WORKING GROUP ON BEAM TRAWL SURVEYS (WGBEAM)

VOLUME 5 | ISSUE 48

ICES SCIENTIFIC REPORTS

RAPPORTS
SCIENTIFIQUES DU CIEM

ICES INTERNATIONAL COUNCIL FOR THE EXPLORATION OF THE SEA
CIEM CONSEIL INTERNATIONAL POUR L'EXPLORATION DE LA MER

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

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

ISSN number: 2618-1371

ICES Scientific Reports

Volume 5 | Issue 48

WORKING GROUP ON BEAM TRAWL SURVEYS (WGBEAM)

Recommended format for purpose of citation:

ICES. 2023. Working Group on Beam Trawl Surveys (WGBEAM).
ICES Scientific Reports. 5:48. 84 pp. https://doi.org/10.17895/ices.pub.22726112

Editor

Ingeborg de Boois

Authors

Chyanna Allison • Gary Burt • Ingeborg de Boois • Holger Haslob • Thomas Lanssens
Jean-Baptiste Lecomte • Kay Panten • Laura Sabatini • Vaishav Soni • Louise Straker Cox
Magnús Thorlacius • Adriana Villamor

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

Contents

i Executive summary

The Working Group on Beam Trawl Surveys (WGBEAM) coordinates and implements European inshore and offshore beam trawl surveys, including planning, standardization, data transmission and data quality assurance. The group also coordinates the Italian-Slovenian and Croatian 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.

In 2022 eleven beam trawl surveys were planned, covering the North Sea, 7d, 7e, 7fg, 7a, 8a, 8b and the Northern Adriatic Sea. COVID-19 infections hampered the German offshore beam trawl survey in the North Sea, and the Italian-Slovenian survey in the Adriatic. Severe weather conditions affected the spatial coverage of the French offshore survey in the Bay of Biscay, and the Dutch Sole Net Survey in the North Sea. The English survey in 7d was cancelled due to the review of lifting procedures on board. All data have been transmitted to the ICES Database of Trawl Surveys (DATRAS). Survey summary sheets have been prepared for all surveys.

Survey results were presented in a joint session with survey data end-users, North Sea and Celtic Sea stock coordinators, and the working group on marine litter chair. The main topic arising from this session is how end-users can be informed sooner on major issues in surveys.

R scripts to evaluate the combined offshore and inshore beam trawl survey data by region and cross-regionally have been further developed. Specific analyses have been conducted on elasmobranchs, patterns in abundance and spatial distribution; brown shrimp Crangon crangon, numbers measured and length ranges by survey; marine litter, consistency in reporting; age at length consistency for flatfish in the North Sea, plaice Pleuronectes platessa and dab Limanda limanda.

The number of closed areas for fishing has increased over the past decade with varying effects on the beam trawl surveys. Mitigating measures were defined and it was decided that the topic should stay on the agenda of WGBEAM in the next years.

Developments in the ICES database on trawl surveys were presented by ICES Data Centre, and feedback was given where requested.

The manual for the offshore beam trawl surveys has been published in January 2023. For publication of the manual for the inshore beam trawl surveys, appointments have been made to reach publication in the first half of 2023.

ii Expert group information

Expert group name	Working Group on Beam Trawl Surveys (WGBEAM)
Expert group cycle	Multiannual
Year cycle started	2023
Reporting year in cycle	1/3
Chair(s)	Ingeborg de Boois, The Netherlands
Meeting venue(s) and dates	20-23 March 2023, Hafnarfjörður, Iceland (15 participants)

1 General information

Participation

The 2023 meeting took place as a hybrid meeting, in Hafnarfjörður, Iceland, and online. In total ten participants joined the full meeting (Annex 1), and five attended the meeting partly. Seven countries and ICES Data Centre were represented. On March 21st, eight data end-users for the relevant flatfish and elasmobranch stocks, as well as from WGML participated in a joint session.

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, standardisation, 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 2023, the specific tasks were:

1. Compilation of survey summary sheets
2. Provide tabular overview of survey planning, including geographical areas for overlapping tows
3. 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 the data evaluation by region as well as across regions, and evaluate beam trawl survey data for a selection of parameters.
5. Provide the manual for inshore beam trawl surveys as a TIMES document for review.

Follow-up of recommendations

ID	EG	Year	Recommendation	Recipients	Status March 2023
22	WGBEAM	2021	Based on the discussions on methodologies used in the inshore surveys, WGBEAM recommends that WGCRAN provides the following information: • WGCRAN's preferred conservation method of shrimp to be measured (fresh, frozen, cooked, ethanol, etc.) for the DYFS; • WGCRAN's view on the minimum number of measurements on shrimp per stratum (i.e., subarea) for a reliable assessment in the DYFS.	WGCRAN;#120	The WGBEAM asked whether shrimp size measurements differ between those measured immediately fresh on board during the surveys and those that were transported frozen to the lab and measured there after thawing. During sampling campaigns in 2021 of the CRANMAN project 293 brown shrimp of the discard fraction of commercial fishing trips were measured fresh onboard and were afterwards put individually in numbered Eppendorf tubes and frozen. Later in the lab, each individual shrimp was thawed and measured again. Both manual measurements of total lengths were accurate to 1

ID	EG	YEAR	RECOMMENDATION	RECIPIENTS	STATUS MARCH 2023
					mm (below). As only the discard fraction was sampled, the majority of measured shrimp were smaller than 50 mm. The size measurements of fresh and thawed shrimp did not differ (slope: 0.99; R^2: 0.97). We conclude that length frequency distributions of brown shrimp are probably not affected by freezing and that the different measurement methods (concerning freezing) between countries are of minor concern. However, we recommend repeating these measurements with shrimp larger than 50 mm. WGCRAN has not expressed a view on the minimum number of measurements other than that the number depends on the goal of the data collection.
108	WGBEAM	2022	It is recommended that an exchange and/or workshop is organised on the maturity staging of lemon sole (*Microstomus kitt*). This summer spawning flatfish species has not been taken into account in previous maturity staging workshops, but is caught frequently in the beam trawl surveys in Q3.	WGBIOP;#203	WGBIOP is organizing a workshop to be held in 2024 and will recommend that samples are collected for this to WGBEAM and WGIBTS.
174	WGSINS	2022	A sprat larvae pilot survey, which is conducted at night-time during the Q3 IBTS by Denmark and partly Germany and Scotland, showed promising results in the first five years (2018-2022). A potential recruitment index may be derived by the sprat survey. However, a more complete area coverage would be beneficial. WGSINS recommends to continue the survey and encourages additional participants to join the survey. Additional sampling in the entire North Sea area is welcome, but most relevant are the areas that are not covered by the present survey participants, i.e. the area north of 56.5 N and ICES rectangles 36F0-F8, 37F6-F8, 38E8-F8, 40E8-F8 and 41E8-F0. The desired sampling period is Q3, ideally in the second half of August. The sampling gear is a MIK net with 1600 μm mesh size (i.e. the same gear that is used on	WGBEAM;#118	See paragraph 6.4 (text of paragraph added to recommendations database)

ID	EG	Year	Recommendation	Recipients	Status March 2023
			the Q1 MIK herring larvae surveys).		
18	WKSAE-DATRAS	2022	a) provide support to ICES Data Centre on quality control checks for relevant haul summary data parameters (Sample Location, Depth, Haul Duration, Groundspeed, and in particular Towed Distance) during the upload process to DATRAS, e.g. rejection or flagging of data, which are outside predefined limits of country/vessel-specific parameter values; b) consider whether swept-area information can be given in a separate file (HH/FlexFile format) in addition to the DATRAS CPUE by length and swept-area product for a limited number of species; c) confirm that an increase from 2 to 4 decimals for swept-area (km2) is appropriate.	WGBEAM, WGDG	(text added to the recommendations database) a) Report of the Workshop on DATRAS data Review Priorities and checking Procedures (WKDATR) (figshare.com) contains the boundaries for beam trawl surveys, including the need for warning or error messages. WGBEAM discussed Table 2.1 of the WKSAE-DATRAS report with the DATRAS Team, and provided comments to it. The table seems to be created mainly for creating output products, and guidance will be added to the WGBEAM manuals when updated; b) WGBEAM response: this is agreed upon, see paragraph 6.1 for the evaluation of the alignment of CPUE products and Flex-file; c) WGBEAM response: in the beam trawl survey CPUE product the swept area (km2) has 6 decimals, and it is proposed to let that be the standard for all swept area (km2) values.
106	WGBEAM	2022	WGBEAM proposes to add a field to the DATRAS HH format for data submission, called 'SurveyIndexArea', that can be entered by the submitter and will stay as uploaded by the submitter, so the output parameter SurveyIndexArea will not have to be calculated from the trawling position.	Data Centre;WGDG;	(text taken from recommendations database) WGDG agreed with proposal and asks DATRAS team to implement the new column
107	WGBEAM	2022	The addition of the option to select specific species in the DATRAS R package (and possibly extension to DATRAS download page) is recommended, in order to facilitate code sharing and parallel use of scripts developed during the working group, and would stimulate use of the most recent data set. Currently the full timeseries for all species have to be loaded in the dataframe and the species selection takes place afterwards (taking up to 1 hour for approx. 20 years).	Data Centre;WGDG	(text taken from recommendations database) WGDG agrees on the proposal, as it now requires a lot of (waiting) time and capacity to first download the full dataset of Exchange files and then select one or a few species. DATRAS team is asked to investigate the implementation in the R package as well as on the DATRAS download page (Exchange data)

ID	EG	YEAR	RECOMMENDATION	RECIPIENTS	STATUS MARCH 2023
			This means that when someone else would like to run the script, or when the person doing the analyses knows changes have been done to the data (maybe even based on the analyses), this will takes another hour.		

2 Survey achievements 2022 (ToR a)

2.1 Survey achievements 2022

For the offshore and the inshore surveys, survey summary sheets (Annex 5) have been prepared, containing information for end-users relevant for fish stock assessment, data collected during the survey, and specific comments on the 2022 surveys. Following the decision in the 2021 meeting, industry beam trawl surveys have been taken into account as well.

2.1.1 Offshore surveys

Eleven research surveys were carried out, covering the North Sea, 5a, 7d, 7e, 7fg, 7a, 8a, 8b and the Northern Adriatic Sea. In addition, three industry beam trawl surveys have been carried out (UK, The Netherlands, France). 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 5. Details on the surveys are available in De Boois *et al*. (2023).

Comments on the 2022 surveys:

- French survey was not fully conducted; based on the incompleteness no sole index should be calculated for 2022 (see Annex 7.1). This should be discussed in WGBIE;
- Icelandic survey will be ceased as of 2023, and will continue as a sea cucumber survey. Results of 2017-2022 are presented in Annex 7.2;
- Italian/Slovenian survey was hampered by COVID-19 cases on board and extremely bad weather, approx. 50% of the stations could be fished, mostly in the Italian area. Spatial coverage effects on indexes will be explored. Litter in the catch sometimes dated back to the 80s and 90s. The time-series trends in the age indices for the northern Adriatic Sea common sole are shown in Annex 7.3. As of 2022, Croatia conducts the seven stations in the Croatian territorial waters (7 stations within 12 nm from the coast). As the survey is on the list of EU mandatory surveys, international coordination is required. There are two options to meet that obligation: set up a coordination group under Mediterranean body GFCM, or let Croatia take part in WGBEAM. WGBEAM does not have a preference for one of the options.
- English survey Q1 was delayed to fuel prices (lower speed), late permissions in some EEZ areas, and two days due to reviewing lifting procedures. Sole and plaice distribution was in line with industry survey. July survey was cancelled, due to the review of lifting procedures (safety) decided by the Cefas management, and was not postponed. September survey lost one day to national mourning as the British Queen passed away. Based on an analysis done in 2007 how to finalise the survey with limited time, it was possible to finish the survey with less stations without losing significant quality. Summarising sole 7a is acceptable, sole 7fg is fine, sole 7d is missing out. The missed sampling of sole in 7d is unfortunate as in the benchmark a lot of effort has been spent to incorporate the survey in the assessment;
- German survey was quit after four days due to covid infections of the crew, and no experienced crew could be organised. Only 25% of the stations have been sampled, in the southern area. Internationally the effect is probably limited, as the Dutch surveys covers a large part of the area as well;
- Dutch survey in southeastern area had some invalid hauls due to extreme catches of the bryozoan *Electra pilosa*;

- Belgian survey was completed without any major issues with a new vessel RV Belgica. Mean length at age seems to have decreased for plaice. Three stations were cancelled due to passive fishing gears on the locations. Two stations were cancelled as no permission was given to fish in the Thames area by the port of London. For next year a passage plan will be developed to avoid this. Station 26 could not be sampled as no approval was received from the UK Authorities in the diplomatic clearance as the station is positioned in the centre of the North Norfolk Sandbanks and Saturn Reef MPA. Therefore, it was decided to re-locate the station within the ICES rectangle to a location with similar stratum and depth profile outside the MPA (station 200). The catch composition in terms of CPUE was comparable to station 26 and can be seen as an alternative.

Table 2.1. Overview of offshore beam trawl surveys during 2022 (planned dates)

Country	Vessel	Area	PLanned Dates	Gear
Belgium	RV Belgica	western-southern North Sea	24 Aug – 02 Sept 2022	4 m beam
France	Côtes de la Manche	8a, 8b	03 Nov – 30 Nov 2022	4 m beam
Germany	Solea	German Bight	22 Aug – 09 Sept 2022	7 m beam
Iceland	Bjarni Saemunds-son	Entire coast of Iceland	10 Aug – 28 Sept 2022	4 m beam
Italy/ Slovenia/Cro-atia	G. Dallaporta	Northern Adriatic Sea (GSA 17)	21 Nov – 18 Dec 2022	2x 3.5m modified beam
Netherlands	Tridens II	southern North Sea, Ger-man Bight	01 – 19 Aug 2022	2x 8 m beam
Netherlands	Tridens II	central and western North Sea	22 Aug – 16 Sep 2022	2x 8 m beam + flip-up rope
UK	Cefas Endeavour	English Channel /Celtic Sea	5 – 31 Mar 2022	4 m beam
UK	Cefas Endeavour	7d, 4c	12-25 Jul 2022	4 m beam
UK	Cefas Endeavour	7fg, 7a	2 – 21 Sept 2022	4 m beam

2.1.2 Inshore surveys

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

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 2022 survey achievements are in Annex 5. Details on the surveys are given in the manual (Beier *et al*., in prep.).

Comments on the 2022 surveys:

a) Germany achieved full coverage of the survey area in 2022; German DYFS 0-group time series were presented based on lengths, although otoliths are collected since 2013. Those data are available in DATRAS;
b) Dutch DYFS and SNS conducted fine, except for SNS suffering from bad weather which meant that the northerly areas couldn't be fished. Some hauls were hampered by bryozoan *Electra pilosa*;
c) Belgian survey has one station which is in a zone dedicated to aquaculture and cannot be fished anymore in future. WGBEAM advice is requested whether to relocate or remove the station (see paragraph 6.2 for guidance). It was planned to do comparative fishing for 30 min hauls vs. 15 min hauls, but due to time constraints caused by bad weather in the survey this could not be done. Strong 0-group for sole visible;
d) English survey ceased in 2010 but was re-installed in 2022. It tried to cover the historic survey stations. Compared to the historic series more data was collected. Only 34 plaice caught. Six comparative hauls for 2- and 3-meter beam trawls conducted. Is WGCRAN interested in shrimp information from the English coastal surveys? The funding requests for 2023-2024 have been prepared, but not yet agreed upon.

Table 2.2. Overview of surveys during 2022 (planned dates)

Country	Vessel	Area	PLanned Dates	Gear
Belgium	Simon Stevin	Belgian coastal zone	12 – 21 Sept 2022	6 m shrimp trawl
Germany	Chartered vessels	German Wadden Sea areas	26 Aug – 23 Sept 2022	3 m shrimp trawl
Germany	RV Clupea	German coastal zone	12 – 30 Sept 2022	3 m shrimp trawl
Netherlands (SNS)	Isis	Dutch, German, Danish coastal zone	6 – 16 Sep 2022	6 m beam trawl
Netherlands (DYFS)	Luctor	Scheldt estuary	5 – 23 Sep 2022	3 m shrimp trawl
Netherlands (DYFS)	Stern	Dutch Wadden Sea	29 Aug – 30 Sept 2022	3 m shrimp trawl
Netherlands (DYFS)	Isis	Dutch coastal zone, German Bight and Danish coastal zone	19 Sept – 21 Oct 2022	6 m shrimp trawl
UK (DYFS)	Chartered vessel	Outer Thames Estuary	7 – 22 September 2022	2 meter beam trawl

2.1.3 Industry surveys

Three industry surveys have been carried out in 2022, by France, UK, and the Netherlands. Further details (areas covered, technical specifications) by country are given in Annex 5.

More information on the Dutch industry survey on turbot and brill: https://library.wur.nl/WebQuery/wurpubs/fulltext/544588

Comments on the 2022 surveys:

a) Industry survey on turbot and brill: initiated to increase the amount of age information on turbot and brill, in order to support the assessment. Area allocation based on catch rates of turbot and brill in the North Sea. Survey is conducted by three commercial vessels. 2022 survey completed with minor issues. Large catches of bryozoans in some hauls. Plan is to have a benchmark on turbot and brill in 2024, in order to add the industry survey to the assessment;
b) English industry survey was completed without incidents. The sampling vessel will be sold in 2023, but a commercial vessel from the same company will be chartered. The benefit of this is that the same gear can be used. Start of the 2022 survey was delayed due to evaluation of lifting procedures. Survey mostly completed.

2.2 Data transmission to DATRAS

(1) Evaluate achievable deadlines for data delivery

In 2020, WGBEAM proposed new data delivery deadlines for beam trawl survey data submission to DATRAS. The deadlines were evaluated during WGBEAM 2021 and have not been changed, as they all could be met, and as a consequence, were kept for 2022. The deadlines for submission of the 2023 beam trawl survey results are in Annex 4.

The deadlines for beam trawl survey 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. As no assessment update in autumn has to be conducted anymore for sole and plaice, the deadlines fit to the current assessment process.

(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 2022 all countries managed to upload their data to DATRAS prior to the meeting. 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).

