WORKING GROUP ON BEAM TRAWL SURVEYS
(WGBEAM)

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

4-7 April 2017

Galway, Ireland

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International Council for the Exploration of the Sea
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Contents

Executive summary

The Working Group on Beam Trawl Surveys (WGBEAM) met on 04–07 April 2017 in Galway, Ireland. The meeting was attended by 11 people representing eight countries and the ICES Data Centre, and was chaired by Holger Haslob, Germany. Data from eleven offshore and four inshore surveys were discussed (all surveys under WGBEAM coordination).

WGBEAM 2017 collated an overview of the 2016 results and the 2017 planning of all surveys under its coordination, and provided standard output under the form of updated abundance index time-series for sole and plaice in the offshore and inshore beam trawl surveys. The annual output on spatial sampling coverage of the offshore and inshore beam trawl surveys was updated.

Combined beam trawl survey indices which were agreed on during the benchmark workshops for dab (WKNSEA 2016) and plaice (WKNSEA 2017) were updated during the WGBEAM meeting.

In relation to the ICES Database on Trawl Surveys (DATRAS), actions leading to better data quality were formulated, and ongoing and future development issues were reported and/or discussed. One issue discussed was the progress of automation the index calculation procedure and the adoption of a modelled approach combining several surveys into a single index based on DATRAS data (e.g. North Sea plaice and dab). WGBEAM feels that currently communication between survey and assessment groups is not fluent in many cases and the automation of procedures unfortunately risks further reducing the important communication between working groups. WGBEAM recommends that further consideration is needed by ACOM to ensure the quality of index information is maintained or improved, while it acknowledges the need for transparency, desire for consistency, and efficiency that the automation of survey indices provides.

WGBEAM worked with http://ecosystemdata.ices.dk/map/index.aspx and sees some room for improvement. Only a few people in the meeting knew about this portal, although it was welcomed. There is a need for better advertisement of the portal to the wider (ICES) audience. Not only survey expert groups should know about it, but the portal may also be functional for advisory groups that would like to have a quick look at e.g. distribution of species/age-groups. WGBEAM recommends that this tool is demonstrated to WGCHAIRS during the 2018 meeting. Further, WGBEAM decided to skip the former produced survey maps within the WGBEAM report and reference instead to the ecosystem data online tool, which has the full functionality to produce survey maps and overviews.

The finalization of the Sole Net Survey DATRAS submission facility was delayed but further progress was made. Format definitions and checks were published in the WGBEAM report and the full implementation of the SNS into the DATRAS system is near completion.

1 Administrative details

Working Group name

Working Group on Beam Trawl Surveys (WGBEAM)

Year of Appointment within the current cycle

2017

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

1

Chair(s)

Holger Haslob, Germany

Meeting venue

Galway, Ireland

Meeting dates

04–07 April 2017

2 Terms of Reference a) – e)

The multi-annual terms of reference are listed below, and mainly focused on coordination and standardisation of the surveys, data quality and data delivery for assessment purposes

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, plaice, dab and other species if required in the North Sea, Division 7a, Divisions 7d-g, Divisions 8ab and the Adriatic taking into account the key issues involved in the index calculation.	a) Science Requirements Length-at-age analysis b) Advisory Requirements Required to support indices for assessements c) Requirements from other EGs Specific questions from other EGs possible	25,27	Annually	WG report chapter
b	Further coordinate and standardize offshore and coastal beam trawl surveys in the North Sea and Divisions 7a, 7d-g, 8a-b and the Adriatic, and update and publish the standard as a SISP protocol.	a) Science Requirements b) Advisory Requirements Required to ensure consistent approach within and between areas to meet EU directives.	31	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. (continuation of WGBEAM work in 2014-2016)	a) Science Requirements The large WGBEAM dataset has the potential to elucidate temporal and spatial changes in population parameters. b) Advisory Requirements Indices are being used by assesements working groups and any changes to age structure of species of interest need to be investigated.	22	Expected output in 2017	WGBEAM 2017 update and ultimately ASC presentation
d	Provide index calculations based on DATRAS for dab in the North Sea, and plaice and sole in Divisions 7a, 7d-g, 8a-b and the Adriatic.	Required to support indices for assessements	25,27	3 years	Provision of new index series to relevant WGs
e	Analyse BTS data with respect to ecosystem and marine quality indicator aspects.	Requested by WKPIMP; link to WGINOSE and WGISUR. a) Science Requirements b) Advisory requirements	25,27	3 years	WG report chapters.

3 Summary of Work plan

Year 1	Annual standard outputs for a,b. ToR c in progress. Continue analysis on ToR d. ToR e: Started to analyse the macro epibenthos catches in species composition and quantity of at least IBTS Q3 and Beam Trawl Survey catches.
Year 2	Annual standard outputs for a,b. ToR c completed. Continue analysis on ToR d, e.
Year 3	Annual standard outputs for a,b.ToR c completed. Continue analysis on ToR d, e.

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

In this delivery period, WGBEAM has worked on and achieved the following:

1. Update and interpretation of abundance index time-series for sole and plaice in offshore and inshore beam trawl surveys:
    - Update of offshore and inshore survey time-series for plaice and sole via DATRAS
    - Update of deltaGAM indices for plaice in Subarea 4 and dab in Subarea 4 and Division IIIa
2. Increase standardization of the surveys:
    - none
3. Data quality and availability:
    - Further progress in incorporation of the Dutch SNS survey in DATRAS
    - Netherlands submitted inshore data (DYFS) to DATRAS (2010 onwards)
    - Update of offshore beam trawl manual (sent in for review, pending)
4. Other activities:
    - Information on the Icelandic beam trawl survey and the Irish beam trawl survey was incorporated into the WGBEAM report. Preliminary results were presented to the group and were discussed.
    - Analysis of the changes in mean length-at-age for sole and plaice in the North Sea, the English Channel, the Bristol Channel, and the Irish Sea (to be continued)
    - Feedback on MSFD data products and the ICES ecosystem data online tool.

5 Progress report on ToRs and workplan

5.1 Tabulate, report and evaluate population abundance indices by age-group for sole, plaice, dab and other species if required in the North Sea, Division 7a, Divisions 7d-g, Divisions 8ab and the Adriatic 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 2016.

The full revision history until 2013 can be found in the WGBEAM 2014 report (ICES, 2014) and preceding WGBEAM reports.

5.1.1.1 Sole

North Sea – Subarea 4

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 the 1 group below the long-term arithmetic mean for the last four years (2012 – 2015). The poor 2011 year class (age group 1 in 2012) resulted in below average age groups up to age group 3 (2014). However, in 2015 this cohort is well above the long-term average and that trend continued in 2016. 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. Here, the number of one-year olds was below the long-term mean from 2012 - 2014. In 2015 the highest value for age 1 for the whole time-series was observed, but in 2016 the value for this age group was well below the average. A strong cohort of 2 year old fish was observed in 2016, a result of the record numbers observed of 1 year old fish the year before.

Western Waters - Subarea 7

The indices for sole from Subarea 7 stocks are summarized in Figure 5.1.1.1c-f in Annex 5.3.

Division 7d

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 in 2013 (the incoming year class 2012) being the second lowest of the time-series. In 2014 and 2015 the number of one year old sole was again far above the average and among the five highest values recorded. This trend did not continue in 2016, as the number of one year old sole was below the long-term mean. However, the very low observed value for the 2013 year class was not observed at that low level for the 2015 group 2 which was above the average.

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 7f

The relative abundances of the age groups 1 sole in the Bristol Channel was below the time-series average for the years 2009-2014. In 2015 and 2016 age group 1 shows again above average value. The low observed age group 1 in 2014 resulted in the lowest observed age group 2 value in 2015 and very low age group 3 value in 2016. The abundance of the 3 group is below the long-term average. The number of age group 4+ was fluctuating around the average for the last three years with values slightly above the average in 2015 and 2016.

Division 7a

Of all Division 7 sole stocks, sole in the Irish Sea is clearly in the worst shape according to the beam trawl surveys carried out in this Division. Since 2005 the abundances have been below the time-series means for all age groups. In 2015 the numbers of age group 1 was observed for the first time since 2005 above the time-series average, but in 2016 a number well below the average was observed again. However, the numbers for the 4+ group remain more or less stable at the low 2005–2014 level. As for most other sole stocks, peaks in the abundance of 1 groups can generally be tracked through to following years.

Division 8 a,b

The ORHAGO survey time-series of age-group abundances of sole in the Bay of Biscay (Figure 5.1.1.1g) are marked by the arrival of two below average year classes in 2011 and 2012 at age 1. The yearly advance in age of these two year classes can be followed from age 1 to 3. Their abundance indices in successive years are consistent between them. The four following year classes are close to the mean at age 1 from 2013 onwards. Their abundance indices at age 2 are consistent with age 1 estimate. The 4+ age group abundance indices have decreased since 2013. This trend is due to the cumulative effect of the increase in age of three year classes (2010, 2011 and 2012) which are below average at age 3.

Northern Adriatic Sea

Figure 5.1.1.1h 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, the ageing is still in progress and for some years, a survey age–length key is not yet available. 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 2016 0-group of sole in the northern Adriatic has been lower than the level of the long-term arithmetic mean. Ages 1 and 2 in 2016 cruise were higher than the long-term arithmetic mean. At age 3, the 2016 cruise yielded the highest index value of the time-series and the abundance was also above the long-term arithmetic mean for age 4+ in this year. Overall is possible to notice a good internal consistency of the cohorts, in particular the high recruitment observed in 2013 can be followed in the succeeding years.

5.1.1.2 Plaice

North Sea – Subarea 4

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 2014, as detected in 2009, 2011 and 2013, the observed number of one year olds was higher than the long-term mean. In 2015 and 2016 it was again below the average. The Tridens survey confirmed the strong 2001 year class, but also documented a series of seven consecutive incoming year classes that were above average from 2007 onwards, including 2014. This pattern is visible at all ages in this survey, and the cohorts can be tracked over time really well. The clear increasing trend in the age 4+ group is continuing in 2016 with the highest record of the time-series ever, and this increasing trend is clearly visible in all ages from 4-10. However, 2015 and 2016 was the first two years since 2010 showing age group 1 below the time-series mean in the combined index. In the more inshore Isis survey this was only the case to a lesser extent, with above average abundances since 2011 for age group 3 and since 2007 for age 4+. Same as for the Tridens survey time-series the 2016 value for age group 4+ is the second highest ever recorded, only surpassed by 2015. The combined Isis-Tridens index (Figure 5.1.1.2c in Annex 5.4) shows above average numbers-at-ages 2-4+ in 2016, 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 Figure 5.1.1.2d), tells a different story for the Southern North Sea. Here, the high incoming year classes 2010 and 2013 are apparent as the biggest since 2002. Differently from Dutch surveys the number of incoming recruits at age 1 (year class 2014) is clearly below the long-term average in 2015, and similar story can be said about year class 2015, which is well below the average in 2016. The increasing trend in numbers which can be seen from the combined Dutch survey index for age group 3 and 4+ is not that clearly visible in the UK offshore survey in this area, although for age group 3 a strong increase was recorded in 2016 and age group 4+ has been above the average for the last five years.

Western Waters - Subarea 7

The indices for plaice from area 7 stocks are summarized in Figure 5.1.1.2e-h in Annex 5.4.

Division 7d

The abundance at age 1 after the dropping observed in 2012, was again close to the long-term arithmetic mean (year class 2012) in 2013. In 2014 the abundance at age 1 was observed to be exceptional high and is by far the highest record of the time-series. However, in 2015 the number of age group 1 dropped again to the long-term average and dropped even further in 2016 when the smallest number since 2005 was observed. In 2014 the observed number of age group 2 was the highest ever observed so far in the time-series, but the value for 2015 was even higher than that. The numbers of age group 2 in 2016 were lower than in 2014 and 2015, but still well above the long-term average. As a result of the good year classes 2009-2011 the numbers of age 4+ were the

highest ever observed in the time-series for the years 2013-2016. Cohorts can be generally well tracked into all or some of the following years in this survey.

Division 7f

The relative abundance at age 1 increased considerably for plaice in the Bristol Channel in 2013, reaching a value similar to what was observed in 2010 and 2011. This trend continued in 2014 and resulted in the highest record for age group 1 in the time-series observed so far. However, in 2015 and 2016 the lowest values ever were recorded. The strong year class 2010 can be tracked over the years, and produced time-series peaks of 3 in 2013 and 4+ year olds in 2014. The numbers in the 4+ group are again the highest of the entire time-series in 2015 and the 2016 numbers are just slightly below this record number. Since 2009 the numbers of this age group consistently increased. 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 7a

The age 1 abundance of plaice in the Irish Sea in 2014 was above the level of the long-term average with the highest record of the time-series. 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. In 2015 the observed number of age group 1 was well below the time-series mean and in 2016, the smallest number of the series was observed. However, as opposed to sole in this area, place in 7a seems to be characterized by a healthy stock status, with numbers for the 4+ group in 2013–2016 being the highest of the time-series and an increasing trend since the beginning of the time-series in 1995. 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.

Previously, 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.

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.

The Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak (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 assessment models for plaice and sole. 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 6.1 for the D(Y)FS and Annex 6.2 for the SNS. The corresponding combined inshore indices and the SNS indices are plotted for 1990 to 2016 in Figures 5.1.2.1 and 5.1.2.2 respectively (Annexes 6.1 and 6.2).

5.1.2.1 Sole

The combined inshore indices for 0 and 1 group sole were below average in 2016 . The 0 group index is among the lowest values estimated since 1990 (Figure 5.1.2.1 in Annex 6.1). In the SNS, age groups 1 and 2 dropped below average. The strong year class 2 of last year is now represented in this year's age group 3 which is now among the highest values estimated since 1990 (Figure 5.1.2.2 in Annex 6.2). Group 4 decreased, but remains just above average.

A year effect can be observed for sole in 2012, where the total for all age groups was the lowest in the entire time-series since 1990 (Figure 5.1.2.2 in Annex 6.2). This was the year where the SNS was carried out on the RV Tridens instead of the RV Isis (ICES WGBEAM 2013) and the observed year effect may indicate that the change in vessel has caused a bias in the SNS indices. The internal consistency is relatively good until age 3 but becomes weaker for age group 4, especially in the most recent years.

5.1.2.2 Plaice

The combined inshore indices for 0 and 1 group plaice were below average in 2016 and are among the lowest values since 1990 (Figure 5.1.2.1 in Annex 6.1). In the SNS, the group 1, 2 and 3 indices are below average while the 4 group indices are above the average (Figure 5.1.2.2 in Annex 6.2).

Although a year effect in 2012 in the SNS is far less evident for plaice than for sole (Figure 5.1.2.2 in Annex 6.2), this year should also be treated with care for plaice. The use of a different vessel in this year may also have affected the catchability of plaice in 2012 (see above). The internal consistency is rather poor for plaice in the most recent survey years.

5.1.3 New combined offshore beam trawl survey indices for plaice and dab

During the recent benchmark workshops for dab (ICES, 2016) and plaice (ICES, 2017) it was agreed to use combined survey indices for each of the stocks using data from different beam trawl surveys. In both cases a GAM model approach (Berg et al., 2014) was applied to construct age based survey indices making use of the DATRAS database.

5.1.3.1 Plaice

The combined beam trawl survey index for the North Sea plaice stock (ple.27.420) includes data from different beam trawl surveys (1996-2016, ages 1-9) which are available in DATRAS. For details see the report of the Benchmark Workshop on North Sea Stocks WKNSEA 2017 (ICES, 2017). The index was updated during the WGBEAM 2017 meeting because not all data from 2016 were available during the benchmark workshop in February 2017 (Annex 7; Figure 5.1.3.1.).

Table 5.1.3.1. Overview of data included in the North Sea plaice index calculation

COUNTRY	VESSEL	GEAR	YEARS	AGES
BEL	BE11	BT4A	2010-2014	1-9
GFR	SOL	BT7	2002-2003	
GFR	SOL2	BT7	2004-2005, 2007-2016	
NED	ISI	BT8	1996-2016	

NED	TRI2	BT8	1996-2016
ENG	COR	BT4A	1996-2007
ENG	END	BT4A	2008-2016

5.1.3.2 Dab

The combined beam trawl survey index for the North Sea dab stock (dab.27.3a4) includes data from different beam trawl surveys (2003-2016, ages 1-6) which are available in DATRAS. For details see the report of the Benchmark Workshop on North Sea Stocks WKNSEA 2016 (ICES, 2016). The index was updated during the WGBEAM 2017 meeting (Annex 7; Figure 5.1.3.2.).

Table 5.1.3.2. Overview of data included in the North Sea dab index calculation

COUNTRY	VESSEL	GEAR	YEARS	AGES
GFR	SOL	BT7	2003	1-6
GFR	SOL2	BT7	2004-2005, 2007-2016	
NED	ISI	BT8	2003-2016	
NED	TRI2	BT8	2003-2016	

5.2 Trawl surveys in the North Sea and Divisions 7a, 7d-g, 8a-b and the Adriatic, and update and publish the standard as a SISP protocol (ToR b.).

5.2.1 Results of 2016 surveys

5.2.1.1 Offshore beam trawl surveys

5.2.1.1.1 Participation and coverage of the area

Eleven surveys were carried out, covering the North Sea, 7d, 7e, 7fg, 7a, 8a, 8b, the Northern Adriatic Sea and the West coast of Iceland. The participating vessels and time of the surveys are listed in Table 5.2.1.1. Further details (areas covered, technical specifications) by country are given in Annex 4.1.

Table 5.2.1.1. Overview of offshore bream trawl surveys during 2016 / early 2017. Survey results

COUNTRY	VESSEL	AREA	DATES	GEAR
Belgium	Ramblers	southern North Sea	06 – 14 Sep 2016	4m beam
England	Endeavour	VIId, IVc	17 – 29 Jul 2016	4m beam
England	Endeavour	VIIa, VIIf	10 – 29 Sep 2016	4m beam
England	Endeavour	VIIe. Celtic Sea	06 Mar – 04 Apr 2017	4m beam
France	Côtes de la Manche	VIIIa, VIIIb	09 – 29 Nov 2016	4m beam
Germany	Solea	German Bight	16 Aug – 01 Sep 2016	7m beam
Iceland	Dröfn RE-35	West coast of Iceland	12 – 22 Sep 2016	4m beam
Ireland	Celtic Explorer	western Celtic sea	06 – 16 Mar 2016	4m beam
Italy/Slovenia	G. Dallaporta	northern Adriatic Sea	15 Nov – 05 Dec 2016	3.5m beam
Netherlands	Tridens	central North Sea	22 Aug – 16 Sep 2016	8m beam + flip-up rope
Netherlands	Isis	southern North Sea	08 Aug – 09 Sep 2016	8m beam

A summary of each of the offshore surveys is to be found in Annex 8.

Belgium

Traditionally, RV Belgica is used for the Belgian offshore Beam Trawl Survey. However in 2015, at the last minute, Belgium was forced to carry out the survey with a commercial beam trawler (Z.279 Ramblers) because of the complete loss of ship time with RV Belgica due to a severe accident that caused a hole in the ship's hull. In 2016, the survey was planned as usual with RV Belgica (the planned dates were 5 – 16 Sep 2016). Unfortunately, due to technical issues (i.e. abnormal heating of the bearing) and the failure to repair the issue in time, ship time was lost for the second year in a row.

As the survey is compulsory, all alternative options were investigated to ensure that the survey could be carried out within the allowed time frame (that was defined up to the end of September, fishing later would deviate too much from the normal timing – no longer in quarter 3 - and would influence catch compositions and length distributions due to migrations and somatic growth of the fish too much). However, no other (national and foreign) RVs that could serve as replacement for RV Belgica could be identified. The main reasons were full ship agenda's within the possible time frame, insufficient budget (the foreign vessels are often much larger and therefore much more expensive), and the unavailability of certain crucial sampling equipment on some vessels. The Belgian commercial trawler (Z.279 Ramblers) that proved to be qualified for the job the previous year was prepared to help us out again. The period from Tuesday 6th until Wednesday 14th of September was an ideal compromise between the agendas of the ILVO staff and the vessel crew.

Apart from using a different vessel (without possibilities for any comparative fishing), using a commercial vessel for the North Sea Beam Trawl Survey obviously also affect the amount of work that could be carried out during the survey, mainly because only two scientists could be embarked instead of the usual minimum of seven scientists. Therefore, the same as in 2015, all focus went to documenting the commercial fish species (needs to be beard in mind when reading the species table in the Belgian offshore Survey Summary Sheet), and all other work had to be cancelled. In this way no non-commercial fish species and invertebrates could be documented, and no data on marine litter were gathered.

51 out of the total of 62 planned stations have been fished successfully and were declared valid.

England

The English Q3 Eastern English Channel and Southern North Sea survey was completed without incident, within the time frame and in good weather. A total of 79 valid stations were successfully sampled. One station was invalid due to a large catch of sand, which was successfully repeated, for four stations the tow duration had to be reduced to <30min because of a history of large catches/bad ground, including one other because of the presence of static gear. Similarly, there were no major incidents for the Irish Sea and Bristol Channel (7a, 7f) survey. 116 stations were successfully sampled. At 13 stations it was necessary to the tow duration from the standard 30 min to either 20 or 15 min, and further 9 stations were hauled early. The Q1 western English and Celtic Sea ecosystem survey ended on the first day of the working group. For this reason, the survey summary sheet was not available.

France

The French ORHAGO survey in the Bay of Biscay was carried out using the research vessel "Côtes de la Manche", a 24.9 m long trawler, as in 2015. All the reference station

hauls were carried out except one which was cancelled because the skipper considered that it was too risky to do it (on a position where it was difficult to haul back the trawl in 2015 because it was full of mud and mussels).

Germany

All 63 planned German beam trawl survey stations were successfully sampled in good weather, without incident.

Italy/Slovenia Adreatic Sea Survey

For the Adriatic survey 74 hauls were carried out. The number of stations have been increased in 2016 because of 7 new stations carried out inside the Croatian national waters. 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.

The Netherlands

Two offshore beam trawl surveys were undertaken by the Netherlands, each using a different vessel ("Tridens" and "Isis"). For the survey conducted by "Tridens", 72 valid hauls were carried out, and was completed without major incidents. For the "Isis" survey, 88 valid hauls were carried out. Although the survey covered most of the planned stations, a few of the stations were taken over by "Tridens".

Iceland

The Icelandic Beam trawl Survey carried out 31 stations on a chartered vessel.

Ireland

In the Irish Beam trawl Ecosystem survey a total of 45 valid tows were completed (out of a possible 51), as well as 2 additional tows (these had not been randomly selected but were sampled opportunistically). There were no foul hauls or gear damage. The weather was good for most of the survey but stratum Ia was not sampled due to poor weather conditions at the time when the vessel was in the area.

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). UK (Young Fish Survey-YFS) ceased the survey due financial constraints.

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 time of the cruises is listed in Table 5.2.1.2. Further details (areas covered, technical specifications) by country are given in Annex 4.2. Details on the strata fished are given in Annex 10.

Table 5.2.1.2. Overview of inshore beam trawl surveys during 2016.

Country	Vessel	Area	Dates	Gear
Belgium	Simon Stevin	Belgian coastal zone	19 Sep – 27 Sep	6 m shrimp trawl

Germany	Chartered vessel and Clupea	German Bight and German Wadden Sea	05 Sep – 06 Oct	3 m shrimp trawl
Netherlands (SNS)	Isis	Dutch coastal zone	12 Sept – 23 Sept	6 m beam trawl
Netherlands	Luctor	Scheldt estuary	5 Sep – 23 Sep	3 m shrimp trawl
Netherlands	Stern	Dutch Wadden Sea	29 Aug – 30 Sep	3 m shrimp trawl
Netherlands	Isis	Dutch coastal zone and German Bight	26 Sep – 4 Nov (5 weeks in the period)	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 9.

Belgium

Belgium carried out all planed stations and all stations were valid.

Germany

The German inshore survey on chartered vessels did not face any difficulties. Due to technical problems on RV Clupea, the survey period was postponed by one week.

The Netherlands

The Netherlands carried out all planed inshore surveys without any problems. In 2016 the Schollevaar was replaced by Luctor, first results from a comparative fishing study in 2015 (results in prep.) between Luctor and Schollevaar did not indicate that a conversion factor is needed for the index calculation.

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 2015, no overlapping hauls were carried out due to time constraints, other priorities and budgetary constraints.

Table 5.2.2.1. Timing of the offshore beam trawl surveys in 2017 / early 2018.

COUNTRY	VESSEL	AREA	DATES	GEAR	CONTACT
Belgium	Belgica	southern North Sea	04 – 15 Sep 2017	4 m beam	Loes.Vandecasteele@ilvo.vlaanderen.be
UK	Cefas Endeavour	English Channel/ Celtic Sea	26 Feb – 23 Mar 2018 (Dates provisional)	4 m beam	ian.holmes@cefas.co.uk
UK	Cefas Endeavour	7d, 4c	19 Jul – 01 Aug 2017	4 m beam	joanne.smith@cefas.co.uk

					Cc: ian.holmes@cefas.co.uk
UK	Cefas Endeavour	7fg, 7a	11 Sep – 01 Oct 2017	4 m beam	stephen.shaw@cefas.co.uk Cc: ian.holmes@cefas.co.uk
France	Côtes de la Manche	8a, 8b	02 – 24 Nov 2017	4 m beam	yann.coupeau@ifremer.fr Cc: Gerard.Biais@ifremer.fr
Germany	Solea	German Bight	18 Aug – 5 Sep 2017	7 m beam	kay.panten@thuenen.de
Adriatic (Italy-Slovenia)	G. Dallaporta	North Adriatic Sea (GSA 17)	11 – 30 Nov 2017	2x 3.5m modified beam	giuseppe.scarcella@an.ismar.cnr.it
Netherlands	Tridens	central North Sea	21 Aug – 15 Sep 2017	2x 8 m beam + flip-up rope	ingeborg.deboois@wur.nl
Netherlands	Isis	southern North Sea	31 Jul – 18 Aug 2017	2x 8 m beam	Ronald.bol@wur.nl Cc:ingeborg.deboois@wur.nl
Iceland	Bjarni Saemundsson	West coast of Iceland	23 Aug – 05 Sep 2017	4 m beam	gudjon.mar.sigurdsson@hafogvatn.is
Ireland	Celtic Explorer	western Celtic Sea	06 – 16 Mar 2018 (Dates provisional)	4 m beam	Hans.gerritsen@marine.ie

5.2.2.1.2 Staff Exchanges

No staff exchanges are planned for the 2017 offshore surveys.

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 5.2.2.2.1. Timing of the surveys in 2017.

Country	Vessel	Area	Dates	Gear	contact
Belgium	Simon Stevin	Belgian coastal zone	11 – 28 Sep	6 m shrimp trawl	Jurgen.Bossaert@ilvo.vlaanderen.be Cc: Loes.Vandecasteele@ilvo.vlaanderen.be
Germany	Chartered vessels and RV Clupea	German Bight and German Wadden Sea	28 Aug – 29 Sep	3 m shrimp trawl	Holger.haslob@thuenen.de
Netherlands (SNS)	Isis	Dutch coastal zone	11 - 22 Sep	6 m beam trawl	Hanz.wiegerinck@wur.nl Cc: Loes.bolle@wur.nl
Netherlands	Luctor	Scheldt estuary	04 – 22 Sep	3 m shrimp trawl	Andre.dijkman@wur.nl Cc: Loes.bolle@wur.nl
Netherlands	Stern	Dutch Wadden Sea	28 Aug – 29 Sep	3 m shrimp trawl	Marcel.devries@wur.nl Cc: Loes.bolle@wur.nl
Netherlands	Isis	Dutch coastal zone and German Bight	25 Sep – 03 Nov	6 m shrimp trawl	Thomas.pasterkamp@wur.nl Cc: Loes.bolle@wur.nl

The UK survey ceased in 2010.

5.2.2.2.2 Staff Exchanges

No staff exchanges are planned for the 2017 inshore surveys.

5.2.3 Beam Trawl Survey Manuals

Offshore beam trawl survey manuals were compiled and sent in for review. It was decided to base the inshore beam trawl survey manuals on the outcome of this review. However, the review of offshore survey manual is still pending. Therefore, no further progress was made on this topic but work will be continued.

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

No progress was made on this topic since the previous meeting. The study will be continued and finalized in 2017 in the form of a draft manuscript, which will be submitted for publication to a peer-reviewed journal.

5.4 Other topics

5.4.1 Revision of survey summary sheets

Over the past years, attempts have been undertaken to improve the information flow between survey groups and (stock) assessment groups. Based on information from different sources, Marie Storr-Paulsen and Ingeborg de Boois propose two information exchange formats:

a. from the stock assessment groups to the survey expert groups describing the stocks and the (survey) data used in the assessment;

b. from the survey groups to the (stock) assessment groups describing the surveys: set-up, information collected, time-series, etc., where possible in line with the DCF survey tables.

A draft version of the second summary sheet was presented to and discussed by WGBEAM. The comments will be taken into account in a next version of the survey summary sheets.

5.4.2 Data issues

5.4.2.1 Review of MSFD product contributors list

WGBEAM reviewed the list of contributors to the MSFD data product from DATRAS and sent an updated version to Meadhbh Moriarty.

5.4.2.2 Incorporation of SNS data in DATRAS

Currently, only the data of the Demersal Young Fish Survey can be added to the Inshore beam trawl survey data in DATRAS. The Sole Net Survey can still not be submitted. Annex 11 contains an overview of field values to be allowed in the format and checks (based on DYFS format) before the survey can be added to DATRAS. The list has been sent to the ICES Data Centre directly.

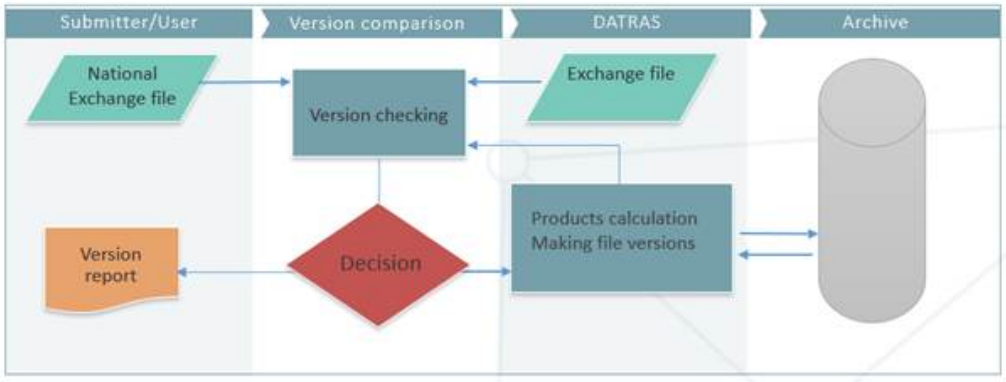
5.4.3 DATRAS developments

1) Including BTS-7a into the BTS international survey umbrella, skype workshop meeting conducted between CEFAS and ICES DC for understanding to resolve issues.

-Merger of data of different quarter and gear name changing in the DATRAS is one of the two main action points.

2) Archiving, versioning and product compare tool presented in the meeting and live test demo shown to the group.

Tracing changes in the database by submitters and find out differences in the data file/data products are very time consuming in the DATRAS tool. In 2006 the first phase of the DATRAS version controlling utility was developed, which allow comparison of the different exchange format files and data-products. If the indices comparison between two versions reveals more than 5% variation an e-mail goes to the working groups. This facility will be ready to go before summer 2017, and Q3 submission will be the pilot year to test and analyse the functionality.



