WORKING GROUP ON BEAM TRAWL SURVEYS (WGBEAM)

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International Council for the Exploration of the Sea
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H.C. Andersens Boulevard 44-46
DK-1553 Copenhagen V
Denmark
Telephone (+45) 33 38 67 00
Telefax (+45) 33 93 42 15
www.ices.dk
info@ices.dk

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Editor

Ingeborg de Boois

Authors

Ulrika Beier ● Gérard Biais ● Ingeborg de Boois ● Gary Burt ● Holger Haslob ● Sven Kupschus ● Guðjón Már Sigurðsson ● Francesco Masnadi ● Kay Panten ● Giuseppe Scarcella ● Vaishav Soni ● Loes Vandecasteele ● Adriana Villamor

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Contents

i Executive summary

The Working Group on Beam Trawl Surveys (WGBEAM) plans, coordinates, and implements European inshore and offshore beam trawl surveys. The group's activities relate mostly to the role of the group, i.e. to coordinate beam trawl surveys in the ICES area, including planning, standardization, data transmission and data quality assurance.

The 2019 inshore and offshore beam trawl survey data for North Sea (subarea 4) and Western Waters (subareas 7 and 8) have been uploaded to the ICES dataportal DATRAS, and are available for the stock assessments. In the North Sea as well as in division 7d, the strong 2018 cohort for both plaice and sole is still visible as 1-year old. For plaice, the 1-year olds are mainly visible in the offshore surveys (BTS), for sole the 2018 cohort is well visible in both the offshore and the inshore survey indices.

Annually, an update assessment is carried out for sole in autumn, using the Dutch BTS data in the southeastern North Sea of the running year. Generally, it is to be expected that the signal from that survey is incomplete to provide a proper forecast based on the 1-year olds in the survey year, because the inshore surveys are still running at the time of the update assessment. As in the past years, the data delivery deadlines for the update assessment for plaice and sole could only nearly be met. WGBEAM has discussed this issue and proposes achievable deadlines for data delivery based on the processing time (technical sample and data processing combined with the time available beside other workflows in the institute), and including sufficient time for quality checks, for both the offshore and the inshore beam trawl surveys.

The planning for the 2020 surveys has been completed, including an overview of rectangles for comparative fishing during the German and Dutch North Sea beam trawl surveys.

An outline was created for the Manual on inshore beam trawl surveys, including intersessional actions to be taken. Updates to the Manual on offshore beam trawl surveys have been added and a full update is scheduled for 2022.

During the meeting R scripts for data consistency checks were developed. Although not finalized, it is proposed that the scripts are stored at a WGBEAM GitHub to facilitate versioned scripts and to support efficient workflows and processing of similar data.

ii Expert group information

Expert group name	Working Group on Beam Trawl Surveys (WGBEAM)
Expert group cycle	Multiannual
Year cycle started	2020
Reporting year in cycle	1/3
Chair(s)	Ingeborg de Boois, the Netherlands
Meeting venue(s) and dates	23-25 March 2020, web-meeting (due to COVID-19), 19 participants

1 General information

Participation

Originally, the 2020 WGBEAM meeting venue was Reykjavik, Iceland. Due to the COVID-19 disease the meeting was turned into a webmeeting, from 13 different households in 9 countries, locations varying from an institute's meeting room to a parent's guest room, kitchen, sleeping room, basement, home office or living room. 13 participants joined the meeting (Annex 1).

Meeting goals

The group's terms of reference (Annex 2) relate mostly to the role of the group, i.e. to coordinate beam trawl surveys in the ICES area, including planning, standardization, data transmission and data quality assurance. The group also coordinates the Italian/Croatian/Slovenian beam trawl survey in the Adriatic Sea as there is no other body in the EU coordinating beam trawl surveys, and the EU Data Collection Framework requires survey coordination.

For 2020, the specific tasks were:

1. Compilation of survey summary sheets;
2. Provide tabular overview of survey planning, including geographical areas for overlapping tows;
3. To upload data for all beam trawl surveys (inshore and offshore) including litter in DATRAS for at least the last two years, as far as DATRAS allows the survey data to be submitted. For datasets where index calculation is done directly from DATRAS, as many years of the time-series should be uploaded as is feasible;
4. Develop R scripts for and results from the data evaluation by region as well as across regions;
5. To provide a first draft of an inshore beam trawl survey manual following the outlines of SISP 14;
6. If relevant, to provide updated SISP 14 at the WGBEAM sharepoint (full update in 2022).

2 Survet results (ToR a, b, c, d, f, i)

Survey achievements 2019 (ToR f)

For the offshore and the inshore surveys survey summary sheets (Annex 4) have been prepared, containing the main data end-users for fish stock assessment, data collected during the survey, and specific comments on the 2019 surveys.

Offshore surveys

Eleven surveys were carried out, covering the North Sea, 5a, 7d, 7e, 7fg, 7a, 8a, 8b and the Northern Adriatic Sea. The participating vessels and time of the surveys are listed in Table 2.1. Further details (areas covered, technical specifications) by country are given in Annex 4.

- The Irish survey ceased in 2018.
- In 2019, three overlapping hauls were carried out during the Dutch and German BTS in 39F7. There was a period of 19 days between the hauls.
- The British survey in the Western English and Celtic Sea started with a delay due to poor weather. A total of 129 beam trawl tows were completed out of 131 planned.
- The French survey (Coupeau&Biais, 2019) was shortened by 10 working days at sea due to very bad weather conditions. For this reason, only 39 of the 49 planned hauls could be processed.
- The Italian survey in the Adriatic Sea was carried out without any incidents. A total of 22 stations fished for less than 30 minutes due to large amounts of bycatch in the net.

Table 2.1. Overview of offshore bream trawl surveys during 2019.

Country	Vessel	Area	Dates	Gear
Belgium	Belgica	southern North Sea	26 Aug – 06 Sep 2019	4m beam
England	Endeavour	7e. Celtic Sea	17 Mar – 14 Apr 2019	4m beam
England	Endeavour	7d, 4c	16 Jul – 29 Jul 2019	4m beam
England	Endeavour	7a, 7fg	08 Sept – 27 Sep 2019	4m beam
France	Côtes de la Manche	8a, 8b	07 Nov – 02 Dec 2019	4m beam
Germany	Solea	German Bight	19 Aug – 03 Sep 2019	7m beam
Iceland	Bjarni Sæmundsson RE-30	Entire coast of Iceland	15 Jul – 24 Jul 2019	4m beam
Italy/Slovenia	G. Dallaporta	northern Adriatic Sea	14 Nov – 09 Dec 2019	3.5m beam
Netherlands	Tridens	central North Sea	19 Aug – 13 Sep 2019	8m beam + flip-up rope
Netherlands	Tridens	southern North Sea	29 Jul – 16 Aug 2019	8m beam

Inshore surveys

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 in 2012.

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 are listed in Table 2.2. Details on the surveys are given in Annex 7. Details on the 2019 survey achievements are in Annex 4.

- The Belgian survey was carried out with an interruption of three day because of over-booking of the ship.
- The German survey outside the island chain was cancelled due to technical problems with RV Clupea. Bad weather conditions did not allow sampling in area 409 by chartered vessel.
- The Dutch SNS survey started with one week delay. As a result, the survey in the Dutch coastal zone was also postponed by one week.

Table 2.2. Overview of surveys during 2019.

Country	Vessel	Area	Dates	Gear
Belgium	Simon Stevin	Belgian coastal zone	16 Sep – 20 Sep & 23 Sep – 30 Sep	6 m shrimp trawl
Germany	Chartered vessel & Clupea	German Bight and German Wadden Sea	01 Sep – 20 Sep	3 m shrimp trawl
Netherlands (SNS)	Isis	Dutch coastal zone	09 Sept – 20 Sept	6 m beam trawl
Netherlands	Luctor	Scheldt estuary	02 Sept – 20 Sept	3 m shrimp trawl
Netherlands	Stern	Dutch Wadden Sea	26 Aug – 27 Sept	3 m shrimp trawl
Netherlands	Isis	Dutch coastal zone and German Bight	23 Sep – 25 Oct	6 m shrimp trawl

Data transmission to DATRAS (ToR d)

(1) Set achievable deadlines for data delivery

As in the past years, the data delivery deadlines (strict deadlines for plaice and sole in the North Sea due to the update assessment) could only nearly be met. WGBEAM proposes achievable deadlines for data delivery based on the processing time (technical sample and data processing combined with the time available next to other workflows in the institute), and with sufficient time for data quality checks, for both the offshore (Annex 9.1) and the inshore (Annex 9.2) beam trawl surveys.

(2) Coordinate and evaluate data delivery to DATRAS

Fish trawl data

Unaggregated beam trawl data are stored in DATRAS up and until the survey of the year previous to the meeting year. For the year 2019 almost all countries have uploaded their data to DATRAS. These data are available in the database, but not all of them are already available for download in exchange format. A full overview of the DATRAS submission status is available at https://datras.ices.dk/Data_products/Submission_Status.aspx (select one of the Beam Trawl Surveys, Inshore beam trawl survey or Sole Net Survey)

For the offshore beam trawl surveys, only the Icelandic survey data are not delivered, as DATRAS does not allow for that yet. For the inshore data, Belgian data are not yet available and will be uploaded to DATRAS within due time after the meeting.

Marine litter

Data on bycatches of marine litter are also stored in the DATRAS database. For catches in the North Sea exchange data from BTS and DYFS are available for download. Data from BTS-VIII (Bay of Biscay), BTS-GSA17 (Adriatic Sea) and SNS (Sole Net Survey) are not available (are not yet uploaded to DATRAS?). Only Belgium collects marine litter data on a regular basis and has uploaded data for DYFS 2018.

An analysis of the last three years (2017-2019) shows that all countries operating in the North Sea have uploaded data on marine litter. The data include information on the hauls with bycatch of litter and the number and description of the items fished. Dutch data for 2019 still have to be uploaded. The same applies to DYFS marine litter data for Belgium.

Survey indices (ToR a, b, i)

North Sea – Subarea 4

For sole (offshore Annex 5 text 5.1.1.1, figures Annex 5.1.1 5.1.1-5.1.5; inshore text 5.2.1, figures Annex 5.2.1) strong 2016 and 2018 yearclasses can be tracked in multiple surveys (offshore and inshore). Depending on the exact survey area, the cohort consistency is stronger. For sole the strong 2018 cohort is visible in both the offshore (BTS) and the inshore (SNS, DYFS) surveys. For sole an update assessment is carried out in autumn based on the Dutch BTS data in the south-eastern North Sea of the running year. It is to be expected that the signal from that survey is incomplete to provide a proper re-estimate of the 1-year olds in the survey year. The inshore surveys are still running at the time of the update assessment.

For plaice (offshore Annex 5 text 5.1.2.1, figures Annex 5.1.2 5.2.1-5.2.6; inshore Annex 5 text 5.2.1, figures Annex 5.2.2) the strong 2018 yearclass is still present as 1-year old. From the Dutch offshore survey in the western and central North Sea (Figure 5.1.2.3) it seems that older age groups have been disappeared from the survey area. It is in line with the field observation that less larger plaice have been caught during the 2019 survey. WGBEAM investigated this further, and it appears that the average length of the plaice catches has decreased over the past years. This is in line with studies showing a decreased growing speed, but does not explain why the age groups suddenly seem to disappear from the catches. In 2018 and 2019 the decreased mean length may have been influenced by extreme recruitment (2018 yearclass).

The combined index shows the highest numbers for age group 1 in 2019 for the whole time-series. It also shows above average numbers for all age groups for the most recent years, with an increasing trend since the beginning of the 21st century. The strong decrease for the 9-group and 10+ group visible in the Dutch index is not reflected by the combined index. In the combined index the 10+ group in 2019 is even the strongest ever observed. There are some strong cohorts which can be tracked well (e.g. 1996, 2001, 2003, 2006) through the years (Figure 5.2.2.).

Western waters-subarea 7 and 8

Sole (Annex 5.1.1 text 5.1.1.2, figures 5.1.6–5.1.8) as well as plaice (Annex 5.1 text 5.1.2.2, figures 5.2.7–5.2.9) from area 7 stocks develops differently between the areas.

The year-class pattern in division 7d overlaps strongly with those in subarea 4 for both sole and plaice. In the time-series, the abundance for plaice at age 1 fluctuates, with strong cohorts 2010, 2013 and 2018. Cohorts can be generally well tracked between years in this survey.

In division 7f the abundance of age 1 sole at first glance appears to have been rather stable across the time-series with one very large cohort observed in 1999. Due to the large contrast the survey has been able to track this cohort very well through its existence. Smaller scale variations are however also observed and it is worthy to note that 4 of the last 5 years have been above average

recruitment. For plaice the survey index is highly informative on long-term stock dynamic trends but estimates of individual cohort abundance are not necessarily tracked that well in all but the smallest and largest cohorts. Some age-based models may confuse these signals with rapid selectivity changes in the fleet. Particularly age-1 abundance seems to be affected by this which may be linked to variable rates of unintended fishing mortality in the area.

Sole in division 7a has in recent years been of concern to managers due to low SSB values. The most recent survey trends indicate that following the strong decrease in sole abundance at age 1 until 2014 is starting to reverse with higher recruitment rates being observed since then. In contrast to the sole stock the 7a plaice stock seems to be in a very healthy condition, although the reduction in recent recruitment indicates that it is unlikely that the recent period of high productivity may not be maintained. A change in productivity might be indicative of some changes to the ecosystem relevant to plaice reproduction and that historic levels of catches applied to the current stock would require further analysis to ensure that they would remain sustainable.

There is no evidence of the synchrony in recruitment pattern observed between division 8 (Annex 5.1.1 text 5.1.1.2, figures 5.1.9, Coupeau&Biais 2019) and divisions 7a and 7f. The division 8 index suggests little if any change in the rate of mortality over the period for the observed age groups. There is good cohort tracking of abundance estimates from age 1 to 3. Some issues for age 0 and older ages are apparent in the survey data early in the time-series (prior to 2012). Particularly the strong 2007 cohort is underestimated at age 0 and the 2009 cohort appears to be significantly weaker than estimated at age 0. Full selectivity appears to be reached at age 2.

Northern Adriatic Sea

Overall an increasing trend for all the ages in the second part on the time-series is visible (Annex 5.1.1 text 5.1.1.3, Figure 5.1.1.10). There is a good internal consistency of the cohorts, in particular the high recruitment observed in 2013 can be followed in the succeeding years. Moreover 2019 seems to be a good year for recruitment.

Icelandic Sea

Some important differences in abundance can be highlighted between 2016 pilot survey and the others, especially for the younger age groups (0-4) (Annex 5.1.2 text 5.1.2.3, Figure 5.1.2.10). This might be because that survey was conducted in a subset of the stations sampled in later years, and was focused only on the main plaice nursery areas. The 2019 survey indicates that almost all the age groups (except for age 9) were lower than the long-term arithmetic mean. The internal consistency is weak in the younger ages but becomes relatively good starting from age group 4, in particular the high value observed in 2016 can be followed in the succeeding years.

Consistency analyses offshore and inshore beam trawl surveys (ToR a, b, i)

A WGBEAM subgroup evaluated offshore and inshore data from DATRAS. The focus was on offshore elasmobranchs and inshore shrimp data.

1) Evaluation of elasmobranch species captured on offshore beam trawl surveys in the North Sea.

It was investigated which elasmobranch species are observed in the offshore beam trawl survey and whether the species naming is consistent between the different countries. The group also looked for the presence of obsolete names that are no longer accepted by the World Register of Marine Species (http://www.marinespecies.org/). The analysis can be reproduced from the R script that was developed by the group and will be of use for ICES assessment working group

WGEF that provides assessments and advice on the state of the stocks of sharks, skates, and rays throughout the ICES area.

As an example the BTS, SNS and DYFS data from 2010 to 2019 was extracted and the spatial distribution of one of the most important skate species *Raja clavata* was plotted, both in terms of abundance by rectangle (Annex 8, Figure 8.1) and haul (Annex 8, Figure 8.2).

2) Evaluation of brown shrimp (*Crangon crangon*) catches from the inshore surveys in the North Sea.

There are three inshore surveys in the North Sea targeting brown shrimp (Annex 7, section 2 'Survey achievements'), carried out by Germany, the Netherlands and Belgium by different vessels and in different regions. An R script was developed for exploration of the data with spatial distribution maps and length frequency plots. This information will be of value for ICES Working Group on Crangon fisheries and life history (WGCRAN).

3 Survey coordination and standardardisaiton (ToR e, g, h)

Offshore and inshore beam trawl survey planning 2020 and comparative tows (ToR e)

The survey planning for the offshore and inshore beam trawl surveys 2020 is largely in line with previous years. Annex 6 contains the detailed planning.

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.

During the Dutch and German surveys in the North Sea, some overlapping hauls should be attempted in the following rectangles: 40F4, 40F5, 40F6, 41F4, 41F5, 41F6, 42F4, 42F5, 42F6, 43F4, 43F5, 43F6. The responsible scientists will contact each other approx. one month before the start of the Dutch survey to make appointments on the execution of the comparative tows. Comparative fishing has always been on the WGBEAM task list, but has become more important since the index calculation takes into account all beam trawl survey data in the North Sea with DeltaGAM. The model is more reliable when overlapping tows are available in the dataseries.

The Belgian and Dutch surveys also include rectangles fished by both in the same time frame, but the bottom of the Belgian positions is very rough. It is not possible to fish on these locations with the gear used by The Netherlands.

Manuals (ToR g, h)

An outline was made for the Manual on inshore beam trawl surveys (table of contents in Annex 10). The structure is based on the manual on offshore beam trawl surveys SISP 14 (ICES 2019). Intersessional actions have been defined (Annex 3.2).

The Manual on offshore beam trawl surveys (ICES 2019) has been updated where necessary. The compy is stored on the WGBEAM sharepoint. The updated manual will be made available in year 3 of the cycle (2022).

4 Survey specific topics

Change of number of stations Dutch offshore survey from 2019 onwards

Up and until 2018, in the southeastern North Sea and German Bight (originally sampled by RV "Isis") 82 priority stations and 12 additional stations were planned, divided over 20 rectangles. In 2019 the number of stations was reduced and for some stations the towing duration was set to 15 minutes. The main reasons were to get an achievable sampling programme and to prevent extremely large catches of especially starfish. Survey data of the past 10 years were evaluated on the number of invalid tows, the number of tows with large catches (5-10 baskets, 10-20 baskets, > 20 baskets), and the number of tows with reduced haul duration. Based on that information, in some rectangles the number of tows has been reduced and in a number of cases the standard towing duration has been set to 15 minutes.

WGBEAM 2020 discussed the change and did not see any risks for the continuity of surveys used in the fish stock assessments. Potentially an effect on the patterns in benthic catches (especially starfish) may occur.

The change has been added to the new version of the offshore manual.

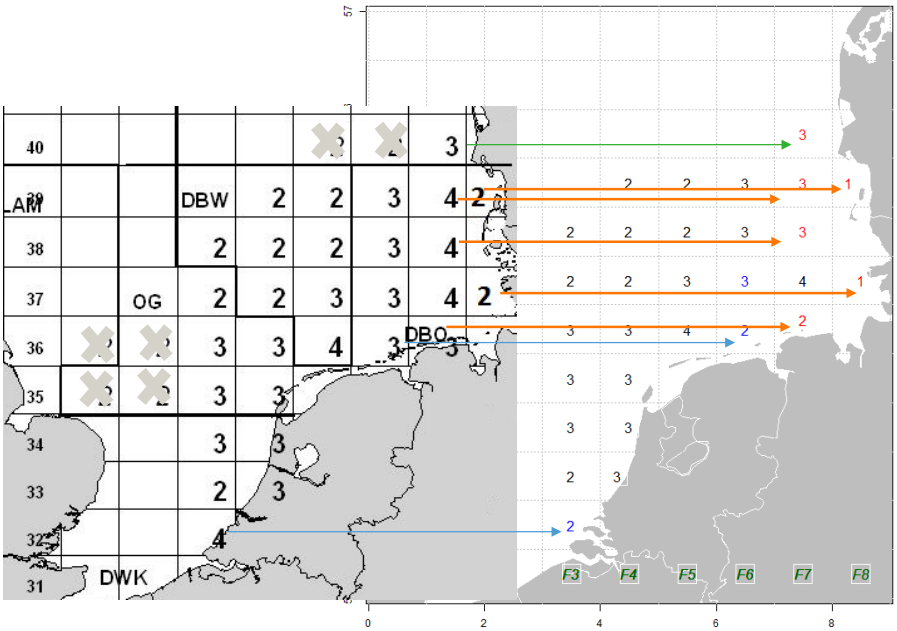

Figure 4.1 Changes in number of stations and towing duration in part of the Dutch beam trawl survey (left: until 2018, right: 2019 onwards). Orange lines: reduction of number of stations and haul towing duration per rectangle; blue lines: reduction on number of stations per rectangle. Right figure: red numbers: 15 minute tows; blue numbers: high chance on extremely large catches; black numbers: 30 minute tows.

The effect of missing stations in 2019 in the Bay of Biscay in 2019

The French ORHAGO survey in the Bay of Biscay was strongly impacted by bad weather conditions in 2019 (Coupeau&Biais, 2019). The number of days at sea was reduced from 21 to 11. As a result, 39 stations were fished out of the 49 planned. The stations withdrawn generally have a lower contribution to the catches. To investigate the effect of the missing data on the time-series, the whole index-series was recalculated without the stations cancelled in 2019 and this series was compared to the series comprising all the reference stations which were carried out each year (Figure 4.2, Biais 2003).

The general trend of the indices remains similar at each age. The index calculated without the stations cancelled in 2019 is generally higher than the index including all the stations, but in a limited proportion (average 4% for groups 2 to 8+, on which the stock assessment is based). This increase is, however, slightly larger for group 2 (10%) and the withdrawal of 10 stations in 2019 could therefore lessen the decrease in abundance observed for this age group between 2018 and 2019. The increase is less significant for age group 3 (average 6%) than for age group 2, but not in 2016 and 2017. The downward trend observed from 2016 to 2018 is thus amplified. For the age group 4 years and over, the difference between the two series of indices is smaller (average 3%).

The effect of missing stations in 2019 could therefore lead to an underestimation of the decrease in age groups 2 between 2018 and 2019. The option of switching to a time-series without the stations cancelled in 2019 could avoid this effect but it will amplify the decrease in abundance at age 3 from 2016 to 2018.

Figure 4.2: Comparison of the abundance indices calculated without the stations cancelled in 2019 and with all the reference stations carried out each year.

This option could therefore have an opposite effect on the quality of the abundance estimate for age groups 2 and 3 in recent years. In addition, at age group 4 and over, the effect of missing stations in 2019 on the abundance indices appears limited. It therefore seems preferable to keep the series which include all the reference stations carried out each year for the stock assessment in 2019, but considering that the decrease in abundance index of the age group 2 shown between 2018 and 2019 might be underestimated.

5 Other topics

Feedback on R shiny app

The ICES DATRAS team asked for feedback on the beta-version of a new R shiny application. It was reviewed by the group and suggestions for adaptations were made (Annex 11).

DATRAS unified format

During 2020, a unified format for DATRAS submissions will be implemented. The ICES DATRAS team need support from survey groups to test the new uploading facility. Holger Haslob and Ingeborg de Boois volunteered.

Use of github for trawl survey groups

As R scripts have been developed during the WGBEAM meetings in the past year, there is a need for proper version control. WGBEAM proposed that ICES Data Centre organizes a comprehensive hand-on Github training for trawl survey groups (IBTSWG, WGBEAM, WGBIFS). The participant list for this workshop from WGBEAM is in Annex 3.2.

6 References

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Annex 1: List of participants

Name	Institute	Country (of institute)	E-mail
Ulrika Beier	Wageningen Marine Research	Netherlands	Ulrika.beier@wur.nl
Gérard Biais	Ifremer, La Rochelle	France	Gerard.biais@ifremer.fr
Ingeborg de Boois	Wageningen Marine Research	Netherlands	Ingeborg.deboois@wur.nl
Gary Burt	Centre for Environment Fisheries and Aquaculture Science (Cefas)	UK	gary.burt@cefas.co.uk
Holger Haslob	Thuenen-Institute of Sea Fisheries	Germany	Holger.haslob@thuenen.de
Sven Kupschus	Centre for Environment Fisheries and Aquaculture Science (Cefas)	UK	sven.kupschus@cefas.co.uk
Guðjón Már Sigurðsson	Marine and Freshwater Research Institute	Iceland	gudjon@hafogvatn.is
Francesco Masnadi	National Research Council (CNR)	Italy	francesco.masnadi@irbim.cnr.it
Kay Panten	Thuenen-Institute of Sea Fisheries	Germany	kay.panten@thuenen.de
Giuseppe Scarcella	Italian National Research Council | CNR · Institute of Marine Science ISMAR	Italy	giuseppe.scarcella@an.ismar.cnr.it
Vaishav Soni	ICES	Denmark	vaishav@ices.dk
Loes Vandecasteele	Institute for Agricultural, Fisheries and Food Research (ILVO)	Belgium	Loes.vandecasteele@ilvo.vlaanderen.be
Adriana Villamor	ICES	Denmark	adriana.villamor@ices.dk

Annex 2: Resolutions

WGBEAM – Working Group on Beam Trawl Surveys

2019/FT/EOSG10 A **Working Group on Beam Trawl Surveys** (WGBEAM), chaired by Ingeborg de Boois*, the Netherlands, will work on ToRs and generate deliverables as listed in the Table below.

