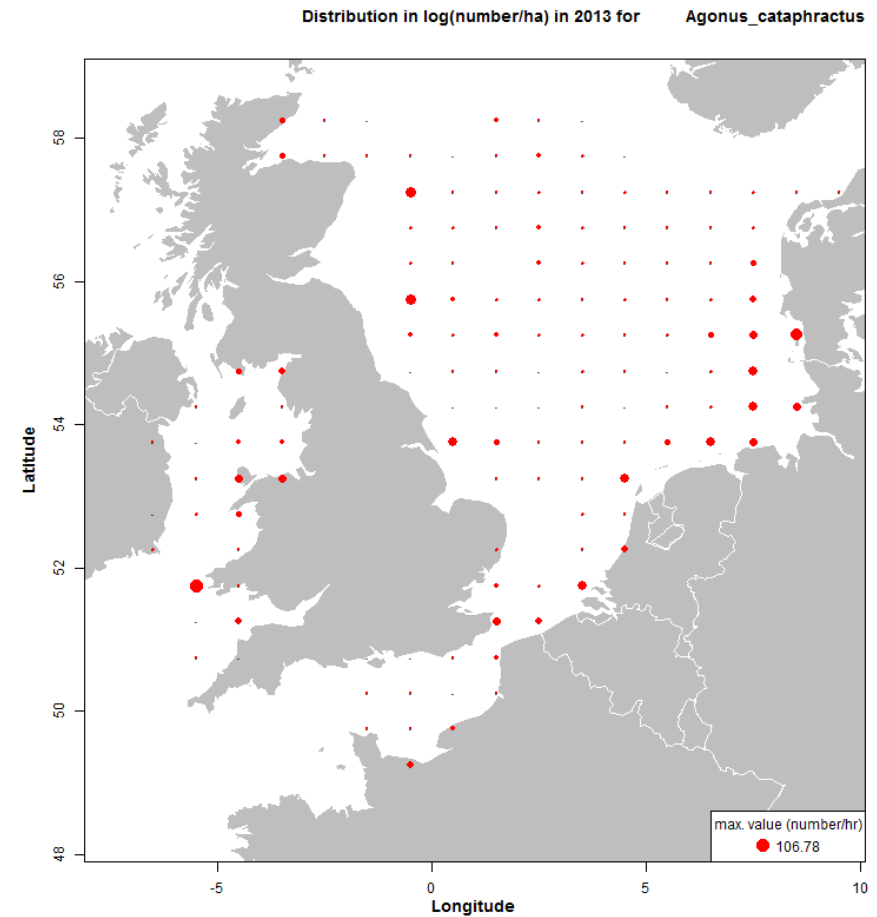
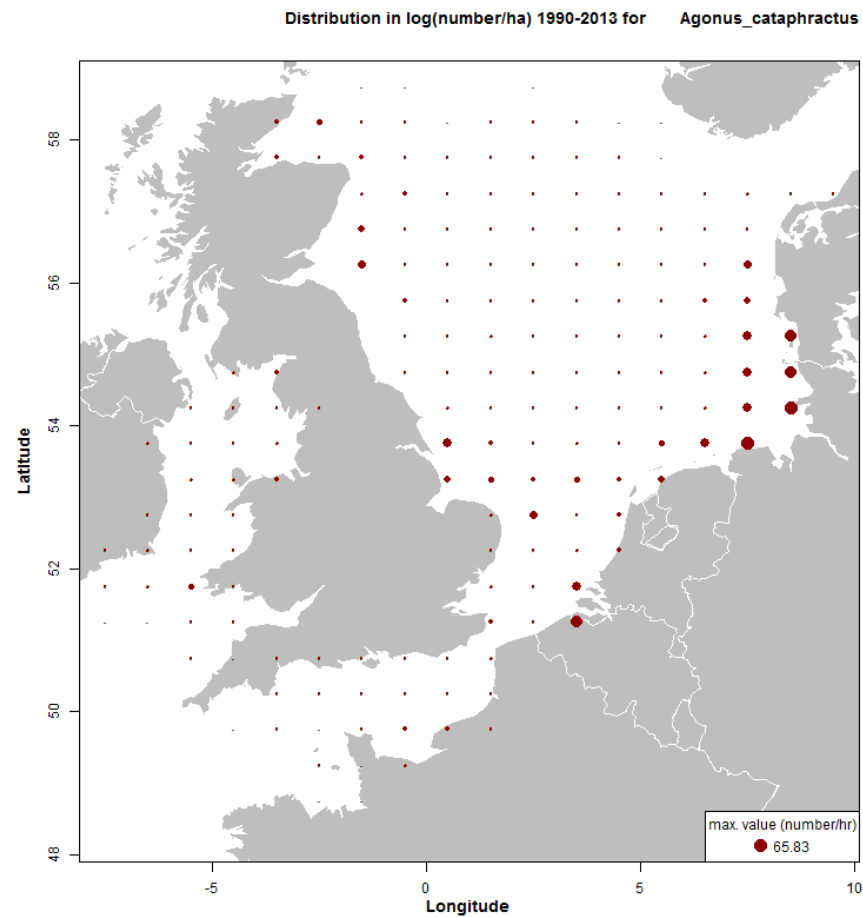
Catches are number/hr/8 m beam; left plot mean of time-series, right plot current year

Thickback sole



**Annex 7.2.12: International offshore beam trawl survey 1990-2013**

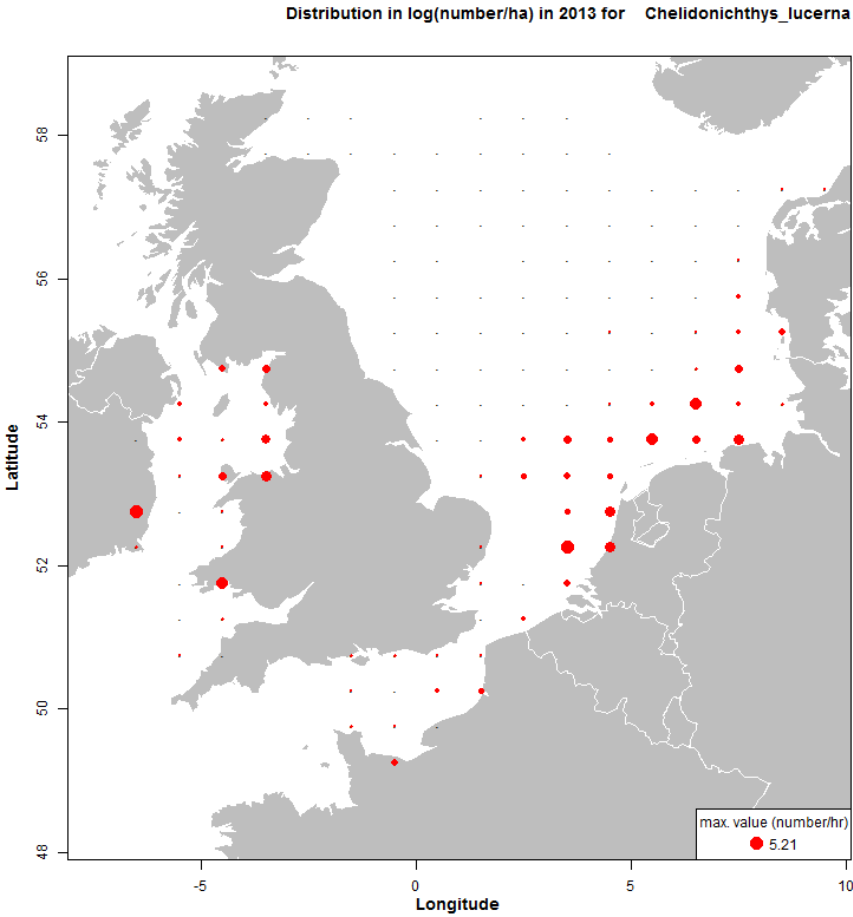
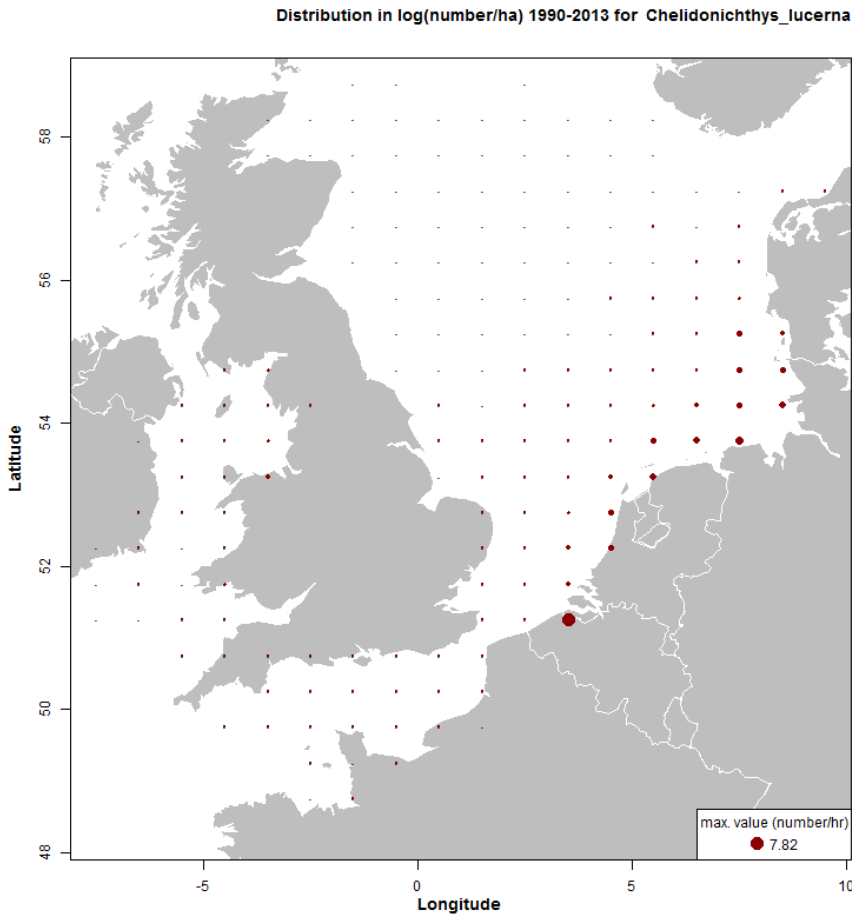
Catches are number/hr/8 m beam; left plot mean of time-series, right plot current year

**Pogge**

Annex 7.2.13: International offshore beam trawl survey 1990-2013

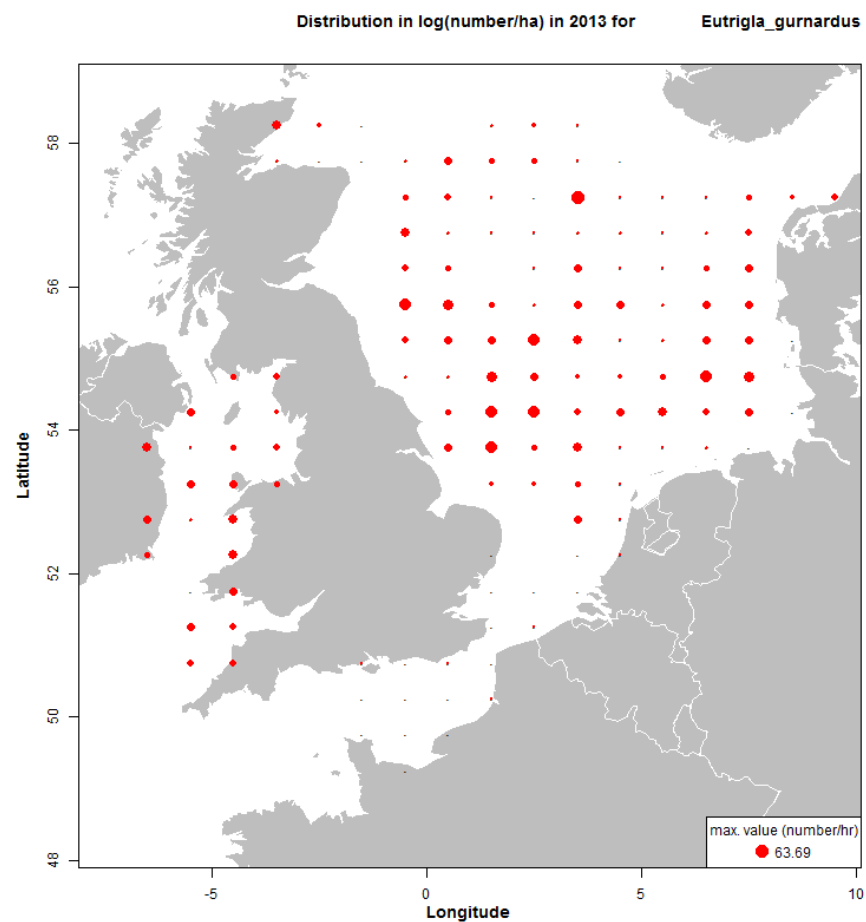
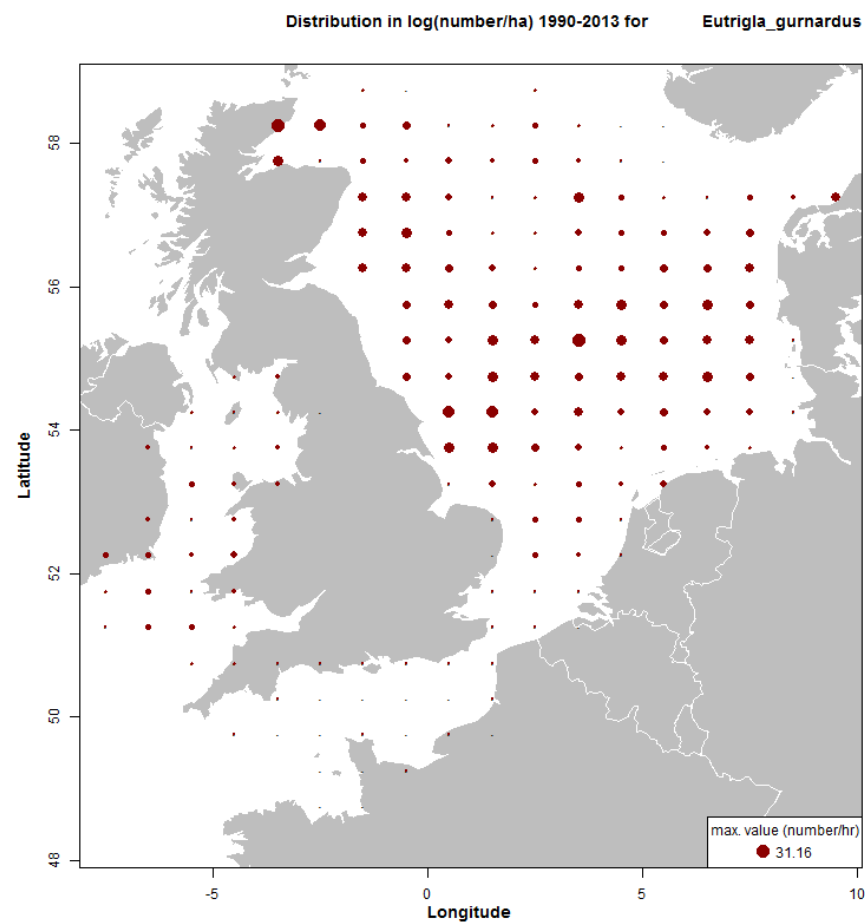
Catches are number/hr/8 m beam; left plot mean of time-series, right plot current year

Tub gurnard



**Annex 7.2.14: International offshore beam trawl survey 1990-2013**

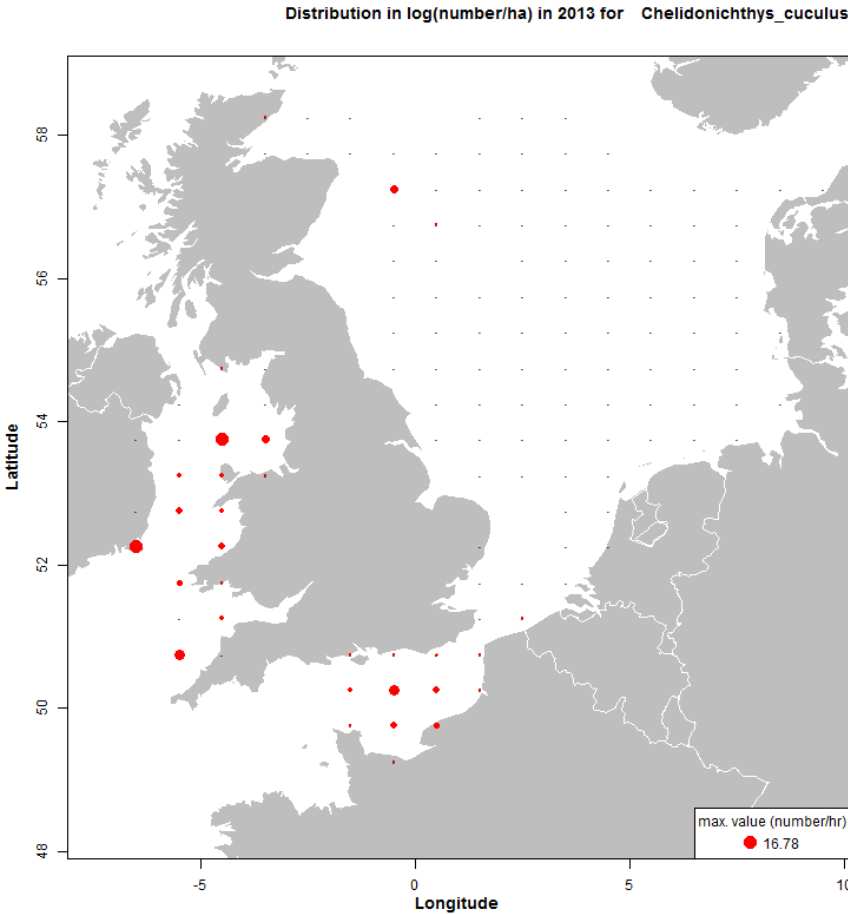
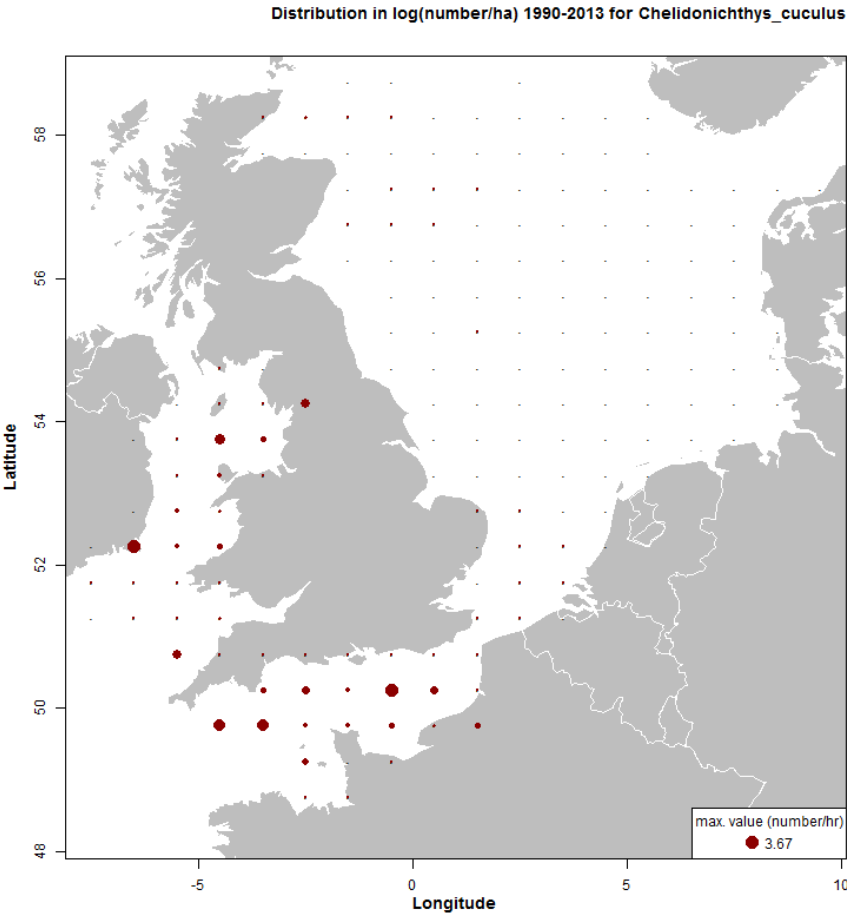
Catches are number/hr/8 m beam; left plot mean of time-series, right plot current year

**Grey gurnard**

Annex 7.2.15: International offshore beam trawl survey 1990-2013

Catches are number/hr/8 m beam; left plot mean of time-series, right plot current year

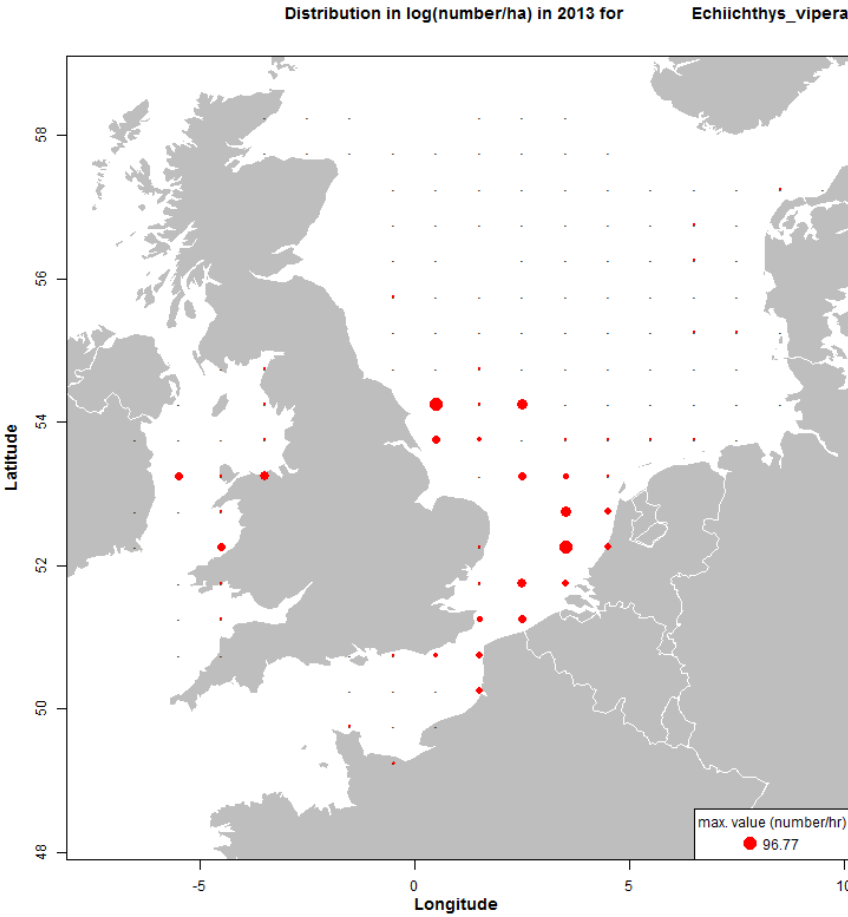
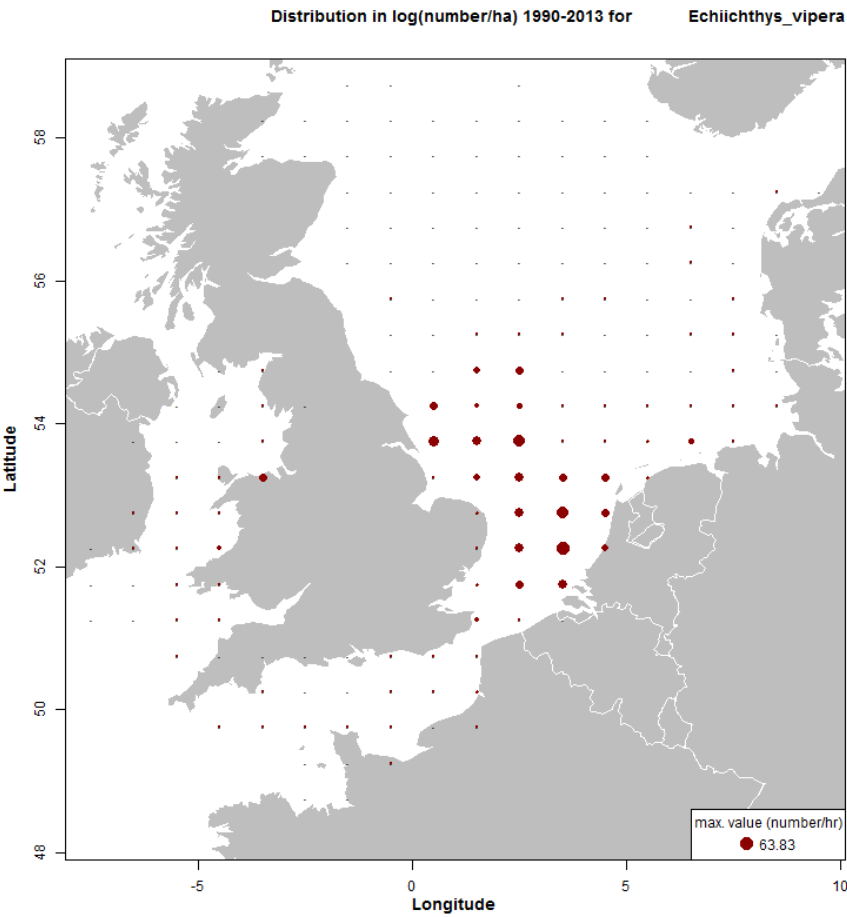
Red gurnard



Annex 7.2.16: International offshore beam trawl survey 1990-2013

Catches are number/hr/8 m beam; left plot mean of time-series, right plot current year

Lesser weever

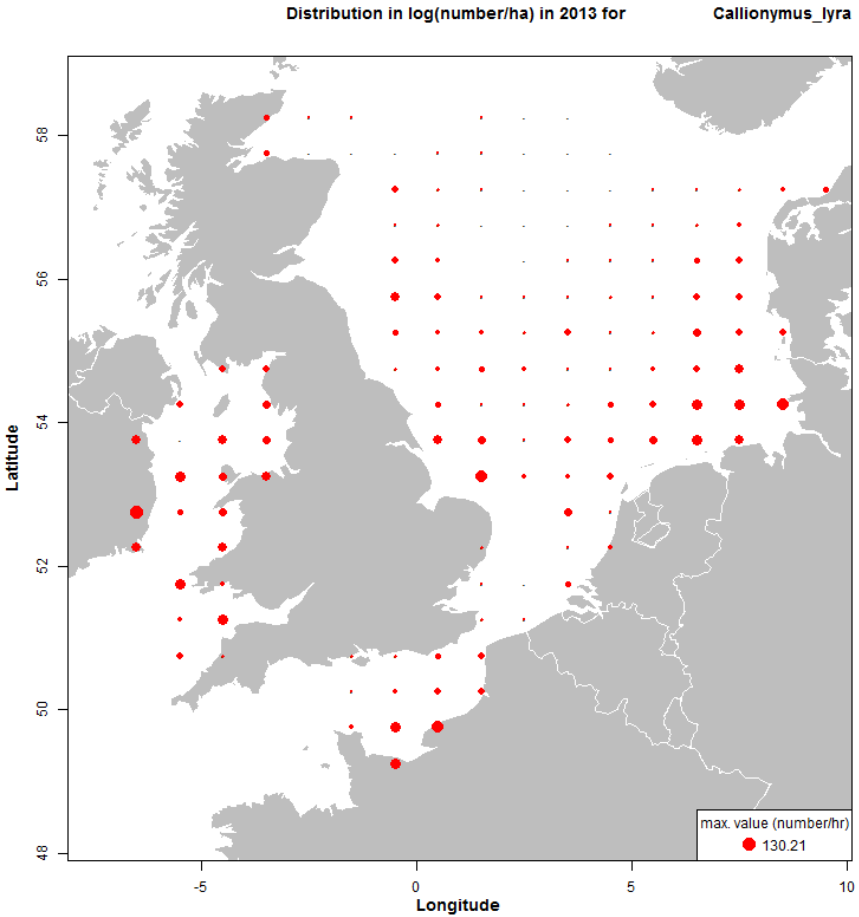
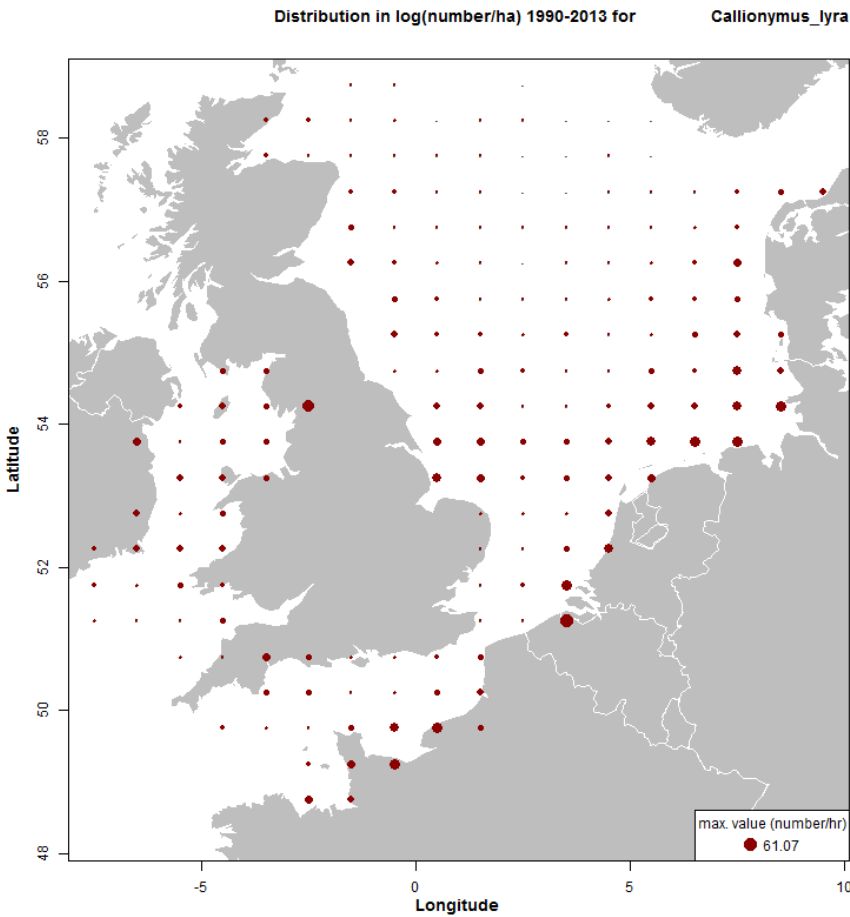