Exceptions in data submission:

a) Offshore French BTS VIII 2022 data have not yet be submitted (deadline 1st April); upload is foreseen before the deadline. No 2022 sole index should be created due to incompleteness of the survey;
b) Inshore survey UK-ENG 2022 data have not been submitted yet; planned to be uploaded in 2025. The Cefas database is currently being revised, and the decision of continuation of the inshore survey has not been taken yet. As soon as the decision on continuation is taken, Cefas will start interacting with ICES Data centre to facilitate inshore survey data submission to DATRAS;
c) Upload of historic German inshore data is hampered by delay in the provision of ship codes. As for the inshore survey multiple commercial vessels are chartered, a 'dummy code' such as Unknown vessel will not be sufficient, as then it will not be possible to separate the different vessels anymore. The provision of ship codes is outside the control of ICES, and can take more than six months. Survey data upload should take place before the deadline set, so end-users can access the data. It is recommended that ICES creates temporary ship codes when new ship codes are requested, which can be replaced by formal codes as soon as they become available (data resubmission required).

Marine litter

Data on by-catches of marine litter are also stored in the DATRAS database. In the offshore beam trawl surveys (BTS) and Belgian inshore survey (DYFS) in the North Sea litter is being registered and submitted to DATRAS on a regular basis. Litter data from the English BTS surveys are regularly added for western Channel and Celtic Sea (Q1), North Sea and eastern Channel (Q3), Irish Sea and Bristol Channel (Q3).

All 2022 litter data for the offshore beam trawl surveys as well as for Belgium inshore beam trawl survey have been uploaded to DATRAS.

3 Survey coordination 2023 (ToR a, b)

3.1 Planning surveys 2023 (ToR a)

The survey planning for the offshore and inshore beam trawl surveys 2023 is largely in line with previous years. Annex 6 contains the detailed planning for offshore, inshore and industry beam trawl surveys in 2023.

As in previous years, WGBEAM encourages 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, like in 2020 and 2021: 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 data series.

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

UK will conduct an inshore survey in Thames area (14 sea days) in 2023, coordinated by Louise Straker Cox (Cefas). Funding has still not been decided upon, but the proposals have been handed in.

From 2023 onwards, the Dutch offshore beam trawl survey will have a slight shift in the number of stations, and in the spatial coverage. The changes are:

- 33F4 3 → 2 stations; this rectangle is half covered by land, and the sea part is covered by a wind park (built in 2021-2022), so the remaining area is too small to maintain minimum 10 miles distance between three stations in the rectangle.
- 35F3, 36F3: 3 → 2 stations in the first part of the survey; in the second part of the survey sampling in those rectangles also takes place.
- 40F6: 0 → 1 station; in this manner the overlapping area of the German and Dutch will be increased, which will be beneficial for the use of data from different sampling gears in the assessment models. Currently, there is little overlap between the Dutch gear without flip-up rope and the German gear.
- 32F1 → 41F3; catch composition of the Dutch BTS in 32F1 is in line with the Belgian survey in that area. The gear used in the Dutch survey is suboptimal for the southwestern North Sea (risk of net damage). In 41F3 currently no BTS sampling takes place, so moving the station will lead to a better spatial coverage in the central North Sea without losing coverage in other areas.

As of 2023, for the Italian/Slovenian survey, RV G. Dallaporta will no longer be available, so the Northern Adriatic survey will be carried out by a charted fishing vessel. This will probably be the same used in the early surveys.

3.2 Manuals (ToR b)

The resolution for the publication of the inshore manual was rejected in November 2022 based on the proposed table of contents. A new table of contents will be drafted based on the table of contents of the Offshore beam trawl survey manual, and the resolutions will be submitted. The latest modifications (addition of feedback of WGCRAN on preservation type of shrimp, and possibly alignment of the number of shrimp to be measured) will be added, and then the manual will be sent to ICES Publications for review.

The Manual on offshore beam trawl surveys (de Boois *et al*., 2023) has been published as a TIMES product. During the meeting minor updates have been made in a version at the SharePoint.

4 Evaluation of combined survey data (ToR c)

4.1 Comparison of by-survey indices and by-area indices

[1] compare signals from 'national' index calculations for plaice and sole with a regional approach directly from DATRAS, decide if by-survey indices are still needed, and investigate of a common method deriving the information from DATRAS for by-survey indices could be used;

Historically, WGBEAM produced indices for plaice and sole, and only these data were presented and checked thoroughly for the use in stock assessments. In recent years, the number of species for which catch advice was requested increased. As a consequence, the use of BTS data for fishery independent survey indices for a number of species, e.g. dab, lemon sole, turbot, brill, and flounder, has also increased. It is impossible to conduct by-survey indices for the North Sea for all species within the timeframe of a working group. Moreover, the index calculation is nowadays mostly done directly by the stock coordinators, who directly extract data from DATRAS.

WGBEAM therefore decided to develop methodology to evaluate the input data for the index calculation, i.e. evaluate and compare age-length relations by country and cohort tracking for the combined data in a region (see paragraph 4.2).

For regions where only one survey is conducted, by-survey indices are available. Indices for sole (*Solea solea*) in the Bay of Biscay (Annex 7.1), plaice (*Pleuronectes platessa*) in the Icelandic Sea (Annex 7.2), and sole in the Adriatic Sea (Annex 7.3) area presented as separate series.

For the North Sea, plaice and sole recruit indices (0- and 1-year olds) are presented separately (Annex 8.3).

4.2 Evaluation of age-based indices for species in North Sea stock assessment

Despite the index calculation by the stock coordinators, the evaluation of the input data from DATRAS and the age-based indices itself is still one of the major tasks of the survey working groups. Hence, one task of the WGBEAM 2023 was to evaluate the age-based indices for the species used in fish stock assessment by region and cross-regionally. For this purpose, overview plots for a number of species were produced in order to identify and document inconsistencies, or correct errors or omissions (Annex 8). The script developed allows for analysis of all species, so it is foreseen that in the coming years evaluation of age-length relations and cohort tracking for all species will be made available.

4.2.1 Plaice offshore surveys

DATRAS data for Plaice has been extracted for all BTS surveys (the Belgian, Dutch, German and UK), in ICES areas 4, 7adfgh. The length structure per length class is provided in Figure A8.1 and show an overall consistency over the period 2015-2022, except for the 2022 German BTS survey, which shows an increase of the proportion of smaller (>20cm) individuals and a decrease of larger ones than in past years. However, the German BTS in 2022 only covered 25 % of the station grid and the results based on the German data alone should be interpreted with caution.

Age-length keys for the Belgian, Dutch, German and UK BTS surveys in the North Sea have been created. No major differences could be found for age 0-5 age-length relationships (Figure A8.2). An age-based index was created for plaice combining Dutch, Belgian, German, and UK BTS data for area 4 (Figure A8.3). The corresponding cohort plot (Figure A8.4) shows that in case of plaice strong cohorts are very well tracked throughout the covered time period (e.g. 1996, 2001, 2016, and 2018 cohorts). However, for the time period 2005 – 2014 cohorts are not that clear visible.

4.2.2 Dab offshore surveys

DATRAS data for dab has been extracted for all BTS surveys (the Belgian, Dutch, German and UK) and filtered to focus on the North Sea only (ICES area 4). The focus on the North Sea is justified by the fact that age-based indices presented later on were computed at this spatial scale. The length structure per length class is provided in Figure A8.5 and show consistency over the period 2015-2022. The UK BTS survey only samples in three ICES statistical rectangles with only 581 dab measured over the period 2015-2022, which provide a length structure with a lot of uncertainty. Age-length keys for the Belgian, Dutch and German BTS surveys in the North Sea have been created (Figure A8.6). No major differences could be found for ages 0-8 age-length relationships.

Age-based indices have been created, and cohort plots have been provided (Figures A8.7 and A8.8). The age-based index for dab shows that after a peak in 2015 for a number of age classes (ages 2-7), the index decreased steadily and was below the average in 2022. However, age classes 8 to 10+ still display figures above the long-term average. The cohort plot reveals that only some cohorts can be tracked well, which is different compared to plaice. One reason for this could be that the age reading for dab is not as straightforward as e.g. in plaice. Age reading uncertainty was high in dab compared to most other North Sea flatfish species. The percentage agreement was 69-73% and the coefficient of variation was 13-14% for dab.27.3a4, based on the age determinations of readers who supply age data for the assessment. As observed previously, uncertainty was highest in the third quarter (Bolle *et al*. 2019). As a consequence, the age reading uncertainty is at its peak during the beam trawl surveys.

Age-based indices have been created, and cohort plots have been provided. Age-length keys for the Belgian, Dutch, German and UK BTS surveys in the North Sea have been created. No major differences could be found for age 0-5 age-length relationships.

4.2.3 Plaice and sole recruits

The international DYFS index for 0- and 1-year plaice resp. sole is a combination of DYFS data from Belgium, the Netherlands (both 0 and 1 group), and Germany (only 0-group). It is a weighted mean, based on the surface of the area covered, and with a weighing factor per depth class.

For plaice the index showed a high recruitment in 2021 (highest since 1996), which is still visible as a relatively strong 1-year age group, the highest since 2004 (Annex 8.3; Figure A8.9 upper panels).

The international DYFS index for sole shows -despite the high recruit signal in the Belgian DYFS (paragraph 2.1.2)- intermediate values for the 0-group in 2021 and 2022 (Annex 8.3; Figure A8.9 lower panels).

4.3 Evaluation of litter and species identification consistency

To evaluate identification consistency, hauls from rectangles that were sampled by more than one country were taken into account for BTS 2019-2022. Data from areas where survey activities overlapped were compared. Two distinct overlapping areas were identified. Germany with the Netherlands in the north-east of the North Sea and Belgium with the UK and Belgium with the Netherlands in the south-west.

4.3.1 Litter identification consistency

4.3.1.1 Analysis of litter identification in overlapping survey areas

The DATRAS data product "Litter Assessment Output" was used to assess the consistency of marine litter identification between the participating countries' surveys.

The analysis shows different numbers of litter categories detected per rectangle (Annex 9.1; Table A9.1) as well as different numbers of litter particles (Annex 9.1; Table A9.2).

In the northern area, on average twice as many waste categories were recorded in the Dutch survey in 2019 as in the German survey. The number of individual items is about seven times higher. The large differences may be due to a difference in fishing gear. The Netherlands use an 8 m beam trawl with a total of 10 chains, while Germany uses a 7 m beam trawl with 5 chains. In 2020 a similar number of litter categories and particles were recorded in both surveys. 2021 and 2022 cannot be included in the comparison. In 2021, the scientific crew on the German vessel had to be reduced from 7 to 5 people due to COVID-19 restrictions. As a result, the marine litter recording was abandoned after four days. In 2022, the German survey had to be quit after four days due to COVID-19 infections. In both cases, only 6 of the 17 overlapping rectangles were covered by the German survey.

In the southern area, the Belgian and UK surveys overlap in five rectangles. In 2019 to 2021, similar numbers of litter categories were found in both surveys. The number of individual items was slightly higher in the UK survey in 2019, while slightly higher numbers were observed in the Belgian survey in 2020 and 2021. The UK survey was not conducted in 2022.

The overlap area between the Belgian and Dutch surveys consists of ten rectangles. In the Dutch survey, higher numbers of litter categories were observed in 2019, 2020 and 2022, and identical numbers in 2021. The number of individual items in the Dutch survey was twice as high as in the Belgian survey in the first two years and similar in the last two years.

There were differences in the identification of marine litter categories between the surveys in the years analysed. In some cases, the mean number of categories and individual items differed significantly. This could be due to different fishing gear. In general, all litter categories are covered in a comparable way in the different surveys.

4.3.1.2 Evaluation of litter catch rates

In 2022 WGBEAM created an R-script to compare and review seafloor litter data associated with beam trawl hauls. In 2023 the R-script has been updated and used to analyse data downloaded from DATRAS (Litter Assessment Output) for the offshore (BTS) between 2020-2022. The inshore survey was not considered as only Belgium collects litter data. The updated R-script has been stored on https://github.com/ices-eg/wg_WGBEAM.

To evaluate whether there are any trends in the data the number of litter items and weight were compared, though no discernible pattern was found. Plastic was the dominant litter category

type found in all survey years and countries (Annex 9.2; Figure A9.1). It is evident for the German survey in 2021 that litter was not present for most of the survey, however it was not recorded for most of the survey. It is recommended that there is a clear separation of categories between litter not being present in a haul and litter data not being recorded for a haul.

The most prevalent plastic litter types recorded were plastic fishing line (A5: monofilament & A6: entangled), plastic sheets/bags (A2/A3), synthetic rope (A7), wood (E1), other plastics (A14) and other natural materials (E5). The litter size category descriptions are used both for item size area (A-F; cm^2/m^2) and length just for rope (μm/mm/cm), so this should be considered when reviewing or analysing litter catches.

Plastic litter was widely distributed in catches and was the most abundant by weight, with glass and metal litter least abundant and sporadically distributed in the North Sea (Annex 9.2; Figure A9.2-Figure A9.3). There are low incidents of no litter being caught (Annex 9.2; Figure A9.4), considering that there was no discrepancy between no litter present and litter not being recorded onboard in this category.

4.3.1.3 Change in litter recording

Coal is recorded differently in different countries; UK does not record, the Netherlands records coal. The ICES manual for seafloor litter data collection (ICES, 2002a) is clear on whether or not coal should be registered:

> *E5: Other Unrecognisable, man-made, processed items and items that do not fit in other categories, such as slate roof tiles, cobbles, concrete, cinder stone, or coal. When the source material is a natural product that has been intentionally heated to produce a man-made material, it belongs to category D (e.g. bricks or things made of glass).*

All countries are requested to start registering coal if not already done so. Next to that, the new litter coding list contains a number of additional categories that should be taken into account. In the photograph guide (ICES, 2022b) examples of litter items are provided.

As in the updated manual new codes have been added, it is recommended that data submitters can refer to this new list of codes in their files (LTREF). Only in this manner reliable analysis of litter catches can be done. E.g. when A15 does not appear in catches from 2023 onwards, it will not be clear if that is because the previous litter coding list was used, or that A15 was absent.

4.3.2 Species identification consistency

The DATRAS data product "CPUE per length per Hour and Swept Area" was used to assess the consistency of species identification between the participating countries' surveys.

A number of discrepancies was found, mostly caused by a different identification level of the species/genus. For some groups this is due to different levels of expertise on board in relation to the time available for catch processing, and it is deemed safer to not identify to the species level and record to the genus level if in doubt. This applies i.e. to gobies, sandeels, sponges, sea squirts. Some species cannot reliably be identified to the species level on board when fresh (e.g. *Sepiola atlantica*), or because DNA analyses are needed (e.g. *Echinus* species due to interbreeding, *Mustelus* species). In that case it is always necessary to upload to the genus or even family level.

Table 4.1 Species inconsistencies in offshore beam trawl surveys that require action

Species 1	Species 2	Countries	Action needed
Callionymus reticulatus	*Callionymus maculatus*	UK, NED, BEL	UK is requested to carefully check recordings of *C. maculatus* in the survey area, as the distribution of the species is generally more northerly.
Illex	*Illex coindetii*	NED, GER	NED: Change into Illex coindetti (data entry error)
Mactra stultorum	*Mactra corallina*	NED, GER	NED: correct name into *Mactra stultorum*; the M. *corallina* var. *atlantica* has been renamed to *M. stultorum*
Mustelus	*Mustelus asterias*	UK, NED, BEL	Although only *M. asterias* is considered to live in the North Sea, reliable identification is only possible based on DNA. BEL and UK are requested to evaluate if the *M. asterias* recordings are based on DNA analyses, and otherwise submit as *Mustelus* sp.
Philine aperta	*Philine quadripartita*	UK, BEL	UK is requested to upload records as *P. quadripartita*, because "*Philine aperta* and *P. quadripartita* have long been treated as synonyms. However, according to Price *et al*. (2011), based on anatomy, there are two distinct species, the first one in South Africa and Mozambique, the second one in European seas" (note in https://www.marinespecies.org/aphia.php?p=taxdetails&id=140744)
Sepiola	*Sepiola atlantica*	NED, GER, BEL, UK	GER, BEL, UK: upload as *Sepiola*, also for historic data -reliable identification based on fresh animals is not possible to the species level- unless identification was done based on preserved animals

4.4 Evaluation elasmobranch catch rates

In 2021, WGBEAM subgroups evaluated offshore and inshore beam trawl survey data from DATRAS. Consistency analyses scripts were made available at https://github.com/ices-eg/wg_WGBEAM. These R scripts can be used to evaluate any beam trawl survey (BTS, DYFS, SNS) and any species in DATRAS. In 2023 the script has been updated and ran to evaluate spatial-temporal distribution of commercially important elasmobranchs in BTS, DYFS and SNS surveys for the years 2000-2022. As an example, the modified script has been applied to the elasmobranch species listed in Annex 10 table A10.1.

Total number of individuals per year are shown by country for the Raja species in figure A10.1 and sharks and dogfish species in figure A10.5. Most species have generally increased throughout the time series (in particular *Raja clavata*, *Raja montagui*, *Mustelus* sp., *Scyliorhinus canicula* and *Scyliorhinus stellaris*). However, *Amblyraja radiata*, is strongly decreasing over the years. In absolute terms, the dominant species are: *Raja clavata* (mainly UK survey), *Amblyraja radiata* (mainly NL survey), *Raja montagui* (mainly UK survey) and *Scyliorhinus canicula* (mainly UK survey).

4.4.1 Ray species

Looking at the Rajiformes distribution in in the BTS (Figures A10.2 and A10.3), it can be seen that the species distribution differs considerably by area. *Amblyraja radiata* is mostly distributed to the northeastern North Sea (between UK and Sweden) and is rarely found below the 54°N parallel. *Raja clavata* and *Raja montagui* are instead more evenly distributed around UK but, unlike *Amblyraja radiata*, they are rarely found at latitudes higher than the 54°N parallel. *Raja brachyura*

is also distributed in the seas surrounding UK but with a greater concentration south of the English Channel and the French coast. The distribution of *Leucoraja naevus* is particular; the species is present in the catches both in the south-west of the area sampled (English Channel and Celtic Sea) and in the north along the coasts of Scotland (with a sample in 2003 even close to Shetland Island). The two rarest species, *Raja microocellata* and *Raja undulata*, seem to have a more restricted range confined to the Celtic Sea and English Channel only.