	Meeting dates	Venue	Reporting details	Comments (change in Chair, etc.)
Year 1	24-27 March 2020	Reykjavik, Iceland	The first interim report by 30 April 2020 to SCICOM and ACOM	**Incoming Chair:** Ingeborg de Boois
Year 2	2021	Town, Country	The second interim report by XX YYY 20XX to SCICOM and ACOM	
Year 3	2022	Town, Country	Final report by XX YYYY 20XX to SCICOM and ACOM	

ToR descriptors[1]

ToR	Description	Background	Science plan codes	Duration	Expected Deliverables
a	Evaluate the combined offshore and inshore beam trawl surveys data by region data in a reproduceable manner for the species used in fish stock assessment, including elasmobranchs and brown shrimp. Compare internal and external consistency of indicies age based indices where provided. Document inconsistencies or correct errors or omissions where identified.	Evaluation by region will ensure that patterns in the data (e.g. time-series, cohort strength) are consistent and sampling artefacts including year effects are identified, even when inter survey trends contradict.	3.1, 3.2	annually	(a) Updated, consistent and quality controlled beam trawl survey data are available in DATRAS; (b) R script to evaluate the results by region
b	Evaluate the cross regional offshore beamtrawl data in a reproduceable manner for the overlapping species used in fish stock assessment in multiple regions (e.g. sole, elasmobranch species). Document inconsistencies and correct errors or omissions where relevant.	Evaluation of species that are assessed in multiple regions cross-regionally will provide insight in the commonalities and differences in stock dynamics in different regions.	3.1, 3.2	annually	(a) Updated, consistent and quality controlled beam trawl survey data are available in DATRAS; (b) R script to evaluate the results cross-regionally
c	Evaluate the combined survey results of the offshore and inshore beam trawl surveys by region on	Evaluation of e.g. species composition and litter registrations will ensure that patterns in the data (e.g. time-	3.1, 3.2	annually	(a) Updated, consistent and quality controlled (e.g. species composition, litter

[1] Avoid generic terms such as "Discuss" or "Consider". Aim at drafting specific and clear ToR, the delivery of which can be assessed

ToR	Description	Background	Science plan codes	Duration	Expected Deliverables
	consistency, including litter data in a reproduceable manner.	series non-commercial species, litter, species composition, length frequencies) are based on correct data and not due to artefacts, even when the signals contradict. By doing this in a reproduceable manner (R script), the focus can be shifted or extended over the years without re-inventing the wheel. Moreover, traceability of analyses increases.			coding, consistent species identification in overlapping survey areas) beam trawl survey data are available in DATRAS. (b) R script to evaluate the results by region
d	Coordinate and evaluate the data delivery into the ICES database for offshore and inshore beam trawl surveys of (at least) the last two years and document gaps.	Unaggregated beam trawl survey data are stored in DATRAS up and until the survey of the year previous to the meeting year. Data from the year(s) before that, should be checked for completeness (final data submitted).	3.1	annually	(1) Achievable deadlines for data delivery of the next survey (2) Updated ICES database for inshore and offshore beam trawl surveys.
e	Coordinate and plan inshore and offshore surveys including overlapping tows	Dates, sampling areas and contact details of key persons are shared in order to (a) identify opportunities for tows on the same location, to support the deltaGAM methodology for index calculation in combining different survey gears. (b) coordinate effort in case of unforeseen circumstances hampering one of the surveys, primarily North Sea	3.1	annually	Finalized planning for the inshore and offshore beam trawl surveys, including areas where overlappinig tows may occur.
f	Report on the performance and abnormalities in the inshore and offshore surveys in the past year	For interpretation of the results, information on the performance of the sampling has to be provided to end-users	3.1	annually	Survey summary sheet by region.
g	Review and update the manual for offshore beam trawl surveys (SISP 14)	Review and update the survey manual.	3.1, 3.2	Year 3	Updated BTS manual (SISP 14)
h	Review and update the manual for inshore beam trawl surveys (DYFS, SNS)	Finalize the current draft manual in line with SISP 14 and hand in for review.	3.1, 3.2	Year 2	Manual for inshore beam trawl surveys
i	Provide indices for plaice, sole and if necessary other species if not yet derived directly from DATRAS	Indices are needed for the stock assessments. Especially for the Q1SWECOS survey, North Sea inshore surveys and offshore surveys outside the North Sea where indices are not (always) yet derived from DATRAS directly	3.1, 3.2	annually	Indices for plaice and sole if needed

Summary of the Work Plan

Year 1	(1) Compilaton of survey summary sheets (2) Provide tabular overview of survey planning, including geographical areas for overlapping tows (3) Data for all beam trawl surveys (inshore and offshore) including litter uploaded in DATRAS for at least the past two years, as far as DATRAS allows the survey data to be submitted. For datasets where index calculation is done directly from DATRAS, as many years of the time-series should be uploaded as is feasible (4) R scripts for and results from the data evaluation by region as well as across regions (5) First draft of inshore beam trawl survey manual following the outlines of SISP 14 (6) If relevant, updated SISP 14 at sharepoint
Year 2	(1) Compilaton of survey summary sheets (2) Provide tabular overview of survey planning, including geographical areas for overlapping tows (3) Data for all beam trawl surveys (inshore and offshore) including litter uploaded in DATRAS for at least the past two years, as far as DATRAS allows the survey data to be submitted. For datasets where index calculation is done directly from DATRAS, as many years of the time-series should be uploaded as is feasible (4) R scripts for and results from the data evaluation by region as well as across regions (5) Final version of inshore beam trawl survey manual following the outlines of SISP 14 (6) If relevant, updated SISP 14 at sharepoint
Year 3	(1) Compilaton of survey summary sheets (2) Provide tabular overview of survey planning, including geographical areas for overlapping tows (3) Data for all beam trawl surveys (inshore and offshore) including litter uploaded in DATRAS for at least the past two years, as far as DATRAS allows the survey data to be submitted. For datasets where index calculation is done directly from DATRAS, as many years of the time-series should be uploaded as is feasible (4) R scripts for and results from the data evaluation by region as well as across regions (5) If relevant, updated SISP 14 for review and publication

Supporting information

Priority	The scientific surveys coordinated by this Group provide major fishery-independent tuning information for the assessment of several fish stocks in the a number of regions. 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 about 12 beam trawl survey experts
Secretariat facilities	Report finalization, support ICES Data Centre with respect to DATRAS-related topics
Financial	No financial implications.
Linkages to ACOM and groups under ACOM	The survey data feed into to the assessments of flatfish stocks, brown shrimp and elasmobranch species carried out by various stock assessment EGs. Linked to ACOM through the quality of stock assessments and management advice.
Linkages to other committees or groups	Outcomes of and data supplied by WGBEAM are relevant to WGML and integrated ecosystem assessment groups.
Linkages to other organizations	The offshore beam trawl survey data are used in the large fish indicator (OSPAR).

Annex 3: Recommendations and actions

Annex 3.1 Recommendations

*Recommendations have been uploaded to ICES recommendation database.

Annex 3.2 Actions

Topic	Action	Action by (lead=*Italics*)	Milestone dates
Inshore manual (tor h)	Fill in information on Dutch, Belgian and German inshore beam trawl surveys	*Ulrika*, Loes, Holger	Planning in inshore manual folder on the sharepoint
Update offshore survey manual	If relevant, add or adapt information up and until the 2019 survey	Kay, Ingeborg, Gérard, Yann, Francesco, Gudjon, Gary	1st June 2020
DATRAS unified format	Testing the unified format, with and without headers	*DATRAS team*, Holger, Ingeborg	To be provided by DATRAS team, depends on development speed
Github training	Organize a comprehensive github training trawl survey groups using DATRAS	*ICES Data Centre* WGBEAM participants: Francesco, Holger, Ingeborg, Loes, Ulrika	To be provided by ICES data Centre team, depends on planning ICES Data Centre and participants
Updated DATRAS deadlines	Talk to Lotte how to proceed	*Ingeborg*	asap
Effects of spatial survey change	Discuss options for WKUSER II with Stan Kotwicki	*Sven*	1st June 2020
Q1 UK survey DATRAS	Discuss and decide on submission and if needed changes Q1 UK beam trawl survey to DATRAS in such a manner that it reflects the survey methodology and facilitates proper data use.	*Ingeborg*, Sven, Gary, Vaishav, Adriana	1st June 2020

Annex 4: Survey summary sheets

Survey, country	Area coverage	Running since	Methodology described in	Information to assessment WG	Data availability	Comments on 2019 survey	Data collected
Beam Trawl Survey (BTS), Belgium	South-western North Sea	1992	WGBEAM beam trawl survey manual	**WGNSSK:** *Pleuronectes platessa* (ple.27.420), indices by age group, age 1-10+; *Solea solea* (sol.27.4), indices by age group, age 1-9+ **WGEF:** elasmobranch species, CPUE per species per haul	Unaggregated data: (2004-2019) datras.ices.dk Density plots per species: http://ecosystemdata.ices.dk/map/	The Belgian BTS was carried out from 26 Aug to 6 Sept 2019 with RV Belgica. The weather conditions were sufficient to carry out all fishing activities during the two weeks of the campaign. All fouling was removed from the ship during summer maintenance, which allowed transits to go faster comparing to last year. However, station 98 had to be skipped due to lack of time. Due to the presence of passive fishing gear (crab pots) on the fishing track the stations 114, 20, 102, 87 and 84 also had to be cancelled. Sampling design remained the same as last year. Conclusion: 56 out of a total of 62 planned stations were successfully fished and declared valid. This is within the margin of 90% of the plan	**Fish species:** all species **Fish length:** all species, elasmobranch by sex **Fish weight:** sample weight per species, elasmobranch by sex **Fish biological data:** individual weight, length, sex, yearclass for plaice, sole, cod, turbot, brill, dab and lemon sole. Maturity data for summer spawner lemon sole. **Benthos:** all species, numbers and total weight per species per haul. Length measurements *for Sepia sp., Loligo vulgaris, Cancer pagurus (by sex), Nephrops norvegicus (by sex) and Homarus gammarus (by sex).* Anthozoa, Bryozoa, Hydrozoa and Porifera only presence absence.

Survey, country	Area coverage	Running since	Methodology described in	Information to assessment WG	Data availability	Comments on 2019 survey	Data collected
						to be achieved imposed by the European Commission (DG Mare).	**Marine litter:** all hauls **CTD:** continuous profile **Other:** /
Beam Trawl Survey (BTS), Germany	German Bight (North Sea)	1991	WGBEAM beam trawl survey manual	**WGNSSK:** *Limanda limanda* (dab.27.3a4), *Pleuronectes platessa* (ple.27.420), *Solea solea* (sol.27.4), indices by age group, age 1-10+ **WGEF:** elasmobranch species, CPUE per species per haul	Unaggregated data: datras.ices.dk Density plots per species: http://ecosystemdata.ices.dk/map/	The survey was carried out as planned. One invalid tow was repeated. A total of 63 valid stations were fished (approx. 31.5 hours fishing time).	**Fish species:** all species **Fish length:** all species; dab, plaice, elasmobranch by sex. **Fish weight:** sample weight per species, elasmobranch by sex Fish biological data: individual weight, length, sex, yearclass for dab, plaice, sole **Benthos:** all species, numbers and total weight per species per haul. Cephalopods, edible crab, *Nephrops norvegicus* length measurements. **Marine litter:** all trawls **CTD:** vertical profile planned for all hauls **Other:** -
Beam Trawl Survey (BTS), Netherlands	Southern and Eastern North Sea	1985	WGBEAM beam trawl survey manual	**WGNSSK:** *Limanda limanda* (dab.27.3a4), *Pleuronectes platessa* (ple.27.420), *Scophthalmus*	Unaggregated data: datras.ices.dk	Original survey planning modified based on number of invalid/shortened tows in previous years and to prevent time constraints. Spatial coverage has remained the same, number of	**Fish species:** all species **Fish length:** all species, elasmobranch by sex.

Survey, country	Area coverage	Running since	Methodology described in	Information to assessment WG	Data availability	Comments on 2019 survey	Data collected
				maximus (tur.27.4), *Scophthalmus rhombus* (bll.27.3a47de), *Solea solea* (sol.27.4), indices by age group, age 1-10+ **WGEF**: CPUE per species per haul	Density plots per species: http://ecosystemdata.ices.dk/map/ Hydrographic data: ocean.ices.dk	planned tows decreased from 82 to 73, for some tows haul duration was limited to 15 minutes due to foreseen large catches of especially starfish that don't lead to representative data. All planned stations have been fished, 2 invalid hauls. Strong 2018 yearclasses for plaice as well as sole clearly visible in index.	**Fish weight:** no sample weight per species till 2017, elasmobranchs by sex. **Fish biological data:** individual weight, length, sex, yearclass for plaice, sole, dab, lemon sole, turbot, brill, long rough dab, flounder, cod. Maturity data for summer spawners such as lemon sole. **Benthos:** all species, numbers. Cephalopods, edible crab, *Nephrops norvegicus* length measurements. **Marine litter:** all trawls **CTD:** vertical profile planned for all hauls, but not always managed due to technical issues and weather conditions. **Other:** -
Beam Trawl Survey (BTS), Netherlands	Central and Western North Sea	1998	WGBEAM beam trawl survey manual	**WGNSSK:** *Limanda limanda* (dab.27.3a4), *Pleuronectes platessa* (ple.27.420), *Scophthalmus*	Unaggregated data: datras.ices.dk	Survey conducted as planned. Strong 2018 yearclasses for plaice as well as sole clearly visible in index.	**Fish species:** all species **Fish length:** all species, elasmobranch by sex.

Survey, country	Area coverage	Running since	Methodology described in	Information to assessment WG	Data availability	Comments on 2019 survey	Data collected
				maximus (tur.27.4), *Scophthalmus rhombus* (bll.27.3a47de), *Solea solea* (sol.27.4), indices by age group, age 1-10+ **WGEF**: elasmobranch species, CPUE per species per haul	Density plots per species: http://ecosystemdata.ices.dk/map/ Hydrographic data: ocean.ices.dk		**Fish weight:** sample weight per species, elasmobranchs by sex. **Fish biological data:** individual weight, length, sex, yearclass for plaice, sole, dab, lemon sole, turbot, brill, long rough dab, flounder, scaldfish, solenette, thickback sole, cod, hake. Maturity data for summer spawners such as lemon sole and thickback sole. **Benthos:** all species, numbers and total weight per species per haul. Commercial cephalopods, edible crab, *Nephrops norvegicus* length measurements. **Marine litter:** all trawls **CTD:** vertical profile planned for all hauls, but not always managed due to technical issues and weather conditions.
Western Channel Beam Trawl Survey, VIIe, 1st quarter	Western English and Celtic Sea	2006	WGBEAM beam trawl survey manual	**WGCSE**: sole 7e, plaice 7e **WGEF**: Cuckoo ray 6, 7 8abd; Spotted ray 7ae-h; Undulate ray 7de; Smooth	Unaggregated data: Cefas	Survey completed between 17 March to 14 April, without major issue. Although start delayed due to poor weather, it remained good for the ma-	**Fish species:** all species **Fish length:** all species. Elasmobrach species, four-spot megrim, megrim, plaice by sex.

Survey, country	Area coverage	Running since	Methodology described in	Information to assessment WG	Data availability	Comments on 2019 survey	Data collected
(SWECOS), England				hound Nea; Lesser-spotted dogfish 7a-ce-j; Greater-spotted dogfish 6, 7; Blonde ray 7e; Small-eyed ray 7d; Thornback ray 7e; Category 6 stocks: Common skate 6 7a-ce-k	Density plots per species: Cefas	jority of the survey. A total of 129 successful beam trawl tows were completed out of a total of 131 planned. This comprised all 81 of the tows planned in the western Channel, and 48 of the 50 planned tows in the Celtic Sea.	**Fish weight:** sample weight by species and sex for all elasmobrach species, four-spot megrim, megrim, plaice. **Fish biological data:** Individual weight, length, sex and maturity for all elasmobranch species, and conger eel, (cod), (haddock), (whiting), ling, hake, (monkfish), John dory, all species of gurnard, sea bass, red mullet, four-spot megrim, (megrim), (turbot), (brill), witch, (lemon sole), (plaice), (sole). Ages determined for those species highlighted by brackets. **Benthos:** all species, numbers and total weight per species quantified for beam trawl with blinder. Additional observations made for beam trawl without blinder captured against catch for beam trawl with blinder. Length measurements collected for cephalopods and commercial shellfish. Sentinel and non-native species

Survey, country	Area coverage	Running since	Methodology described in	Information to assessment WG	Data availability	Comments on 2019 survey	Data collected
							weighed and counted for both beam trawls. **Marine litter:** all trawls **CTD:** average surface and bottom temperatures and salinities collected for each tow. **Other:** zoo-plankton (ringnet), phyto-plankton (plankton image analyser), epi-benthos (2m beam trawl), infauna, PSA (grab), seabed images (drop camera), environmental data (ESM2), acoustic data, water samples for caesium & tritium analysis, opportunistic tagging of species of elasmobranch.
Beam Trawl Survey (BTS), England	Eastern English Channel and Southern North Sea	1988	WGBEAM beam trawl survey manual	**WGNSSK**: Plaice 4 SD20l Plaice 7d; Sole 7d **WGEF**: Blonde ray 4c, 7d; Cuckoo ray 3, 4; Spotted ray 3, 4, 7d; Thornback ray 3, 4, 7d; Undulate ray 7de; Smooth-hound Nea; Lesser-spotted dogfish 3a, 4, 7d	Unaggregated data: datras.ices.dk Density plots per species: http://ecosystemdata.ices.dk/map/	Survey completed as planned and in good weather, with no significant issues. Out of a total of 65 targeted tows in VIId, it was not possible to fish one location due to the presence of static gear, and the tow duration had to be reduced for 10 due to the presence of static gear or a history of large catches (particularly on the French coast),	**Fish species:** all species **Fish length:** all species. Elasmobrach species, plaice by sex. **Fish weight:** sample weight by species and sex for all elasmobrach species, plaice. **Fish biological data:** Individual weight, length, sex and maturity for

Survey, country	Area coverage	Running since	Methodology described in	Information to assessment WG	Data availability	Comments on 2019 survey	Data collected
						which is common place for this survey. 21 tows were undertaken in IVc, one being invalid with another having to be reduced in time due to the presence of cables. Of these 21 completed tows, 6 were additional tows off the Belgium coast. Further tows were undertaken and grabs deployed (during night-time) to collect samples for chemical analysis as part of the CSEMP project (Clean Seas Environmental Monitoring Programme).	all elasmobranch species, and conger eel, (cod), (whiting), ling, (monkfish), John dory, all species of gurnard, (sea bass), red mullet, (turbot), (brill), dab (lemon sole), flounder, (plaice), (sole). Ages determined for those species highlighted by brackets. **Benthos:** all species. Numbers and total weight per species at a selected number of preselected stations. If not, species observed only. Sentinel and non-native species weighed and counted. Length measurements collected for cephalopods and commercial shellfish. **Marine litter:** all trawls **CTD:** average surface and bottom temperatures and salinities collected for each tow. **Other:** environmental data (ESM2), collection of water samples for nutrient analysis, opportunistic tagging of species of elasmobranch.

Survey, country	Area coverage	Running since	Methodology described in	Information to assessment WG	Data availability	Comments on 2019 survey	Data collected
ISBCBTS (September) (ISBCTS), England	Irish Sea and Bristol Channel	1988	WGBEAM beam trawl survey manual	**WGCSE**: Plaice 7a; Sole 7a; Sole 7fg; Plaice 7fg **WGEF**: Thornback ray 7afg; Small-eyed ray 7fg; Spotted ray 7ae-h; Cuckoo ray 6 7 8abd; Smooth-hound Nea; Lesser-spotted dogfish 7a-ce-j; Greater-spotted dogfish 6, 7 Category 5 stocks: Blonde ray 7afg	Unaggregated data: datras.ices.dk Density plots per species: http://ecosystemdata.ices.dk/map/	The survey was completed in good weather as planned between 8 to 27 September 2019. In total of 108 valid stations were completed. For 19 stations the duration had to be reduced from the standard due to the presence static gear or expected large catches, and a few had to moved short distances to avoid undersea cables.	**Fish species:** all species **Fish length:** all species. Elasmobrach species, plaice by sex. **Fish weight:** sample weight by species and sex for all elasmobrach species, plaice. **Fish biological data:** individual weight, length, sex and maturity for all elasmobranch species, and conger eel, (cod), (haddock), (whiting), ling, hake, (monkfish), John dory, all species of gurnard, sea bass, red mullet, (turbot), (brill), dab (lemon sole), (plaice), (sole). Ages determined for those species highlighted by brackets. **Benthos:** all species. Numbers and total weight per species at a selected number of preselected stations. If not, species observed only. Sentinel and non-native species weighed and counted. Length measurements collected for cephalopods and commercial shellfish. **Marine litter:** all trawls

Survey, country	Area coverage	Running since	Methodology described in	Information to assessment WG	Data availability	Comments on 2019 survey	Data collected
							CTD: average surface and bottom temperatures and salinities collected for each tow. **Other:** environmental data (ESM2), collection of surface water samples for analysis of tritium and water samples to determine alkalinity, opportunistic tagging of species of elasmobranch.
Beam Trawl Survey, France	Bay of Biscay	2007	WGBEAM beam trawl survey manual	**WGBIE** : Sole 8ab	Unaggregated data: datras.ices.dk	Due to bad weather conditions, the number of working days at sea went from 21 to 11. As a result, 39 stations were fished out of the 49 planned. The missing stations are: the 6 stations of the southern stratum, 3 stations in the central offshore stratum and one in the central coastal stratum. The contribution of these stations to the total catch of sole has been limited in recent years: 7-9% for the 10 stations cancelled and 3-4% for the 6 stations in the southern stratum in 2016-2018. Due to a change in working practices on board, the sex is not recorded in the HL Datras file for certain fish measured by sex (meagre, monkfish, red mullet, sea bass,	**Fish species:** all species **Fish length:** all species, meagre, monkfish, red mullet, sea bass, sole and elasmobrach species by sex. **Fish weight:** sample weight by species. **Fish biological data:** maturity, sex, otoliths for meagre, red mullet, sea bass and sole. Illicium for monkfish. **Benthos:** Numbers and total weight per species **Marine litter:** all trawls.

Survey, country	Area coverage	Running since	Methodology described in	Information to assessment WG	Data availability	Comments on 2019 survey	Data collected
						whiting and undulate ray). This problem needs to be fixed in the future.	**CTD:** bottom temperatures collected for each tow (end).
Beam Trawl Survey, Iceland	Waters around Iceland	2016	WGBEAM beam trawl survey manual	**NWWG:** Used for local assessments for *Limanda limanda* and *Microstomus kitt* since 2016 and for *Pleuronectes platessa* since 2020	Upon request	The survey was completed as scheduled between the 15th and the 24th of July. A total of 76 valid hauls were carried out, and two invalid hauls due to net damage. Catch was lower overall this year, but that could be in part because the survey was conducted in July instead of late August like in the previous two years. All benthos was identified and weighted at a subset of the stations for the first time.	**Fish species:** all species **Fish length:** all species **Fish weight:** Individual weight taken for 10 fish at each station for following species: plaice, dab, lemon sole, halibut, megrim, long rough dab, flounder, witch flounder **Fish biological data:** individual weight, maturity, sex, otoliths for 10 fish at each station for plaice, dab, lemon sole, halibut, megrim, long rough dab, flounder, witch flounder **Benthos:** Crabs, Nephrops, commercially important shrimp and sea cucumber are counted. All benthos identified and weighted for daytime stations. **Marine litter:** all trawls, recorded and weighted

Survey, country	Area coverage	Running since	Methodology described in	Information to assessment WG	Data availability	Comments on 2019 survey	Data collected
							CTD: continuous during haul; CTD attached to net. **Other: -**
Beam Trawl Survey, Italy-Slovenia-Croatia	North Adriatic Sea (GSA 17)	2005	WGBEAM beam trawl survey manual; SoleMon handbook (available here: http://dcf-italia.cnr.it/reserved/linee-guida/1)	**FAO-GFCM-SAC-WGSAD, STECF**: *Melicertus kerathurus, Pecten jacobeus, Scophthalmus maximus, Scophthalmus rhombus, Sepia officinalis, Solea solea, Squilla mantis.* Index of Abundance by size and age for sole, mantis shrimp and cuttlefish.	Unaggregated data: datras.ices.dk for sole	The 2019 survey was carried out from 14/11-09/12/2019 with RV G. Dallaporta. 73 hauls (66 Italian + 1 Slovenian + 6 Croatian) were carried out during 2019 survey. The survey was completed without incident, and it was carried out in Croatian waters in the period 21/11/2019 to 22/11/2019. A total of 22 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.	**Fish species:** The primary target species is *Solea solea*, with additional species including cuttlefish, scallop, queen scallops, turbot, brill, skates, purple dye murex and caramote prawn. **Fish length:** all species **Fish weight:** individual weight for target species, total weight for the other. Fish biological data: individual weight, length, sex and maturity for target species. Length and total weight for other species. **Benthos:** all hauls, more than 250 macro and megabenthos species **Marine litter:** all hauls

Survey, country	Area coverage	Running since	Methodology described in	Information to assessment WG	Data availability	Comments on 2019 survey	Data collected
							CTD: vertical profile planned for all hauls
Inshore beam trawl survey (DYFS)	Coastal zone Belgium	1971	Inshore beam trawl survey manual in progress	**WGNSSK:** *Pleuronectes platessa* (ple.27.420), *Solea solea* (sol.27.4), combined BEL/GER/NED recruitment index	Unaggregated data (2010 – 2019): datras.ices.dk	The Belgian DYFS was carried out from 16-20 Sept and on 23 Sept and 30 Sept 2019 with RV Simon Stevin. The weather did not interfere with the seagoing operations and no technical problems were encountered. The reason for the interruption in sampling days was because of overbooking of the ship. Nevertheless, all 33 sampling stations were completed successfully. Sampling design remained the same as last year.	**Fish species:** all species **Fish length:** selected list of commercial species; elasmobranch by sex **Fish weight:** sample weight per species for species that are measured **Fish biological data:** individual weight, length, sex, yearclass for plaice and sole **Benthos:** only *Crangon crangon* weight per size fraction (small and large) and length of minimal 250 individuals per haul. Marine litter: all hauls **CTD:** continuous profile **Other:** /
Inshore beam trawl survey (DYFS)	Coastal zone Germany and German	1972	Inshore beam trawl survey manual in progress	**WGNSSK:** *Pleuronectes platessa* (ple.27.420), *Solea solea* (sol.27.4), combined BEL/GER/NED recruitment index	Unaggregated data: datras.ices.dk	Due to technical problems the cruise with RV Clupea was cancelled completely. Further, bad weather conditions did not allow sampling in area 409.	**Fish species:** all species **Fish length:** all species **Fish weight:** sample of all species

Survey, country	Area coverage	Running since	Methodology described in	Information to assessment WG	Data availability	Comments on 2019 survey	Data collected
	Wadden Sea					Strong 0-group for plaice was observed in the coastal areas.	Fish biological data: individual weight, length, sex, year class for plaice. **Benthos:** all species, *Crangon crangon* total weight and length measurements of 250g subsample. **Marine litter:** only on RV Clupea **CTD:** continuous during haul, CTD attached to net. **Other:** Secchi-Depth
Inshore beam trawl survey (DYFS)	Coastal zone Netherlands, Dutch Wadden Sea, Eastern and Western Scheldt	1970	Inshore beam trawl survey manual in progress	**WGNSSK:** *Pleuronectes platessa* (ple.27.420), *Solea solea* (sol.27.4), combined BEL/GER/NED recruitment index	Unaggregated data: datras.ices.dk Density plots per species: http://ecosystemdata.ices.dk/map/	Surveys in the Wadden Sea and Eastern and Western Scheldt conducted as planned. Survey in the coastal zone started one week later than planned due to the delayed SNS (see below). Sampling programme has been finished without further issues. Strong 2018 year classes for plaice as well as sole visible in index for the coastal area, not in the other areas.	**Fish species**: all species **Fish length:** all species **Fish weight:** no sample weight per species Fish biological data: individual weight, length, sex, yearclass for plaice, dab, sole, flounder, turbot, brill. Maturity data only to separate between immature and maturing.