Annex 7.2.17: International offshore beam trawl survey 1990-2013

Catches are number/hr/8 m beam; left plot mean of time-series, right plot current year

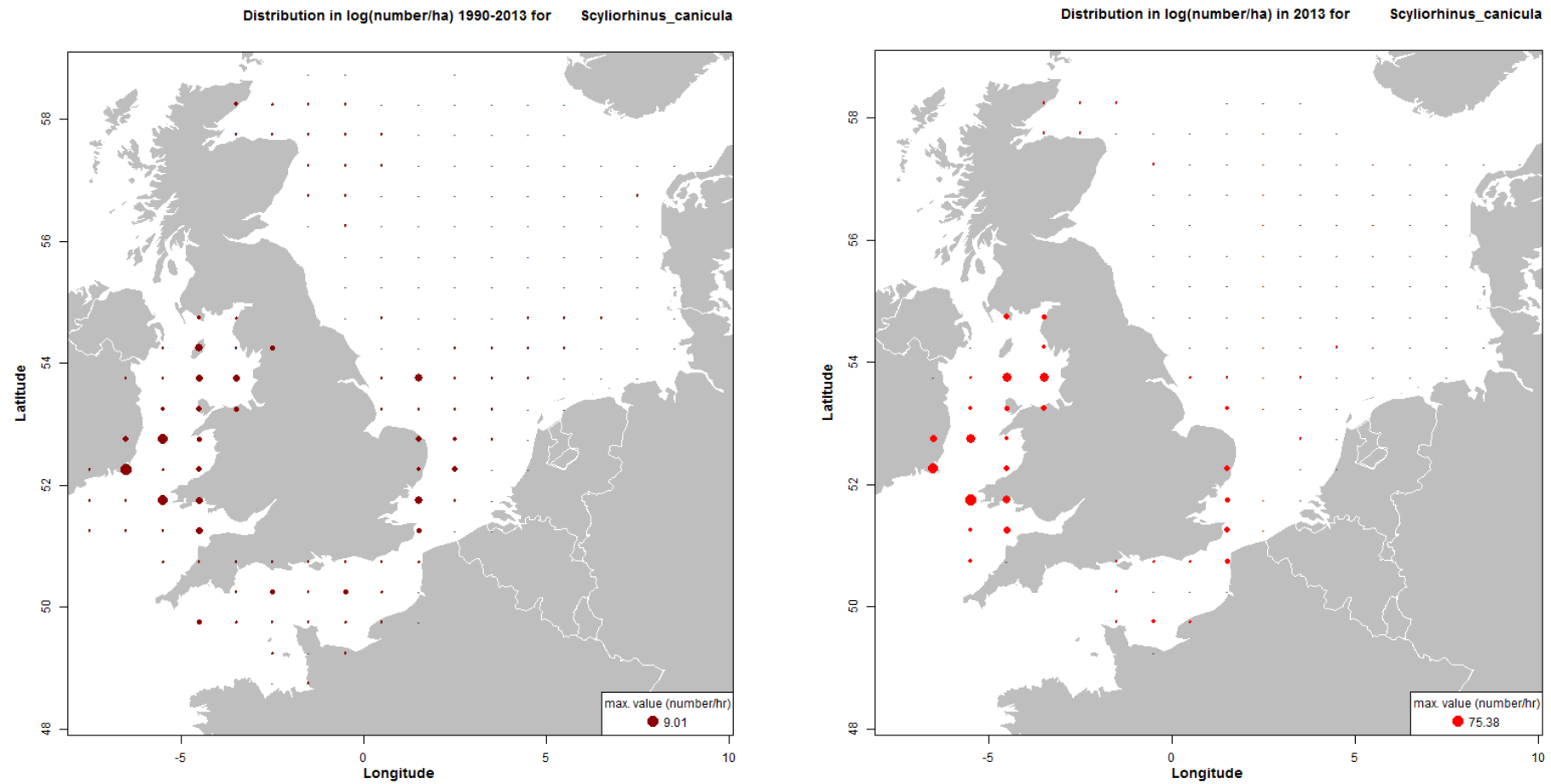
Common dragonet



### Annex 7.2.18: International offshore beam trawl survey 1990-2013

Catches are number/hr/8 m beam; left plot mean of time-series, right plot current year

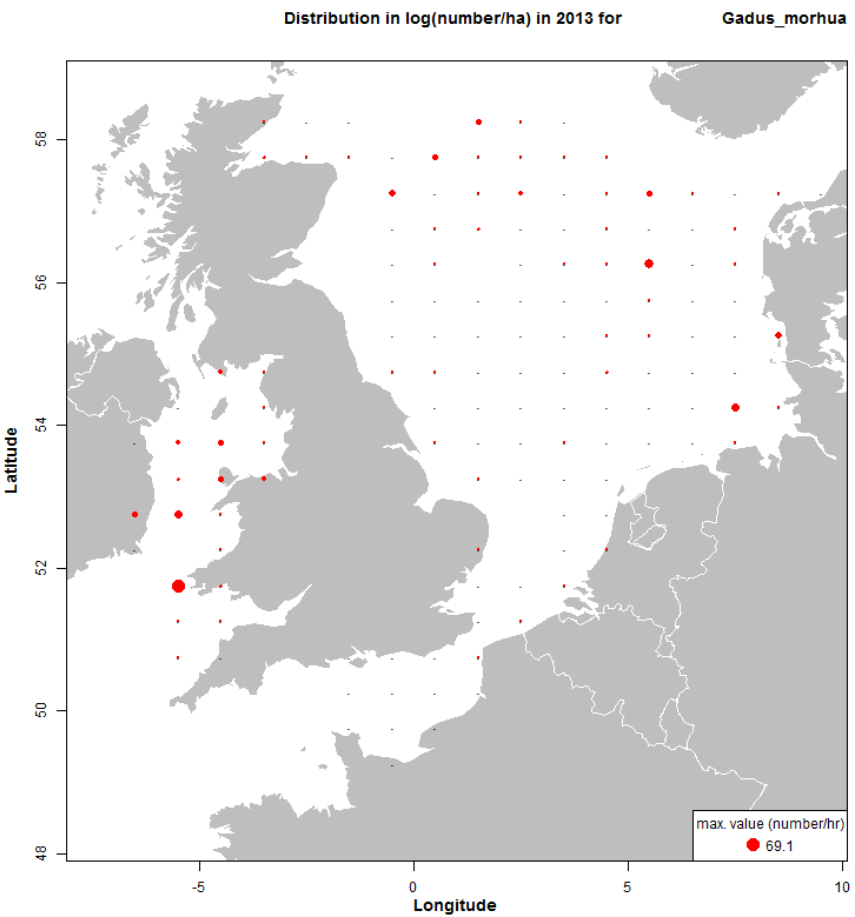
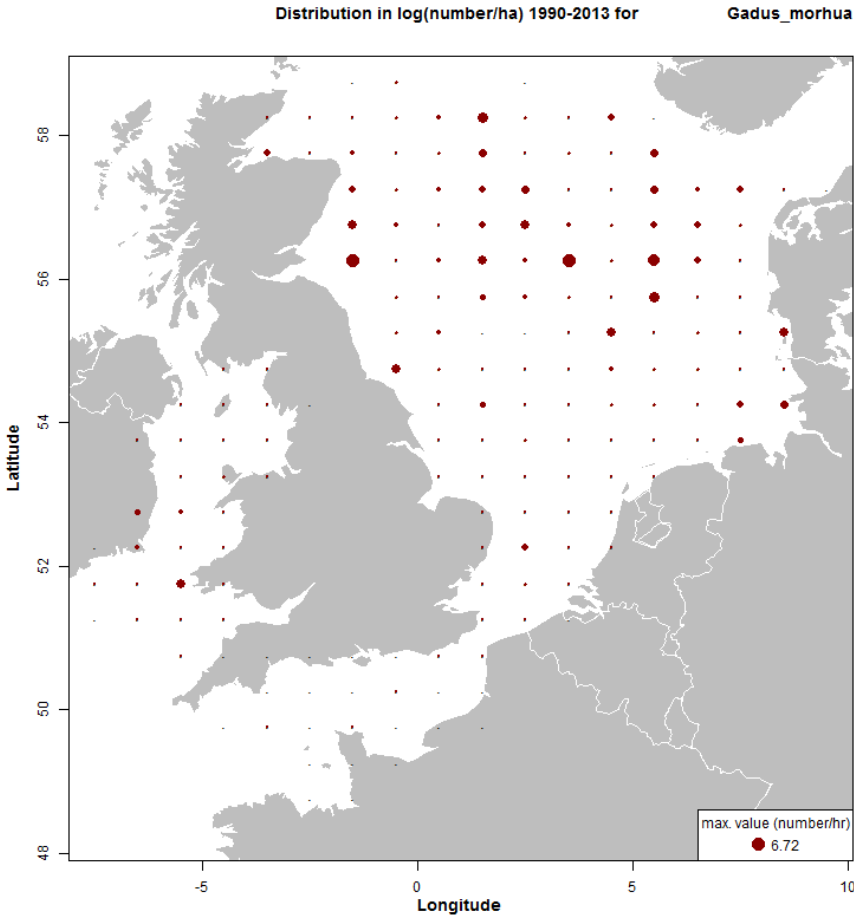
#### Lesser spotted dogfish



Annex 7.2.19: International offshore beam trawl survey 1990-2013

Catches are number/hr/8 m beam; left plot mean of time-series, right plot current year

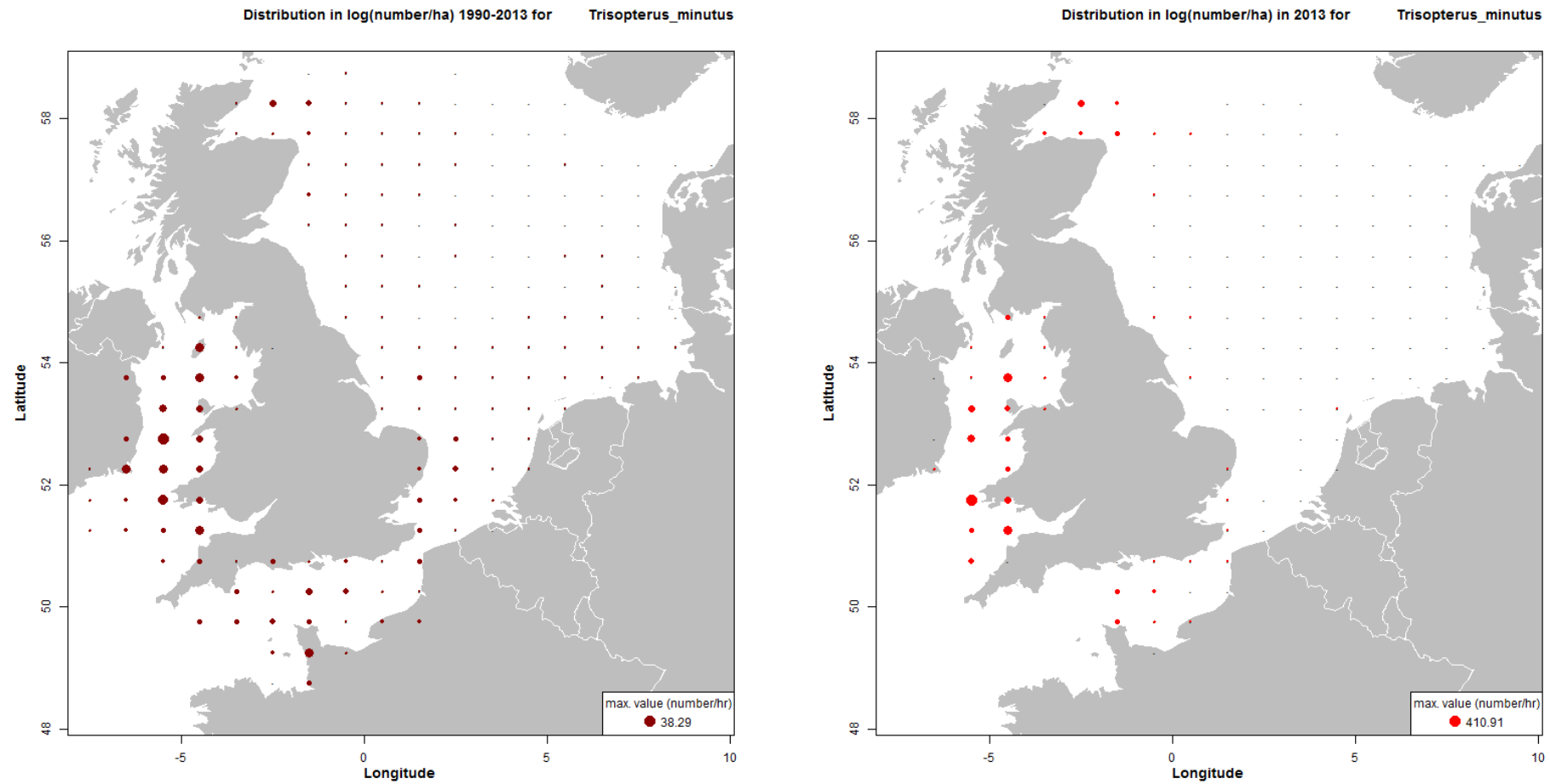
Cod



### Annex 7.2.20: International offshore beam trawl survey 1990-2013

Catches are number/hr/8 m beam; left plot mean of time-series, right plot current year

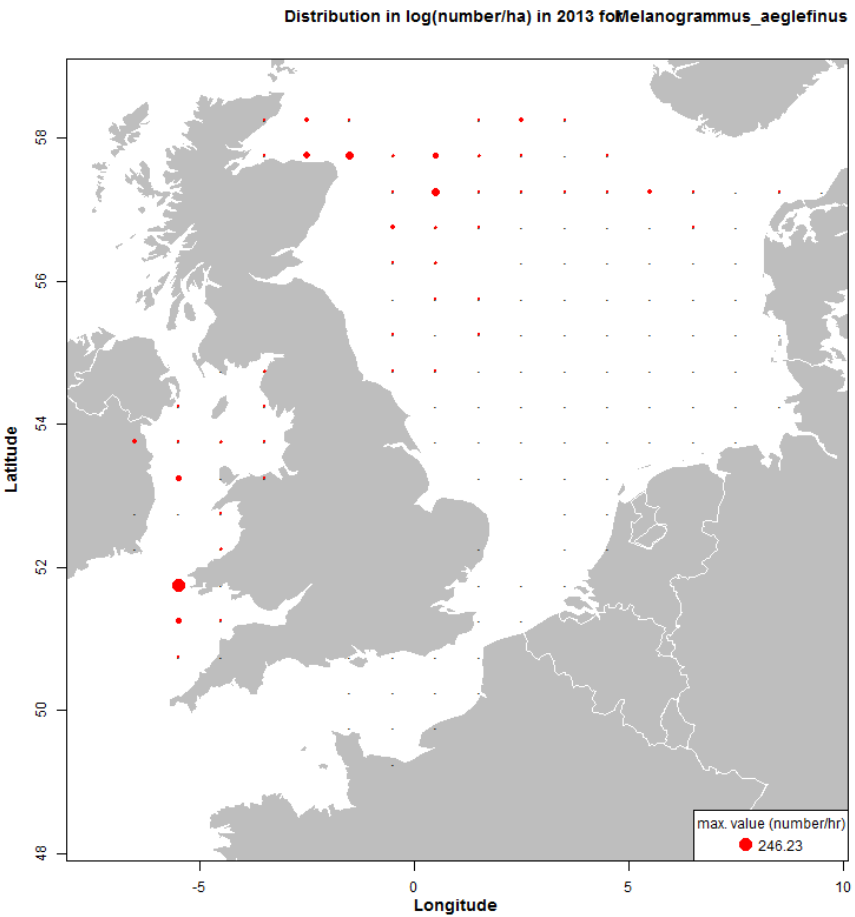
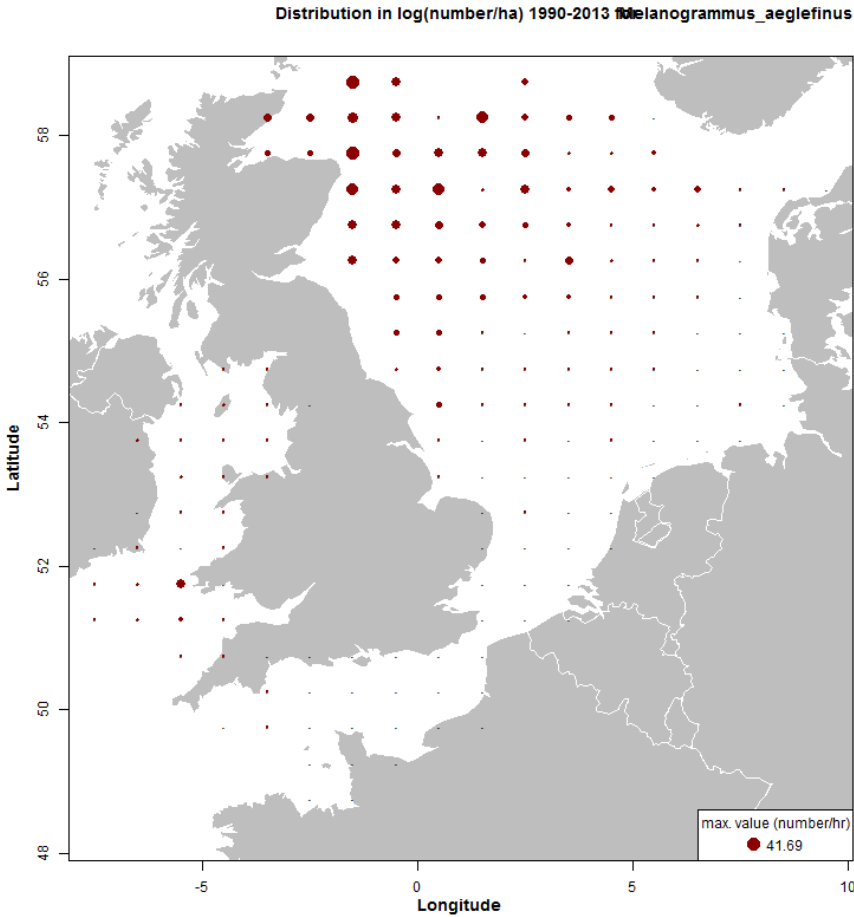
#### Poor cod



Annex 7.2.21: International offshore beam trawl survey 1990-2013

Catches are number/hr/8 m beam; left plot mean of time-series, right plot current year

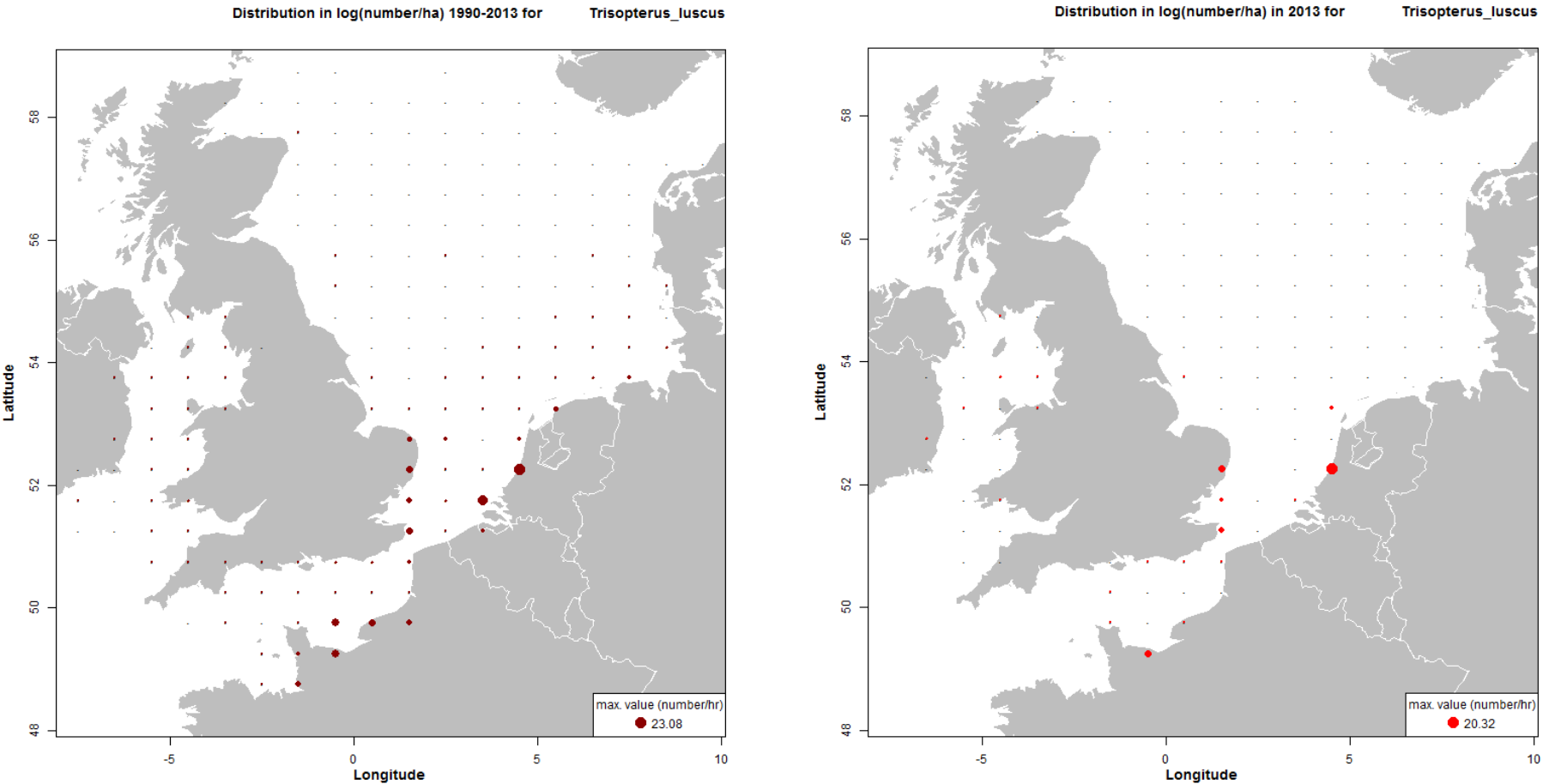
Haddock



Annex 7.2.22: International offshore beam trawl survey 1990-2013

Catches are number/hr/8 m beam; left plot mean of time-series, right plot current year

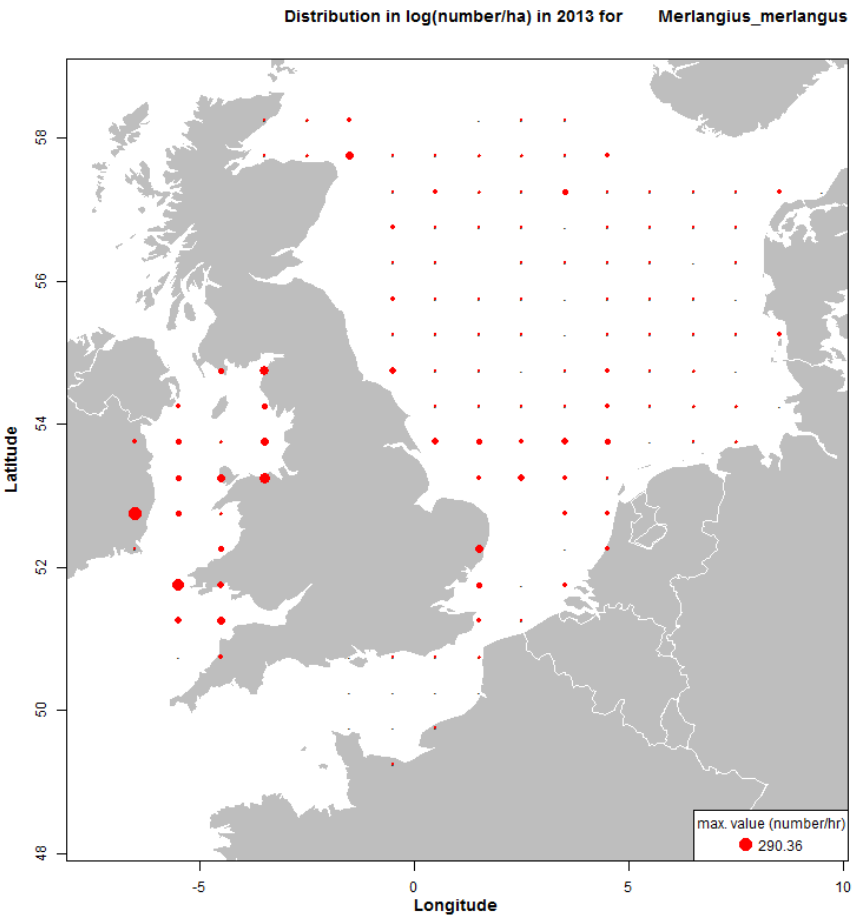
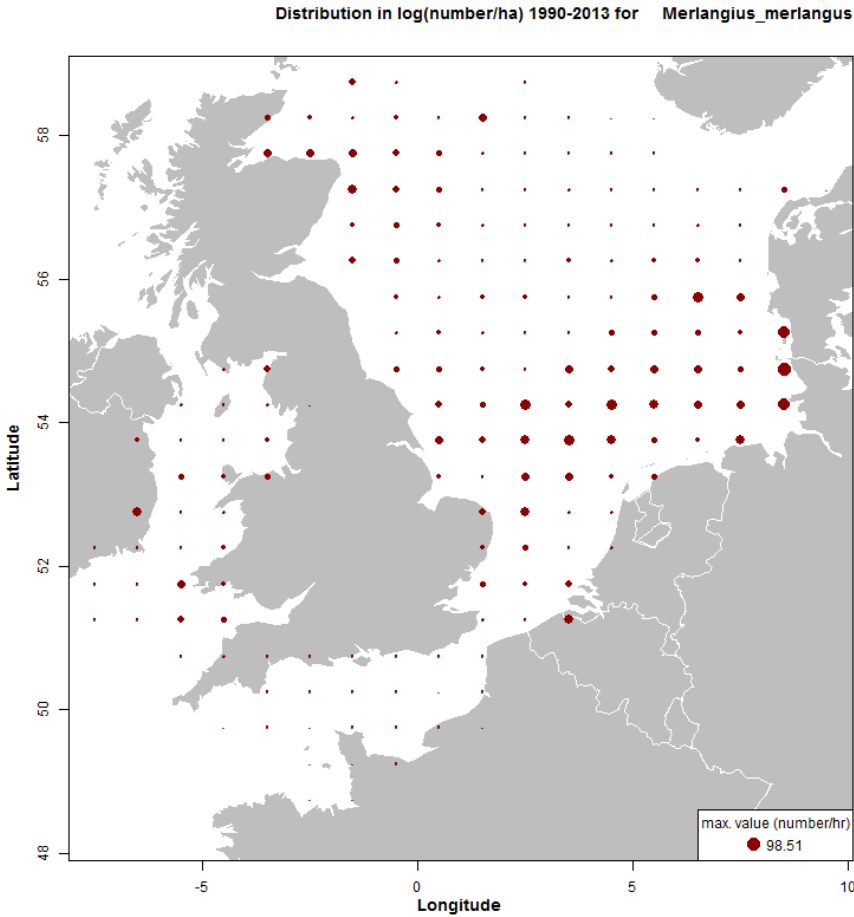
Pout whiting



Annex 7.2.23: International offshore beam trawl survey 1990-2013

Catches are number/hr/8 m beam; left plot mean of time-series, right plot current year