Low total numbers of undulate rays (*Raja undulata*) and thornback ray (*Raja clavata*) may be due to the incomplete coverage of the UK surveys in 2022. The 7d survey was not conducted at all, and the quarter 1 southwest coast survey was only conducted in 2022. As for 2020 data collected by UK, the quarter 1 southwest survey was postponed from March to July, and the Irish sea survey was limited to the Bristol channel (7fg), which might have affected the elasmobranch catches (*Raja brachyura*, *R. clavata*, *R. montagui*, *Leucoraja naevus*).

The maps by years (figure A10.4) also show the general increasing trend from year to year highlighted in the first plot. It should be noted that in the early years of the time series (2002-2005) the sampling stations in the English Channel were significantly lower compared to the sampling effort of more recent years. In addition, several transects further north of the 58°N parallel were carried out only in 2002 and 2003. This could affect the total number of individuals per year especially for *Amblyraja radiata* and *Leucoraja naevus* (Figure A10.4).

4.4.2 Shark and dogfish species

The maps by years (figure A10.7-9) also show the general increase trend from year to year highlighted in the first plot. It should be noted that in the early years of the time series (2002-2005) the sampling stations in the English Channel were significantly lower compared to the sampling effort of more recent years. In addition, several transects further north of the 58°N parallel were carried out only in 2002 and 2003. This could affect the total number of individuals per year especially for *Scylorhinus canicula* (Figure A10.7) and *Mustelus* sp. (Figure A10.8).

All five of the shark and dogfish species are found in the Irish and Celtic Sea and the English Channel (Figure A10.6). *Scylorhinus canicula* is found in high densities around England stretching into the southern part of the North Sea along with a patch around Orkney Islands (Figure A10.6). For the other four, *Mustelus* sp. has the highest density, while *Scyliorhinus stellaris*, *Galeorhinus galeus* and *Squalus acanthias* have much lower densities (Figure A10.6), the latest being more widely distributed but captured sporadically throughout most of the North Sea over the past 20 years (Figure A10.9). In 2022 *Scyliorhinus stellaris* and *S. canicula* catches were affected by incomplete UK quarter 1 survey and by the cancellation of the 7d survey.

4.5 Evaluation of shrimp sample size

In 2022 WGBEAM created an R-script to review *Crangon crangon* lengty frequency data from the inshore beam trawl surveys (DYFS) to help determine whether sub-sampling sizes could be reduced for each haul. In 2023 the R-script has been updated and used to analyse data downloaded from DATRAS (DYFS HH, HL and CA) for the inshore between 2011-2022. The updated R-script has been stored on https://github.com/ices-eg/wg_WGBEAM.

To evaluate the length frequency distribution range data by country was analysed (Annex 12 Figure A12.1). The length frequency distribution varies by country and year. The majority of shrimps measure between 25-75mm in each countries' surveys and the German surveys have the largest sample sizes. The Dutch data shows that very small shrimp 1-4 mm have been reported

in several years 2011-2014, 2017-2019) and very large shrimp 435-473 mm in 2017. These data should be checked and corrected.

The samples sizes with data for all countries combined were reviewed for 3 and 5 years 2020-2022 and 2017-2021, and ≤3 mm and ≥150 mm lengths removed (Annex 12 Figure A12.2 and Figure A12.3). The normal distributions are grouped into five sample size categories per haul (≤50, 51-100, 101-250, 251-500 and >501). The distributions are similar for the years 2020-2022, though a wider length frequency range is present in the ≥101 samples. The German data for 2022 should not be considered at this stage, as the dataset was not complete during the working group meeting.

The normal distribution differs for the 2017-2021 samples, with variation in the mean and smoothed mean. There was a wider length class range within sampling group (>51 individuals sampled per haul) for 2017-2019, compared to 2020-2022 data. The largest and the smallest lengths are captured in greater sample sizes, and sampling strategy (categorisation of sub-samples, selecting length extremes within sub-samples etc.) may also affect the length distribution ranges.

Based on this analysis alone, no conclusion on the impact of sample size on the overall length-frequency distribution can be drawn. Therefore, a bootstrap statistical analysis method will intersessionally be applied to the data, in order to estimate an appropriate sampling quantity representative of the shrimp length frequency distribution. After this analysis, the working group on life history of Crangon (WGCRAN) will be asked to conduct sensitivity analyses for different sample sizes, to assess potential impacts, e.g. the length based estimation of shrimp total mortality.

5 Growth patterns in plaice (ToR d)

In the 2022 inshore surveys, the following numbers of small plaice have been collected:

- Belgium has sampled young plaice, at least one is left unprocessed (30); there is experience available, but no budget available for processing. The otoliths can be sent to the Netherlands for further processing;
- Germany has collected smaller plaice (64); there is some experience on day ring analyses, no budget available to process the samples. The otoliths can be sent to the Netherlands for further processing;
- Netherlands has collected otoliths of small plaice, partly already processed, check how much is left. A draft manual for processing the otoliths and conducting day ring analyses is available and will be drafted within the project scope where day-ring analyses will be carried out;
- UK has collected smaller plaice and left one unprocessed (21); in-house expertise and budget is available, and there is potential to process the otoliths. The grinding for daily rings is still very experimental. The Robbins and Choat (2002) protocol for age-based dynamics of tropical reef fish has been followed, as the species worked on so far have been from the tropics.

As there is expertise available in different countries, it is advised that workshop is organised to exchange experiences and share expertise. This can either be an informally organised workshop, or a more formalised ICES workshop which would require resolutions. The final decision will be made in the course of 2023.

6 Other topics

6.1 DATRAS related

The ICES DATRAS team presented the developments in the system, and topics discussed by the Working group on DATRAS governance (WGDG). Among the implemented tasks during the previous year, DATRAS team presented the implementation of the new field in HH SurveyIndexArea. This field allows submitters to include this information directly on submission. The field value is defined by the adhoc vocab CodeType for the different areas existing for each survey. In this regard, DATRAS team asked for feedback on how to better proceed to merge two Code Types existing for the same survey DYFS, one for English otoliths and another one for the rest. Other implemented tasks presented include a new survey FR-WCGFS available in DATRAS, the publication of the DATRAS data schematic (will add the library link here if we make it on time), and the service-based submission, a machine to machine system already in place with Wageningen Marine Research (Netherlands) that allows bulk (re)submissions in an automated way. DATRAS team also requested feedback to WGBEAM on two ongoing processes: the review of the SpecVal descriptions, and the review of the suggestion from WGDG on data products naming and description, to be displayed in the download page. This last task aims to improve the understanding of the general user of the different data products.

The team also presented the DATRAS data comparison tool for exchange data, which is crucial for ensuring the accuracy and usefulness of the data. This process involves analysing two sets of data versions and identifying any differences between them. The comparison may involve analysing values and contextual information associated with the data to determine if there are any changes that could affect the accuracy or usefulness of the data/data products. When working with datasets such as HH, HL, and CA, it is essential to perform a thorough comparison of data versions. This comparison can help determine how to reconcile any differences between the data versions and ensure that the most accurate and up-to-date information is being used. By comparing multiple versions (5 version maximum), working group/ expert group can also see a comprehensive report of differences can help highlight changes affecting field values and provide a clear view of each change and can also use the report to determine if any updates or changes need to be made to the data before analysis. Subscription of related stocks notification will be very useful for stock coordinator which they are responsible for, DATRAS Data comparison tool development is in the developing and testing phase and the target date to launch the final version is end of 2023, there will be required a tester group form the WG members who can guide and give feedback to DATRAS team for further improvements.

WGBEAM was asked to reflect on some developments, and to review a number of proposals:

a) WGBEAM has reviewed the proposal for the DATRAS submission comparison tool and provided input to the DATRAS team on the information to compare and on the format (e.g. tabular, figures) to present the comparisons. It looks like a promising tool to increase the insight in changes, from a submitter's perspective as well as for end-users. Up to five versions back will be checked, from the moment the system is installed. It also provides the opportunity to compare litter submissions with Exchange file resubmissions, e.g. providing a message when resubmission of survey data occurs and hauls for which litter has been submitted are not resubmitted;
b) New format CPUE product and flexfile (Annex 11.1 and 11.2): WGBEAM agrees with the proposal to align the CPUE product for beam trawl surveys and surveys under IBTSWG and WGBIFS. The limitation of parameters in the foreseen CPUE product compared will

not lead to issues for the majority of the analyses. If more information is needed this can be derived from the flex file. The addition of the variable SweptAreaBeamwidthKM2 is necessary to allow incorporation of beam trawl survey information in the Flexfile;

c) Specval descriptions (Annex 11.3): the descriptions are clear, and it is useful to have the information on whether or not information is used in DATRAS products or not. WGBEAM suggests to recommends that the following information is added:
   - specval=5: use in DATRAS product: yes, it is recommended that a comment 'presence-absence only' is added;
   - specval=6; use in DATRAS product: yes, it is recommended that the weight is summed up per species per haul (length=-9, number=-9, weight=SUM(catcatchwght). NB this means an additional parameter in the CPUE product file;
   - specval=8; use in DATRAS product: yes, it is recommended that the weight is summed up per species per haul (length=-9, number=-9, weight=-9, volume=SUM(catcatchwght). NB this means an additional parameter in the CPUE product file;
   - specval=10; use in DATRAS product: yes.

d) Data product descriptions (Annex 11.4): the proposed descriptions are clear;

e) Survey index area codes in vocab //vocab.ices.dk/?ref=363 and //vocab.ices.dk/?ref=364 can be combined into one vocabulary category 'TS_DYFS_Areas' as there is no overlap in coding;

f) Survey index area codes in //vocab.ices.dk/?ref=312 can be combined with //vocab.ices.dk/?ref=190 into 'TS_BTS_otoliths' (slight name change proposed);

g) WGBEAM recommends that in the download of the Exchange file via https://datras.ices.dk/Data_products/Download/Download_Data_public.aspx the selection of gear is removed and the selection of country is added, in order to allow for easier download of data submitted by one country. It should be considered to use 'Surveying country' to prevent misunderstanding about geographical country definitions;

h) WGBEAM recommends that when selection of species is made possible in the download of the Exchange file via https://datras.ices.dk/Data_products/Download/Download_Data_public.aspx, all HH information is always provided for the year, country and vessel selected.

6.2 Maintaining survey quality

6.2.1 Exchanges and workshops 2023/2024

The workshop on maturity staging of lemon sole will take place in 2024 in Ostend. Wageningen Marine Research is currently drafting the protocol for gonad collection to create histological slides.

Depending on the decision of the group working on the day-ring analyses of North Sea plaice (see chapter 5), a workshop on otolith processing for day-ring analyses as well as exchange of day-ring readings may be organized in 2024.

Regular species identification workshops are conducted by Belgium, the Netherlands, UK. Those workshops and tests are very important to maintain quality of the identification. Germany is interested in organizing such a workshop for its personnel. The Dutch report of the most recent workshop will be shared with WGBEAM, and German WGBEAM members will be invited to the Dutch workshop on demersal fish and epibenthos.

Staff exchange is considered as a powerful way to align surveys, and to better understand the commonalities and differences between data collection. Staff exchange will be arranged for the

inshore surveys, in 2023 or 2024. It will be investigated if a Dutch person can join the Belgian as well as the German DYFS (both day trips). If the UK (England) inshore survey is continued, Cefas staff may be interested to join one of the continental DYFS campaigns, to align the methodology as good as possible. Staff exchange on offshore surveys is also encouraged, but more difficult to arrange as the trips are longer than the inshore trips. At the UK Q1 survey there is room for additional people in the first half of the survey. As there is a lot of focus on benthic organisms, benthic expertise is welcomed.

Benchmark groups: see paragraph 6.3.

6.2.2 Closed areas affecting surveys

For the beam trawl surveys, the number of closed areas for fishing has increased over the past decade. Those closed areas have a different nature and the effect on the surveys differs (Table 6.1). WGBEAM will discuss this topic in the next meetings, and add the information when manuals are updated. A list with contact details of relevant authorities will be created at the WGBEAM sharepoint. Suggestions on how to deal with unavoidable survey reduction are also provided in ICES (2020) chapter 2.

Table 6.1. Closed areas and their effect on the beam trawl surveys

Type of closed areas	Effect(s)	Surveys affected (up to 2022)	Mitigating measures	more information availabe at
Wind farms	More steaming time needed to reach a station Station cannot be sampled as its location is in the windfarm	BTS-NLD, BTS-UK BTS-NLD	In newer wind farms it may be allowed to transit through, and in some even fishing with light demersal gears is allowed (DYFS-UK) Re-locate station in a similar stratum, or remove station in case stratum is covered sufficiently	https://emodnet.ec.europa.eu/geoviewer/ (Human activities → Energy) https://www.4coffshore.com/offshorewind/
Cables	Not allowed to fish on the cables Not allowed to fish in exclusion zones during installation of cables	DYFS-GER DYFS-UK	Re-locate station in a similar stratum Re-locate station in a similar stratum during the installation, return to original location when exclusion zone has lifted	https://emodnet.ec.europa.eu/geoviewer/
Aquaculture	No fishing activities allowed	DYFS-BEL	Re-locate station in a similar	https://emodnet.ec.europa.eu/geoviewer/

	in areas dedicated to aquaculture		stratum, or remove station in case stratum is covered sufficiently	(Human activities → Aquaculture)
Marine protected areas	Impact analysis requested for fishing activities No fishing activities allowed in marine protected areas	BTS-UK, BTS-NLD BTS-NLD,BTS-BEL	Mostly no mitigation measures are required as exemptions are given Re-locate station in a similar stratum, or remove station in case stratum is covered sufficiently	UK waters: https://jncc.gov.uk/our-work/marine-protected-area-mapper/ NED waters: IHM Viewer (openearth.nl) (choose Kaarten → Beleid en Beheer → Natura 2000/Toegangsbeperking ***/Beschermde gebieden) Natura2000 areas Europe: Natura 2000 Network Viewer (europa.eu)
Management permission areas (e.g. port of London)	Exemption for fishing activities required Fishing activities not allowed	DYFS-UK BTS-BEL	Communicate well before the survey to ask for exemption Re-locate station in a similar stratum, or remove station in case stratum is covered sufficiently	

6.3 Feedback from end-users

Cancellations of surveys should be communicated as soon as possible to end-users. WGBEAM will think about a way to communicate survey cancellations as soon as possible to end-users. End-users are encouraged to check soon after the data delivery deadlines (see Annex 4) if the data are in line with their expectations (e.g. number of stations submitted, spatial and temporal coverage). If this is not the case, then the end-user is requested to contact the data submitter of the specific survey, and/or the ICES Datras administration (DatrasAdministration@ices.dk).

Benchmarks in near future of relevance for WGBEAM: sole in 4, sole 7d, plaice 7d (2023 data compilation, 2024 benchmark)-7d depending on the survival workshop; plaice 4 (probably 2024 data compilation, 2025 benchmark); turbot and brill to incorporate industry survey depending on priority list of WGNSSK.

For the next plaice benchmark the goal to include non-zero discards, but also provides the opportunity to add more information to the current assessment. It is preferred to add the inshore surveys (SNS and DYFS) to the assessments. The value of the SNS timeseries in the assessment has been downgraded over time. DYFS is only used for age 0. Young plaice moves earlier offshore than in previous years. Data in DATRAS are available for SNS 1985-now, DYFS Netherlands 1985-now, Belgium 1985-now, Germany 2002-now, and preferably sooner. Age information not recorded for German and Belgian surveys. It is recommended to borrow age-length information from the Dutch data.

Brill 3a47de went through benchmark in January 2023 (BWKMSYSPiCT). The assessment method was changed from chr rule to SpiCT. As input for the SpiCT model, a combined survey

index was made. This survey index compiled all surveys in the stock area (3a47de) available in DATRAS (more specifically BITS, BTS, DYFS, FR-CGFS, NS-IBTS and SNS) using the methodology as developed during Workshop 2 on fish distribution shifts (WKFISHDIS2; ICES 2023).

The DYFS in the Belgian area showed an increase in sole 0-group, which was not visible in the other surveys. When evaluating the 0-group sole in the DYFS by country over time (2000-2022, Figure 6.1), no pattern could be seen between the different areas. This may well be due to the different nature of the DYFS sampling areas: the area sampled by Belgium is considerable deeper than the areas sampled by the Netherlands and Germany. Furthermore, the index for the Dutch DYFS is calculated over the area ranging from Denmark to the Dutch-Belgian border and includes the Wadden Sea and Scheldt basins. The German sampling area is mainly the German and Danish Wadden Sea.

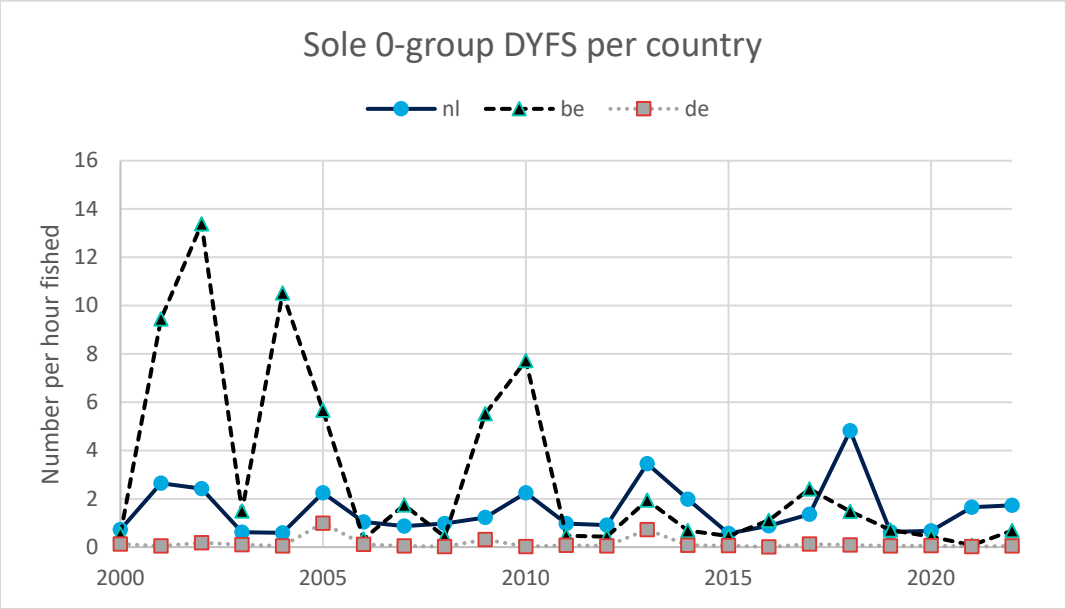

Figure 6.1 Sole 0-group development in Belgian, Dutch and German DYFS 2000-2022.