3) BTS indices for NED data: need to resolve 2008, 2009, 2010 and 2011 indices differences; the task is in progress.

5.4.4 Feedback on beam trawl survey data products

In the BTS data product 'CPUE per length per Hour and Swept-area' Belgium is currently not included. As DATRAS now contains Belgian data, the product calculation should be applied to the Belgian data as well. ICES Data Centre will incorporate Belgium in the calculation (Action Vaishav).

The 2016 DATRAS NED indices for plaice and sole have been checked with the outcomes from the Dutch calculation. Some inconsistencies were discovered, all due to data (transmission) issues. And updated index will be provided and checked when resubmission of the data has taken place. Then also the open ends for other years will be covered. (Action Ingeborg/Vaishav)

5.4.5 Evaluation of index calculation product

WGBEAM has been working with the ICES data centre to implement the automatic calculation of survey indices for use in NS plaice and sole following annual upload of the Isis and Tridens data. Survey indices have been shown to be consistent with those provided by Wageningen Marine Research. WGBEAM agreed that going forward WGNSSK should consider these the final indices to use in the relevant assessments. WGBEAM discussed the opportunity to carry out similar automation for other surveys and areas.

For scientific, operational, animal well fare and budgetary reasons sampling design and effort have changed at least in a number of UK surveys over time, but also other countries have changed data collection strategies over time. These changes mean that not all data can be treated in the same manner, e.g. the age data cannot be interpreted by a single methodology over the entire time-series, or some benthos data cannot be analysed to the lowest taxonomic level throughout the full time-series. It is possible to conditionally process historic data in accordance to its specific sampling design. However, such changes are likely to continue as improvements and efficiency are sought so that there is no guarantee that whatever methodology is implemented in DATRAS that

future survey data will be interpreted consistently with its design, without the ability to specify otolith sampling designs in DATRAS.

5.4.6 Feedback on Ecosystem data portal

WGBEAM worked with http://ecosystemdata.ices.dk/map/index.aspx and sees some room for improvement.

Only a few people in the meeting knew about this portal, although it was welcomed. There is a need for better advertisement of the portal to the wider (ICES) audience. Not only survey expert groups should know about it, but the portal may also be functional for advisory groups that would like to have a quick look at e.g. distribution of species/age groups. WGBEAM recommends that this tool is demonstrated to WGCHAIRS during the 2018 meeting.

WGBEAM proposes the following developments for the trawl survey plotting facility and recommends that the ICES Data Centre investigates the possibility to incorporate this:

Technical:

- Only show list of parameters that link to the dataset selected (and vice versa)
- Align legend text in Grid view with the Parameter selected
- Add Legend to Cluster view
- Make Cluster into the priority view (now it starts in Grid)
- Also plot 0 values in the map using a different symbol

Addition of Parameters for beam trawl survey:

- Plots by age group for plaice, sole, dab, lemon sole, turbot, brill (e.g. based on output index calculation procedure file aco5_CPUEAge)
- Trawling locations by survey type (option to select multiple surveys, based on DATRAS survey description)
- Trawling locations by country (option to select multiple countries, data based on HH information)
- Numbers per swept-area (based on DATRAS BTS product 'CPUE per length and Hour and Swept-area') for all species
- Numbers per hour (based on DATRAS BTS product 'CPUE per length and Hour and Swept-area') for all species

5.4.7 New data products

WGBEAM requests the following additional products for the beam trawl surveys:

- CPUE per length per Hour and Swept-area for Inshore surveys (currently DYFS). A request form has been sent in to accessions@ices.dk .

5.4.8 Evaluation of benchmark process

Communication, knowledge transfer

Recent benchmarks particularly for North Sea stocks have started to adopt a modelled index approach (Berg *et al.*, 2014) combining several surveys into a single index based on DATRAS data. The methodology is implemented in R so would lend itself to automation in general. The methodology of calculation may change during subsequent benchmarks and would require updating of calculations.

Currently, ICES Data Centre calculates an index for the Dutch Beam Trawl survey based on information from DATRAS, and using the criteria as have been used by Netherlands to provide the BTS indices over the past years. This includes selection of rectangles taken into account for the index calculation, standardized allocation methodology for historic age information, standardized procedure for filling in gaps (e.g. in lf or age–length in a certain area). Different indices may be required for different purposes, particularly data exploration at benchmarks. Provisions of retrieving historic index calculations should be made if the data centre is the sole repository of such indices.

Furthermore, it is unclear how unplanned changes in survey collections such as moving of stations, inability to sample some stations because of technical or weather events, inability to match length to ages etc. can be accounted for appropriately in an automated procedure. The concern is that indices are available and used prior to verification by survey data providers.

The North Sea benchmark groups on plaice (WKNSEA 2017) and dab (WKNSEA 2016) decided not to use the DATRAS index calculation provided by the ICES data centre. This brings up the question who is in the end responsible for (a) the calculation of the indices, and (b) for the reasoning behind the choice of the indices in the stock assessment. WGBEAM feels that at least the survey group should be involved in both decisions, and a dialogue should take place between survey experts and those running the stock assessment to ensure knowledge transfer on the development and usability of the surveys in the specific assessment. WGBEAM therefore recommends that in future survey experts will explicitly be invited to the data compilation and/or benchmark groups, and that the invitation is sent to the expert group's chair as well as to the preferred experts in person. The survey experts should have no other task than (i) provide information about the survey(s), (ii) review choices made on index calculation procedures, (iii) review on decisions on combining and/or splitting index series from a survey perspective in order to ensure that choices are being made on assumptions that link to the survey history and setup. The survey expert should not run any assessment during that specific benchmark group, to prevent conflict of interest.

Also currently communication between survey and assessment groups is not fluent in many cases and the automation of procedures unfortunately risks further reducing the important communication.

WGBEAM recommends that further consideration is needed by ACOM to ensure the quality of index information is maintained or improved, while it acknowledges the need for transparency, desire for consistency, and efficiency that the automation of survey indices provides.

6 Revisions to the work plan and justification

(As deemed necessary based on progress report (Section 5), highlight changes in summary table. (new ToRs, if applicable. Typically 1 page).

7 Next meetings

The next WGBEAM meeting will be held on 10-13 April in IJmuiden, The Netherlands.

8 References

Berg, C., Nielsen, A., Christensen, K., 2014. Evaluation of alternative age-based methods for estimating relative abundance from survey data in relation to assessment models. Fisheries Research 151: 91-99.

ICES, 2017. Report of the Benchmark Workshop on North Sea Stocks (WKNSEA), ICES CM 2017/ACOM:34.

ICES 2016. Report of the Benchmark Workshop on North Sea Stocks (WKNSEA), 14–18 March 2016, Copenhagen, Denmark. ICES CM 2016/ACOM:37. 698 pp.

Annex 1: List of participants

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Annex 2: Recommendations

Recommendation	Adressed to	follow-up
ACOM to ensure the quality of index information is maintained or improved, while the methodologies of index calculations are further automatized.	ACOM	
WGBEAM proposes some improvements for the trawl survey plotting facility (ecosystem data online tool) and recommends that the ICES Data Centre investigates the possibility to incorporate these (see chapter 5.4.6. WGBEAM report 2017).	ICES data centre	
WGBEAM reccommends to demonstrate the ecosystem data online tool (http://ecosystemdata.ices.dk/map/index.aspx) at the WGCHAIRS 2018 meeting to the WG chairs.	WGCHAIRS / ICES data centre	

Actions

- 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 chairs on the required information, and to collate this information for the attention of WGEF. This is addressed to Loes Vandecasteele. All information which is there is currently available to WGEF with the exception of Belgium tagging data.
- Continue work on inshore BTS manual and send to SSGIEOM-chairs for review in the process towards publication in the SISP-series. This is addressed to Loes Vandecasteele, Ingeborg de Boois, Gary Burt, Holger Haslob, Loes Bolle. Offshore manual ready for review (to be arranged by SSGIOEM chair.
- IFREMER to give priority to the upload of beam trawl survey data to DATRAS. This is addressed to ACOM (France). In Progress.
- WGBEAM member countries to continue the upload of: - inshore beam trawl survey data to DATRAS; - offshore beam trawl survey including all taxa. This is addressed to Ingeborg de Boois, Loes Vandecasteele, Gary Burt, Kay

Panten. BEL: inshore in progress; offshore done (2010-2016), in progress for earlier years. GER: inshore in progress; offshore (1998 – 2016) NED: inshore DYFS 2010-2016 submitted; offshore done UK: inshore in progress; Western Channel to be completed, all others done.

- Sort out submission of SNS data to DATRAS. This is addressed to ICES Data Centre (Vaishav Soni, Anna Osypchuk), Ingeborg de Boois. Dialogue between ICES Data Centre and NED, see chapter 5.4.2.2. for progress.
- Continue the work on DATRAS checking procedures to be made available in an R-script so national data can be screened prior to the DATRAS screening, making the process more efficient. This is addressed to ICES Data Centre (Vaishav Soni, Anna Osypchuk). Long-term aim in progress.
- If time and weather allows: - overlapping hauls are carried out by countries operating in the same area; - the ICES Rectangles are visited that just miss out in the survey selection criteria for use in MSFD GES assessment (based on list of M. Moriarty); - NED and GFR continue to 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. This is addressed to all. No overlapping tows done in 2016 .
- CPUE per length per Hour and Swept-area for Inshore surveys (currently DYFS). A request form has been sent in to accessions@ices.dk. This is addressed to Ingeborg de Boois, Vaishav Soni. In progress.
- Restrict access to previous versions of data uploaded into DATRAS to data submitters. Previous versions of uploaded data should be available upon request only for all other users. This is addressed to ICES data center.

Annex 3:WGBEAM Terms of Reference

WGBEAM – Working Group on Beam Trawl Surveys

Approved by SCICOM pending minor updates

SSGIEOM/EOSG chair will work with this group to add linkages and summary of work plan.

2016/MA2/SSGIEOM11

The **Working Group on Beam Trawl Surveys** (WGBEAM), chaired by Holger Haslob*, Germany, will work on ToRs and generate deliverables as listed in the Table below.

	Meeting dates	Venue	Reporting details	Comments (change in Chair, etc.)
Year 2017	4-7 April	Galway, Ireland	Interim report by 20 May 2017 to SSGIEOM, SCICOM, WGISUR and ACOM	New chair*
Year 2018	10-13 April	IJmuiden, The Netherlands	Interim report by 25 May 2018 to SSGIEOM, SCICOM, WGISUR and ACOM	
Year 2019	TBD	TBD	Final report by Date Month May to SSGIEOM, SCICOM, WGISUR and ACOM	

ToR descriptors

ToR	Description	Background	Science Plan topics addressed	Duration	Expected Deliverables
	This should capture the objectives of the ToR	Provide very brief justification, e.g. advisory need, links to Science Plan and other WGs	Use codes	1, 2 or 3 years	Specify what is to be provided, when and to whom
a	Tabulate, report and evaluate population abundance indices by age-group for sole, plaice and dab and other species if required in the North Sea, Division 7a, Divisions 7d-g, Divisions 8ab and the Adriatic taking into account the key issues involved in the index calculation.	a) Science Requirements Length-at-age analysis b) Advisory Requirements Required to support indices for assessements c) Requirements from other EGs Specific questions from other EGs possible	25,27	Annually	WG report chapter

b	Further coordinate and standardize offshore and coastal beam trawl surveys in the North Sea and Divisions 7a, 7d-g, 8a-b and the Adriatic, and update and publish athe standard as a SISP protocol.	a) Science Requirements b) Advisory Requirements Required to ensure consistent approach within and between areas to meet EU directives.	31	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. (continuation of WGBEAM work in 2014-2016)	a) Science Requirements The large WGBEAM dataset has the potential to elucidate temporal and spatial changes in population parameters. b) Advisory Requirements Indices are being used by assesements working groups and any changes to age structure of species of interest need to be investigated.	22	Expected output in 2017	WGBEAM 2017 update and ultimately ASC presentation
d	Provide index calculations based on DATRAS for dab in the North Sea, and plaice and sole in Divisions 7a, 7d-g, 8a-b and the Adriatic.	Required to support indices for assessements	25,27	3 years	Provision of new index series to relevant WGs
e	Analyse BTS data with respect to ecosystem and marine quality indicator aspects.	Requested by WKPIMP; link to WGINOSE and WGISUR. a) Science Requirements b) Advisory requirements	25,27	3 years	WG report chapters.

Summary of the Work Plan

Year 1	Annual standard outputs for a, b. ToRc (completed?). Continue analysis on ToR d. ToR e: Started to analyse the macro epibenthos catches in species composition and quantity of at least IBTS Q3 and Beam Trawl Survey catches.
Year 2	Annual standard outputs for a,b. ToR c : completed? Continue analysis on ToR d, e.
Year 3	Annual standard outputs for a,b.ToR c: completed? Continue analysis on ToR d, e.

Supporting information

Priority	The current activities of this Group will lead ICES into issues related to the ecosystem affects of fisheries, especially with regard to the application of the Precautionary Approach. Several indices produced by WGBEAM are already included in Category 1 stock assessments (NS sole, NS plaice, Biscay sole, NS dab since 2016) and data collected on beam trawl surveys are increasingly used to produce indices for Category 3 stock assessments. Consequently, these activities are considered to have a very high priority.

Resource requirements	The research programmes which provide the main input to this group are already underway, and resources are already committed. The additional resource required to undertake additional activities in the framework of this group is negligible.
Participants	The Group is normally attended by some 10–15 members and guests.
Secretariat facilities	None.
Financial	No financial implications.
Linkages to ACOM and groups under ACOM	As WGBEAM directly calculates and discusses survey indices for stock assessments, and coordinates surveys from which data are used in other stock assessments, there is a clear linkage to ACOM and some of the stock assessment WGs under is coordination (WGNSSK, WGCSE, WGBBI, WGEF, WGINOSE, WGISUR).
Linkages to other committees or groups	There is a very close working relationship with all the groups of the SSGIEOM/SSGESST. Joint sessions are sometimes organized (e.g. with WGCRAN in 2014). It is also relevant to the Working Group on Ecosystem Effects of Fisheries.
Linkages to other organizations	The work of this group is closely aligned with similar work in FAO.

Annex 4: Details on offshore and inshore beam trawl surveys

Annex 4.1: Details of the offshore beam trawl surveys currently undertaken by each country coordinated by WGBEAM.

	Belgium	France	Germany	Italy	Netherlands	Netherlands	UK	UK	UK
Survey area:	4b and c west	8ab	4b east	North Adriatic Sea (GSA 17)	4b and c east	Central N Sea	7d, 4c	7a, f and g	Celtic Sea
Year survey started:	1992	2007	1991	2005	1985	1996	1988	1988	2006
Dates:	August-early September	November	mid August	November	August-early September	mid August-mid September	late July	September	mid February – mid March
Usual start date	week 35	Week 44	week 32	Week 45	week 32/33	week 34	week 30	Week 36/37	Week 36/37
Number of survey days	10	35	13	18	20	16–20	15	21–24	28
Ship:	RV Belgica	RV Gwen Drez	RV Solea #	RV G. Dallaporta	RV Isis	RV Tridens	RV Cefas Endeavour ##	RV Cefas Endeavour	RV Cefas Endeavour
Ship length:	50 m	24.5 m	42 m	35.7 m	28 m	73.5	73 m	73 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	1	1
Number of beams sorted:	1	1	1	2	1	1	1	1	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	62	120	63	67	88	63-73	100	94	131
Benthos sampling since:	1992	2007	1992	2005	1985	1996	1991	1992	2006

 # 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 4.1 continued: Details of the offshore beam trawl surveys currently undertaken by each country coordinated by WGBEAM.

	Iceland	Ireland
Survey area:	Va	7jgh
Year survey started:	2016	2016
Dates:	September	March
Usual start date	week 36	Week 10
Number of survey days	10	10
Ship:	Chartered vessel	RV Celtic Explorer
Ship length:	26 m	65 m
Beam trawl length:	4 m	4 m
Number of beams fished:	1	2
Number of beams sorted:	1	2
Trawl duration (min):	30	30
Tow speed (knots):	4	4
Codend stretched mesh (mm):	75 Liner: 40 mm	75 Liner: 40 mm
Number of ticklers:	0	0
Gear code:		BT4FM
Attachment:	*	*
Station positions:	fixed	random
Av No stns/yr	30	50
Benthos sampling since:	2016	2016

Annex 4.2: Inventory of the inshore beam trawl surveys.

Country	Netherlands (SNS)	Netherlands (DYFS)			UK (YFS)	Belgium (DYFS)
Geographical Area	Scheveningen (NL) to Esbjerg (DK)	Wadden Sea	Scheldt Estuary	Dutch coast to Danish coast	Eastern/Southeastern English Coast	Belgian Coast
Ship	Tridens / Isis	Stern / Waddenzee	Luctor ##	Isis / Beukels / WR17 / GO29	Chartered vessels	Simon Stevin #
ship size (m)	73m / 28m	21m / 21m	34m	± 28m	8–10m	36m
Date started	1969	1970	1970	1970	1973-2007 Ceased 2011	1970
Sampling Period	Apr/May ('69–'89) Sept/Oct	Apr/May ('70–'86) Sept/Oct	Apr/May ('70–'86) Sept/Oct	Apr/May ('70–'86) Sept/Oct	Sept/Oct	Sept/Oct
Usual Start date	12 Sept	29 Aug	5 Sept	26 Sept	1 Sept	1–14 Sept
Number of days per period	8–9 within 2 weeks	20 within 5 weeks	12 within 3 weeks	16 within 5 weeks	3 surveys x 8 days	7 within 2 weeks
Beam trawl type	6m beam trawl	3m shrimp trawl	3m shrimp trawl	6m shrimp trawl	2m shrimp trawl	6m shrimp trawl
Tickler Chains	4	1	1	1	3	0
Mesh size net	80mm	35mm	35mm	35mm	10mm	40mm
Mesh size codend	40mm	20mm	20mm	20mm	4mm	22mm
Speed fished	3.5–4 knots	3 knots	3 knots	3 knots	1 knot	3 knots
Time Fished	15 min	15 min	15 min	15 min	10 min	30 min
Approx. number of stations per year	55	120	80	100	82	33
Target species	0– 4 group sole and plaice	0–1 group sole and plaice	0–1 group sole and plaice	0–1 group sole and plaice	0–1 group sole and plaice	0–2 group sole and plaice
Catch rate and LF distribution	All fish species	All fish species *Crangon*	All fish species *Crangon*	All fish species *Crangon*	All fish species	Commercial fish species, *Crangon* (1973–92, 2004–05)
Catch rate	Epibenthos (quantity)	Epibenthos (quantity)	Epibenthos (quantity)	Epibenthos (quantity)	*Crangon* (volume)	*Crangon* (weight)
Age data for plaice and sole	All years	All years	All years	All years	Since 2003	None

 # Broodwinner (27 m) in 2013 replaiced by Simon Stevin; ## Schoolevaar (21 m) in 2016 replaiced by Luctor

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

Country	Germany (DYFS)		
Geographical Area	NiedersachsenWadden Sea +Elbe Estuary	Schleswig-Holstein Waddensea	Coastal Area outside the island chain
Ship	Chartered vessels	Chartered vessels	RV 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, offshore surveys.

a) Netherlands: sole (N.hr^-1/8m trawl) North Sea (4) RV "Isis".

Year/Age	0	1	2	3	4+
1985	0.00	7.03	7.12	3.69	2.62
1986	0.00	7.17	5.18	1.60	2.01
1987	0.04	6.97	12.55	1.83	1.68
1988	0.00	83.11	12.51	2.68	1.68
1989	0.49	9.01	68.08	4.19	5.23
1990	0.02	37.84	24.49	21.79	2.94
1991	0.82	4.03	28.84	6.87	6.91
1992	0.02	81.63	22.28	10.45	5.97
1993	0.02	6.35	42.35	1.34	15.31
1994	2.17	7.66	7.12	19.74	2.85
1995	0.43	28.13	8.46	6.27	7.42
1996	0.16	3.98	7.63	1.95	5.46
1997	0.54	169.34	4.92	2.99	2.06
1998	0.37	17.11	27.42	1.86	1.72
1999	6.34	11.96	18.36	15.78	3.95
2000	0.19	14.59	6.14	4.04	2.17
2001	9.20	8.00	9.96	2.16	2.55
2002	5.91	20.99	4.18	3.43	1.76
2003	0.32	10.51	9.95	2.46	2.56
2004	0.68	4.19	4.35	3.55	1.54
2005	0.08	5.53	3.40	2.38	1.78
2006	0.06	17.09	2.33	0.28	1.46
2007	0.71	7.50	19.50	1.46	1.48
2008	3.09	15.25	9.06	12.30	2.09
2009	4.91	15.95	5.00	2.86	5.52
2010	2.46	54.81	10.71	2.03	2.41
2011	2.23	26.17	17.39	4.01	2.88
2012	1.09	5.15	18.21	8.86	3.03
2013	0.38	6.84	3.56	12.57	6.74
2014	0.14	18.93	15.58	3.37	10.50
2015	0.20	21.10	25.60	9.66	8.15
2016	0.74	6.45	11.83	8.42	5.40

b) United Kingdom: sole (total numbers per km towed) Southern North Sea (4c).

Year/Age	0	1	2	3	4+
1996	1.75	41.02	41.66	22.79	32.28
1997	3	66.76	57.27	20.2	28.53
1998	5.5	9.42	53.46	16.5	14.63
1999	8	184.11	39.72	45.74	54.03
2000	3	162.5	160.74	12.85	44.41
2001	4	40.76	174.02	77.16	28.05
2002	1.87	117.85	44.64	30.73	32.65
2003	0	49.41	116.88	15.11	50.32
2004	0	0	0	0	0
2005	52.5	143.36	69.17	24.01	83.96
2006	7.25	145.3	55.42	15.82	58.46
2007	9.43	48.27	87.81	21.33	29.01
2008	1	103.36	54.6	47.19	35.26
2009	1.01	35.62	97.53	45.06	94
2010	1.6	72.07	58.93	17.7	45.98
2011	5.86	155.22	51.8	15.03	21.01
2012	0	38.71	128.17	40.64	30.86
2013	0	61.13	50.15	82.43	47.72
2014	10.71	69.12	112.74	17.8	44.27
2015	0	232.38	29.19	28.7	40.93
2016	2.67	22.94	113.55	12.01	35.6

c) United Kingdom: sole (N.hr^-1/8m trawl) Eastern Channel (7d)

Year/Age	0	1	2	3	4+
1989	0.16	3.01	22.09	4.62	4.40
1990	0.00	17.96	5.55	5.55	2.94
1991	0.00	12.14	31.17	3.19	4.65
1992	0.00	1.33	15.29	13.47	5.05
1993	0.00	0.82	22.96	11.42	13.77
1994	0.00	8.33	4.26	11.07	11.14
1995	0.06	5.89	16.09	2.22	8.64
1996	5.55	5.30	10.79	5.97	7.08
1997	0.06	24.75	10.85	4.42	5.19
1998	0.13	3.27	24.11	3.67	3.43
1999	2.56	35.99	8.22	11.33	5.05
2000	0.00	14.98	27.45	5.52	8.75
2001	1.27	10.19	27.88	11.55	6.84
2002	0.00	53.56	16.11	8.60	8.09
2003	0.00	11.03	45.65	5.87	7.44
2004	0.00	12.67	11.81	10.97	7.63
2005	0.00	43.27	6.91	3.50	9.72
2006	0.00	10.84	42.62	4.51	7.35
2007	0.00	2.57	28.97	15.45	5.80

Year/Age	0	1	2	3	4+
2008	0.00	3.77	7.35	9.14	8.15
2009	0.00	51.25	19.16	7.10	13.06
2010	0.00	16.59	30.76	5.14	8.29
2011	0.00	13.66	28.60	14.70	6.14
2012	0.00	1.75	9.72	7.51	6.99
2013	0.00	0.72	8.91	15.09	16.41
2014	0.45	25.39	16.35	12.38	22.04
2015	0.00	25.24	21.36	6.04	11.96
2016	0.00	10.17	33.14	11.17	12.84

d) United Kingdom: sole (total numbers for 2*4m beam trawl) Western Channel (7e).

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
2014	Survey discontinued										

e) United Kingdom: sole (total numbers for 4m beam trawl) Bristol Channel (7f).

Year/Age	0	1	2	3	4+
1995	26.57	123.88	222.1	51.99	36.4
1996	2.55	150.29	211.4	53.56	40.6
1997	32.04	433.35	180.47	17.93	39.23
1998	90.29	770.05	411.18	50.9	33.71
1999	24.38	2464.28	250.2	32.05	35.47
2000	13.17	915.67	1355.65	30.83	34.36
2001	22.3	378.72	599.32	258.58	41.99
2002	7.75	662.7	238.33	127.23	127.68
2003	11.83	392.36	529.52	46.78	86.43
2004	55.7	748.87	377.4	86.6	79.58
2005	37.17	342.92	224.96	31.87	40.65
2006	10.73	273.36	200.5	39.29	32.73
2007	91.26	357.35	108.04	42.75	46.23
2008	5.1	1038.53	104.26	12.68	45.41
2009	0.84	509.45	317.75	24.17	32.88
2010	17.84	85.08	470.57	121.81	41.29
2011	17.32	501.31	52.26	138.64	92.04
2012	13.19	542.01	230.89	7.2	90.03
2013	9.39	278.96	517.91	43.35	64.62
2014	33.83	243.96	257.6	76.27	52.34
2015	27.61	746.63	48.35	44.19	64.29
2016	25.95	573.51	359.34	11.61	65.04

f) United Kingdom: sole (total numbers for 4m beam trawl) Irish Sea (7a).

Year/Age	0	1	2	3	4+
1995	18.8	195.2	122.32	200.46	199.97
1996	3.34	703.15	100.07	25.2	155.99
1997	4.02	919.09	458.01	56.9	132.89
1998	1.59	427.83	568.26	231.5	82.73
1999	2.65	305.21	232.92	202.38	235.23
2000	0	281.1	368.16	116.44	292.47
2001	0.79	72.31	225.42	152.36	203.9
2002	0	162.88	48.56	95.92	253.8
2003	0	192.12	166.5	40.81	238.33
2004	0	322.44	190.81	94.45	187.92
2005	0	43.42	135	56.07	102.31
2006	0	84.53	86.95	71.14	119.81
2007	0	99.1	73.48	39.17	120.38
2008	0	102.96	103.08	49.22	98.96
2009	0	47.49	118.89	54.17	99.48
2010	0	20.28	47.43	58.45	66.74
2011	0	72.28	28.48	50.75	122.48
2012	0	17.75	39.16	12.93	92.4
2013	6.49	59.47	45.06	28.64	89.4
2014	15.01	136.53	33.73	17.17	102.8
2015	0	334.1	119.32	32.88	94.32
2016	0	105.88	296.63	74.39	96.28

Annex 5.2: Tables of catch rate of plaice. offshore surveys.

a) Netherlands: plaice (N.hr^-1/8m trawl) North Sea (4) RV "Isis".

Year/Age	0	1	2	3	4	5	6	7	8	9	10+
1985	595,27	136,76	173,89	36,06	11,00	1,27	0,97	0,34	0,15	0,09	0,23
1986	9,30	667,44	131,70	50,17	9,21	3,78	0,40	0,42	0,15	0,07	0,19
1987	44,13	225,82	764,19	33,84	4,88	1,84	0,61	0,25	0,13	0,08	0,19
1988	29,62	680,17	146,99	182,31	9,99	2,81	0,81	0,46	0,04	0,11	0,25
1989	31,86	467,88	319,27	38,66	47,30	5,85	0,83	0,31	0,66	0,13	0,07
1990	27,00	185,34	146,07	79,34	26,35	5,47	0,76	0,19	0,38	0,24	0,20
1991	152,18	291,38	159,42	33,96	13,57	4,31	5,66	0,24	0,20	0,09	0,11
1992	26,81	360,89	174,53	29,25	5,96	3,75	2,87	1,19	0,35	0,05	0,09
1993	74,27	188,99	283,40	62,78	8,27	1,13	1,13	0,58	0,46	0,15	0,07
1994	284,48	193,26	77,14	34,46	10,59	2,67	0,60	0,80	0,90	0,37	0,03
1995	108,10	265,63	40,62	13,22	7,53	1,11	0,81	0,33	1,05	0,20	0,12
1996	222,51	310,29	206,88	21,47	4,47	3,13	0,84	0,04	0,16	0,12	0,11
1997	65,52	1046,84	59,24	17,18	2,67	0,26	0,36	0,16	0,11	0,00	0,03
1998	255,65	347,58	402,66	44,96	8,29	1,22	0,34	0,15	0,21	0,07	0,08
1999	257,56	293,25	121,55	171,25	3,39	1,96	0,13	0,13	0,03	0,03	0,08
2000	209,29	267,47	69,25	29,35	22,36	0,57	0,16	0,50	0,03	0,01	0,05
2001	807,93	206,53	72,24	17,84	9,17	8,72	0,27	0,13	0,04	0,04	0,17
2002	248,36	519,22	44,48	14,90	4,99	2,54	1,32	0,08	0,13	0,00	0,09
2003	225,62	132,75	159,12	10,06	5,55	1,43	1,13	0,64	0,11	0,10	0,02
2004	197,94	233,71	39,62	61,91	6,15	2,46	1,49	0,95	2,84	0,00	0,01
2005	270,77	163,05	66,18	6,76	12,79	1,08	1,16	0,29	0,15	0,49	0,04
2006	250,80	128,61	36,38	18,11	2,98	5,89	0,87	0,76	0,04	0,27	0,39
2007	298,09	312,00	67,17	19,71	14,42	2,94	6,09	0,68	0,83	0,16	0,65
2008	387,59	221,57	120,73	30,11	9,08	7,20	0,62	1,72	0,29	0,23	1,05
2009	555,47	408,99	105,22	45,98	13,01	4,03	3,47	0,57	2,13	0,28	0,93
2010	814,36	261,10	84,25	34,24	20,18	4,66	2,16	3,46	0,21	2,55	1,23
2011	323,43	486,16	148,22	55,31	20,06	12,90	3,95	2,24	2,26	0,23	0,91
2012	454,62	241,84	191,50	58,07	20,90	12,64	5,59	1,79	0,49	1,69	0,79
2013	336,30	449,77	113,18	90,49	27,00	10,64	5,82	1,50	1,52	1,08	1,94
2014	138,25	360,29	145,34	82,28	39,50	22,38	8,48	2,54	2,55	1,66	1,62
2015	139,93	267,28	239,65	84,42	30,28	30,42	11,09	4,05	2,39	1,71	1,91
2016	549,77	227,77	79,42	67,81	30,97	24,77	12,31	8,46	2,67	1,12	3,63

b) Netherlands: plaice (N.hr^-1/8m trawl) North Sea (4) RV "Tridens"

Year/Age	0	1	2	3	4	5	6	7	8	9	10+
1996	0.00	1.64	6.02	4.45	2.90	2.04	1.57	0.72	0.42	0.19	0.47
1997	0.00	0.22	7.12	9.13	3.25	2.11	1.52	0.40	0.82	0.35	0.43
1998	0.00	0.23	32.25	9.57	4.87	2.20	1.27	0.93	0.76	0.30	0.54
1999	0.05	2.69	7.71	35.23	5.56	2.50	1.93	0.63	0.76	0.31	0.33
2000	0.04	4.79	13.44	12.91	16.96	2.88	1.72	0.93	0.81	0.22	0.53
2001	0.18	2.15	8.61	9.90	6.68	7.36	1.06	0.59	0.42	0.51	0.54
2002	0.00	18.55	12.91	9.54	6.41	4.18	4.42	0.74	0.74	0.39	0.93
2003	0.34	3.98	41.69	13.38	9.06	5.08	2.81	3.92	0.70	0.74	1.56
2004	0.01	5.98	15.78	31.49	9.43	4.32	2.44	1.24	2.50	0.41	1.41
2005	0.04	6.88	23.37	12.23	17.67	2.82	6.87	1.56	0.57	3.57	2.48
2006	0.24	6.73	32.19	25.73	11.37	10.92	1.99	3.90	0.86	0.72	3.26
2007	0.00	26.57	23.74	19.55	23.17	4.90	10.15	1.97	3.79	0.32	5.47
2008	0.00	17.47	50.46	25.59	18.39	18.97	6.24	12.75	2.66	6.75	8.41
2009	0.12	12.11	41.68	43.33	19.13	12.05	11.77	3.08	10.12	1.57	8.03
2010	0.64	26.18	35.72	34.56	30.09	13.41	5.70	12.23	2.74	6.36	7.71
2011	0.17	41.88	71.48	41.59	28.46	31.67	14.28	5.50	11.88	1.17	12.89
2012	0.00	12.99	87.81	65.99	32.01	19.32	16.04	7.15	3.63	8.63	8.99
2013	0.00	15.06	48.68	63.14	39.97	25.03	14.23	10.97	4.24	2.96	12.47
2014	0.19	23.72	74.41	60.68	48.55	30.20	13.07	9.83	6.03	7.13	13.24
2015	0.00	11.01	67.41	73.77	48.30	41.66	23.01	8.76	6.46	7.07	15.77
2016	0.28	17.12	40.53	72.33	45.16	26.00	19.98	14.18	6.32	5.98	13.61

c) Netherlands: plaice (N.hr^-1/8m trawl) North Sea (4) Combined with gear correction (RV "Isis" and RV "Tridens").