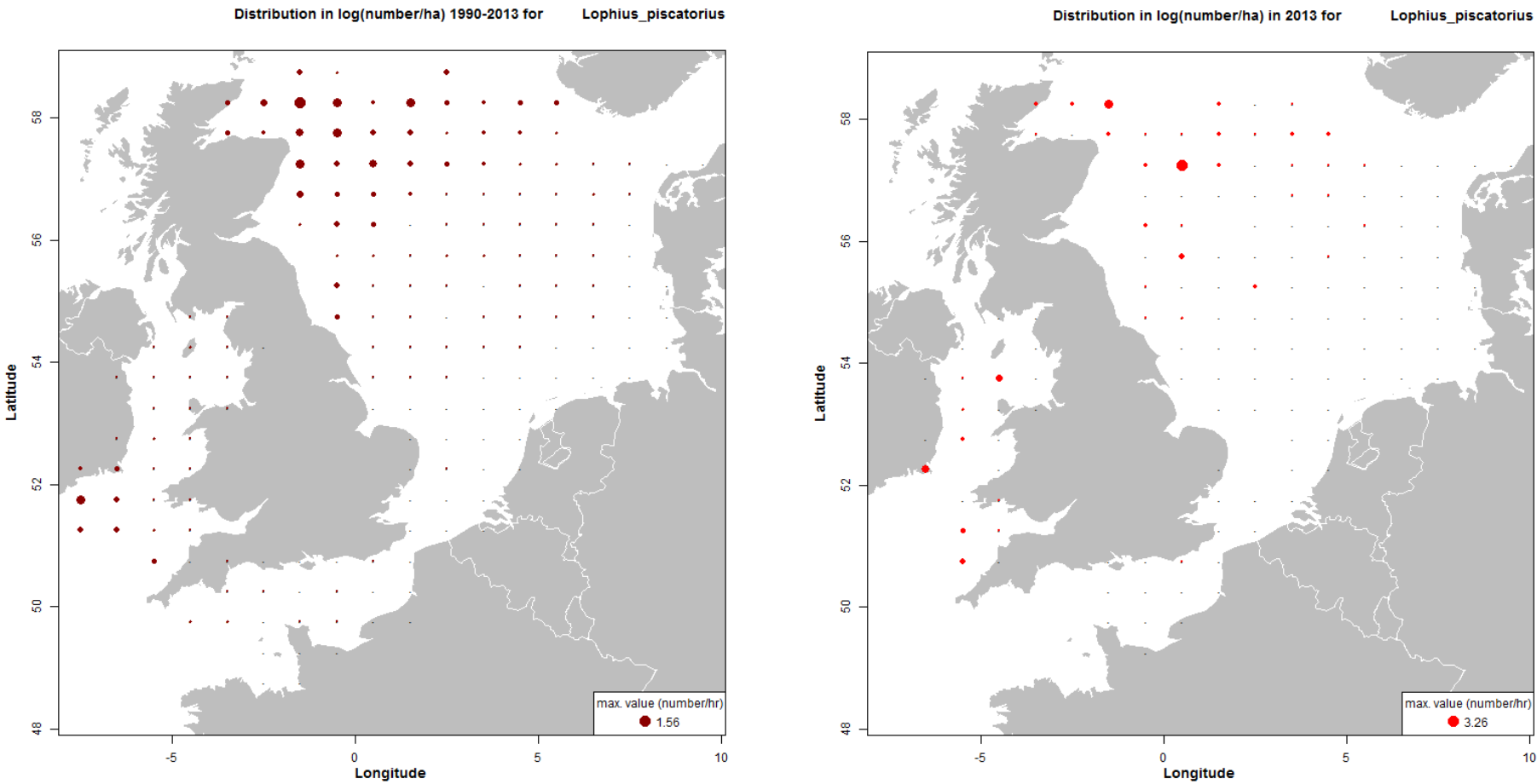
Whiting



Annex 7.2.24: International offshore beam trawl survey 1990-2013

Catches are number/hr/8 m beam; left plot mean of time-series, right plot current year

Monkfish

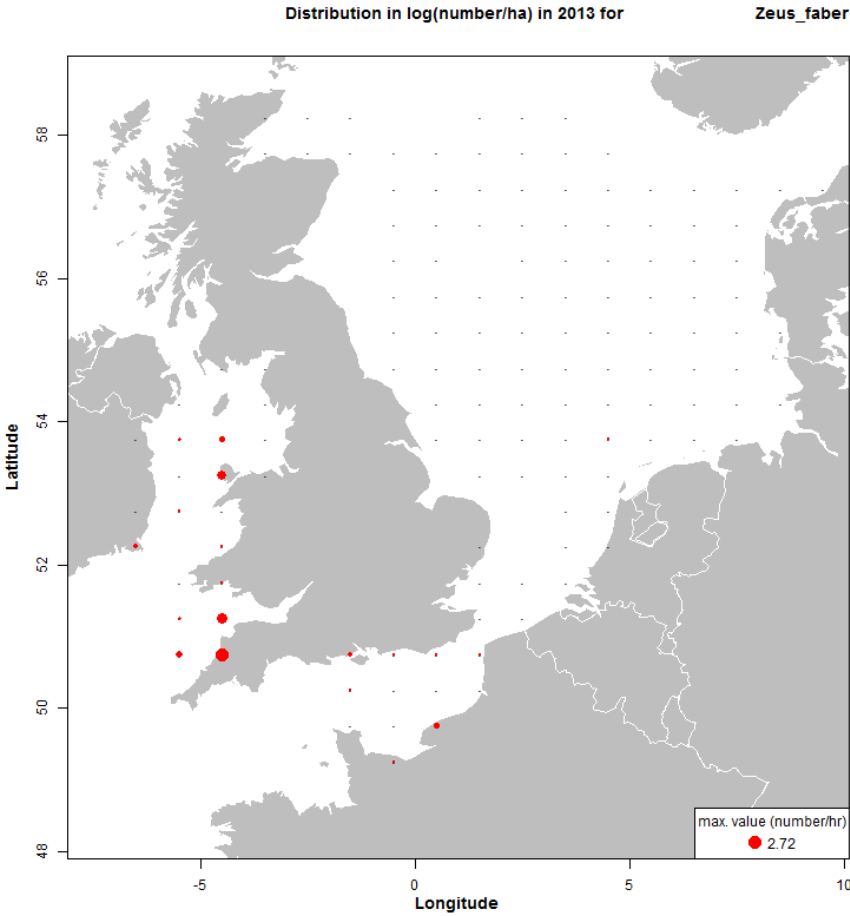
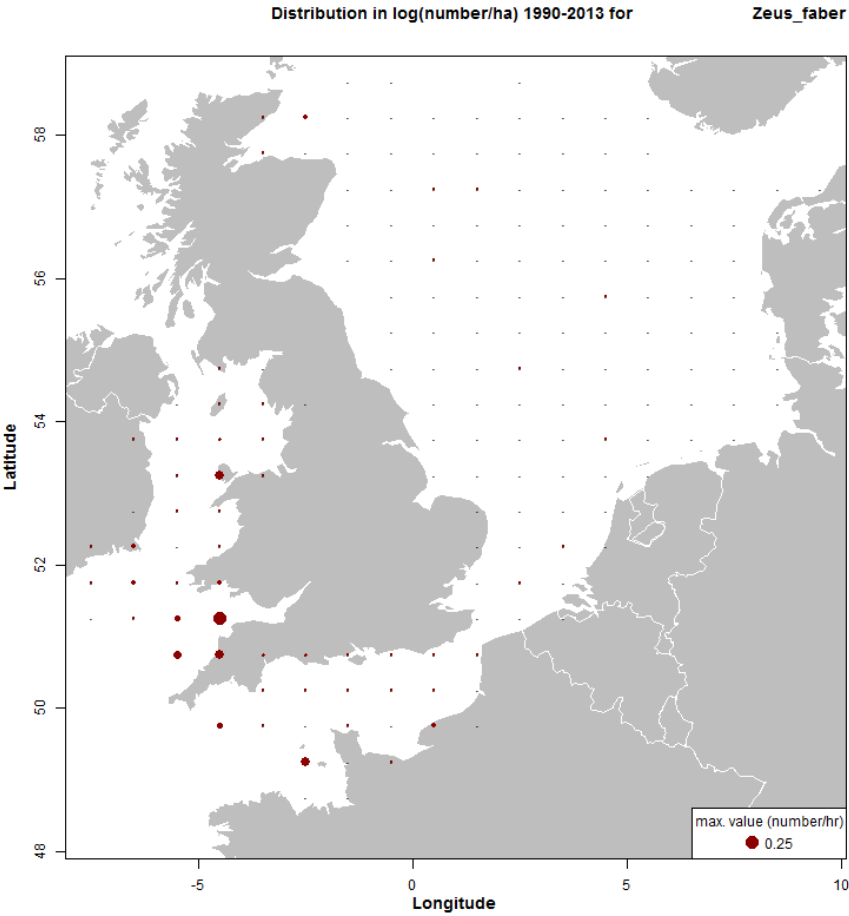




Annex 7.2.25: International offshore beam trawl survey 1990-2013

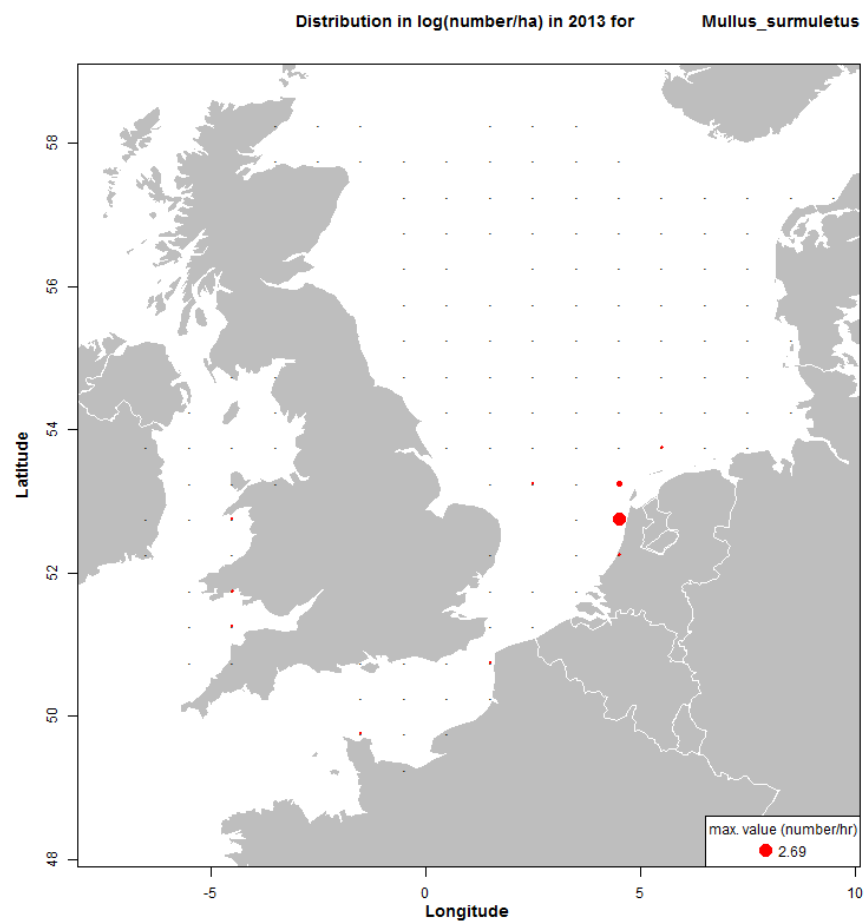
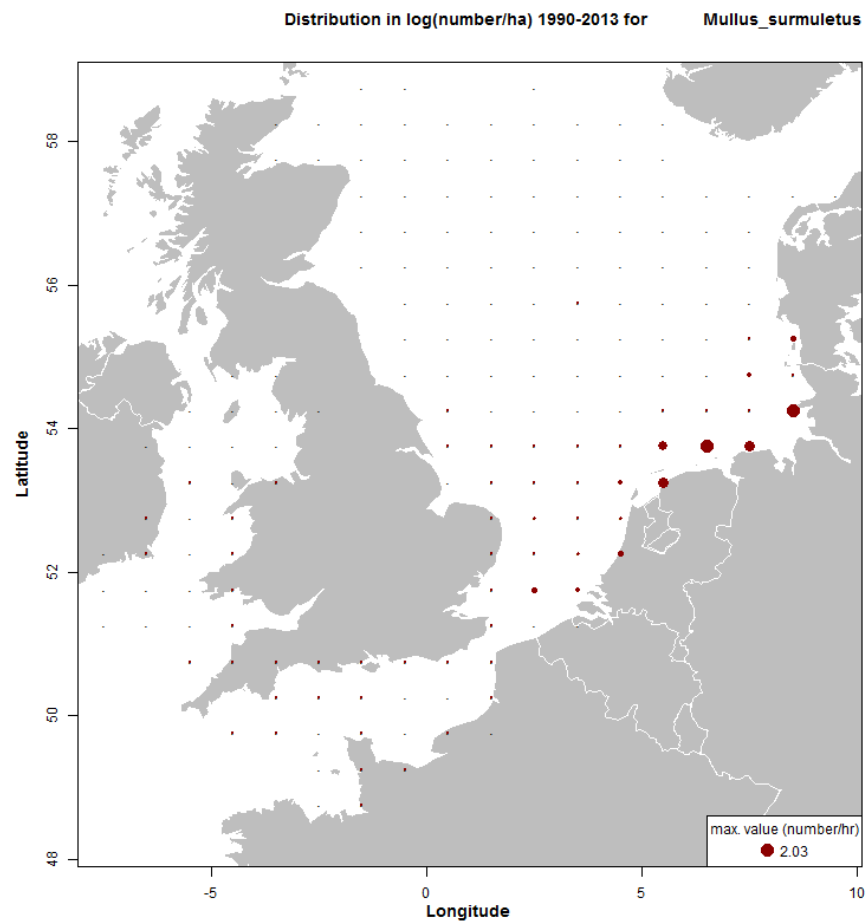
Catches are number/hr/8 m beam; left plot mean of time-series, right plot current year

John Dory



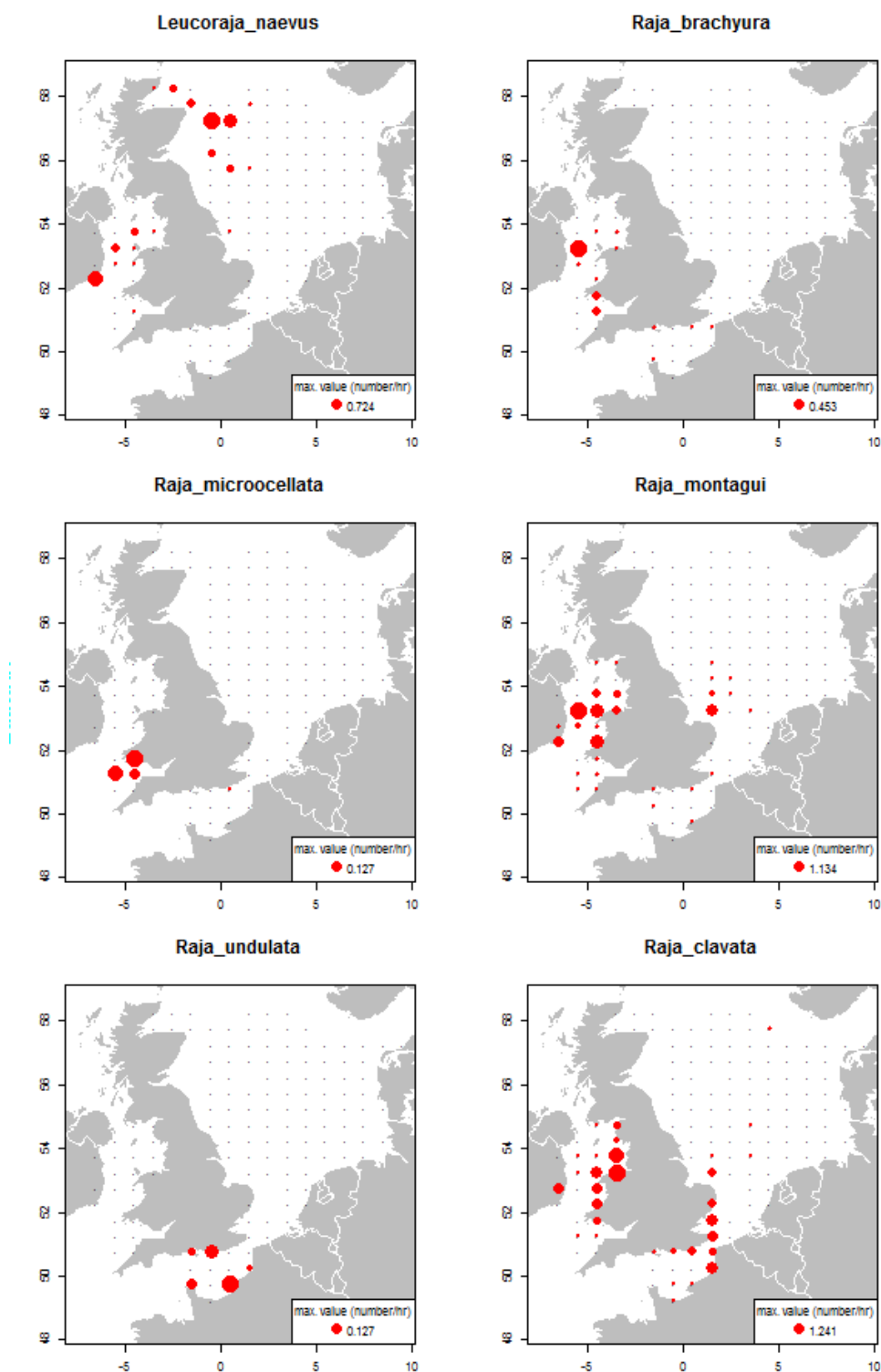
**Annex 7.2.26: International offshore beam trawl survey 1990-2013**

Catches are number/hr/8 m beam; left plot mean of time-series, right plot current year

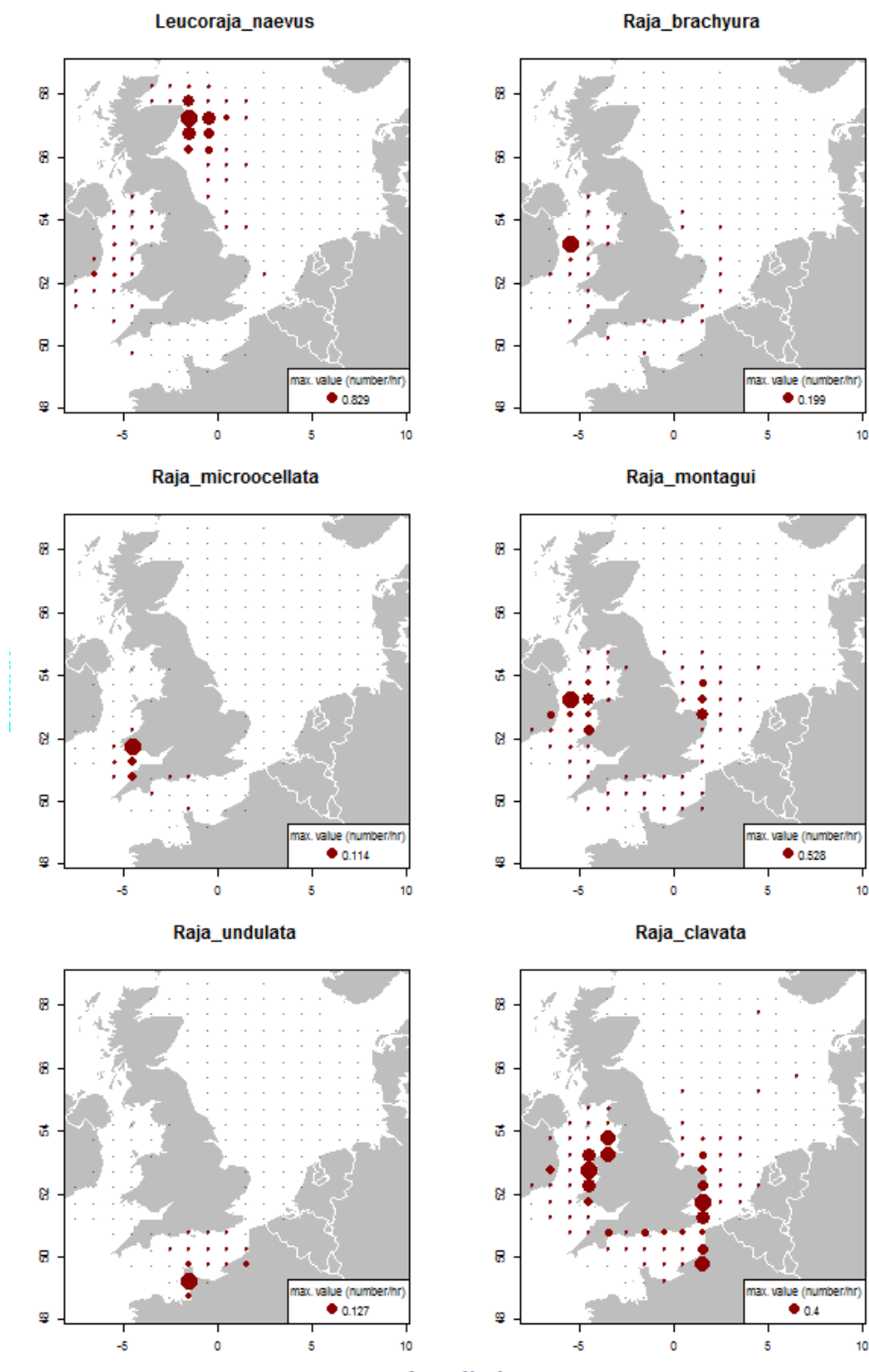
**Red mullet**

### Annex 7.3: Distribution of Rajidae in the North Sea and Celtic Sea, as recorded from offshore beam trawl survey catches

Distribution of rays and skates from the offshore beam trawl surveys carried out by Netherlands, Germany and England, in 2013.



Distribution of rays and skates from the offshore beam trawl surveys carried out by Netherlands, Germany and England, mean by rectangle over period 1990–2013.



## Annex 8: Survey summary sheets offshore surveys per country

### 8.1.1.1 Surveys summary Belgium

Nation:	Belgium	Vessel:	RV "Belgica"
Survey:	Offshore North Sea Beam Trawl Survey	Dates:	26 August to 6 September 2013

Survey description:	An annual North Sea Beam Trawl Survey is carried out in the southwestern part of the North Sea (IVb and IVc West) to sample the adult flatfish stocks, primarily targeting plaice <i>Pleuronectes platessa</i> and sole <i>Solea solea</i> . Starting in 1992, the RV “Belgica” samples 62 fixed sampling stations in BTS Areas 2, 3 and 4.				
Gear details:	All NSBTS sampling stations are fished for approx. 30 min, with a 4 m beam trawl, a 40 mm codend and chain mat.				
Notes from survey (e.g. problems, additional work etc.):	<p>In 2013, we were blessed with calm seas and almost no wind, so the weather did not interfere with the fishing activities. Technical issues that have affected the cruise plan only occurred once, being after our departure from Ipswich on Monday the 2<sup>nd</sup> of September when hydraulic problems caused us to miss one station. There were some additional minor malfunctions (e.g. the sudden loss of electricity in the fish lab) that were always quickly solved by the crew and didn’t cause any delays or data losses. For two stations (61 and 62) we did lose the ODAS/OURS data as one of the crew members had turned off the automatically recording computer. A second station was missed due to active crab fisheries on the track, and one performed tow was declared invalid as such due to a rupture of the fishing net. Conclusion: 60 out of the total of 62 planned stations have been fished successfully, of which 59 were declared valid. This is within the margin of 10% missed stations (would be a maximum of 6 missed stations) superposed by the European Commission (DG Mare). The three missed/invalid stations were well spread over the survey area, so a minimum of three valid stations was fished in each of the fourteen rectangles that make up the survey area, ensuring a good geographical spread of the obtained data.</p> <p>Number of otoliths: 4 ind per cm size class per ICES Statistical Rectangle for cod, brill, turbot, plaice and sole. This was the third time that the collection of biological samples was geographically organized based on the rectangles instead of the formerly used ALK-areas.</p> <p>Indices for plaice and sole are the numbers per hour, averaged by ICES rectangle and averaged over all sampled ICES rectangles.</p>				
Target species catch rates:		TIME-SERIES MEAN NR. PER HR	2013 MEAN NR. PER HR		
	Plaice	62.7	100.9		
	Sole	87.7	67,5		
Number of fish species recorded and notes on any rare species or unusual catches:	<p>The NS BTS measures all commercial fish species to the 5 mm below (no subsampling), and also records all other fish species by length (mostly all individuals, but sometimes based on subsamples). 53 different species of fish were caught.</p> <p>The top 10 by number are:</p> <table><tr><th>SPECIES</th><th>TOTAL NUMBER</th></tr></table>			SPECIES	TOTAL NUMBER
SPECIES	TOTAL NUMBER				

	Dab ( <i>Limanda limanda</i> )	4785
	Lesser Weever ( <i>Echiichthys vipera</i> )	2628
	Plaice ( <i>Pleuronectes platessa</i> )	2618
	Sole ( <i>Solea solea</i> )	2535
	Pogge ( <i>Agonus cataphractus</i> )	1935
	Common Dragonet ( <i>Callionymus lyra</i> )	1691
	Whiting ( <i>Merlangius merlangus</i> )	1516
	Solenette ( <i>Buglossidium luteum</i> )	1116
	Scaldfish ( <i>Arnoglossus laterna</i> )	955
	Lemon Sole ( <i>Microstomus kitt</i> )	593
Number of epifauna species recorded	All individuals of epibenthic/benthic species and occasionally caught pelagic species are recorded on the species-level whenever possible (or the most detailed taxonomical level otherwise) based on complete catches (subsampling only for the bigger catches). A selected list, decided upon by WGBEAM, is presented to the WGBEAM.	
Index revisions:	None	

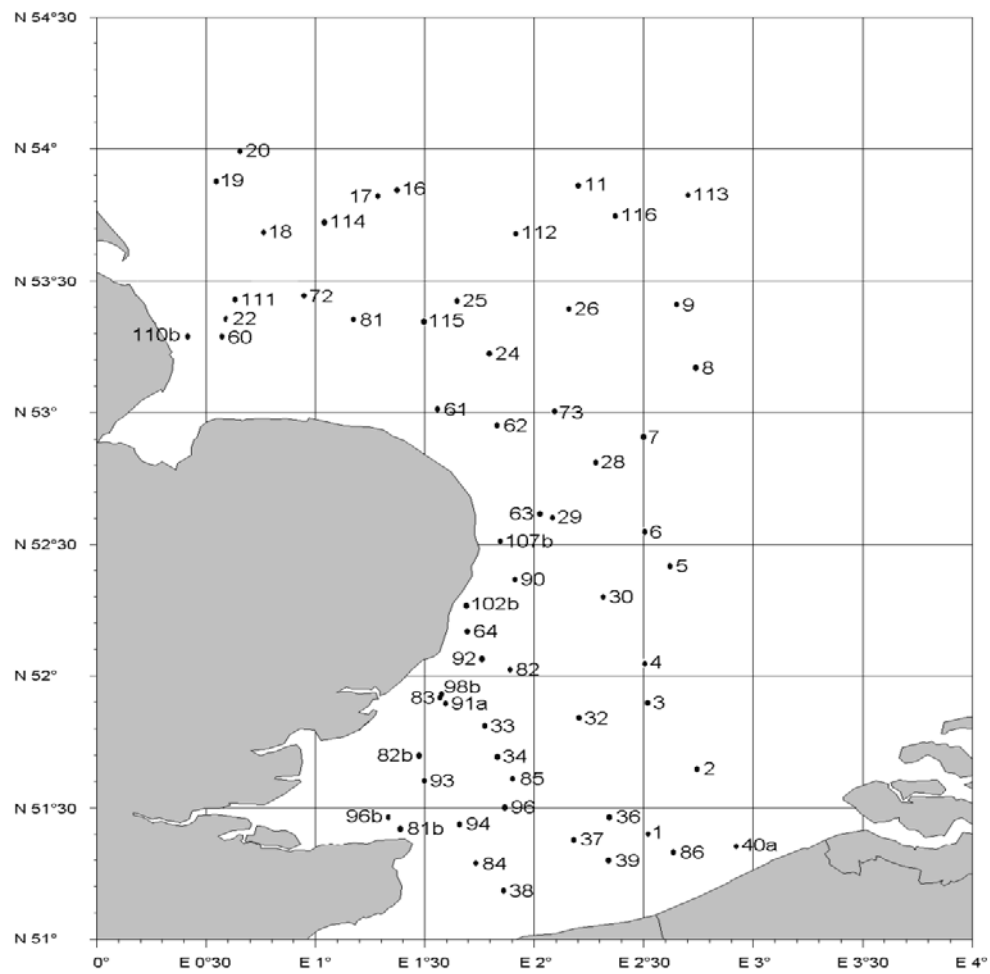
## Stations fished:

ICES Divisions	Strata	Gear	Indices stations	comments
VIb, c	62 fixed stations	4 m beam trawl	57	
Number of biological samples (maturity and age material, *maturity only):				

4 otoliths per cm size class are collected per ICES Statistical Rectangle for cod, brill, turbot, plaice and sole, and the fish these came from are also sexed.

No maturity information is recorded (inappropriate period of the year)..