6.4 Options for sprat larvae sampling during beam trawl surveys

WGBEAM discussed the possibility to add sprat larvae sampling to the beam trawl surveys. This will not be possible in 2023, as it requires significant change of the sampling plans.

Sprat larvae sampling is only considered for the offshore surveys in the North Sea. The spatial coverage of the inshore surveys is limited and the vessels used for the surveys don't allow for extra personnel to conduct night-time sampling.

Both the BTS-UK and BTS-BEL are (mostly) outside the region specified by WGSINS in the recommendation ("i.e. the area north of 56.5 N and ICES rectangles 36F0-F8, 37F6-F8, 38E8-F8, 40E8-F8 and 41E8-F0"). As a consequence, only the BTS-GER and BTS-NED may be candidate for sprat larvae sampling. For BTS-GER there is no room for additional personnel and working hours are restricted, so no additional night time activities could be taken on board.

In 2023 for BTS-NED the options will be investigated. There is room for additional scientific staff on board, and also for additional crew. The sprat larvae sampling however has to follow the BTS sampling, which means that night time sampling will not be possible every night, as sometimes steaming to the next survey area is needed at night time.

References

Bolle L. J., Albrecht, C., Bekaert, K., Bjarnadóttir, A., Vries, M. de, Dressler, S., Ellebode, R., Fuglsang, N., Hefter-Siebold, M., Hoek, R., Jónsdóttir, A., Koelemij, E., Lundgaard, L., Maertens, I., Moerman, M., Pennock, I., Rasmussen, H., Telliez, S., Visconti, V. 2020. Dab (Limanda limanda) Age Reading Exchange 2019. CVO report 20.013 https://doi.org/10.18174/536351

de Boois, I. J., Burt, G., Lecomte, J.-B., Masnadi, F., Panten, K., Raat, H., Sigurdsson, G. M., Thorlacius, M. 2023. ICES Survey Protocols – Offshore beam trawl surveys, coordinated by Working group on Beam Trawl Surveys (WGBEAM). ICES Techniques in Marine Environmental Sciences Vol. 69. 70 pp. https://doi.org/10.17895/ices.pub.21603336

ICES. 2020. ICES Workshop on unavoidable survey effort reduction (WKUSER). ICES Scientific Reports. 2 :72. 92pp. http://doi.org/10.17895/ices.pub.7453

ICES. 2022a. ICES manual for seafloor litter data collection and reporting from demersal trawl samples. ICES Techniques in Marine Environmental Sciences Vol. 67. 16 pp. https ://doi.org/10.17895/ices.pub.21435771

ICES. 2022b. Photograph guide for ICES manual for seafloor litter data collection and reporting from demersal trawl samples. In : ICES. 2022. ICES manual for seafloor litter data collection and reporting from demersal trawl samples. ICES Techniques in Marine Environmental Sciences Vol.67. 16 pp. https ://doi.org//10.17895/ices.pub.21435771

ICES. 2023. Workshop 2 on Fish Distribution (WKFISHDISH2 ; outputs from 2022 meeting). ICES Scientific Reports. 5 :7. 127 pp. https ://doi.org/10.17895/ices.pub.21692246

Robbins, W.D., and Choat, J.H., 2002. Age-based dynamics of tropical reef fishes; A guide to the processing, analysis and interpretation of tropical fish otoliths. School of Marine Biology and Aquaculture James Cook University. 39 pp.

Annex 1: List of participants

Name	Institute	Country (of institute)	Email
Full meeting attended			
Chyanna Allison	Centre for Environment Fisheries and Aquaculture Science (Cefas)	UK	chyanna.allison@cefas.gov.uk
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.gov.uk
Holger Haslob	Thuenen-Institute of Sea Fisheries	Germany	holger.haslob@thuenen.de
Thomas Lanssens	Flanders Research Institute for Agriculture, Fisheries and Food (ILVO)	Belgium	Thomas.Lanssens@ilvo.vlaanderen.be
Jean-Baptiste Lecomte	Institut français de recherche pour l'exploitation de la mer (IFREMER)	France	Jean.Baptiste.Lecomte@ifremer.fr
Kay Panten	Thuenen-Institute of Sea Fisheries	Germany	kay.panten@thuenen.de
Vaishav Soni	ICES	Denmark	vaishav@ices.dk
Louise Straker Cox	Centre for Environment Fisheries and Aquaculture Science (Cefas)	UK	louise.strakercox@cefas.gov.uk
Magnús Thorloacius	Marine and Freshwater Research Institute	Iceland	magnus.thorlacius@hafogvatn.is
Meeting partly attended			
Laura Sabatini	Institute for Marine Biological Resources and Biotechnologies -National Research Council (IRBIM CNR)	Italy	laura.sabatini@irbim.cnr.it
Heleen Raat	Flanders Research Institute for Agriculture, Fisheries and Food (ILVO)	Belgium	Heleen.raat@ilvo.vlaanderen.be
Giuseppe Scarcella	Institute for Marine Biological Resources and Biotechnologies - National Research Council (IRBIM CNR)	Italy	giuseppe.scarcella@cnr.it
Adriana Villamor	ICES	Denmark	Adriana.villamor@ices.dk
Jip Vrooman	Wageningen Marine Research	Netherlands	Jip.vrooman@wur.nl

Annex 2: Resolutions

WGBEAM – Working Group on Beam Trawl Surveys

2022/FT/EOSG01 The **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.)
2023	20-23 March 2023	Hafnarfjörður, Iceland	The first interim report by 30 April 2023 to SCICOM and ACOM	Chair: Ingeborg de Boois Additional chair to be defined
Year 2	19-22 March 2024	Bremerhaven, Germany	TBD	chair to be defined
Year 3	2025 TBD		TBD	chair to be defined

ToR descriptors[1]

ToR	Description	Background	Science plan codes	Duration	Expected Deliverables
a	Coordinate inshore and offshore surveys, in the ICES areas as well as in the Adriatic Sea. Industry surveys are also included.	Dates, sampling areas and contact details of key persons are shared in order to identify opportunities for tows on the same location, to support the deltaGAM methodology for index calculation in combining different survey gears. coordinate effort in case of unforeseen circumstances hampering one of the surveys, primarily North Sea 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) Report on the performance and abnormalities in the inshore and offshore surveys in the past year	3.1	annually	(1) Finalized planning for the inshore and offshore beam trawl surveys, including areas where overlappinig tows may occur. (2) Updated ICES database for inshore and offshore beam trawl surveys. (3) Survey summary sheet by region.

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

B	Review and if needed update the manuals for offshore and inshore beam trawl surveys	Review and update the survey manuals if needed.	3.1	annual check, finalisation in Year 3	Up-to-date manuals for offshore and inshore beam trawl surveys. If no changes occur over the time period, a time stamp identifying the latest review will be added to the latest version. Otherwise updated manuals will be provided.
C	Evaluate the offshore and inshore beam trawl survey data by region, as well as cross-regionally in a systematic and reproduceable manner. Document inconsistencies, or correct errors or omissions identified.	Evaluation by region will ensure that patterns in the data (e.g. time-series, cohort strength) are clear, even when inter-survey trends contradict. Evaluation across regions will provide insight in the commonalities and differences in e.g. stock dynamics, species abundance and/or length groups in different regions. Evaluation of e.g. species composition, length measurements and litter registrations will ensure that patterns in the data are based on correct data and not due to artefacts. 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. Evaluation of age-based information is relevant for stock assessment. As almost all final fisheries-independent timeseries are generated by stock assessors themselves, the survey coordination group should make sure that there is sufficient insight prior to stock assessment on the development of age groups over time, regions, and species.	3.2, 3.3	annually	Updated, consistent (e.g. species composition, litter coding, consistent species identification in overlapping survey areas) and quality controlled beam trawl survey data are available in DATRAS; Up-to-date R script (github) to evaluate the results by region, and cross-regionally
d	Investigate growth patterns in plaice (*Pleuronectes platessa*), for small fish (day rings) as well for 1+ fish, over the areas.	Dutch research on histological maturation of plaice as well as field observations in the offshore beam trawl survey in the southwerstern North Sea show that plaice spawns in August/September in that area. It is unclear if the spawning results in Reproduction. Additional data collection will be done, in order to do dayring analayses for the 0-group plaice. Next to that, growth rates of fish (i.a. plaice) are changing directly affecting the length at age. As stock assessments are age-based, a decrease of length at age will affect the available fish within the commercial length range.	3.2, 5.2	Year 3 finalising	Peer reviewed publication on plaice

Summary of the Work Plan

Year 1	(1) Compilation 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 inshore and offshore survey manual at sharepoint (6) Data collection and analyses on growth rates of plaice
Year 2	(1) Compilation 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 inshore and offshore survey manual at sharepoint (6) Data collection and analyses on growth rates of plaice
Year 3	(1) Compilation 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 inshore and offshore survey manual at sharepoint, and versions ready for review and publication (6) Finalisation of analyses on growth rates of plaice, first draft of peer reviewed publication ready.

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, possibly to BEWG, 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: Actions

Topic	Action	Action by (lead=*Italics*)	Milestone dates
Additional sampling	Investigate the possibilities for sprat larvae sampling at nighttime on Dutch BTS	*Ingeborg*	1 December 2023
Data collection -litter	Implement instruction of updated litter manual to survey protocols, including recording of coal	*Gary, Ingeborg, Kay, Thomas, Louise*	1 July 2023
Data consistency - maturity staging	Share manual for data collection (histology and pictures of gonads) to WGBEAM	*Ingeborg*	1 May 2023
Data consistency - species identification	Invite German WGBEAM participants to Dutch identification workshop on demersal fish and epibenthos	*Ingeborg*	1 October 2023
Data resubmission DYFS	Check and if needed correct data for shrimp 1-4 mm in 2011-2014, 2017-2019 and very large shrimp 435-473 mm in 2017. GER 2009, 2010, 2011, 2012 (very small shrimp-length coding correct?)	*Ingeborg,* Jip*, Holger*	1 July 2023
Data resubmission BTS	Resubmit data based on species consistency analysis in Table 4.1 of WGBEAM 2023 report. This also may apply to historic data.	*Gary, Thomas, Kay, Ingeborg*	1 December 2023
Data submission DYFS	Upload German historic data to DATRAS (also depending on ship codes), 2002 onwards and then 1985-2001	Holger	1 October 2023
Data submission BTS-VIII	Upload historic data (back to 2007)	Jean-Baptiste	1 November 2023
Day-ring analysis plaice	Check the number of otoliths available for day-ring analysis from Dutch DYFS	*Jip*, Ingeborg	15 April 2023
Day-ring analysis plaice	Decide on the best way to share expertise on and calibrate day-ring readings (informal workshop and/or format ICES workshop)	*Ingeborg*	1 August 2023
Manual inshore	Create new resolutions and updated table of contents (in line with manual for offshore beam trawl surveys)	*Ingeborg*	1 April 2023
Manual inshore	Add the latest modifications (addition of feedback of WGCRAN on preservation type of shrimp, and possibly alignment of the number of shrimp to be measured)	*Holger*, Heleen, Thomas, Jip	8 May 2023
Manual inshore	Send the manual to ICES Publications for review	*Ingeborg*	25 May 2023
Manual offshore	Add chapter on closed areas and note that latest version of table 6.1 (this report) should be added to the manual before publication in 2025	*Ingeborg*	1 May 2023
Manual offshore	Add the relevant elements of Table 2.1 of the WKSAE-DATRAS to the chapter 'Data use'	*Ingeborg*	1 May 2023
Sampling design - closed areas	Address the topic to WGBEAM meeting 2024	*chair*	1 February 2024

Sampling design - closed areas	Create list of contact details of relevant authorities	*chair,* WGBEAM members	1 July 2023
Sampling design - sample size	Evaluate length-frequencies of shrimp in relation to sample size (bootstrap analysis)	Thomas, Heleen, Chyanna	1 June 2023
Species consistency	Add species consistency checks for inshore surveys to agenda WGBEAM 2024 (lead: Holger)	chair	1 February 2024

Annex 4: Deadlines for data delivery to DATRAS

The deadlines for beam trawl survey 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 age classes (0-2) ranges for both plaice and sole is only properly covered by the combination of the DYFS, SNS, BTS, NS-IBTS.

Annex 4.1 Deadlines for data delivery to DATRAS of the offshore beam trawl surveys conducted in 2023.

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 December[2] 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
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

[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)

Annex 4.2 Deadlines for data delivery to DATRAS of the inshore beam trawl surveys conducted in 2023.

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. Coastal Area outside the island chain	mid-October	DYFS	Complete: 1st February
Netherlands (DYFS)	Scheldt estuary, Dutch Wadden Sea, Dutch coastal zone and German Bight	end October	DYFS	Complete: 1st February
Netherlands (SNS)	Dutch coastal zone	end September	SNS	Complete: 1st February
UK	Thames estuary	end September	DYFS	Submission foreseen from 2025 onwards

Annex 4.3 Overview of open (green) and closed (grey marked with X) periods for resubmission of beam trawl survey data to DATRAS.

Region	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Greater North Sea				X	X	X						
7d				X	X	X						
7a, fg				X	X	X						
Bay of Biscay					X	X						
Adriatic Sea						X					X	X
Icelandic Sea				X	X	X						

Annex 5: Survey summary sheets 2022

Survey, country	Area coverage	Running since	Methodology described in	Information to assessment WG	Data availability	Comments on 2022 survey	Data collected
Beam Trawl Survey (BTS), Belgium	South-western North Sea	1985	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 1-10+ WGEF: elasmobranch species, CPUE per species per haul	Unaggregated data: (fish, benthos, litter) http://datras.ices.dk Area based age information from 2004-2009. Haul based age information from 2010-2022. Density plots per species: ICES DataPortal	The Belgian BTS was carried out from 24 Aug to 2 Sept 2022 with the new RV Belgica (in operation since 2022). Three stations were cancelled due to the presence of crab pots. One station was cancelled due to heavy traffic. Another station in the Thames estuary was cancelled as no authorization from London VTS was received to fish. One station (26) was relocated to new station 200 in the same ICES rectangle and with a similar stratum and depth profile, as it was located in the centre of an MPA, and no authorization was received to fish there. Catch composition in terms of CPUE was comparable. One haul was considered invalid due to technical issues with the fishing winch, making it impossible to haul the net in time (haul duration > 40 minutes). Due to the historical presence of large amounts	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, age for plaice, sole, cod, turbot, brill, dab and lemon sole. Maturity data for summer spawner lemon sole and plaice for the first year. Benthos: all species, numbers and total weight per species per haul. Length measurements for *Sepia sp., Loligo vulgaris,*and *Loligo forbesii*. Carapax width measurements for *Cancer pagurus* (by sex) andcarapax length measurement for *Homarus gamarus* (by sex). Only presence absence for Anthozoa, Bryozoa, Hydrozoa and Porifera. Marine litter: all hauls CTD: continuous tow profile Other: -

						of *Alcyonidium digitatum* or *Sabellaria sp.* and the presence of ships at anchor, some hauls were shortened to 15 minutes. Sampling design remained the same as last year. Conclusion: in total 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 to be achieved as outlined in the DCF programme.	
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 (fish, benthos, litter): datras.ices.dk Density plots per species: ICES DataPortal	The survey started das planed. After four days, fishing had to be temporarily stopped due to bad weather. During this time the first COVID-19 infections occurred and increased daily. After it was no longer possible to staff the vessel with an experienced crew, the survey was terminated. Only 15 out of 63 hauls could be successfully processed.	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),	Southern and Eastern North Sea	1985	WGBEAM beam trawl survey manual	WGNSSK: *Limanda limanda* (dab.27.3a4), *Pleuronectes platessa* (ple.27.420), *Scophthalmus maximus*	Unaggregated data (fish, benthos, litter) for complete timeseries: datras.ices.dk	Most stations have been fished, 71 in total, 9 invalid hauls.	Fish species: all species Fish length: all species, elasmobranch by sex.

Netherlands				(tur.27.4), *Scophthalmus rhombus* (bll.27.3a47de), *Solea solea* (sol.27.4), *Platichthys flesus* (fle.27.3a4), indices by age group, age 1-10+ WGEF: CPUE per species per haul	Density plots per species: ICES DataPortal Hydrographic data: ocean.ices.dk	Of the 9 invalid hauls, 6 contained too much bryozoan *Electra pilosa*. Tow durations for other stations had to be shortened to max. 15 minutes in those areas to still be able to process the catch properly. As the high densities of *Electra pilosa* occurred in certain areas, spatial coverage of the survey has been affected on a rectangle basis, but not on a wider scale. It is unclear what the effect of the high number of invalid tows will be on the survey index. Also, valid tows with high densities of the bryozoan may have affected the catchability due to clogging of the net, resulting in relatively more small fish that otherwise would have escaped the net. Strong 2018 yearclasses for plaice visible in index as 4 year olds in whole survey area. Strong 2018 yearclass sole visible as 4 year olds in the south-eastern North Sea.	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 maximus* (tur.27.4), *Scophthalmus rhombus* (bll.27.3a47de), *Solea solea* (sol.27.4), *Platichthys flesus*	Unaggregated data (fish, benthos, litter) for complete timeseries: datras.ices.dk Density plots per species: ICES DataPortal	Survey conducted as planned. All planned stations have been fished, 73 in total. Witch flounder otoliths have been collected, but no age reading has taken place due to budget issues. Strong 2018 yearclasses for plaice still visible in index as 4 year olds in whole survey area.	Fish species: all species Fish length: all species, elasmobranch by sex. 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, and witch flounder (2022 onwards).