Year/Age	0	1	2	3	4	5	6	7	8	9	10+
1996	102.14	143.90	99.62	13.28	3.49	2.47	1.22	0.47	0.32	0.16	0.32
1997	24.19	386.84	28.68	14.89	3.01	1.39	1.07	0.30	0.54	0.22	0.28
1998	96.33	131.19	177.63	25.46	5.74	1.79	0.94	0.65	0.56	0.22	0.37
1999	100.26	116.99	53.60	96.35	4.74	2.24	1.30	0.45	0.51	0.21	0.25
2000	81.46	108.39	38.89	22.88	18.47	2.08	1.17	0.81	0.53	0.15	0.36
2001	297.38	80.30	39.79	15.69	6.85	7.12	0.75	0.43	0.28	0.34	0.42
2002	87.79	217.28	26.71	14.03	5.64	3.48	3.25	0.51	0.52	0.26	0.64
2003	87.99	53.58	94.43	15.86	7.52	3.74	2.19	2.75	0.50	0.52	1.02
2004	80.36	101.41	30.31	51.22	8.17	3.62	2.12	1.15	2.63	0.26	0.90
2005	106.92	70.84	45.65	13.81	15.24	2.18	4.79	1.09	0.40	2.46	1.64
2006	97.99	54.86	42.92	29.19	8.18	8.70	1.50	2.71	0.57	0.54	2.22
2007	115.92	139.39	44.43	24.59	19.29	4.11	8.45	1.47	2.72	0.26	3.78
2008	143.96	98.91	89.74	33.84	14.87	14.55	4.29	8.90	1.85	4.50	5.87
2009	219.27	170.84	76.53	54.06	15.65	9.01	8.51	2.16	7.06	1.08	5.39
2010	326.44	144.79	69.54	47.94	31.17	13.79	5.07	12.01	2.31	6.20	6.31
2011	120.52	226.46	125.99	58.14	24.20	23.62	10.62	4.13	8.24	0.77	8.66
2012	178.35	118.44	149.63	79.76	26.66	16.43	11.64	5.01	2.43	6.01	6.21
2013	132.57	192.77	90.45	90.34	34.15	19.59	10.89	7.68	3.18	2.27	8.71
2014	50.41	155.22	123.19	83.28	43.05	25.39	10.79	7.30	4.67	5.22	9.32
2015	54.65	116.49	156.63	102.48	42.19	36.39	18.30	6.94	5.00	5.11	10.95
2016	214.64	111.87	68.79	89.45	38.77	23.94	16.28	11.10	4.90	4.26	9.97

d) United Kingdom: plaice (total numbers per km towed) Southern North Sea (4c)

Year/Age	0	1	2	3	4	5	6	7	8	9	10+
1996	6.50	14.00	4.00	0.50	0.25	0.25	0.25	0.00	0.00	0.00	0.00
1997	0.25	12.13	2.13	1.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00
1998	0.75	0.25	13.25	2.25	0.50	0.00	0.00	0.00	0.00	0.00	0.00
1999	1.63	24.73	2.27	3.88	0.50	0.00	0.00	0.00	0.00	0.25	0.00
2000	13.75	25.63	4.46	0.25	2.58	0.33	0.00	0.00	0.00	0.00	0.00
2001	24.50	47.59	22.91	0.50	0.50	0.25	0.00	0.00	0.25	0.00	0.00
2002	1.07	42.67	1.87	1.07	0.00	0.00	0.27	0.00	0.00	0.00	0.00
2003	2.93	12.13	12.13	0.53	0.27	0.27	0.00	0.53	0.00	0.27	0.00
2004											
2005	0.00	14.72	9.28	0.50	0.00	0.00	0.00	0.00	0.00	0.50	0.00
2006	1.50	16.83	1.42	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2007	0.43	16.39	3.46	0.43	0.29	0.00	0.29	0.00	0.00	0.00	0.00
2008	0.25	20.60	3.56	0.50	0.00	0.25	0.25	0.00	0.00	0.00	0.00
2009	2.46	13.98	3.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2010	4.53	17.72	3.96	0.58	0.27	0.00	0.00	0.00	0.00	0.00	0.00
2011	9.14	35.41	7.67	1.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2012	0.53	9.70	8.83	1.91	0.80	0.00	0.53	0.00	0.00	0.00	0.00
2013	10.40	16.78	2.87	1.40	1.07	0.27	0.00	0.00	0.00	0.00	0.00
2014	1.14	26.77	3.69	0.36	0.79	0.29	0.00	0.00	0.00	0.00	0.00

2015	3.56	7.24	6.23	2.30	0.27	1.07	0.27	0.00	0.00	0.00	0.00
2016	1.33	10.02	6.13	5.73	0.27	0.27	0.80	0.00	0.00	0.00	0.00

e) United Kingdom: plaice (N.hr^-1/8m trawl) Eastern Channel (7d).

Year/Age	0	1	2	3	4	5	6	7	8	9	10+
1989	4.39	3.79	15.84	28.93	31.66	4.00	1.72	1.65	0.63	0.31	1.75
1990	1.30	9.24	9.39	11.13	11.73	12.59	1.53	0.96	1.23	1.02	0.63
1991	0.00	16.80	14.53	11.47	8.68	8.64	4.60	1.83	1.08	0.11	1.14
1992	0.00	22.37	21.31	6.60	6.64	7.17	5.41	3.20	0.54	0.28	0.79
1993	0.00	4.59	20.18	7.99	2.79	2.87	2.38	3.05	3.42	0.62	0.65
1994	0.20	9.35	8.54	10.07	5.95	1.98	0.61	0.97	1.73	1.78	0.80
1995	0.00	14.48	6.24	3.80	5.68	2.22	0.75	0.75	1.48	1.17	1.36
1996	24.14	22.09	17.26	1.73	1.03	2.00	1.29	0.57	0.38	0.66	4.13
1997	0.98	48.17	28.55	10.97	1.25	1.57	0.51	0.56	0.36	0.20	1.84
1998	43.19	30.59	37.93	12.06	4.98	0.63	0.60	0.65	0.32	0.30	2.03
1999	1.38	12.82	10.67	28.77	4.62	1.61	0.31	0.19	0.26	0.13	1.01
2000	1.59	19.53	30.19	18.75	20.47	4.99	1.27	0.73	0.38	0.44	2.04
2001	2.73	27.90	20.27	14.12	9.82	14.84	2.74	0.78	0.45	0.32	1.79
2002	1.31	37.86	25.86	12.51	5.46	2.62	5.28	0.98	0.20	0.17	0.90
2003	3.20	10.62	39.70	9.81	4.42	2.28	1.14	2.67	0.81	0.20	0.47
2004	15.97	52.93	22.48	20.72	4.75	1.15	0.26	0.84	1.27	0.23	0.55
2005	0.34	15.62	36.18	12.80	10.04	3.19	1.07	0.64	0.43	0.99	0.98
2006	5.58	30.06	28.85	16.80	5.94	4.27	1.31	1.08	0.59	0.33	0.94
2007	0.23	53.11	28.90	12.17	6.21	3.17	2.90	0.82	0.59	0.19	1.59
2008	0.13	39.58	40.58	10.51	4.29	3.84	1.80	0.90	0.67	0.16	0.39
2009	8.76	77.73	39.53	20.92	5.87	3.23	2.27	0.77	1.30	0.33	1.19
2010	1.36	64.24	64.70	17.74	9.15	3.12	1.72	1.27	0.18	0.35	0.99
2011	12.30	115.07	112.22	39.55	10.28	7.00	2.85	1.09	0.34	0.70	1.05
2012	0.00	24.69	81.10	55.98	18.65	4.24	3.30	1.06	0.90	0.66	0.95
2013	0.22	32.26	61.02	88.19	45.04	10.24	3.41	1.13	1.08	0.13	0.92
2014	0.52	145.33	156.47	50.67	62.13	26.75	8.95	1.96	1.82	0.92	1.20
2015	0.00	37.99	178.70	63.19	30.15	33.42	15.69	3.30	1.21	0.27	0.44
2016	3.98	12.53	101.41	102.92	37.87	21.26	23.17	11.29	2.86	0.64	0.59

f) United Kingdom: plaice (total numbers for 2*4m beam trawl) Western Channel (7e).

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
2014	Survey discontinued										

g) United Kingdom: plaice (total numbers for 4m beam trawl) Bristol Channel (7f).

Year/Age	0	1	2	3	4	5	6	7	8	9	10+
1995	1.02	239.59	90.48	17.23	2.96	6.84	1.54	0.00	0.00	1.70	0.00
1996	8.10	223.69	288.11	30.78	0.99	2.62	0.80	0.00	0.00	0.00	0.00
1997	6.96	225.37	102.14	34.54	4.25	1.77	1.67	0.86	0.00	0.00	0.00
1998	4.98	237.20	126.22	46.99	8.92	2.00	0.97	0.00	0.00	0.00	0.92
1999	162.19	152.59	79.62	29.03	19.67	7.00	0.00	0.00	1.69	0.00	0.00
2000	84.73	339.63	63.17	31.25	6.56	5.50	0.00	0.89	0.00	0.00	0.00
2001	35.56	211.44	156.14	15.81	8.74	4.23	3.39	1.65	0.00	0.00	0.00
2002	0.94	136.74	175.12	80.45	5.93	6.13	2.03	3.52	0.84	0.00	0.00
2003	60.73	98.37	80.48	60.95	21.83	2.72	1.73	0.84	0.89	1.83	0.00
2004	163.87	258.51	33.41	27.08	13.42	2.19	0.96	0.96	2.48	0.00	1.94
2005	2.59	192.50	75.22	20.87	8.06	10.93	2.51	0.80	0.00	0.00	0.84
2006	80.54	85.78	101.97	34.16	9.57	1.79	9.03	0.00	2.48	0.79	0.00
2007	34.83	150.40	92.25	47.26	15.11	1.67	2.51	0.84	1.67	0.83	0.00
2008	6.27	140.69	217.04	46.79	15.70	4.82	0.82	2.49	0.00	0.00	0.84
2009	186.33	161.81	55.96	78.58	21.45	10.89	4.09	1.59	0.00	0.83	0.00
2010	143.24	331.76	88.54	26.41	39.94	6.68	4.29	0.88	0.00	0.83	1.77
2011	8.28	362.26	300.14	55.04	21.86	21.37	13.99	2.56	2.58	0.85	0.00
2012	17.28	142.13	430.79	100.57	22.36	9.02	12.53	4.94	0.83	0.00	0.00
2013	63.52	329.79	139.06	185.39	46.85	5.77	3.88	7.91	2.80	1.30	0.00
2014	0.00	371.76	202.30	64.65	105.70	23.80	1.79	2.91	1.69	1.68	1.68
2015	19.39	28.36	454.08	162.34	52.37	76.66	48.06	15.23	8.34	3.73	4.33
2016	0.00	12.52	163.10	268.26	102.30	27.50	33.05	16.22	5.97	1.02	1.30

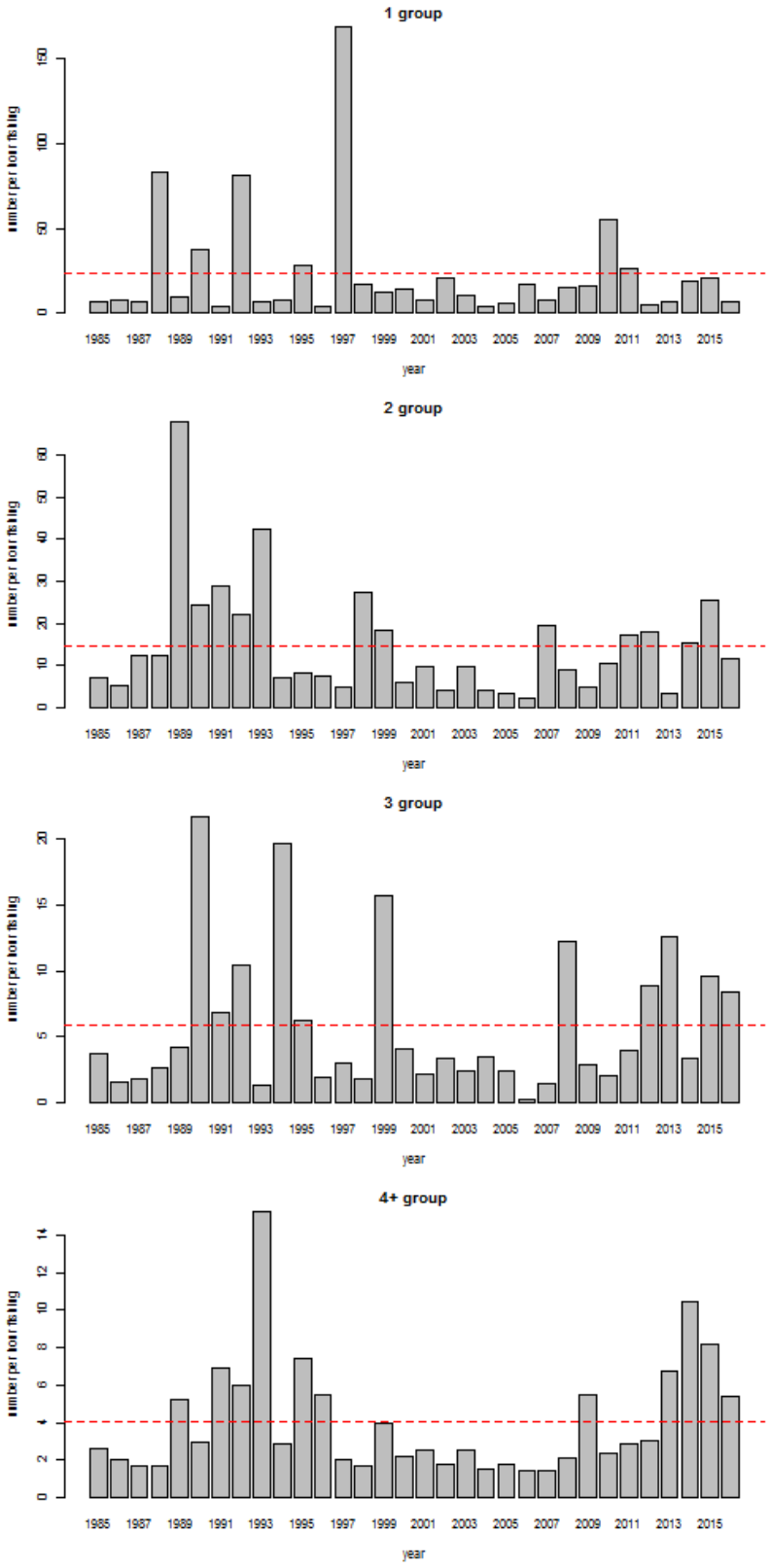
h) United Kingdom: plaice (total numbers for 4m beam trawl) Irish Sea (7a).

Year/Age	0	1	2	3	4	5	6	7	8	9	10+
1995	210.82	1018.39	307.43	142.05	66.34	12.63	13.95	0	0.84	2.4	6.67
1996	82.96	1349.92	476.84	98.11	58.74	38.86	7.47	8.6	0.88	1.72	6.66
1997	24.72	1081.33	529.88	255.42	51.5	39.5	17.98	6.54	5.87	0	5.34
1998	134.39	926.42	608.71	168.31	75.55	27.03	17.95	10.95	2.3	0.76	5.42
1999	142.92	943.45	765.83	273.12	89.33	30.34	13.34	5.76	5.7	3.4	0
2000	104.9	1676.41	523.23	236.12	111.86	57.83	17.43	5.33	2.74	2.55	4.19
2001	197.99	1165.38	526.08	172.91	103.5	70.93	22.21	8.32	5.53	4.55	3.19
2002	12.68	1376.5	1281.68	513.25	192.97	62.48	40.13	12.61	13.42	4.1	5.23
2003	204.92	1174.77	1461.85	656.39	234.76	96.68	49.19	31.07	7.79	3.3	3.45
2004	172.84	1440.89	942.24	939.96	320.48	207.17	45.47	45.5	10.93	2.95	2.63
2005	235.77	710.26	1058.72	544.84	407.78	242.61	90.74	14.09	13.79	7.18	8.7
2006	384.75	888.82	666.27	572.61	326.36	140.61	65.48	46.43	12.83	11.52	4.75
2007	147.46	2116.25	996.39	416.47	331.17	155.34	75.26	35.76	29.36	5.04	7.56
2008	359.35	1057.52	1553.72	506.4	277.59	199.17	62	44.94	26.82	3.71	0
2009	119.22	1158.79	859.37	971.88	246.11	149.9	198.39	51.77	24.63	16.09	10.41
2010	400.61	1446.78	1121.35	531.83	400.57	145.99	123.21	77.64	47.71	20.04	17.49
2011	186.43	1772.79	1177.06	528.14	265.08	310.05	111.89	98.74	71.49	50.12	52.38
2012	278.22	1540.8	1463.84	524.32	247.23	125.07	115.32	98.29	57.25	70.32	56.09
2013	542.38	1185.15	1318.8	771.94	460.05	298.41	119.9	128.14	65.36	71.58	51.99
2014	100.77	2192.82	1737.55	731.08	601.97	262.65	203.56	151.59	62.76	23.12	60.88
2015	67.48	893.81	2058.32	574.21	440.06	273.1	209.29	94.12	56.2	48.02	95.38
2016	49.89	446.83	1412.71	1047.38	646.17	400.93	219.72	239.91	127.28	61.49	103.46

i) Iceland: plaice (N.hr^-1/4m trawl)

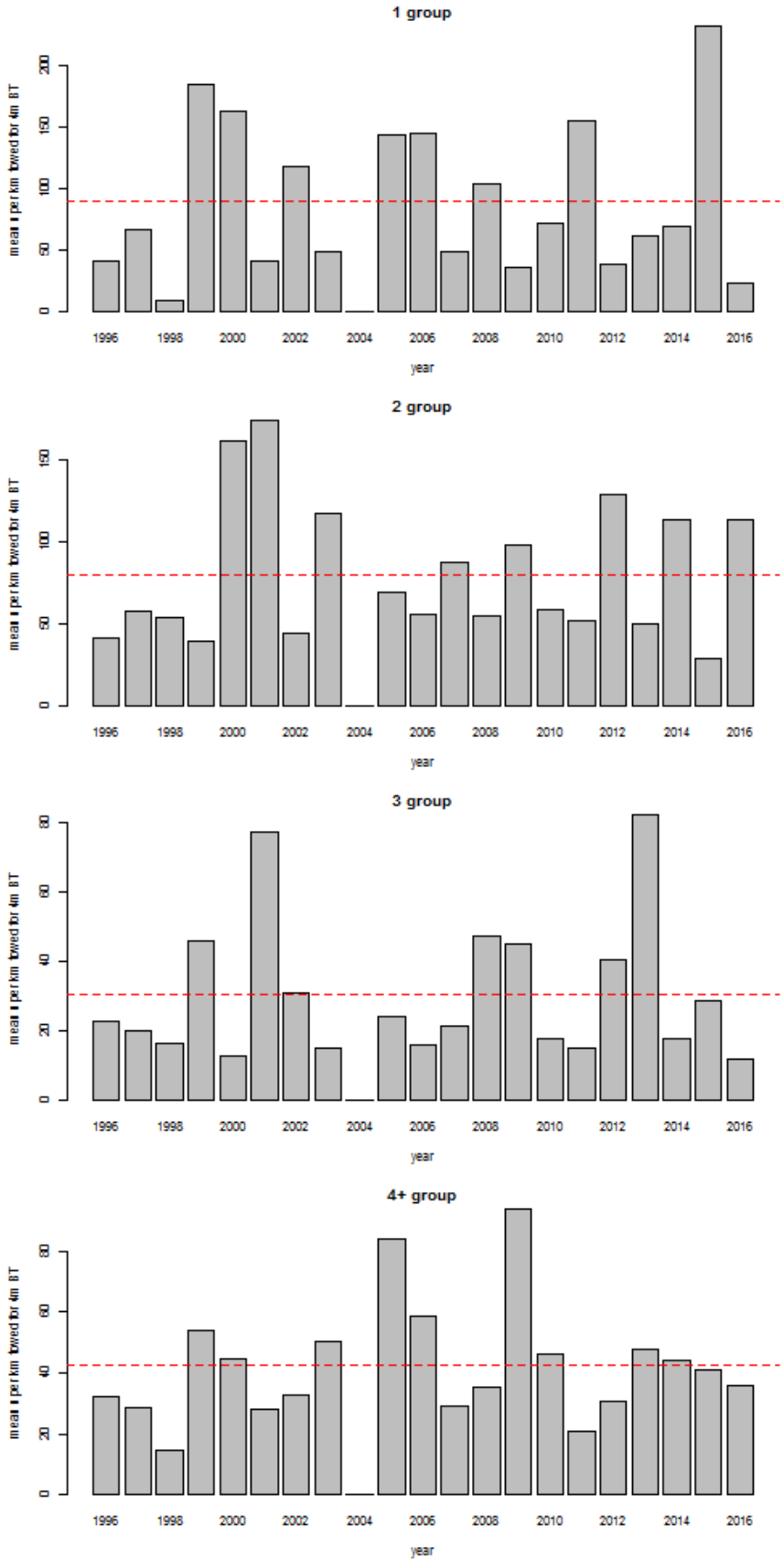
Year/Age	0	1	2	3	4	5	6	7	8	9	10+
2016	3.19	30.84	37.22	36.16	36.16	20.21	12.76	6.38	6.38	6.38	16.03

Annex 5.3: Figures of catch rate of sole. offshore surveys



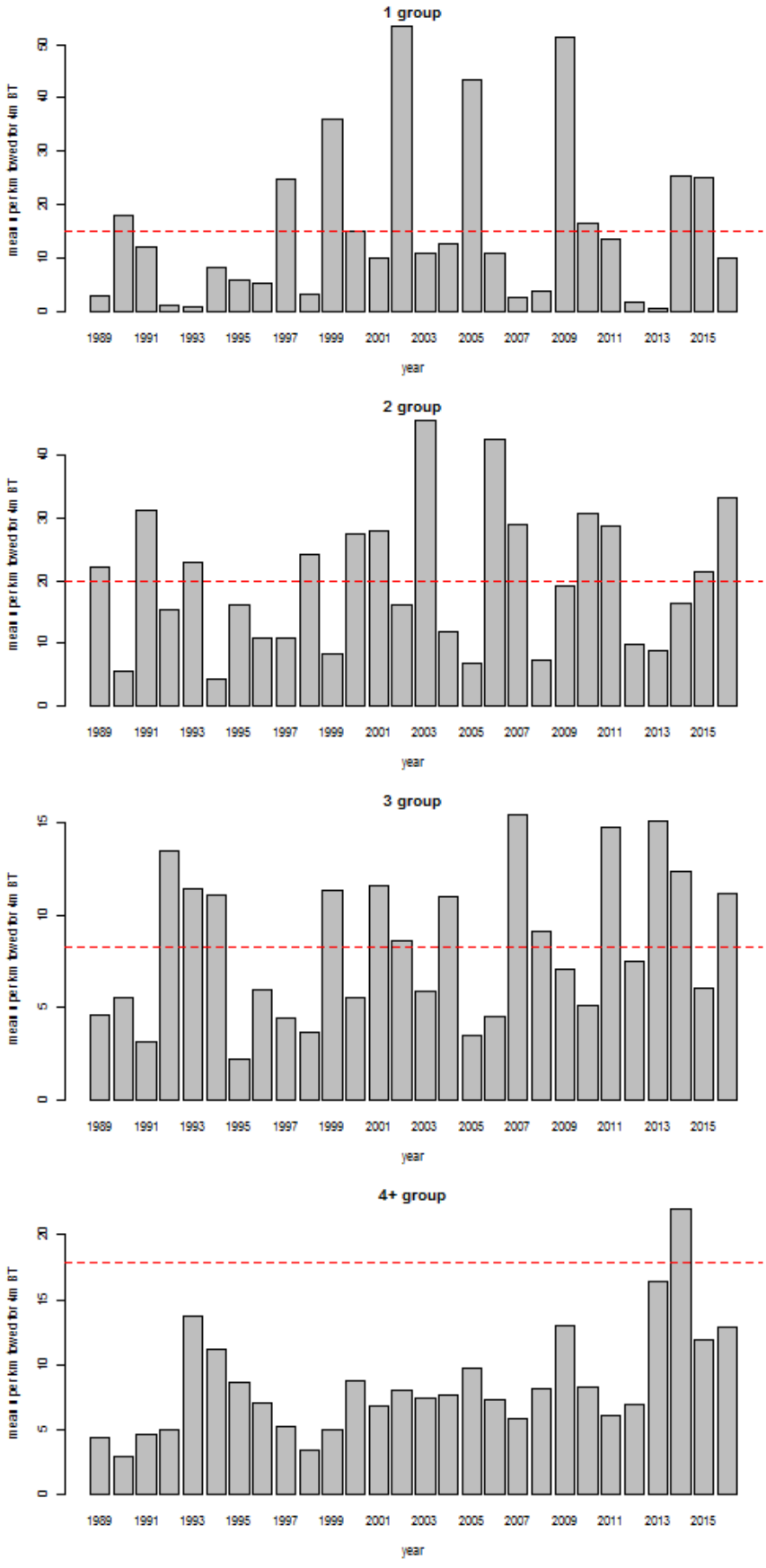
a) Netherlands: sole (N.hr^-1/8m trawl) North Sea (4) RV "Isis"

Figure 5.1.1.1. Catch rate of sole. offshore surveys. (Horizontal line=long-term mean for the period presented).