### Tow positions "Belgica" Beam trawl survey.



### 8.1.1.2 Survey summary England: VIId and IVc

Nation:	UK (England and Wales)	Vessel:	RV Cefas Endeavour
Survey:	12/13	Dates:	11 – 24 July 2013

Survey description:	Q3 Eastern English Channel and Southern North Sea survey aims to collect data on distribution and relative abundance, with biological information on commercial fish species in VIId and IVc. The primary target species are sole and plaice, with additional species including lemon sole and cod.				
Gear details:	Steel 4m-beam trawl with chain mat and single flip-up rope, 80mm trawl with 40mm codend liner. Also attached is the SAIV mini CTD.				
Notes from survey (e.g. problems, additional work etc.):	<p>A total of 85 valid stations were successfully sampled during the surveys, although it was necessary to reduce the tow duration to less than 30 minutes on 19 of the prime stations. (1, 4, 6, 7, 9, 16,19, 27, 29, 47, 50, 59, 70, 71, 79, 95, 96, 97 and 100). Primarily to avoid the presence of static gear or to reduce the impact of large catches of shell/gravel. Prime station 53 was fished for only 12 minutes and hauled early due to a large amount of static gear in the area, this tow was not repeated. A full benthic sort was carried out on 15 prime stations. (7, 10, 18, 24, 27, 37, 47, 54, 62, 72, 74, 78, 82 and 100).</p> <p>The “Manta” trawl was deployed at 12 prime stations, (23, 44, 49, 51, 55, 62, 67, 74, 78, 83, 97 and 99)to collect surface micro litter.</p> <p>Additional survey aims included the collection of: live crab and starfish for a local Sea Life centre; water samples for nutrient analysis; dissolved CO<sub>2</sub> data.</p>				
At Target species catch rates:		Time-series mean no. per hr	2013 mean no. per hr	Time-series mean catch weight per hr (kg)	2013 mean catch weight per hr (kg)
	Sole	37.78	40.32	4.28	4.5
	Plaice	47.61	105.52	11.64	21.66
Number of fish species recorded and notes on any rare species or unusual catches:	61 separate species / genera of finfish were caught. The top 10 by number are:				
	Pleuronectes platessa			4273	
	Buglossidium luteum			3468	
	Limanda limanda			1802	
	Callionymus lyra			1608	
	Solea solea			1579	
	Echiichthys vipera			636	
	Merlangius merlangus			589	
	Arnoglossus laterna			448	
	Scyliorhinus canicula			416	
Agonus cataphractus			399		
Number of epifauna species recorded:	180 separate infauna species / genera were observed during the 2013 survey across both ICES divisions. At 15 selected fishing stations (12 VIId, 3 IVc), samples of the epi-benthic bycatches were sorted and 32 ‘core species’ identified and quantified, and at all fishing stations epi-benthic species were observed and the nine sentinel taxa quantified.				
Index revisions:					

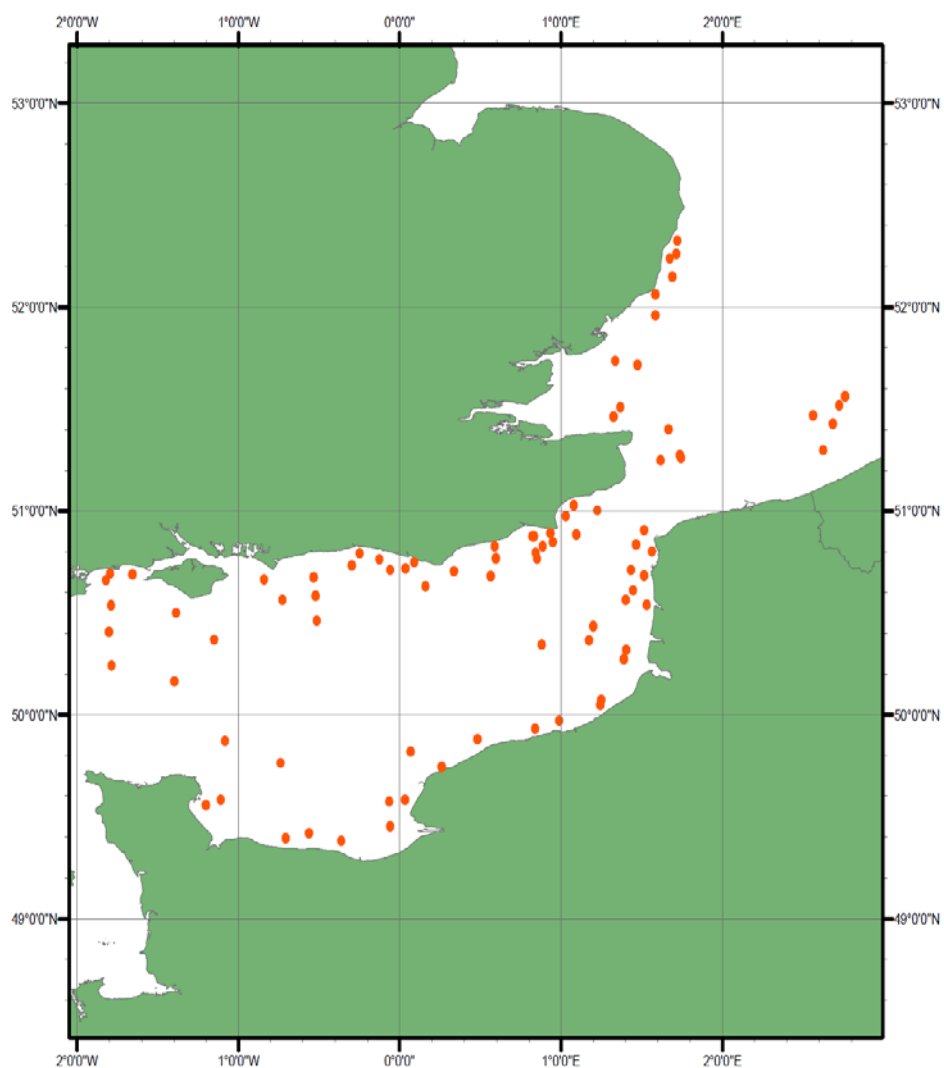


## Stations fished:

ICES Divisions	Strata	Gear	Valid	Invalid	Unable to fish	Comments
VIIId	English	4m beam trawl	36	1	3	
VIIId	French	4m beam trawl	30	0	0	
IVc		4m beam trawl	19	0	0	

Number of biological samples (maturity and age material, *maturity only):			
Species	Number	Species	Number
<i>Pleuronectes platessa</i>	1354	<i>Trigloporus lastoviza</i>	47
<i>Solea solea</i>	941	<i>Scophthalmus rhombus</i>	23
<i>Limanda limanda</i>	564	<i>Psetta maximus</i>	22
<i>Microstomus kitt</i>	129	<i>Chelidonichthys gurnardus</i>	15
<i>Merlangius merlangus</i>	111	<i>Zeus faber</i>	14
<i>Aspitrigla cuculus</i>	89	<i>Gadus morhua</i>	10
<i>Platichthys flesus</i>	56	<i>Mullus surmuletus</i>	5
<i>Chelidonichthys lucerna</i>	46	<i>Dicentrarchus labrax</i>	3

## CEND 12/13 Stations Fished



**8.1.1.3 Survey summary England: VIIa and VIIf**

Nation:	<b>UK (England and Wales)</b>	Vessel:	RV Cefas Endeavour
Survey:	18/13	Dates:	12 Sept – 3 Oct 2013

Survey description	Q3 Irish Sea and Bristol Channel survey aims to collect data on distribution and relative abundance, with biological information on commercial fish species in VIIa and VIIf. The primary target species are sole and plaice, with additional species including whiting, lemon sole and cod.				
Gear details:	Steel 4m-beam trawl with chain mat and single flip-up rope, 80mm trawl with 40mm codend cover. Also attached is the SAIV mini CTD.				
Notes from survey (e.g. problems, additional work etc.):	<p>The survey was completed with hall prime stations plus an additional 9 stations fished in SEI strata. The tow duration at nine prime stations (27, 53, 54, 203, 220, 233 313, 425, 501) was reduced to either 15 or 20 minute tow from the standard 30-minutes, and for a further 9 stations, durations were hauled early (2, 3, 112, 133, 136, 302, 425, 512, 525). All tow reductions were due to expected large catches of weed, broken shell, or large numbers of small flatfish species. A couple of stations had to be slightly shifted to avoid snagging of undersea cables and construction of wind farms. This is becoming an increasing problem for this survey especially along the Northwest coast. Additional survey aims included the collection of: surface and bottom temperature/salinity data; length/weight and maturity information using individual fish measurements, in support of the EU Data Collection Framework; surface water samples for analysis of tritium; water samples to determine alkalinity.</p> <p>In a cooperation between researchers from the National Oceanography Centre (NOCs), Cefas, the British Antarctic Survey (BAS) and the University of St Andrews, two shallow water (200m) Slocum gliders were deployed around the western Scilly Isles to conduct repeated transects over a tidal mixing front until late October.</p>				
Target species catch rates:		Time-series mean no. per hr (for period 2001–2012)	2013 mean no. per hr	Time-series mean catch weight per hr (kg)	2013 mean catch weight per hr (kg)
	Sole VIIa	18.74	11.2	2.86	1.6
	Sole VIIf	67.12	68.94	8.46	8.8
	Plaice VIIa	255.04	262.09	22.0	25.78
	Plaice VIIf	37.01	58.94	6.47	10.79
Number of fish species recorded and notes on any rare species or unusual catches:	83 separate species / genera of finfish were caught. The top 10 by number (Standardized to 30-minute tow duration) were:				
	Limanda limanda			14441	
	Pleuronectes platessa			9524	
	Buglossidium luteum			8226	
	Trisopterus minutus			5832	
	Merlangius merlangus			4172	
	Callionymus lyra			3649	
	Arnoglossus laterna			2234	
	Scyliorhinus canicula			2169	
	Eutrigla gurnardus			1639	
	Solea solea			1530	

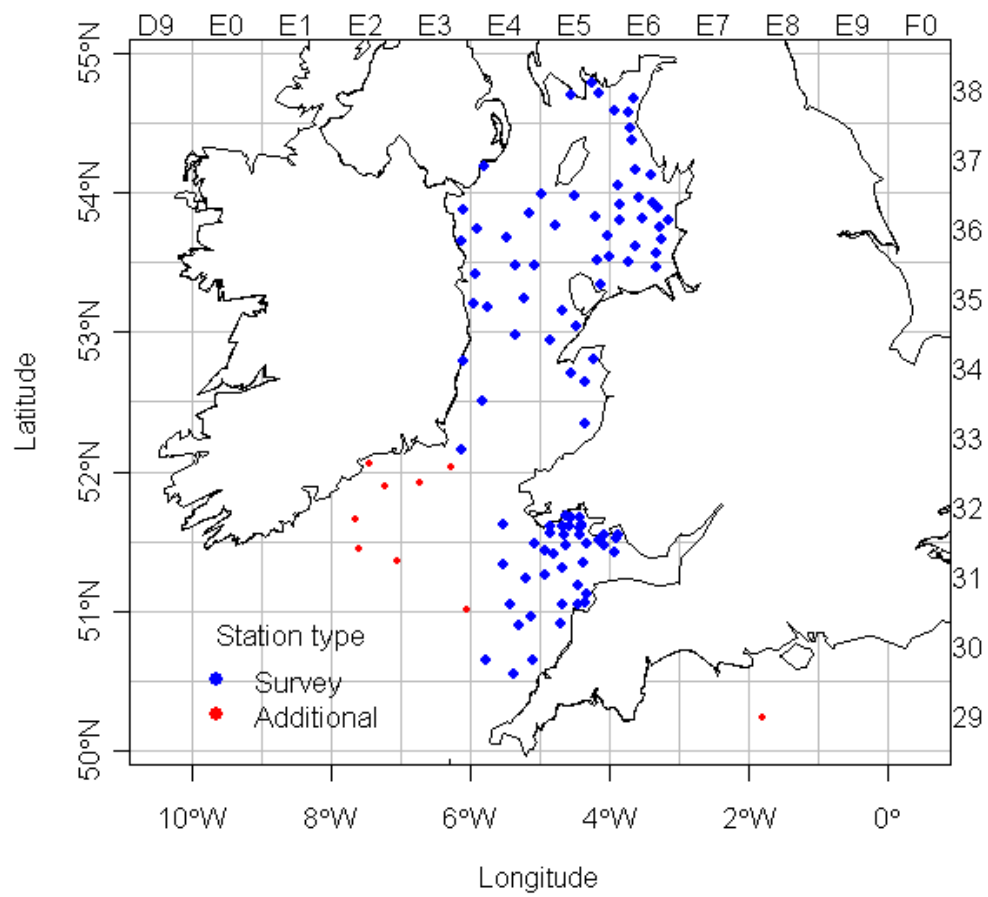
Number of infauna species recorded	137 separate infauna species / genera were observed during the 2012 survey across both ICES divisions. At 25 selected fishing stations, samples of the epi-benthic bycatches were sorted and 32 'core species' identified and quantified, and at all fishing stations epi-benthic species were observed and the nine sentinel taxa quantified.
Index revisions:	

## Stations fished:

ICES Divisions	Strata	Gear	Valid	Addit ional Invalid	Tota Comments
VIIa,f	Depth band within stratum area	4m beam trawl	107 (of which 65/65 were priority index stns)	9 2	118

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

Species	Number	Species	Number
<i>Pleuronectes platessa</i>	1971	<i>Melanogrammus aeglefinus</i>	76
<i>Solea solea</i>	708	<i>Zeus fabeyr</i>	64
<i>Chelidonichthys gurnardus</i>	306	<i>Merluccius merluccius</i>	62
<i>Limanda limanda</i>	284	<i>Lophius piscatorius</i>	56
<i>Aspitrigla cuculus</i>	231	<i>Scophthalmus rhombus</i>	28
<i>Gadus morhua</i>	217	<i>Psetta maxima</i>	19
<i>Chelidonichthys lucerna</i>	217	<i>Dicentrarchus labrax</i>	13
<i>Merlangius merlangus</i>	202	<i>Mullus surmuletus</i>	11
<i>Microstomus kitt</i>	190	<i>Trigloporus lastoviza</i>	4
<i>Lepidorhombus whiffiagonis</i>	80	<i>Lophius budegassa</i>	1



**Station positions for Cefas Endeavour 18/13 Beam Trawl survey.**

**8.1.1.4 Survey summary England: Vlle**

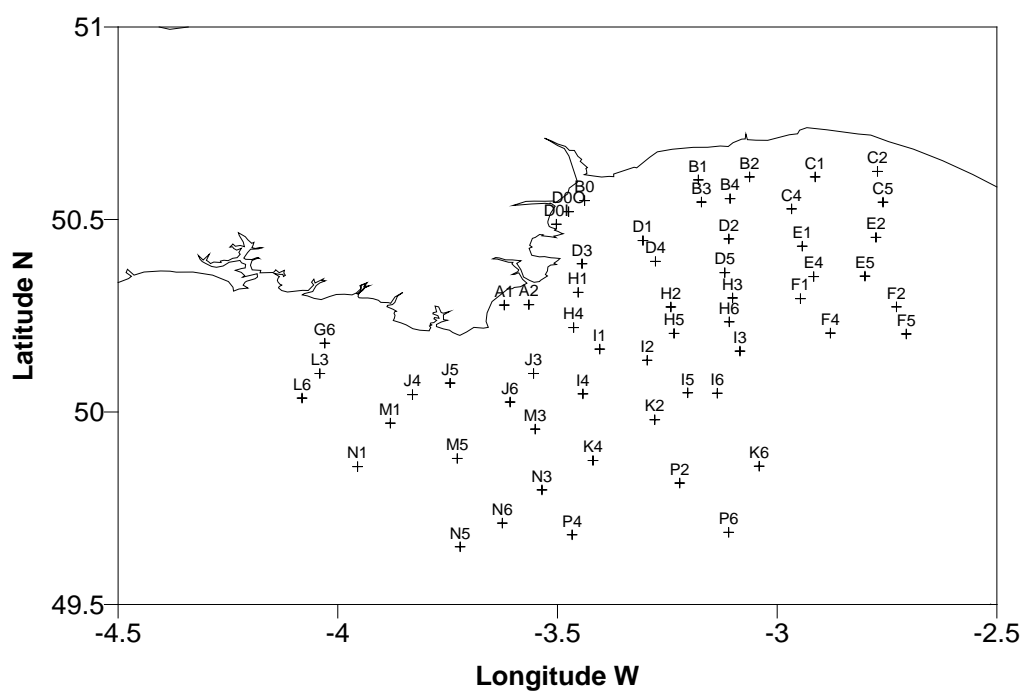
Nation:	UK (England and Wales)	Vessel:	FV Carhelmar
Survey:	2/13	Dates:	13 – 19 October 2013

Survey description	Q4 Western English Channel beam trawl survey. The primary target species are sole and plaice, with additional species including lemon sole and monkfish.			
Gear details:	Twin steel 4m-beam trawls with chain mat and single flip-up rope, 80mm trawl with 40mm codend cover. From 2006, a SAIV mini CTD has been attached to one beam.			
Notes from survey (e.g. problems, additional work etc.):	<p>Cefas has carried out the survey since 1984, first on the FV Bogey1, then from 1989 onwards the FV Carhelmar. In 2002 the survey was switched to the RV Corystes for three years, although both vessels were used in 2003. Since 2005 the survey returned to using the FV Carhelmar. For 2011 a number of changes were implemented. The principal ones were to stop collecting length measurements for non-commercial fish species at a randomly selected station each day, to collect length frequency data for all commercial cephalopods (<i>Sepia</i> and <i>Loligo</i> spp.), and to restrict the collection of biological samples to <i>Pleuronectes platessa</i>, <i>Solea solea</i> and <i>Microstomus kitt</i> as well as reducing slightly some of the length group targets. Weights are only recorded for individual biological samples.</p> <p>The 2013 survey was successfully completed with all 58 stations sampled, without the need to repeat any tows to obtain valid samples, and on all occasions both port and starboard trawls were brought aboard and processed.</p>			
Target species catch rates:		Time-series mean no. per hr	2013 mean no. per hr	No catch weights recorded
	Sole	15.48	15.03	
	Plaice	22.83	54.75	
Number of fish species recorded and notes on any rare species or unusual catches:	51 separate species / genera of finfish were caught in 2012. The top 10 by number were:			
	<i>Pleuronectes platessa</i>			1598
	<i>Chelidonichthys cuculus</i>			1049
	<i>Merlangius merlangus</i>			610
	<i>Scyliorhinus canicula</i>			557
	<i>Solea solea</i>			436
	<i>Limanda limanda</i>			355
	<i>Chelidonichthys gurnardus</i>			351
	<i>Trisopterus luscus</i>			97
	<i>Lophius piscatorius</i>			74
	<i>Zeus faber</i>			71
Number of infauna species recorded	A total of 52 species / genera of epifauna were observed during the survey. The most commonly encountered species were common starfish ( <i>Asterias rubens</i> ), hydroids (Hydroida) and hermit in <i>Adamsia</i> ( <i>Pagurus prideaux</i> ) that all occurred at over 70% of the stations surveyed. Large aggregations of the colonial tube worm <i>Serpula vermicularis</i> were encountered at station B1 and to a lesser extent at station B2.			

Stations fished:

ICES Divisions	Strata	Gear	Indices stations	Priority stations	Additional	Invalid	Total Valid comments
VIIe	Distance from shore	2 x 4m beam trawl	49	49	9	0	58

Number of biological samples (maturity and age material, *maturity only):			
Species	Number	Species	Number
<i>Pleuronectes platessa</i>	473	<i>Solea solea</i>	257
<i>Microstomus kitt</i>	59		



Station positions for Carhelmar 2/13 Beam Trawl survey.

## 8.1.1.5 Survey summary France

Nation :	France	Vessel :	NO "Gwen Drez"
Survey :	ORHAGO 13	Dates :	9 Nov. – 3 Dec. 2013

Survey description :	The Q4 Bay of Biscay ORHAGO survey aims to collect data on composition, distribution and change in relative abundance of fish fauna on yearly basis. Information is collected on length frequency for all the fish, with biological information (age, maturity) on some species. The main target species is sole, other additional abundant commercial species include (by decreasing numbers/hour in 2013) Norway lobster, hake, cuttlefish, whiting, wedge sole, lesser-spotted dogfish, striped red mullet, European squid, grey gurnard, meagre, monks and conger. For the first time in 2013, the benthos was exhaustively sampled for all the hauls (for determination at the laboratory).																								
Gear details :	4m-beam trawl with chain mat, 50mm mesh in the net et 40 mm mesh in the codend.																								
Notes from survey (e.g. problems, additional work etc.) :	Some hauls displaced or cancelled because the presence of fixed net on the position. No haul by night contrarily to preceding years.																								
Target species catch rates :		Time-series mean no. per hr	2013 mean no. per hr	Time-series mean catch weight per hr	2013 mean catch weight per hr (kg)																				
	Sole	43.4	40.5	5.8	6.2																				
Number of fish recorded and note on any rare species or unusual catches :	58 separate species of fish were caught																								
	<table><tr><td><i>Arnoglossus laterna</i></td><td>61</td></tr><tr><td><i>Trisopterus luscus</i></td><td>60</td></tr><tr><td><i>Merluccius merluccius</i></td><td>60</td></tr><tr><td><i>Solea solea</i></td><td>42</td></tr><tr><td><i>Callionymus lyra</i></td><td>35</td></tr><tr><td><i>Trisopterus minutus</i></td><td>32</td></tr><tr><td><i>Trachinus draco</i></td><td>17</td></tr><tr><td><i>Microchirus variegatus</i></td><td>15</td></tr><tr><td><i>Buglossidium luteum</i></td><td>13</td></tr><tr><td><i>Merlangius merlangus</i></td><td>13</td></tr></table>					<i>Arnoglossus laterna</i>	61	<i>Trisopterus luscus</i>	60	<i>Merluccius merluccius</i>	60	<i>Solea solea</i>	42	<i>Callionymus lyra</i>	35	<i>Trisopterus minutus</i>	32	<i>Trachinus draco</i>	17	<i>Microchirus variegatus</i>	15	<i>Buglossidium luteum</i>	13	<i>Merlangius merlangus</i>	13
	<i>Arnoglossus laterna</i>	61																							
	<i>Trisopterus luscus</i>	60																							
	<i>Merluccius merluccius</i>	60																							
	<i>Solea solea</i>	42																							
	<i>Callionymus lyra</i>	35																							
	<i>Trisopterus minutus</i>	32																							
	<i>Trachinus draco</i>	17																							
	<i>Microchirus variegatus</i>	15																							
	<i>Buglossidium luteum</i>	13																							
<i>Merlangius merlangus</i>	13																								
Number of epifauna	132 separates epifauna species or group of species sorted by lower taxon to which they can be attributed on board (number, total weight, length distribution of some of them).																								

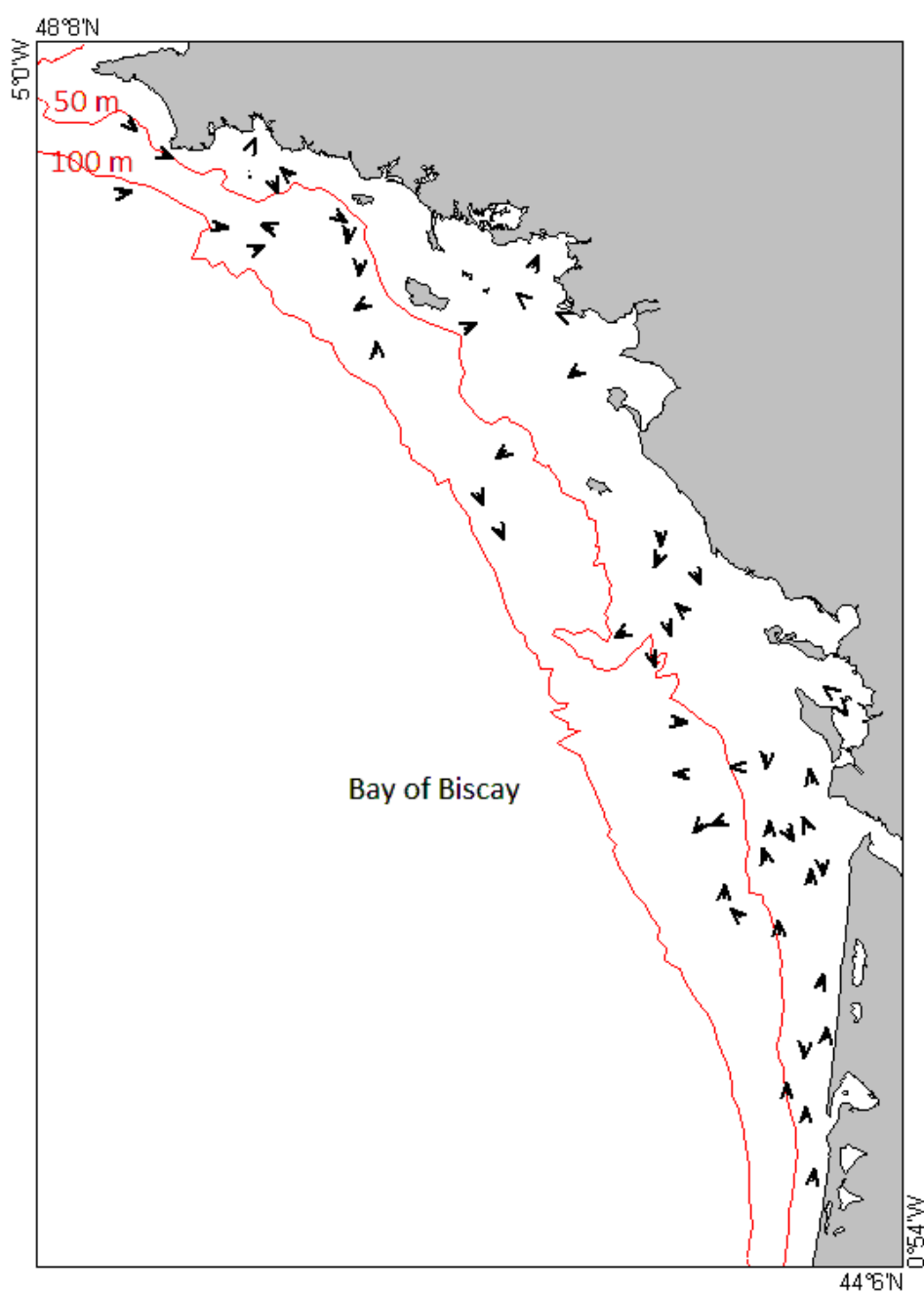


species recorded	
------------------	--

Stations fished :

ICES Divisions	Strata	Gear	Indices stations	Priority stations	Additional	Invalid	Total valid	comments
VIIIab	N/A	4m beam trawl	49		3	0	53	1 replicate tow.

Number of biological samples ( *age materiel only)			
Species	Number	Species	Number
<i>Solea solea</i> maturity and age	747	<i>Dicentrarchus labrax</i>	10
<i>Solea solea</i> maturity only	308	<i>Lophius piscatorius</i> *	43
<i>Mullus surmuletus</i>	71	<i>Lophius budegasa</i> *	4
<i>Argyrosomus regius</i>	119		



ORHAGO 2013 tow positions.