				(fle.27.3a4), indices by age group, age 1-10+ WGEF: elasmobranch species, CPUE per species per haul	Hydrographic data: ocean.ices.dk		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 (SWECOS), England	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 hound Nea Lesser-spotted dogfish 7a-ce-j Greater-spotted dogfish 6 7 Blonde ray 7e Small-eyed ray 7de Thornback ray 7e Category 6 stocks	Unaggregated data: Cefas Density plots per species: Cefas	Survey undertaken between 5 to 31 Mar 2022. A total of 55 out of 81 planned tows in the western Channel survey area were successfully fished along with 11 out of a planned 50 tows in the Celtic Sea. The survey failed to complete the entire survey due to a combination of having a reduced number of working days on the survey whilst lifting operations were being reviewed, and not receiving permission to work in an EEZ prior to the survey commencing. In the western Channel, only five strata were completed (numbers 1,2,3,4 and 7) and two strata were not sampled at all (numbers 11 and 12). All remaining strata were partially completed with some of the stations fished out of numerical sequence. In the Celtic Sea, no strata were completed with several strata not sampled at all (strata E, G, H, J, K and N). All	Fish species: all species Fish length: all species. Elasmobrach species, four-spot megrim, megrim, plaice by sex. Fish weight: sample weight by species and sex for all elasmobranch 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, seabass, 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

				Common skate 6 7a-ce-k		remaining strata were partially completed with some of the stations also fished out of numerical sequence. One trawl station was invalid after rocks in the net caused damage to the gear. In addition to the trawl, ESM, Niskin, and CTD were deployed to collect environmental data and water samples for caesium analysis.	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 weighed and counted for both beam trawls. Marine litter: all trawls CTD: average surface and bottom temperatures and salinities collected for each tow. Other: zooplankton (ring net), phytoplankton (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 SD20 Plaice 7d Sole 7d WGEFlonde ray 4c 7d Cuckoo ray 3 4	Unaggregated data: datras.ices.dk Density plots per species: ICES DataPortal	Although the survey was originally scheduled to take place during July, unfortunately it had to be cancelled, and could not be rescheduled, whilst the introduction of new Cefas' internal procedures relating to lifting operations at sea were being finalised and approved.	Fish species: all species Fish length: all species. Elasmobrach species, plaice by sex. Fish weight: sample weight by species and sex for all elasmobranch species, plaice. Fish biological data: Individual weight, length, sex and maturity for all elasmobranch species, and

				Spotted ray 3 4 7d Thornback ray 3 4 7d Undulate ray 7de Smooth-hound Nea Lesser-spotted dogfish 3a 4 7d			conger eel, (cod), (whiting), ling, (monkfish), John dory, all species of gurnard, (seabass), 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 pre-selected 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.
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	Unaggregated data: datras.ices.dk Density plots per species: ICES DataPortal	The survey was completed between 2 to 21 Sept 2022. Out of the 108 stations targeted for the survey a total of 90 hauls were successfully completed. At the beginning of the survey, after the Bristol Channel (BCI) was successfully completed, a major issue with the starboard towing block occurred and fishing operations had to be suspended pending repair, which resulted in 3½ days of	Fish species: all species Fish length: all species. Elasmobrach species, plaice by sex. Fish weight: sample weight by species and sex for all elasmobranch species, plaice. Fish biological data: individual weight, length, sex and maturity for all elasmobranch species, and

				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		lost time. A further day was lost for a day of national mourning for the late Queen's funeral. Once the survey recommenced after the block had been repaired, and it was known that the survey could not be completed in its entirety, the selection of stations to be sampled was based on a historic analysis to identify how the survey could be successfully completed with a reduced number of stations. Four hauls were deemed invalid either due to the presence of static gear (2), gear damage or the failing of the lifting block, all of which were successfully repeated. As usual for the survey the duration for some of the tows was reduced from the nominal 30 min due to either a history of large catches or the presence of static gear. The ESM and CTD were deployed at a number of locations to collect environmental data.	conger eel, (cod), (haddock), (whiting), ling, hake, (monkfish), John dory, all species of gurnard, seabass, 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 pre-selected 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 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 http://datras.ices.dk	23 hauls of the 50 reference stations were carried out during 2022. Main issue in 2022: 27 hauls of the 50 reference stations were not sampled because of extremely bad weather conditions.	Fish species: all species Fish length: all species, meagre, monkfish, red mullet, seabass, sole and elasmobranch species by sex. Fish weight: sample weight by species. Fish biological data: maturity, sex, otoliths for meagre, red mullet,

							seabass and sole. Illicium for monk-fish. Benthos: Numbers and total weight per species Marine litter: all trawls. CTD: bottom temperatures collected for each tow (end).
Beam Trawl Survey, Iceland	Waters around Ice-land	2016	WGBEAM beam trawl survey manual	NWWG: Used for local assess-ments for *Limanda li-manda* and *Microsto-mus kitt* since 2016 and for *Pleuronectes platessa* since 2020	Upon request	The survey was combined with an environmental survey and was completed between the 8th of and 29th of August instead of late au-gust to the ~10th of September. A total of 76 valid hauls were carried out. Additional 52 shorter hauls for sea cucumbers were con-ducted for the third 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, hali-but, megrim, long rough dab, flounder, witch flounder. At the additional stations for sea cu-cumber, all sea cucumbers were meas-ured (length, weight, circumference, drained weight), while 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, commer-cially important shrimp and sea cu-cumber are counted. All benthos iden-tified and weighted for daytime sta-tions. Marine litter: all trawls, recorded and weighted

							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: https://dcf-italia.cnr.it/web/#/links/42aniguida)	FAO-GFCM-SAC-WGSAD, STECF: *Melicertus kerathurus, Pecten jacobeus, Scophthalmus maximus, Scophthalmus rhombus, Sepia officinalis, Solea solea, Squilla mantis, Bolinus brandaris* Index of Abundance by size and/or age for common sole, spottail mantis shrimp, cuttlefish and Mediterranean scallop.	Unaggregated data: datras.ices.dk for sole	The 2022 survey was carried out from 21/11 to 18/12/2022 with RV G. Dallaporta. 38 hauls (37 Italian + 1 Slovenian) were carried out during 2022 survey. Due to exceptionally bad weather conditions and Covid-19 cases on board, 30 Italian hauls and all Croatian EEZ hauls had to be dropped. Main issues in 2022 survey were the overlap of 1) exceptionally bad weather conditions; 2) COVID-19 cases on board. For these reasons, 16 days out of 28 available days were lost. Also, CTD profiles were not performed in 2022. Like in 2020 and 2021, spatial coverage effect on the survey index has to be explored. An eDNA sampling activity was also started.	Fish species: The primary target species is *Solea solea*, with additional species including cuttlefish, Mediterranean scallop, queen scallop, turbot, brill, skates, purple dye murex, spottail mantis shrimp 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 Temperature and depth data loggers attached to the gears recording bottom parameters during hauls.
Inshore beam trawl survey (DYFS)	Coastal zone Belgium	1971	Inshore beam trawl survey manual in progress	WGNSSK: Recruitment information available on *Pleuronectes platessa*	Unaggregated data (1985 – 2022): http://datras.ices.dk	The Belgian DYFS was carried out from 12-21 Sept 2022 with RV Simon Stevin. One station was cancelled as it is positioned within a new mussel	Fish species: all species (since 2020), before only commercial species. Fish length: selected list of commercial species; elasmobranchs by sex

				(ple.27.420) and *Solea solea* (sol.27.4).		farm. The remaining hauls were shortened to 15 minutes (in line with other inshore beam trawl surveys). Due to bad weather two days were lost but as the haul duration was shortened, this did not result in any loss of stations. Conclusion: 32 sampling stations were completed successfully at 15 minutes of haul duration.	Fish weight: sample weight per species Fish biological data: individual weight, length, sex, age for plaice and sole Benthos: *Crangon crangon* sample weight and length of minimal 500 individuals per haul. Subsample of epibenthos: numbers and sample weight (since 2020). Marine litter: all hauls CTD: continuous tow profile Other: /
Inshore beam trawl survey (DYFS)	Coastal zone Germany and German Wadden Sea	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: (2008 – 2022) datras.ices.dk	The RV Clupea cruise and all other cruises with chartered commercial shrimp vessels were conducted as planned. The whole survey area in the coastal zone was covered (RV Clupea: 98 valid hauls, 1 invalid). The whole survey area in the Wadden Sea was covered (chartered vessels: 154 valid hauls, 7 invalid).	Fish species: all species Fish length: all species Fish weight: sample of all species 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, Germany, Denmark, Dutch Wadden Sea, Eastern and	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 (from 1985 till most recent year): datras.ices.dk Density plots per species: ICES DataPortal	Survey coverage in coastal zone as planned (112 valid hauls, 2 invalid). Some hauls in the coastal zone were dominated by bryozoan *Electra pilosa*, and one of these was invalid. One haul included 12 short-snouted seahorses	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

	Western Scheldt					(*Hippocampus hippocampus*), and a few others were caught. Survey coverage in the Dutch Wadden Sea (132 valid hauls, 10 invalid) and in Eastern and Western Scheldt (72 valid hauls, 4 invalid) conducted as planned. One station in the Wadden Sea has been moved/replaced, as it became increasingly shallow.	data only to separate between immature and maturing. 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) , *Platichthys flesus* (fle.27.3a4), indices by age group age 1-4+	Unaggregated data (from 1985 till most recent year): datras.ices.dk Density plots per species: ICES DataPortal	In total 41 hauls were conducted, of which 4 were declared invalid. The two northernmost transects had to be dropped due to severe weather conditions. Spatial coverage was affected, so effect on the survey indices is to be expected. When combining the SNS, DYFS and BTS 2022 data the effect may be minimised, as DYFS and BTS coverage in that area was according to plan. Multiple hauls, including the four invalid hauls, were dominated by bryozoan *Electra pilosa*. Tow duration was shortened to max. 7.5 minutes in those areas to be able to process the catch properly. Due to the data deficiency in the northernmost area, and the high	Fish length: all species Fish weight: no sample weight per species Fish biological data: individual weight, length, sex, year class 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 CTD: continuous during haul, CTD attached to net. Other: -

						percentage invalid hauls, the 2022 data of SNS should be treated with care, and preferable be combined with other beam trawl survey data. Strong 2021 year class for plaice still visible in 2022 SNS index as 1-year olds.	
Industry survey, The Netherlands	Southern North Sea	2019	Schematic: https://edepot.wur.nl/545556 (in Dutch) Report: 544588 (wur.nl)	Not yet, but after 5 years to benchmark related to WGNSSK: *Scophthalmus maximus* (tur.27.4), *Scophthalmus rhombus* (bll.27.3a47de)	Unaggregated data (complete timeseries): datras.ices.dk; since January 2023 all years also include HL records	Area fully covered as planned. Although less problematic than last year, some hauls were dominated by bryozoan *Electra pilosa*. This did not lead to dangerous situations due to the nets that could only be hauled in with difficulty, but tow duration on a number of stations had to be shortened. It is still unclear to what extent this affects the catchability. For the 2021 survey a few hauls were deemed invalid, but this is not expected for the 2022 survey (yet to be evaluated). The evaluation of the 2021 survey concluded not to change the survey area to avoid bryozoan issues in future surveys.	Fish length: turbot and brill Fish weight: individual weights per fish Fish biological data: individual weight, length, sex, year class for turbot, brill. Maturity data only to separate between immature and maturing. Benthos: no Marine litter: no CTD: no Other: -
Industry survey, France						unknown	

Industry survey, UK	Western English Channel 7e	2003	2021 Report (2022 awaiting approval): 2021 report available on Cefas Data Portal	WGCSE since 2007 for *Pleuronectes platessa*, *Solea solea* (7e)	Unaggregated data (complete timeseries) not currently available on DATRAS. Data available on request from UK national database.	Survey completed in usual time window, with the eastern taking place between 12–18 September, followed by the western leg between 20–25 September. Delayed by three weeks whilst revised lifting procedures were being finalised. All 45 of the planned eastern survey hauls were successfully completed although for a number of hauls the trawls filled with gravel and were difficult to bring aboard, and for two the tow times had to be reduced slightly because of this. For the western survey one of the planned 45 hauls had to be dropped due to the presence of static gear and could not be relocated, and in addition to this a further six hauls had to be moved because of the static gear.	Fish length: All species Fish weight: Not recorded Fish biological data: Biological samples collected for sole and plaice (length, sex, age). Targets by east and west survey, and length group. Benthos: no Marine litter: no CTD: no Other: -

Annex 6: Planning beam trawl surveys 2023

Annex 6.1 Timing of the offshore beam trawl surveys in 2023

Country	Vessel	Area	Dates	Gear	Contact
Belgium	Belgica	western-southern North Sea	22 – 31 Aug 2023	4 m beam	thomas.lanssens@ilvo.vlaanderen.be; laura.lemey@ilvo.vlaanderen.be; Cc: els.torreele@ilvo.vlaanderen.be
France	Côtes de la Manche	8a, 8b	01 Nov – 30 Nov 2023	4 m beam	jean.baptiste.lecomte@ifremer.fr yann.coupeau@ifremer.fr
Germany	Solea	German Bight	18 Aug – 05 Sept 2023	7 m beam	kay.panten@thuenen.de
Iceland	Survey ceased as of 2023				
Italy/ Slovenia	Chartered fishing vessel	Northern Adriatic Sea (GSA 17)	Oct – Nov 2023	2x 3.5m modified beam	giuseppe.scarcella@cnr.it laura.sabatini@irbim.cnr.it
Croatia	Chartered fishing vessel	Northern Adriatic Sea (GSA 17)	Oct - Nov2023	2x 3.5m modified beam	nedo@izor.hr igor@izor.hr
Netherlands	Tridens	southern North Sea, German Bight	31 July–18 Aug 2023	2x 8 m beam	ingeborg.deboois@wur.nl Cc: betty.vanos@wur.nl
Netherlands	Tridens	central and western North Sea	21 Aug–15 Sep 2023	2x 8 m beam + flip-up rope	ingeborg.deboois@wur.nl Cc: michiel.dammers@wur.nl
UK	Cefas Endeavour	English Channel /Celtic Sea	20 Mar -15 Apr 2023	4 m beam	ian.holmes@cefas.gov.uk
UK	Cefas Endeavour	7d, 4c	1 – 14 Jul 2023	4 m beam	linford.mann@cefas.gov.uk Cc: ian.holmes@cefas.gov.uk
UK	Cefas Endeavour	7fg, 7a	6 – 25 Sept 2023	4 m beam	stephen.shaw@cefas.gov.uk Cc: ian.holmes@cefas.gov.uk

Annex 6.2 Timing of the inshore beam trawl surveys in 2023

Country	Vessel	Area	Dates	Gear	Contact
Belgium (DYFS)	Simon Stevin	Belgian coastal zone	11-20 Sep 2023	6 m shrimp trawl	thomas.lanssens@ilvo.vlaanderen.be; laura.lemey@ilvo.vlaanderen.be; Cc: els.torreele@ilvo.vlaanderen.be
Germany	Chartered vessels	German Wadden Sea areas	28 Aug – 30 Sep 2023	3 m shrimp trawl	holger.haslob@thuenen.de
Germany	RV Clupea	German coastal zone	18 Sep – 6 Oct 2023	3 m shrimp trawl	holger.haslob@thuenen.de
Netherlands (SNS)	Isis	Dutch coastal zone	5-15 Sep 2023	6 m beam trawl	Maarten.vanhoppe@wur.nl; Cc: jip.vrooman@wur.nl
Netherlands (DYFS)	Luctor	Scheldt estuary	4-22 Sep 2023	3 m shrimp trawl	jetze.vanzwol@wur.nl; Cc: jip.vrooman@wur.nl
Netherlands (DYFS)	Stern	Dutch Wadden Sea	28 Aug – 29 Sep 2023	3 m shrimp trawl	Marcel.devries@wur.nl; Cc: jip.vrooman@wur.nl
Netherlands (DYFS)	Isis	Dutch coastal zone and German Bight	18 Sep– 20 Oct 2023	6 m shrimp trawl	Thomas.pasterkamp@wur.nl Cc: jip.vrooman@wur.nl
UK (DYFS)	Chartered vessel	Thames area	Sep 2023	2 m beam trawl; 3 m beam trawl	louise.strakercox@cefas.gov.uk Cc: ian.holmes@cefas.gov.uk

Annex 6.3 Timing of the industry beam trawl surveys in 2023

Country	Vessel	Area	Dates	Gear	Contact
Netherlands	Industry survey on Turbot and Brill	southern North Sea	Oct 2023	Commercial beam trawl	Edward.schram@wur.nl
UK	Industry survey	7e (western English Channel)	Aug – Sept 2023		gary.burt@cefas.gov.uk
France	Industry survey	Dieppe to Authie Bay	End Aug 2023	3 m beam trawl	Victor.Martin.Bailleret@ifremer.fr

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-F6, 41F4-F6, 42F4-F6, 43F4-F6.

The Belgian and Dutch surveys also include rectangles fished by both, but the bottom of the Belgian positions is very rough, making it impossible to conduct comparative tows without damaging the Dutch fishing gear.

Annex 7: Age-based indices sole and plaice in ICES areas 8, 5a and Adriatic Sea (GSA17)

Annex 7.1 Sole in the Bay of Biscay (B1706; ICES area 8)-2022 ORHAGO survey

Jean-Baptiste Lecomte, March 2023

Context

The French ORHAGO survey in the Bay of Biscay (B1706) was strongly impacted by the bad weather conditions in November 2022. The number of working days at sea was 6 out of the 27 days of the ship mobilization. As a result, 23 stations were fished out of the 49 planned.

Effect of missing hauls on sole index of abundance

Given the number of stations withdrawn, the impact of the cancellation of these stations on the abundance index deserved to be examined. For this purpose, the index (2015 to 2021) was recalculated without the stations cancelled in 2022 and this series was compared to the series comprising all the reference stations which were carried out each year.

Figure A7.1 represents the index computed with all sampled stations and stations sampled in 2022 only. Figure A7.2 shows the percentage of change between the index computed with all the available data and without the stations unsampled in 2022.