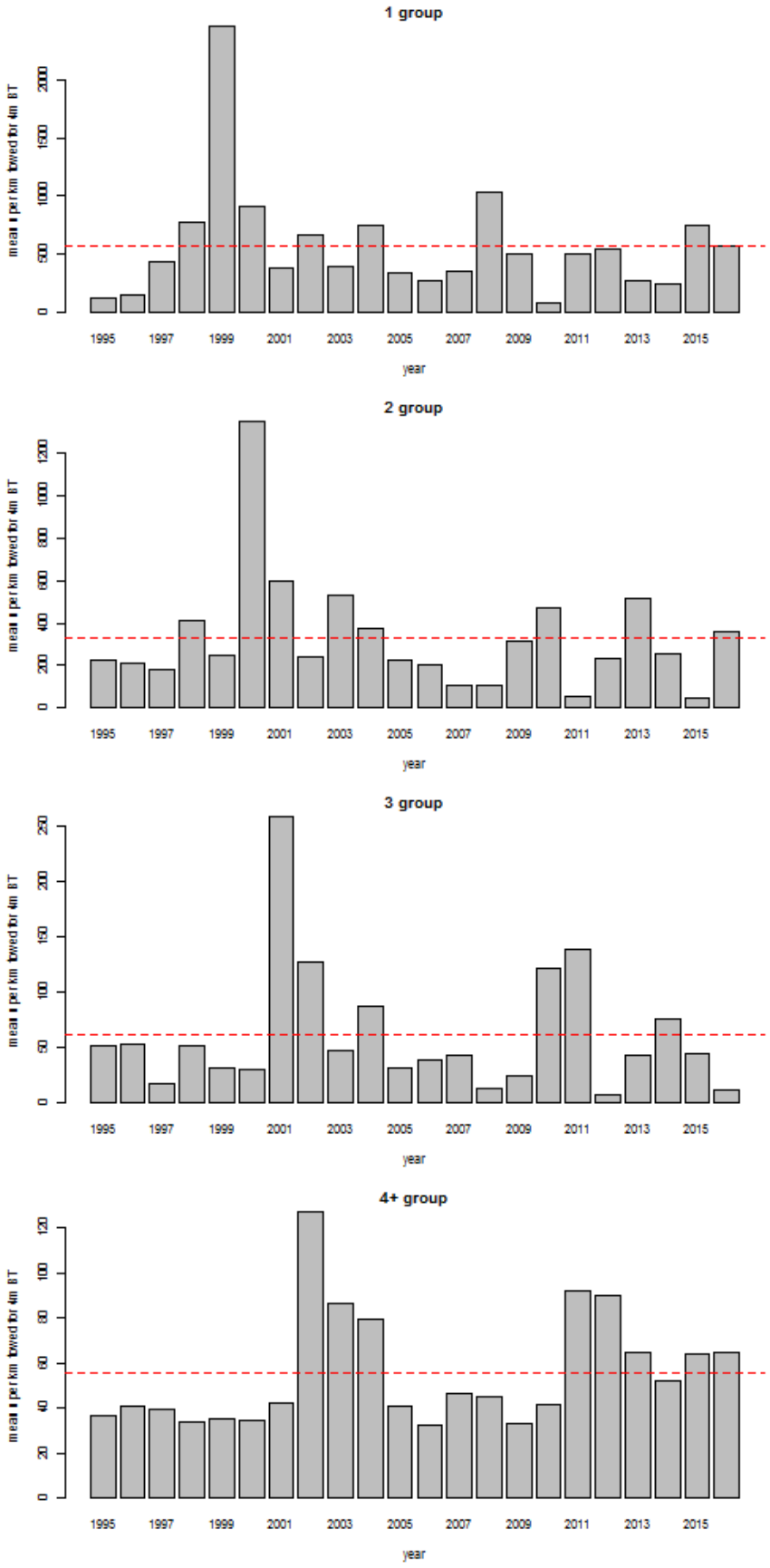
b) b)UK: sole (mean numbers per km towed for 4m beam trawl) Southern North Sea (4c)

Figure 5.1.1.1. Continued



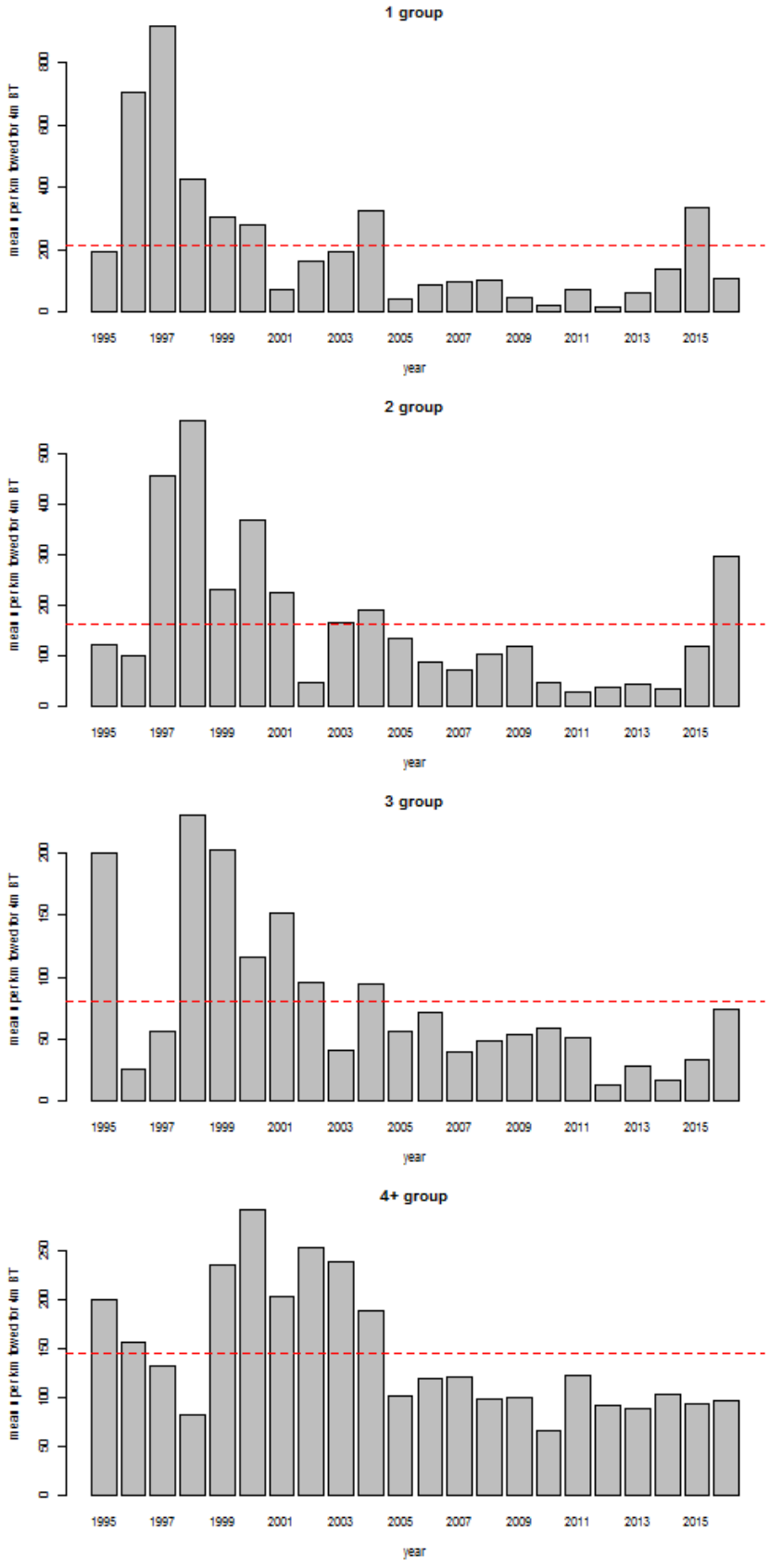
c) UK: sole (N.hr^-1/8m beam) Eastern English Channel (7d)

Figure 5.1.1.1. Continued



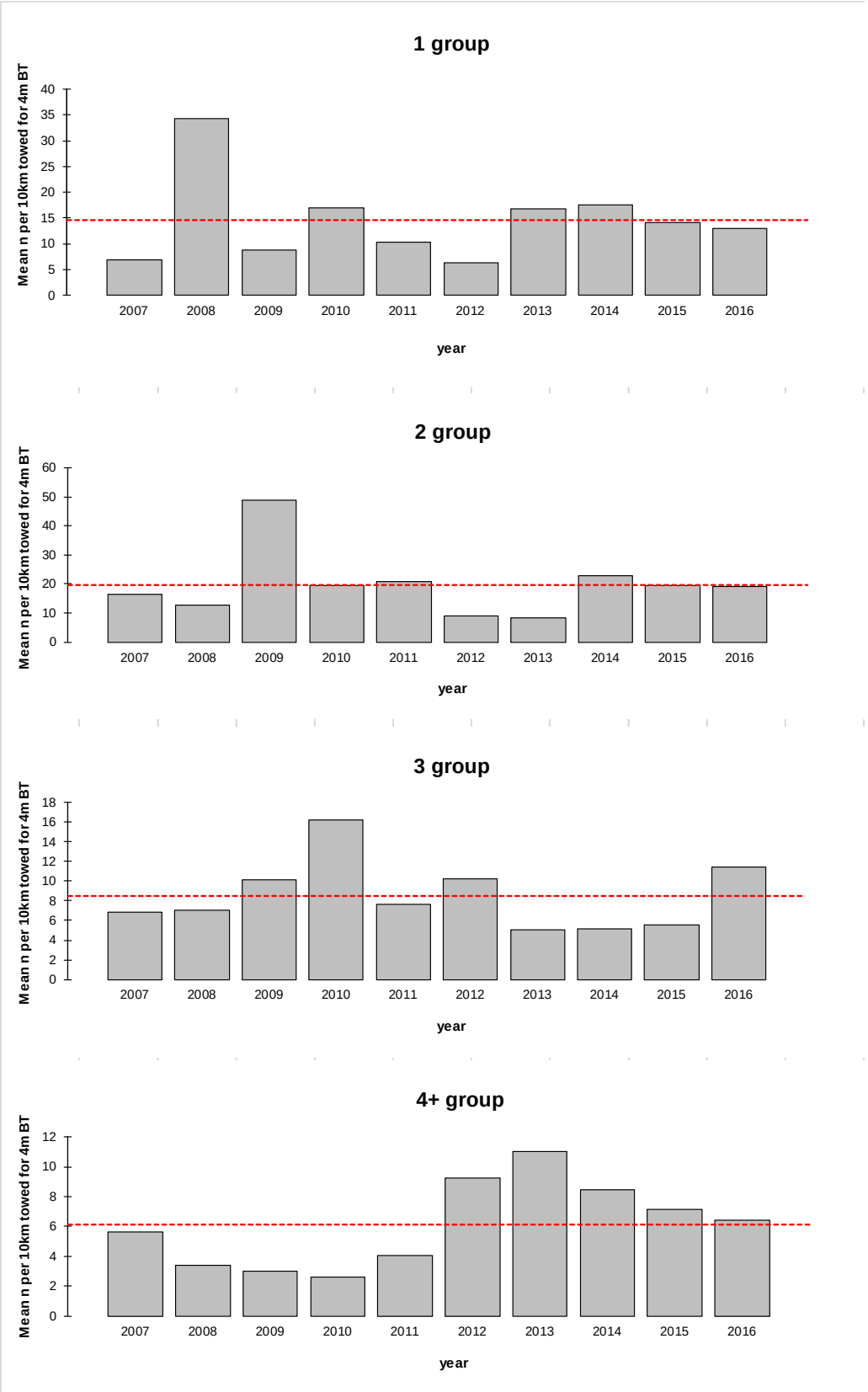
d) UK: sole (mean numbers per km towed for 4m beam trawl) Bristol Channel (7f)

Figure 5.1.1.1. Continued



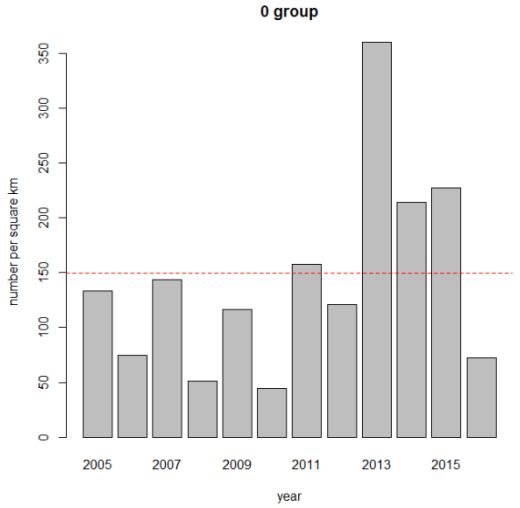
e) UK: sole (mean numbers per km towed for 4m beam trawl) Eastern Irish Sea (7a)

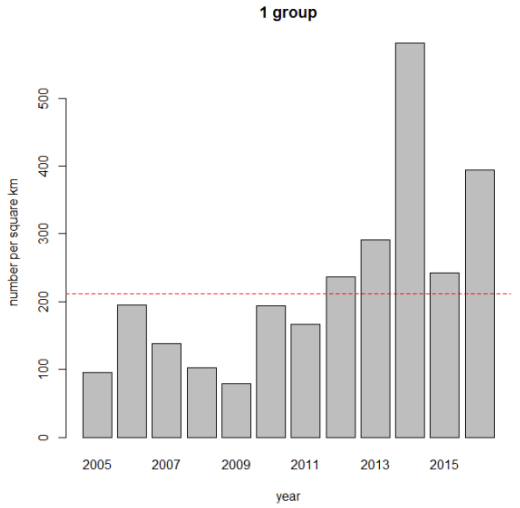
Figure 5.1.1.1. Continued

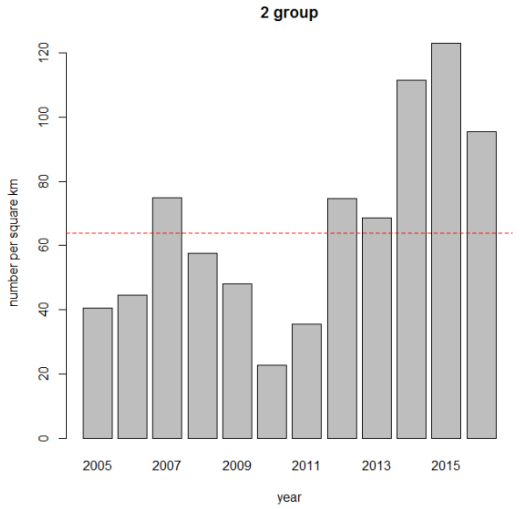


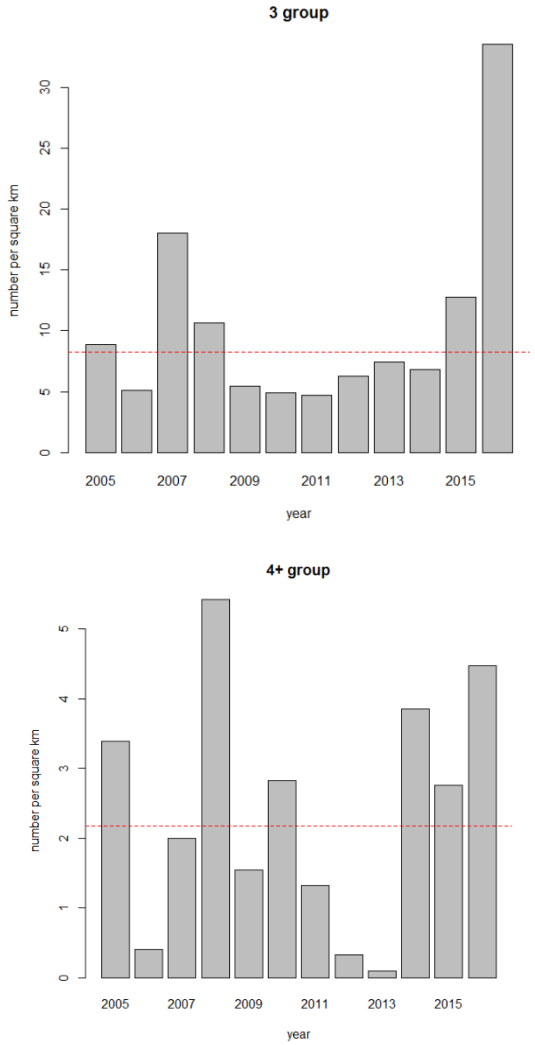
f) France: Catch rate of sole from French survey in the Bay of Biscay. (mean numbers per 10km towed for 4m beam trawl; Horizontal line=long-term mean for the period presented).

Figure 5.1.1.1. Continued


0 group
number per square km
0
50
100
150
200
250
300
350
2005
2007
2009
2011
2013
2015
year


1 group
number per square km
0
100
200
300
400
500
2005
2007
2009
2011
2013
2015
year

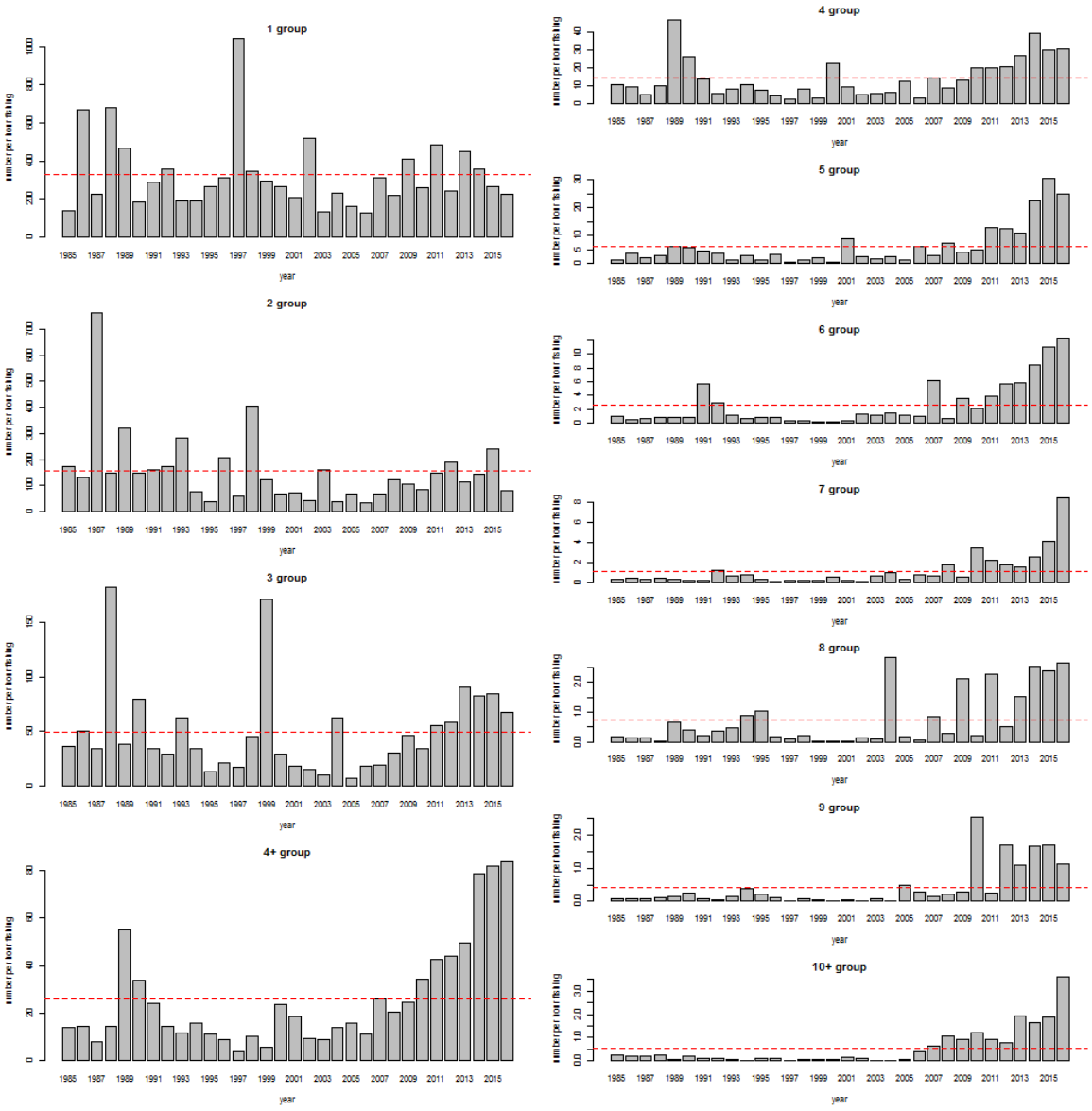

2 group
number per square km
0
20
40
60
80
100
120
2005
2007
2009
2011
2013
2015
year



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

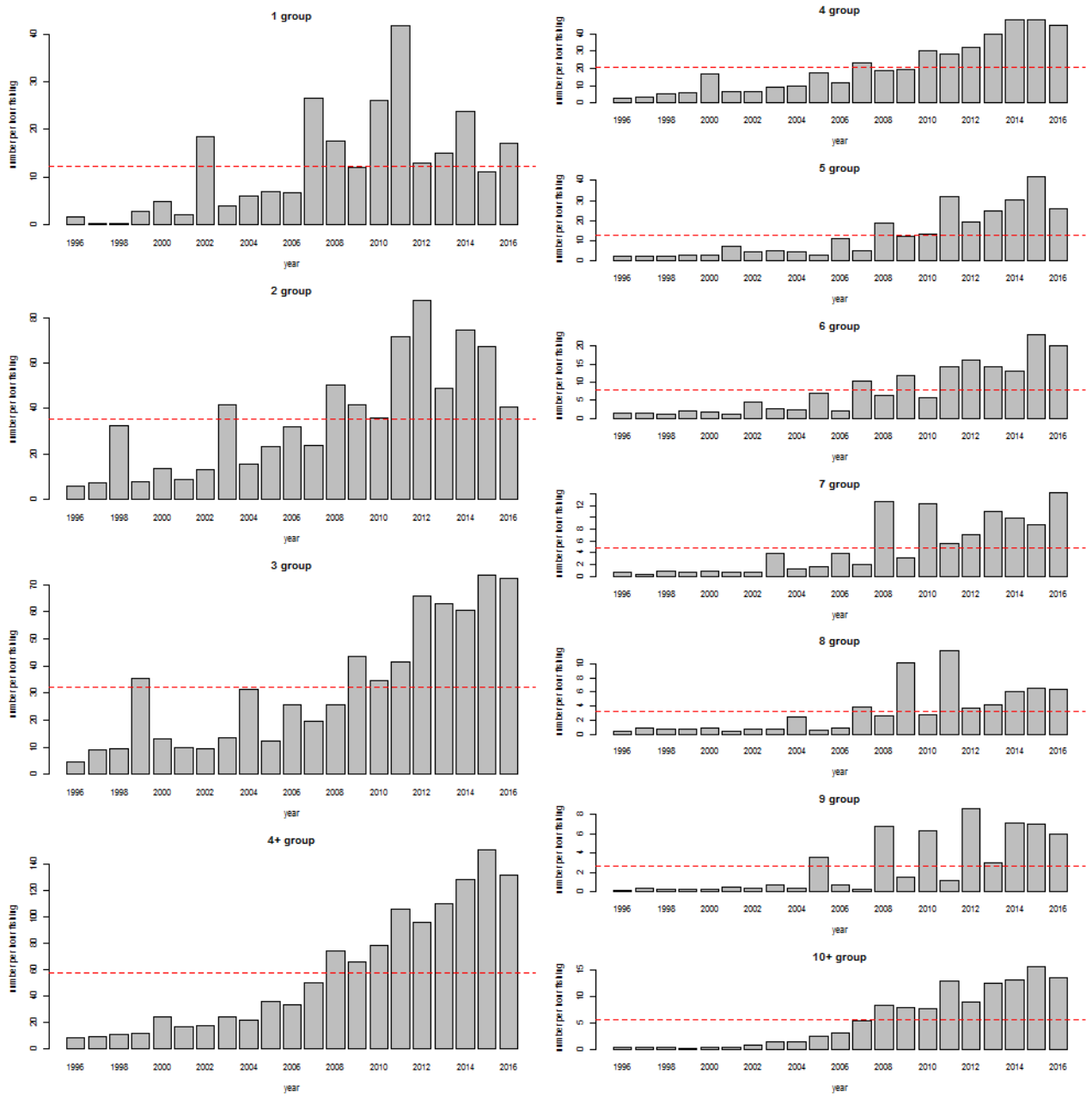
Figure 5.1.1.1. Continued

Annex 5.4: Figures of catch rate of plaice. offshore surveys



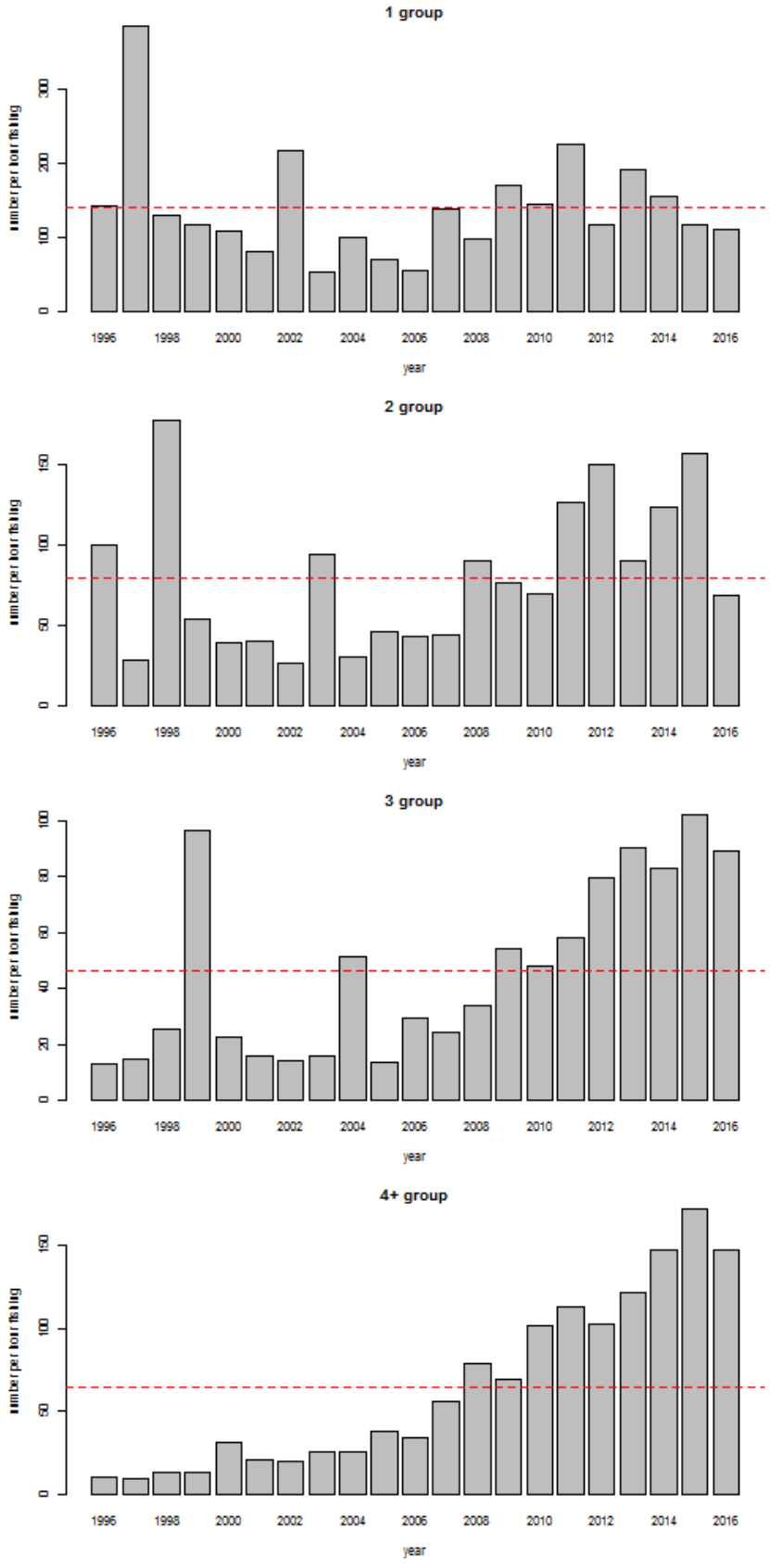
a) Netherlands: plaice (N.hr^-1/8m trawl) North Sea (4) RV "Isis"

Figure 5.1.1.2. Catch rate of plaice. offshore surveys. (Horizontal line=long-term mean for the period presented)



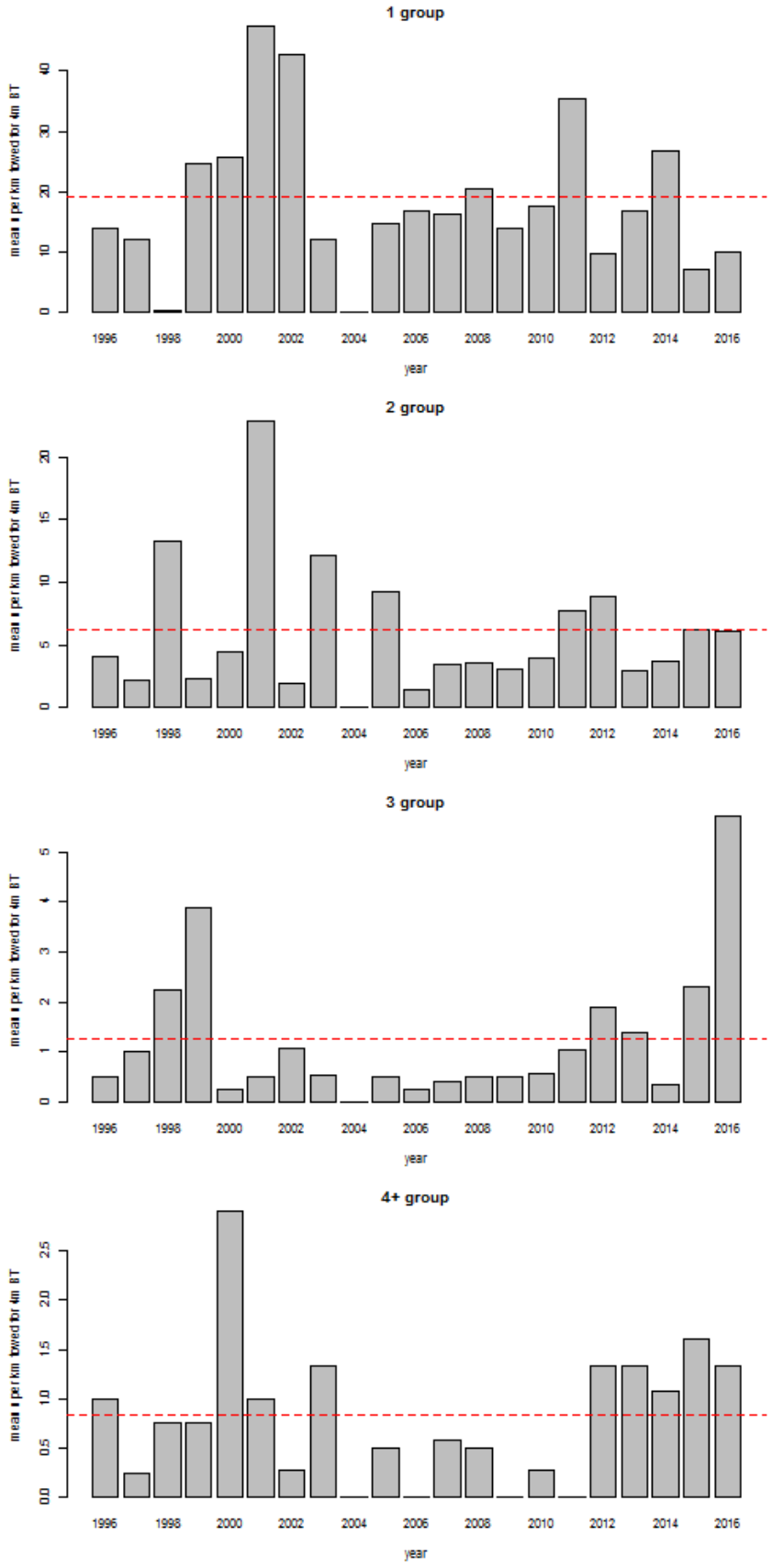
b) Netherlands: plaice (N.hr^-1/8m trawl) North Sea (4) RV "Tridens"

Figure 5.1.1.2: continued.



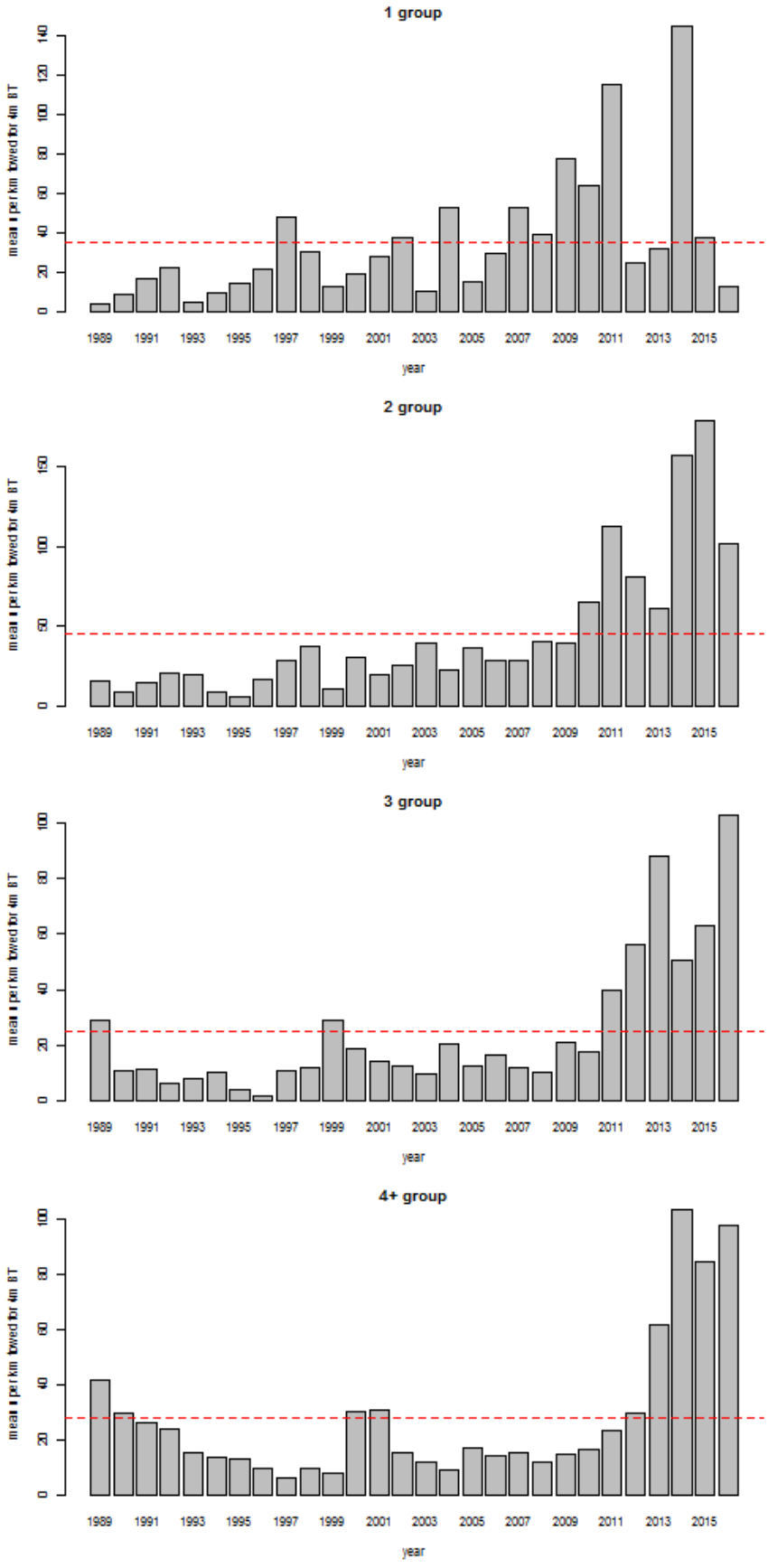
c) Netherlands: plaice (N.hr^-1/8m trawl) North Sea (4) RV "Isis" and RV "Tridens"

Figure 5.1.1.2: continued.