**8.1.1.6 Survey summary Germany**

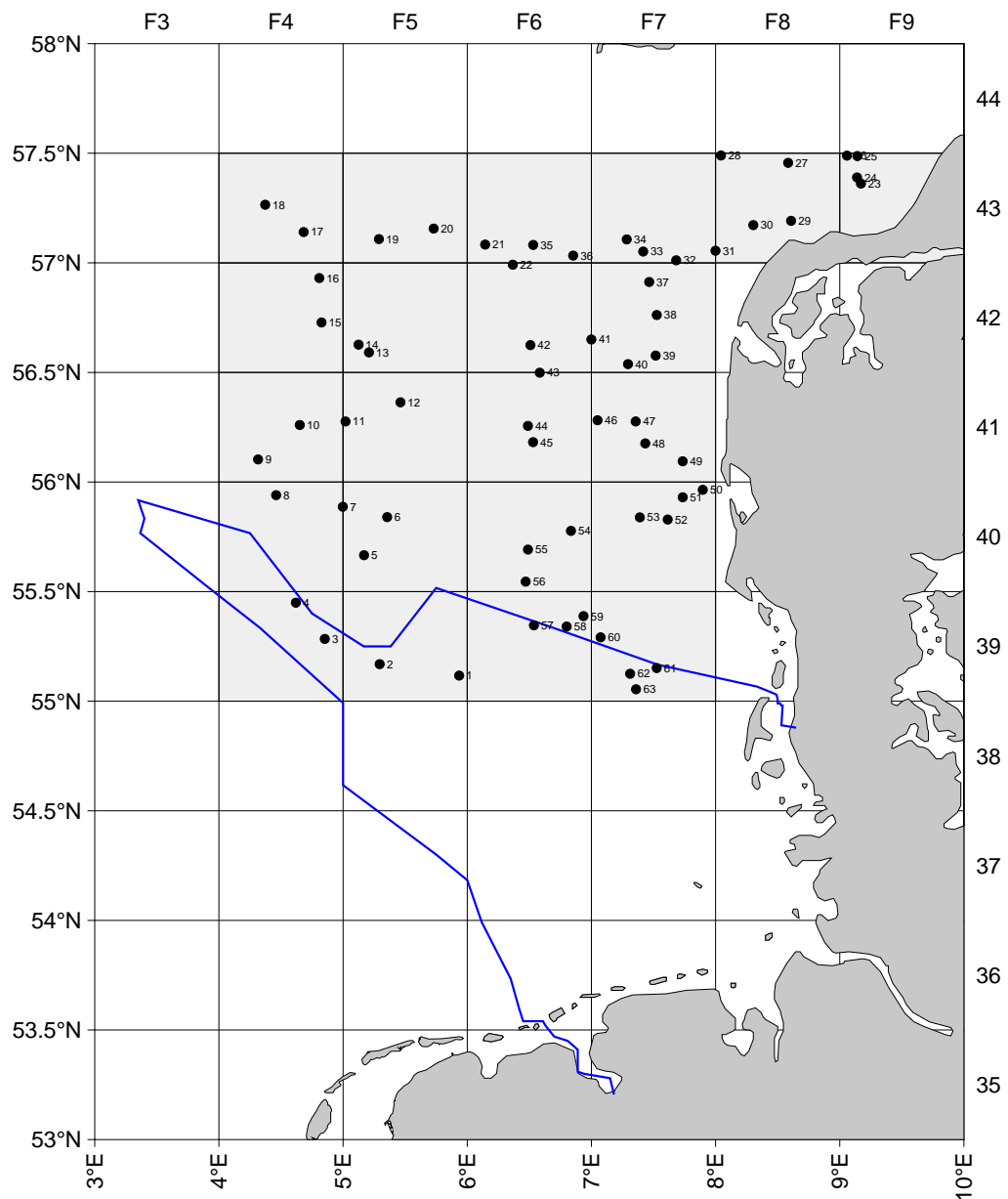
Nation:	<b>Germany</b>	Vessel:	RV "Solea"
Survey:	BTS	Dates:	17 – 28 Aug 2013

Survey description:	Q3 North Sea survey aims to collect data on distribution and relative abundance, with biological information, on commercial and other fish and invertebrate species in IVb to the west of Denmark. The distribution of young flatfish, particularly plaice, has particular attention (higher sampling density further inshore). In 2013 two rectangles off the north coast of Denmark were added, each with 4 hauls.	
Gear details:	7 metre beam trawl with 5 ticklers, 40 mm mesh in the codend, 80 mm mesh in the net.	
Notes from survey (e.g. problems, additional work etc.):	63 hauls were carried out (approx. 31.5 hours fishing time).	
Target species catch rates:	Time-series mean no. per hr	2013 mean no. per hr
	Sole 4.01	9.06
	Plaice 265.29	619.96
Number of fish species recorded and notes on any rare species or unusual catches:	34 separate species of finfish were caught. The top 10 by number are: <i>Limanda limanda</i> 32219 <i>Pleuronectes platessa</i> 19130 <i>Buglossidium luteum</i> 1091 <i>Hippolossoides platessoides</i> 1042 <i>Callionymus lyra</i> 1026 <i>Microstomus kitt</i> 918 <i>Eutrigla gurnardus</i> 895 <i>Agonus cataphractus</i> 530 <i>Arnoglossus laterna</i> 417 <i>Amblyraja radiata</i> 281	
Number of epifauna species recorded:	72 epifauna (attached and free-living) species were observed during the 2013 survey.	
Index revisions:		

**Stations fished:**

ICES Divisions	Strata	Gear	Indices stations	Priority stations	Additional	Invalid	Total Valid	Comments
North Sea IVb	N/A	7m beam trawl	63	63	8	0	63	

Number of biological samples (maturity and age material, *maturity only):			
Species	Number	Species	Number
<i>Pleuronectes platessa</i>	2355	<i>Limanda limanda</i>	2240
<i>Solea solea</i>	145		



Towing positions Germany "Solea" Beam Trawl Survey.

## 8.1.1.7 Survey summary Adriatic Sea: GSA17

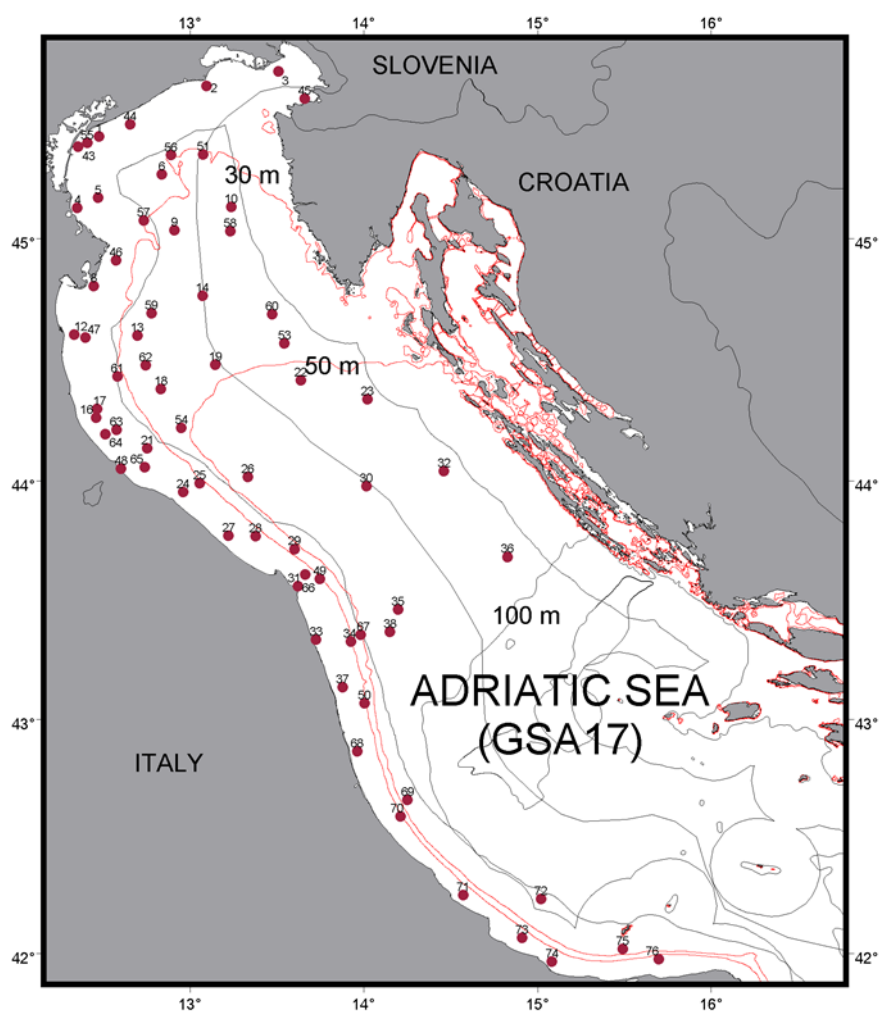
Nation:	Italy and Slovenia	Vessel:	N/O G. Dallaporta
Survey:	SoleMon	Dates:	30 Nov – 17 Dec 2013

Survey description	SoleMon survey aims to collect data on distribution and relative abundance, with biological information on commercial fish species in FAO-GFCM Geographical Sub-Area 17 (Figure 5.1.3.7.1). The primary target species is sole, with additional species including cuttlefish, scallop, queen scallops, turbot, brill, skates, purple dye murex and caramote prawn.																								
Gear details:	Modified beam trawl with a rigid mouth. The frame is rigged with 46 iron teeth along the lower leading edge. Joined to the iron frame there are 4 skids and a reinforced rubber diamond-mesh net in the lower part to protect the polyamide net bag tied to the iron frame (Width: 3.5 m; Weight: 225 kg; Four 120-mm wide skids; 40-mm codend mesh size). The beam trawl is provided with DST Logic Temperature and Depth Recorders.																								
Notes from survey (e.g. problems, additional work etc.):	65 hauls were carried out (approx. 29 hours fishing time). Due delay caused by adverse sea conditions and time constraint in availability of vessels, 2 station were not carried out. The survey was completed without incident. A total of 18 stations had to be fished for less than 30 minutes. This was mainly due to large by catches of benthos and/or as a precaution against gear damage. A significant amount of additional aims were carried out. These included <i>Solea solea</i> , <i>Scophthalmus rhombus</i> and <i>Scophthalmus maximus</i> otolith and finclips for ageing and comparative population genetics structure, collection of samples for Lindane and TBT contaminants analyses, maturity stages of <i>Sepia officinalis</i> , epibenthos analyses. Vertical CTD measurements were carried out after each haul.																								
Target species catch rates:		Time-series mean no. per hr	2013 mean no. per hr	Time-series mean catch weight per hr (kg)	2011 mean catch weight per hr (kg)																				
	Sole GSA17	32.6	53.6	3.00	3.73																				
Number of fish species recorded and notes on any rare species or unusual catches:	52 separate species of finfish were caught. The top 10 by number per square km are: <table><tr><td><i>Solea solea</i></td><td>726.74</td></tr><tr><td><i>Arnoglossus laterna</i></td><td>685.45</td></tr><tr><td><i>Serranus hepatus</i></td><td>226.67</td></tr><tr><td><i>Buglossidium luteum</i></td><td>144.4</td></tr><tr><td><i>Gobius niger</i></td><td>135.15</td></tr><tr><td><i>Eutrigla gurnardus</i></td><td>114.32</td></tr><tr><td><i>Merluccius merluccius</i></td><td>92.83</td></tr><tr><td><i>Scorpaena notata</i></td><td>70</td></tr><tr><td><i>Uranoscopus scaber</i></td><td>61.79</td></tr><tr><td><i>Lepidotrigla cavillone</i></td><td>52.29</td></tr></table>					<i>Solea solea</i>	726.74	<i>Arnoglossus laterna</i>	685.45	<i>Serranus hepatus</i>	226.67	<i>Buglossidium luteum</i>	144.4	<i>Gobius niger</i>	135.15	<i>Eutrigla gurnardus</i>	114.32	<i>Merluccius merluccius</i>	92.83	<i>Scorpaena notata</i>	70	<i>Uranoscopus scaber</i>	61.79	<i>Lepidotrigla cavillone</i>	52.29
<i>Solea solea</i>	726.74																								
<i>Arnoglossus laterna</i>	685.45																								
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<i>Merluccius merluccius</i>	92.83																								
<i>Scorpaena notata</i>	70																								
<i>Uranoscopus scaber</i>	61.79																								
<i>Lepidotrigla cavillone</i>	52.29																								
Number of in-fauna species recorded	261 separate macro- and megabenthos species were observed during the 2013 survey.																								
Index revisions:																									

Stations fished:

GSA	Strata	Gear	Indices stations	Priority stations	Additional	Invalid	Total Valid	comments
17	3 depth strata	2 x 3.5m modified beam trawls	65		0	0		

Number of biological samples (maturity and age material):		
Species	Number	Biological material
<i>Solea solea</i>	2652	(maturity)
<i>Solea solea</i>	286	(otolith)
<i>Scophthalmus rhombus</i>	66	(maturity and otolith)
<i>Psetta maximus</i>	9	(maturity and otolith)
<i>Platichthys flesus</i>	11	(maturity)



Towing positions of SoleMon survey.

**8.1.1.8 Survey summary Netherlands: Tridens**

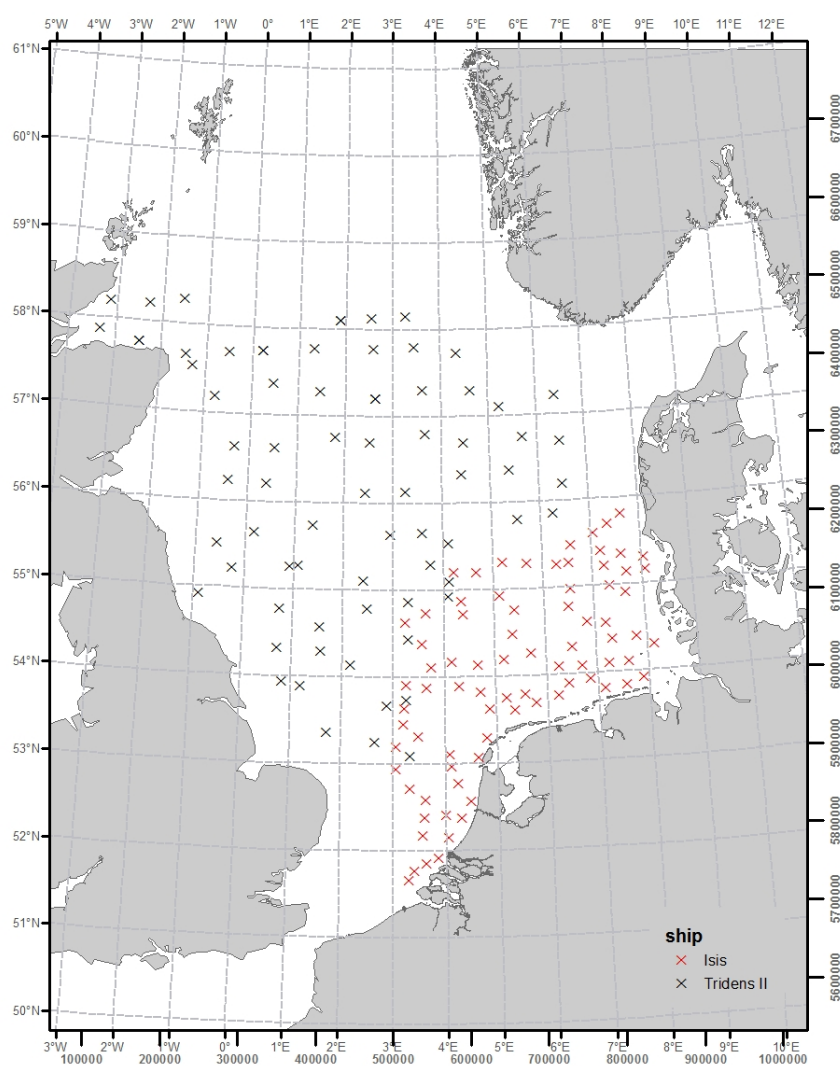
Nation:	Netherlands	Vessel:	RV "Tridens"
Survey:	BTS (Beam Trawl Survey)	Dates:	19 Aug – 12 Sep 2013

Survey description	The BTS aims to (i) monitor fish fauna by sampling length frequency distributions of all fish species and age composition of flatfish species, (ii) monitor species composition of epibenthos species by counting and weighing (if possible), (iii) create a fishery-independent estimate of age density for plaice and sole in the North Sea for stock assessment, (iv) monitor sex- and length composition of <i>Cancer pagurus</i> , <i>Nephrops norvegicus</i> and elasmobranch species.		
Gear details:	8 meter beam trawl with 8 ticklers, 40 mm mesh in the codend, 120 mm mesh in the net and a flip-up rope.		
Notes from survey:	69 hauls were carried out (approx. 35 hours fishing time). The survey was finished without major incidents, although time was lost due to bad weather conditions, resulting in less hauls carried out than originally planned. Net damage was repaired within a few hours. Vertical CTD measurements were carried out after each haul.		
Target species catch rates:	Time-series mean no. per hr	2013 mean no. per hr	
	Sole no index		
	Plaice 112.70	236.76	
Number of fish species recorded and notes on any rare species or unusual catches:	58 separate species of finfish were caught. The top 10 by number are: <i>Limanda limanda</i> 27840 <i>Pleuronectes platessa</i> 8193 <i>Hippoglossoides platessoides</i> 5515 <i>Microstomus kitt</i> 2618 <i>Eutrigla gurnardus</i> 2378 <i>Arnoglossus laterna</i> 2152 <i>Buglossidium luteum</i> 1705 <i>Callionymus lyra</i> 1172 <i>Trisopterus esmarkii</i> 800 <i>Echiichthys vipera</i> 556		
Number of epifauna species recorded:	146 epifauna (attached and free-living) species were observed during the 2013 survey.		
Index revisions:	None		

**Stations fished:**

ICES Divisions	Strata	Gear	Indices stations	Priority stations	Additional	Invalid	Total Valid	Comments
North Sea	N/A	8m beam trawl	47	21	0	1	69	

Number of biological samples (age material), including hauls with Isis gear:			
Species	Number	Species	Number
<i>Pleuronectes platessa</i>	1262	<i>Merluccius merluccius</i>	55
<i>Limanda limanda</i>	527	<i>Microchirus variegatus</i>	41
<i>Microstomus kitt</i>	426	<i>Scophthalmus maximus</i>	32
<i>Solea solea</i>	152	<i>Scophthalmus rhombus</i>	10
<i>Hippoglossoides platessoides</i>	216	<i>Zeugopterus norvegicus</i>	3
<i>Gadus morhua</i>	184		



Towing positions Dutch Beam Trawl survey: black=Tridens, red=Isis (in Isis summary sheet).



**8.1.1.9 Survey summary Netherlands: Isis**

Nation:	<b>Netherlands</b>	Vessel:	RV "Isis"
Survey:	BTS (Beam Trawl Survey)	Dates:	5 Aug - 6 Sep 2013

Survey description	The BTS aims to (i) monitor fish fauna by sampling length frequency distributions of all fish species and age composition of flatfish species, (ii) monitor species composition of epibenthos species by counting, (iii) create a fishery-independent estimate of age density for plaice and sole in the North Sea for stock assessment, (iv) monitor sex- and length composition of <i>Cancer pagurus</i> , <i>Nephrops norvegicus</i> and elasmobranch species.		
Gear details:	8 meter beam trawl with 8 ticklers, 40 mm mesh in the codend, 120 mm mesh in the net.		
Notes from survey:	80 hauls were carried out (approx. 40 hours fishing time) by Isis, meaning that the full sampling programme has been carried out in 2013. The survey however suffered from technical problems and bad weather conditions.		
Target species catch rates:	Time-series mean no. per hr	2013 mean no. per hr	
	Sole 49.29	30.09	
	Plaice 817.71	1039.25	
Number of fish species recorded and notes on any rare species or unusual catches:	47 separate species of finfish were caught. The top 10 by number are: <i>Limanda limanda</i> 93624 <i>Pleuronectes platessa</i> 42250 <i>Arnoglossus laterna</i> 7532 <i>Callionymus lyra</i> 4802 <i>Buglossidium luteum</i> 4171 <i>Agonus cataphractus</i> 3044 <i>Eutrigla gurnardus</i> 2284 <i>Echiichthys vipera</i> 1407 <i>Solea solea</i> 1234 <i>Merlangius merlangus</i> 1000		
Number of epifauna species recorded:	48 epifauna (attached and free-living) species were observed during the 2012 survey		
Index revisions:	None		

**Stations fished:**

ICES Divisions	Strata	Gear	Indices stations	Priority stations	Additional	Total Invalid	Valid	Comments
North Sea	N/A	8m beam trawl	76	2	2	78		

Number of biological samples (age material):			
Species	Number	Species	Number
<i>Pleuronectes platessa</i>	697	<i>Scophthalmus rhombus</i>	52
<i>Limanda limanda</i>	278	<i>Microstomus kitt</i>	97
<i>Solea solea</i>	528	<i>Gadus morhua</i>	2
<i>Psettas maximus</i>	105		

## Annex 9: Survey summary sheets inshore surveys per country

### Survey summary Belgium

Nation:	Belgium	Vessel:	RV 'Simon Stevin'
Survey:	Inshore Demersal Young Fish and Brown shrimp Survey	Dates:	9–19 September 2013

Survey description	As part of the international Demersal Young Fish and Brown Shrimp Survey, an annual autumn sampling survey is carried out in the Belgian coastal waters, to collect data on the abundance of juvenile flatfish (primarily plaice <i>Pleuronectes platessa</i> , and sole <i>Solea solea</i> ) and brown shrimp ( <i>Crangon crangon</i> ). Since 1973, 33 fixed sampling stations are fished. Until 1982, the research vessel Hinders was used, from 1983 onwards the survey was carried out with the training and research vessel O.29 'Broodwinner'. 2013 was the first year in which the new RV 'Simon Stevin' was used. The location of the sampling area matches the main flatfish nursery grounds along the Belgian coast.																										
Gear details:	All DYFS sampling stations are fished for approx. 30 min, with a standard shrimp beam trawl (beam length 6 m; codend mesh size 11 mm, no tickler chains), at 3 knots against tide.																										
Notes from survey (e.g. problems, additional work etc.):	The weather did not interfere with the sea-going operations in 2013, and no technical problems were encountered. This allowed for all 33 sampling stations to be fished succesfully. None of the fished stations were declared invalid.																										
Target species catch rates:	<table><tr><th></th><th>TIME-SERIES</th><th>2013</th></tr><tr><th></th><th>MEAN NR. PER 1000 M²</th><th>MEAN NR. PER 1000 M²</th></tr></table>				TIME-SERIES	2013		MEAN NR. PER 1000 M²	MEAN NR. PER 1000 M²																		
	TIME-SERIES	2013																									
	MEAN NR. PER 1000 M²	MEAN NR. PER 1000 M²																									
2013 data	Plaice	5.92	7.20																								
	Sole	3.97	2.89																								
Number of fish species recorded and notes on any rare species or unusual catches:	<p>The DYFS focuses on measuring the most important commercial fish species (value and/or volume) to the cm below being cod, whiting, plaice, flounder, dab, sole, brill and turbot. From 2009 on, the species list was extended to cover all commercial fish species caught (e.g. including lesser spotted dogfish, gurnards, lemon sole, ...). In this way, 12 species were documented in 2013. Ordered by number, these are:</p> <table><tr><th>SPECIES</th><th>TOTAL NUMBER</th></tr><tr><td>Dab (<i>Limanda limanda</i>)</td><td>6539</td></tr><tr><td>Whiting (<i>Merlangius merlangus</i>)</td><td>5489</td></tr><tr><td>Plaice (<i>Pleuronectes platessa</i>)</td><td>4316</td></tr><tr><td>Sole (<i>Solea solea</i>)</td><td>1831</td></tr><tr><td>Flounder (<i>Platichthys flesus</i>)</td><td>194</td></tr><tr><td>Horse Mackerel (<i>Trachurus trachurus</i>)</td><td>116</td></tr><tr><td>Tub Gurnard (<i>Chelidonichthys lucerna</i>)</td><td>50</td></tr><tr><td>Cod (<i>Gadus morhua</i>)</td><td>33</td></tr><tr><td>Turbot (<i>Psetta maxima</i>)</td><td>9</td></tr><tr><td>Lemon Sole (<i>Microstomus kitt</i>)</td><td>8</td></tr><tr><td>Lesser Spotted Dogfish (<i>Scyliorhinus</i>)</td><td>2</td></tr></table>			SPECIES	TOTAL NUMBER	Dab ( <i>Limanda limanda</i> )	6539	Whiting ( <i>Merlangius merlangus</i> )	5489	Plaice ( <i>Pleuronectes platessa</i> )	4316	Sole ( <i>Solea solea</i> )	1831	Flounder ( <i>Platichthys flesus</i> )	194	Horse Mackerel ( <i>Trachurus trachurus</i> )	116	Tub Gurnard ( <i>Chelidonichthys lucerna</i> )	50	Cod ( <i>Gadus morhua</i> )	33	Turbot ( <i>Psetta maxima</i> )	9	Lemon Sole ( <i>Microstomus kitt</i> )	8	Lesser Spotted Dogfish ( <i>Scyliorhinus</i> )	2
SPECIES	TOTAL NUMBER																										
Dab ( <i>Limanda limanda</i> )	6539																										
Whiting ( <i>Merlangius merlangus</i> )	5489																										
Plaice ( <i>Pleuronectes platessa</i> )	4316																										
Sole ( <i>Solea solea</i> )	1831																										
Flounder ( <i>Platichthys flesus</i> )	194																										
Horse Mackerel ( <i>Trachurus trachurus</i> )	116																										
Tub Gurnard ( <i>Chelidonichthys lucerna</i> )	50																										
Cod ( <i>Gadus morhua</i> )	33																										
Turbot ( <i>Psetta maxima</i> )	9																										
Lemon Sole ( <i>Microstomus kitt</i> )	8																										
Lesser Spotted Dogfish ( <i>Scyliorhinus</i> )	2																										

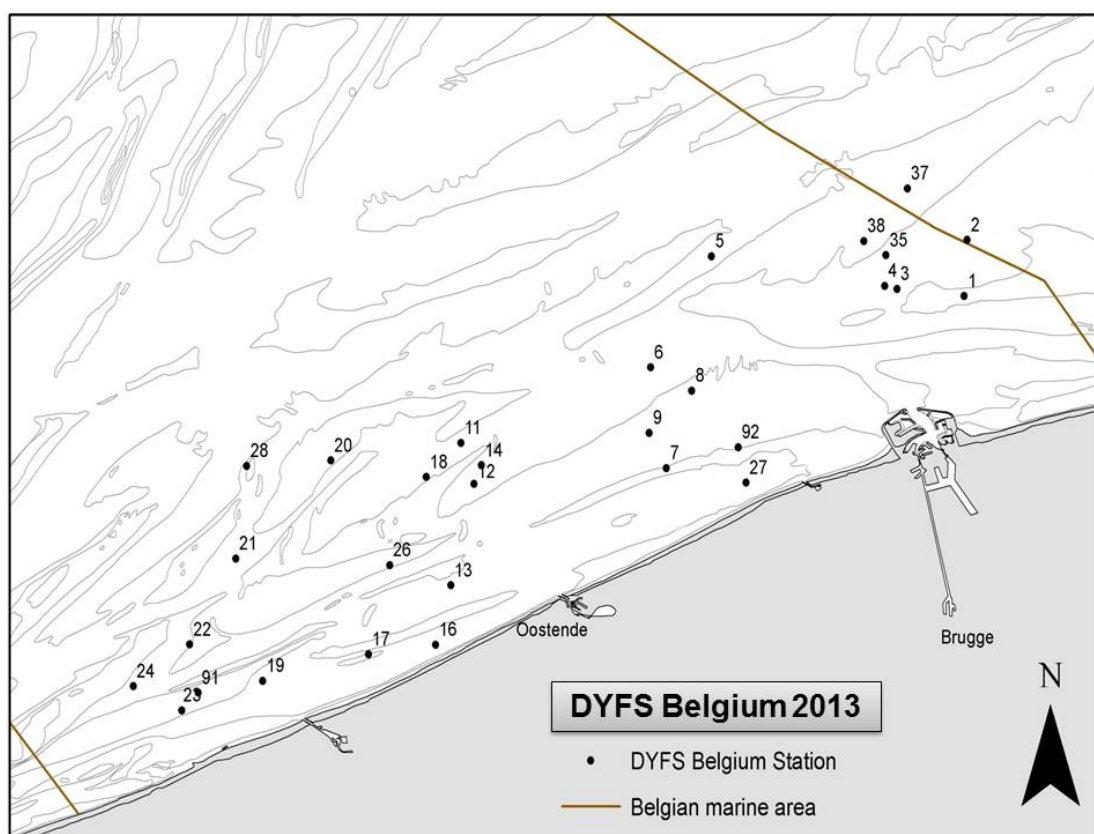
	<i>canicula</i> Brill ( <i>Scophthalmus rhombus</i> )	1
Number of epifauna species recorded:	Appr. 500 brown shrimp per station are measured in 5 mm size classes. No other epifauna species are recorded.	
Index revisions:	No	

**Stations fished:**

ICES Divisions	Strata	Gear	Indices stations	Priority stations	Additional	Invalid	Valid	Comments
IVc	N/A	6m beam trawl	133	33	0	0	33	none

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

None

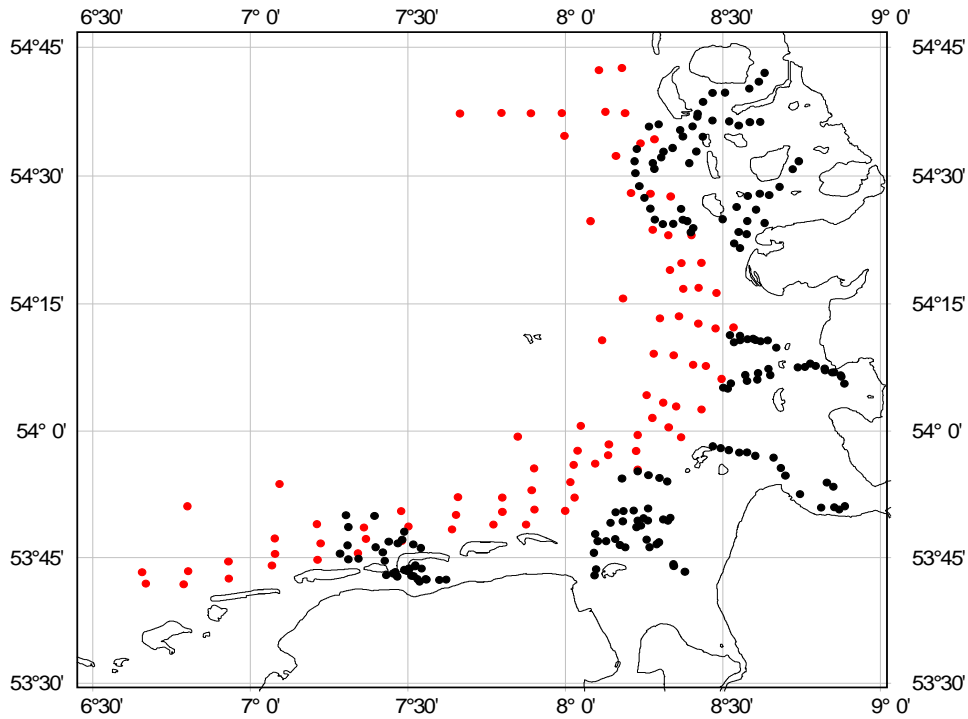
**DYFS sampling stations in the Belgian coastal waters**

## Survey summary Germany

Nation:	Germany	Vessel:	RV "Clupea" and Chartered Cutters
Survey:	DYFS	Dates:	27 Aug – 30 Sept 2013

Survey description	The DYFS (Demersal Young Fish and Brown Shrimp Survey) aims to collect data on distribution and relative abundance, with biological information on fish and crustacean species in the Wadden Sea region. The primary target species are plaice and sole, with additional species including whiting, cod and brown shrimp.				
Gear details:	Steel 3m- shrimp-beam trawl without tickler chain, 20mm cod-end. An electronic mini sensor for time, temperature and pressure (light optional) is attached.				
Notes from survey (e.g. problems, additional work etc.):	TI-SF operates the survey since 1974. Weser estuary and Jade were included from 2005 onwards. Spring series were terminated in 2004. There is no fixed position grid, but the same channel systems and all depth strata covered within and outside the island chain down to approx. 12m water depth are sampled on a yearly basis. The deeper gullies are taken into account, too. Since 2012 the survey area outside the island chain was intensified by using RV Clupea in addition to chartered cutters. Single station data are available for the entire dataset. At present, time-series indices are available from 1980 onwards, the earlier survey data are in a validation process. Data of only a limited number of “standard” invertebrates are stored in the TI-SF database. (Species list has changed also over years) In total 263 valid hauls of 271 total hauls were carried out in 2013.				
Target species catch rates:		Time-series mean (Schleswig-Holstein only) n/1000m²	2013 mean (Schleswig-Holstein only) n/1000m²	Time-series mean	2013 mean (coastal Zone all along Germany) n/1000m²
	Plaice	14.40	8.88		9.24
	Sole	0.97	0.62		0.52
	Cod	0.98	0.82		0.86
	Whiting	2.23	1.08		3.09
	Brown shrimp	1899	2203.50		1791.27
Number of fish species recorded and notes on any rare species or unusual catches:	The top 10 by number are:				
	54 taxa of finfish were caught from 2001 to 2013. The top 10 by number in 2013 out of 40 taxa:				
	<i>Pomatoschistus minutus</i>			15326	
	<i>Pleuronectes platessa</i>			9088	
	<i>Limanda limanda</i>			8043	
	<i>Merlangius merlangus</i>			2367	
	<i>Osmerus eperlanus</i>			2265	
	<i>Syngnathus rostellus</i>			1688	
	<i>Agonus cataphractus</i>			1365	
	<i>Clupea harengus</i>			904	
	<i>Liparis liparis</i>			770	
	<i>Platichthys flesus</i>			593	
Number of epifauna species recorded:	All epifauna found are recorded and available in the SF database. For 2013 the top 10 were:				
	<i>Crangon crangon</i>			1933877	
	<i>Liocarcinus holsatus</i>			95124	
	<i>Pandalus montagui</i>			12440	
	<i>Ophiurida</i>			10328	
	<i>Asterias rubens</i>			8878	
	<i>Mytilus edulis</i>			3521	
	<i>Carcinus maenas</i>			3027	
	<i>Crangon allmanni</i>			930	
	<i>Actinaria</i>			386	

	<i>Paguridae</i> 262		
Number of biological samples (maturity and age material):			
Species	Number	Species	Number
<i>Pleuronectes platessa</i>	672	<i>Scophthalmus rhombus</i>	1
<i>Platichthys flesus</i>	156	<i>Limanda limanda</i>	190
<i>Solea solea</i>	57		



Stations sampled in the German DYFS 2013.