This comparison shows that the general trend of the index is strongly affected by the stations withdrawn in 2022 at each age (Figure A7.1). The index calculated without the stations cancelled in 2022 is generally lower than the index including all the stations. The percentage of change between the index computed without 2022 missing stations is 25% to 50% lower for ages 2 and 3 and this change can be negative or positive for ages 4 to 7 (Figure A7.2). The trend is similar for ages 2 to 4 with and without 2022 missing stations (Figure A7.1). However, ages 5 to 7 show discrepancies between the two time series. It can be explained by the fact that soles older than age 5 are less targeted and caught than sole under age 5, leading to higher spatial and annual variability.

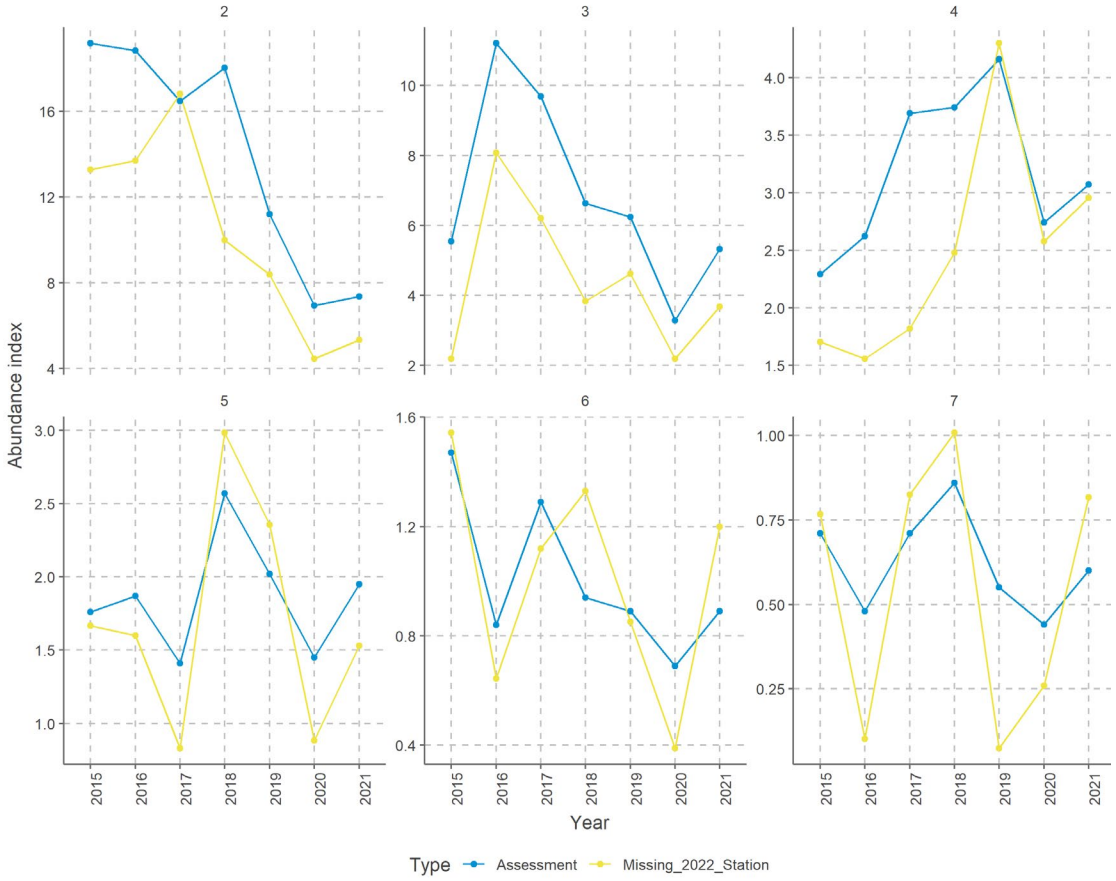

Figure A7.1: Comparison of the abundance index calculated without the stations cancelled in 2022 and with all the reference stations

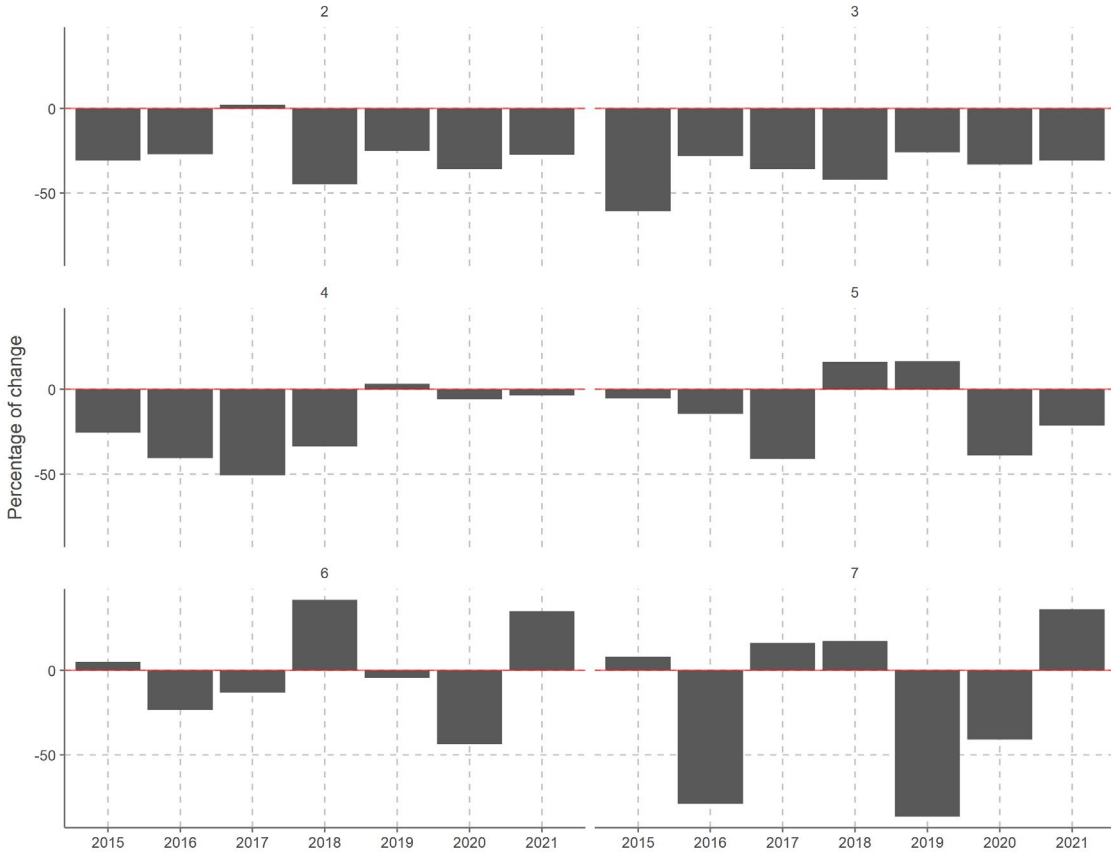

Figure A7.2: Percentage of change of the abundance index calculated without the stations cancelled in 2022 and with all the reference stations

Annex 7.2 Plaice in the Icelandic Sea – ICES subarea 5a

Due to the recent establishment of the survey, plaice time-series is quite short. The year 2016 was a pilot study with fewer hauls than in later years and only covering the west of Iceland, which were largely conducted in nursery areas of plaice. Hence, 2016 was not included in the index. In 2019, the survey was conducted in the middle of July instead of August-September like the other years.

The younger age classes (1-3) show similar values for plaice since 2017 (figure A7.3), except for 2022, where the indices show substantially lower values than previous years.

The 2022 values for age groups 4-7 are similar to the previous years and age groups 8, 9 and 10+ are higher, especially the 10+ group compared with the previous year. The 2019 survey indicated that almost all the age groups (except for age 9) were lower than the long-term arithmetic mean, most likely due to it being conducted in the middle of July instead of August-September as in the other years.

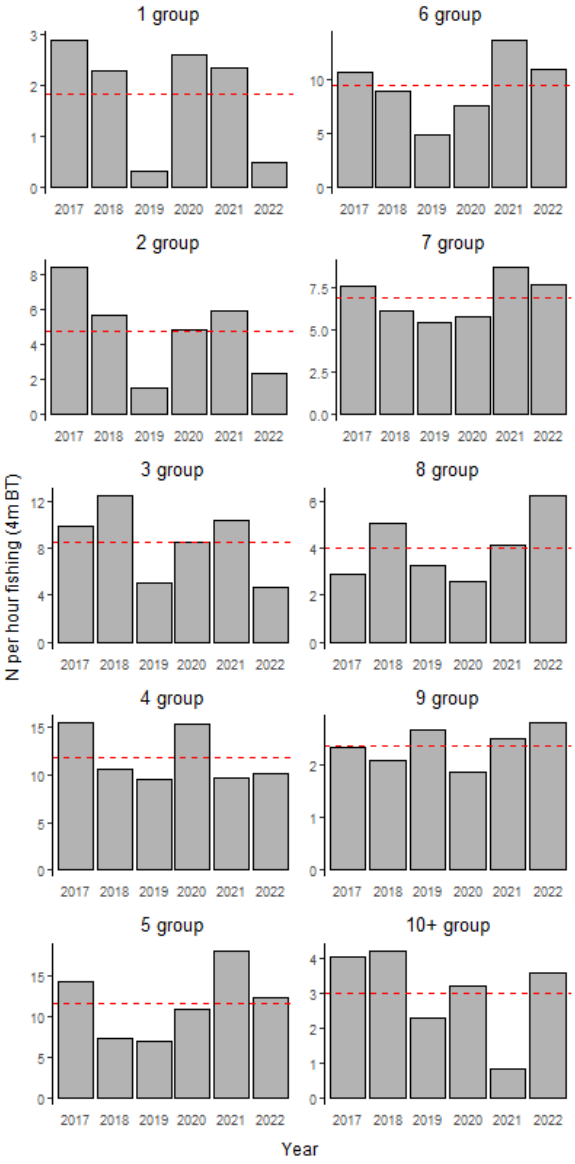

Figure A7.3 Plaice indices Icelandic survey in Icelandic Sea, ages 1-9 and 10+

Annex 7.3 Sole in the Adriatic Sea – GSA17

Figure A7.4 shows the time-series trends in the indices for the northern Adriatic Sea common sole, based on the SoleMon offshore beam trawl surveys. Age slicing, based on von Bertalanffy parameters coming from 2020 FAO-GFCM Benchmark assessment (Linf: 38.1; k: 0.29, t0: -1.7), was carried out using FSA R script.

The 2022 survey indicates that the 0 age group was highly lower than the long-term arithmetic mean, settling on values similar to 2016. Whereas, 1, 2, and 3 age groups were higher than the arithmetic mean. As in 2021, the age 4 in the 2022 survey was slightly lower than the mean value. Ages 5+ stay below the long-term arithmetic mean since 2020. More in general, this plus group is quite fluctuating due to the very few specimens that reach these ages. Moreover, in 2022, the area where older individuals concentrate (offshore waters southwest of the Istrian peninsula) was not sampled due to bad weather conditions and COVID-19 issues.

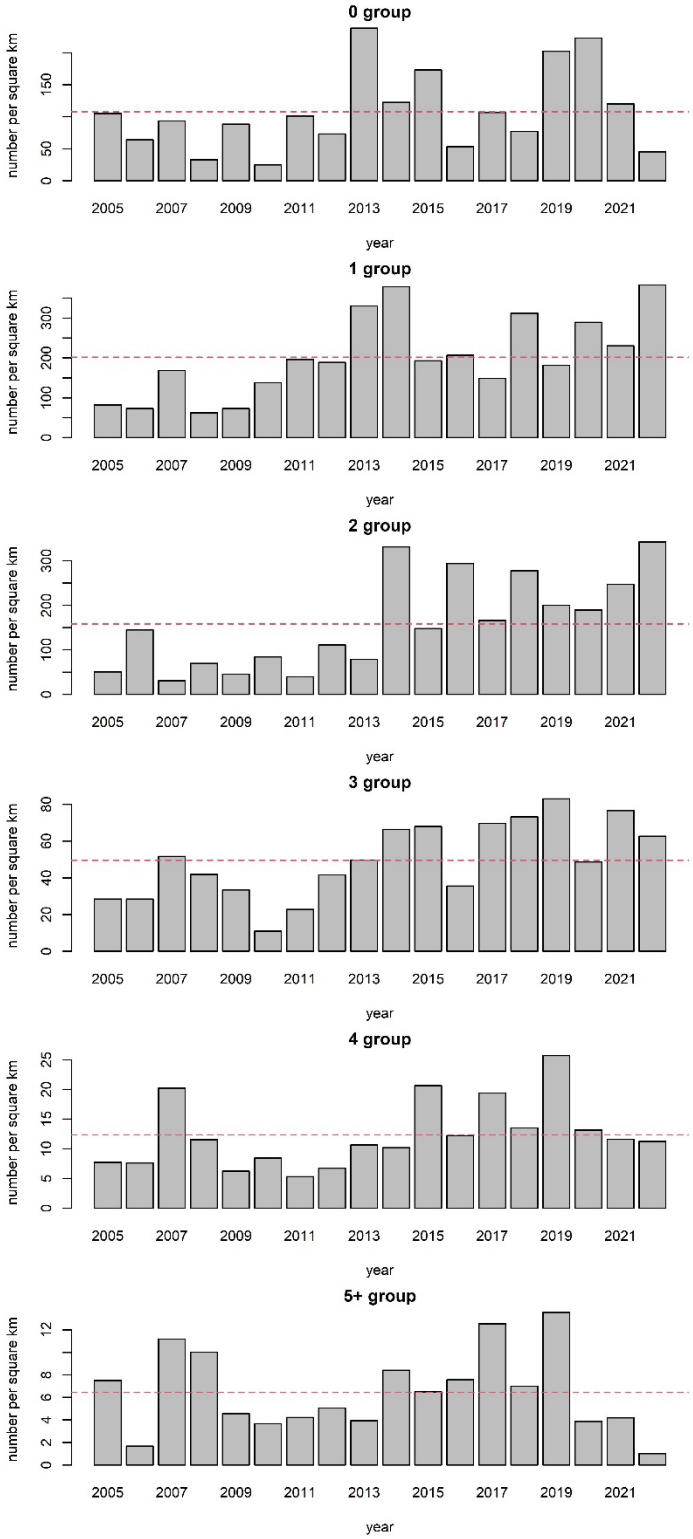

Figure A 7.4 Common sole age indeces in the Adriatic Sea (SoleMon surveys).

Annex 8: Evaluation of age-based indices for species in stock assessment

Annex 8.1 Plaice offshore surveys

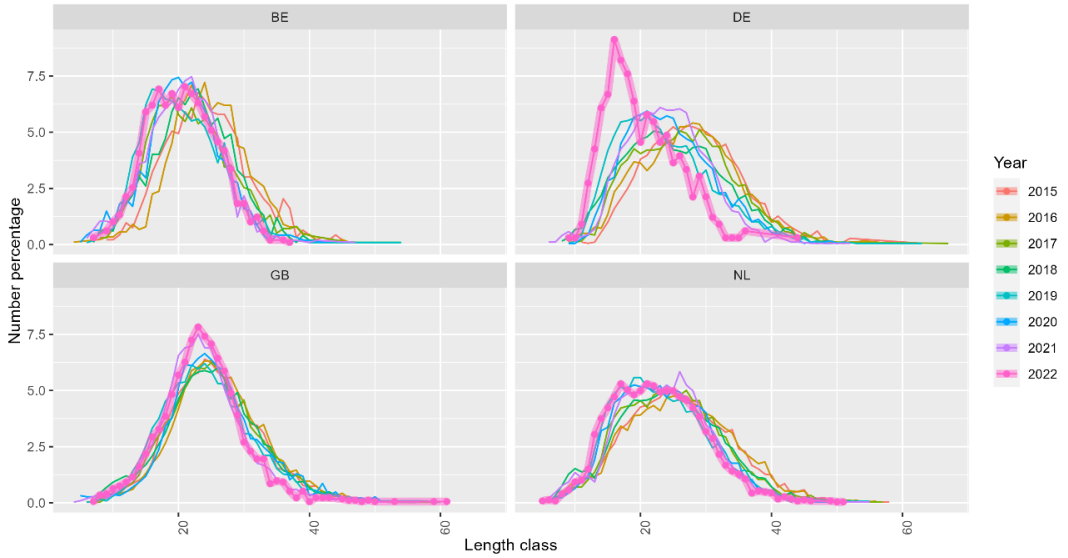

Figure A8.1: Length frequency distribution for plaice (Pleuronectes platessa) comparing data of different countries (2015–2022).

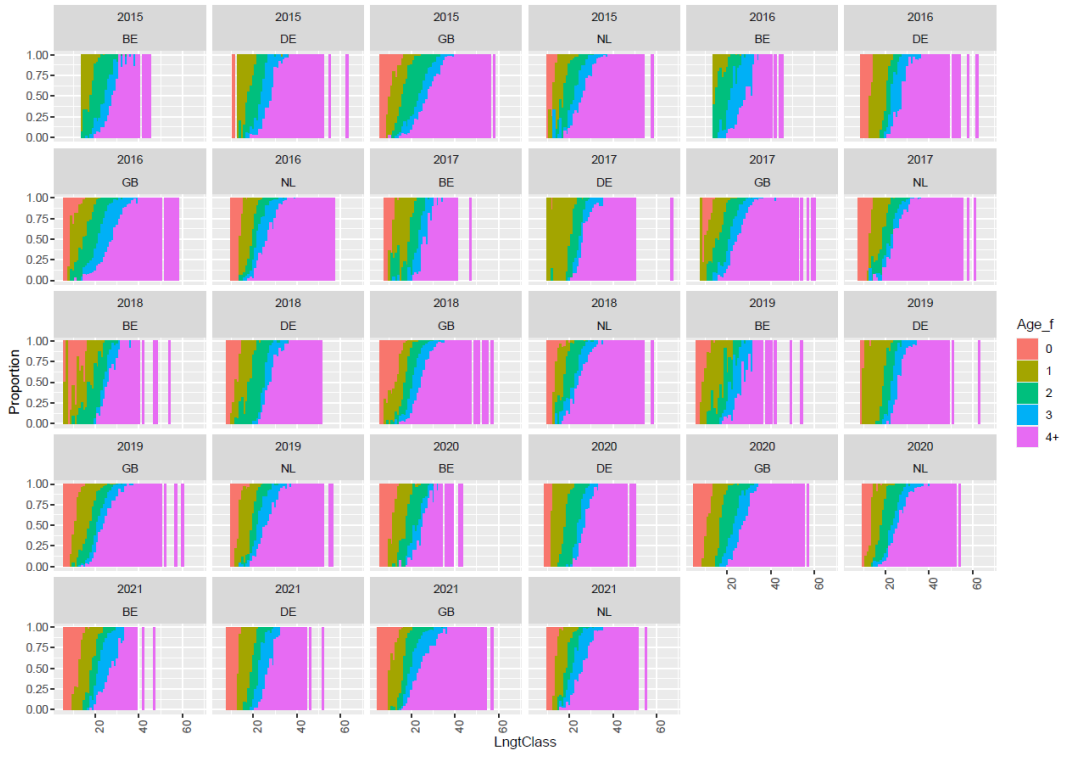

Figure A8.2: Age-Length key comparison between data of different countries and years (2015 – 2021) for plaice (Pleuronectes platessa).