Survey, country	Area coverage	Running since	Methodology described in	Information to assessment WG	Data availability	Comments on 2019 survey	Data collected
							Benthos: all species numbers. *Crangon crangon*, Cephalopods, edible crab length measurements **Marine litter:** no **CTD:** continuous during haul, CTD attached to net. **Other:** additional hauls conducted for national programmes.
Sole net survey (SNS)	Dutch EEZ and southern German Bight	1969	Inshore beam trawl survey manual in progress	**WGNSSK:** *Pleuronectes platessa* (ple.27.420), *Solea solea* (sol.27.4), indices by age group age 1-4+	Unaggregated data: datras.ices.dk Density plots per species: http://ecosystemdata.ices.dk/map/	Survey suffered from one week delay, caused by limited personnel capacity. The timing was shifted with a week compared to planning, a number of stations had to be dropped. Spatial coverage has been maintained, so limited effect on the survey index is to be expected. Strong 2018 yearclasses for plaice as well as sole clearly visible in index.	**Fish length:** all species **Fish weight:** no sample weight per species **Fish biological data:** individual weight, length, sex, yearclass for plaice, dab, sole, flounder, turbot, brill. Maturity data only to separate between immature and maturing. **Benthos:** all species numbers. Cephalopods, edible crab length measurements. Marine litter: no

Survey, country	Area coverage	Running since	Methodology described in	Information to assessment WG	Data availability	Comments on 2019 survey	Data collected
							CTD: continuous during haul, CTD attached to net. **Other:** -

Annex 5: Survey indices

Annex 5.1 Offshore surveys

Sole

North Sea – Subarea 4

The combined sole BTS deltaGAM index was calculated by WGBEAM2020 (Figure 5.1.1.1., Annex 5.1). It has to be noted that this combined index differs slightly from that presented during the last sole benchmark assessment work shop (ICES, 2020) and from what will be calculated by the responsible stock coordinator for the final sole assessment run. However, the index presented here was calculated following the data specifications listed in the last updated stock annex and the same DATRAS data plus the data for 2019 were used (including Dutch, Belgian and German data). The index confirms the strong 1-age group in 2019 which is also visible for the separated indices (see below). Apart from that the index is able to track cohorts quite well, e.g. the cohort plot (Annex 5.1, Figure 5.1.1.2.) shows strong cohorts from 2002, 2005 and 2010. Overall, as expected the combined index largely averages the trends between the single surveys as expected.

The indices for sole from different surveys on area 4 stocks are summarized in Figure 5.1.1.3. – 5.1.5. and Tables a-b in Annex 5.1).

Time-series trends for sole in the southeastern North Sea and the German Bight, based on the Netherlands BTS-I (previously Isis) offshore survey indicate that recent year classes have been mainly poor with the 1-group below the long-term arithmetic mean for the years (2012–2018). However, the 1-group observed in 2019 was the second highest observed value of the time-series. The 2-group index was again below the long-term mean in 2019, while the 3-group index was above the long term mean in 2019. Although indices for the recent year classes (age group 1) were below the average, the 4-group indices were observed above the long-term average from 2016 – 2018 and on average in 2019. The 5-group index was above the long-term arithmetic mean for the last 6 years now (2014-2019).

Time-series trends for sole in the Southern North Sea (4c), based on the UK offshore survey show that number of age group 1 is highly variable, and numbers of one-year olds were below the long-term mean from 2012–2014. Since then, observed age group 1 values increased and in 2017 the highest age group 1 survey index was observed for the whole time-series. The strong 2017 cohort is well trackable in the survey indices and formed the highest observed index value for age group 2 in 2018, and the third highest of age group 3 in 2019. However, in 2018 the value for the 1-group was well below the average again, but similar to the Dutch survey index a strong 1-group was detected in 2019 again. The number of older fish (4+ group) fluctuated around the long-term arithmetic mean for the last 10 years.

Time-series trends for sole in the Southern North Sea (4c), based on the Belgian offshore survey show variations in age group 1, with high observed age group 1 values in 2015, 2017 and also in 2019. The 2017 cohort is also tracked good by this survey, similar to the UK survey which has a strong geographical overlap with the Belgian survey. The strong 2019 1-group is also confirmed by the Belgian survey. The observed age group 2 value in 2018 was the highest recorded in this time-series and reflects the strong age group 1 observed in 2017. Also the below average 2018 1-group is reflected by the below average 2-group in 2019. The strong 2013 age group 3 cohort is visible until 2015 where a strong age group 5 was observed. However, age group 5 for the recent

four years was observed below the average mean. For age group 6 a decreasing trend was observed from 2016 onwards.

Western Waters - Subareas 7 and 8

The indices for sole from area 7 stocks are summarized in Figure 5.1.1.6.–5.1.8. and Tables c – f in Annex 5.1.

Division 7d

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.

While the 1-group value in 2018 was below the long term mean, the observed 1-group value in 2019 was the highest in the time-series. The abundance of age group 2 in 2019 was well above the long-term average, although the 2018 1-group was below the mean. However, the strong 2016 cohort is reflected by the highest observed 3-group in 2019. The 4+-group was above the long term average for the last seven years now.

In 2014 and 2015 the number of one-year old sole was 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, while the numbers in 2017 were similar high as the values in 2014 and 2015.

Division 7f

The abundance of age 1 sole at first glance appears to have been rather stable across the time-series with one very large cohort observed in 1999. Due to the large contrast the survey has been able to track this cohort very well through its existence. Smaller scale variations are however also observed and it is worthy to note that 4 of the last 5 years have been above average recruitment. This is commensurate with the improved recruitment observed in division 7a although appears that the change is much less than in the latter stock. It is also synchronous with the large reduction in the plaice recruitment in 7f. The size of the 1998 cohort relative to the recent cohorts is variable across the ages, but without trend suggesting that the mortality rate has been relatively constant if selectivity patterns have remained stable over the last 20 years. In any case abundance of five year olds are quite consistently some of the highest abundances in the time-series.

Division 7a

Sole in 7a has in recent years been of concern to managers due to low SSB values. The most recent survey trends indicate that following the strong decrease in sole abundance at age 1 until 2014 is starting to reverse with higher recruitment rates being observed since then. This is commensurate with the sharp decline in plaice recruitment as indicated by the same survey. Those improved recruitment estimates are feeding through to more recent improvements in abundance of the older ages possibly. While the recruitments are likely only around half the size of the high historic recruitments, they seem to have a disproportionate effect on the abundance at older ages suggesting that mortality is now lower than historically. At age 5 the abundance is now estimated to be substantially higher than the previously observed maximum. While adjacent ages confirm the positive trend, it is likely that the age five estimate is overly optimistic.

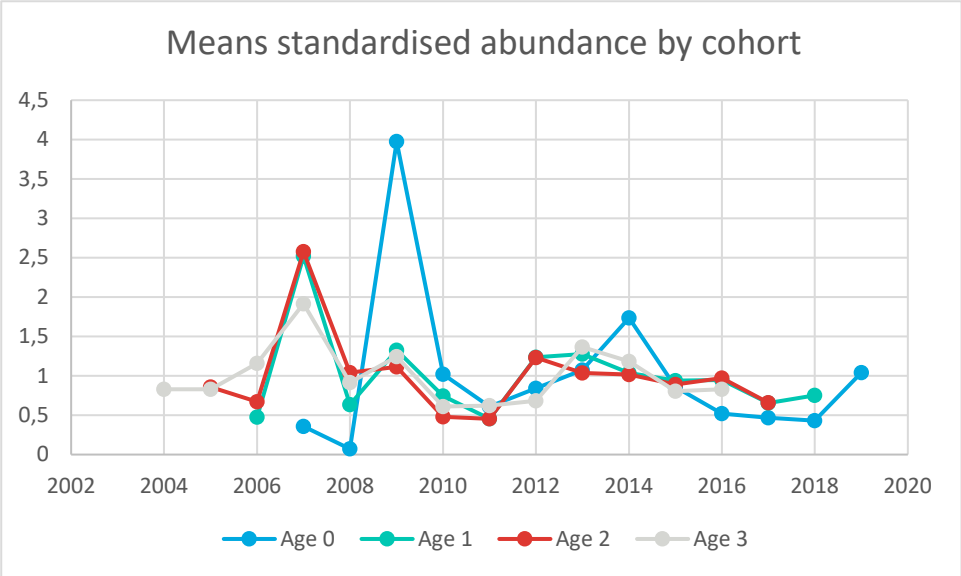
The survey index seems to be able to pick up the long-term population dynamic trends well and demonstrates internal consistency. However, unlike other sole stocks the recruitment autocorrelation seems quite high and the lack of year-to-year contrast in cohort strengths is likely to make it difficult for an age based assessment model to distinguish rapid changes in fishing mortality or selectivity.

Division 8 a, b

The ORHAGO survey time-series of age group abundances of sole in the Bay of Biscay (Figure 5.1.1.9.; Table g in Annex 5.1) 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 five 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 estimates. The 4+ age group abundance indices indicate a sudden jump from 2011 to 2012 inconsistent with the weakly estimated yearclass coming in. Since then the 4+ group has fluctuated minorly in synchrony with estimated cohort strengths entering the plus group.

The population up to age 3 appears to have been largely stable over the time-series with the 2007 cohort showing the largest contrast with a slight decrease in the inter annual variability of recruitment in recent years. The observed contrast in cohort strength appears to be smaller than other Celtic Sea sole stocks. There is no evidence of the synchrony in recruitment pattern observed between division 7a and 7f. The index suggests little if any change in the rate of mortality over the period for the observed age groups.

There is good cohort tracking of abundance estimates from age 1 to 3. Some issues for age 0 and older ages are apparent in the survey data early in the time-series (prior to 2012). Particularly the strong 2007 cohort is underestimated at age 0 and the 2009 cohort appears to be significantly weaker than estimated at age 0. Full selectivity appears to be reached at age 2.



Northern Adriatic Sea

Figure 5.1.1.10. (table j) in Annex 5.1 shows the time-series trends in the indices for the northern Adriatic Sea common sole, 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 FSA R script (https://CRAN.R-project.org/package=FSA).

Overall an increasing trend for all the ages in the second part on the time-series and a good internal consistency of the cohorts is visible, in particular the high recruitment observed in 2013 can be followed in the succeeding years. Moreover the 2019 seems to be a good year for recruitment.

The 2019 survey indicates that the 0, 1, 2 and 3 age groups were higher than the long-term arithmetic mean. Differently from 2018, age 4+ in 2019 survey has been lower than the level of the long-term arithmetic mean. Ages 4+ trend is quite fluctuating due to the very few specimens that reach this ages (≃ 2.7 Num./Km^2).

Plaice

North Sea – Subarea 4

The combined plaice BTS deltaGAM index was calculated by WGBEAM2020 (Annex 5.1.2 Figure 5.1.2.1). It has to be noted that this combined index might differ from that which will be calculated by the responsible stock coordinator for the final plaice assessment run. However, it was calculated following the stock annex for North Sea plaice and it combines Dutch, Belgian, German and UK data. The combined index shows the highest numbers for age group 1 in 2019 for the whole time-series. It also shows above average numbers for all age groups for the most recent years, with an increasing trend since the beginning of the 21st century. The strong decrease for the 9-group and 10+ group visible in the Dutch index (see below) is not reflected by the combined index. In the combined index the 10+ group in 2019 is even the strongest ever observed. There are some strong cohorts which can be tracked well (e.g. 1996, 2001, 2003, 2006) through the years (Annex 5.1.2 Figure 5.2.2).

Annex 5.1.2 figure 5.2.3 show trends in the indices for North Sea plaice from the Netherlands offshore survey carried out by Tridens. The survey is split up in two parts: one that covers mainly the southern North Sea (BTS-I; previously: Isis), and the other part extends substantially further north and west (BTS-II; previously: Tridens).

The BTS-I 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, 2016 and 2018 it was again below the average, while it was above the long-term mean in 2017. In 2019, the strong 2018 year class, which was detected in the inshore surveys, reflects the highest 1-group index value since 1997. The BTS-II survey documented six incoming year classes that were above average from 2007 onwards. This pattern is visible at all ages in this survey, and the cohorts can be tracked well over time. The 2018-year class is by far the highest on record, evident by the high values of the 1-group in 2019, while the 2017 year class was lower than the average. The clear increasing trend in the age 4 ended in 2018, and also in 2019 there was a further decrease detected. The 5+ group showed the highest record of the time-series ever for the 2018 value, but in 2019 it also decreased.

The population abundance series for plaice from the UK offshore survey (depicted in Figure 5.2.4), confirms the strong incoming 2018 year class. Also for the age groups 2 to 4+ the trends are similar to the Dutch surveys for the most recent years with index values above average. However, in the UK survey the above average values occur some years later. Apart from the strong 2018 year class, the high incoming year classes 2010 and 2013 were the biggest since 2002 in this survey. The increasing trend in numbers which can be seen from the combined Dutch survey indices for age groups 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. Since then, the index values for this age group are clearly above the long-term average. These strong year classes can be tracked in the age group 4+ for the years 2017 to 2019.

The plaice abundance time-series for plaice by the Belgian offshore survey are displayed in figure 5.2.5 Annex 5.1.2. Age group 1 shows variable values fluctuating around the long term average without trend and close below the average in 2018. The strong incoming 2018 year class is also confirmed in this survey. Age group 2 values were observed above the average for the last six years. Age group 3 was fluctuating without trend around the average, but the strong 2013 cohort is traceable until age group 3. Age group 4 values are since 2012 observed above the average with only the 2017 and 2019 values below the average.

The index calculated for the German survey data is presented in Figure 5.1.2.6. (Annex 5.1.2). Also this survey confirms the strong 1-age group in 2019, also the highest in this time-series.

While the 2-group in 2018 was clearly above the long term mean it decreased strongly for 2019, but is still above average. The 3-group and 4-group show below average values for the last three and two years, respectively. A decreasing trend for the 4-group is visible since 2016, which is also the case for age groups 5 and 6. For the older age groups (8 to 10+) the 2019 values are the highest in the time-series. This trend for the older age groups differs clearly from the Dutch survey.

Western Waters - Subarea 7

The indices for plaice from area 7 stocks are summarized in Figure 5.2.6 to 5.2.8 in Annex 5.1.2.

Western Waters - Subarea 7

Division 7d

In 2019, the observed number of age group 1 was the second highest ever observed in the time-series which is similar to the pattern observed in the North Sea. In the time-series, the abundance at age 1 fluctuates, with strong cohorts of 2010 and 2013. As a result of the good year classes in the numbers of age 4+ were the highest ever observed in the time-series for the years 2013-2019, with a decrease for the last year. Cohorts can be generally well tracked between years in this survey.

Division 7f

Abundance of age 1 plaice has shown a largely stable mean abundance over the time-series until 2014, however the interannual variability of recruitment has been increasing. After 2014 a sudden reduction in recruitment has been observed along with a similar pattern observed in division 7a plaice. followed by a sharp decline since 2014. In 2010 age 2 abundance suddenly increased and seems to have maintained higher levels since then with older ages confirming this increase in subsequent years indicating good cohort tracking. The lower recruitment values post 2015 are showing up as decreases in the older ages more recently, but the abundance is still relatively high compared to earlier strong recruitments. Mortality is therefore likely to have decreased since that earlier time. Mortality of 7f plaice seems to be higher and closer to long-term sustainable levels than in division 7a so that a more rapid decrease in the SSB should be expected from this stock in response to the observed reduction in recruitment. The contrast and the synchrony of the recruitment decline along with the different levels of exploitation rate seems to suggest that larger scale environmental or ecosystem processes are at work.

The survey index is highly informative on long-term stock dynamic trends but estimates of individual cohort abundance are not necessarily tracked that well in all but the smallest and largest cohorts. Some age-based models may confuse these signals with rapid selectivity changes in the fleet. Particularly age-1 abundance seems to be affected by this which may be linked to variable rates of unintended fishing mortality in the area.

Division 7a

The age 1 abundance of plaice in the Irish Sea has been variable but generally increasing until reaching the maximum in 2014. Since then recruitment appears to have decreased persistently with some very low abundances being recorded in the last 4 years. For age 2 – 5 the picture is increasingly optimistic with these ages all increasing over the time-series with the strongest contrast observed in the oldest age. The apparent decrease in recruitment (after age 1 in 2014) is feeds through well in the 2018 and 2019 surveys indicating that it should be possible for an assessment models to distinguish the population dynamic trends of decreasing recruitment and mortality well despite the inter annual variability in the index.

In contrast to the 7a sole stock the plaice stock seems to be in a very healthy condition, although the reduction in recent recruitment indicates that it is unlikely that the recent period of high

productivity may not be maintained. A change in productivity might be indicative of some changes to the ecosystem relevant to plaice reproduction and that historic levels of catches applied to the current stock would require further analysis to ensure that they would remain sustainable.

Icelandic Sea

Figure 5.2.9 shows the time-series trends in the indices for Iceland Sea plaice based on the offshore beam trawl surveys carried out along the entire coast of Iceland. Due to the recent establishment of the survey, plaice time-series is quite short. Moreover, the 2016 survey must be considered different from the other years, as it was a smaller pilot study (31 tows conducted vs 70-80 later), which focused on the main nursery areas of plaice.

For this reason, some important differences in abundance can be highlighted between 2016 survey and the others, especially for the younger age groups (0-4). The 2019 survey indicates that almost all the age groups (except for age 9) were lower than the long-term arithmetic mean. The internal consistency is weak in the younger ages but becomes relatively good starting from age group 4, in particular the high value observed in 2016 can be followed in the succeeding years.

Annex 5.1.1 Figures and tables offshore indices sole

North Sea – Subarea 4

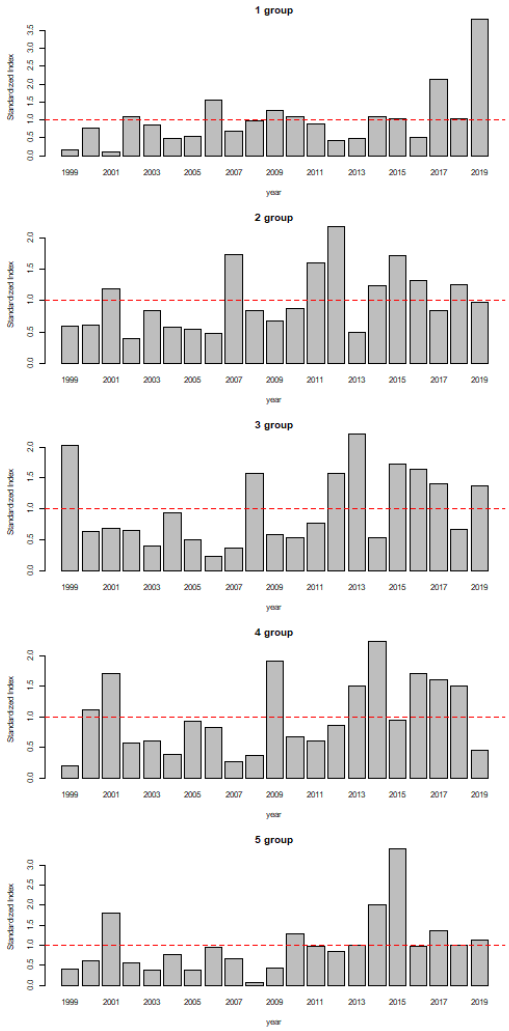


Figure 5.1.1.1 Combined sole BTS deltaGAM index North Sea, ages 1-5 (combining Dutch, Belgian and German beam trawl survey data).

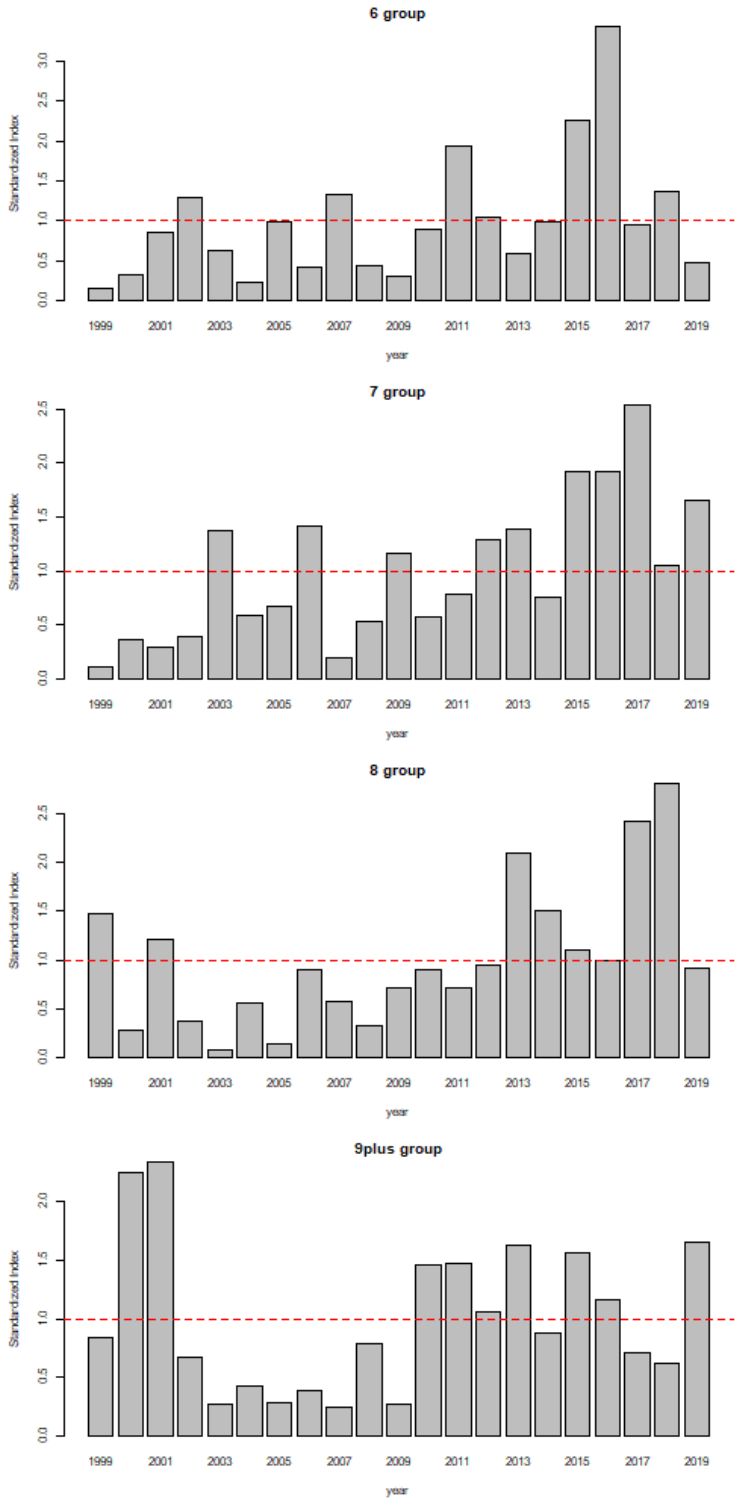


Figure 5.1.1.1 continued: Combined sole BTS deltaGAM index North Sea, ages 6-8 and 9+ (combining Dutch, Belgian and German beam trawl survey data).

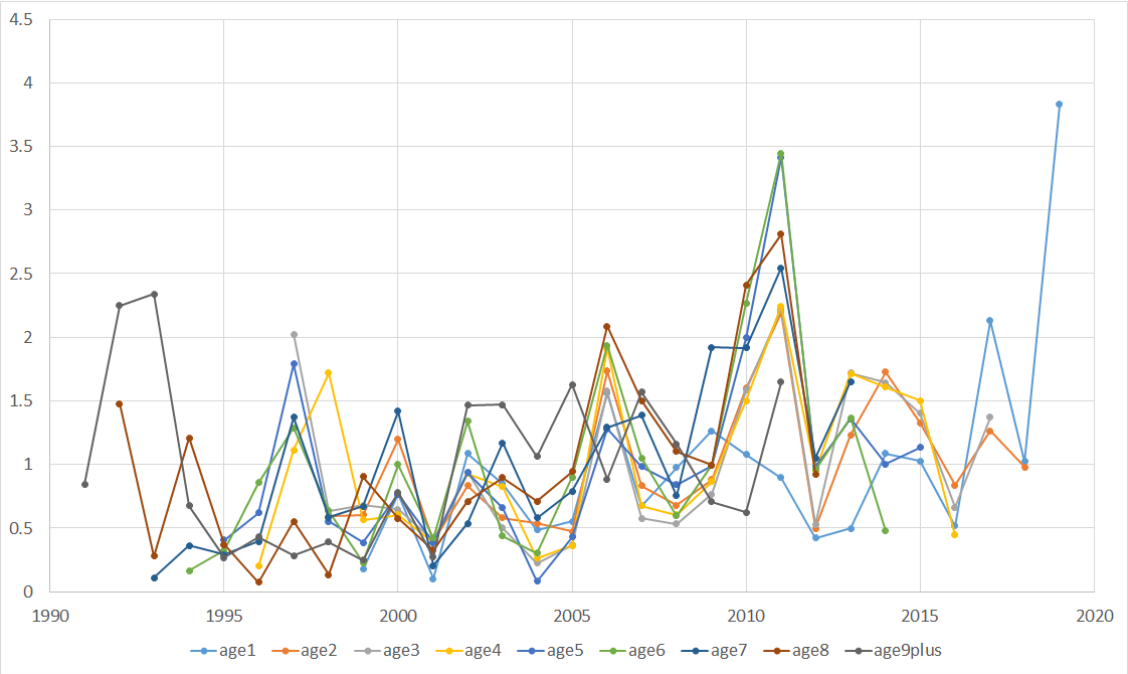


Figure 5.1.1.2 Cohort plot of the combined sole BTS deltaGAM index North Sea, ages 1-8 and 9+ (combining Dutch, Belgian and German beam trawl survey data).