Black circles: chartered vessels, red circles: RV 'Clupea'.

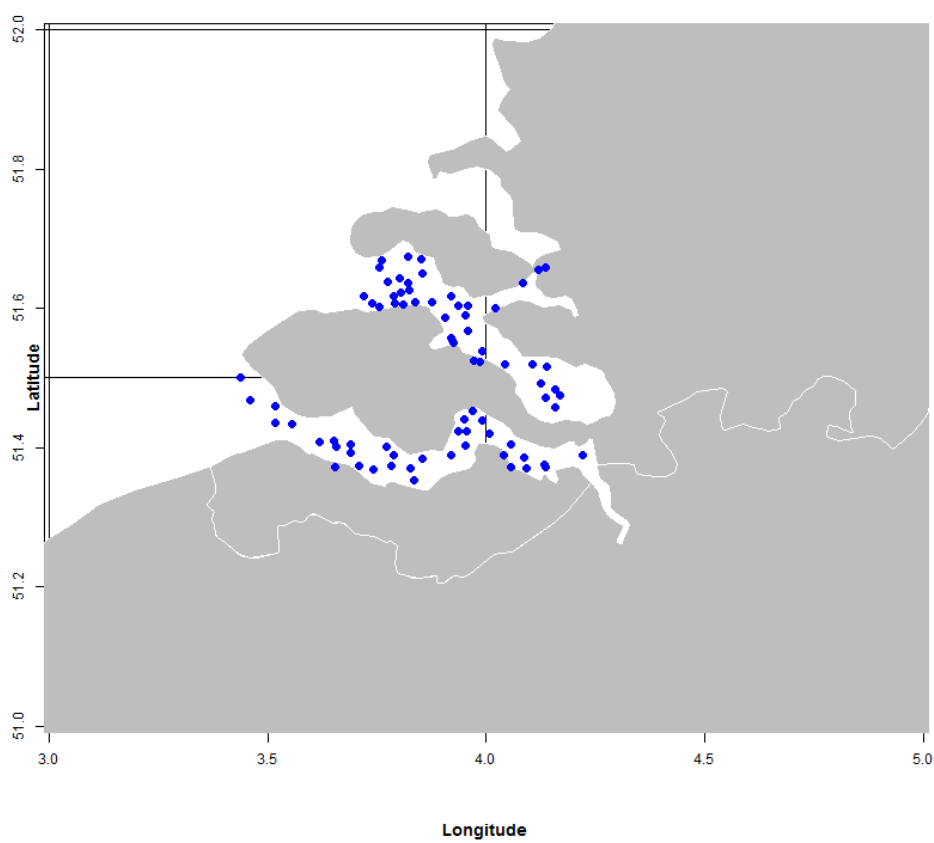
**Survey summary Netherlands: Schollebaar**

Nation:	Netherlands	Vessel:	RV "Schollebaar"
Survey:	DYFS (Demersal Young Fish Survey)	Dates:	7–19 Sep 2013

Survey description	The DYFS aims to (i) monitor fish fauna by sampling length frequency distributions of all fish species and age compositions of flatfish species, (ii) monitor species composition of epibenthos species by counting, (iii) create a fishery-independent index of abundance by age group (0- and 1-group) for plaice and sole in the North Sea for stock assessment, (iv) collect data on length frequency distribution of brown shrimp ( <i>Crangon crangon</i> ).	
Gear details:	3 meter beam trawl with 1 tickler chain and a bobbin rope ("shrimp net").	
Notes from survey (e.g. problems, additional work etc.):	73 valid hauls were carried out. A CTD was attached to the net.	
Target species catch rates:	Time-series mean no./1000m <sup>2</sup>	2013 mean no. per 1000m <sup>2</sup>
	Sole 3.43	1.02
	Plaice 10.25	17.44
	Note: without area based weighting as used in the index calculations	
Number of fish species recorded and notes on any rare species or unusual catches:	38 separate species of finfish were caught. The top 10 by number are: <i>Pomatoschistus minutus</i> 5904 <i>Pleuronectes platessa</i> 5904 <i>Clupea harengus</i> 4770 <i>Osmerus eperlanus</i> 2499 <i>Trachurus trachurus</i> 1388 <i>Pomatoschistus lozanoi</i> 773 <i>Platichthys flesus</i> 646 <i>Syngnathus rostellatus</i> 455 <i>Merlangius merlangus</i> 374 <i>Solea solea</i> 302	
Number of epifauna species recorded:	38 epifauna (attached and free-living) species were observed during the 2013 survey.	
Index revisions:	No	

**Stations fished:**

ICES Divisions	Strata	Gear	Indices stations	Priority stations	Additional	Total Invalid	Valid	Comments
IVc: Scheldt estuary	area and depth class	3m beam trawl	173		0	6	73	
Number of biological samples (maturity and age material):								
Species			Number	Species		Number		
<i>Pleuronectes platessa</i>			116	<i>Limanda limanda</i>		16		
<i>Solea solea</i>			94	<i>Scophthalmus rhombus</i>		5		
<i>Platichthys flesus</i>			96					



**Positions DYFS Schollebaar 2013.**

**Survey summary Netherlands: Stern (DYFS)**

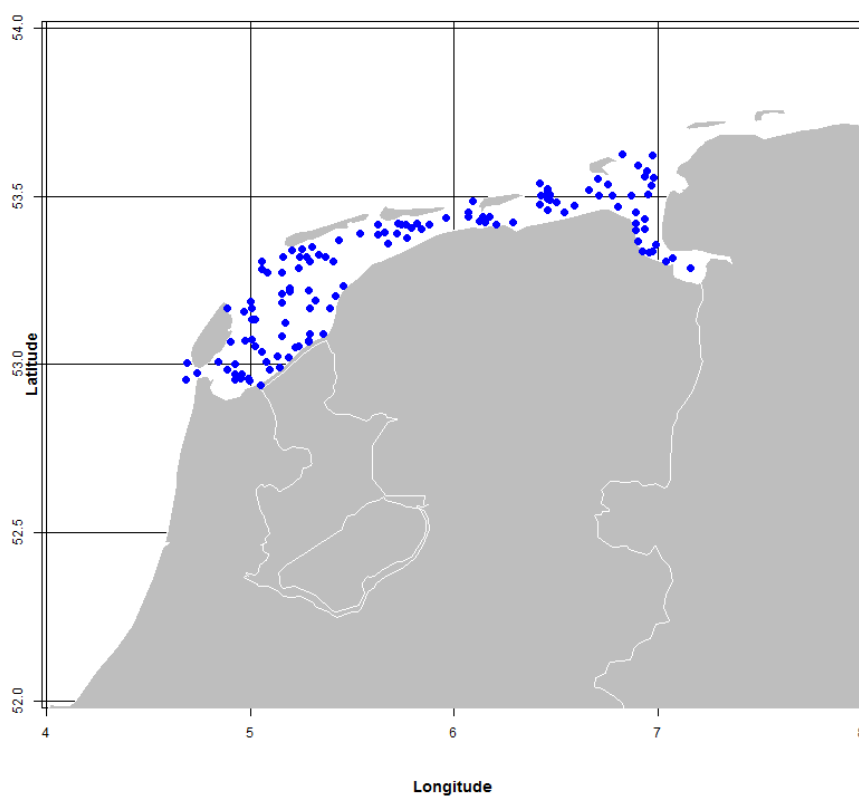
Nation:	Netherlands	Vessel:	RV "Stern"
Survey:	DYFS (Demersal Young Fish Survey)	Dates:	26 Aug- 26 Sep 2013

Survey description	The DYFS aims to (i) monitor fish fauna by sampling length frequency distributions of all fish species and age compositions of flatfish species, (ii) monitor species composition of epibenthos species by counting, (iii) create a fishery-independent index of abundance by age group (0- and 1-group) for plaice and sole in the North Sea for stock assessment, (iv) collect data on length frequency distribution of brown shrimp ( <i>Crangon crangon</i> ).		
Gear details:	3 meter beam trawl with 1 tickler chain and a bobbin rope (“shrimp net”).		
Notes from survey (e.g. problems, additional work etc.):	123 valid hauls were carried out. A CTD was attached to the net.		
Target species catch rates:		Time-series mean no/1000m <sup>2</sup>	2013 mean no/1000m <sup>2</sup>
	Sole	5.88	3.73
	Plaice	31.16	12.86
	Note: without area based weighting as used in the index calculations		
Number of fish species recorded and notes on any rare species or unusual catches:	34 separate species of finfish were caught. The top 10 by number are: <i>Pomatoschistus minutus</i> 18521 <i>Pleuronectes platessa</i> 6413 <i>Syngnathus rostellatus</i> 6158 <i>Solea solea</i> 1929 <i>Platichthys flesus</i> 863 <i>Clupea harengus</i> 855 <i>Limanda limanda</i> 519 <i>Merlangius merlangus</i> 474 <i>Liparis liparis</i> 352 <i>Agonus cataphractus</i> 337		
Number of epifauna species recorded:	29 epifauna (attached and free-living) species were observed during the 2013 survey.		
Index revisions:	No		

**Stations fished:**

ICES Divisions	Strata	Gear	Indices stations	Priority stations	Additional	Invalid	Valid	Comments
IVc: Wadden Sea	area and depth class	3m beam trawl	111		12	2	123	
Number of biological samples (maturity and age material):								
Species			Number	Species			Number	
<i>Pleuronectes platessa</i>			218	<i>Scophthalmus rhombus</i>			9	
<i>Platichthys flesus</i>			152	<i>Limanda limanda</i>			5	
<i>Solea solea</i>			111	<i>Scophthalmus maximus</i>			5	





**Positions DYFS Stern 2013.**

**Survey summary Netherlands: Isis (DYFS)**

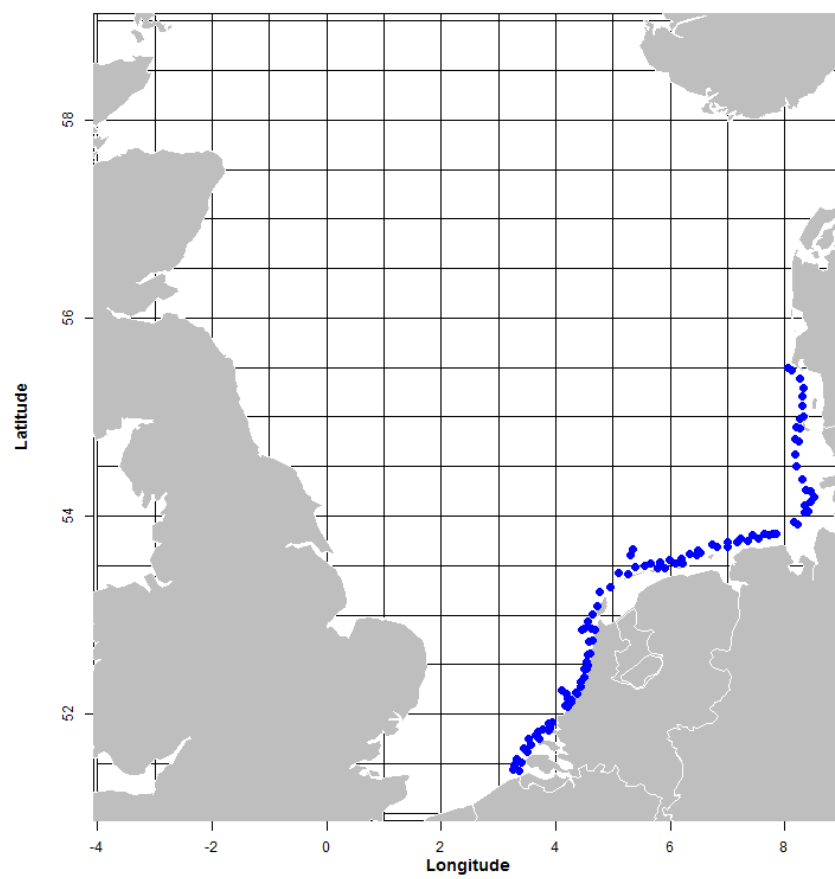
Nation:	Netherlands	Vessel:	RV "Isis"
Survey:	DYFS (Demersal Young Fish Survey)	Dates:	25 Sep –30 Oct 2013

Survey description	The DYFS aims to (i) monitor fish fauna by sampling length frequency distributions of all fish species and age compositions of flatfish species, (ii) monitor species composition of epibenthos species by counting, (iii) create a fishery-independent index of abundance by age group (0- and 1-group) for plaice and sole in the North Sea for stock assessment, (iv) collect data on length frequency distribution of brown shrimp ( <i>Crangon crangon</i> ).		
Gear details:	6 meter beam trawl with 1 tickler chain and a bobbin rope (“shrimp net”).		
Notes from survey (e.g. problems, additional work etc.):	102 valid hauls were carried out. A CTD was attached to the net.		
Target species catch rates:		Time-series mean no/1000m <sup>2</sup>	2013 mean no/1000m <sup>2</sup>
	Sole	9.66	1.99
	Plaice	22.42	8.17
	Note: without area based weighting as used in the index calculations		
Number of fish species recorded and notes on any rare species or unusual catches:	43 separate species of finfish were caught. The top 10 by number are: <i>Pomatoschistus</i> sp. 109556 <i>Limanda limanda</i> 11706 <i>Pleuronectes platessa</i> 6087 <i>Merlangius merlangus</i> 3655 <i>Buglossidium luteum</i> 3031 <i>Callionymus lyra</i> 2982 <i>Syngnathus rostellatus</i> 1745 <i>Solea solea</i> 1471 <i>Clupea harengus</i> 1126 <i>Sprattus sprattus</i> 1033		
Number of epifauna species recorded:	38 epifauna (attached and free-living) species were observed during the 2013 survey.		
Index revisions:	No		

**Stations fished:**

ICES Divisions	Strata	Gear	Indices stations	Priority stations	Additional	Invalid	Total Valid	Comments
IVc: Dutch coast	area and depth class	6m beam trawl	102	0	0	0	102	

Number of biological samples (maturity and age material):			
Species	Number	Species	Number
<i>Limanda limanda</i>	464	<i>Platichthys flesus</i>	129
<i>Pleuronectes platessa</i>	367	<i>Scophthalmus rhombus</i>	13
<i>Solea solea</i>	177	<i>Scophthalmus maximus</i>	6



**Positions DYFS Isis 2013.**

**Survey summary Netherlands: Isis (SNS)**

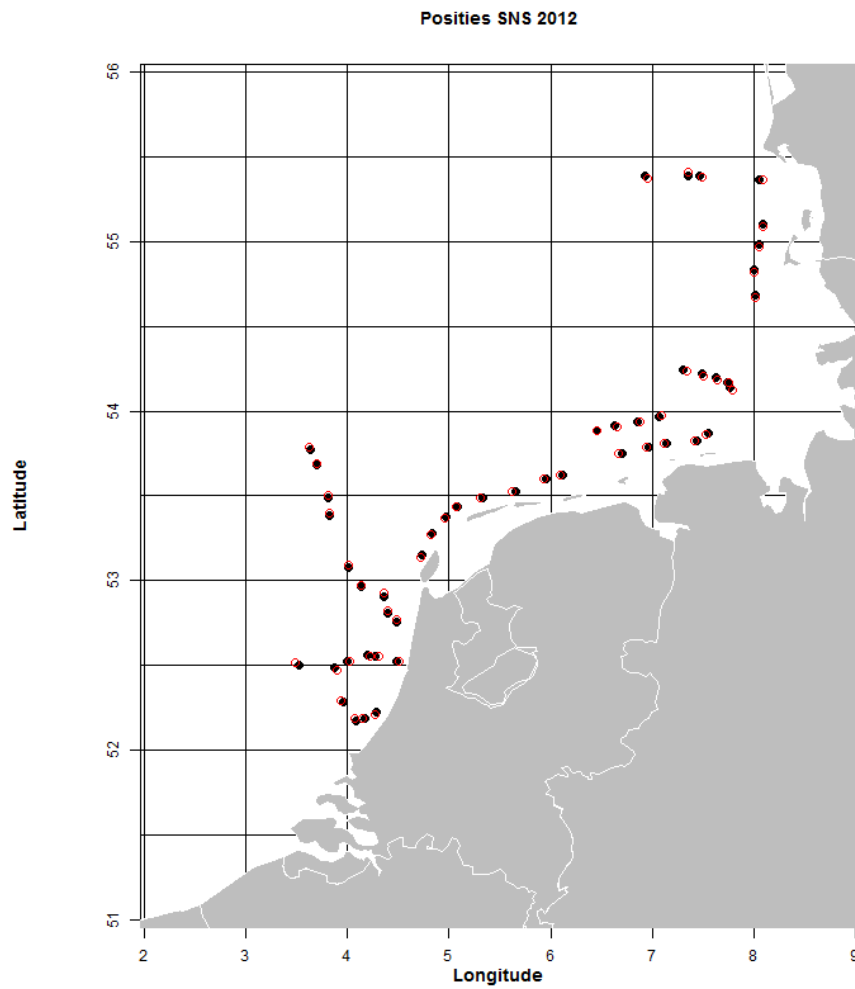
Nation:	Netherlands	Vessel:	RV "Tridens"
Survey:	SNS (Sole Net Survey)	Dates:	1–7 Oct 2012

Survey description	The SNS aims to (i) monitor fish fauna by sampling length frequency distributions of all fish species and age compositions of flatfish species, (ii) monitor species composition of epibenthos species by counting, (iii) create a fishery-independent index of abundance by age group (1-, 2-, 3- and 4-group) for plaice and sole in the North Sea for stock assessment.	
Gear details:	6 meter beam trawl with 4 tickler chains, mesh size 40 mm in the cod-end.	
Notes from survey (e.g. problems, additional work etc.):	49 hauls were carried out (approx. 13 hours fishing time). A vertical CTD sample was taken at the first station of each transect. All transects were covered. Due to technical problems the survey was carried out by RV Tridens. The survey started two weeks later than normal.	
Target species catch rates:	Time-series mean no/100 hr	2012 mean no/100 hr
	Sole 6393	619
	Plaice 66569	54658
Number of fish species recorded and notes on any rare species or unusual catches:	38 separate species of finfish were caught. The top 10 by number are: <i>Limanda limanda</i> 10762 <i>Pleuronectes platessa</i> 6254 <i>Pomatoschistus sp.</i> 1810 <i>Arnoglossus laterna</i> 1692 <i>Callionymus lyra</i> 1465 <i>Agonus cataphractus</i> 1313 <i>Buglossidium luteum</i> 1273 <i>Merlangius merlangus</i> 559 <i>Echicichthys vipera</i> 371 <i>Myoxocephalus scorpius</i> 136	
Number of epifauna species recorded:	27 epifauna (attached and free-living) species were observed during the 2012 survey.	
Index revisions:		

**Stations fished:**

ICES Divisions	Strata	Gear	Indices stations	Priority stations	Additional	Invalid	Valid	Comments
IVc: North Sea	area and depth class	6m beam trawl	49	0	0	0	49	

Number of biological samples (maturity and age material):			
Species	Number	Species	Number
<i>Limanda limanda</i>	704	<i>Platichthys flesus</i>	47
<i>Pleuronectes platessa</i>	538	<i>Scophthalmus maximus</i>	18
<i>Solea solea</i>	122	<i>Scophthalmus rhombus</i>	16



**Station positions for SNS Tridens (black=shooting positions, open red=hauling positions).**

## Annex 10: Number of hauls by area and year for the Dutch DFS, German DYFS and Belgian DYFS

### Annex 10.1. Dutch DFS

region	Belgian Coast	Dutch Coast				German Bight			Scheldt Est			Dutch Wadden Sea						
area code	400	401	402	403	404	405	406	407	631	634	638	610	612	616	617	618	619	620
1970		6	11	11	22				13	31	26	23		24	16	10	12	20
1971		9	9	13	19				4	29	30	25		28	14	8	12	22
1972		8	15	11	20				5	29	28	18		25	11	10	10	20
1973		8	9	8	19				5	30	31	18	2	24	11	9	9	22
1974		8	16	11	19				6	32	32	19	7	24	12	10	11	21
1975		8	11	10	19				4	31	26	21	7	25	14	9	10	21
1976									6	30	26	21	7	25	13	10	10	21
1977		10	16	9	23				8	28	27	21	7	26	13	10	11	21
1978		1	15	10	23	8	16	18	5	30	28	21	7	26	13	10	10	21
1979			15	8	13	7	18	19	6	28	28	21		26	13	10	10	21
1980		9	7	10	26	7	16	23	6	27	29	21	7	26	13	10	10	21
1981		10	9	9	25	10	10		6	28	27	19	6	28	13	10	10	21
1982	3	18	8	9	28	14	21	6	6	28	27	21	7	26	13	10	10	21
1983		18	13	6	15	8	21	6	7	27	27	21	7	26	13	10	9	21
1984		23	13	8	31	15	22	4	6	27	27	22	7	25	12	10	10	21
1985		17	12	9	28	15	20	7	6	26	27	21	7	26	12	10	8	20
1986		17	13	9	28	15	21	5	6	26	27	21	7	26	13	10	9	21
1987		18	13	9	28	15	21	6		30	28	17	7	30	13	10	8	23
1988		18	14	8	28	15	22	5		24	27	21		26	13	9	8	22
1989		26	13	9	28	10	23	6		40	30	21		26	13	10	8	23
1990		25	13	9	28	15	21	6		39	29	21		25	13	11	8	23
1991		16	13	9	28	15	21	6		31	31	23	5	25	13	10	10	24
1992		26	16	13	28	15	21	6		36	28	23	6	26	12	6		28
1993		22	20	9	28	15	21	5		31	27	23		27	14	11	8	29
1994		21	16	13	28	15	19	6		35	33	24		26	12	10	7	25
1995		17	13	9	25	14	22	6		41	33	31		23	15	10	9	26
1996		17	12	10	29	14	21	6		43	33	28	6	28	15	10	9	27
1997		17	13	9	28	13				43	34	27		28	15	11	9	27
1998		9	10	8						43	34	27	6	29	15	10	10	27
1999		17	14	8	14	1				43	35	28		31	14	13	10	22
2000		15	7	2	17	10	19	6		45	43	42		26	15	11	10	26
2001			13	5	28	15	19	3		45	49	28		27	14	11	10	26
2002		21	13	8	26	14				44	41	27		26	13	11	9	26
2003		16	14	9	28	15	18	6		42	36	29		27	13	9	9	26
2004		17	13	4	19	15	17	6		41	31	28	6	27	14	10	8	27
2005		17	16	12	30	15	15	8		43	36	29	6	25	13	11	9	34
2006		15	14	10	28	15	17	6		41	36	28	7	28	16	8	9	29
2007		17	16	13	30	15	17	6		41	36	30	9	25	13	11	8	25
2008		16	11	8	19	11	4	6		41	37	30	7	24	12	9	9	30
2009		16	13	16	28	15	16	6		44	37	32	6	26	12	10	8	28
2010		17	13	15	26	15	16	6		41	36	31	6	24	13	10	6	28
2011		15	12	19	28	15	14	6		49	25	32	6	22	14	9	7	28
2012		17	28	18	28	14	16	3		43	37	26	7	27	15	8	22	28
2013		16	12	16	21	15	16	6		42	37	31	6	26	15	9	10	28

**Annex 10.2. German DYFS**

region	German Bight		German/DK Wad						
area code	405	406	408	409	410	411	412	413	414
1978		7	4	9	7	22	18		
1979	3	7	4	9	7	23	15		31
1980	2	5	4	8	7	22	17		23
1981		7	4	9	7	20	31		29
1982	11	7	4	9	7	23	30		26
1983						9	25		45
1984	6	3	4	7	6	17	28		35
1985	8	6			38		26		38
1986	10	17		7	6	24	27		35
1987	10	8			33	14	25		39
1988	1	13		5	22	15	26		43
1989	9	1			24	21	25		43
1990	15	15		5	29	20	29		40
1991	11	4		11	27	14	26		35
1992		10	3	13	12	20	26		45
1993	12	15		12	14	17	25		22
1994	23	11		7	23	20	24		10
1995	18	19	7	14	14	21	23		25
1996	13	11		21	8	25	24		21
1997	26	22		17	13	38	25		8
1998	1	31		18	10	33	23		29
1999		23		10	14	36	25		36
2000	12	14		16	14	30	23		28
2001	12	17		11	11	29	20		23
2002	8	17		13	11	28	23		19
2003		12		9	19	34	18		25
2004		7		11	14	24	24		19
2005	17	24	6	17	12	22	21	23	25
2006	12	16	5	14	11	23	28	21	23
2007	4	13		13	14	33	40	29	24
2008	13	31		15	14	20	19	25	22
2009	17	18		23	9	19	20	29	15
2010	8	16		23	11	30	16	21	21
2011	10	1		16	17	31	16	31	19
2012	12	10		20	12	29	17	31	17
2013	19	28		12	14	24	16	32	21

**Annex 10.3. Belgian DYFS**

region	Belgian Coast
area code	400
1973	35
1974	35
1975	35
1976	35
1977	29
1978	27
1979	29
1980	31
1981	33
1982	33
1983	33
1984	32
1985	33
1986	33
1987	33
1988	29
1989	33
1990	33
1991	33
1992	24
1993	33
1994	33
1995	33
1996	33
1997	33
1998	33
1999	31
2000	27
2001	33
2002	33
2003	33
2004	33
2005	33
2006	33
2007	32
2008	31
2009	23
2010	28
2011	31
2012	32
2013	33



## Annex 11: Trends in mean length-at-age for sole and plaice (ToR c)

### 1. Introduction

Originally, the objective was to analyse the changes in mean length-at-age for sole in the North Sea, English Channel, Bristol Channel and Irish Sea (ToR c). We decided to include plaice to widen the scope of this study. The main goal of this study is to examine consistency of trends across areas and species, to enable formulation and evaluation of hypotheses on the causal factors underlying trends in length-at-age.

### 2. Methods

#### 2.1 General

As plaice and sole are sexual dimorphic species, length-at-age was examined for males and females separately. Length distributions by haul were converted into sex-age distributions by haul using sex-age-length-keys (SALKs). Mean lengths by sex and age group were calculated for each haul. Then, weighted mean lengths were calculated for each subarea (i.e. ICES rectangle for the BTS surveys and transect for the SNS), using the number of fish per sex and age group in each haul as weighting factor. Finally, these mean lengths by subarea were averaged over all subareas in the survey. Only the stations and/or subareas that have been sampled consistently over time were included (following the approach taken for the index calculations) to ensure that observed changes over time were not related to geographical shifts in the survey. Mean length estimates based on less than 5 fish in total were eliminated.