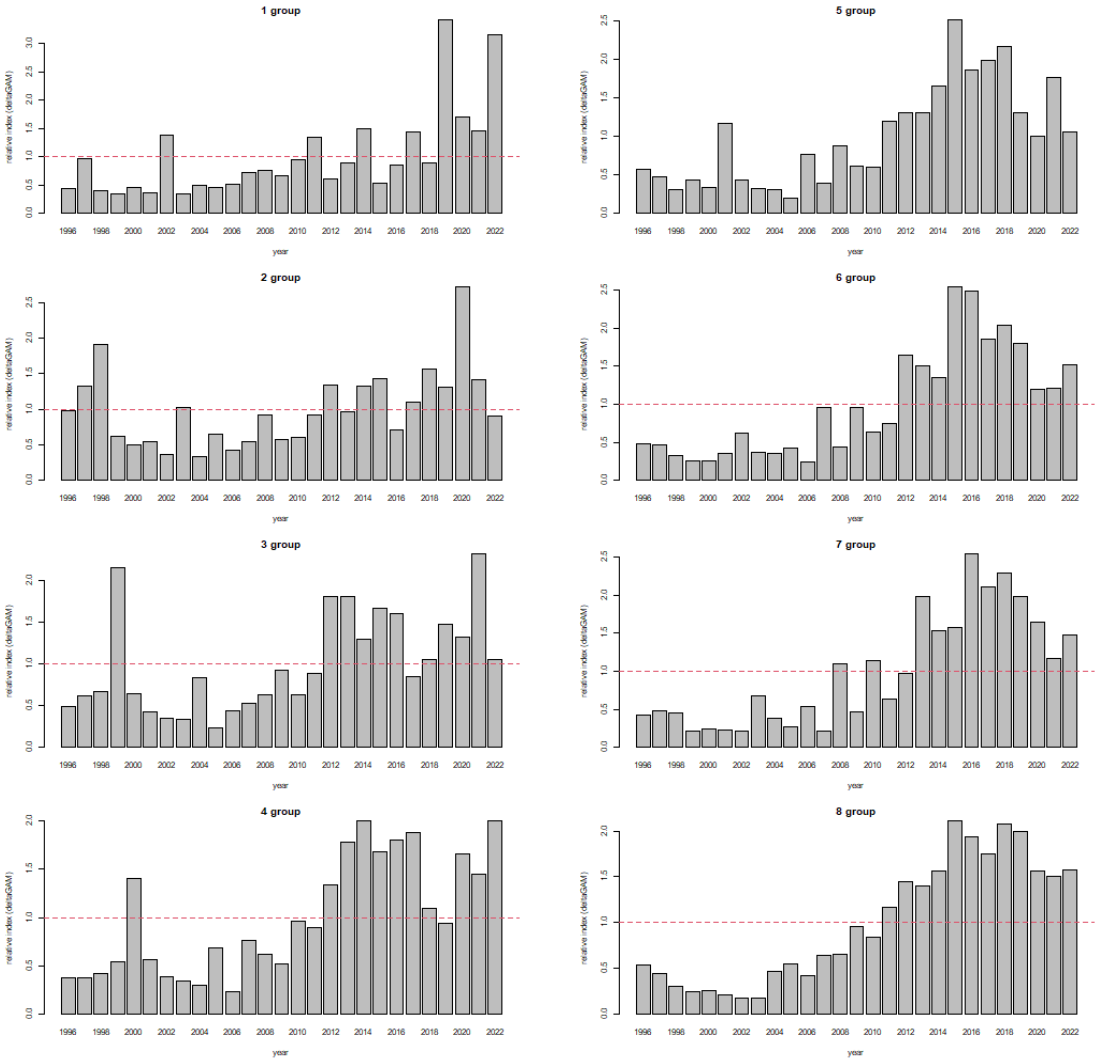

Figure A8.3: Age-based index for plaice (*Pleuronectes platessa*) in area 4 combining Dutch, Belgian, UK, and German BTS data (1996 – 2022).

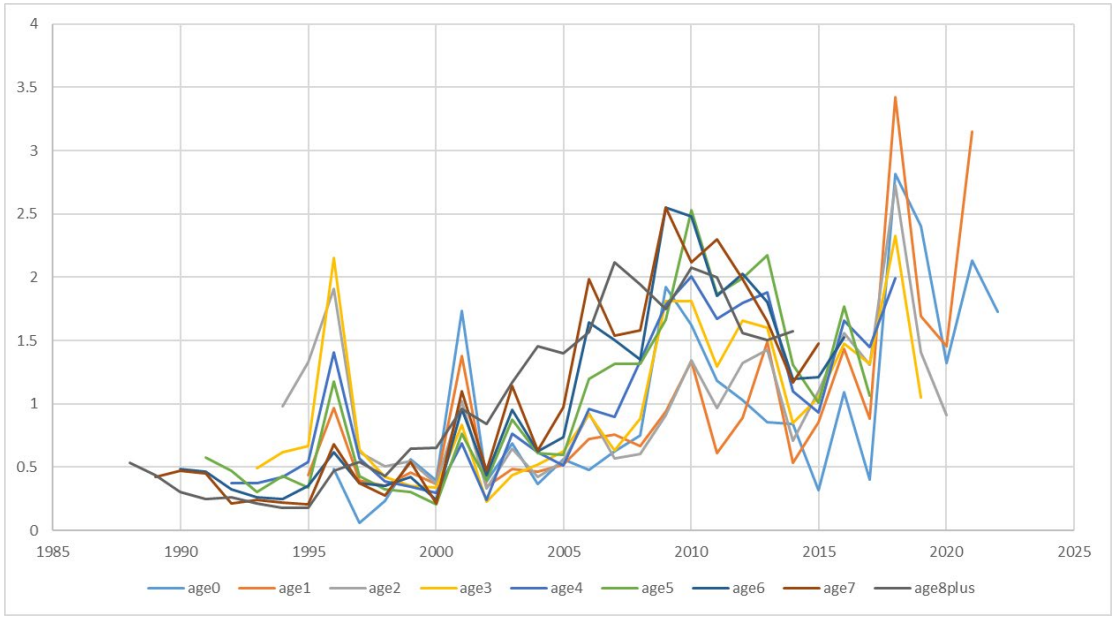

Figure A8.4: Cohort plot for combined age-based plaice (*Pleuronectes platessa*) index area 4, combining Dutch, Belgian, UK, and German BTS data (1996-2022).

Annex 8.2 Dab offshore surveys

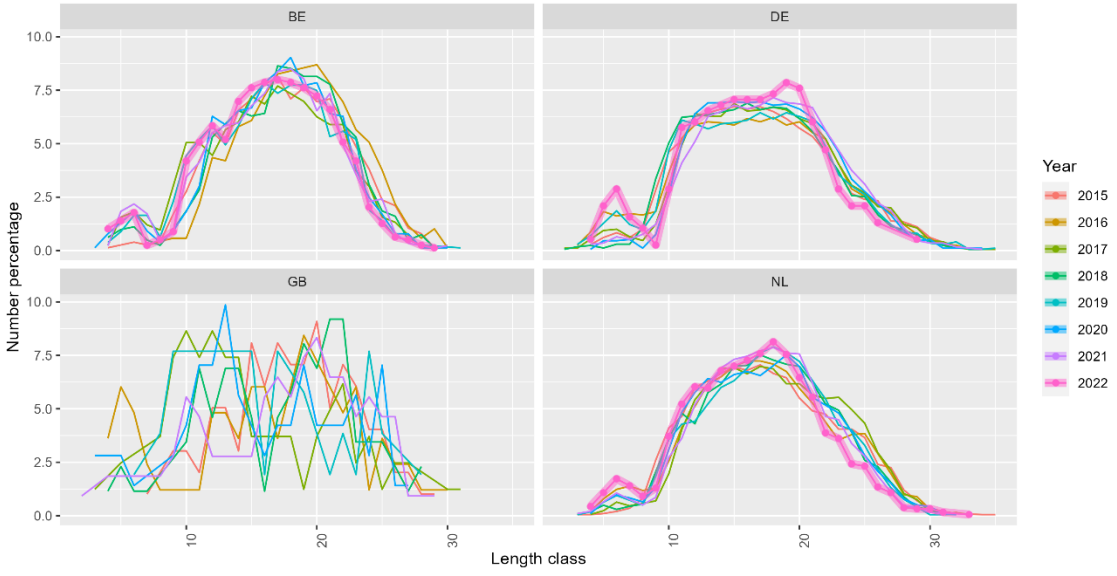

Figure A8.5: Length frequency distribution for dab (Limanda limanda) comparing data of different countries (2015 – 2022).

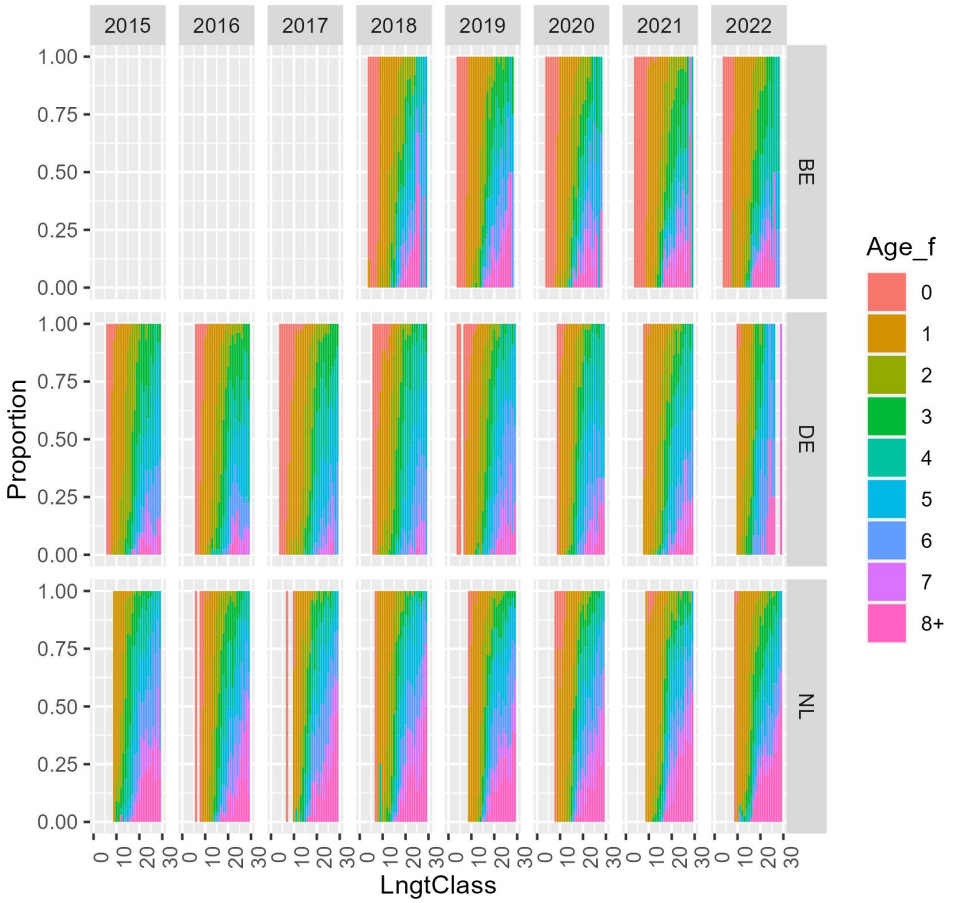

Figure A8.6: Age-Length key comparison between data of different countries and years (2015 – 2022) for dab (Limanda limanda).

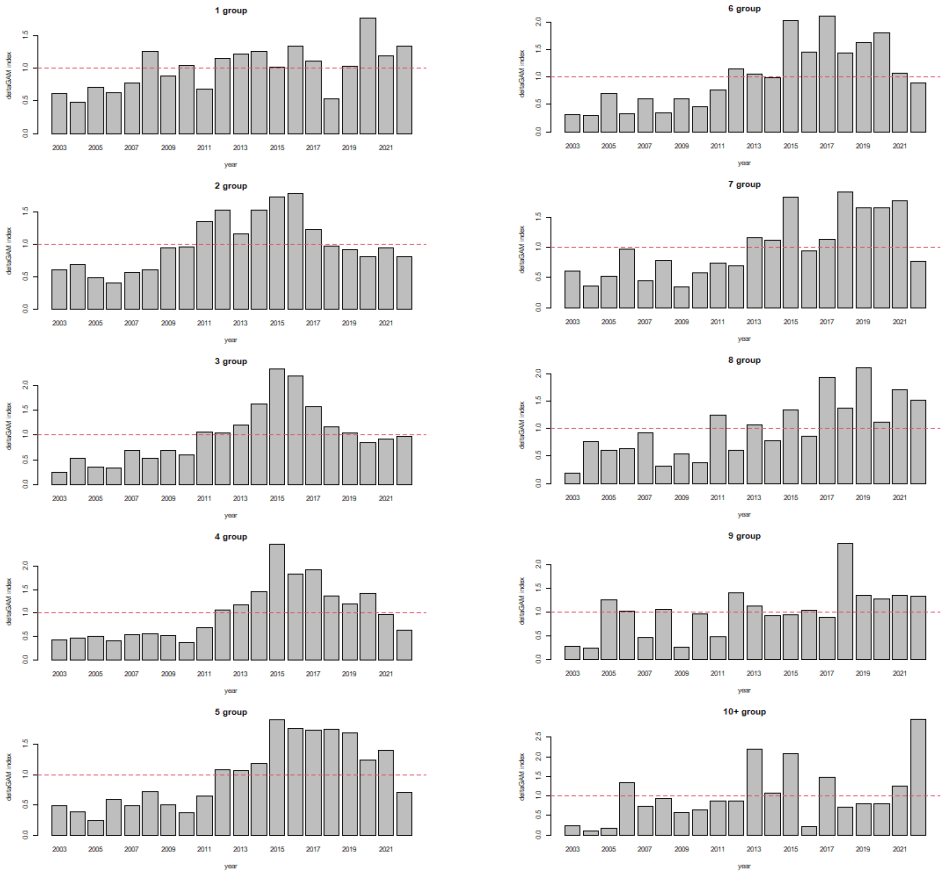

Figure A8.7: Age-based index for dab (Limanda limanda) in area 4 combining Dutch and German BTS data (2003 – 2022).