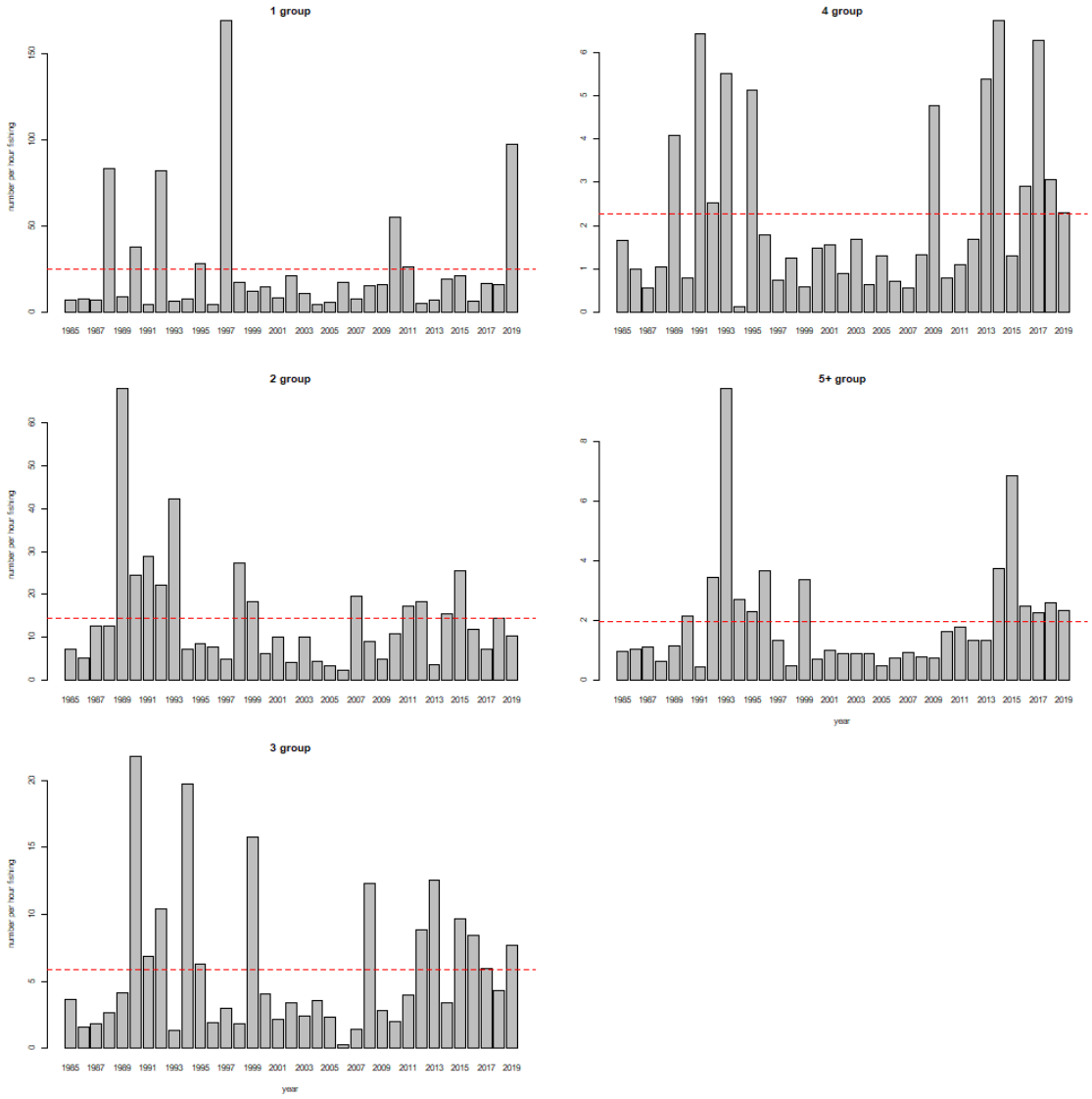


Figure 5.1.1.3 Sole indices Dutch survey in southeastern North Sea and German Bight, ages 1-4 and 5+.

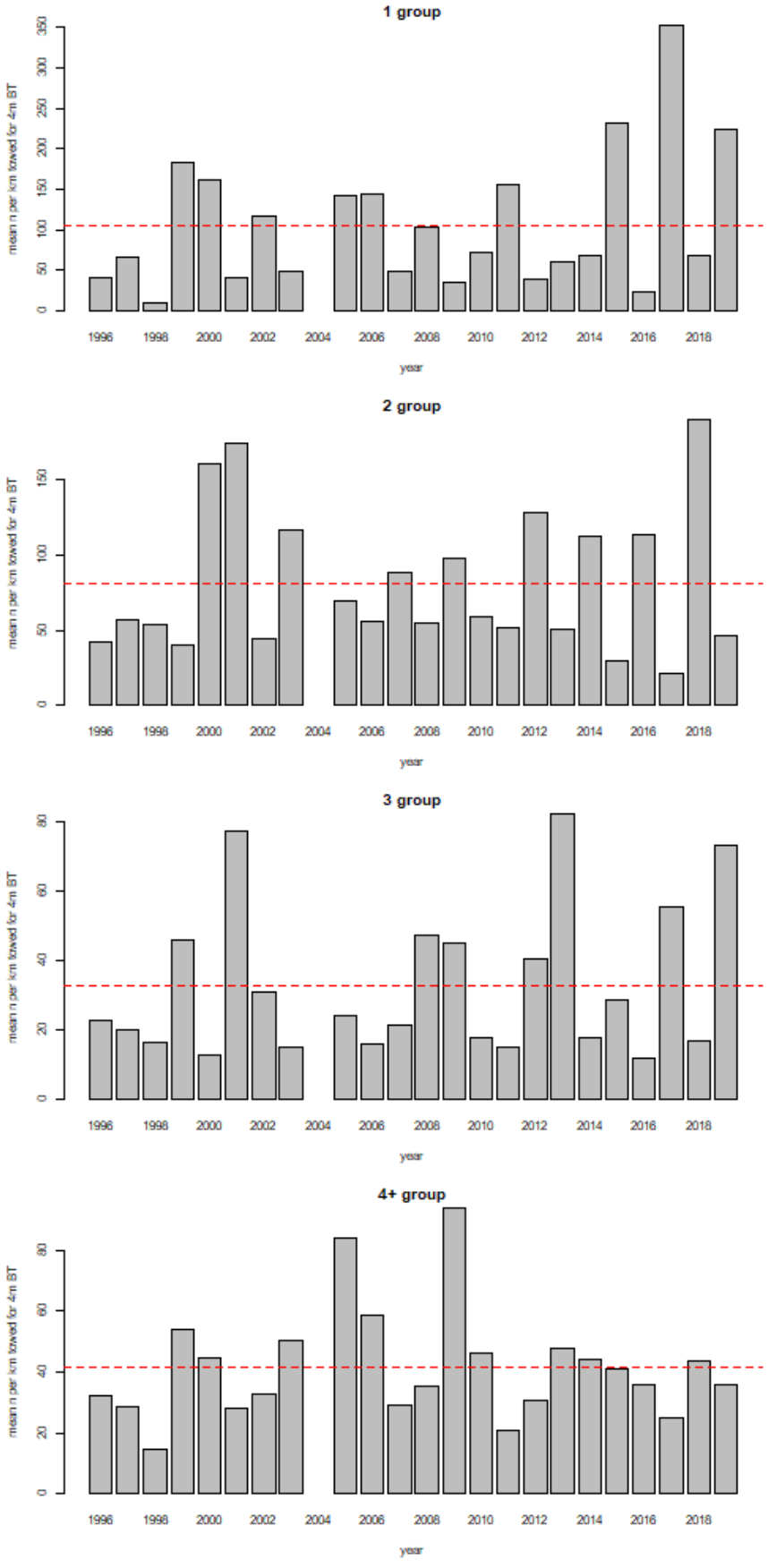


Figure 5.1.1.4 Sole indices UK survey in southeastern North Sea, ages 1-3 and 4+.

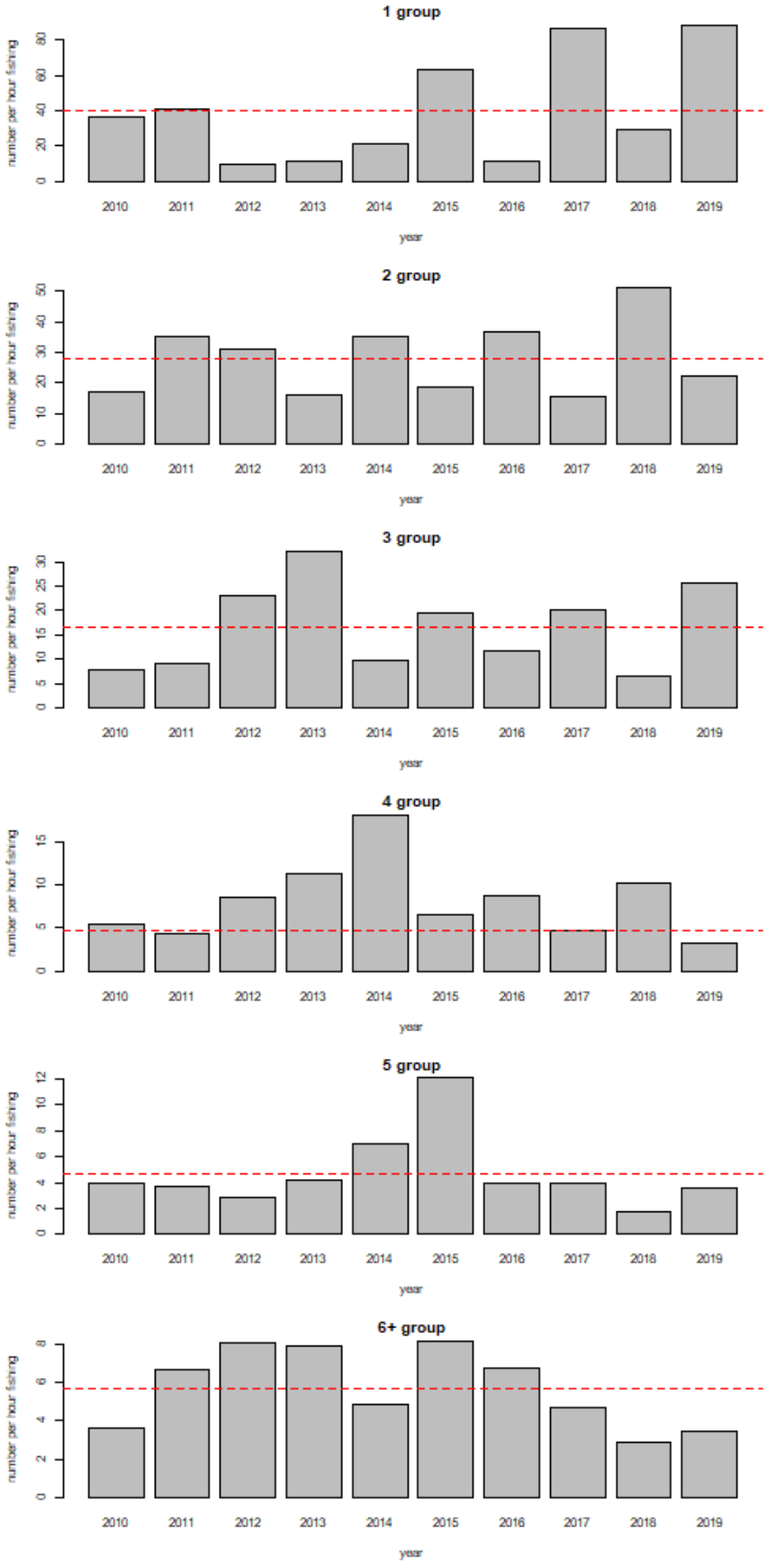


Figure 5.1.1.5 Sole indices Belgian survey in southwestern North Sea, ages 1-5 and 6+.

Western Waters - Subarea 7

Division 7d

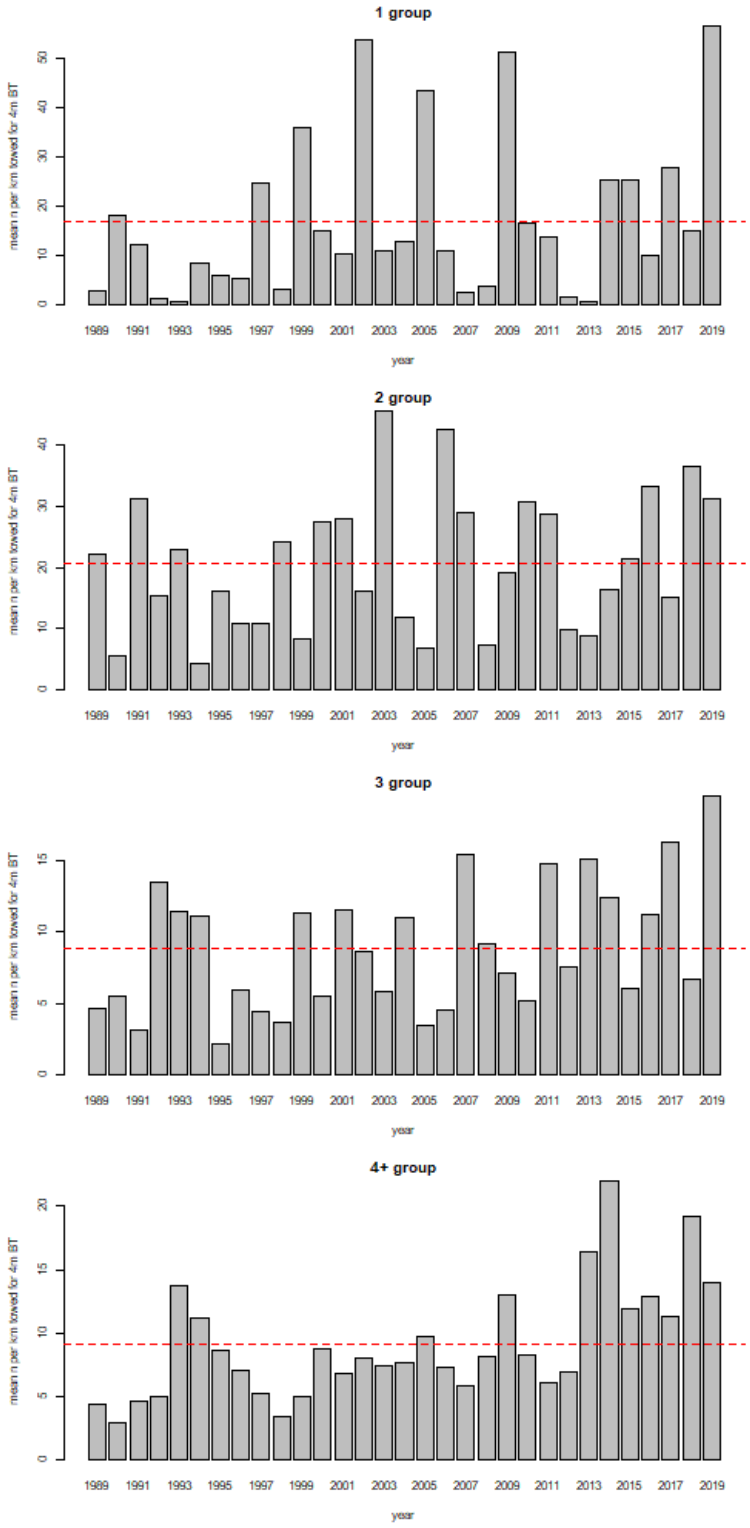


Figure 5.1.1.6 Sole indices UK survey in the eastern Channel, ages 1-3 and 4+.

Division 7f

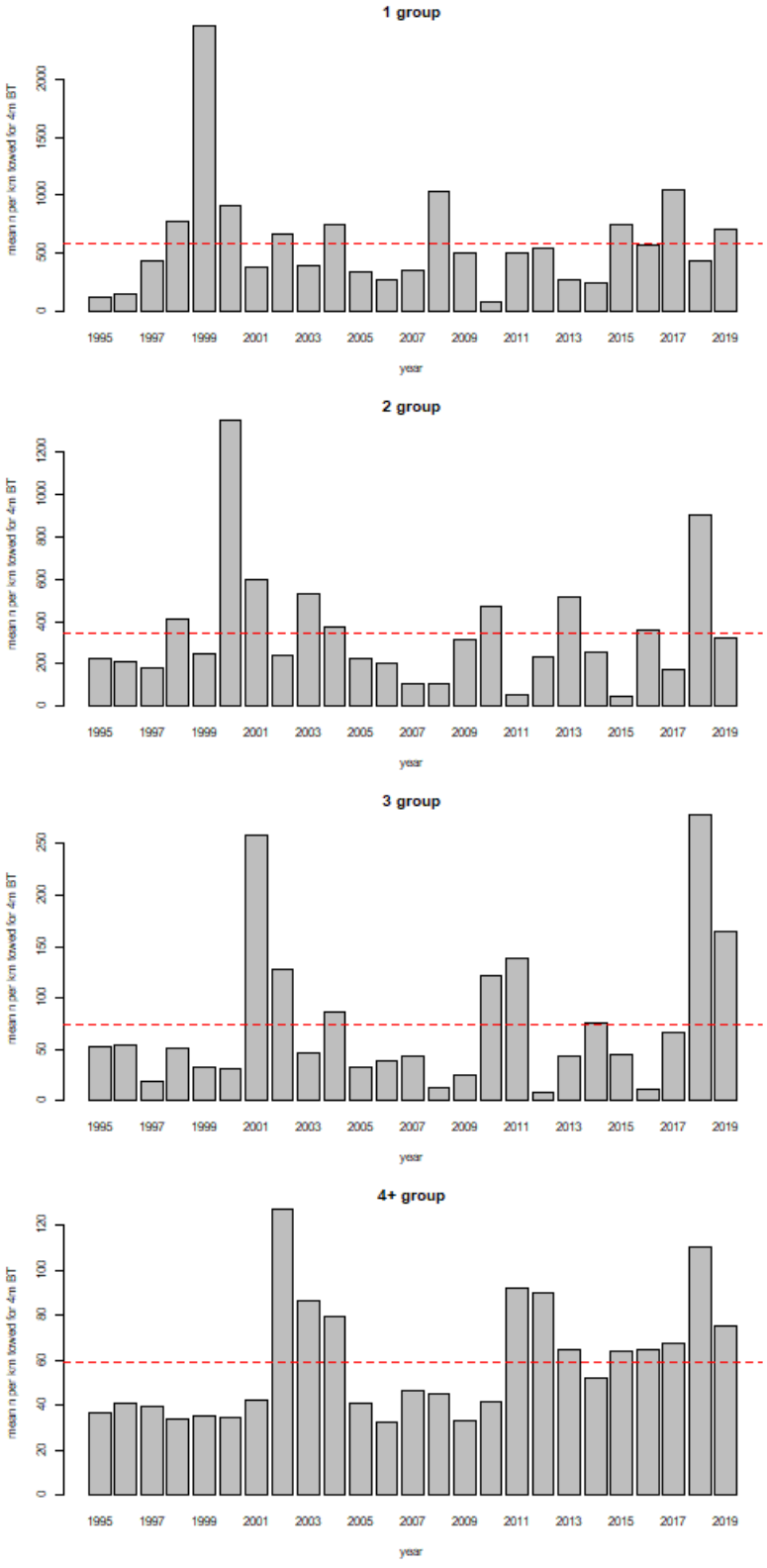


Figure 5.1.1.7 Sole indices UK survey in the Bristol Channel, ages 1-3 and 4+5.

Division 7a

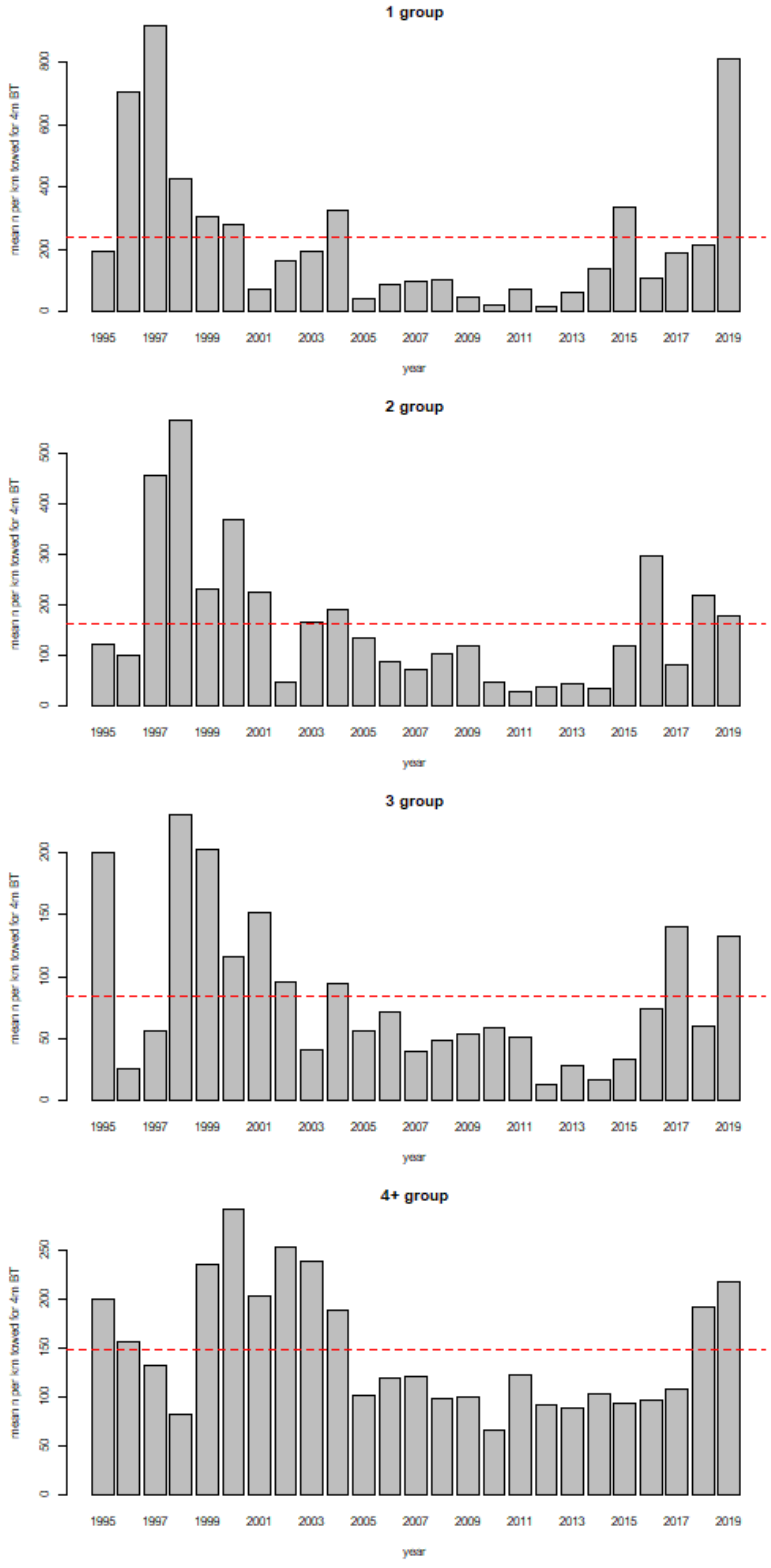


Figure 5.1.1.8 Sole indices UK survey in the Irish Sea, ages 1-3 and 4+.

Division 8 a,b

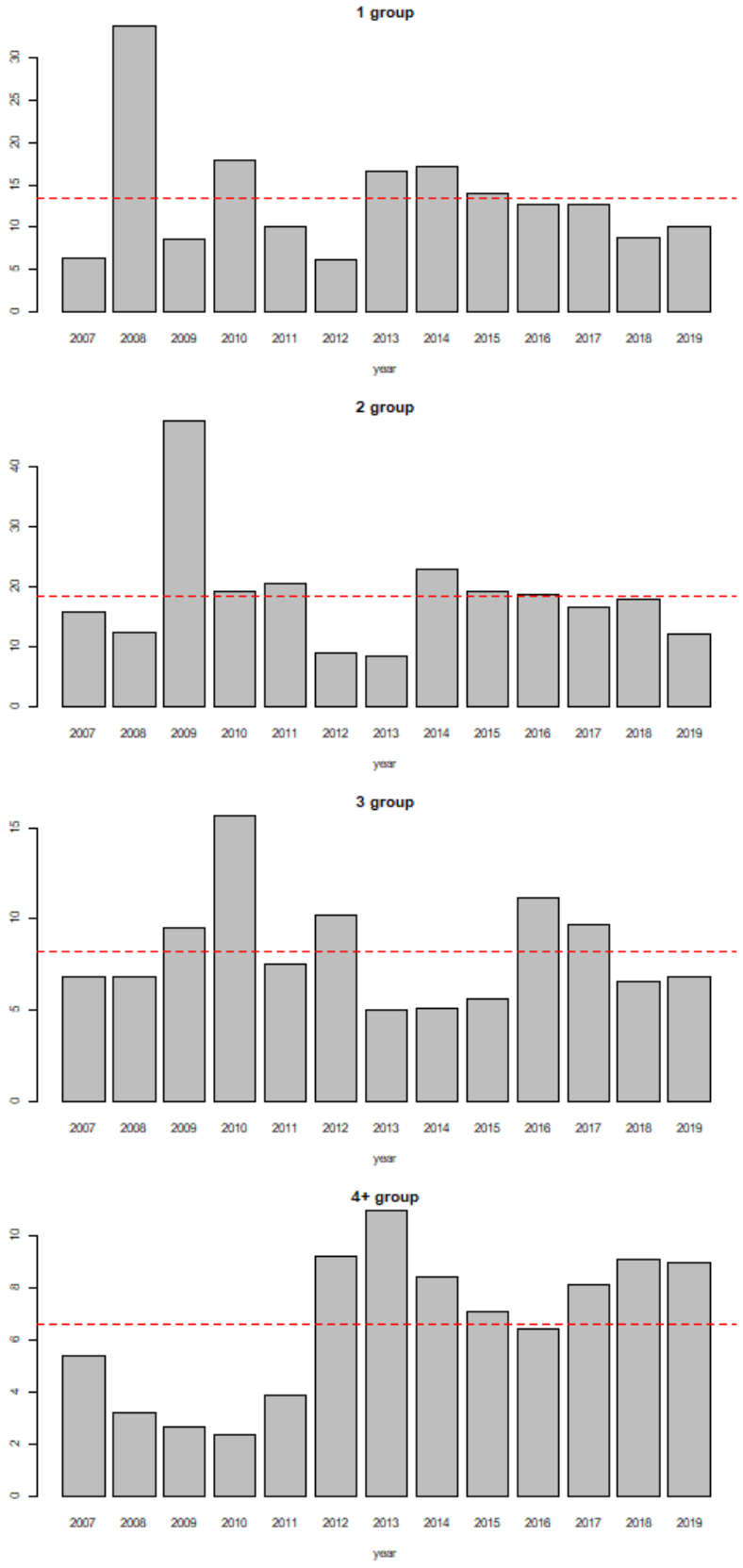


Figure 5.1.1.9 Sole indices French survey in the Bay of Biscay, ages 1-3 and 4+.