Six surveys are currently included in the analyses. The specifics per survey are listed below. The analyses will be elaborated with the English BTS in ICES areas VIIa and VIIf and, if available in DATRAS before next year's meeting, with the English BTS in ICES area VIIe and the Belgian BTS in ICES area IV.

A GAM model was fitted (by species, age group and sex) to describe the trends over time and to investigate differences between surveys (areas). The model is given by:

$$\text{Length} = \alpha + \text{factor}(\text{survey}) + s(\text{year}) + s(\text{year} * \text{survey}) + \varepsilon \text{ and } \varepsilon \sim N(0, \sigma^2)$$

The model was fitted for each species, age group and sex separately. Some surveys were excluded in the analyses of certain age groups, because of insufficient data (e.g. the older age groups in the inshore SNS survey). The surveys included for each species and age group are listed in Table 1.

#### 2.2 Specifics per survey

Dutch beam trawl survey - RV Isis (NL BTS Isis)

- database: national (DATRAS needs to be updated)
- survey years: 1985–2013
- sufficient data available: 1985–2013
- age data selection: all data from Isis and Tridens combined
- age data aggregation: 8 SALKs (701–708, see sascode for definition)
- SALK sequence: local, adjacent, overall, smoothed-overall
- catch data aggregation: subareas=ICES rectangles
- catch data selection: ICES rectangles included in the BTS-Isis index calculation (see sascode for definition)

#### Dutch beam trawl survey - RV 'Tridens' (NL BTS 'Tridens')

- database: national (DATRAS needs to be updated)
- survey years: 1996–2013
- sufficient data available: 1996–2013
- age data selection: all data from Isis and Tridens combined
- age data aggregation: 8 SALKs (701–708, see sascode for definition)
- SALK sequence: local, adjacent, overall, smoothed-overall
- catch data aggregation: subareas=ICES rectangles
- catch data selection: ICES rectangles included in the BTS-Tridens index calculation (see sascode for definition)

#### Dutch sole net survey (NL SNS)

- database: national (inshore surveys not in DATRAS yet)
- survey years: 1970–2013
- sufficient data available: 1970–2013
- age data selection: all data
- age data aggregation: 10 SALKs, 1 for each transect
- SALK sequence: local, adjacent, overall, smoothed-overall
- catch data aggregation: subareas=transects
- catch data selection: all data

#### German beam trawl survey (DE BTS)

- database: DATRAS BTS (8 May 2014)
- survey years: 2003–2005, 2007–2013
- sufficient data available ple: 2003–2005, 2007–2013
- sufficient data available sol: -
- age data selection: all data from DE BTS combined
- age data aggregation: 1 SALK
- SALK sequence: n.a., only 1 SALK
- catch data aggregation: subareas=ICES rectangles
- catch data selection: all data

#### English beam trawl survey – ICES area IV (UK BTS IV)

- database: DATRAS BTS (8 May 2014)
- survey years: 1990–2013
- sufficient data available ple: 1996–2003, 2006–2013
- sufficient data available sol: 1995–2003, 2006–2013
- age data selection: all data from UK BTS combined
- age data aggregation: 4 SALKs (western Eng. Channel, eastern Eng. Channel, North Sea 3 index rectangles, the rest)
- SALK sequence: local, adjacent, overall, smoothed-overall
- catch data aggregation: subareas=ICES rectangles
- catch data selection: 3 ICES rectangles and 15 stations included UK-IV index (see sascode)

English beam trawl survey – ICES area VIId (UK BTS VIId)

- database: DATRAS BTS (8 May 2014)
- survey years: 1990–2013
- sufficient data available: 1990–2013
- age data selection: all data from UK BTS combined
- age data aggregation: 4 SALKs (western Eng. Channel, eastern Eng. Channel, North Sea 3 index rectangles, the rest)
- SALK sequence: local, adjacent, overall, smoothed-overall
- catch data aggregation: subareas=ICES rectangles
- catch data selection: all hauls in VIId and ship=COR or END

English beam trawl survey – ICES Area VIIe (UK BTS VIIe)

- database: DATRAS BTS (8 May 2014)
- survey years: ?
- sufficient data available: 2010 (only 1 year uploaded in DATRAS)
- age data selection: all data from UK BTS combined
- age data aggregation: 4 SALKs (western Eng. Channel, eastern Eng. Channel, North Sea 3 index rectangles, the rest)
- SALK sequence: local, adjacent, overall, smoothed-overall
- catch data aggregation: subareas=ICES rectangles
- catch data selection: all hauls in VIIe and ship=CAR
- not included in trend analyses yet (only 1 year)

English beam trawl survey – ICES area VIIa (UK BTS VIIa)

- database: DATRAS BTS-VII (8 May 2014)
- not analysed yet

English beam trawl survey – ICES area VIIIf (UK BTS VIIIf)

- database: DATRAS BTS-VII (8 May 2014)
- not analysed yet

Belgian beam trawl survey (BE BTS)

- not uploaded to DATRAS yet (8 May 2014)

### 3. Results

Mean length-at-age clearly decreased over the full time span of the surveys for both plaice and sole aged 2 years or older (Figures 1–2). This was observed in all surveys, except for 2-group plaice in the UK BTS IV, which is possibly due to the fact that overall catch rates of plaice were relatively low in this survey. One-group fish, both plaice and sole, showed a decline since approximately 2005 (Figures 1–2).

Year was significant in the GAM analyses for each species, age group and sex, indicating significant (non-linear) trends in length. The factor survey was significant in several cases, indicating that the level of the trend often differed between surveys. The interaction term year\*survey was only significant in a limited number of cases, indicating that the pattern of the trend did not differ between most surveys. The GAM predicted trends are presented in Figure 3. The surveys showing significantly different levels (compared to NL BTS Isis) and significantly different patterns are listed in Table 1.

**Table 1. Surveys included in the GAM analyses and surveys with a significantly different trend.**

Species	Age	Surveys included	Sex	Significantly different trend	
				level	pattern
Sole	1	NL-ISI, SNS, UK-IV, UK-VIId	M	SNS, UK-IV	UK-VIId
			F	SNS, UK-IV	UK-VIId
	2	NL-ISI, NL-TRI, SNS, UK-IV, UK-VIId	M	SNS, UK-IV, UK-VIId	
			F	SNS, UK-IV	
	3	NL-ISI, NL-TRI, SNS, UK-IV, UK-VIId	M	UK-VIId	UK-IV
			F	NL-TRI, SNS	UK-IV
	4	NL-ISI, NL-TRI, UK-IV, UK-VIId	M	UK-IV, UK-VIId	
			F	NL-TRI, UK-IV	
	5	NL-ISI, UK-IV, UK-VIId	M	UK-IV, UK-VIId	
			F	UK-IV	
	6	NL-ISI, UK-IV, UK-VIId	M	UK-VIId	NL-ISI
			F	UK-IV	
Plaice	1	NL-ISI, NL-TRI, SNS, UK-IV, UK-VIId, DE-IV	M	NL-TRI, SNS, UK-VIId	UK-IV
			F	NL-TRI, SNS, UK-IV, UK-VIId	UK-VIId
	2	NL-ISI, NL-TRI, SNS, UK-IV, UK-VIId, DE-IV	M	NL-TRI, UK-VIId, DE-IV	SNS, UK-IV
			F	NL-TRI, UK-IV, UK-VIId	NL-ISI, SNS, UK-IV
	3	NL-ISI, NL-TRI, SNS, UK-VIId, DE-IV	M	UK-VIId, DE-SOL	NL-TRI
			F	UK-VIId	
	4	NL-ISI, NL-TRI, SNS, UK-VIId, DE-IV	M	UK-VIId	NL-TRI, SNS
			F	UK-VIId	
	5	NL-ISI, NL-TRI, UK-VIId, DE-IV	M	UK-VIId, DE-SOL	NL-ISI
			F	NL-TRI, UK-VIId	
	6	NL-ISI, UK-IV, UK-VIId	M	UK-VIId, DE-SOL	NL-TRI
			F	NL-TRI, UK-VIId	

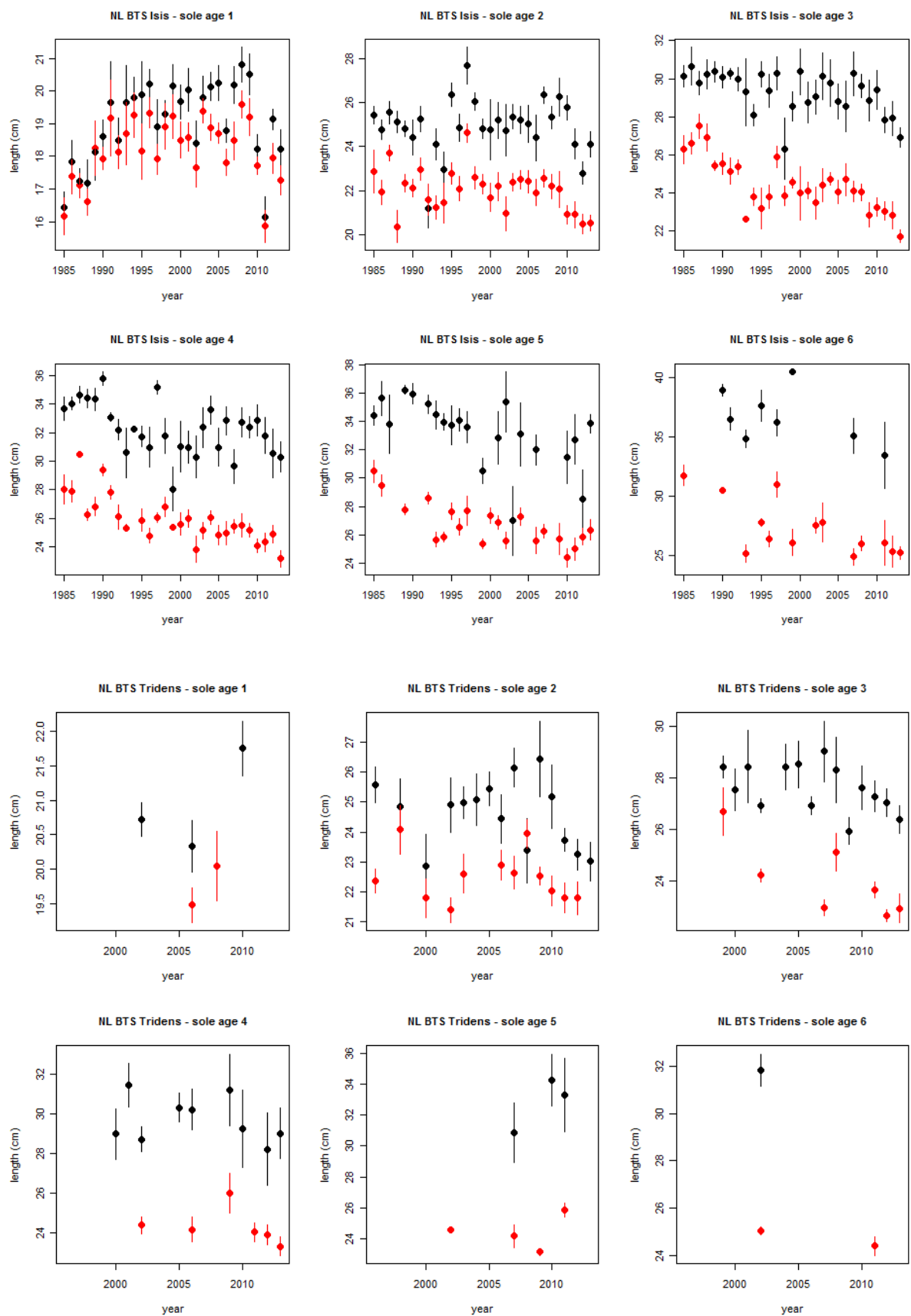


Figure 1. Sole mean length-at-age ( $\pm$  sd) by survey, age group and sex (black = females, red = males).

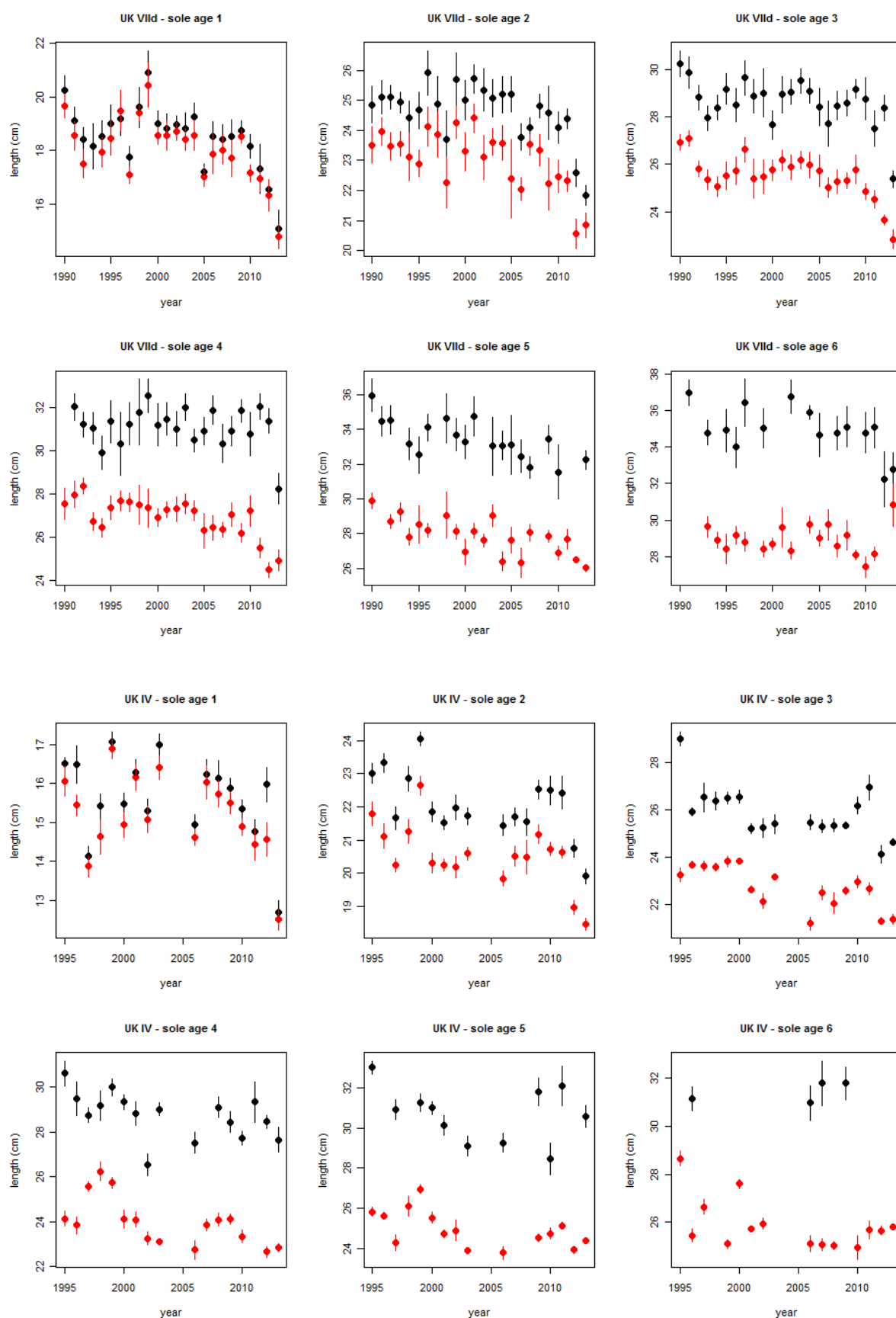


Figure 1. Continued.

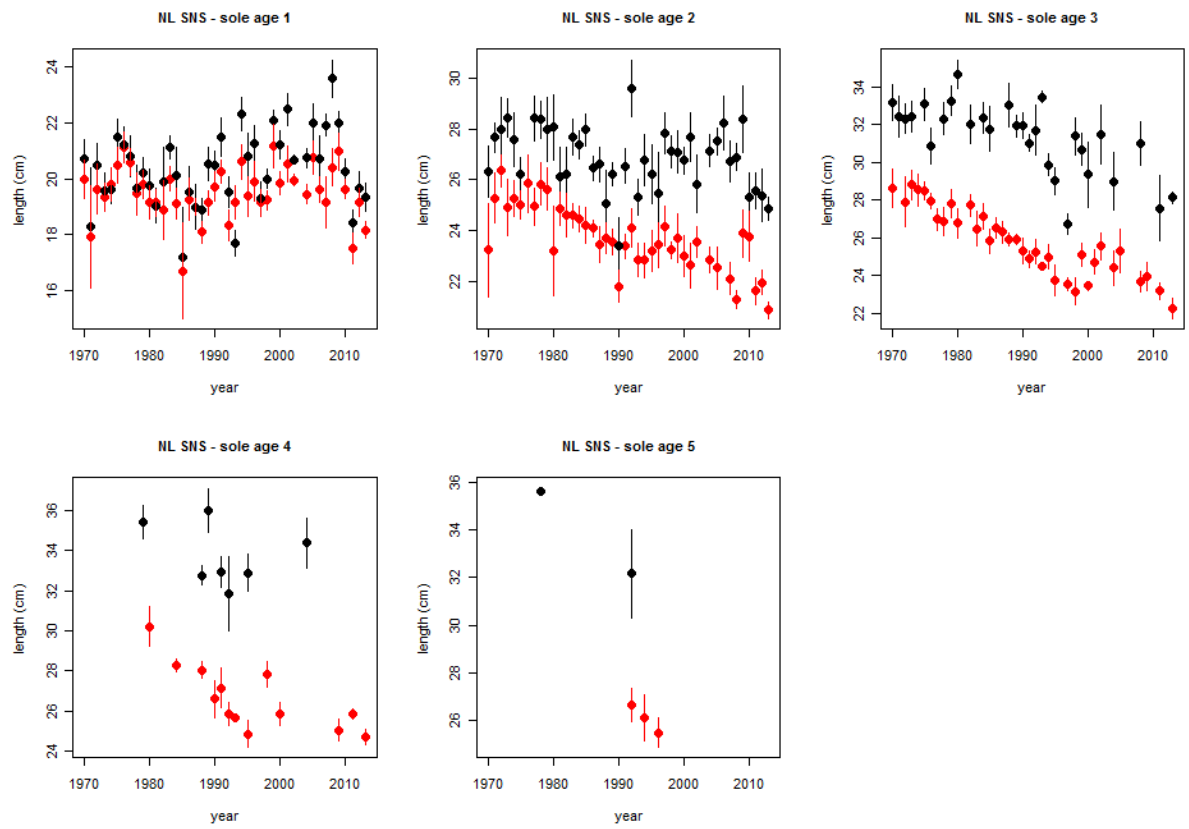


Figure 1. Continued.

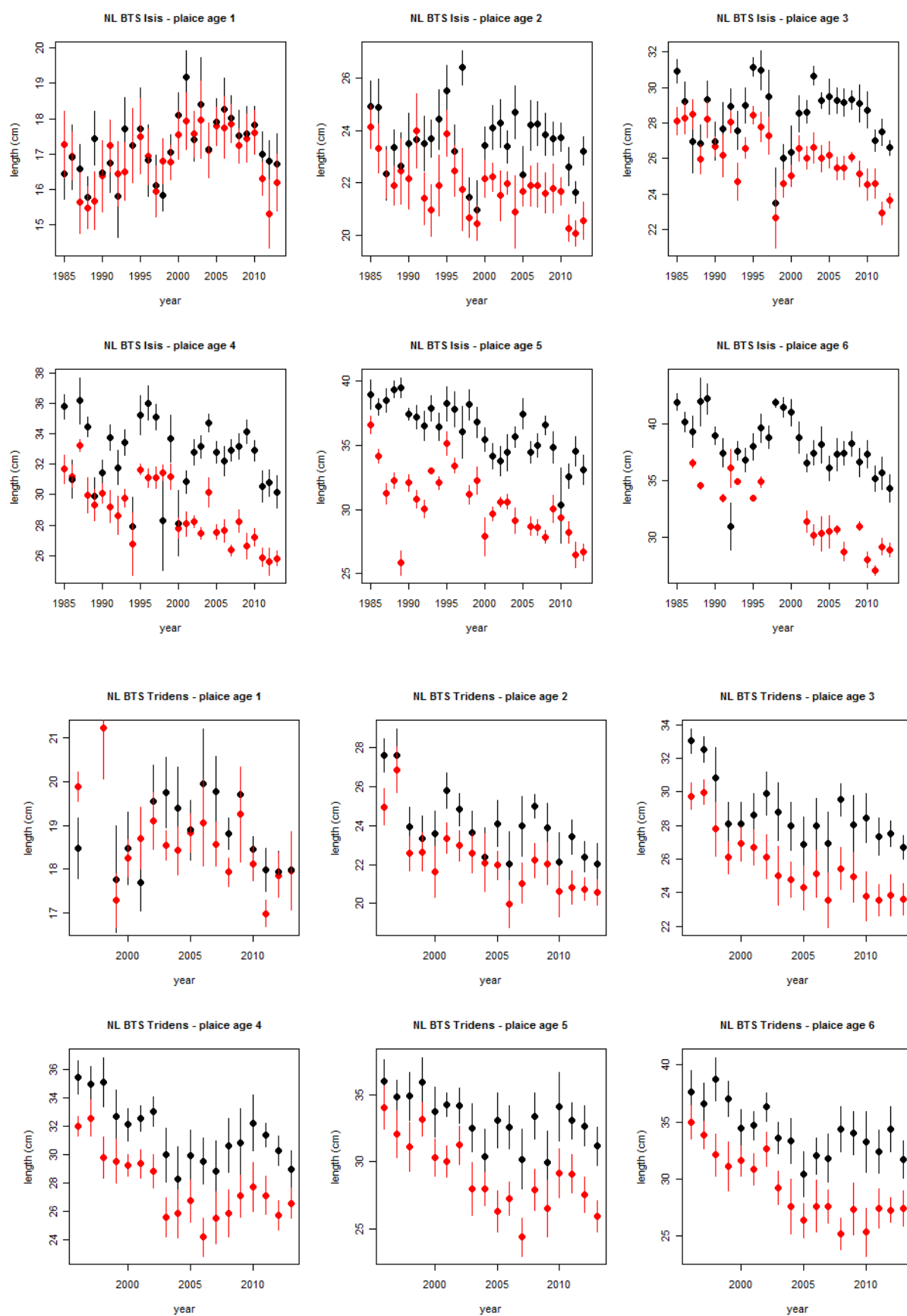


Figure 2. Plaice mean length-at-age ( $\pm$  sd) by survey, age group and sex (black = females, red = males).



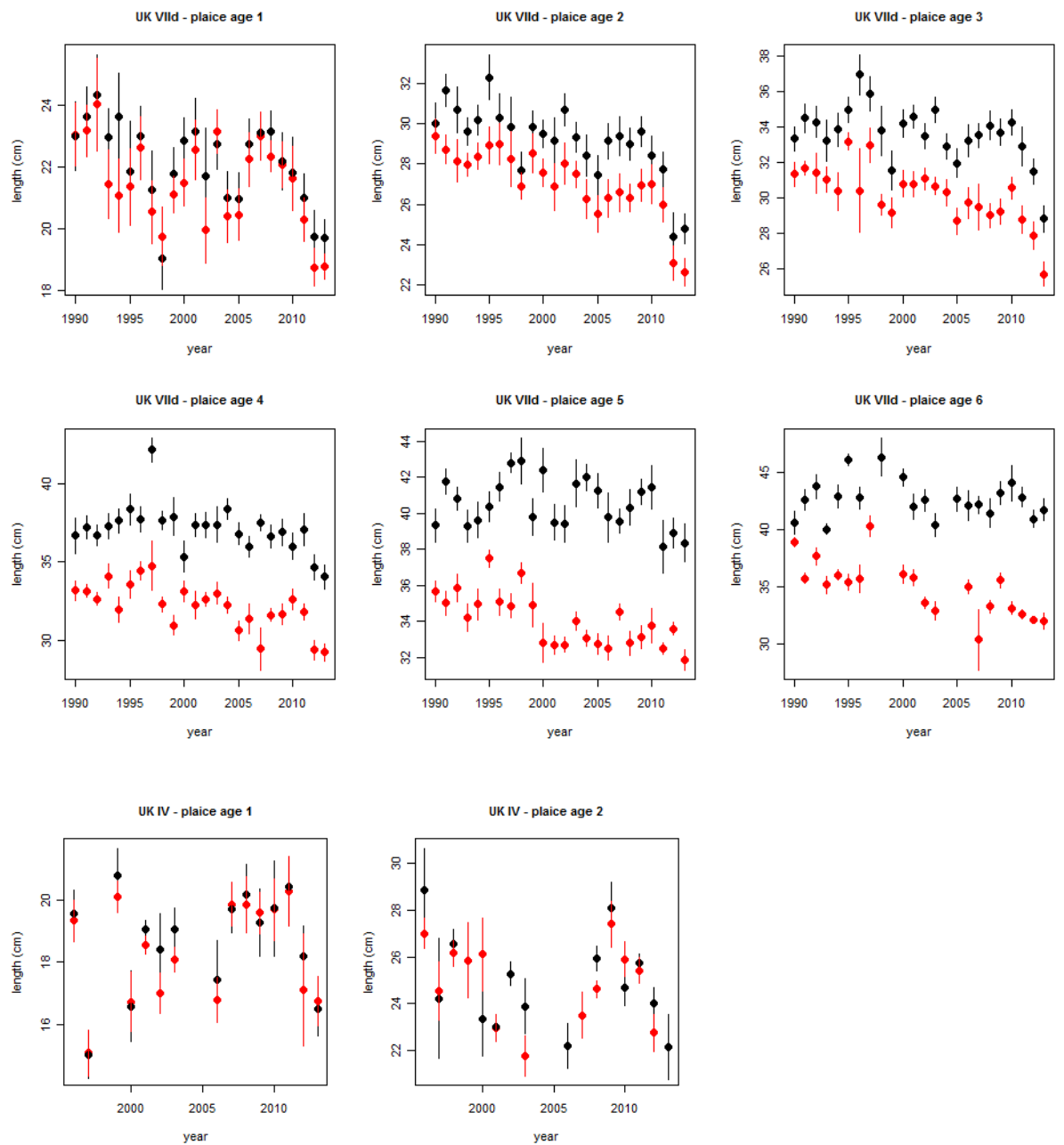


Figure 2. Continued.

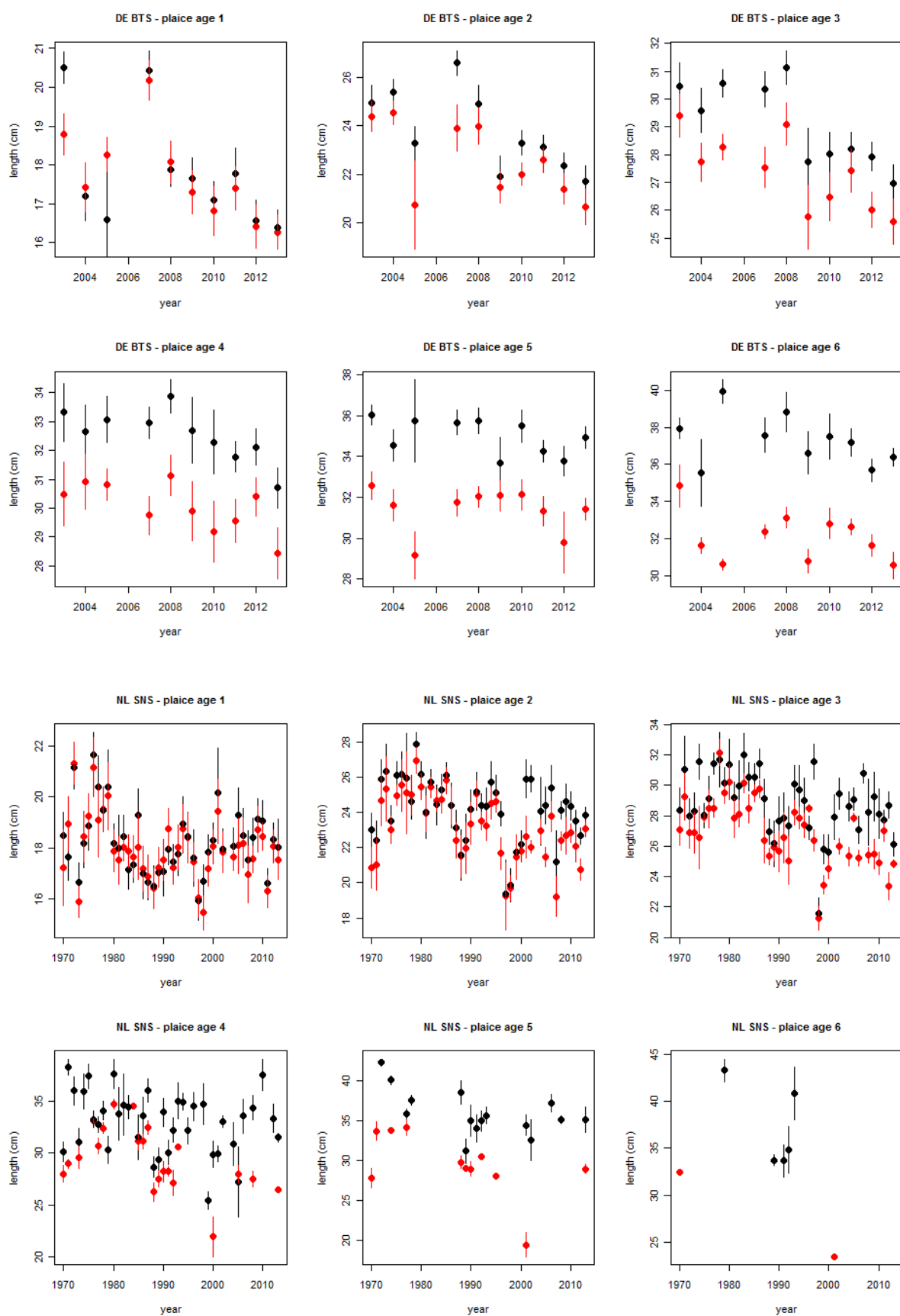


Figure 2. Continued.