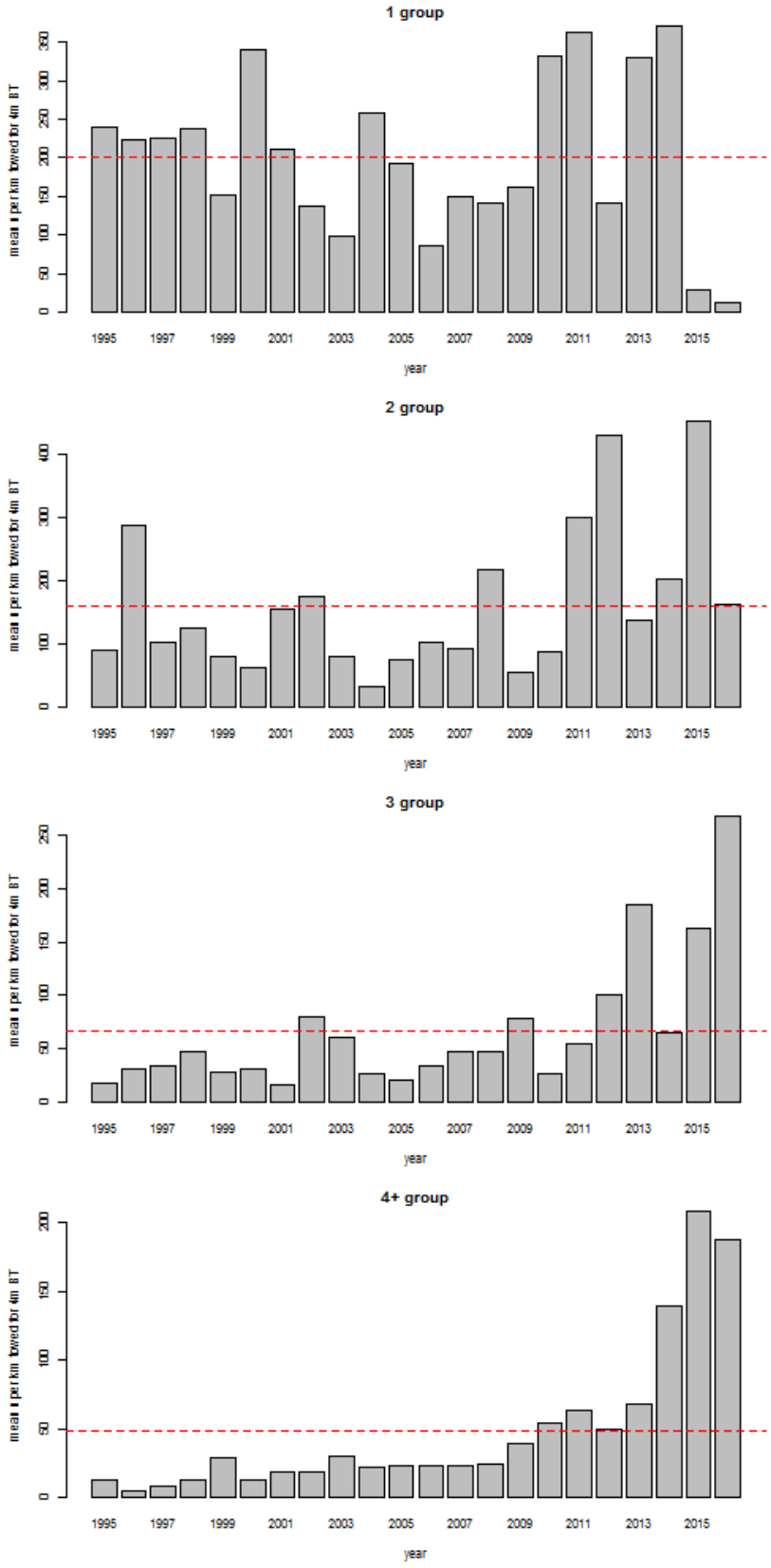
d) UK: plaice (mean numbers per km towed for 4m beam trawl) Southern North Sea (4c)

Figure 5.1.1.2: continued.



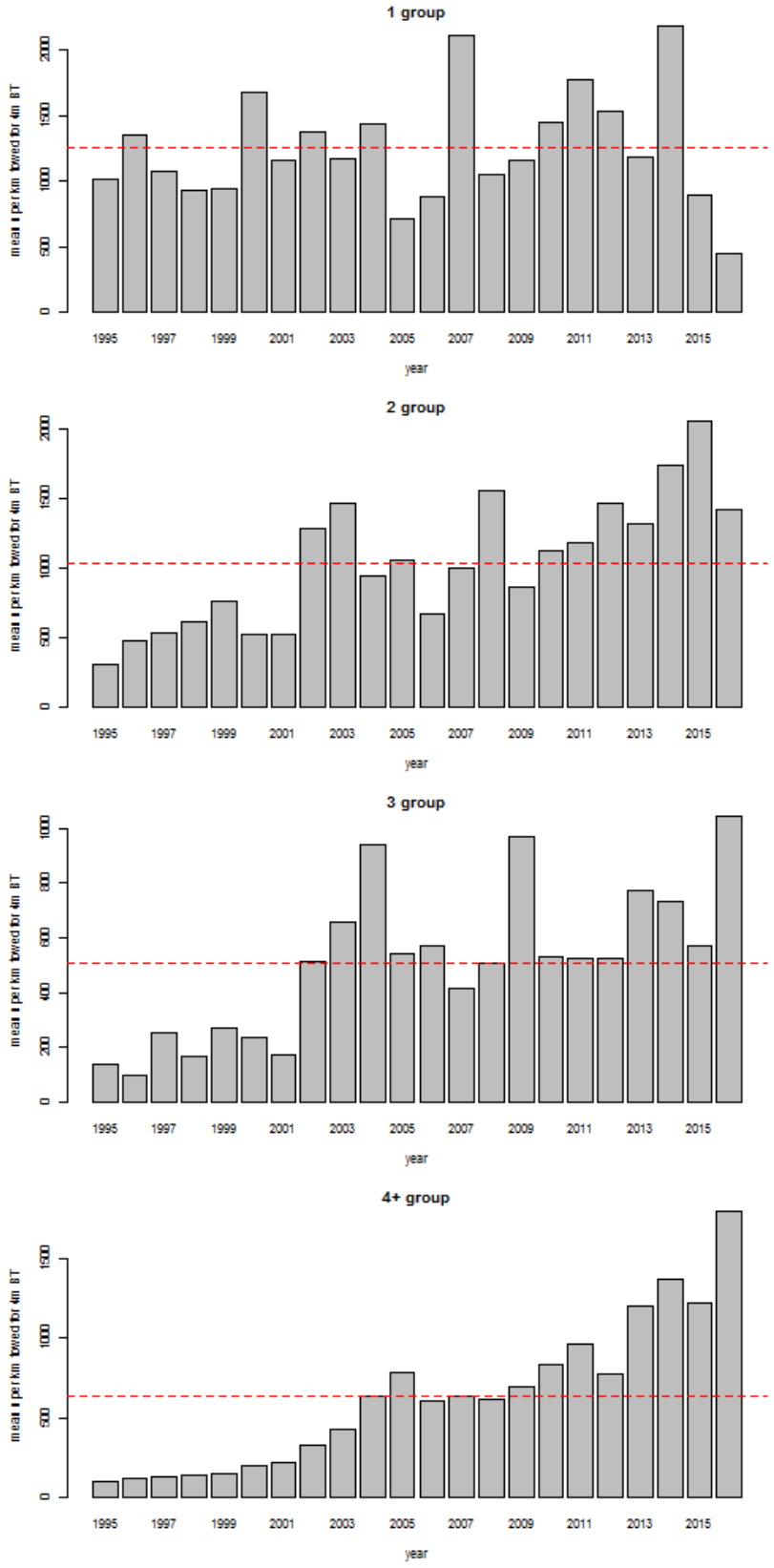
e) UK: plaice (N.hr^-1/8m beam trawl) Eastern English Channel (7d)

Figure 5.1.1.2: continued.



g) UK: plaice (mean numbers per km towed for 4m beam trawl) Bristol Channel (7f)

Figure 5.1.1.2: continued.



(h) UK: plaice (mean numbers per km towed for 4m beam trawl) Eastern Irish Sea (7a)

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^2 (national) or numbers*10^6 (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	5.716	9.423	168.48	0.267	0.745	4.03
2014	8.454	3.822	3.450	107.99	0.207	1.372	4.29
2015	8.124	1.504	3.435	100.162	0.206	1.560	4.559
2016	6.44	2.15	1.39	78.052	0.19	0.89	3.447

*** No valid survey**

b) Sole abundance indices in numbers per 1000m² (national) or numbers*10⁶ (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	1.944	0.724	44.819	0.036	0.528	1.868
2014	1.980	0.686	0.070	23.616	0.094	0.532	2.522
2015	0.564	0.461	0.054	7.448	0.025	0.222	0.893
2016	0.88	1.11	0.0046	12.276	0.08	0.36	1.888

*** No valid survey**

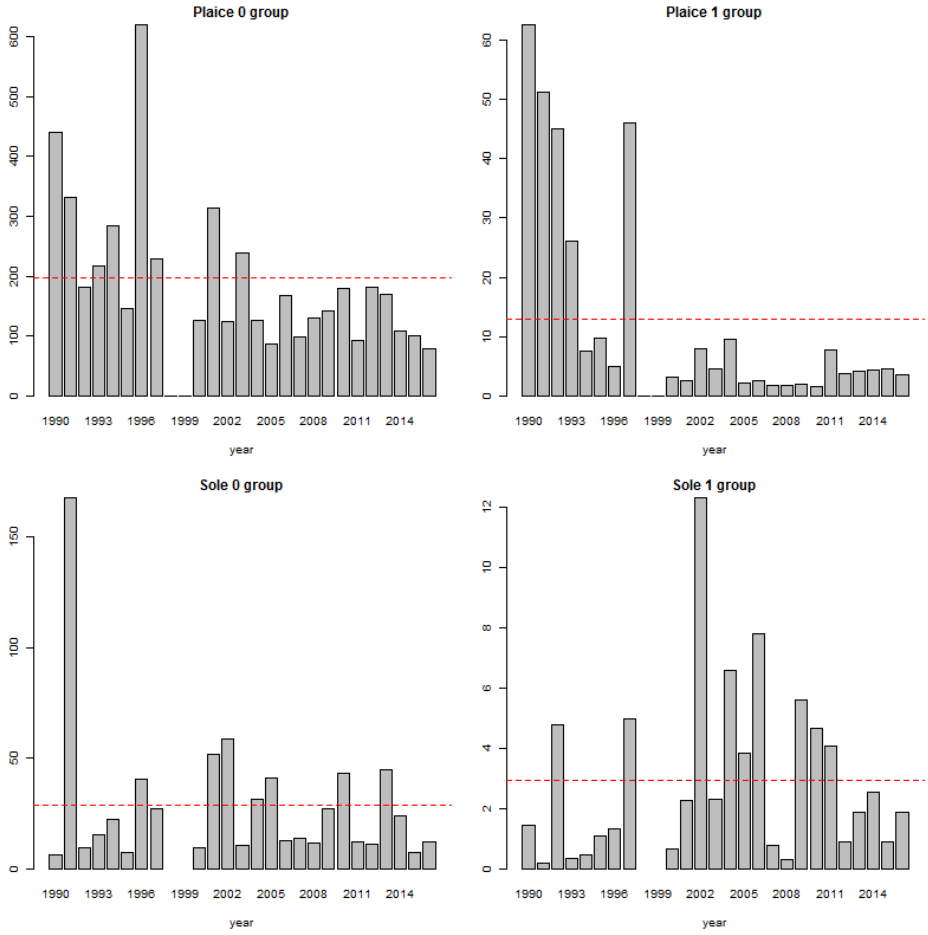


Figure 5.1.2.1. Combined inshore indices for 0 and 1 group plaice and sole. The horizontal line is the long-term mean for the period presented. The indices were declared to be invalid in 1998 and 1999, due to insufficient coverage of the Dutch survey area and are not displayed.

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
2014	17312.696	2258.336	513.847	457.944
2015	16726.486	5040.444	1881.944	477.611
2016	10384.82	2434.271	1086.255	521.6

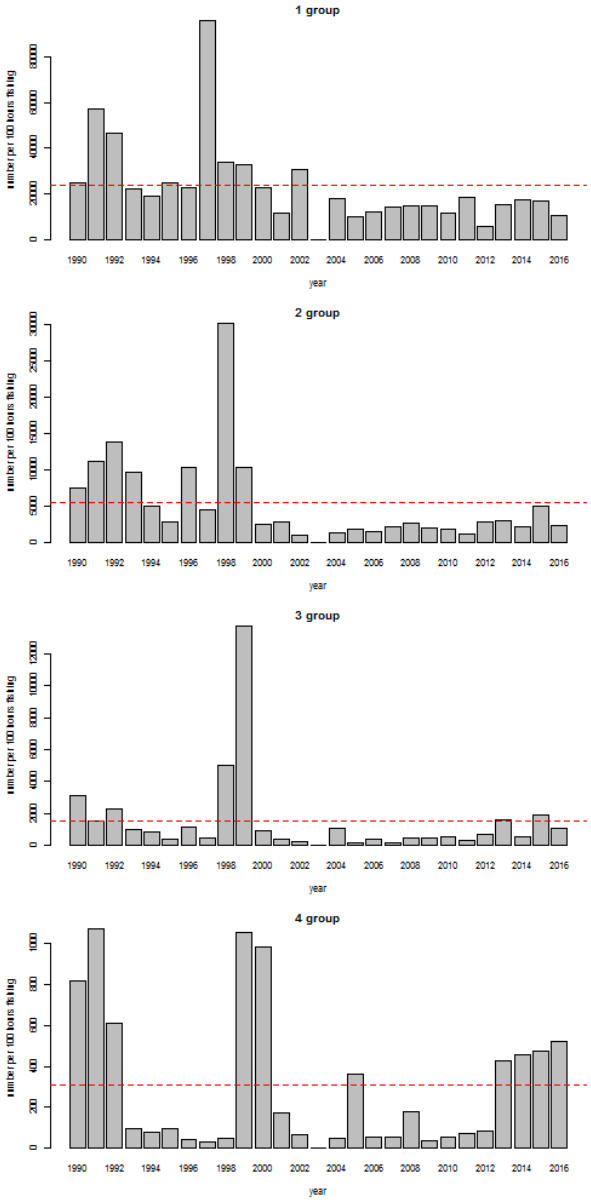
*** No survey**

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
2014	2849.000	448.190	44.786	60.000
2015	3192.000	2333.889	137.833	159.944
2016	733.75	623.32	494.632	109.77

*** No survey**


1 group
number per 100 hours fishing
0
20000
40000
60000
80000
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
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2012
2014
2016
year
2 group
number per 100 hours fishing
0
5000
10000
15000
20000
25000
30000
year
3 group
number per 100 hours fishing
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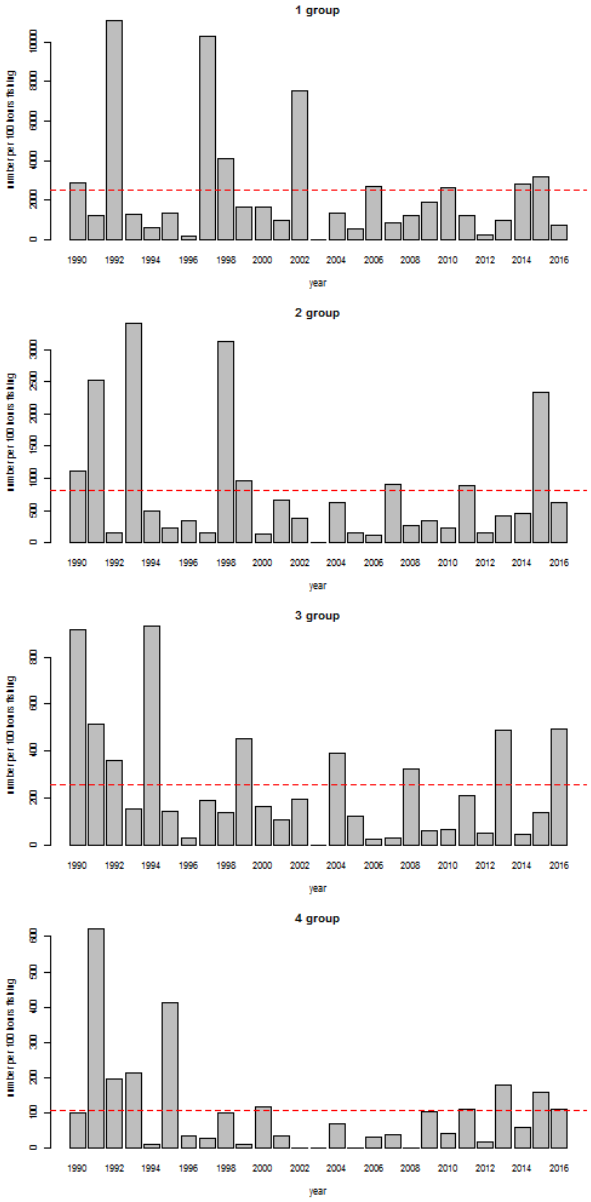


Figure 5.1.2.2. SNS indices for 1 – 4 group plaice (left) and sole (right), in numbers per 100 hours fishing. The horizontal line is the long-term mean for the period presented.

Annex 7: Combined GAM Index update North Sea plaice and dab

a) North Sea plaice combined Gam index

	North Sea plaice Age group										
	0	1	2	3	4	5	6	7	8	9	10
1996	24131.61	24151.24	24289.54	5549.25	1483.96	1129.34	590.98	373.20	51.25	8.81	282.77
1997	4304.64	44320.44	91473.68	6413.02	1411.63	564.54	407.06	71.35	265.89	48.97	125.75
1998	28668.33	32461.77	78654.29	9043.00	2569.91	644.11	375.42	226.21	195.43	74.30	124.16
1999	40796.80	41889.85	17096.40	28159.51	2701.77	1082.85	256.69	95.81	88.13	42.91	31.29
2000	41352.98	40157.79	21087.16	8713.57	9584.73	604.44	217.88	108.21	96.93	16.90	57.54
2001	134308.35	26548.84	18749.96	6469.44	3346.55	3338.38	263.42	90.65	73.39	57.23	85.66
2002	31669.47	129196.24	15911.31	6487.94	3615.30	2048.53	1509.61	265.34	131.02	45.47	204.85
2003	55120.22	30650.81	43460.93	6376.05	3229.20	1569.14	913.39	910.09	68.30	53.63	247.25
2004	24575.54	42560.78	13093.20	16755.80	2891.17	1490.71	855.18	484.06	707.83	46.32	221.29
2005	44090.50	36680.05	26616.23	4299.11	6544.36	895.96	1014.64	365.80	82.03	838.90	384.04
2006	35673.89	39569.35	16170.46	9517.04	2315.00	3675.44	572.91	723.49	100.72	131.59	699.16
2007	51104.80	81298.73	21108.72	10118.55	7823.34	1666.36	2451.58	278.13	608.48	72.63	989.14
2008	51980.78	64306.88	44176.04	11673.65	6064.21	4289.96	906.38	1377.11	287.98	451.36	900.32
2009	197760.98	62541.88	22139.28	18353.89	4895.53	3015.33	2456.08	629.62	1404.78	276.42	1154.05
2010	185679.16	68808.01	23850.67	13049.82	10165.12	3005.10	1667.44	1721.14	576.02	935.62	1342.57
2011	99938.48	123448.66	39016.42	16154.60	8998.29	5995.84	1861.36	871.31	1555.79	232.91	1689.99
2012	96059.40	64398.30	65563.48	34137.29	13438.02	7701.21	4759.50	1521.48	1165.75	1537.39	1512.46
2013	72335.80	91925.01	55652.96	36370.31	17937.48	6813.44	4046.86	3103.00	1171.12	717.33	2273.46
2014	63443.57	126541.32	57934.35	25268.51	18649.01	8298.07	3410.30	2195.22	1700.38	957.51	2264.09
2015	25408.11	50860.04	65021.24	31560.45	15496.66	12125.67	6255.39	2163.30	1547.45	1444.62	2551.47
2016	89277.72	85329.83	33051.35	31424.63	17063.11	8985.53	6255.41	3463.59	1606.54	1026.75	2310.47

b) North Sea dab combined GAM index

	North Sea dab Age group					
	1	2	3	4	5	6
2003	118297.75	79530.04	16583.17	19143.98	14622.57	6709.69
2004	74293.57	87060.25	35183.47	19803.36	11169.12	5730.62
2005	119177.79	60071.74	22736.55	21055.46	6814.59	13315.18
2006	124057.41	53791.79	22135.55	17255.11	17274.29	6359.54
2007	115677.53	72551.71	46117.42	23710.89	14788.32	11847.90
2008	250286.95	76712.71	36652.91	24256.10	23259.81	6247.89
2009	163008.10	122342.27	46140.75	22335.94	14965.47	11757.40
2010	231289.36	129788.37	41727.72	16624.13	10847.47	8719.92
2011	149015.02	171358.58	68799.00	28820.93	18604.09	13995.78
2012	210362.53	189533.21	67224.08	43628.94	30588.39	21270.46
2013	210932.46	142479.96	79045.08	49793.09	30467.81	19491.08
2014	228589.03	198420.92	105442.38	58864.10	33135.48	18107.07
2015	180709.74	209045.77	151934.74	102456.59	52946.52	36624.85
2016	188802.67	211965.60	137814.42	72579.48	47335.40	25765.52

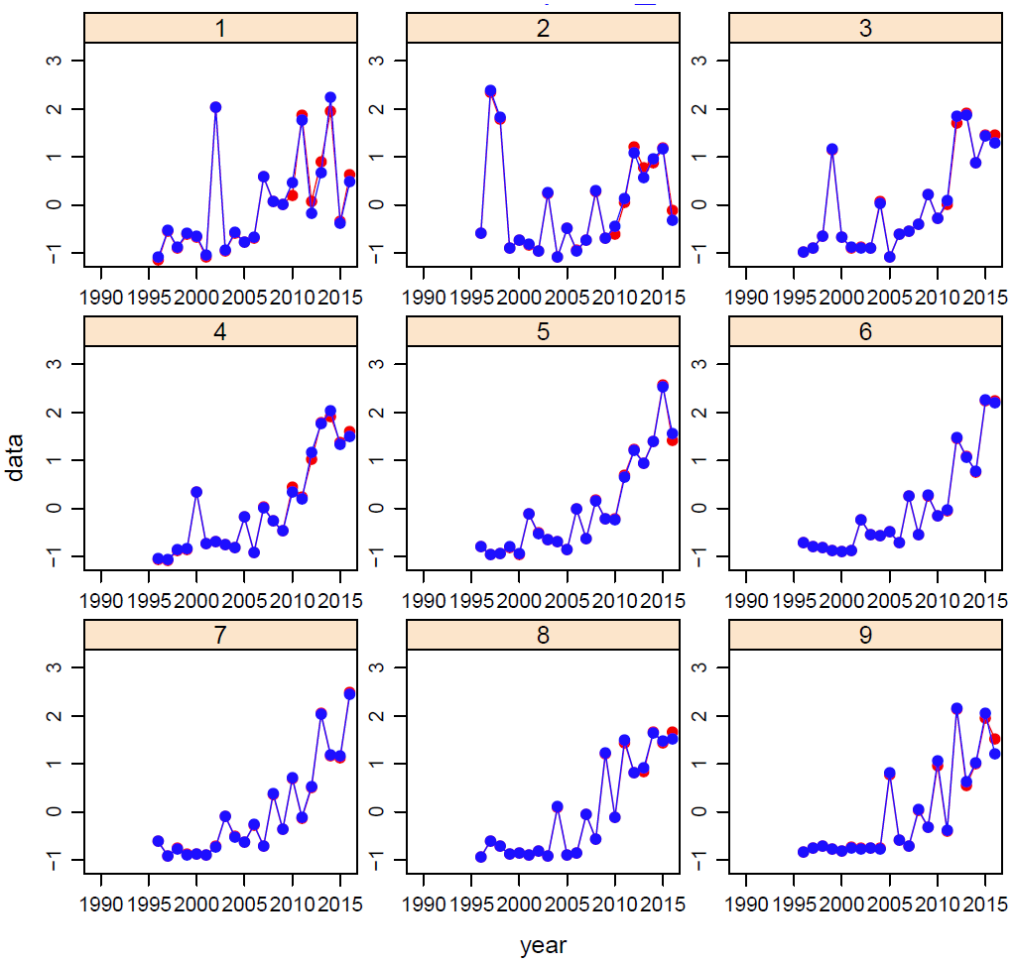


Figure 5.1.3.1. North Sea plaice combined GAM index (standardized values). Index calculated during the benchmark work shop (red line), and the updated index (blue line) including all 2016 data.

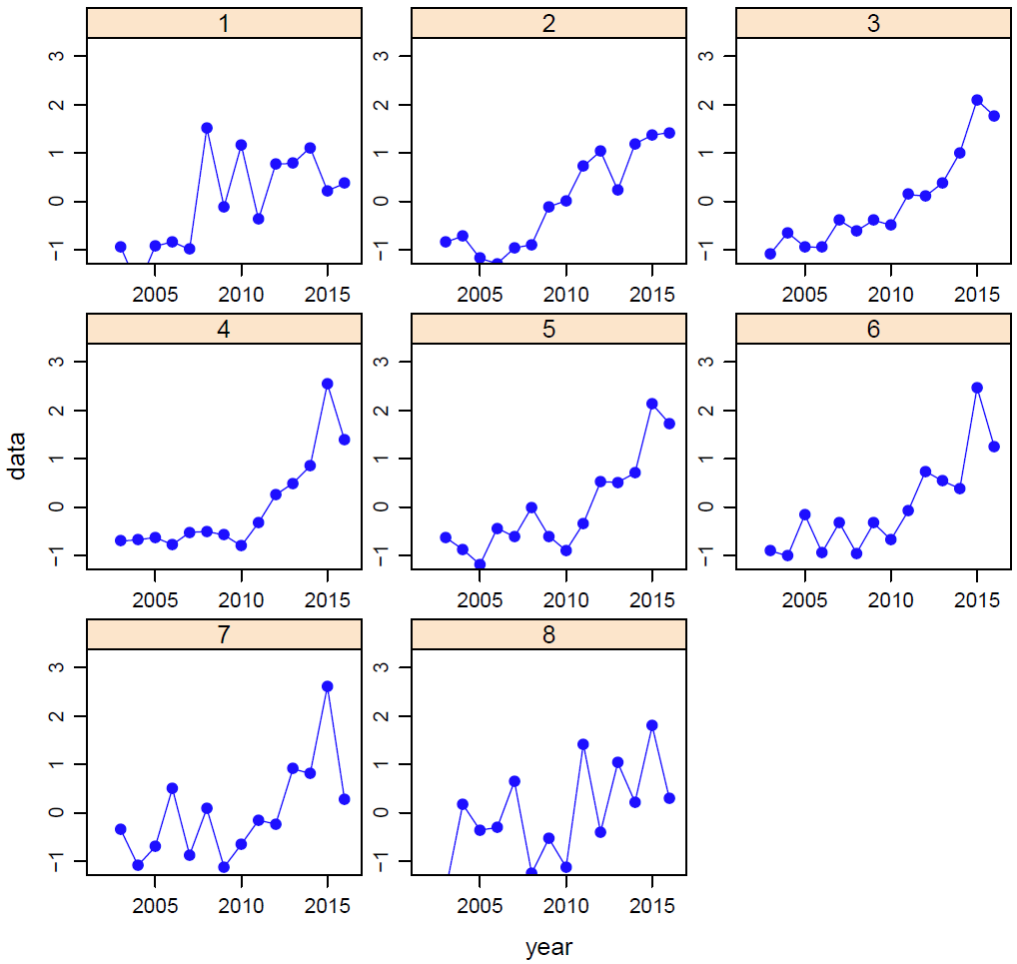


Figure 5.1.3.2. North Sea dab combined GAM index (standardized values).

Annex 8: Survey summary sheets offshore surveys per country

8.1 Survey summary Belgium

Nation:	**Belgium**	Vessel:	FV "Z.279 Ramblers"
Survey:	Offshore North Sea Beam Trawl Survey	Dates:	6 - 14 September 2016

Survey description:	An annual North Sea Beam Trawl Survey is carried out in the south-western part of the North Sea (4b and 4c West) to sample the adult flatfish stocks, primarily targeting plaice *Pleuronectes platessa* and sole *Solea solea*. 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.):	- Due to technical issues with RV Belgica, the complete ship time for the Belgian Beam Trawl Survey was lost in 2016, and the survey had to be carried out using a commercial trawler (Z. 279 Ramblers). It was arranged to schedule the survey approximately in the same time as scheduled (still in quarter 3). - The meteorological conditions were favorable, but there were a few technical issues (see below).

- Eleven stations were missed:
  - Eight (station 18, 19, 20, 22, 87, 72, 81 and 114) due to collision or risk of collision with passive gear (static gear or crab pots) on the track.
  - Two (station 60 and 92) due to risk of capsizing because of excessive weights of benthos trapped in the net.
  - One station (station 111) due to shortage of warp line because of the depth.
- As only two scientists could be embarked on Z.279 Ramblers instead of the usual minimum of 7 scientists, the focus of the survey could only go to the commercial fish species. As a result, no non-commercial fish and no invertebrates were documented, and no marine litter data were recorded.

Conclusion: 51 out of the total of 62 planned stations have been fished successfully and were declared valid. Unfortunately, this is not within the margin of 10% missed stations (maximum of 6 missed stations) superposed by the European Commission (DG Mare). If the survey needs to be carried out with the Ramblers again in 2017, a solution will be found to get around the issues that were encountered in the stations were there was passive gear on the track, so these will not be missed the next time.

Number of otoliths: 5 ind per cm size class per ICES Statistical Rectangle for cod, brill, turbot, plaice and sole. This was the sixth time that the collection of biological samples was geographically organized based on the rectangles instead of the formerly used ALK-areas.

Indices for plaice and sole are the numbers per hour, averaged by ICES rectangle and averaged over all sampled ICES rectangles.

Target species catch rates:

	TIME-SERIES MEAN NR. PER HR	2016 MEAN NR. PER HR
Plaice	65.7	147.38
Sole	86.2	64.92

Number of fish species recorded and notes on any rare species or unusual catches:

The NS BTS measures all commercial fish species to the 5 mm below (no sub-sampling), and usually also records all other fish species by length. In 2015 and 2016 however, only the commercial fish could be documented. In 2016, 28 different species of commercial fish were caught (as opposed to > 50 species including non-commercial species in usual BTS years).