Northern Adriatic Sea

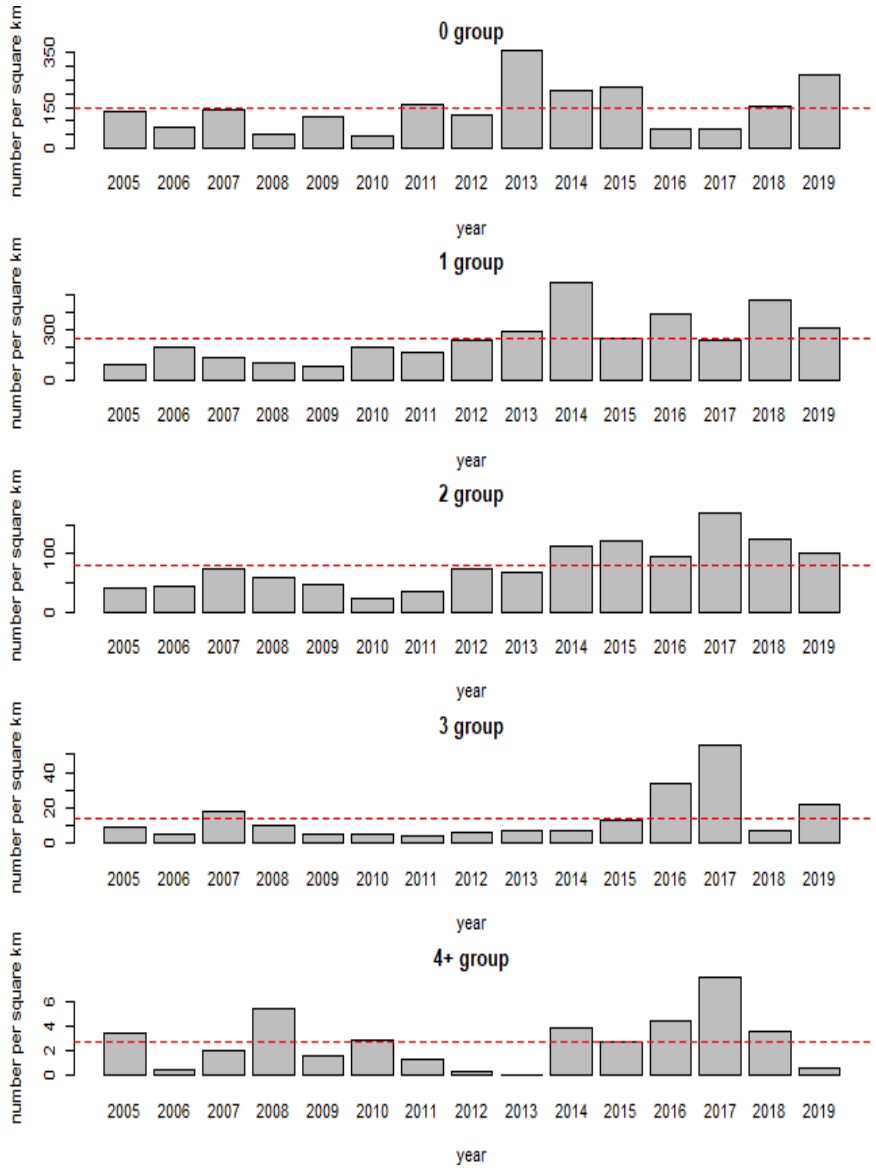


Figure 5.1.1.10 Common sole indices Adriatic survey in Adriatic Sea (BTS-GSA17), ages 0-3 and 4+.

Annex 5.1.2 Figures and tables offshore indices plaice

North Sea – Subarea 4

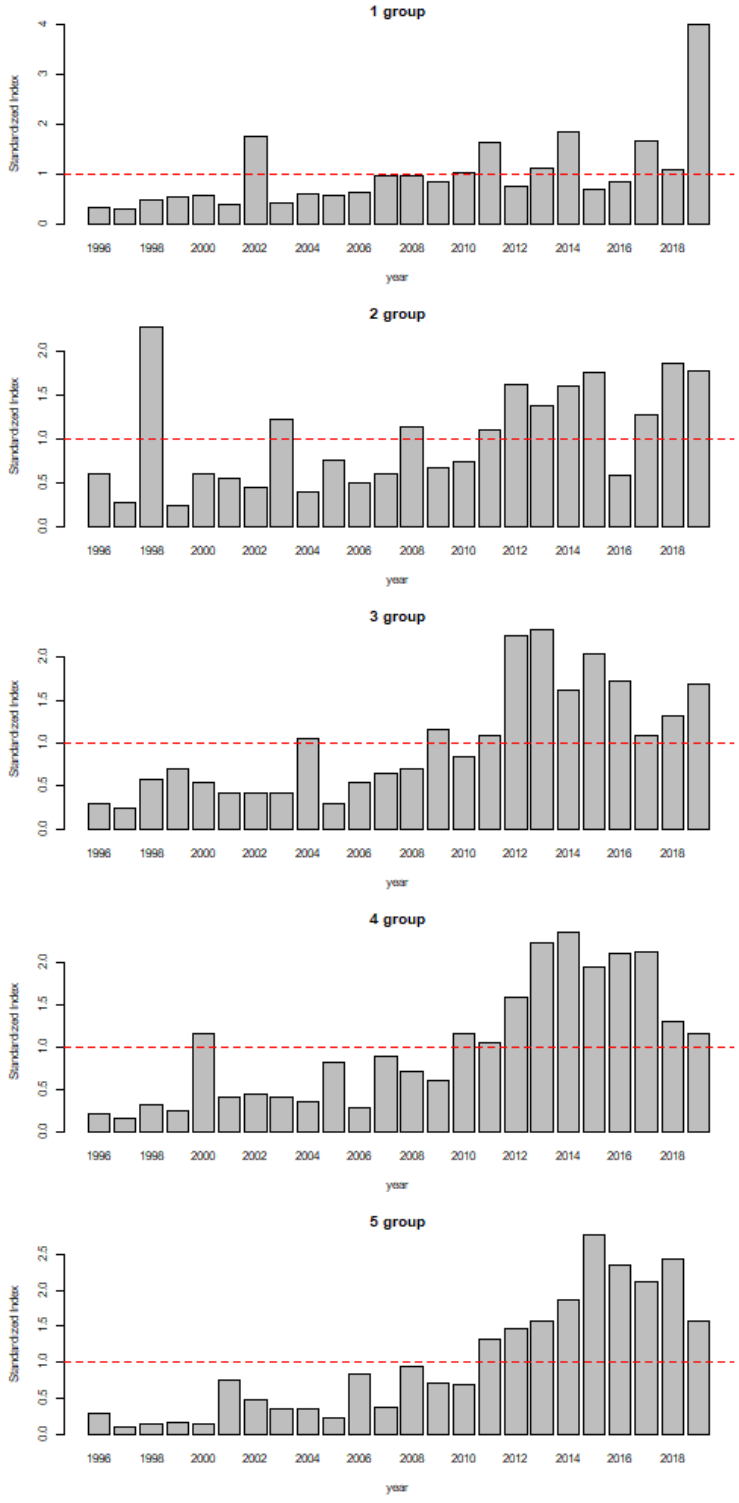


Figure 5.1.2.1 Combined plaice BTS deltaGAM index North Sea ages 1-5 (combining Dutch, Belgian, German and UK beam trawl survey data).

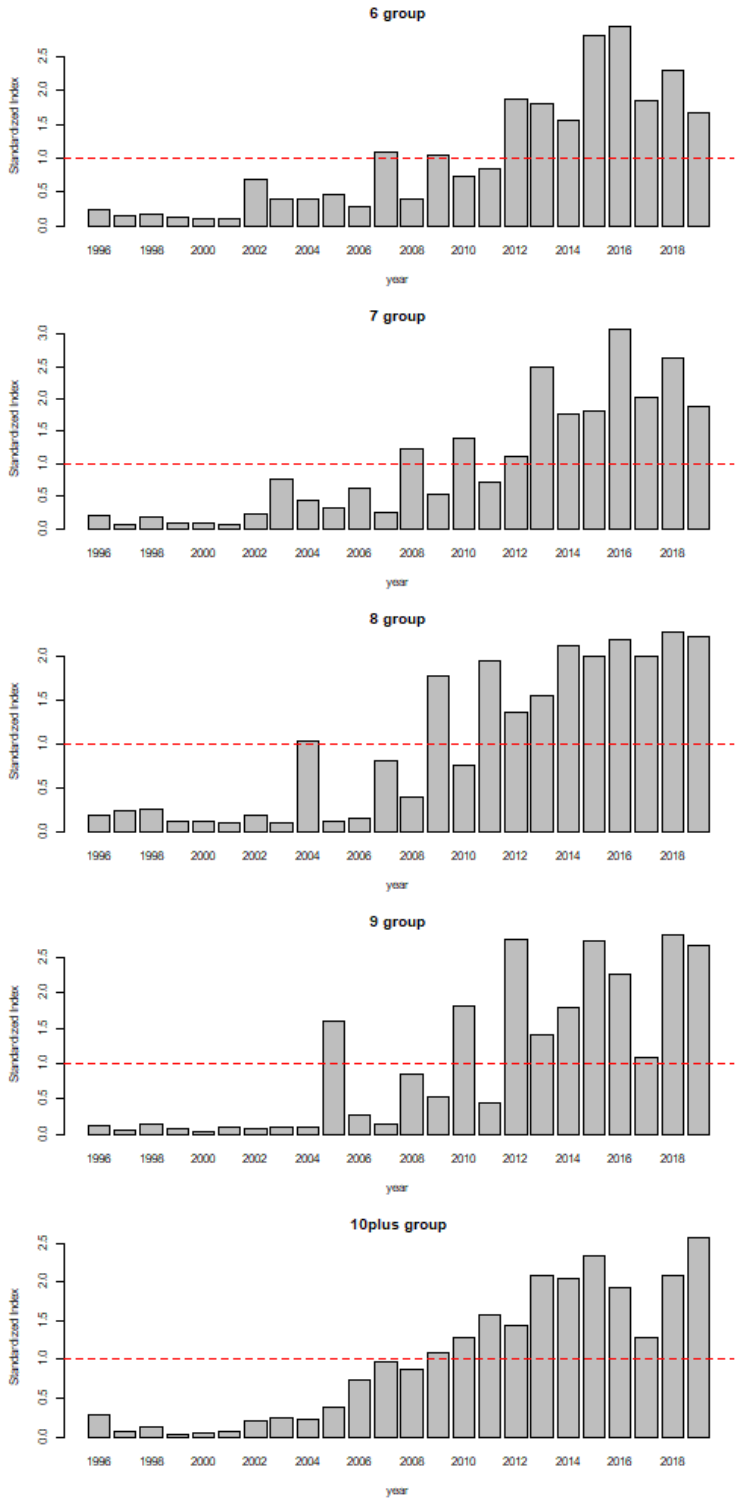


Figure 5.1.2.1 continued: Combined plaice BTS deltaGAM index North Sea ages 6-9 and 10+ (combining Dutch, Belgian, German and UK beam trawl survey data).

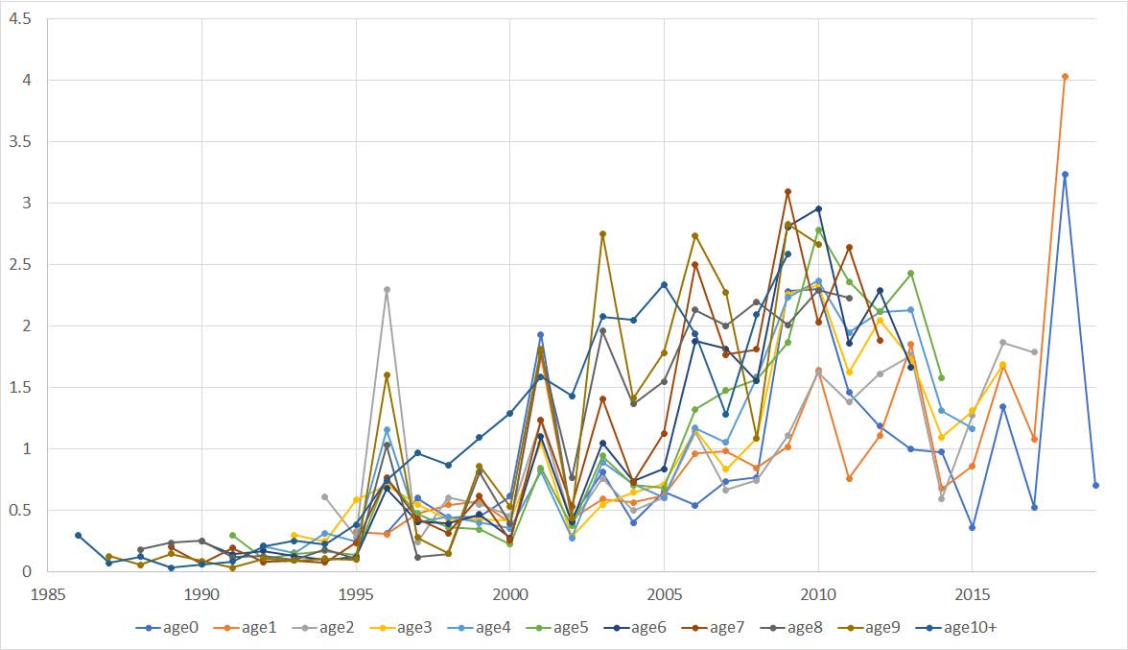


Figure 5.1.2.2 Cohort plot of the combined plaice BTS deltaGAM index North Sea ages 0-9 and 10+ (combining Dutch, Belgian, German and UK beam trawl survey data).

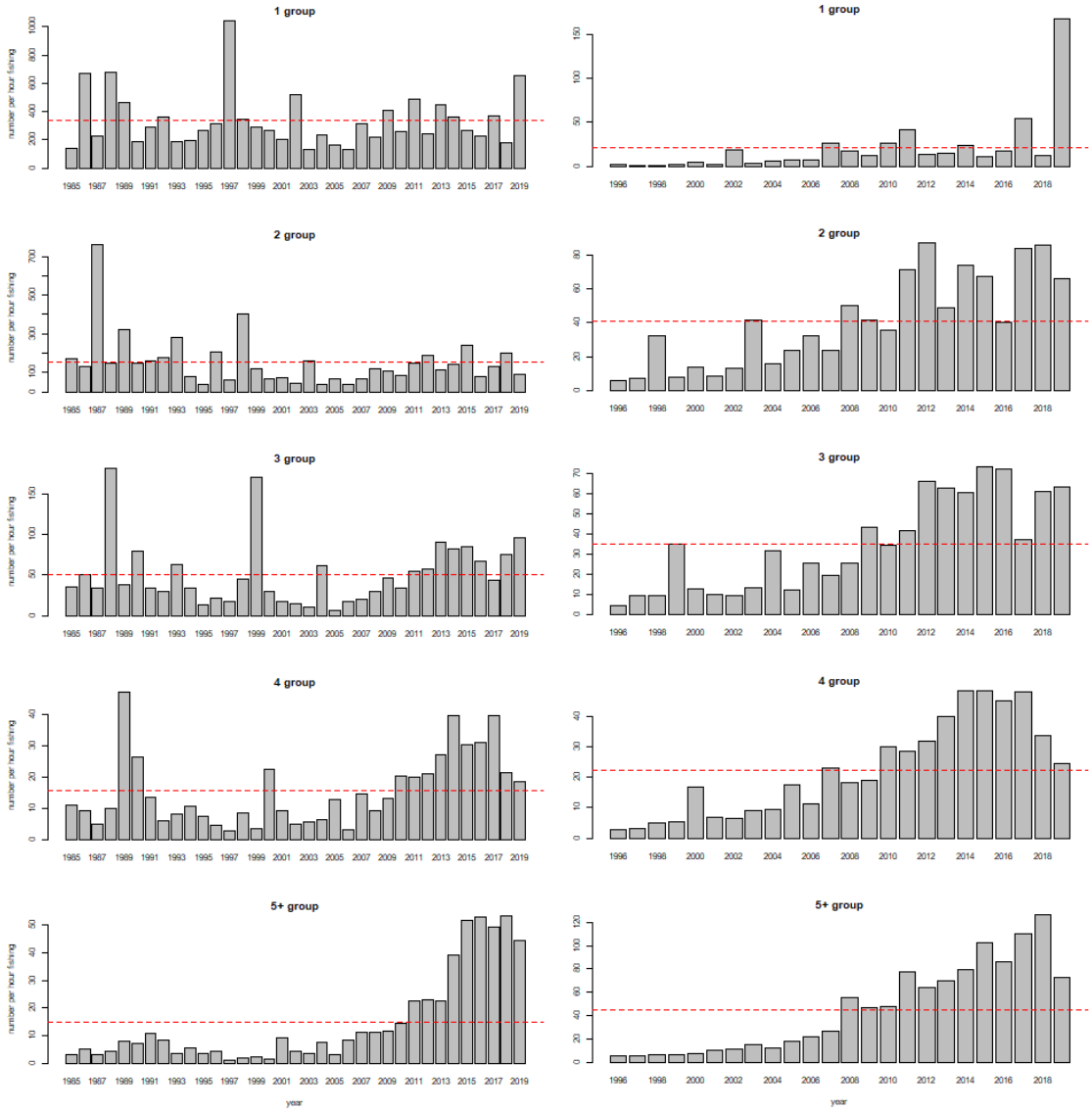


Figure 5.1.2.3 Plaice indices Dutch surveys in southeastern North Sea and German Bight (left) and central and western North Sea (right), ages 1-4 and 5+.

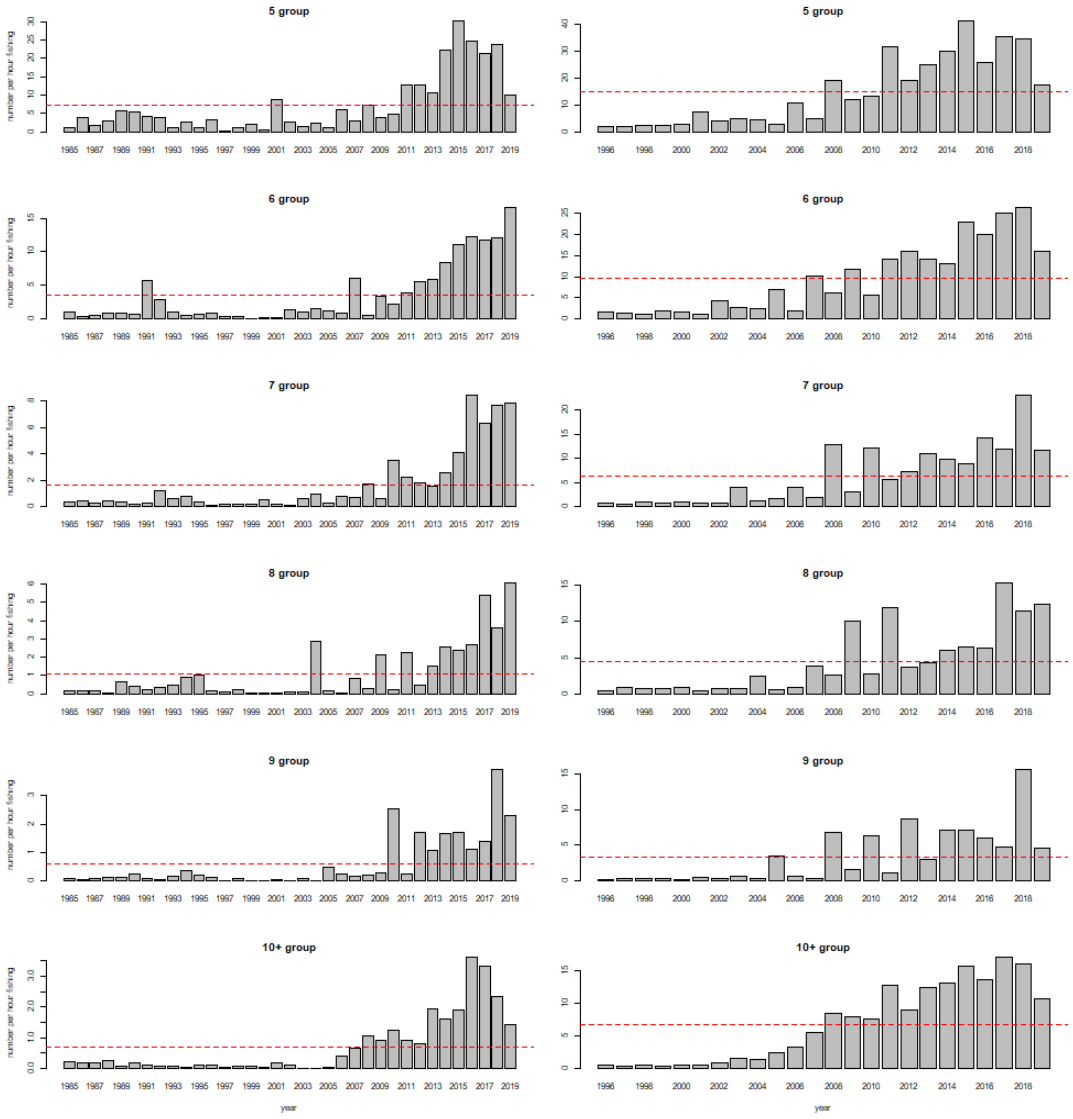


Figure 5.1.2.3 continued: Plaice indices Dutch surveys in southeastern North Sea and German Bight (left) and central and western North Sea (right), ages 5-9 and 10+.

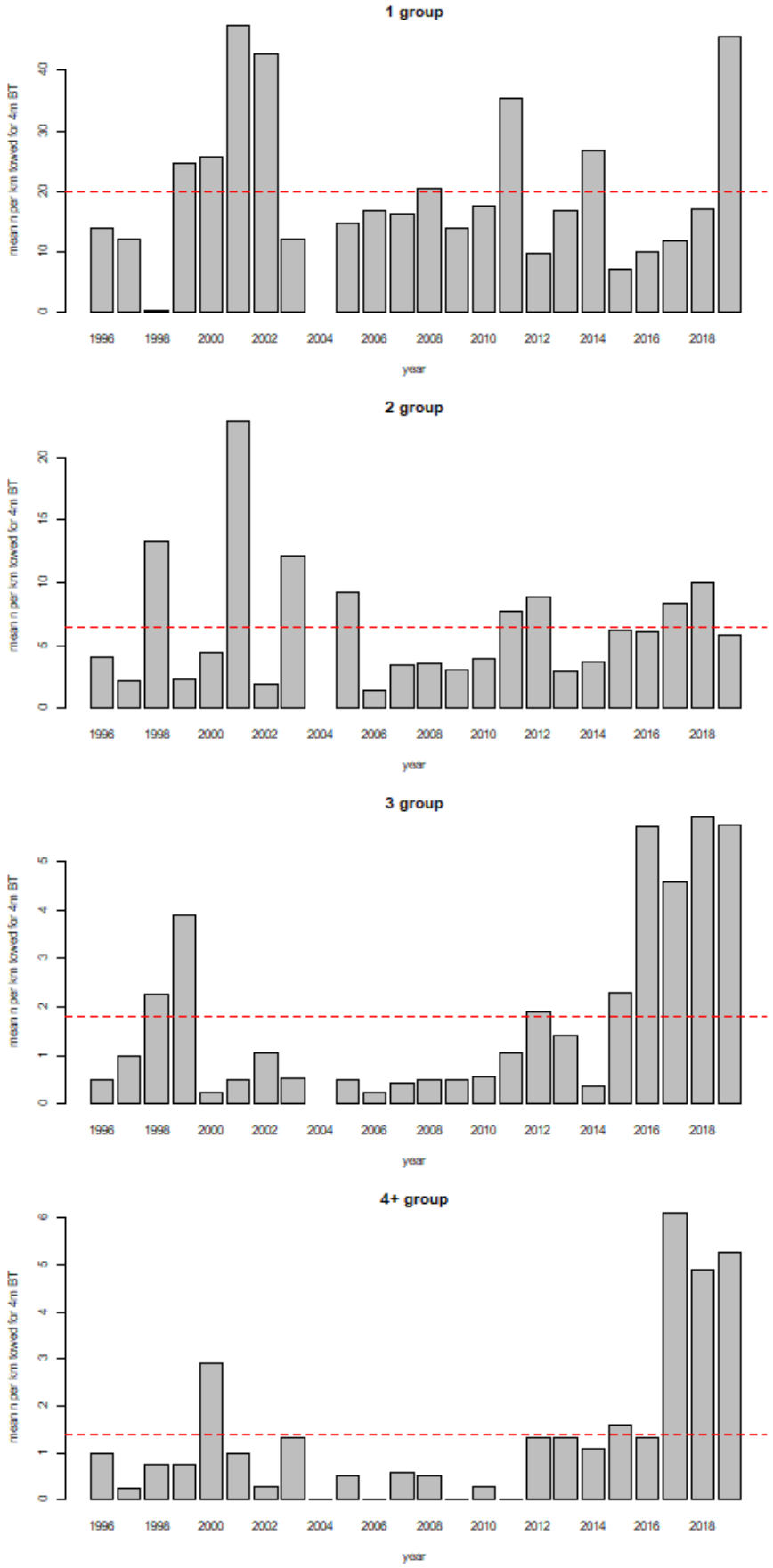


Figure 5.1.2.4 Plaice indices UK survey in southeastern North Sea (4c), ages 1-3 and 4+.