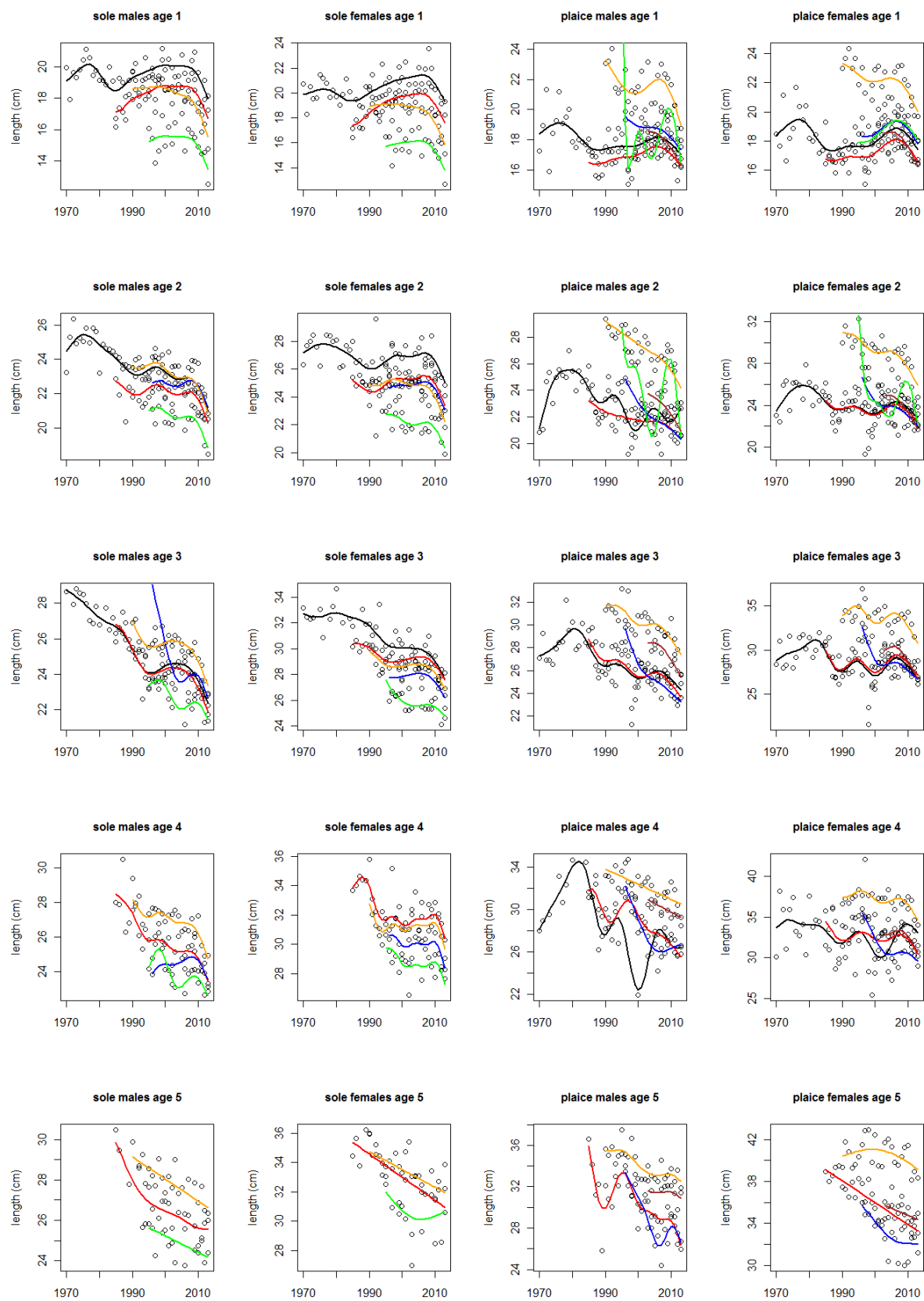


Figure 3. Mean length-at-age by species and age group (symbols). The lines show the smoothed (GAM) trends by surveys (black=NL SNS, red=NL BTS Isis, blue=NL BTS 'Tridens', green=UK BTS IV, orange=UK BTS VIIId, brown=DE BTS).

## Annex 12: Comparison of DATRAS and national index calculation methods

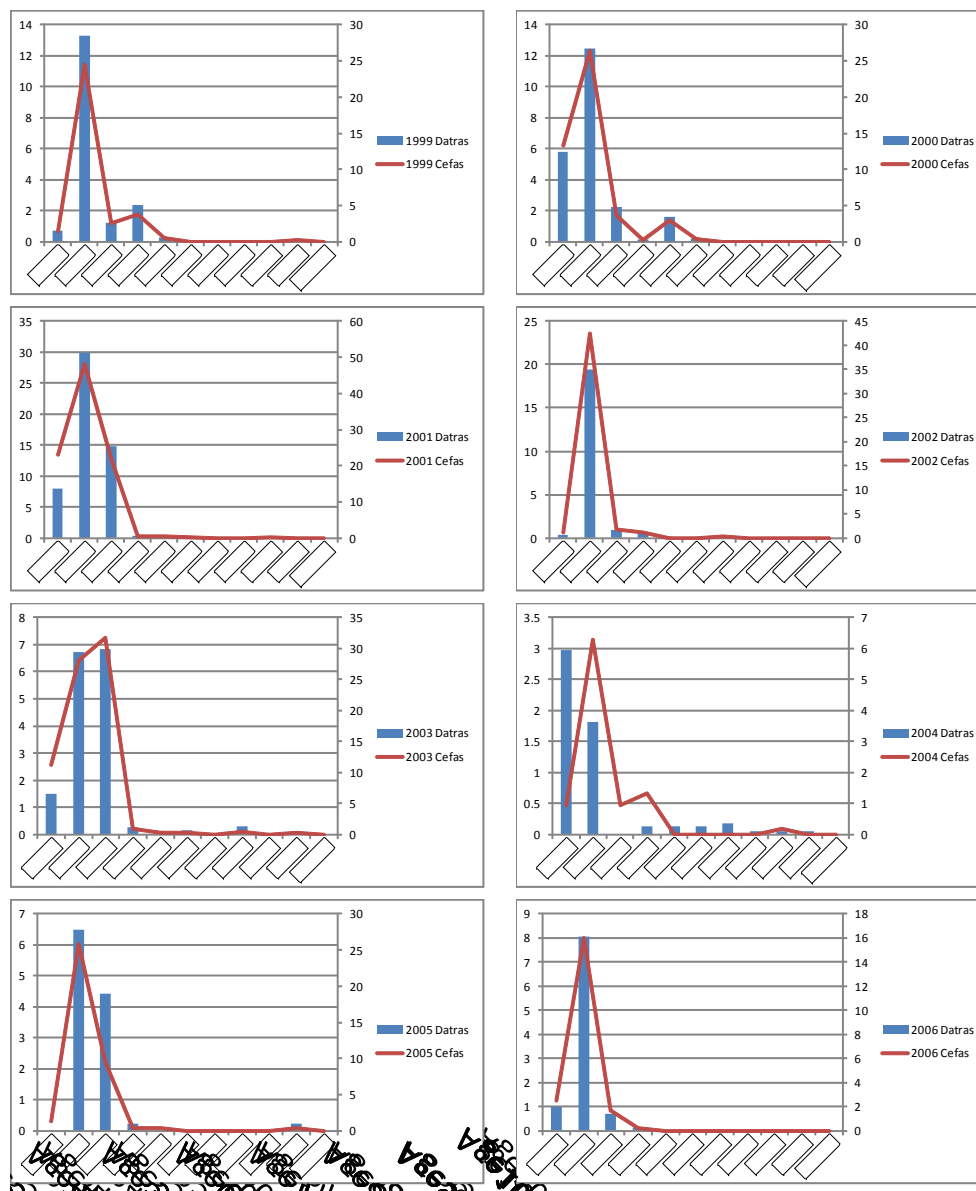
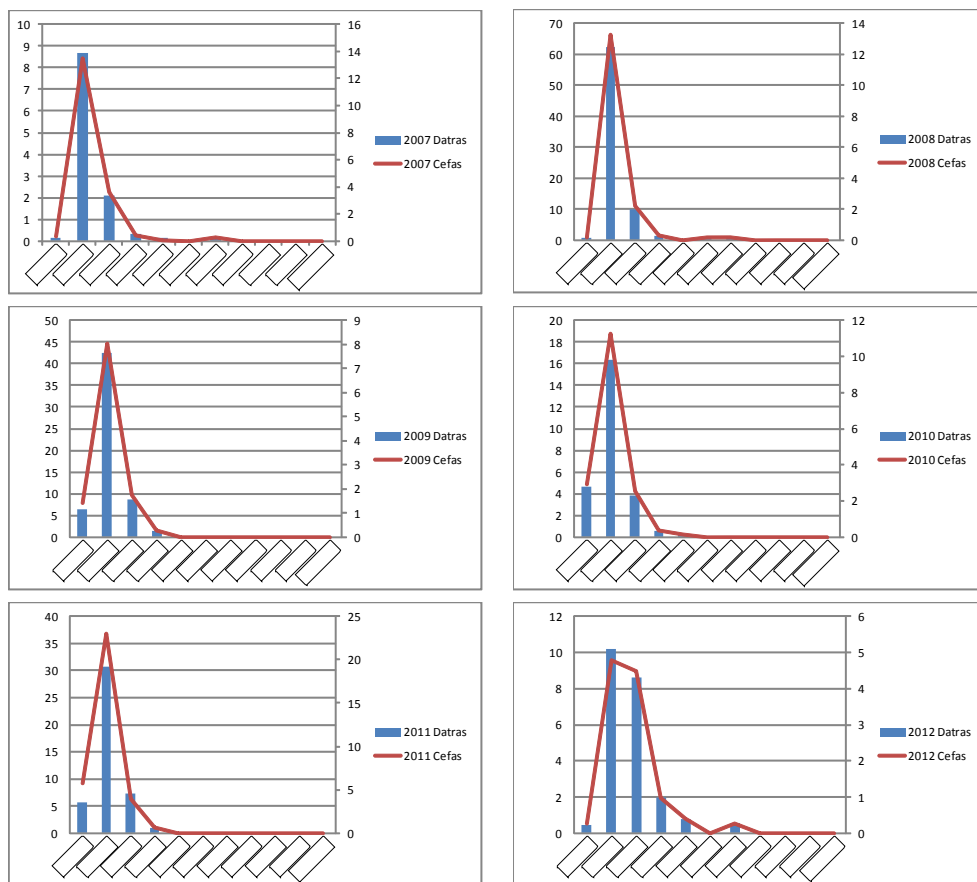


Figure 1a. Comparison of DATRAS and Cefas Indices method trends for North Sea plaice (1999 – 2006).



**Figure 1b. Comparison of DATRAS and Cefas Indices method trends for North Sea plaice (2007 – 2012).**

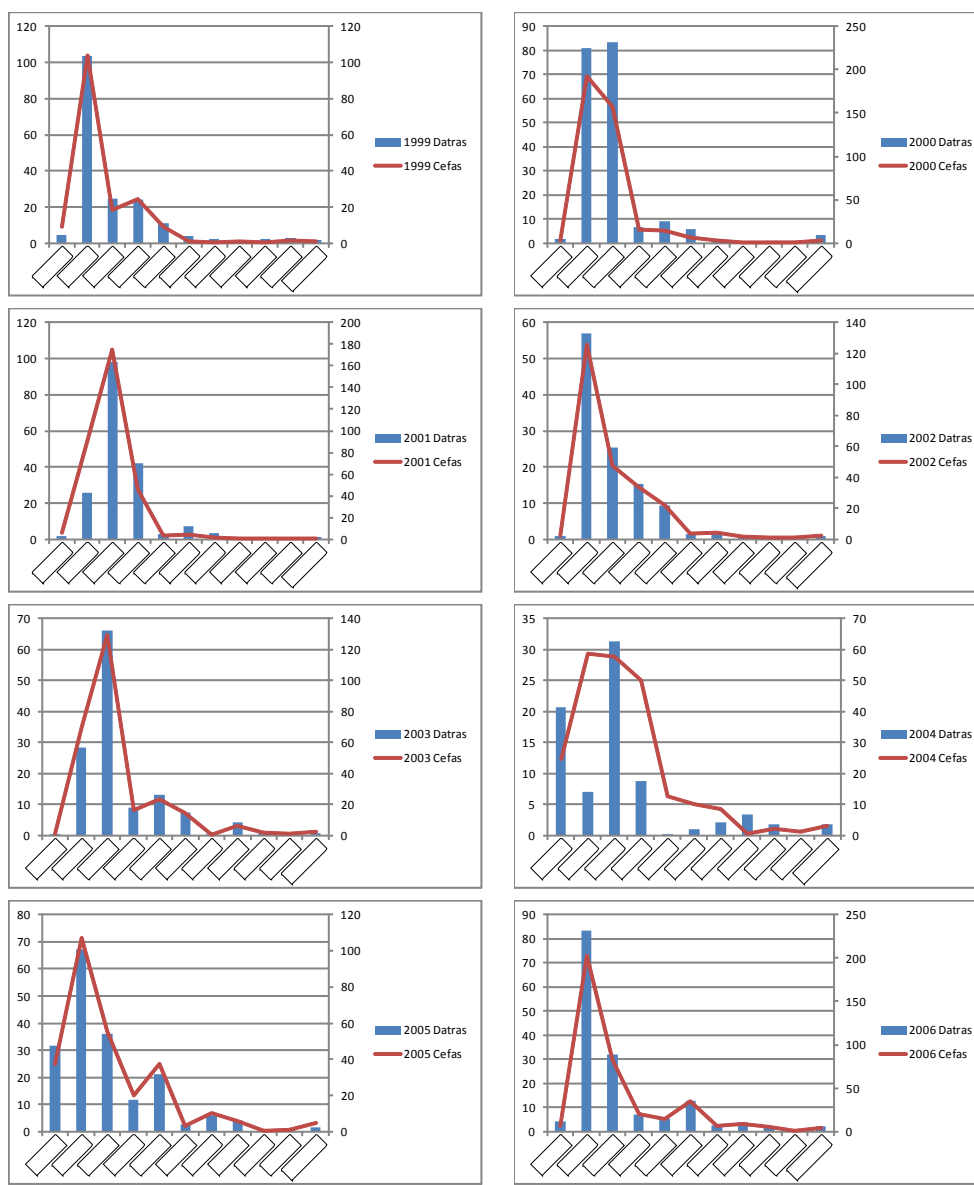


Figure 2a. Comparison of DATRAS and Cefas Indices method trends for North Sea sole (1999 – 2006).

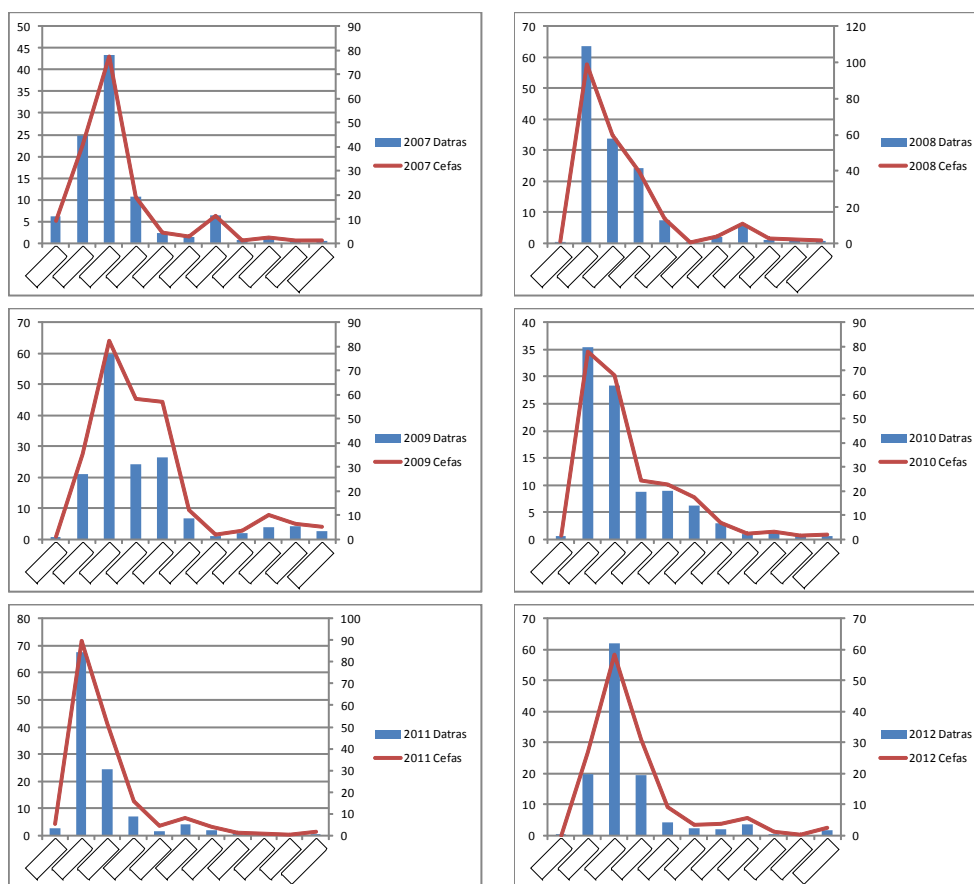


Figure 2b. Comparison of DATRAS and Cefas Indices method trends for North Sea sole (2007 – 2012).

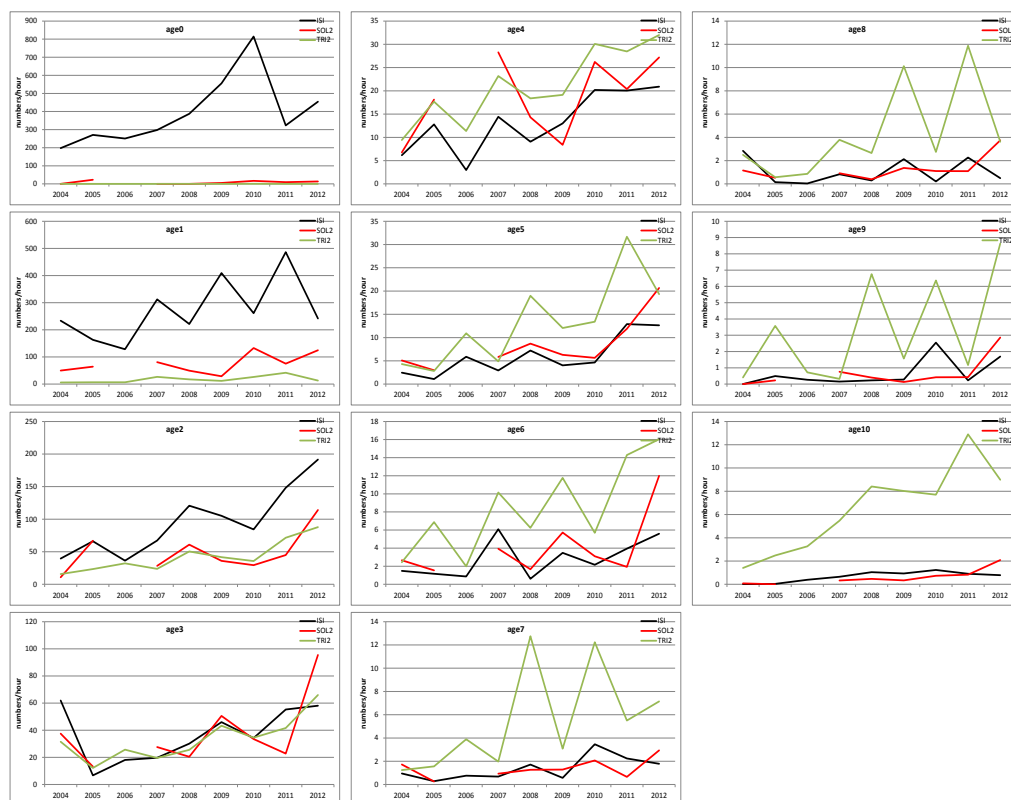


Figure 3. German (red) and Dutch (Isis: black, Tridens: green) indices for North Sea plaice 2004–2012. Numbers per hour for plaice per year graphs per age group.



### Annex 13: ACOM Biodiversity request

Country	Survey	Species collected			DATRAS		National database		Stable sampling coverage since
		Species groups	Stations	Year range	Uploads	Year range	Availability	Year range	
BEL	BTS	all fish	all	1992 onwards	no(1)	1992 onwards	no(2)	1992 onwards	1992
		all benthos	all	2009 onwards	no(1)	2009 onwards	no(2)	2009 onwards	2009
FRA	ORHAGO	all fish	all	2007 onwards	no(1)	2007 onwards	yes	2007 onwards	2007
		benthos closed list	all	2007–2010	no(1)	2007–2010	yes	2007–2010	2007–2010
		benthos closed list	selection	2011–2012	no(1)	2011–2012	yes	2011–2012	2011–2012
		all benthos	selection	2011–2012	no(1)	2011–2012	yes	2011–2012	2011–2012
		all benthos	all	2013 onwards	no(1)	2013 onwards	yes	2013 onwards	2013
GFR	BTS	all fish	all	1991 onwards	yes	2003 onwards(3)	yes	1991 onwards	1991
		benthos selection	all	2000 onwards	yes	2003 onwards(3)	yes	2000 onwards	2000
NLD	BTS-TRI	all fish	all	1996 onwards	yes	1987 onwards	yes	1996 onwards	1998
		bentos closed list	all	1996–2001	yes	1996–2001	yes	1996 onwards	1998
		all benthos	all	2002 onwards(3)	yes	2002 onwards(3)	yes	1996 onwards	1998
	BTS-ISI	all fish	all	1987 onwards	yes	1987 onwards	yes	1985 onwards	1985
		bentos closed list	all	1987–2001	yes	1987–2001	yes	1985 onwards	1985
		all benthos	all	2002 onwards(3)	yes	2002 onwards(3)	yes	1985 onwards	1985
UK(ENG)	BTS	all fish	all	1988 onwards	yes	1990 onwards	yes	1988 onwards	1988
		all benthos	selection	2009	yes	2009 onwards(3)	yes	2009 onwards	1988
		all benthos (abs/pres)	all	2002	yes	2009 onwards(3)	yes	2002 onwards	1988
	BTS-VIIa	all fish	all	1988 onwards	yes	1993 onwards	yes	1988 onwards	1988
		all benthos	selection	2009	yes	2009 onwards(3)	yes	2009 onwards	1988
		all benthos	abs/pres all	2005	yes	2009 onwards(3)	yes	2005 onwards	1988
ITA	SOLEMON	all fish	all	2005	no(4)	2005 onwards	yes(5)	2005 onwards	2007
		all benthos	all	2005	no(4)	2005 onwards	yes(5)	2005 onwards	2007

**Note:** identification skills keep improving over time, therefore numbers of species sometimes grow over time without reflecting an increasing biodiversity

- (1) preparations for upload ongoing
- (2) database under development
- (3) ongoing for preceding years
- (4) DATRAS not set up for this survey as Italy is not an ICES-member
- (5) available in shared FAO-database ATRIS

## Annex 14: Standard output WGBEAM from DATRAS

When the upload facility for BTS-VIII and the inshore surveys is ready, and data are uploaded, the output products from three can be made available for the next WGBEAM meeting. For the output to be calculated by ICES Data Centre, a formal data product request has to be done (action Ingeborg).

### 1 ) Standard products from DATRAS input:

Update frequency: continuous

Information type: flexible (always use most recent data)

Data used: all available in DATRAS

Timing: always

Location: on the DATRAS webpage, where people also can download the Exchange file

Products:

To be created by	Product name	Aggregation level	Methodology	Target audience	Countries involved	Contact person WGBEAM
ICES Data Centre	ALK	By country and ship for all CA species (real numbers)	Pivot table from CA, all aged fish (age $\geq 0$ )	Wider audience	NED, GFR, ENG, BEL	Ingeborg
	SMALK	By country and ship for all CA species (real numbers)	Pivot table from CA, all aged fish (age $\geq 0$ ) and sex IN('M','F')	Wider audience	NED, GFR, ENG, BEL	Ingeborg
	cpue per species by length by haul	cpue as in numbers/km <sup>2</sup> . File does not include values!	Combine HH and HL data	Wider audience, including WGEF, WGCEPH, WGNEW	NED, GFR, ENG, BEL	Ingeborg
	cpue per species by haul	cpue as in numbers/km <sup>2</sup> , file includes values.	Combine HH and HL data	Wider audience, including WGEF, WGCEPH, WGNEW	NED, GFR, ENG, BEL	Ingeborg
	Flat file	As described in <a href="#">WKDATR</a> report, and recommendation from <a href="#">WGBEAM</a> 2013	See <a href="#">WKDATR</a> report	Wider audience	NED, GFR, ENG, BEL	Ingeborg

WGBEAM decided only to provide data up to the haul level because users themselves should decide how to combine the different gears. As long as WGBEAM does not have a well-developed protocol for this, the group feels it should be clear to all users that one has to be aware of the different characteristics of the surveys.

## 2 ) Results from the BTS index

### a ) Frequency: once per year

Information type: fixed (so: no updates throughout the year)

Data used: only the WGBEAM approved indices and related products as used in the assessment groups. In 2014 and 2015: sole and plaice in the North Sea for Netherlands (Tridens and Isis), and England and in VIId.

Timing: prior to WGNSSK (depending on the WGNSSK deadlines)

Location: on the DATRAS webpage, the file marked with \* will be added to the Indices download and won't be available as separately downloadable products

NB: before the information can be made available:

- fine-tuning of Dutch index to be done (action Ingeborg)
- English index calculations for IVa have to be approved by Cefas (action Brian)
- Documentation on index calculation. Action Vaishav/ Ingeborg

Products:

TO BE CREATED BY	PRODUCT NAME	CALCULATION STEP	SPECIES (PLEASE PROVIDE SCIENTIFIC SPECIES NAMES)	COUNTRIES INVOLVED	COMMENT
ICES Data Centre	Indices	S6	<i>Pleuronectes platessa, Solea solea</i>	NED, ENG	No of countries will be extended after index approval by WGBEAM
	SD*	S6	<i>Pleuronectes platessa, Solea solea</i>	NED, ENG	No of countries will be extended after index approval by WGBEAM
	Aco4*	S5	<i>Pleuronectes platessa, Solea solea</i>	NED, ENG	Remove meanlen columns (and meanweight?) Rename file into Age_composition No of countries will be extended after index approval by WGBEAM
	ALK*	S4	<i>Pleuronectes platessa, Solea solea</i>	NED, ENG	No of countries will be extended after index approval by WGBEAM

TO BE CREATED BY	PRODUCT NAME	CALCULATION STEP	SPECIES (PLEASE PROVIDE SCIENTIFIC SPECIES NAMES)	COUNTRIES INVOLVED	COMMENT
	CombineHH_HL	S2	<i>Pleuronectes platessa, Solea solea</i>	NED, ENG	No of countries will be extended after index approval by WGBEAM

## b) Frequency: continuous

Information type: flexible (always latest data available)

Data used: all index calculations for available data

Timing: always available

Location: at DATRAS webpage, only available on login

Products: all 'in-between' products as produced by current DATRAS index calculation

## 3) Internal WGBEAM products for survey summary

Frequency: continuous

Information type: flexible

Data used: all available of the last survey year (in 2015: all data for 2014)

Timing: always available

Location: at DATRAS webpage, only available on login

Products:

To be created by	Product name	Product	Methodology	Contact person WGBEAM	Comment
ICES Data Centre	WGBEAM1	Time schedule, by week	From HH file, calculate week number and put in sheet	Ingeborg de Boois	
	WGBEAM2	Overview of hauls carried out	Pivot table from HH (valid and invalid hauls) +number of planned stations	Ingeborg de Boois	Planned tows are in sheet WGBEAM2a
	WGBEAM3	Biological sampling: ages	Pivot table from CA, all aged fish (age >= 0)	Ingeborg de Boois	
	WGBEAM4	Biological sampling: not aged	Pivot table from CA, not aged information (age=- 9)	Ingeborg de Boois	

<b>To be created by</b>	<b>Product name</b>	<b>Product</b>	<b>Methodology</b>	<b>Contact person WGBEAM</b>	<b>Comment</b>
	WGBEAM5	Map with hauls, only valid hauls	From HH table, real towing positions. Map including ICES rectangles.	Ingeborg de Boois	Options: different colour by gear, by country or by ship
WGBEAM	WGBEAM6	Distribution plots by agegroup (sole, plaice)			
	WGBEAM7	Species distribution plots densities			