The top 10 by number are (the ones in bold usually appear in the top 10 of all fish species caught, the rest doesn't):

SPECIES	TOTAL NUMBER
Plaice (*Pleuronectes platessa*)	**3230**
Dab (*Limanda limanda*)	**2775**
Sole (*Solea solea*)	**2139**
Whiting (*Merlangius merlangus*)	**1268**
Lesser Spotted Dogfish (Scyliorhinus canicula)	**856**
Bib (*Trisopterus luscus*)	**534**
Thornback Ray (*Raja clavata*)	**186**
Lemon sole (*Microstomus kitt*)	**161**
Grey Gurnard (*Eutrigla gurnardus*)	**140**
Tub Gurnard (*Chelidonichthys lucerna*)	**83**

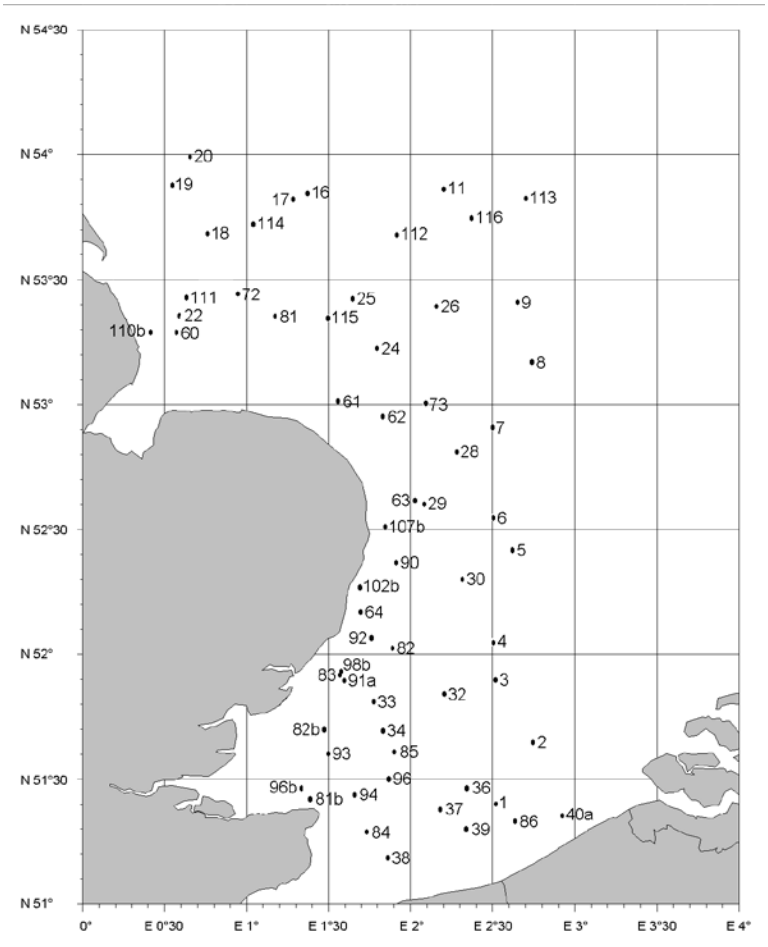
Number of epifauna species recorded	All individuals of epibenthic/benthic species and occasionally caught pelagic species are usually recorded on the species-level whenever possible (or the most detailed taxonomical level otherwise) based on complete catches (subsampling only for the bigger catches). Due to the limited number of scientists that could be embarked on the commercial vessel, this task could not be carried out in 2016.
Index revisions:	None

Stations fished:

ICES Divisions	Strata	Gear	Indices stations	Comments
4bc	51 fixed stations	4 m beam trawl	51 (of 62)	
Number of biological samples (maturity and age material, *maturity only):				

5 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 "Ramblers" Beam trawl survey.

8.2 Survey summaries England

8.2.1 Survey summary 7d and 4c

Nation:	**UK (England and Wales)**	Vessel:	RV Cefas Endeavour
Survey:	16/16	Dates:	17 – 29 July 2016

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 7d and 4c. 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 nylon trawl with 40mm codend liner. Also attached is the SAIV mini CTD.
Notes from survey (e.g. problems, additional work etc.):	The survey was completed without incident, within the time frame and in good weather. A total of 79 valid stations were successfully sampled. One station was invalid due to a large catch of sand, which was successfully repeated, for four stations the tow duration had to be reduced to <30min because of a history of large catches/bad ground, including one other because of the presence of static gear. During the survey, time was available to complete replicate tows of 15min for three stations to make comparison to the standard 30min tow. From an additional 18 deployments of the trawl, of short (10min) duration, a total of 328 sole were tagged and released by Ifremer staff. Additional survey aims included the collection of: litter data, water samples for nutrient analysis, environmental data; tag and release of species of elasmobranch.
At Target species catch rates:	

	Time-series mean no. per hr	2016 mean no. per hr	Time-series mean catch weight per hr (kg)	2016 mean catch weight per hr (kg)
Sole	40.39	44.80	4.44	4.63
Plaice	58.87	130.04	13.11	24.67

Number of fish species recorded and notes on any rare species or unusual catches:

67 separate species / genera of finfish were caught. The top 10 by number(Standardized to 30-minute tow duration) were:

Pleuronectes platessa	5137
Callionymus lyra	1845
Solea solea	1770
Buglossidium luteum	1516
Limanda limanda	954
Raja clavata	458
Trisopterus luscus	450
Arnoglossus laterna	404
Trisopterus minutus	388
Agonus cataphractus	321

Number of epifauna species recorded:	134 separate infauna species / genera were observed during the 2016 survey across both ICES divisions. At 15 selected fishing stations (12 7d, 3 4c), samples of the epi-benthic bycatches were sorted 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
7d	English	4m beam trawl	35	0	0	
7d	French	4m beam trawl	30	1	0	
4c		4m beam trawl	14	0	0	

Number of biological samples (maturity and age material, *maturity only):			
Species	Number	Species	Number
Pleuronectes platessa	1876	*Scophthalmus maximus*	24
Solea solea	488	*Eutrigla gurnardus*	22
Limanda limanda	131	*Scophthalmus rhombus*	20
Platichthys flesus	92	*Zeus faber*	6
Merlangius merlangus	85	*Lophius piscatorius*	5
Microstomus kitt	77	*Dicentrarchus labrax*	3
Aspitrigla cuculus	58		
Trigla lucerna	54		
Trigloporus lastoviza	41		

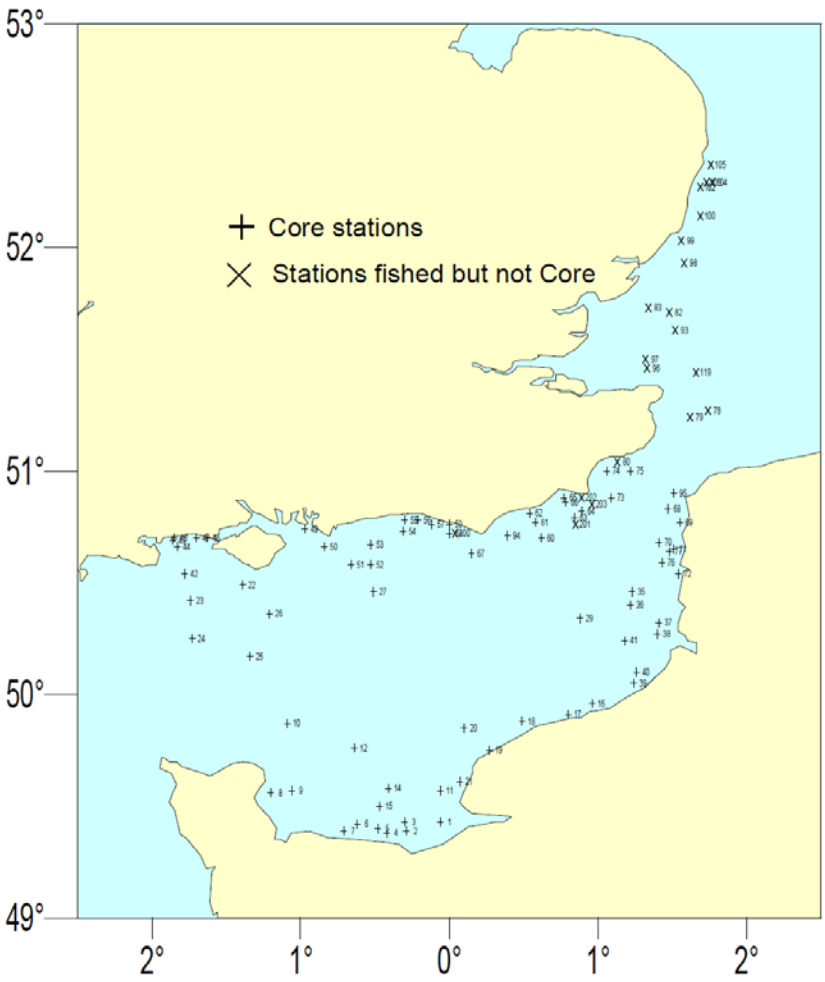


Figure 1: Station positions for Cefas Endeavour 16/16 Beam Trawl survey

8.2.2 Survey summary 7a and 7f

Nation:	**UK (England and Wales)**	Vessel:	RV Cefas Endeavour
Survey:	20/16	Dates:	10 Sept – 29 Sept 2016

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 7a and 7f. 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 nylon trawl with 40mm codend liner. Also attached is the SAIV mini CTD.
Notes from survey (e.g. problems, additional work etc.):	The survey was completed in essentially good weather without major incident. At 13 stations it was necessary to the tow duration from the standard 30 min to either 20 or 15 min, and further 9 stations were hauled early. These reductions were to either avoid potential large catches of weed, broken shell, small flatfish, or static gear. A few stations were moved slightly to avoid undersea cables (an increasing problem in the area). Additional survey aims included the collection of: surface and bottom temperature/salinity data; surface water samples for analysis of tritium; water samples to determine alkalinity.

Target species catch rates:

	Time-series mean no. per hr (for period 2001-2016)	2016 mean no. per hr	Time-series mean catch weight per hr (kg)	2016 mean catch weight per hr (kg)
Sole 7a	20.20	27.12	2.89	3.75
Sole 7f	66.77	76.91	8.21	8.56
Plaice 7a	266.10	291.65	23.36	29.87
Plaice 7f	40.70	47.16	7.33	10.08

Number of fish species recorded and notes on any rare species or unusual catches:

76 separate species / genera of finfish were caught. The top 10 by number (Standardized to 30-minute tow duration) were:

Limanda limanda	16760
Pleuronectes platessa	10230
Buglossidium luteum	3226
Merlangius merlangus	2469
Solea solea	2201
Callionymus lyra	2159
Trisopterus minutus	2157
Scyliorhinus canicula	1750
Arnoglossus laterna	1412
Eutrigla gurnardus	1086

Number of infauna species recorded	115 separate infauna species / genera were observed during the 2016 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	Additional	Invalid	Total	Comments
7a,f	Depth band within stratum area	4m beam trawl	107	4	5	116	

Number of biological samples (maturity and age material, *maturity only):			
Species	Number	Species	Number
Pleuronectes platessa	1959	*Scophthalmus rhombus*	38
Solea solea	936	*Lepidorhombus whiffiagonis*	31
Limanda limanda	271	*Mullus surmuletus*	13
Merlangius merlangus	192	*Merluccius merluccius*	10
Eutrigla gurnardus	131	*Scophthalmus maximus*	10
Microstomus kitt	91	*Dicentrarchus labrax*	9
Trigla lucerna	86	*Zeus faber*	7
Melanogrammus aeglefinus	82	*Trigloporus lastoviza*	3
Aspitrigla cuculus	80	*Conger conger*	3
Lophius piscatorius	52	*Molva molva*	3
Gadus morhua	43		

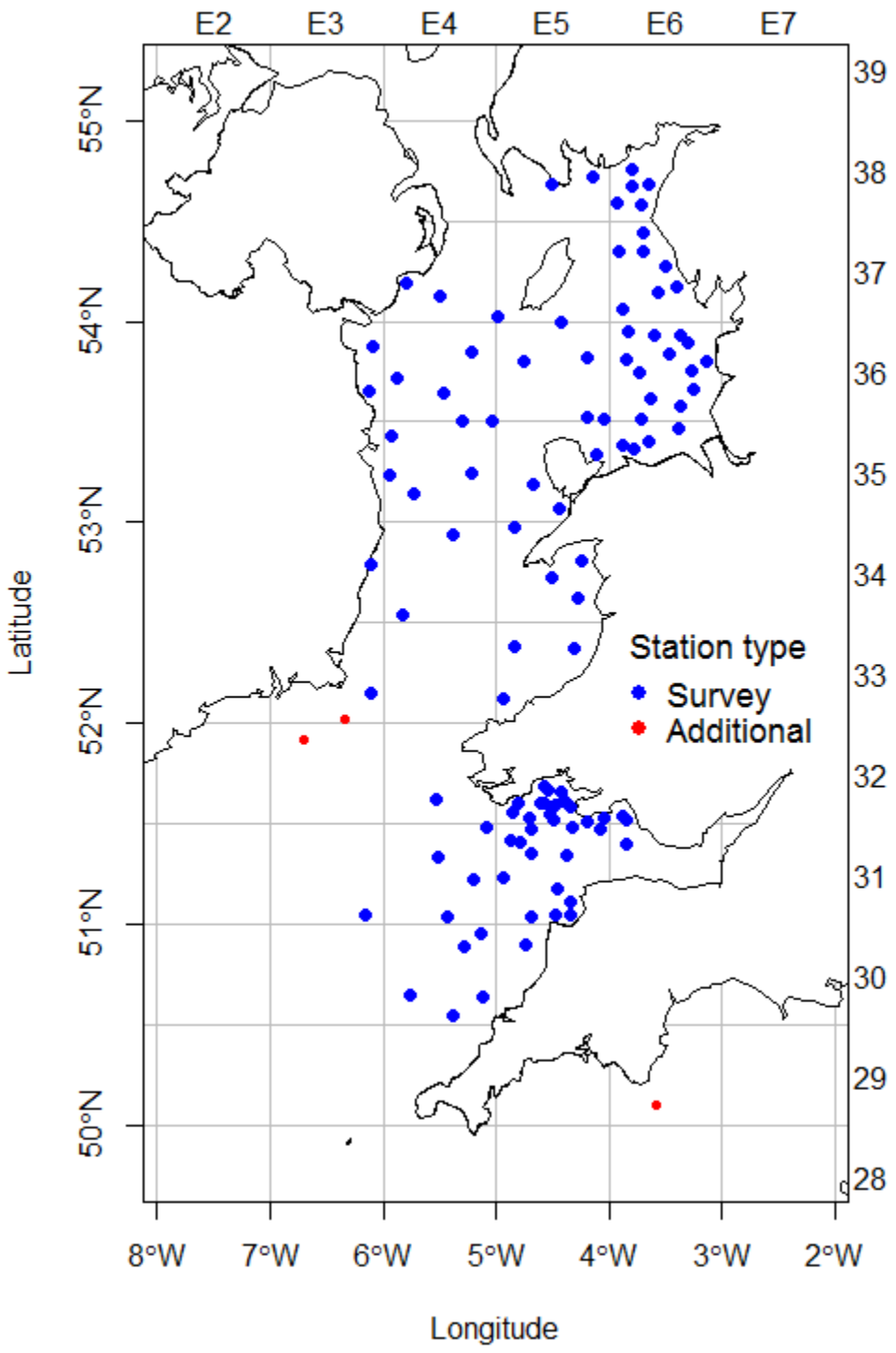


Figure 1: Station positions for Cefas Endeavour 20/16 Beam Trawl survey

8.2.3 Survey summary 7e and Celtic Sea

Nation:	**UK (England and Wales)**	Vessel:	RV Cefas Endeavour
Survey:		Dates:	06 Mar – 04 Apr 2017

Survey description	Q1 western English and Celtic Sea ecosystem survey aims to collect data on distribution and relative abundance, with biological information on commercial fish species in 7e and Celtic Sea (7e, 7f, 7g, 7h, 7j). Stations are randomly selected by startum.
Gear details:	Steel 4m-beam trawl with chain mat and single flip-up rope, 80mm polypropylene trawl with 40mm codend liner. Also attached is the SAIV mini CTD. At a station two beam trawls are deployed, one with and one without a liner.

The survey ended on the first day of the working group. For this reason, the survey summary sheet was not available.

8.3 Survey summary France

Nation :	**FRANCE**	Vessel :	NO "Côtes de la Manche"
Survey :	ORHAGO 16	Dates :	9 - 29 November 2016

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 a yearly basis. Information is collected on length frequency for all the fish, with biological information (age, maturity) for some species. The main target species is sole, other additional abundant commercial species include (the top ten species by decreasing numbers/hour in 2016): queen scallops, hake, whiting pout, Norway cockle, grey gurnard, cuttlefish, common whelk, Norway lobster, wedge sole, dog-cockle. From 2013 onwards, the benthos is exhaustively sampled for all the hauls (for determination on board or 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.):	One haul was cancelled because the skipper considered that it was too risky to carry it out (on a position where it was difficult to haul back the trawl in 2015 because it was full of mud and mussels)
Target species catch rates :	

	Time-series mean no. per hr	2016 mean no. per hr	Time-series mean catch weight per hr	2016 mean catch weight per hr (kg)
Sole	51	48	6.9	8.0

Number of fish recorded and note on any rare species or unusual catches :

61 separate species of fish were caught. The top 10 by number per hr are :

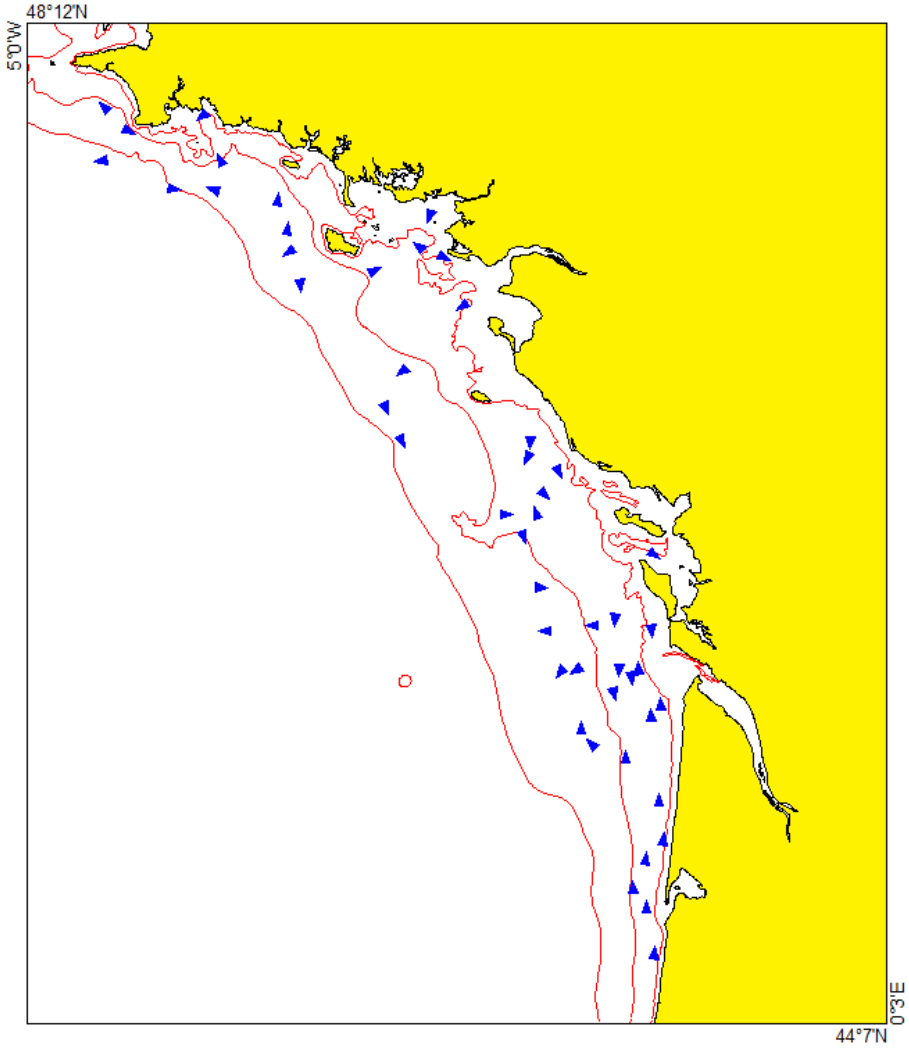
Arnoglossus laterna	125
Merluccius merluccius	114
Trisopterus luscus	55
Solea solea	46
Callionymus lyra	45
Eutrigla gurnardus	34
Buglossidium luteum	32
Microchirus variegatus	26
Dicologlossa cuneata	15
Trisopterus minutus	10

Number of epifauna species recorded	143 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).

Stations fished:

ICES Divisions	Strata	Gear	Indices stations	Priority stations	Additional	Invalid	Total valid	comments
8ab	N/A	4m beam trawl	49				49	none

Number of biological samples (*age materiel only)			
Species	Number	Species	Number
Solea vulgaris maturity and age	643	Bass	12
Solea vulgaris maturity only	462	Lophius piscatorius*	29
Red mullet	42	Lophius budegasa	44
Argyrosomus regius	11		



ORHAGO 2016 tow positions (blue arrows; 20, 50 and 100m isobaths are reported in red)

8.4 Survey summary Germany

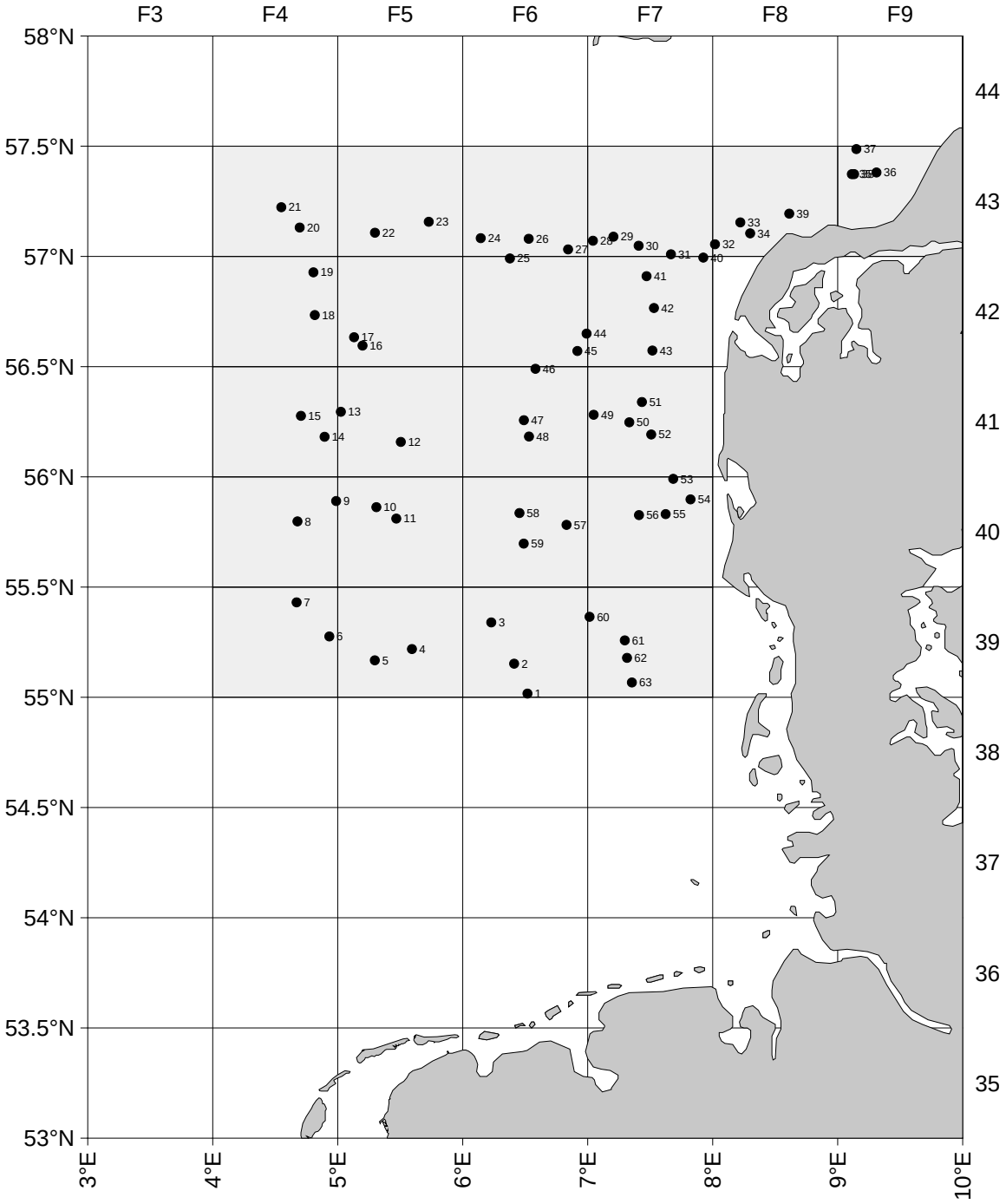
Nation:	**Germany**	Vessel:	RV "Solea"
Survey:	BTS	Dates:	16 Aug – 01 Sept 2016

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 4b 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 meter 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 without any incidents (approx. 31.0 hours fishing time).
Target species catch rates:	Time-series mean no. per hr / 2016 mean no. per hr Sole 9.72 / 13.45 Plaice 292.43 / 315.57
Number of fish species recorded and notes on any rare species or unusual catches:	37 separate species of finfish were caught. The top 10 by number are: *Limanda limanda* 30370 *Buglossidium luteum* 19672 *Pleuronectes platessa* 9502 *Arnoglossus laterna* 2076 *Calionymus lyra* 1292 *Eutrigla gurnardus* 1117 *Hippolossoides platessoides* 804 *Agonus cataphractus* 789 *Microstomus kitt* 709 *Merlangius merlangus* 527
Number of epifauna species recorded:	73 epifauna (attached and free-living) species were observed during the 2016 survey.
Index revisions:	

Stations fished:

ICES Divisions	Strata	Gear	Indices stations	Priority stations	Additional	Invalid	Total Valid	Comments
North Sea 4b	N/A	7m beam trawl	63	63	0	0	63	

Number of biological samples (maturity and age material, *maturity only):			
Species	Number	Species	Number
Pleuronectes platessa	842	*Limanda limanda*	788
Solea vulgaris	226		



Towing positions Germany "Solea" Beam Trawl Survey

8.5 Survey summary Adriatic Sea: GSA17

Nation:	**Italy, Slovenia and Croatia**	Vessel:	N/O G. Dallaporta
Survey:	SoleMon	Dates:	15 Nov – 5 Dec 2016

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; 46-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.):	74 hauls were carried out (approx. 32 hours fishing time). The number of stations have been increased in 2016 because of 7 new stations carried out inside the Croatian national waters. 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 *Solea solea*, *Scophthalmus rhombus* and *Scophthalmus maximus* otolith and finclips for ageing and comparative population genetics structure, collection of samples for Lindane and TBT contaminants analyses, maturity stages of *Sepia officinalis*, epibenthos analises, genetic samples of *Raja* spp. And survivability studies for *S. solea* and *Pecten jacobeus*. Vertical CTD measurements were carried out after each haul.
Target species catch rates:	

	Time-series mean no. per hr	**2016 mean no. per hr**	**Time-series mean catch weight per hr (kg)**	**2016 mean catch weight per hr (kg)**
Sole GSA17	33.49	44.34	3.14	5.50

Number of fish species recorded and notes on any rare species or unusual catches:	**62 separate species of finfish were caught. Sole showed the highest catch rates in term of number per square kilometres:**

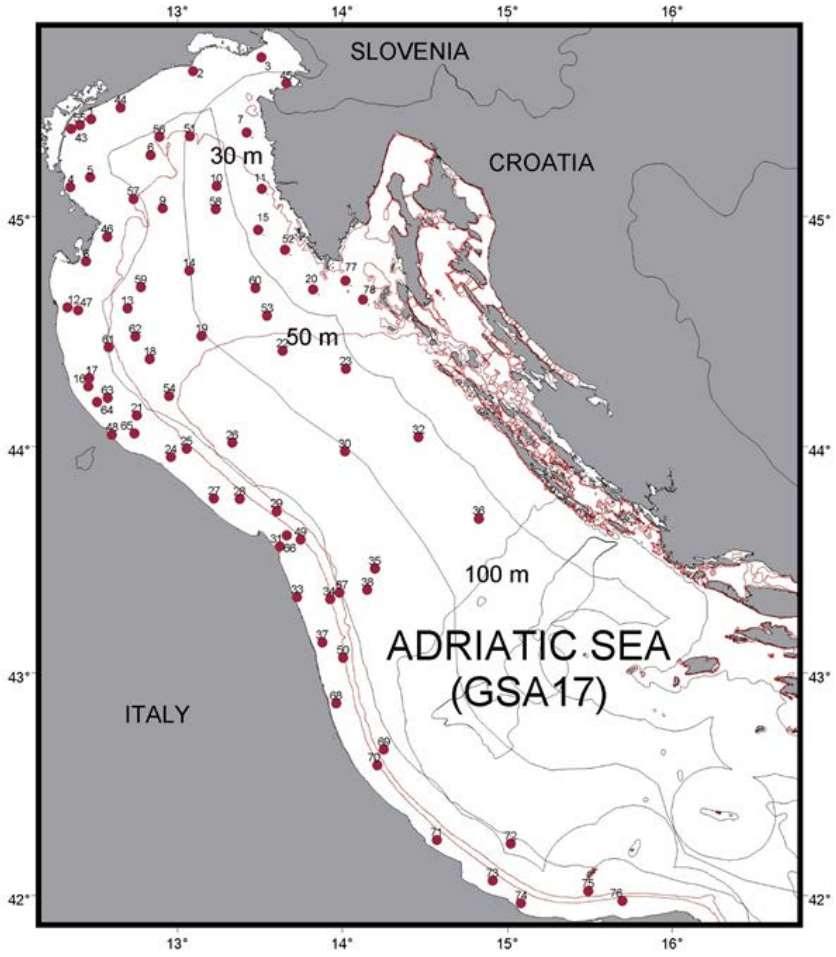
Solea solea	598.50

Number of infauna species recorded	**More than 250 separate macro- and megabenthos species were observed during the 2016 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		74	0	0		

Number of biological samples (maturity and age material):		
Species	Number	Biological material
Solea solea	2551	(maturity)
Solea solea	420	(otolith)
Scophthalmus rhombus	39	(maturity and otolith)
Scophthalmus maximus	5	(maturity and otolith)



Towing positions of SoleMon survey

8.6 Survey summary Netherlands: Tridens

Nation:	**Netherlands**	Vessel:	RV "Tridens"
Survey:	BTS (Beam Trawl Survey)	Dates:	22 Aug – 16 Sep 2016