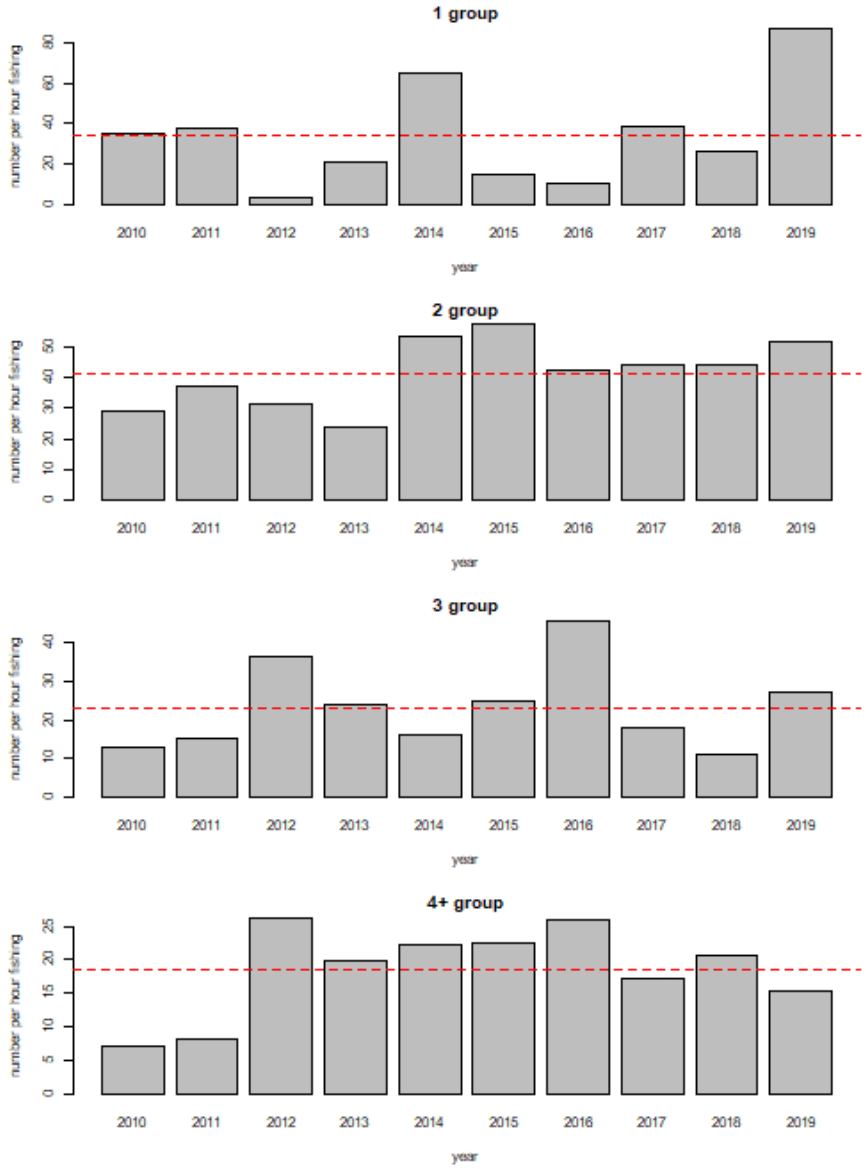


Figure 5.1.2.5 Plaice indices Belgian survey in southwestern North Sea (4c and 4b), ages 1-3 and 4+.

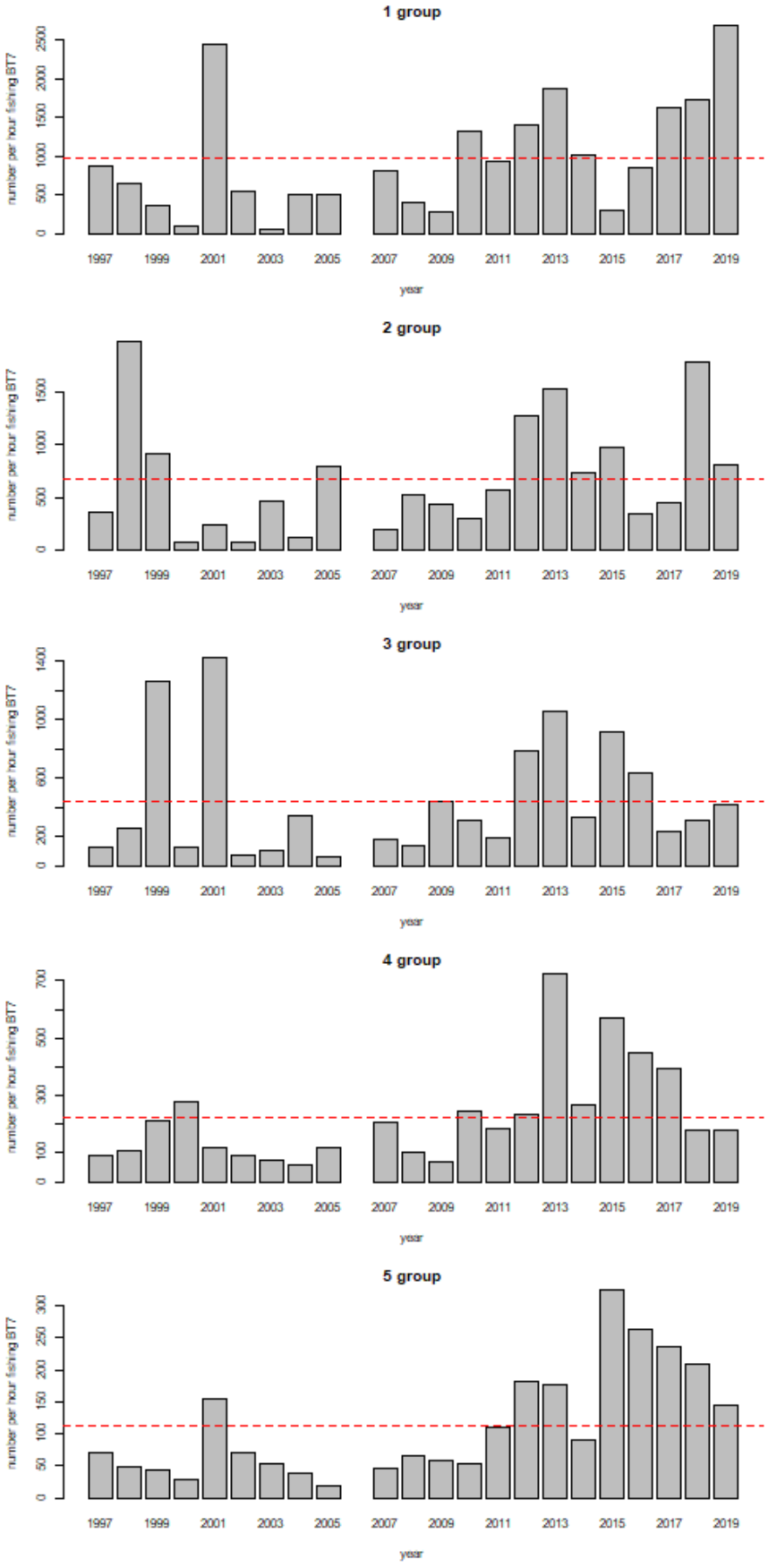


Figure 5.1.2.6 Plaice indices German survey in the central and northeastern North Sea (4b), ages 1-5.

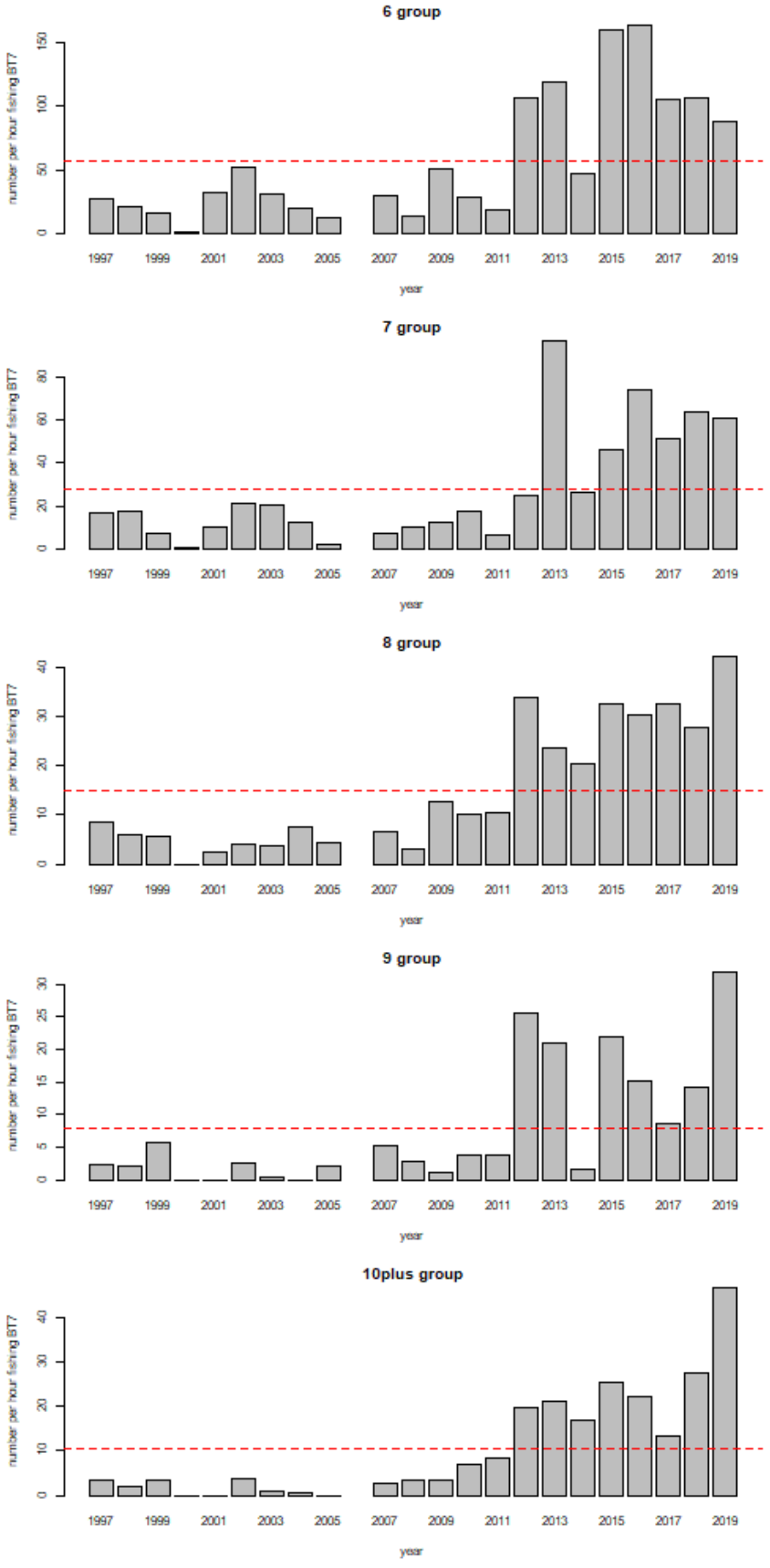


Figure 5.1.2.6 continued. Plaice indices German survey in the central and northeastern North Sea (4b), ages 6-9 and 10+.

Western Waters - Subarea 7

Division 7d

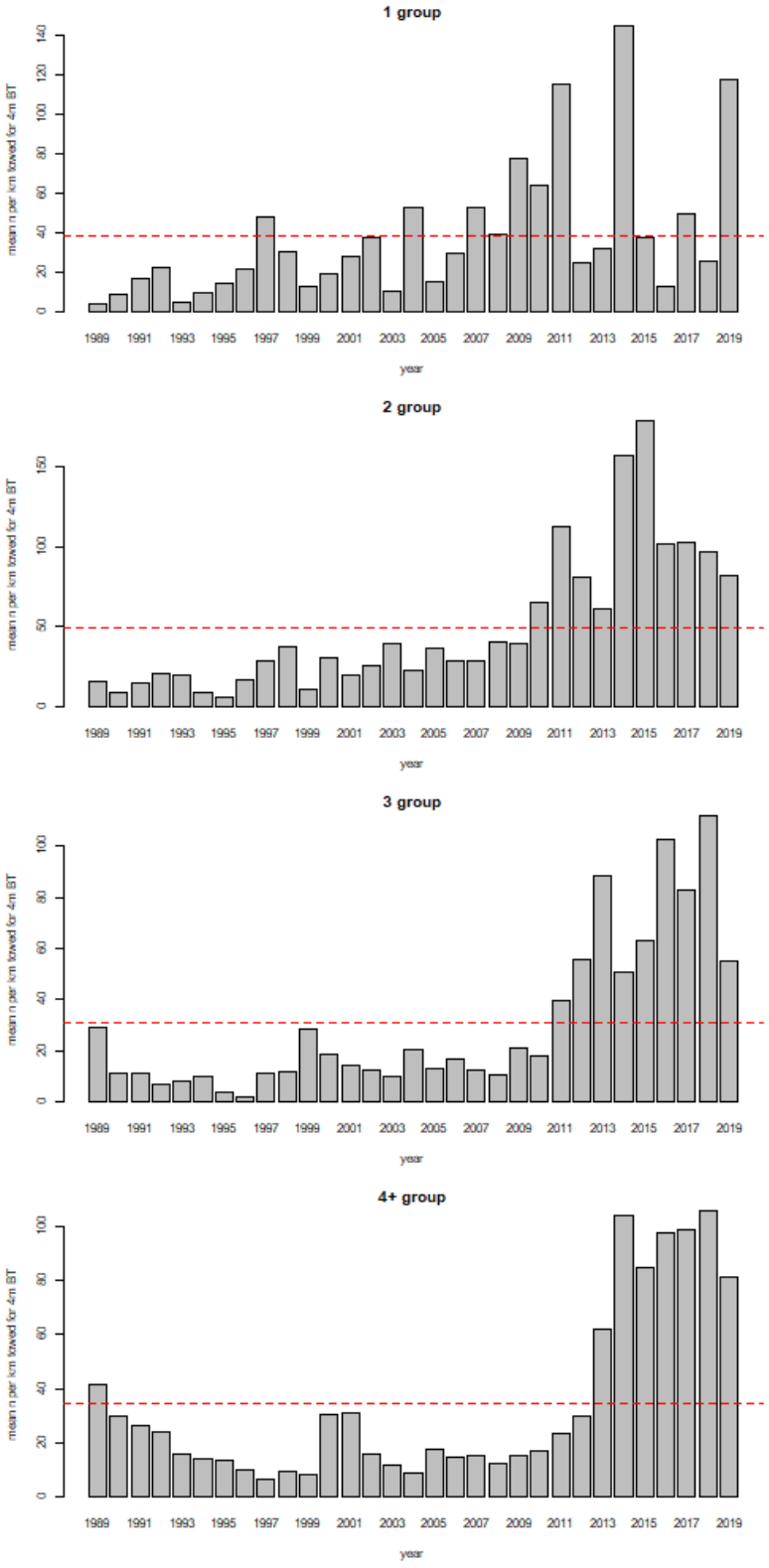


Figure 5.1.2.7 Plaice indices UK survey in the Eastern Channel, ages 1-3 and 4+.

Division 7f

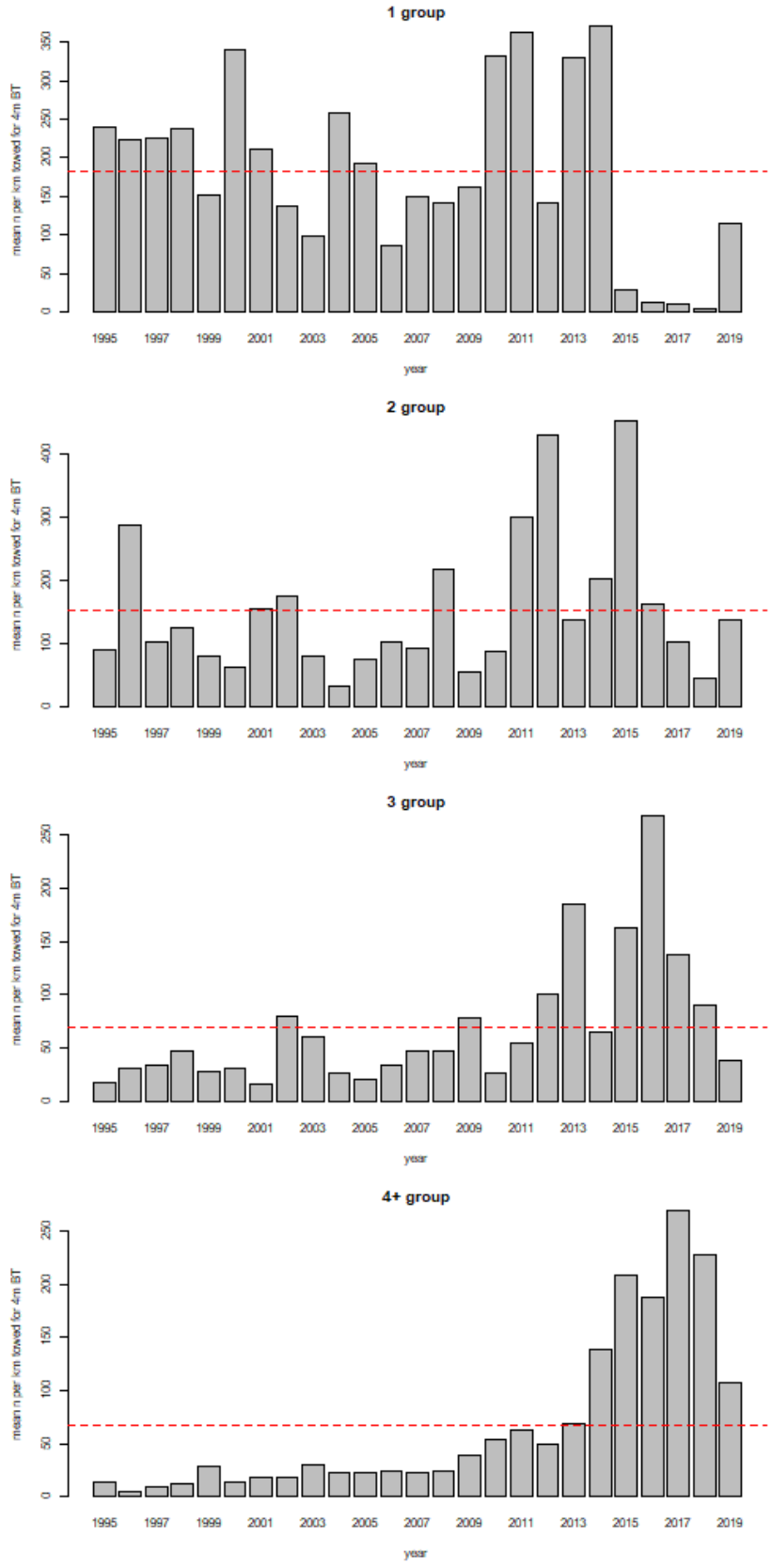


Figure 5.1.2.8 Plaice indices UK survey in the Bristol Channel, ages 1-3 and 4+.

Division 7a

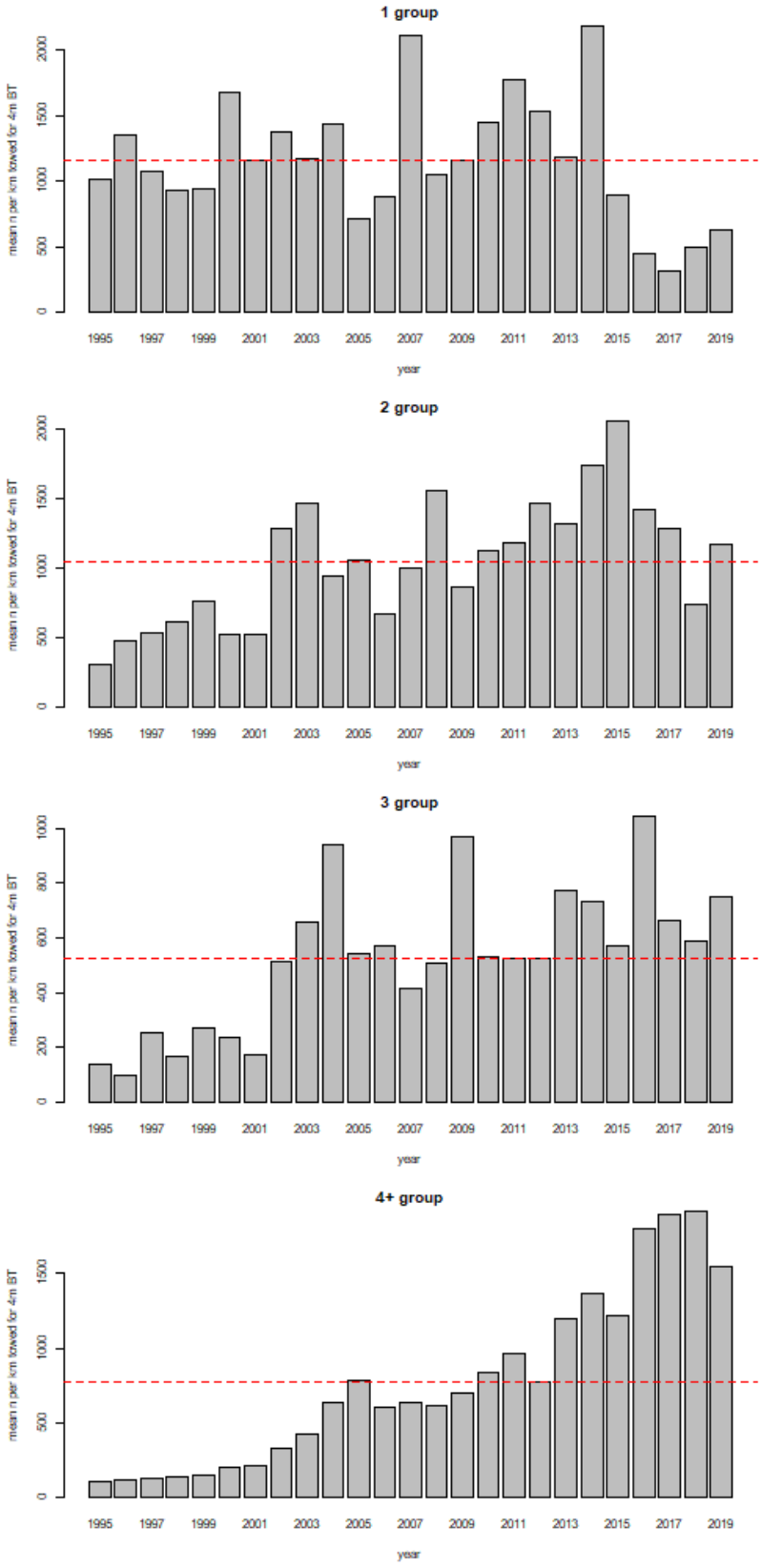


Figure 5.1.2.9 Plaice indices UK survey in the Irish Sea, ages 1-3 and 4+.

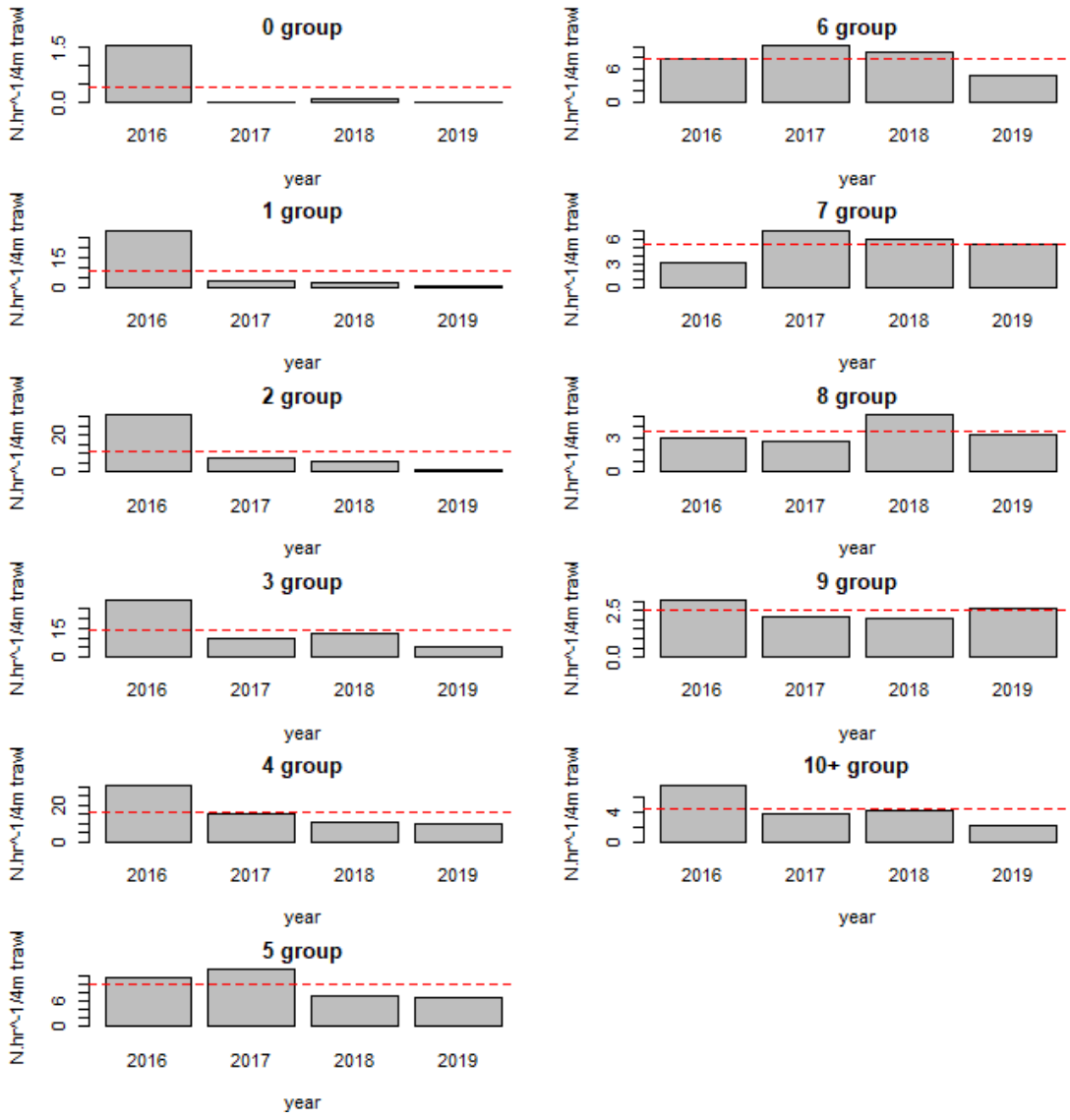


Figure 5.1.2.10 Plaice indices Icelandic survey in Icelandic Sea, ages 0-9 and 10++.

Annex 5.2 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.

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 even more so 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.

Sole North Sea – Subarea 4

Sole net survey (SNS)

The index from the 2019 survey (Annex 5.2.1 Figure 5.2.1.1, table 5.2.1.1) indicates that, differently from 2018, ages 1 and 3 were higher than the long-term arithmetic mean. The strong age 1 reflects the strong 2018 cohort, also seen in the offshore surveys. On the contrary, ages 2, 4 and 5+ in 2019 survey has been lower than the level of the long-term arithmetic mean. In particular, the 1-group sole index appears to be much higher than that recorded since 2004 onwards. Indices trends are quite fluctuating and record peaks well above the arithmetic mean from the 90's onwards (Figure 5.2.2.1 in Annex 5.2.1). 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 5.2.2.1 in Annex 5). 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. In addition, 2018 seems to have been a good year for recruitment as 1-group individuals are very numerous in the 2019 survey. This is in line with the other surveys in the North Sea.

Demersal Young Fish survey (DYFS)

The sole recruitment index (Annex 5.2.1 Figure 5.2.1.2) shows a low 2019 year class, and the strong 2018 year class, which is in line with the index of the SNS (Annex 5.2.1 Figure 5.2.1.1).

Plaice North Sea – Subarea 4

Sole net survey (SNS)

Figure 5.5.1 and Table 5.5.1 shows the time-series trends in the indices for plaice based on the Dutch Sole Net Survey inshore beam trawl surveys.

The 2019 survey (Annex 5.2.2 Figure 5.2.2.1, Table 5.2.2.1) indicates that, due to the strong 2018 yearclass, plaice age 1 were slightly higher than the long-term arithmetic mean. On the contrary, ages 2, 3 and 4 in 2019 survey has been lower than the level of the long-term arithmetic mean. The 5+ group indices are above the average since 2015. Overall, indices are generally higher before 2000 (especially ages 1 and 2). However, in recent years (especially since 2010) an increasing trend is recorded for ages 4 and 5+.

Although a year effect in 2012 in the SNS is far less evident for plaice than for sole (Figure 5.5.1 in Annex 5), this year should also be treated with caution 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.

Demersal Young Fish survey (DYFS)

For plaice, the recruitment index (Annex 5.2.2 Figure 5.2.2.2) shows quite a strong 2019 year class, with numbers almost reaching those of the 2018 cohort. The 2018 cohort was however already visible in the SNS and BTS as 0-group, and this is not the case for the 2019 0-group, so it is to be expected that the 2019 recruitment is lower than the 2018 recruitment. The strong 2018 cohort is not really visible in 2019 as age group 1, which may be due to its distribution. The 2018 cohort is clearly visible in the SNS and BTS indices.

Annex 5.2.1 Figures and tables inshore indices sole

North Sea – Subarea 4

Sole net survey

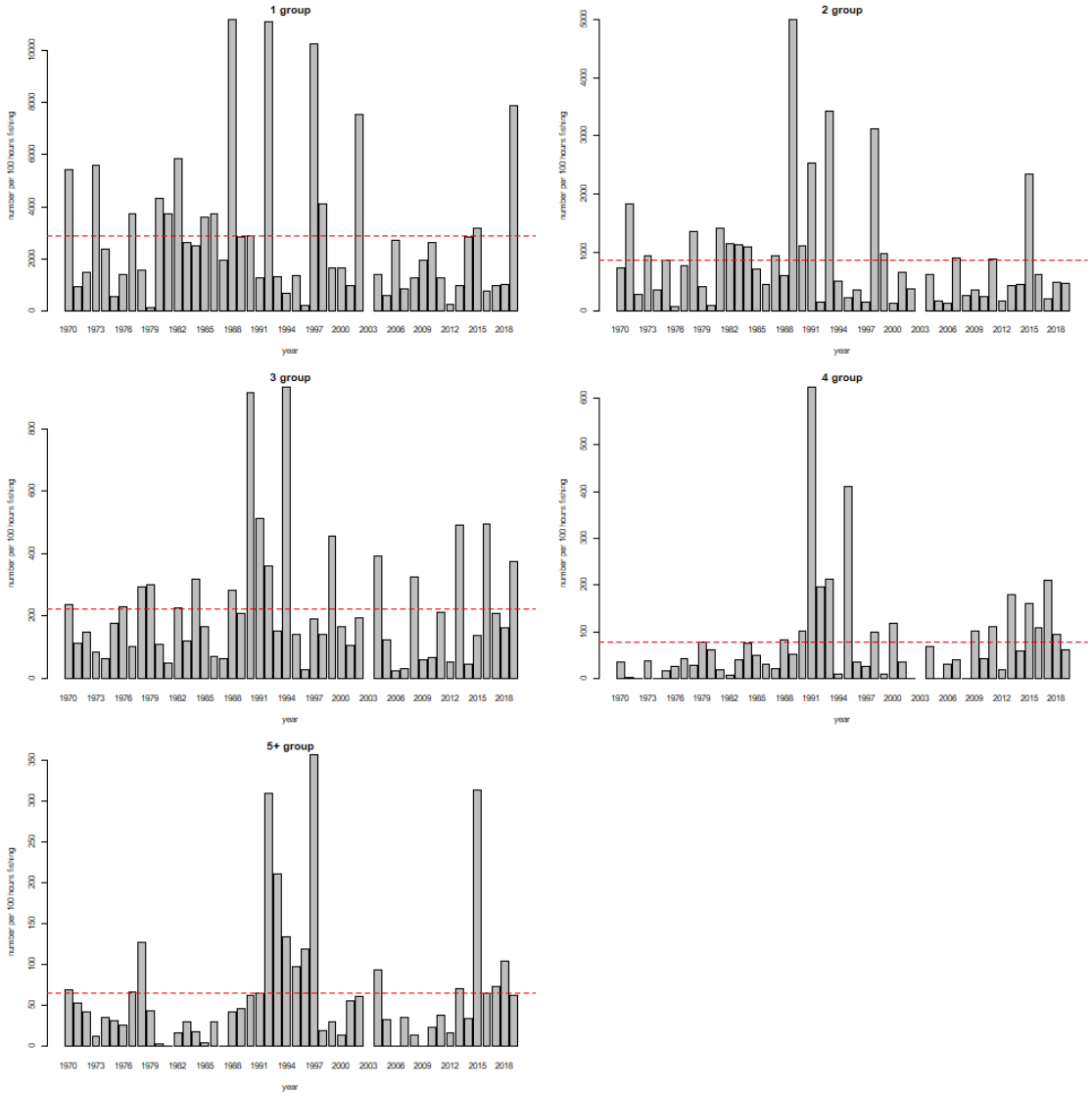


Figure 5.2.1.1 Sole indices from sole net survey, in numbers per 100 hours fishing, age groups 1-4, 5+.

Table 5.2.1.1 Sole indices from sole net survey, in numbers per 100 hours fishing, age groups 1-4, 5+

year	1	2	3	4	5+
1970	5410.3	734.4	237.7	35.4	69.7
1971	902.7	1831.1	113.4	2.9	53.5
1972	1454.7	272.3	148.6	0.0	41.6
1973	5587.2	935.3	83.8	37.3	13.0

1974	2347.9	361.4	65.2	0.0	35.6
1975	525.4	864.5	177.0	17.5	32.1
1976	1399.4	73.6	229.1	26.7	25.7
1977	3742.9	776.1	103.8	43.1	66.2
1978	1547.7	1354.7	294.1	28.0	127.1
1979	93.8	408.3	300.8	76.9	43.3
1980	4312.9	88.9	109.3	61.3	3.3
1981	3737.2	1413.1	50.0	20.0	0.0
1982	5856.5	1146.2	227.8	6.7	16.7
1983	2621.1	1123.3	120.6	39.9	29.7
1984	2493.1	1099.9	318.3	74.4	18.0
1985	3619.4	715.6	167.1	49.3	4.4
1986	3705.1	457.6	69.2	31.4	30.7
1987	1947.9	943.7	64.8	21.3	0.0
1988	11226.7	593.8	281.6	81.5	42.4
1989	2830.7	5005.0	207.6	53.1	45.9
1990	2856.2	1119.5	914.3	100.4	62.1
1991	1253.6	2529.1	513.8	623.9	64.6
1992	11114.0	144.4	360.4	194.9	309.8
1993	1290.8	3419.6	153.8	212.8	211.4
1994	651.8	498.3	934.1	10.2	133.4
1995	1362.1	223.7	142.8	411.1	97.1
1996	218.4	349.1	29.6	35.5	118.6
1997	10279.3	153.6	189.8	26.5	356.4
1998	4094.6	3126.4	141.7	98.7	20.0
1999	1648.9	971.8	455.6	10.0	30.7
2000	1639.2	125.9	166.3	118.0	13.3
2001	970.3	655.4	106.7	35.5	56.2
2002	7547.5	379.0	195.3	0.0	60.8
2003	*	*	*	*	*

2004	1369.5	624.4	393.0	68.9	93.5
2005	568.1	162.9	124.0	0.0	33.0
2006	2726.4	117.1	25.0	30.0	0.0
2007	848.6	911.0	33.3	39.5	35.4
2008	1259.1	258.5	325.3	0.0	13.3
2009	1931.6	344.4	61.7	102.7	0.0
2010	2636.9	237.1	67.1	42.2	23.2
2011	1248.0	883.9	211.3	111.8	38.0
2012	226.6	159.5	54.0	18.0	16.0
2013	967.4	426.6	490.5	179.3	70.6
2014	2849.0	448.2	44.8	60.0	33.6
2015	3192.0	2333.9	137.8	159.9	313.0
2016	733.8	623.3	494.6	109.8	65.2
2017	956.7	204.3	209.6	209.7	73.6
2018	1002.3	482.4	163.1	94.1	103.9
2019	7896.7	476.3	375.2	60.7	62.6

*No survey

Demersal young fish survey

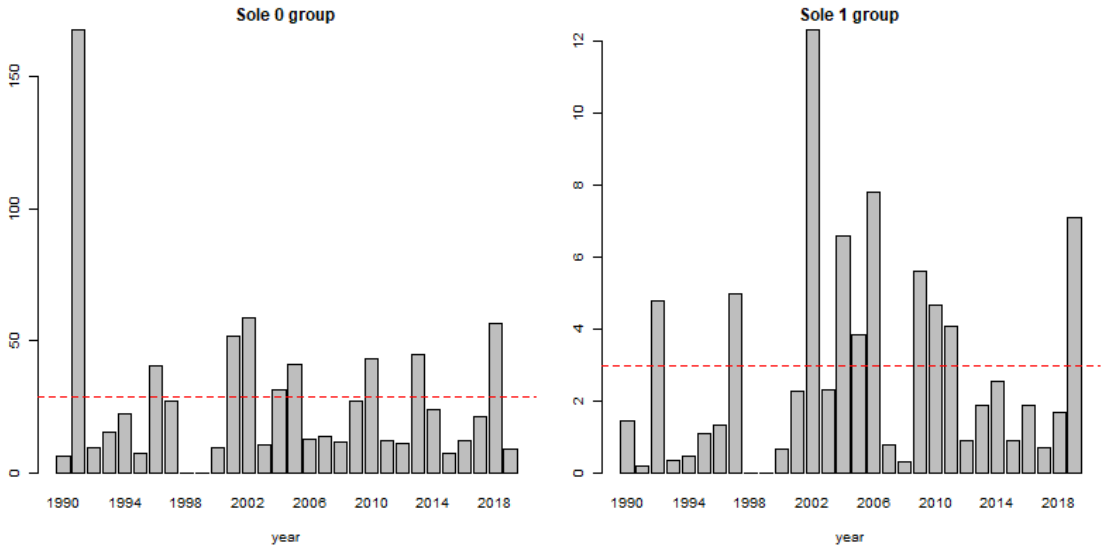


Figure 5.2.1.2 Sole indices from international DYFS survey (combined German, Dutch and Belgian data), in numbers per numbers*10^6 m^2 fished area, age groups 0 and 1.

Table 5.2.1.2 Sole indices from international DYFS survey (combined German, Dutch and Belgian data), in numbers per numbers*10^6 m^2 fished area, age groups 0 and 1 (*=invalid survey)

year	age0	age1
1990	6.381	1.435021
1991	167.5628	0.183961
1992	9.266028	4.770869
1993	15.32398	0.335254
1994	22.06324	0.456818
1995	7.064778	1.065177
1996	40.27174	1.305915
1997	26.93957	4.981413
1998	*	*
1999	*	*
2000	9.504133	0.63642
2001	51.42419	2.269092
2002	58.58299	12.30704
2003	10.60934	2.297676

2004	31.25178	6.585095
2005	40.98701	3.819168
2006	12.5667	7.813433
2007	13.72748	0.776117
2008	11.76762	0.291603
2009	27.33151	5.61977
2010	42.86197	4.673361
2011	12.12998	4.088182
2012	11.22614	0.880055
2013	44.81884	1.867842
2014	23.61608	2.521723
2015	7.448352	0.893179
2016	12.27554	1.88786
2017	20.96561	0.681463
2018	56.74828	1.693035
2019	8.749073	7.110469

Annex 5.2.2 Figures and tables inshore indices plaice

Sole net survey

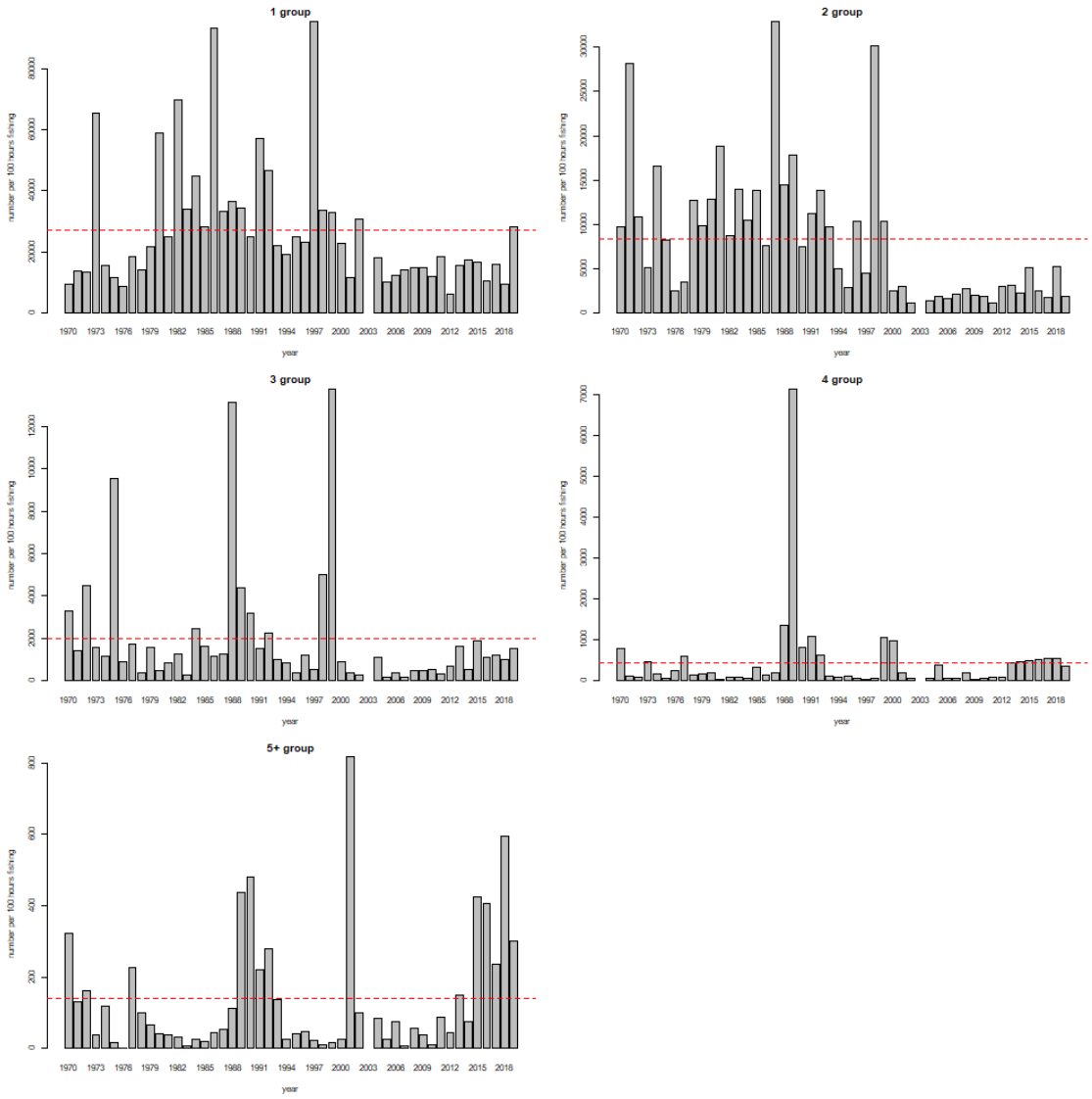


Figure 5.2.2.1 Plaice indices from sole net survey, in numbers per 100 hours fishing, age groups 1-4, 5+.

Table 5.2.2.1 Plaice indices from sole net survey, in numbers per 100 hours fishing, age groups 1-4, 5+.

year	1	2	3	4	5+
1970	9311.4	9731.5	3273.0	769.7	323.3
1971	13538.5	28163.5	1414.7	100.8	130.6
1972	13206.9	10779.7	4477.8	89.1	160.7
1973	65642.5	5133.3	1578.2	461.4	37.7
1974	15366.4	16508.9	1128.8	160.0	117.5

1975	11628.2	8168.4	9556.3	65.2	15.2
1976	8536.5	2402.6	868.2	236.3	2.3
1977	18536.7	3423.8	1737.3	589.9	225.9
1978	14012.0	12678.0	345.5	134.8	99.4
1979	21495.4	9828.8	1574.9	161.2	65.8
1980	59174.2	12882.3	490.7	180.4	40.5
1981	24756.2	18785.3	834.4	38.3	36.7
1982	69993.3	8642.0	1261.0	87.9	32.1
1983	33974.2	13908.6	249.4	71.0	7.5
1984	44964.5	10412.8	2466.9	41.7	26.7
1985	28100.5	13847.8	1597.7	328.0	18.3
1986	93551.9	7580.4	1152.1	144.9	45.2
1987	33402.4	32991.1	1226.7	199.6	53.1
1988	36608.6	14421.1	13153.2	1350.1	113.7
1989	34276.3	17810.2	4372.8	7126.4	436.7
1990	25036.6	7496.0	3160.0	816.1	479.4
1991	57221.3	11247.2	1517.8	1076.8	219.8
1992	46798.2	13841.8	2267.6	613.0	279.9
1993	22098.3	9685.6	1006.3	97.8	137.8
1994	19188.4	4976.6	855.9	75.9	25.9
1995	24767.0	2796.4	381.3	97.0	42.3
1996	23015.4	10268.2	1185.2	44.7	46.5
1997	95900.9	4472.7	496.6	31.7	23.3
1998	33665.7	30242.2	5013.9	49.7	10.0
1999	32951.3	10272.1	13783.1	1058.2	16.7
2000	22855.0	2493.4	891.4	982.6	26.7
2001	11510.5	2898.5	370.2	175.8	816.7
2002	30809.2	1102.7	264.6	65.2	99.8
2003	*	*	*	*	*
2004	18201.6	1349.7	1080.7	50.8	83.1

2005	10118.4	1818.9	141.9	365.5	27.0
2006	12164.2	1571.0	384.7	52.4	75.6
2007	14174.5	2133.9	139.5	51.9	7.4
2008	14705.8	2700.4	464.1	178.5	57.5
2009	14860.0	2018.7	492.5	38.3	36.7
2010	11946.9	1811.5	529.3	55.5	10.0
2011	18348.6	1142.5	308.2	74.7	88.0
2012	5893.4	2928.6	681.5	82.0	45.0
2013	15394.9	3021.3	1638.5	427.6	149.7
2014	17312.7	2258.3	513.8	457.9	74.3
2015	16726.5	5040.4	1881.9	477.6	423.9
2016	10384.8	2434.3	1086.3	521.6	404.7
2017	15935.9	1715.5	1211.7	534.1	234.8
2018	9464.9	5250.0	993.1	533.0	594.1
2019	28308.6	1885.6	1533.3	337.9	301.7

*No survey

Demersal young fish survey

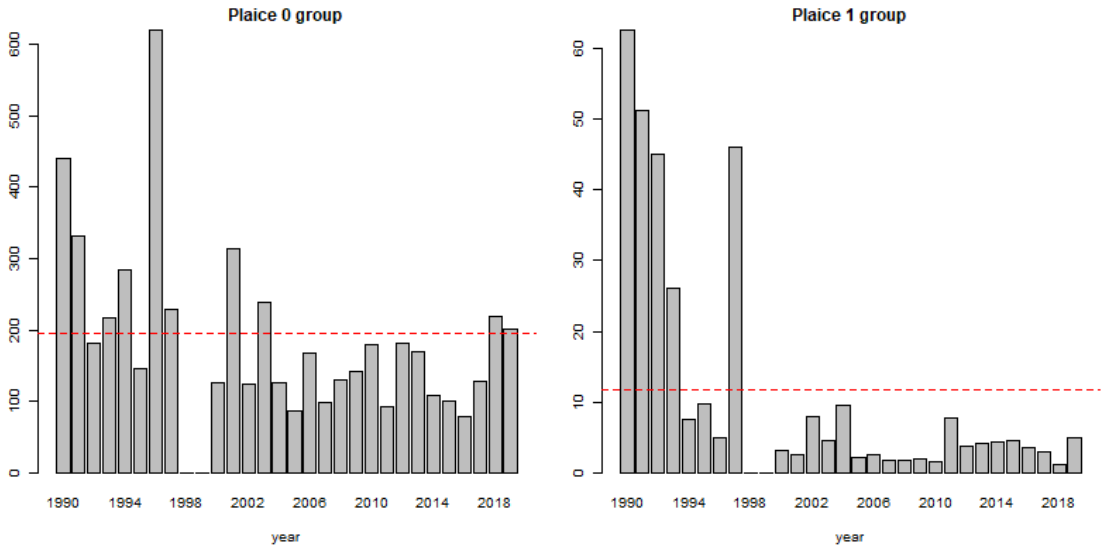


Figure 5.2.2.2 Plaice indices from international DYFS survey (combined German, Dutch and Belgian data), in numbers per numbers*10^6 m^2 fished area, age groups 0 and 1.

Table 5.2.2.2 Plaice indices from international DYFS survey (combined German, Dutch and Belgian data), in numbers per numbers*10^6 m^2 fished area, age groups 0 and 1 (*=invalid survey).

year	age0	age1
1990	439.593	62.58831
1991	332.3579	51.25087
1992	180.3098	45.02041
1993	216.9896	26.17763
1994	283.4379	7.432426
1995	146.0756	9.749124
1996	619.6147	4.985129
1997	229.2426	46.11934
1998	*	*
1999	*	*
2000	124.9256	3.185394
2001	313.1752	2.422088
2002	122.907	7.86081
2003	238.6262	4.607383
2004	126.7383	9.45473
2005	85.87962	2.099852
2006	167.9882	2.584789
2007	98.25258	1.769902
2008	129.7098	1.707966
2009	141.8704	1.981376
2010	179.6146	1.536524
2011	92.96254	7.713137
2012	181.1218	3.713203
2013	168.4809	4.033875
2014	107.9918	4.294105
2015	100.1616	4.559275
2016	78.05228	3.447096
2017	127.1979	2.867452

2018	219.3361	1.136788
2019	200.1965	5.002348

Annex 6: Survey planning 2020

Table 3.1 Timing of the offshore beam trawl surveys in 2020..

Country	Vessel	Area	Dates	Gear	Contact
Belgium	Belgica	western-southern North Sea	24 Aug – 04 Sept 2020	4 m beam	noemi.vanbogaert@ilvo.vlaanderen.be; lies.vansteenbrugge@ilvo.vlaanderen.be; loes.vandecasteele@ilvo.vlaanderen.be Cc: els.torreele@ilvo.vlaanderen.be
France	Côtes de la Manche	8a, 8b	09 Nov – 03 Dec 2020	4 m beam	gerard.biais@ifremer.fr yann.coupeau@ifremer.fr
Germany	Solea	German Bight	24 Aug – 08 Sept 2020	7 m beam	kay.panten@thuenen.de
Iceland	Bjarni Sae-mundsson	Entire coast of Iceland	26 Aug – 11 Sept 2020	4 m beam	gudjon.mar.sigurdsson@hafogvatn.is
Italy/ Slovenia	G. Dallaporta	Northern Adriatic Sea (GSA 17)	21 Nov – 10 Dec 2020	2x 3.5m modified beam	giuseppe.scarcella@cnr.it
Netherlands	Tridens	southern North Sea, German Bight	27 Jul–14 Aug 2020	2x 8 m beam	ingeborg.deboois@wur.nl Cc:
Netherlands	Tridens	central and western North Sea	17 Aug–11 Sep 2020	2x 8 m beam + flip-up rope	ingeborg.deboois@wur.nl Cc:
UK	Cefas Endeav-our	English Channel /Celtic Sea	18 Mar – 13 Apr 2020 (Currently on hold due to virus out-break)	4 m beam	ian.holmes@cefas.co.uk
UK	Cefas Endeav-our	7d, 4c	16 – 29 Jul 2020	4 m beam	joanne.smith@cefas.co.uk Cc: ian.holmes@cefas.co.uk
UK	Cefas Endeav-our	7fg, 7a	07 – 27 Sept 2020	4 m beam	stephen.shaw@cefas.co.uk Cc: ian.holmes@cefas.co.uk

Table 3.2 Timing of the inshore beam trawl surveys in 2020.