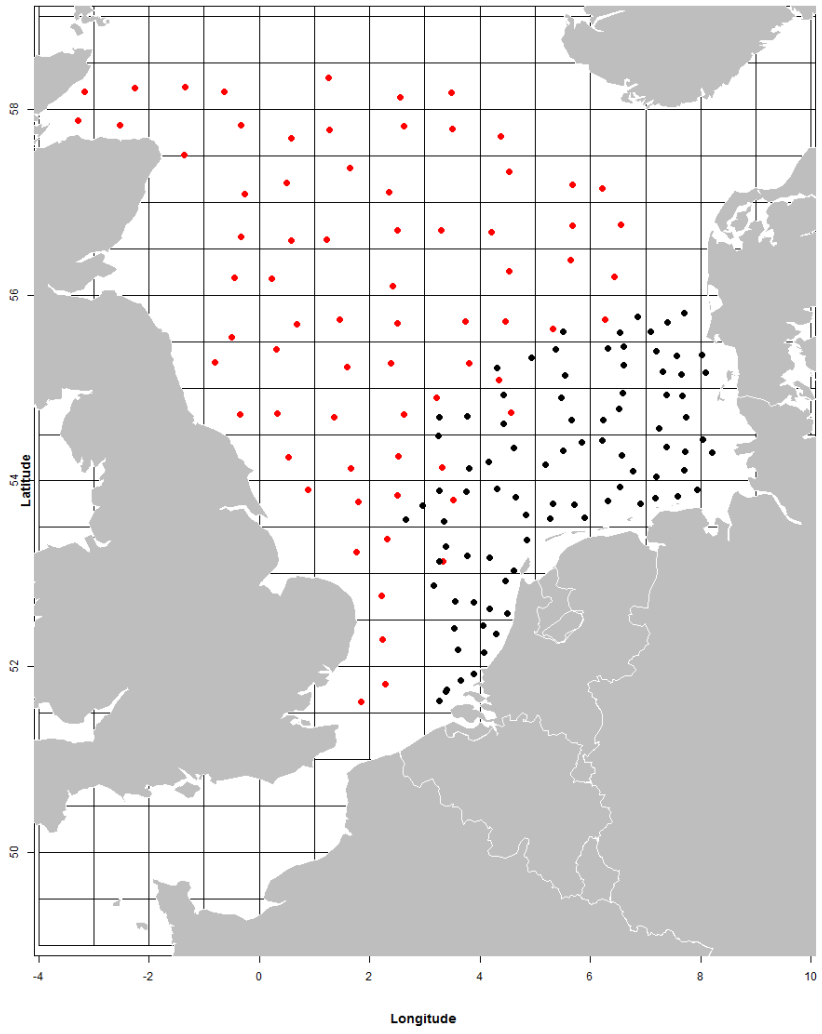
Survey description	The BTS aims to (i) monitor fish fauna by sampling length frequency distributions of all fish species and age composition of flatfish species, (ii) monitor species composition of epibenthos species by counting and weighing (if possible), (iii) create a fishery-independent estimate of age density for plaice and sole in the North Sea for stock assessment, (iv) monitor sex- and length composition of *Cancer pagurus*, *Nephrops norvegicus* 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:	72 valid hauls were carried out (approx. 35 hours fishing time). The survey was finished without major incidents. 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 / 2016 mean no. per hr Sole: no index Plaice: 137.2 / 261.5
Number of fish species recorded and notes on any rare species or unusual catches:	57 separate species of finfish and elasmobranch species were caught. The top 10 by number are: *Limanda limanda* 4931 *Pleuronectes platessa* 4695 *Hippoglossoides platessoides* 2388 *Eutrigla gurnardus* 2119 *Microstomus kitt* 2069 *Merlangius merlangus* 1508 *Arnoglossus laterna* 1355 *Buglossidium luteum* 1239 *Callionymus lyra* 727 *Solea solea* 590
Number of epifauna species recorded:	149 epifauna (attached and free-living) species were observed during the 2016 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	52	20	0	0	72	

Number of biological samples (age material), including hauls with Isis gear:			
Species	Number	Species	Number
Arnoglossus laterna	43	*Microstomus kitt*	455

Buglossidium luteum	27	*Molva molva*	4
Gadus morhua	110	*Phrynorhombus norvegicus*	7
Hippoglossoides platessoides	197	*Pleuronectes platessa*	1319
Lepidorhombus whiffiagonis	4	*Scophthalmus maximus*	52
Limanda limanda	564	*Scophthalmus rhombus*	13
Merluccius merluccius	61	*Solea solea*	282
Microchirus variegatus	42		



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

8.7 Survey summary Netherlands: Isis

Nation:	**Netherlands**	Vessel:	RV "Isis"
Survey:	BTS (Beam Trawl Survey)	Dates:	8 Aug - 9 Sep 2016

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 *Cancer pagurus*, *Nephrops norvegicus* 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:	88 valid hauls were carried out (approx. 30 hours fishing time) by Isis. The survey covered most of the planned stations. A few stations were taken over by Tridens.
Target species catch rates:	Time-series mean no. per hr / 2016 mean no. per hr Sole 43.7 32.8 Plaice 860.3 1008.7
Number of fish species recorded and notes on any rare species or unusual catches:	46 separate species of finfish and elasmobranchs were caught. The top 10 by number are: *Pleuronectes platessa* 6232 *Limanda limanda* 5013 *Merlangius merlangus* 1779 *Arnoglossus laterna* 1459 *Callionymus lyra* 1360 *Eutrigla gurnardus* 1354 *Buglossidium luteum* 1219 *Solea solea* 1191 *Agonus cataphractus* 801 *Chelidonichthys lucerna* 580
Number of epifauna species recorded:	75 epifauna (attached and free-living) species were observed during the 2016 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	79	0		1	80	

Number of biological samples (age material):			
Species	Number	Species	Number
Gadus morhua	2	*Pleuronectes platessa*	911
Limanda limanda	255	*Scophthalmus maximus*	256
Microstomus kitt	82	*Scophthalmus rhombus*	81
Phrynorhombus norvegi-cus	1	*Solea solea*	649
Platichthys flesus	89		

8.8 Survey summary Iceland

Nation:	**Iceland**	Vessel:	Dröfn RE-35
Survey:	ISLBTS (Icelandic Beam Trawl Survey)	Dates:	12 - 22 September 2016

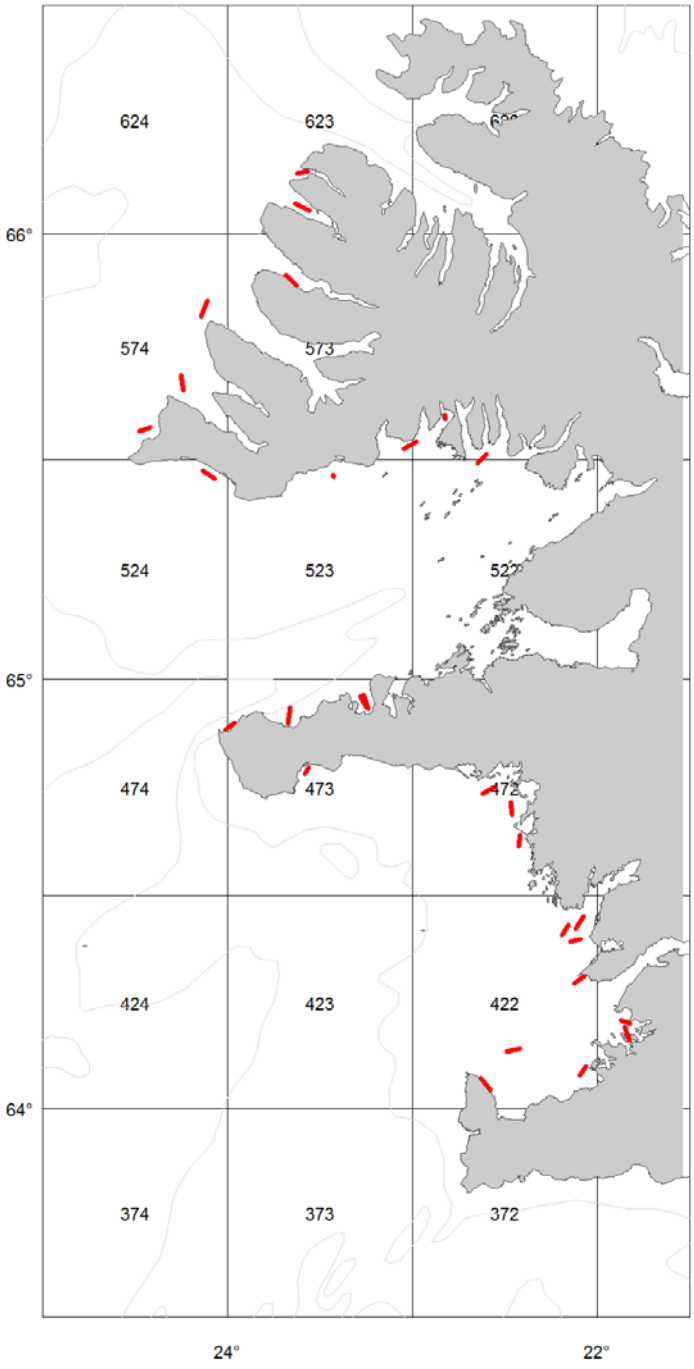
Survey description	The IBTS aims to create a fishery-independent estimate of recruitment for plaice and dab in Iceland for stock assessment, and provide information on the abundance, age and size of other species such as lemon sole, megrim, witch flounder and halibut.
Gear details:	4 meter beam trawl, 40 mm mesh in the codend, chainmat, 82 mm mesh in the net and a flip-up rope.
Notes from survey:	31 valid hauls were carried out (approx. 12 hours fishing time).
Target species catch rates:	Time-series mean no. per hr / 2016 mean no. per hr Plaice 212.7 212.7 Dab 209.4 209.4
Number of fish species recorded and notes on any rare species or unusual catches:	26 separate species of finfish, elasmobranch and invertebrate species were caught. The top 10 by number are: *Pleuronectes platessa* 2430 *Limanda limanda* 2392 *Cucumaria frondosa* 2072 *Chlamys islandica* 517 *Hyas araneus* 397 *Crangon crangon* 372 *Gadus morhua* 316 *Ammodytes marinus* 250 *Cancer irroratus* 247 *Microstomus kitt* 193
Number of epifauna species recorded:	Not recorded
Index revisions:	None

Stations fished:

ICES Divisions	Strata	Gear	Indices stations	Priority stations	Additional	Invalid	Total Valid	Comments
Va	N/A	4m beam trawl	31	31	0	0	31	

Number of biological samples (age material):			
Species	Number	Species	Number
Glyptocephalus cyno-glossus	1	*Pleuronectes platessa*	309

Hippoglossoides plates-soides	50		
Hippoglossus hippoglos-sus	2		
Limanda limanda	246		
Microstomus kitt	91		



Towing positions of the Icelandic beam trawl survey

8.9 Survey summary Ireland

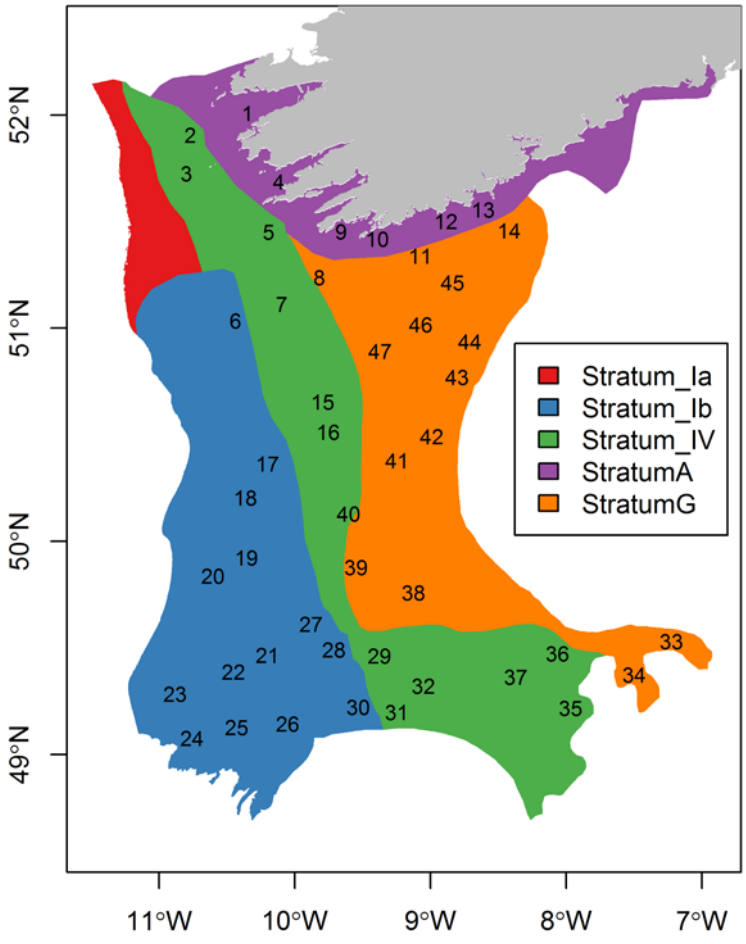
Nation:	**Ireland**	Vessel:	RV "Celtic Explorer"
Survey:	BTS (Beam Trawl Survey)	Dates:	6 March – 16 March 2016

Survey description	The first annual Irish Beamtrawl Ecosystem (IBES) took place from 6-16 March 2016 on RV Celtic Explorer in the western Celtic sea. The main objective of the survey is to connect the Irish Anglerfish and Megrim Survey (IAMS) to the UK beam trawl surveys in the Celtic Sea, English Channel and Irish Sea, with the purpose of providing a swept-area biomass estimate for anglerfish (Lophis piscatorius and L. budegassa) in area 7. Secondary objectives are to collect data on the distribution and relative abundance of commercially exploited species as well as invertebrates and bycatch species, particularly vulnerable and indicator species. The survey also collects maturity and other biological information for commercial fish species in the western Celtic Sea. The IBES survey is coordinated with the CEFAS Q1 South-west Ecoystem Survey (Q1SWECOS) and uses the same gear and methods.
Gear details:	Two 4 meter beam trawl were used, which were fitted with a chain mat and single flip-up rope and an 80mm mesh size in the codend. The starboard trawl was fitted with a 40mm codend liner
Notes from survey:	A total of 45 valid tows were completed (out of a possible 51), as well as 2 additional tows (these had not been randomly selected but were sampled opportunistically). There were no foul hauls or gear damage. The weather was good for most of the survey but stratum Ia was not sampled due to poor weather conditions at the time when the vessel was in the area.
Target species catch rates:	**Species** / **CatchNum** / **CatchNumHr** / **CatchWtKgHr** Megrim / 3467 / 144.0 / 11.28 Black bellied angler / 907 / 37.7 / 9.89 Four-spot megrim / 474 / 19.7 / 1.01 White-bellied angler / 230 / 9.6 / 9.25
Number of fish species recorded and notes on any rare species or unusual catches:	57 separate species of finfish were caught. The top 10 by number are: *Lepidorhombus whiffiagonis* 3467 *Trisopterus esmarkii* 942 *Lophius budegassa* 907 *Capros aper* 851 *Eutrigla gurnardus* 534 *Lepidorhombus boscii* 474 *Glyptocephalus cynoglossus* 441 *Pleuronectes platessa* 417 *Trisopterus minutus* 343 *Callionymus lyra* 330
Number of epifauna species recorded:	104 species and genera of invertebrates were caught.
Index revisions:	None

Stations fished:

Divisions	Strata	Gear	Target	Achieved	Area (km2)	Swept-area (km2)	Swept-area (%)
7jg	Stratum A	4m beam trawl	5	4	6832	0.1782	0.0026%
7j	Stratum_Ia	4m beam trawl	2	0	2502	0	0
7j	Stratum_Ib	4m beam trawl	16	14	20065	0.4246	0.0021%
7jh	Stratum_IV	4m beam trawl	14	13	17970	0.3901	0.0022%
7ghj	Stratum G	4m beam trawl	14	14	17309	0.4251	0.0025%
	Total		51	45	64675	1.4180	0.0026%

Number of biological samples (age material), including hauls with Isis gear:			
Species	Number	Species	Number
Pleuronectes platessa	1435	*Scophthalmus maximus*	35
Limanda limanda	587	*Microchirus variegatus*	32
Microstomus kitt	496	*Buglossidium luteum*	28
Solea solea	270	*Scophthalmus rhombus*	21
Hippoglossoides platessoides	201	*Platichthys flesus*	7
Gadus morhua	153	*Zeugopterus norvegicus*	6
Merluccius merluccius	67	*Lepidorhombus whiffiagonis*	5
Arnoglossus laterna	62		



Towing positions Irish Beam Trawl survey: numbers correspond to haul numbers.

Annex 9: Survey summary sheets inshore surveys per country

9

9.1 Survey summary Belgium

Nation:	**Belgium**	Vessel:	RV 'Simon Stevin'
Survey:	Inshore Demersal Young Fish and Brown shrimp Survey	Dates:	19 - 27 September 2016

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 *Pleuronectes platessa*, and sole *Solea solea*) and brown shrimp (*Crangon crangon*). Since 1973, 33 fixed sampling stations are fished. Untill 1982, the research vessel Hinders was used, from 1983 onwards the survey was carried out with the training and research vessel O.29 'Broodwinner'. In 2013 a switch was made to the new RV 'Simon Stevin', that was used for the Belgian DYFS for the firth time in 2016. 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 2016, 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:	TIME-SERIES / 2016 Plaice: 4.29 / 3.04 Sole: 3.76 / 1.47
Number of fish species recorded and notes on any rare species or unusual catches:	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, 14 species were documented in 2016. Ordered by number, these are:

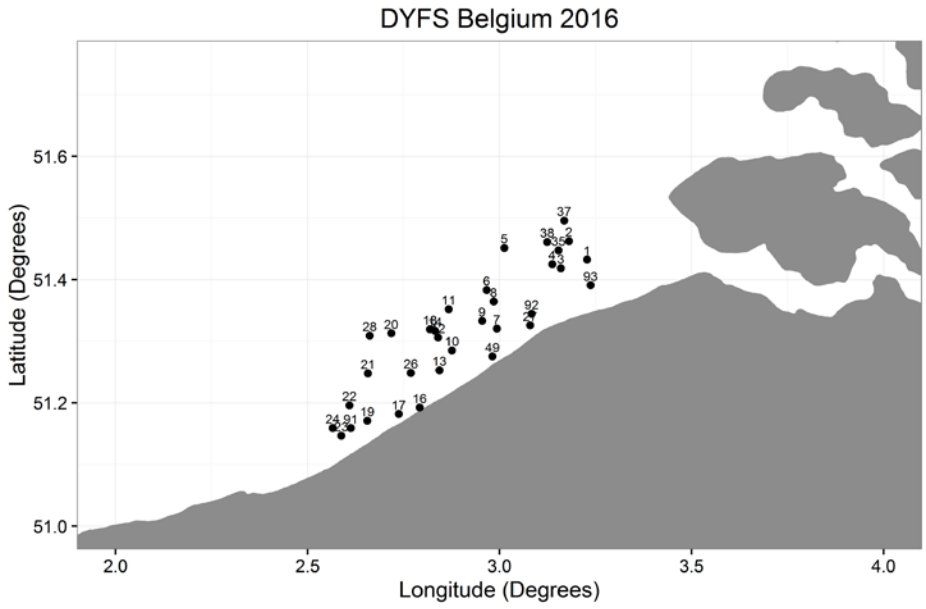
Species	Total number
Dab (*Limanda limanda*)	2996
Plaice (*Pleuronectes platessa*)	2382
Whiting (*Merlangius merlangus*)	1922
Sole (*Solea solea*)	857
Flounder (*Platichthys flesus*)	93
Tub Gurnard (*Chelidonichthys lucerna*)	75
Turbot (*Scophthalmus maximus*)	13
Horse Mackerel (*Trachurus trachurus*)	8
Thornback Ray (*Raja clavata*)	3
European Mackerel (*Scomber scombrus*)	3

	Cod (*Gadus Morhua*)	1
	European Seabass (*Dicentrarchus labrax*)	1
	Striped Red Mullet (*Mullus surmuletus*)	1
	Lemon Sole (*Microstomus kitt*)	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	Total Valid	Comments
4c	N/A	6m beam trawl	33	33	0	0	33	none

Number of biological samples (maturity and age material, *maturity only):
None



DYFS sampling stations in the Belgian coastal waters

9.2 Survey summary Germany

Nation:	**Germany**	Vessel:	RV "Clupea" and Chartered Cutters
Survey:	DYFS	Dates:	05 Sep – 06 Oct 2016

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 codend. An electronic mini sensor for time, temperature and pressure (turbidity 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. 20m 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 avilable from 1976 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 273 valid hauls were carried out in 2016.

Target species catch rates:

	Time-series mean (Schleswig-Holstein only 2005 - 2016) n/1000m²	2016 mean (Schleswig-Holstein only) n/1000m²	Time-series mean (coastal Zone all along Germany, 2005 - 2016) n/1000m²	2016 mean (coastal Zone all along Germany) n/1000m²
Plaice	5.40	1.04	10.02	4.76
Sole	0.15	0.00	0.20	0.00
Cod	0.30	0.02	0.27	0.06
Whiting	1.34	8.71	1.75	12.09
Brown shrimp	1553.52	218.58	1546.12	206.99

Number of fish species recorded and notes on any rare species or unusual catches:

74 taxa of finfish were caught from 2001 to 2016. The top 10 by number in 2016 were:

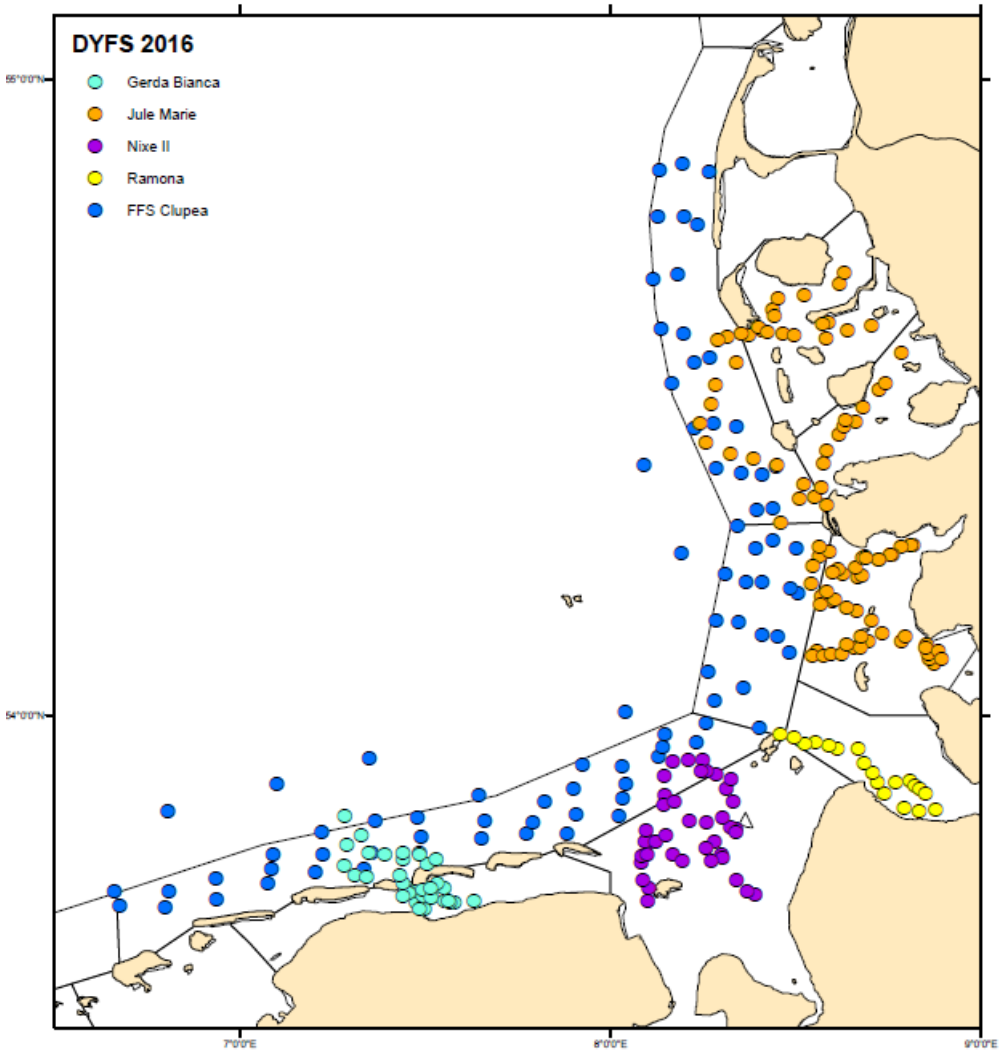
MERLANGIUS MERLANGUS	16525
PLEURONECTES PLATESSA	3879
LIMANDA LIMANDA	2559
OSMERUS EPERLANUS	2290
CLUPEA HARENGUS	1714
AGONUS CATAPHRACTUS	800
POMATOSCHISTUS MINUTUS	729
PLATICHTHYS FLESUS	396
SPRATTUS SPRATTUS	223
SYNGNATHUS ROSTELLATUS	185

Number of epifauna species recorded:

All epifauna found are recorded and available in the SF database. The top 10 by number in 2016 were:

CRANGON CRANGON	248638
OPHIURIDA	95332
MACROPIPUS HOLSATUS	13970
CARCINUS MAENAS	6871
ASTERIAS RUBENS	3451
PAGURIDAE	1147
ABRA ALBA	229
SPISULA SOLIDA	222
PALAEMON	117
PANDALUS MONTAGUI	100

Index revisions:	Inclusion of RV Clupea data since 2012 in the time-series means and top ten species for the whole German coastline.



Stations sampled in the German DYFS 2016.

9.3 Survey summary Netherlands: Luctor

Nation:	**Netherlands**	Vessel:	RV "Luctor"
Survey:	DYFS (Demersal Young Fish Survey)	Dates:	5-23 Sep 2016

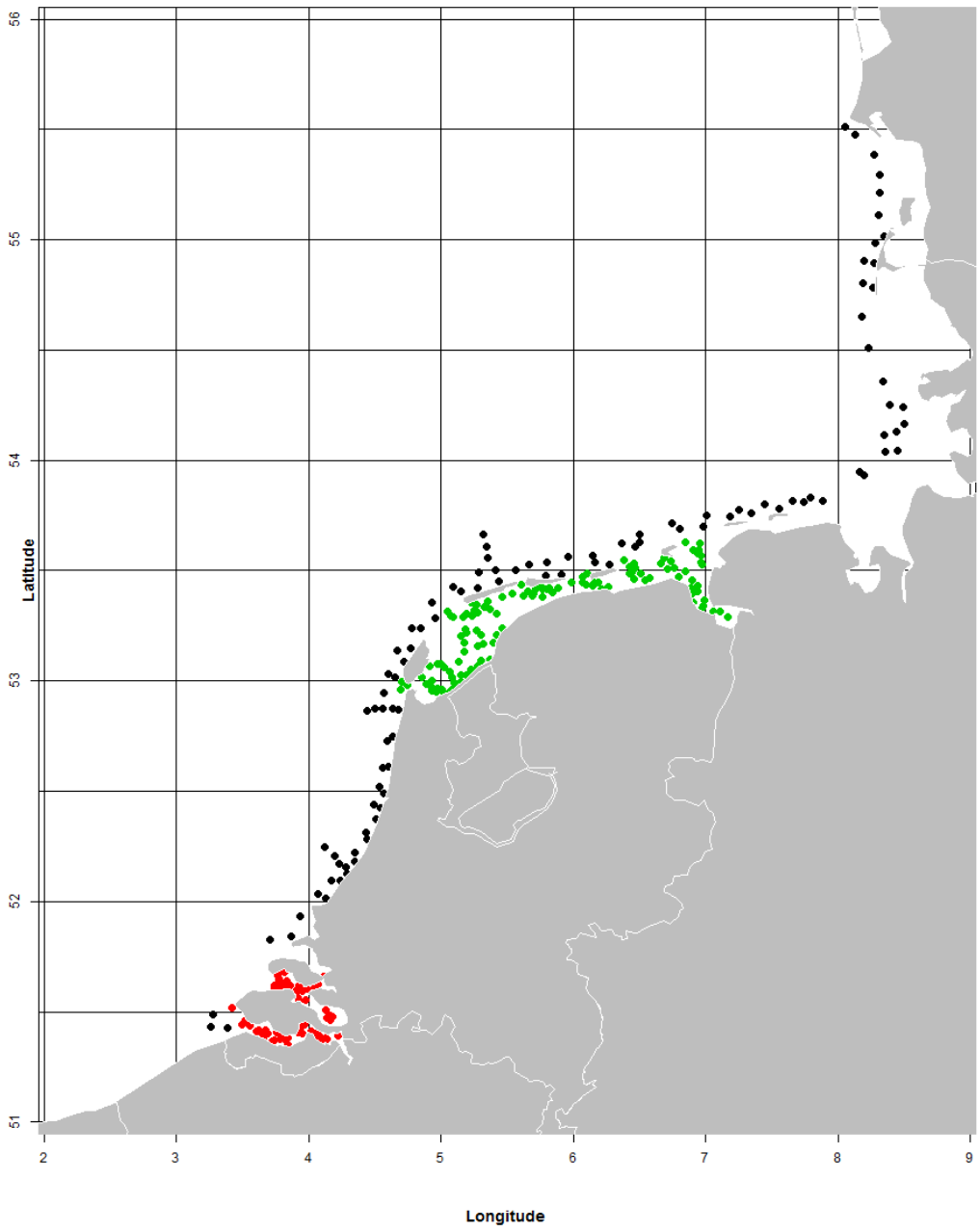
Survey description	The DYFS aims to (i) monitor fish fauna by sampling length frequency distributions of all fish species and age compositions of flatfish species, (ii) monitor species composition of epibenthos species by counting, (iii) create a fishery-independent index of abundance by age group (0- and 1-group) for plaice and sole in the North Sea for stock assessment, (iv) collect data on length frequency distribution of brown shrimp (*Crangon crangon*).
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.):	77 valid hauls were carried out. A CTD was attached to the net. In 2016 the Schollevaar was replaces by Luctor, first results from a comparative fishing study in 2015 (results in prep.) between Luctor and Schollevaar don't indicate that a conversion factor is needed for the index calculation.
Target species catch rates:	Time-series mean no./1000m^2 / 2016 mean no. per 1000m^2 Sole 3.21 0.94 Plaice 9.84 5.37 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: *Clupea harengus* 3466 *Pomatoschistus lozanoi/minutus* 3134 *Pleuronectes platessa* 1330 *Osmerus eperlanus* 788 *Platichthys flesus* 766 *Solea solea* 530 *Syngnathus rostellatus* 455 *Dicentrarchus labrax* 143 *Pholis gunnellus* 141 *Abramis sapa* 120
Number of epifauna species recorded:	53 epifauna (attached and free-living) species were observed during the 2016 survey.
Index revisions:	No

Stations fished:

ICES Divisions	Strata	Gear	Indices stations	Priority stations	Additional	Invalid	Total Valid	Comments
4c: Scheldt estuary	area and depth class	3m beam trawl	73		0	4	77	

Number of biological samples (maturity and age material):			
Species	Number	Species	Number
Pleuronectes platessa	94	Limanda limanda	4

Solea solea	125	Scophthalumus rhombus	3
Platichthys flesus	105	Scophthalmus maximus	1



Positions DYFS 2016: red=Luctor; black=Isis, green=Stern

9.4 Survey summary Netherlands: Stern (DYFS)

Nation:	**Netherlands**	Vessel:	RV "Stern"
Survey:	DYFS (Demersal Young Fish Survey)	Dates:	29 Aug- 30 Sep 2016