Country	Vessel	Area	Dates	Gear	Contact
Belgium	**Simon Stevin**	**Belgian coastal zone**	**14 – 23 Sept 2020**	**6 m shrimp trawl**	noemi.vanbogaert@ilvo.vlaanderen.be; lies.vansteenbrugge@ilvo.vlaanderen.be; loes.vandecasteele@ilvo.vlaanderen.be Cc: els.torreele@ilvo.vlaanderen.be; jurgen.bossaert@ilvo.vlaanderen.be
Germany	Chartered vessels & RV Clupea	German Bight and German Wadden Sea	21 Aug – 05 Oct 2020	3 m shrimp trawl	**Holger.haslob@thuenen.de**
Netherlands (SNS)	Isis	Dutch coastal zone	7-18 Sep 2020	6 m beam trawl	Maarten.vanhoppe@wur.nl Cc: ulrika.beier@wur.nl
Netherlands (DYFS)	Luctor	Scheldt estuary	31 Aug– 18 Sep 2020	3 m shrimp trawl	Andre.dijkman@wur.nl Cc: ulrika.beier@wur.nl nl
Netherlands (DYFS)	Stern	Dutch Wadden Sea	24 Aug– 25 Sep 2020	3 m shrimp trawl	Marcel.devries@wur.nl Cc: ulrika.beier@wur.nl
Netherlands (DYFS)	Isis	Dutch coastal zone and German Bight	21 Sep– 23 Oct 2020	6 m shrimp trawl	Thomas.pasterkamp@wur.nl Cc: ulrika.beier@wur.nl

Annex 7: Information on inshore beam trawl surveys

Country	Netherlands (SNS)	Netherlands (DYFS)			Belgium (DYFS)
Geographical area	Scheveningen (NL) to Esbjerg (DK)	Wadden Sea	Scheldt Estuary	Dutch coast to Danish coast	Belgian Coast
Ship	Tridens / Isis	Stern / Waddenzee	Luctor ##	Isis / Beukels / WR17 / GO29	Simon Stevin #
ship size (m)	73m / 28m	21m / 21m	34m	± 28m	36m
Date started	1969	1970	1970	1970	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
Usual Start date	12 Sept	29 Aug	5 Sept	26 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	7 within 2 weeks
Beam trawl type	6m beam trawl	3m shrimp trawl	3m shrimp trawl	6m shrimp trawl	6m shrimp trawl
Tickler Chains	4	1	1	1	0
Mesh size net	80mm	35mm	35mm	35mm	40mm
Mesh size codend	40mm	20mm	20mm	20mm	22mm
Speed fished	3.5–4 knots	3 knots	3 knots	3 knots	3.5 knots
Time Fished	15 min	15 min	15 min	15 min	30 min
Approx. number of stations per year	55	120	80	100	33

Target species	0– 4 group sole and plaice	0–1 group sole and plaice, *Crangon crangon*	0–1 group sole and plaice, *Crangon crangon*	0–1 group sole and plaice, *Crangon crangon*	0–2 group sole and plaice, *Crangon crangon*
Catch rate and LF distribution	All fish species	All fish species *Crangon*	All fish species *Crangon*	All fish species *Crangon*	Commercial fish species; *Crangon crangon* (1973–92, 2004–05)
Catch rate	Epibenthos (quantity)	Epibenthos (quantity)	Epibenthos (quantity)	Epibenthos (quantity)	*Crangon crangon* (weight)
Age data for plaice and sole	All years	All years	All years	All years	Since 2018

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

Country	**Germany (DYFS)**			**UK (YFS)**
Geographical Area	NiedersachsenWadden Sea +Elbe Estuary	Schleswig-Holstein Waddensea	Coastal Area outside the island chain	Eastern/South-Eastern English Coast
Ship	Chartered vessels	Chartered vessels	RV Clupea	Chartered vessels
ship size (m)	12–16m	12–18m	28m	8–10m
Date started	1972	1974	2012	1973-2007 Ceased 2011
Sampling Period	Apr/May (’74–’04) Sept/Oct	Apr/May (’74–’04) Sept/Oct	Sept/Oct	Sept/Oct
Usual Start date	15 Sept	5 Sept	15 Sept	1 Sept
Number of days per period	5	5 – 7	14	3 surveys x 8 days
Beam trawl type	3m shrimp trawl	3m shrimp trawl	3m shrimp trawl	2m shrimp trawl
Tickler Chains	0	0	0	3

Mesh size net	32mm	32mm	32mm	10mm
Mesh size codend	18mm	18mm	18mm	4mm
Speed fished	3 knots	3 knots	3 knots	1 knot
Time Fished	15 min	15 min	15 min	10 min
Approx. number of stations per year	75	75	85	82
Target species	0–1 group sole and plaice, *Crangon crangon*	0–1 group sole and plaice, *Crangon crangon*	0–1 group sole and plaice, *Crangon crangon*	0–1 group sole and plaice
Catch rate and LF distribution	All fish species *Crangon*	All fish species *Crangon*	All fish species *Crangon*	All fish species
Catch rate	Epibenthos (quantity)	Epibenthos (quantity)	Epibenthos (quantity)	*Crangon* (volume)
Age data for plaice	Since 2013	Since 2013	Since 2013	Since 2003

Annex 8: Results consistency analyses DATRAS BTS, SNS and DYFS data

1. Evaluation of brown shrimp (*Crangon crangon*) catches from the inshore surveys in the North Sea.

There are six inshore surveys in the North Sea targeting brown shrimp (Annex 4, Annex 7). Data from 2002 onwards for the Dutch surveys and from 2017 onwards for the German surveys have been stored in DATRAS. An R script was developed for exploration of those data with spatial distribution maps and length frequency plots (example plots in Figure 8.1, 8.2). When the script is complete, and most DYFS data stored in DATRAS, the insight in the data created by these scripts will be of value for ICES Working Group on Crangon fisheries and life history (WGCRAN).

There were some inconsistencies with the data extraction from the 'icesDatras' package in R and the exchange file that can be downloaded from the DATRAS website. For example the German data length data (HL) did not appear in the R extraction, although it was available in the DATRAS warehouse. The ICES data team is working to solve this inconsistency

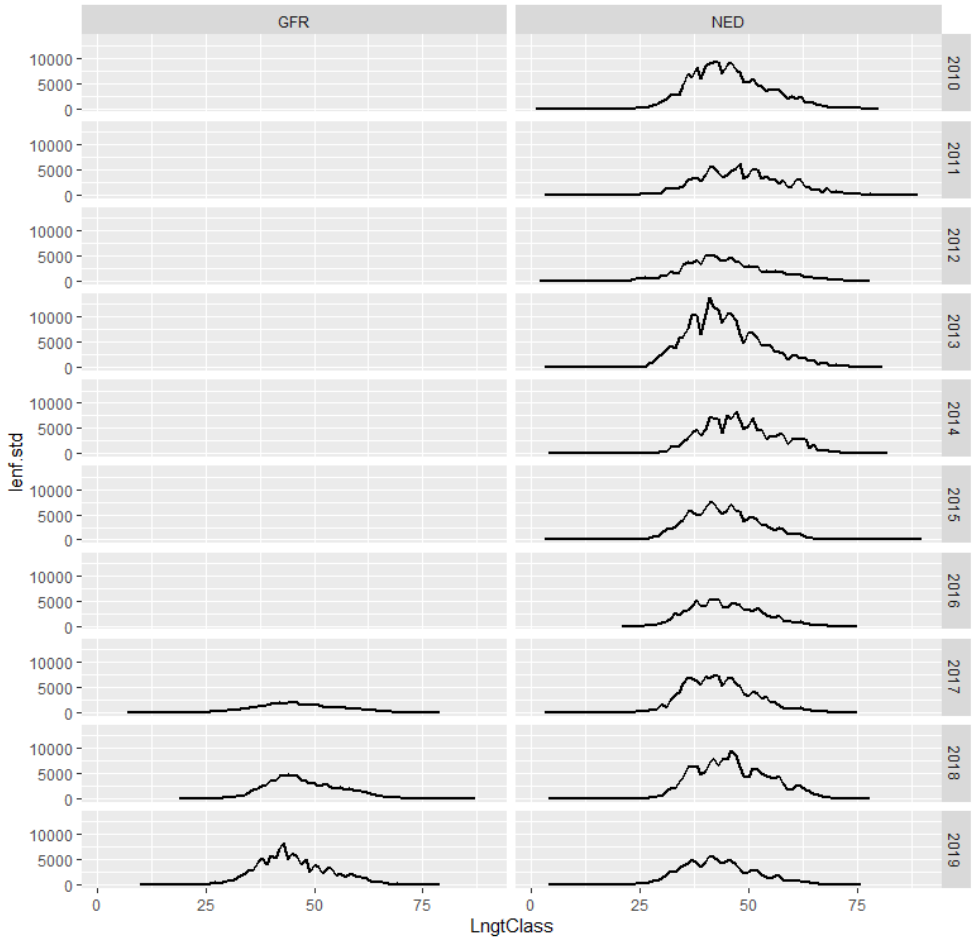


Figure 8.1 Length distribution of Crangon crangon based on DYFS data stored in DATRAS, by year.

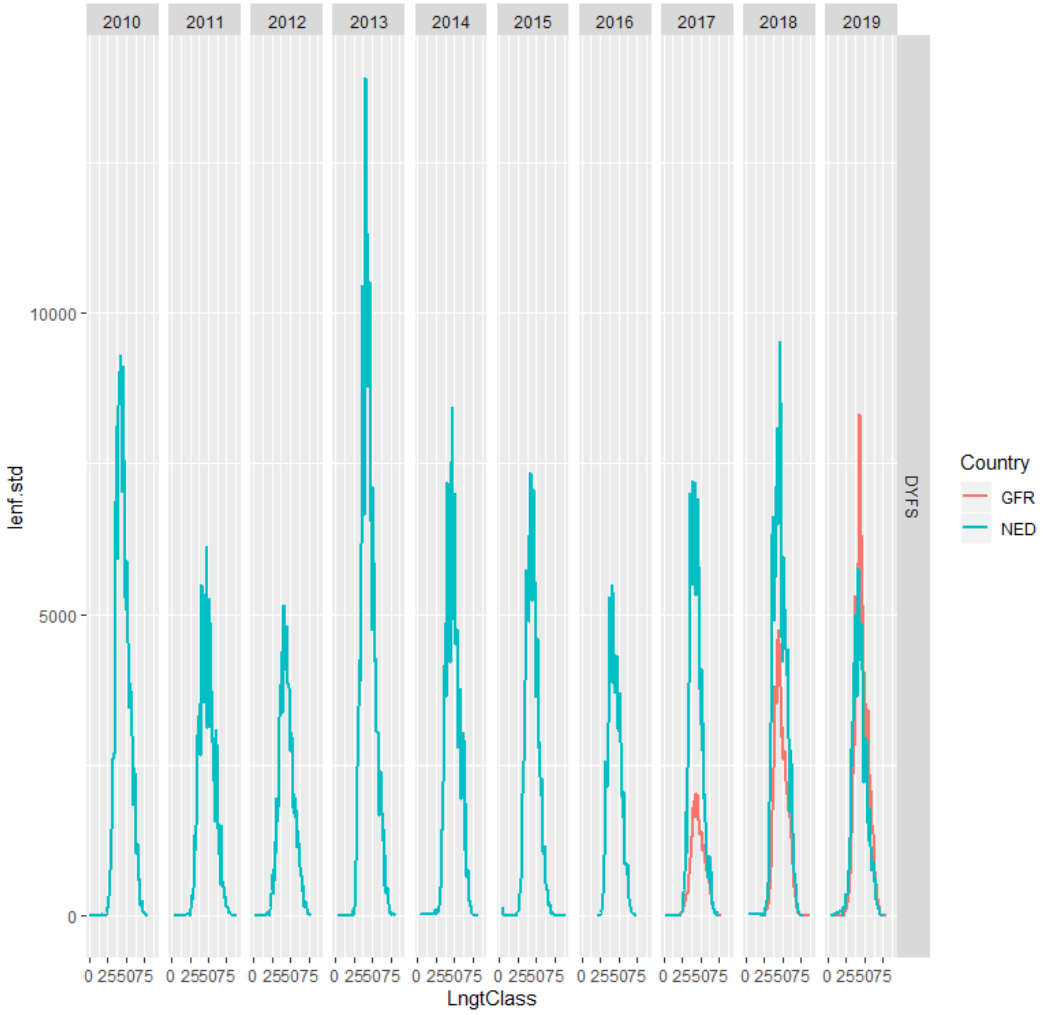


Figure 8.2 Comparison plot of length frequencies of Crangon crangon in DYFS survey data sorted in DATRAS.

2. Sustainable storage of scripts and sharing with others

The final goal is to share the final R scripts are on the DATRAS Github page, so they are easily accessible to other working groups. The advantage of using R scripts for manipulation and visualization of survey data produced by the survey working group itself gives survey groups (in this case WGBEAM) the opportunity to have more control that the data are used in a correct way, in accordance to the way it was sampled. It also gives the survey group an overview of possible data gaps in DATRAS.

It is the idea that non-finalized R scripts are stored and versioned in a WGBEAM github. In order to be able to use github properly, WGBEAM recommends that ICES Data Centre provides a short though comprehensive online training for trawl survey group members.

Annex 9: Deadlines for data delivery to DATRAS

The deadlines for data delivery to DATRAS are based on a realistic timeline where data for all species that are relevant for stock assessment can be delivered at the same moment. That is different from to the current situation, where, under high pressure, plaice and sole data for the offshore beam trawl surveys in the North Sea, mainly targeting older flatfish, are made available for the update assessment in autumn. Recruit information comes from the inshore surveys (SNS, DYFS) that are still running when the update assessment is carried out. The distributional range of the younger ageclasses (0-2) ranges for both plaice and sole is only properly covered by the combination of the DYFS, SNS, BTS, NS-IBTS.

Annex 9.1 Deadlines for data delivery to DATRAS of the offshore beam trawl surveys in 2020..

Country	Area	End date survey	DATRAS survey code	Deadline DATRAS delivery	Deadline DATRAS LITTER delivery
Belgium	western-southern North Sea	mid September	BTS	Incomplete: 5th December2 Complete: 1st March	1st March
Germany	German Bight	mid September	BTS	Complete: 5th December	1st March
Netherlands	North Sea	mid September	BTS	Incomplete: 5th December 3 Complete: 1st March	1st March
UK	English Channel / Celtic Sea	mid April	BTS	Incomplete: 5th August 4 Complete: 1st December	1st December
UK	7d, 4c	end July	BTS	Incomplete: 5th December 5 Complete: 1st March	1st March
UK	7fg, 7a	mid September	BTS	Incomplete: 5th December 6 Complete: 1st March	1st March

2 **file includes complete HH information, HL information for fish species, CA information for commercial flatfish species (brill, dab, flounder, lemon sole, plaice, sole, turbot)**

3 **file includes complete HH and HL information; CA information available for commercial flatfish species (brill, dab, flounder, lemon sole, plaice, sole, turbot)**

4 **file includes complete HH and HL information; CA information available for commercial flatfish species (brill, lemon sole, plaice, sole, turbot, megrim)**

5 **file includes complete HH and HL information; CA information available for commercial flatfish species (brill, lemon sole, plaice, sole, turbot)**

6 **file includes complete HH and HL information; CA information available for commercial flatfish species (brill, lemon sole, plaice, sole, turbot)**

Italy/ Slovenia	Northern Adriatic Sea (GSA 17)	mid December	BTS-GSA17	Complete: 1st June	No litter data delivery
France	8a, 8b	mid December	BTS-VIII	Complete: 1st April	No litter data delivery
Iceland	Entire coast of Iceland	end July	No code	Complete: 1st April (currently no delivery to DATRAS)	No litter data delivery

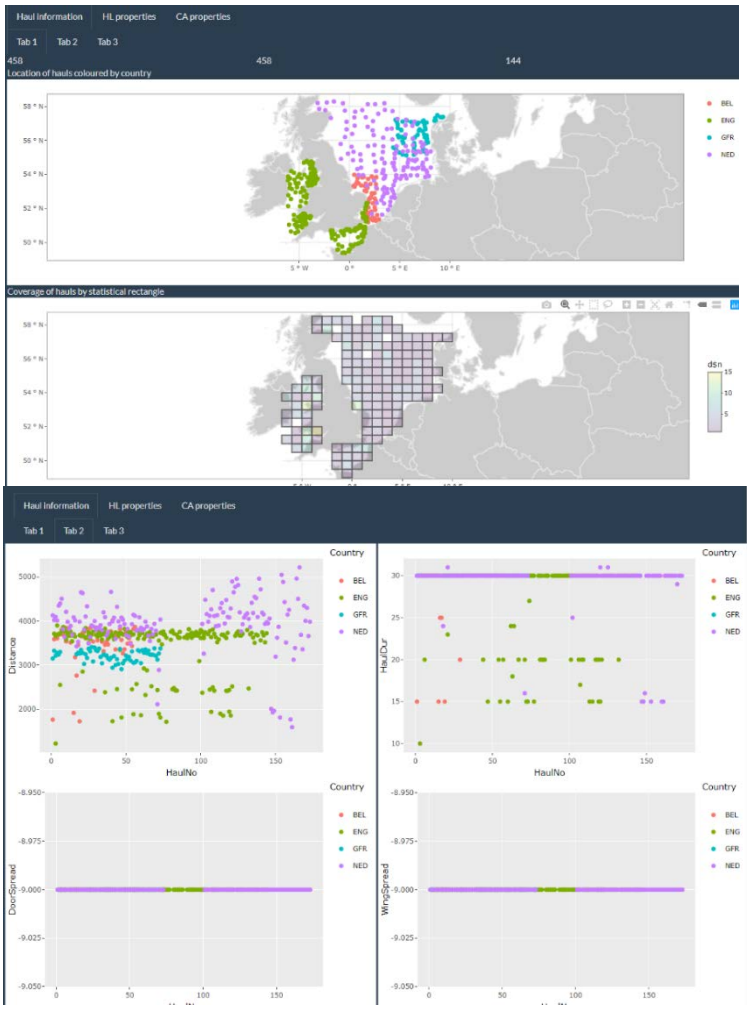
Annex 9.2 Deadlines for data delivery to DATRAS of the inshore beam trawl surveys in 2020.

Country	Area	End date survey	DATRAS survey code	Deadline DATRAS delivery
Belgium	**Belgian coastal zone**	**end September**	**DYFS**	Complete: 1st February
Germany	**German Bight and German Wadden Sea**	**mid October**	**DYFS**	**Complete: 1st February**
Netherlands (SNS)	Dutch coastal zone	end September	SNS	Complete: 1st February
Netherlands (DYFS)	Scheldt estuary, Dutch Wadden Sea, Dutch coastal zone and German Bight	end October	DYFS	Complete: 1st February

Annex 10: Table of contents Manuel on inshore beam trawl surveys

Annex 11: WGBEAM feedback on DATRAS R shiny app

Link to app: https://ices-taf.shinyapps.io/DATRAS-data-mining/



Feedback on the current overviews

Haul information Tab 1

- In addition to Hauls not only per country, also by gear and gear sub-type (maybe by the same colour per country, but different symbols
- Coverage of hauls by statistical rectangle: the contrast of colours could be improved, and especially the white rectangles are in the range of the higher numbers.

Haul information Tab 2

- Door spread and wing spread are irrelevant for beam trawl surveys, can be deleted
- A plot of distancexhauldur is more informative than the distance plot. Logic would be: plot hauldurxhaulno in the upper panel distancexhauldur in the lower panel

Haul information Tab 3

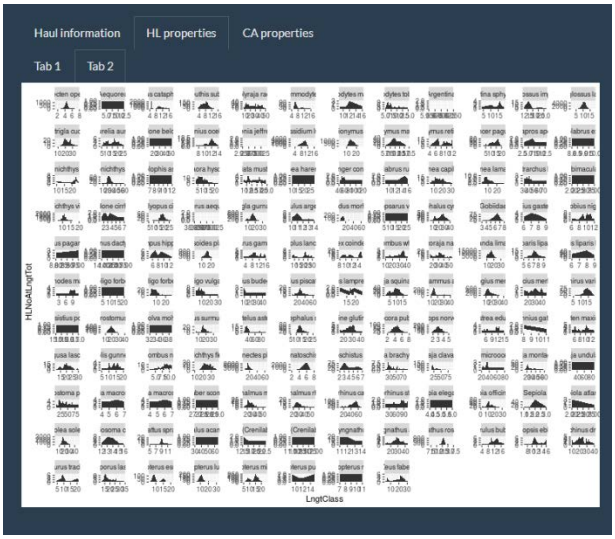
Good text 'this panel is intentionally left blank', it prevents confusion.

HL properties

- Change title into 'Overviews on species level'

- Tab title helps to understand what we see; e.g. number of hauls in which species have been encountered for &survey &year &quarter
- Sorting the list descending helps in getting the overview.
- What does the number in the upper left corner mean? Number of species, number of hauls?
- When selecting multiple years there is no outcome.
- As especially the BTS covers multiple ICES area, overview by area may be more informative than the total list.

HL properties Tab 2

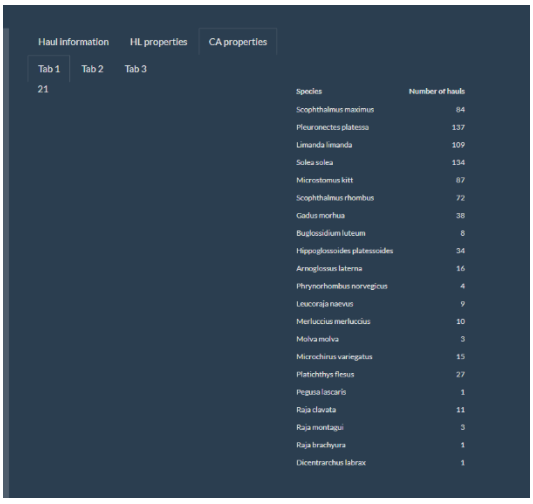


- Tab title helps to understand what we see; e.g. length frequency for measured species for &survey &year &quarter
- Assuming these are length overviews: only take measured species and specimens (sval=1) into account, and a limited amount of species, e.g. only the species present in a minimum number of hauls (as a percentage of the hauls taken into account), or the top 12 species.
- Preferred unit on the y-axis CPUE (swept-area), as calculated for BTS product.
- Separate tabs for different species groups, e.g. 'finfish', 'elasmobranchs' (by sex?), 'crustaceans', 'cephalopods'.

CA properties

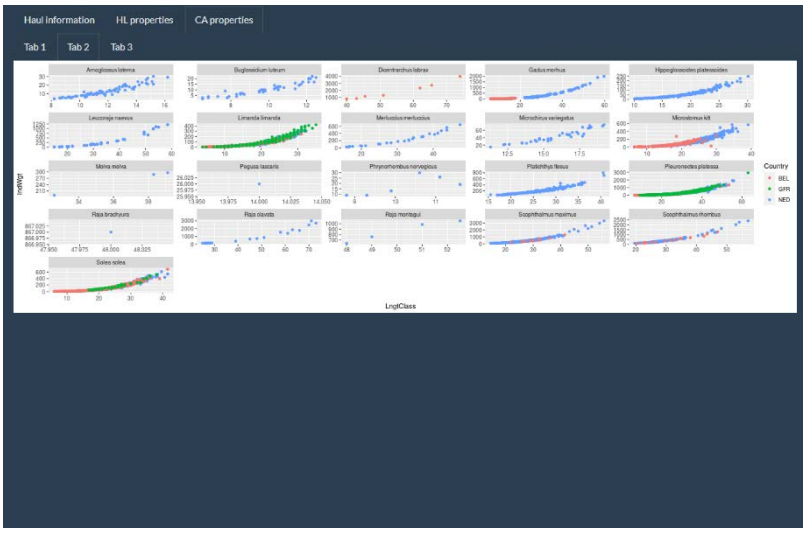
- Change title into 'Overviews on species level'

CA properties Tab 1



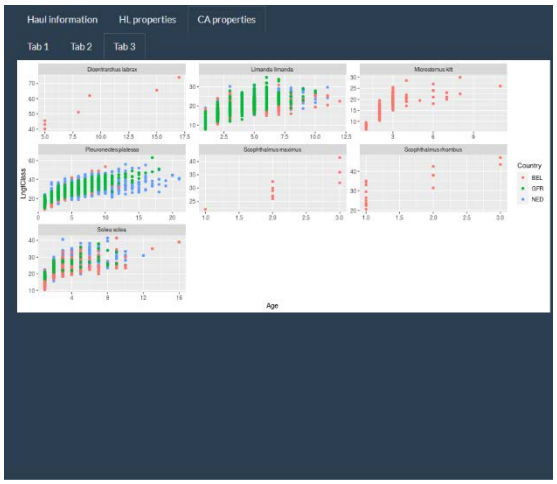
- Tab title helps to understand what we see
- I think we see the number of hauls in which biological data have been collected for the species. More informative would be: the number of individually measured and weighed fish used for biological data collection (sex, maturity, yearclass)
- Sort descending by number of alphabetically by scientific name. If English name can be presented easily: please add.
- As especially the BTS covers multiple ICES area, overview by area may be more informative than the total list.

CA properties Tab 2



- Tab title helps to understand what we see, in this case presumably 'individual length-weight relationship by species for &survey &year &quarter
- Make sure you use the full panel for the plots. Four graphs wide and all figures a bit higher provide a better view.

CA properties Tab 3



- Tab title helps to understand what we see, in this case presumably 'individual age-length relationship by species for &survey &year &quarter
- Make sure you use the full panel for the plots. It can be assumed that most species in Tab2 also will appear in Tab3. Same layout of Tab2 and Tab3 is therefore recommended.

Suggestions for additional overviews

HL properties Tab 1

- In case multiple years selection, putting the number of hauls in which the species has been caught may provide information people would like to see.