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 (*Crangon crangon*).
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.):	143 valid hauls were carried out. A CTD was attached to the net.
Target species catch rates:	Time-series mean no/1000m^2 / 2016 mean no/1000m^2 Sole 4.86 / 1.06 Plaice 30.1 / 6.05 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:	35 separate species of finfish were caught. The top 10 by number are: *Pomatoschistus lozanoi/minutus* 3128 *Syngnathus rostellatus* 3110 *Pleuronectes platessa* 2810 *Clupea harengus* 2724 *Sprattus sprattus* 535 *Solea solea* 501 *Platichthys flesus* 447 *Osmerus eperlanus* 268 *Pomatoschistus microps* 262 *Zoarces viviparus* 227
Number of epifauna species recorded:	37 epifauna (attached and free-living) species were observed during the 2016 survey.
Index revisions:	No

Stations fished:

ICES Divisions	Strata	Gear	Indices stations	Priority stations	Additional	Invalid	Total Valid	Comments
4c: Wadden Sea	area and depth class	3m beam trawl	116		24	3	143	

Number of biological samples (maturity and age material):			
Species	Number	Species	Number
Pleuronectes platessa	182	Scophthalmus rhombus	8
Platichthys flesus	153	Limanda limanda	6
Solea solea	165	Scophthalmus maximus	2

Positions DYFS Stern 2016: see map above

9.5 Survey summary Netherlands: Isis (DYFS)

Nation:	**Netherlands**	Vessel:	RV "Isis"
Survey:	DYFS (Demersal Young Fish Survey)	Dates:	26 Sep – 4 Nov 2016 (5 weeks in this period)

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 (*Crangon crangon*).
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.):	99 valid hauls were carried out. A CTD was attached to the net.
Target species catch rates:	Time-series mean no/1000m^2 / 2016 mean no/1000m^2 Sole 5.44 / 0.94 Plaice 19.9 / 6.01 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:	41 separate species of finfish were caught. The top 10 by number are: *Pomatoschistus lozanoi/minutus* 32284 *Merlangius merlangus* 8310 *Pleuronectes platessa* 4547 *Limanda limanda* 4026 *Buglossidium luteum* 2017 *Clupea harengus* 1793 *Syngnathus rostellatus* 1088 *Pomatoschistus sp.* 768 *Agonus cataphractus* 729 *Solea solea* 713
Number of epifauna species recorded:	43 epifauna (attached and free-living) species were observed during the 2016 survey.
Index revisions:	No

Stations fished:

ICES Divisions	Strata	Gear	Indices stations	Priority stations	Additional	Invalid	Total Valid	Comments
4c: Dutch coast	area and depth class	6m beam trawl	99	0	0	2	101	

Number of biological samples (maturity and age material):			
Species	Number	Species	Number
Limanda limanda	385	*Platichthys flesus*	31
Pleuronectes platessa	317	*Scophthalmus rhombus*	18
Solea solea	184	*Scophthalmus maximus*	19

Positions DYFS Isis 2016: see map above

9.6 Survey summary Netherlands: Isis (SNS)

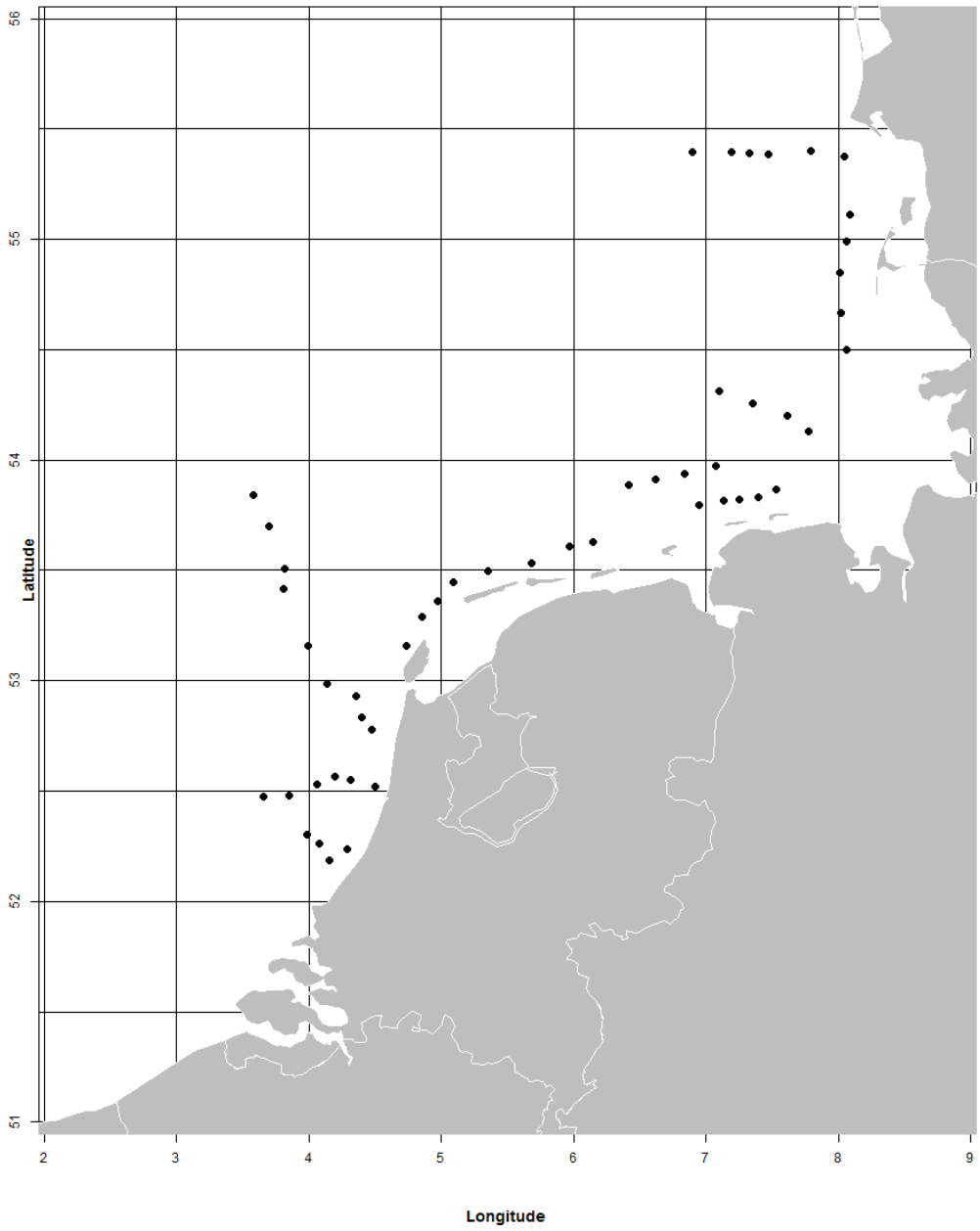
Nation:	**Netherlands**	Vessel:	RV "Isis"
Survey:	SNS (Sole Net Survey)	Dates:	12-23 Sep 2016

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 codend. A Valeport CTD is attached to the gear
Notes from survey (e.g. problems, additional work etc.):	51 hauls were carried out (approx. 13 hours fishing time). A CTD was mounted to the net, collecting a profile throughout the haul. All transects were covered.
Target species catch rates:	Time-series mean no/100 hr / 2016 mean no/100 hr Sole 6154 / 2400 Plaice 65374 / 58943
Number of fish species recorded and notes on any rare species or unusual catches:	29 separate species of finfish+elasmobranchs were caught. The top 10 by number are: *Limanda limanda* 14616 *Pleuronectes platessa* 7272 *Pomatoschistus lozanoi/minutus* 3400 *Arnoglossus laterna* 2741 *Buglossidium luteum* 2241 *Merlangius merlangus* 1695 *Agonus cataphractus* 1042 *Mullus surmuletus* 642 *Callionymus lyra* 570 *Echiichthys vipera* 433
Number of epifauna species recorded:	48 epifauna (attached and free-living) species were observed during the 2016 survey.
Index revisions:	None

Stations fished:

ICES Divisions	Strata	Gear	Indices stations	Priority stations	Additional	Invalid	Total Valid	Comments
4c: North Sea	area and depth class	6m beam trawl	50	0	0	1	51	

Number of biological samples (maturity and age material):			
Species	Number	Species	Number
Limanda limanda	542	*Platichthys flesus*	17
Pleuronectes platessa	696	*Scophthalmus rhombus*	19
Solea solea	306	*Scophthalmus maximus*	44



Station positions for SNS 2016

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
2014		17	14	17	28	15	16	6		42	39	28	6	29	15	9	11	27
2015		17	13	18	28	15	16	6		41	36	28	6	29	14	9	11	26
2016		17	13	18	28	15	16	6		34	35	31		26	14	10	10	27

Annex 10.2. German DYFS

region	German Bight				German/DK Wadden Sea						
area code	405	406N	406S	Outside	408	409	410	411	412	413	414
1978		3	3		4	10	7	22	18		
1979	4	3	3		4	10	7	23	15		30
1980	4	1	3		4	9	7	23	17		21
1981	1	3	6		4	10	7	20	25	2	29
1982	13	3	3		4	10	7	23	29		25
1983	12		1					9	23		34
1984	6		7		4	8	6	16	24		35
1985	7	7	2				37		23	1	39
1986	11	10	9			8	7	23	25		34
1987	11	9	2				31	15	23		38
1988	2	4	10			5	23	16	23		42
1989	10		3				24	21	23		42
1990	19	6	8			6	29	21	27	1	36
1991	12		5			12	27	14	24		34
1992	1	3	7		3	13	12	22	24		45
1993	13	11	6			12	14	17	23		21
1994	23	5	7			8	23	20	22		10
1995	17	9	9		7	18	14	20	21		27
1996	12		9	1		25	8	25	21	1	21
1997	8	9	14			16	14	39	23		26
1998	1	29	2			19	11	33	21		29
1999	1	16	7			13	13	36	23		35
2000	11	11	5			16	14	29	21		29
2001	14	14	2			12	11	30	19		21
2002	8	11	4			15	10	29	23		19
2003		10	1			10	18	35	18		25
2004			7			11	14	24	24		19
2005	17	13	8		6	19	12	22	21	23	25
2006	12	11	5		5	14	11	23	28	21	23
2007	4	10	1	1		13	14	34	40	29	24
2008	12	17	6	7		15	14	21	19	25	22
2009	13	6	13	6		22	9	18	20	29	16
2010	8	10	8			23	9	30	16	21	21
2011	13	1	1	2		15	17	32	15	28	17
2012	32	18	14	16		20	12	29	17	38	17
2013	57	48	23	13		14	13	26	15	33	21
2014	61	43	28	10		19	16	32	21	34	21
2015	54	44	23	16		25	12	46	19	34	21
2016	58	38	24	6		16	11	46	19	33	22

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
2014	33
2015	33
2016	33

Annex 11: Definitions for SNS inclusion in DATRAS

Format descriptions

HH records

No	Fields	Width	Mandatory	DataType	value SNS	additional comments/information
1	RecordType	2	Yes	char	HH	
2	Quarter	1	Yes	int	3	
3	Country	3	Yes	char	NED	
4	Ship	4	Yes	char	ISI, TRI2, TRI, Jakoriwi	Jakoriwi
5	Gear	6	Yes	char	BT6	
6	SweepLngt	3	n/a	int	-9	
7	GearExp	2	n/a	char	-9	
8	DoorType	2	n/a	char	-9	
9	StNo	6	Yes	char		
10	HaulNo	6	Yes	int		
11	Year	4	Yes	char	1969-current	
12	Month	2	Yes	int	9,10	
13	Day	2	Yes	int		
14	TimeShot	4	Yes	char		
15	Stratum	4	Yes	char	-9	
16	HaulDur	3	Yes	int		
17	DayNight	2	Yes	char		
18	ShootLat	8	Yes	decimal4		
19	ShootLong	9	Yes	decimal4		
20	HaulLat	8	Yes	decimal4		
21	HaulLong	9	Yes	decimal4		
22	StatRec	4		char	-9	
23	Depth	4	Yes	int		
24	HaulVal	1	Yes	char		
25	HydroStNo	8		char		
26	StdSpecRecCode	1	Yes	char		
27	BycSpecRecCode	1	Yes	char		
28	DataType	2	Yes	char	R	
29	Netopening	4	n/a	decimal1	n/a	
30	Rigging	2	Yes	char	T	I see 2 codes for 'tickler' in vocab
31	Tickler	2	Yes	int	4	

32	Distance	5	Yes	int		
33	Warplngt	4		int		
34	Warpdia	2	n/a	int	-9	
35	WarpDen	2	n/a	int	-9	
36	DoorSurface	4	n/a	decimal1	-9	
37	DoorWgt	4	n/a	int	-9	
38	DoorSpread	5	n/a	decimal1	-9	
39	WingSpread	4	n/a	decimal1	-9	
40	Buoyancy	4	n/a	int	-9	
41	KiteDim	3	n/a	decimal1	-9	
42	Wgt-GroundRope	4	n/a	int	-9	
43	TowDir	3		int		
44	GroundSpeed	3		decimal1		
45	SpeedWater	3		decimal1		
46	SurCurDir	3		int		
47	SurCurSpeed	4		decimal1		
48	BotCurDir	3	n/a	int	-9	
49	BotCurSpeed	4	n/a	decimal1	-9	
50	WindDir	3		int		
51	WindSpeed	3		int		
52	SwellDir	3		int		
53	SwellHeight	4		decimal1		
54	SurTemp	4		decimal1		
55	BotTemp	4		decimal1		
56	SurSal	5		decimal2		
57	BotSal	5		decimal2		
58	ThermoCline	2	n/a	char	-9	
59	ThClineDepth	4	n/a	int	-9	
60	CodendMesh	4		int		
61	SecchiDepth	6		decimal1		
62	Turbidity	6		int		
63	TidePhase	4		int		
64	TideSpeed	4		decimal1		

HL

No	Fields	Width	Man-datory	DataType	Code	additional com-ments/information
1	RecordType	2	Yes	char	HL	
2	Quarter	1	Yes	int	3	
3	Country	3	Yes	char	NED	
4	Ship	4	Yes	char	ISI, TRI2, TRI, Ja-koriwi	Jakoriwi
5	Gear	6	Yes	char	BT6	
6	SweepLngt	3	n/a	int	-9	
7	GearExp	2	n/a	char	-9	
8	DoorType	2	n/a	char	-9	
9	StNo	6	Yes	char		
10	HaulNo	6	Yes	int		
11	Year	4	Yes	char	1969-current	
12	SpecCodeType	1	Yes	char		
13	SpecCode	10	Yes	char		
14	SpecVal	2	Yes	char		
15	Sex	2		char		
16	TotalNo	10		decimal2		
17	CatIdentifier	2	Yes	int		
18	NoMeas	3	Yes	int		
19	SubFactor	9	Yes	decimal4		
20	SubWgt	6		int		
21	CatCatchWgt	8	Yes	int		
22	LngtCode	2	Yes	char		
23	LngtClass	4	Yes	int		
24	HLNoAtLngt	10	Yes	decimal2		
25	DevStage	4		char		

CA

No	Fields	Width	Manda-tory	DataType	value SNS	additional information
1	RecordType	2	Yes	char	CA	
2	Quarter	1	Yes	int	3	
3	Country	3	Yes	char	NED	
4	Ship	4	Yes	char	ISI, TRI2, TRI, Jako-riwi	Jakoriwi
5	Gear	6	Yes	char	BT6	
6	SweepLngt	3	n/a	int	-9	
7	GearExp	2	n/a	char	-9	
8	DoorType	2	n/a	char	-9	
9	StNo	6	Yes	char		
10	HaulNo	6	Yes	int		
11	Year	4	Yes	char	1969-cur-rent	
12	SpecCodeType	1	Yes	char		
13	SpecCode	10	Yes	char		
14	AreaType	2	Yes	char		
15	AreaCode	5	Yes	char		
16	LngtCode	2	Yes	char		
17	LngtClass	4	Yes	int		
18	Sex	2	Yes	char		
19	Maturity	4		char		
20	PlusGr	2		char		
21	AgeRings	3	Yes	int		
22	CANoAtLngt	3	Yes	int		
23	IndWgt	5		decimal1		
24	FishID	6		int		
25	GenSamp	2		char		
26	StomSamp	2		char		
27	AgeSource	4		char		
28	AgePrepMet	4		char		
29	OtGrading	4		char		

Checks and ranges (based on DYFS checks and ranges)

Rec-ord type	Position	Description	Message	Check	Message type	OK for SNS?
HH	2	Quarter	Not in the range specified	Lower:1.000000000000 Upper: 4.000000000000	warning	Y
HH	3	Country	Field A is not consistent with field B (rel)	Country is not consistent with Ship (rel)	error	Y
HH	3	Country	Field value is invalid (Rel) - prevents entry to database		error	Y
HH	4	Ship	Field A is not consistent with field B (rel)	Ship is not consistent with Gear (rel)	error	Y
HH	4	Ship	Field value is invalid (Rel) - prevents entry to database		error	Y
HH	5	Gear	Field value is invalid (Rel) - prevents entry to database		error	Y
HH	6	SweepLngt	Not used in this format		error	Y
HH	7	GearExp	Not used in this format		error	Y
HH	8	DoorType	Not used in this format		error	Y
HH	9	StNo				Y
HH	10	HaulNo	Not in the range specified	Lower:1.000000000000 Upper: 999.000000000000	warning	Y
HH	11	Year	Not in the range specified	Lower:1900.000000000000 Upper: 2099.000000000000	warning	Y
HH	12	Month	Not in the range specified	Lower:1.000000000000 Upper: 12.000000000000	warning	Y
HH	13	Day	Max day in month depend on month and year		error	Y
HH	13	Day	Not in the range specified	Lower:1.000000000000 Upper: 31.000000000000	warning	Y
HH	14	TimeShot	Not in the range specified	Lower:1.000000000000 Upper: 2400.000000000000	warning	Y
HH	15	Stratum	Field value is invalid (Rel) - prevents entry to database		error	Y
HH	16	HaulDur	Not in the range specified	Lower:5.000000000000 Upper: 30.000000000000	warning	Y

HH	17	DayNight	Field value is invalid - prevents entry to database		error	Y
HH	17	DayNight	Day/night is NOT within the legal range according to NOAA		warning	Y
HH	18	ShootLat	Not in the range specified	Lower:50.000000000000 Upper: 56.500000000000	warning	Y
HH	18	ShootLat	The position is recorded on land		error	Y
HH	18	ShootLat	There is no statistical rectangle matching the hauling position		error	Y
HH	19	ShootLong	Not in the range specified	Lower:-4.000000000000 Upper: 9.000000000000	warning	Y
HH	20	HaulLat	Not in the range specified	Lower:50.000000000000 Upper: 56.500000000000	warning	Y
HH	20	HaulLat	The position is recorded on land		error	Y
HH	21	HaulLong	Not in the range specified	Lower:-4.000000000000 Upper: 9.000000000000	warning	Y
HH	22	StatRec	The Shooting Position is not within the reported Statistical Rectangle		error	Y
HH	23	Depth	Not in the range specified	Lower:2.000000000000 Upper: 35.000000000000	warning	max is 45 in SNS
HH	23	Depth	The depth is not within a 50% range of the calculated depth from the ETOPO2 dataset		warning	Y
HH	24	HaulVal	Field A is inconsistent with field B in child record (rel)	HaulVal is inconsistent with SpecVal in child record (rel)	error	Y
HH	24	HaulVal	Field value is invalid (Rel) - prevents entry to database		error	Y
HH	25	HydroStNo				Y
HH	26	StdSpecRecCode	Field value is invalid (Rel) - prevents entry to database		error	Y
HH	27	BycSpecRecCode	Field value is invalid (Rel) - prevents entry to database		error	Y

HH	28	DataType	Field value is invalid - prevents entry to database		error	Y
HH	28	DataType	Field A is inconsistent with field B in child record	DataType is inconsistent with CatIdentifier in child record	error	Y
HH	29	Netopening	Not used in this format		error	Y
HH	30	Rigging	Field value is invalid - prevents entry to database		error	Y
HH	31	Tickler	Not in the range specified	Lower:0.000000000000 Upper: 3.000000000000	warning	max should be 4 for SNS
HH	32	Distance	Not in the range specified	Lower:250.000000000000 Upper: 4000.000000000000	warning	Y
HH	32	Distance	The calculated distance between shooting and haul position is more than 300 m different from the provided distance		warning	Y
HH	33	Warplngt	Not in the range specified	Lower:10.000000000000 Upper: 100.000000000000	warning	max should be 150 for SNS
HH	34	Warpdia	Not used in this format		error	Y
HH	35	WarpDen	Not used in this format		error	Y
HH	36	DoorSurface	Not used in this format		error	Y
HH	37	DoorWgt	Not used in this format		error	Y
HH	38	DoorSpread	Not used in this format		error	Y
HH	39	WingSpread	Not used in this format		error	Y
HH	40	Buoyancy	Not used in this format		error	Y
HH	41	KiteDim	Not used in this format		error	Y
HH	42	Wgt-GroundRope	Not used in this format		error	Y
HH	43	TowDir	Not in the range specified	Lower:1.000000000000 Upper: 360.000000000000	warning	Y
HH	44	GroundSpeed	Not in the range specified	Lower:0.800000000000 Upper: 4.000000000000	warning	why is the lower boundary 0.8? Inshore survey speed is 2-4 knots (DYFS 2-3, SNS 2.5-4)

HH	45	SpeedWater	Not in the range specified	Lower:0.800000000000 Upper: 4.000000000000	warning	Y
HH	46	SurCurDir	Not in the range specified	Lower:0.000000000000 Upper: 360.000000000000	warning	Y
HH	47	SurCurSpeed	Not in the range specified	Lower:0.000000000000 Upper: 10.000000000000	warning	Y
HH	48	BotCurDir	Not used in this format		error	Y
HH	49	BotCurSpeed	Not used in this format		error	Y
HH	50	WindDir	Not in the range specified	Lower:0.000000000000 Upper: 360.000000000000	warning	Y
HH	51	WindSpeed	Not in the range specified	Lower:0.000000000000 Upper: 20.000000000000	warning	Y
HH	52	SwellDir	Not in the range specified	Lower:0.000000000000 Upper: 360.000000000000	warning	Y
HH	53	SwellHeight	Not in the range specified	Lower:0.000000000000 Upper: 2.000000000000	warning	Y
HH	54	SurTemp	Not in the range specified	Lower:-1.000000000000 Upper: 30.000000000000	warning	Y
HH	55	BotTemp	Not in the range specified	Lower:1.000000000000 Upper: 30.000000000000	warning	Y
HH	56	SurSal	Not in the range specified	Lower:8.000000000000 Upper: 40.000000000000	warning	Y
HH	57	BotSal	Not in the range specified	Lower:8.000000000000 Upper: 40.000000000000	warning	Y
HH	58	ThermoCline	Not used in this format		error	Y
HH	59	ThClineDepth	Not used in this format		error	Y
HH	60	CodendMesh	Not in the range specified	Lower:4.000000000000 Upper: 24.000000000000	warning	meshsize is 40 mm for SNS
HH	61	SecchiDepth	Not in the range specified	Lower:0.000000000000 Upper: 5.000000000000	warning	Y
HH	62	Turbidity	Not in the range specified	Lower:200.000000000000 Upper: 2000.000000000000	warning	Y
HH	63	TidePhase	Not in the range specified	Lower:0.000000000000 Upper: 780.000000000000	warning	Y
HH	64	TideSpeed	Not in the range specified	Lower:0.000000000000 Upper: 4.000000000000	warning	Y
HL	2	Quarter	Not in the range specified	Lower:1.000000000000 Upper: 4.000000000000	warning	Y

HL	3	Country	Field A is not consistent with field B (rel)	Country is not consistent with Ship (rel)	error	Y
HL	3	Country	Field value is invalid (Rel) - prevents entry to database		error	Y
HL	4	Ship	Field A is not consistent with field B (rel)	Ship is not consistent with Gear (rel)	error	Y
HL	4	Ship	Field value is invalid (Rel) - prevents entry to database		error	Y
HL	5	Gear	Field value is invalid (Rel) - prevents entry to database		error	Y
HL	6	SweepLngt	Not used in this format		error	Y
HL	7	GearExp	Not used in this format		error	Y
HL	8	DoorType	Not used in this format		error	Y
HL	9	StNo				Y
HL	10	HaulNo	Not in the range specified	Lower:1.000000000000 Upper: 999.000000000000	warning	Y
HL	11	Year	Not in the range specified	Lower:1900.000000000000 Upper: 2099.000000000000	warning	Y
HL	12	SpecCode-Type	Field value is invalid - prevents entry to database		error	Y
HL	13	SpecCode	Species code is not found in the species list used for this dataset		warning	Y
HL	13	SpecCode	LngtClass is larger than allowed for the species	LngtClass is larger than allowed for the species	warning	Y
HL	13	SpecCode	Inconsistency between species and field B	Inconsistency between species and LngtCode	error	Y
HL	14	SpecVal	If validity code=4 then TotalNo should be larger than 0		error	Y
HL	14	SpecVal	if validity code is 9 then TotalNo, CatchWeight, NoMeasured, LengthClassCode, MinLengthClass and HLNoAtLength = -9		error	Y

HL	14	SpecVal	if validity code is 4 then Length-ClassCode, MinLength-Class and HLNoAtLength = -9		error	Y
HL	14	SpecVal	if validity code is 0 then To-talNo, Catch-Weight, NoMeasured, SubFactor, LengthCode, MinLength-Class and HLNoAtLength = -9		Information	Y
HL	14	SpecVal	Only one rec-ord can be given per haul and species with the Validi-tyCode 4, 5 or 9		error	Y [although re-lated to that is the issue that when I have data in one haul in SpecVal 4 and SpecVal 1 for the same species, submis-sion is not al-lowed. That happens how-ever frequently in all (IBTS, BTS, DYFS, SNS) Dutch sur-veys]
HL	14	SpecVal	Field value is invalid (Rel) - prevents entry to database		error	Y
HL	14	SpecVal	if validity code is 1 then HLNoAtLngt should be sup-plied for at least one length class (no -9 or 0 allowed)		error	Y
HL	15	Sex	Field value is invalid (Rel) - prevents entry to database		error	Y
HL	16	TotalNo	Not in the range specified	Lower:1.000000000000 Upper: 9999999.000000000000	warning	Y
HL	17	CatIdentifier	Not in the range specified	Lower:1.000000000000 Upper: 5.000000000000	warning	Y
HL	18	NoMeas	Not in the range specified	Lower:1.000000000000 Upper: 9999.000000000000	warning	Y
HL	19	SubFactor	Not in the range specified	Lower:1.000000000000 Upper: 1000.000000000000	warning	Y

HL	20	SubWgt	Not in the range specified	Lower:1.000000000000 Upper: 200000.000000000000	warning	Y
HL	21	CatCatchWgt	Not in the range specified	Lower:0.000000000000 Upper: 1000000.000000000000	warning	Y
HL	22	LngtCode	Field value is invalid (Rel) - prevents entry to database		error	Y
HL	23	LngtClass	If Length-ClassCode = 0 then MinLength-Class must be half cm units		error	Y
HL	23	LngtClass	If Length-ClassCode = 5 then MinLength-Class must be 5 cm units		error	Y
HL	23	LngtClass	If Length-ClassCode = 1 then MinLength-Class must be cm units		error	Y
HL	23	LngtClass	Not in the range specified	Lower:1.000000000000 Upper: 1300.000000000000	warning	Y
HL	23	LngtClass	If Length-ClassCode = 5 then MinLength-Class must be > 60		error	Y
HL	23	LngtClass	If Length-ClassCode = . then MinLength-Class must be mm units		error	Y
HL	24	HLNoAtLngt	For each species and sex in HL: TotalNo should not differ from the sum of HLNoAtLength by more than 20%		error	Y
HL	24	HLNoAtLngt	Not in the range specified	Lower:0.100000000000 Upper: 999999.000000000000	warning	Y
HL	25	DevStage	Field value is invalid (Rel) - prevents entry to database		error	Y

CA	2	Quarter	Not in the range specified	Lower:1.000000000000 Upper: 4.000000000000	warning	Y
CA	3	Country	Field A is not consistent with field B (rel)	Country is not consistent with Ship (rel)	error	Y
CA	3	Country	Field value is invalid (Rel) - prevents entry to database		error	Y
CA	4	Ship	Field A is not consistent with field B (rel)	Ship is not consistent with Gear (rel)	error	Y
CA	4	Ship	Field value is invalid (Rel) - prevents entry to database		error	Y
CA	5	Gear	Field value is invalid (Rel) - prevents entry to database		error	Y
CA	6	SweepLngt	Not used in this format		error	Y
CA	7	GearExp	Not used in this format		error	Y
CA	8	DoorType	Not used in this format		error	Y
CA	9	StNo				Y
CA	10	HaulNo	Not in the range specified	Lower:1.000000000000 Upper: 999.000000000000	warning	Y
CA	11	Year	Not in the range specified	Lower:1900.000000000000 Upper: 2099.000000000000	warning	Y
CA	12	SpecCode-Type	Field value is invalid - prevents entry to database		error	Y
CA	13	SpecCode	Species code is not found in the species list used for this dataset		warning	Y
CA	13	SpecCode	LngtClass is larger than allowed for the species	LngtClass is larger than allowed for the species	warning	Y
CA	13	SpecCode	LngtClass is larger than allowed for the species	LngtClass is larger than allowed for the species	warning	Y
CA	13	SpecCode	Inconsistency between species and field B	Inconsistency between species and LngtCode	error	Y
CA	14	AreaType	Field value is invalid (Rel) - prevents entry to database		error	Y
CA	14	AreaType	Area code is not consistent with area type		error	Y

CA	15	AreaCode				Y
CA	16	LngtCode	Field value is invalid (Rel) - prevents entry to database		error	Y
CA	17	LngtClass	If LengthClassCode = 0 then MinLengthClass must be half cm units		error	Y
CA	17	LngtClass	If LengthClassCode = 1 then MinLengthClass must be cm units		error	Y
CA	17	LngtClass	Not in the range specified	Lower:1.000000000000 Upper: 500.000000000000	warning	Y
CA	17	LngtClass	If LengthClassCode = . then MinLengthClass must be mm units		error	Y
CA	18	Sex	Field value is invalid (Rel) - prevents entry to database		error	Y
CA	19	Maturity	Field value is invalid (Rel) - prevents entry to database		error	Y
CA	20	PlusGr	Per haul, species and length class only the oldest age group can be PlusGr		error	Y
CA	20	PlusGr	If a plus group is defined per haul/area and species then all records for this species with age => than the plus group must contain the plus identifier		error	Y
CA	21	AgeRings	Not in the range specified	Lower:0.000000000000 Upper: 9.000000000000	warning	Y
CA	22	CANoAtLngt	Not in the range specified	Lower:1.000000000000 Upper: 999.000000000000	warning	Y
CA	23	IndWgt	Not in the range specified	Lower:1.000000000000 Upper: 1000.000000000000	warning	Y
CA	24	FishID				Y

CA	25	GenSamp	Field value is invalid - prevents entry to database		error	Y
CA	26	StomSamp	Field value is invalid - prevents entry to database		error	Y
CA	27	AgeSource	Field value is invalid (Rel) - prevents entry to database		error	Y
CA	28	AgePrepMet	Field value is invalid (Rel) - prevents entry to database		error	Y
CA	29	OtGrading	Field value is invalid - prevents entry to database		error	Y