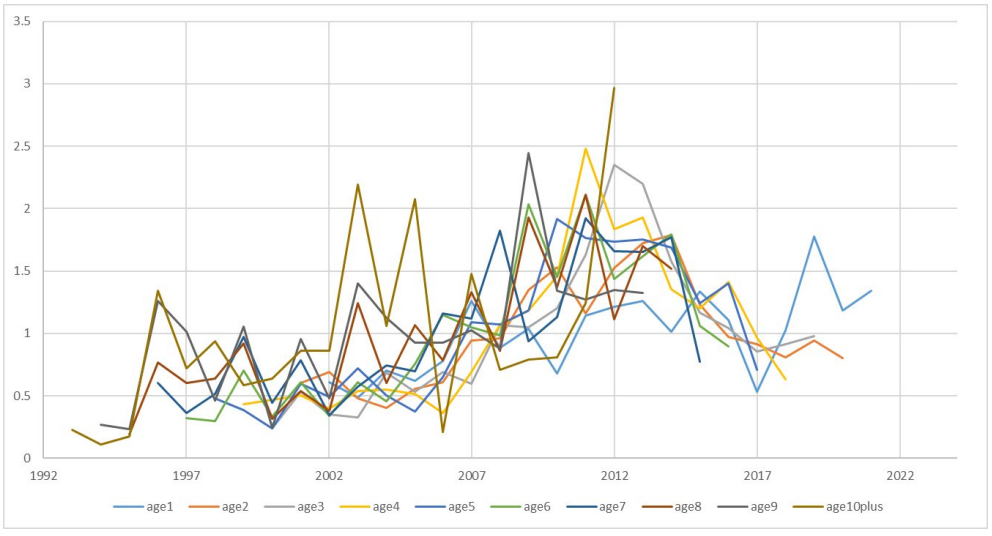

Figure A8.8: Cohort plot for combined age-based dab (Limanda limanda) index area 4, combining Dutch and German BTS data

Annex 8.3 Plaice and sole recruits

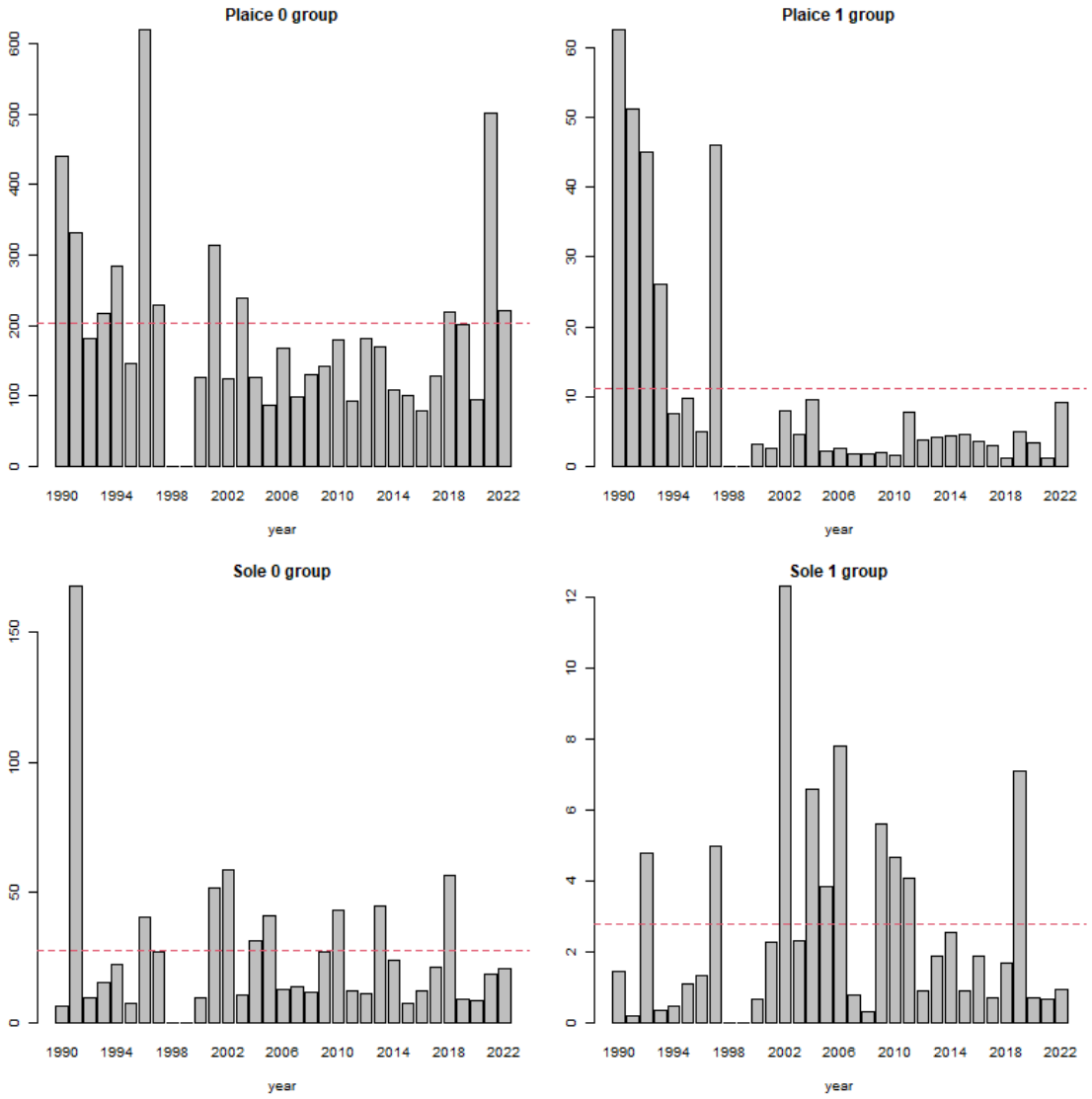

Figure A8.9: Plot for international DYFS plaice (Pleuronectes platessa, upper panels) and sole (Solea solea, lower panels) index area 4, combining Begian, Dutch and German DYFS data

Annex 9: Evaluation of litter catches

Annex 9.1 Litter identification consistency

Table A9.1 Example of average number of identified litter category per rectangle in overlapping BTS survey areas

Year	Area	StatRec	BE	DE	GB	NL
2019N		39F4		0		4
2019N		39F5		2		3
2019N		39F6		1		4
2019N		39F7		2		3
2019N		40F4		1		8
2019N		40F5		2		4
2019N		40F6		1		6
2019N		40F7		2		4
2019N		41F4		2		4
2019N		41F5		2		4
2019N		41F6		2		8
2019N		42F4		6		4
2019N		42F5		6		4
2019N		42F6		3		2
2019N		43F4		5		4
2019N		43F5		0		4
2019N		43F6		2		2
2019S		31F1	3		6	
2019S		31F2	3		2	
2019S		32F1	3		7	
2019S		32F2	2		1	4
2019S		33F1	3		3	
2019S		33F2	1			8
2019S		34F2	2			
2019S		35F1	2			4
2019S		35F2	1			6

Table A9.2: Example of average number of recorded items per rectangle in overlapping BTS survey areas

Year	Area	StatRec	BE	DE	UK	NL
2019N		39F4		0		22
2019N		39F5		2		4
2019N		39F6		1		6
2019N		39F7		2		10
2019N		40F4		1		18
2019N		40F5		2		54
2019N		40F6		1		18
2019N		40F7		2		16
2019N		41F4		2		8

Year	Area	StatRec	BE	DE	UK	NL
2019	N	41F5		2		12
2019	N	41F6		2		30
2019	N	42F4		8		10
2019	N	42F5		6		24
2019	N	42F6		4		4
2019	N	43F4		6		10
2019	N	43F5		0		64
2019	N	43F6		2		6
2019	S	31F1	4		15	
2019	S	31F2	3		2	
2019	S	32F1	3		11	
2019	S	32F2	2		1	4
2019	S	33F1	4		6	
2019	S	33F2	2			12
2019	S	34F2	2			
2019	S	35F1	2			4
2019	S	35F2	1			10
2019	S	36F0	4			6
2019	S	36F1	2			6
2019	S	36F2	1			4

Annex 9.2 Litter catches

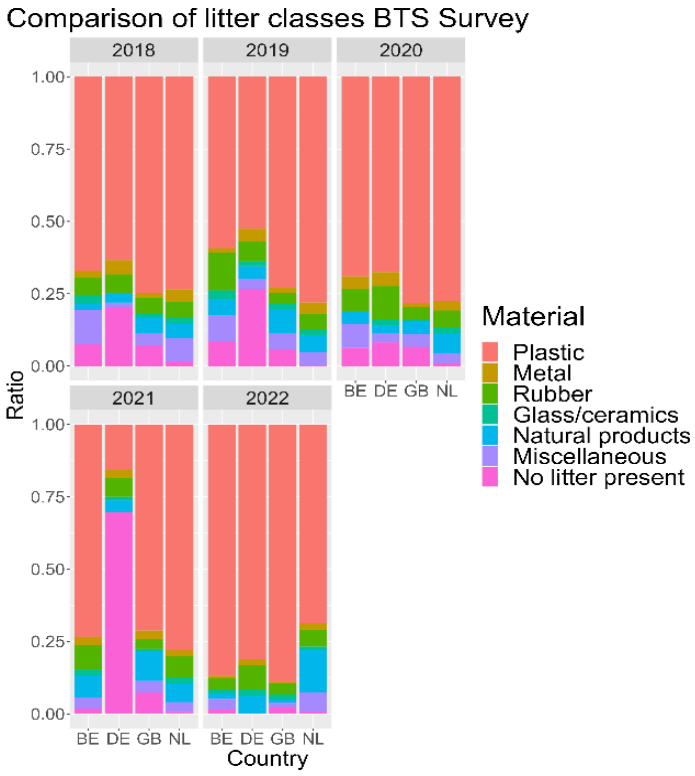

Figure A9.1: Proportion of Materials Caught during the BTS Survey 2018-2022

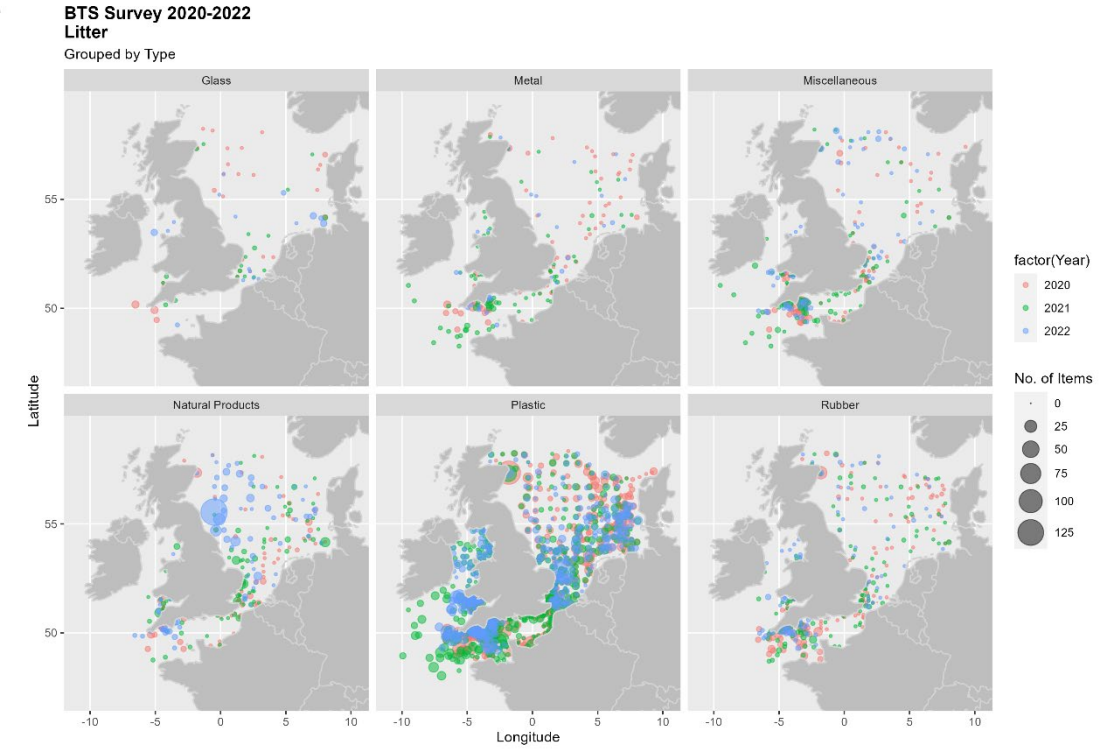

Figure A9.2: Distribution of litter items categorised by material type caught during BTS Surveys 2020-2022

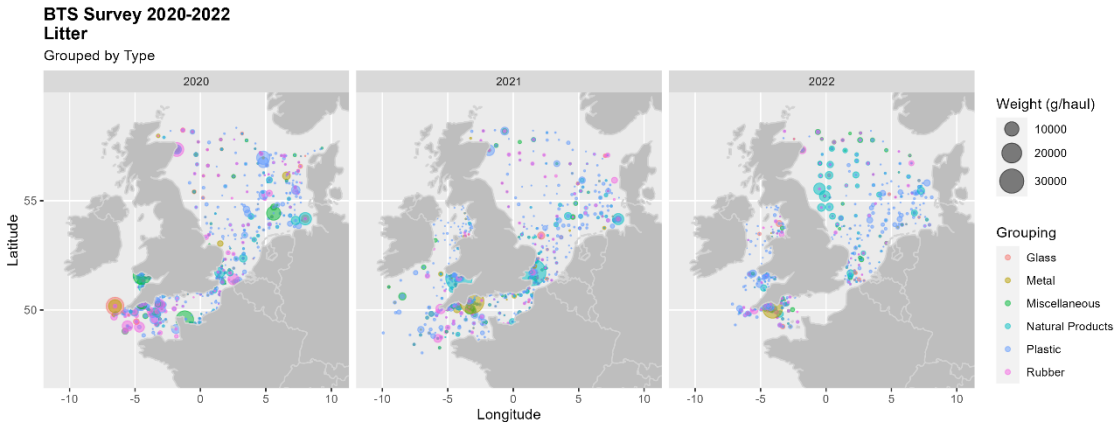

Figure A9.3: Distribution of litter weights categorised by material type caught during BTS Surveys 2020-2022

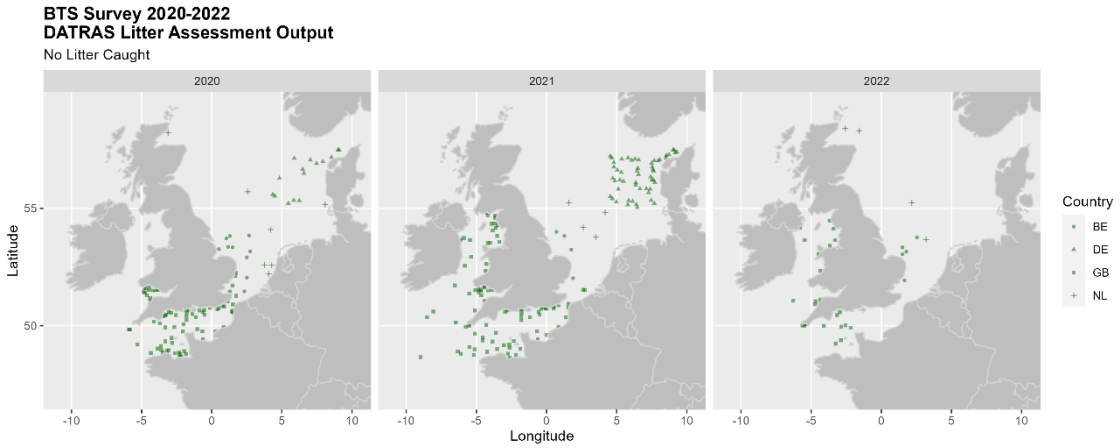

Figure A9.4: Distribution of hauls with either no litter present within net or litter was not recorded during BTS Surveys 2020-2022

Annex 10: Evaluation elasmobranch catches

In 2021, WGBEAM subgroups evaluated offshore and inshore beam trawl survey data from DATRAS. Consistency analyses scripts were made available at https://github.com/ices-eg/wg_WGBEAM. These R scripts can be used to evaluate any beam trawl survey (BTS, DYFS, SNS) and any species in DATRAS. In 2022 the script has been updated and ran to evaluate spatial-temporal distribution of commercially important elasmobranchs in BTS, DYFS and SNS surveys. In 2023 an update analysis of the elasmobranch species was conducted for species listed in table A10.1.

The latest information on DATRAS is extracted by the getDATRAS function (icesDatras package). Haul information (HH) and length information (HL) is combined into one dataset. Simple quality checks (e.g. tables to explore missing data, checks for Nas) are incorporated in the script. In the script a species list is created from WoRMS (www.marinespecies.org), so valid Aphia ID codes in DATRAS can be linked to the correct scientific names. Before filtering to a specific species of interest, a list of the fished stations is created. In this way stations with zero observations can be taken into account when calculating average values. In order to calculate CPUEs (square roots of numbers/km^2) from the beam trawl surveys, total numbers per haul and the surface area that was fished (swept area option 1 = beam with*dis-tance/10^6) for each haul need to be made available with the script. If the column for total numbers is not filled in (NA or -9), total catch numbers can be calculated based on haul numbers at-length (HLNoAtLngt) multiplied by the subsampling ratio (SubFactor).

Before explaining the figures and the results, we need to address 2022, where there is a drop in some species numbers as well as a smaller coverage of the studied area, which is mainly due to a heavily reduced survey of the UK. Especially for *Scyliorhinus stellaris*, *Squalus acanthias*, *Raja clavata* and *Raja undulata*, we see a drop in the total number caught in 2022. Further, figures A10.7 till A10.9 show a smaller coverage with gaps in 7h and 7d.

Total number of individuals per year are shown by country for the Raja species in figure A10.1 and sharks and dogfish species in figure A10.5. Most species have generally increased throughout the time series, if we exclude 2022. (in particular *Raja clavata, Raja montagui, Mustelus sp., Scyliorhinus canicula* and *Scyliorhinus stellaris*). However, *Amblyraja radiata* is strongly decreasing over the years. In absolute terms, the dominant species are four: *Raja clavata* (mainly UK survey), *Amblyraja radiata* (mainly NL survey), *Raja montagui* (mainly UK survey) and *Scyliorhinus canicula* (mainly UK survey).

Looking at the Rajiformes distribution in the area under examination proposed in Figure A10.2 and A10.3, it can be seen that the species distribution differ considerably by area. *Amblyraja radiata* is mostly distributed to the north-east (between UK and Sweden) and is rarely found below the 54°N parallel. *Raja clavata* and *Raja montagui* are instead more evenly distributed around UK but, unlike *Amblyraja radiata*, they are rarely found at latitudes higher than the 54°N parallel. *Raja brachyura* is also distributed in the seas surrounding UK but with a greater concentration south of the English Channel and the French coast. Particular is the distribution of *Leucoraja naevus* which is present in the catches both in the south-west of the area sampled (English Channel and Celtic Sea) and in the north along the coasts of Scotland (with a sample in 2003 even close to Shetland Island). The two rarest species, *Raja microocellata* and *Raja undulata*, seem to have a more restricted range confined to the Celtic Sea and English Channel only. All five of the shark and dogfish species are found in the Irish and Celtic Sea and the English Channel (Figure A10.6). *Scylorhinus canicula* is found in high densities around England stretching into the southern part of the North Sea along with a patch around Orkney Islands (Figure A10.6). For the other four,

Mustelus spp. has the highest density, while *Scyliorhinus stellaris*, *Galeorhinus galeus* and *Squalus acanthias* have much lower densities (Figure A10.6), the latest being more widely distributed but captured sporadically throughot most of the North Sea over the past 20 years (Figure A10.9).

Table A10.1: Elasmobranch species list used for the analysis with common name, scientific name and Aphia ID

Code	Common Name	Scientific Name	AphiaID
SYR	starry ray	*Amblyraja radiata*	105865
CUR	cuckoo ray	*Leucoraja naevus*	105876
BLR	blonde ray	*Raja brachyura*	367297
THR	thornback ray (roker)	*Raja clavata*	105883
PTR	smalleyed (painted) ray	*Raja microocellata*	105885
SDR	spotted ray	*Raja montagui*	105887
UNR	undulate (painted) ray	*Raja undulata*	105891
GAG	Tope shark	*Galeorhinus galeus*	105820
SDV	Smooth-hound species	*Mustelus mustelus & Mustelus asterias*	105732
SYC	Lesser spotted dogfish	*Scyliorhinus canicula*	105815
SYT	Nursehound	*Scyliorhinus stellaris*	105815
DGS	Spiny dogfish	*Squalus acanthias*	105923

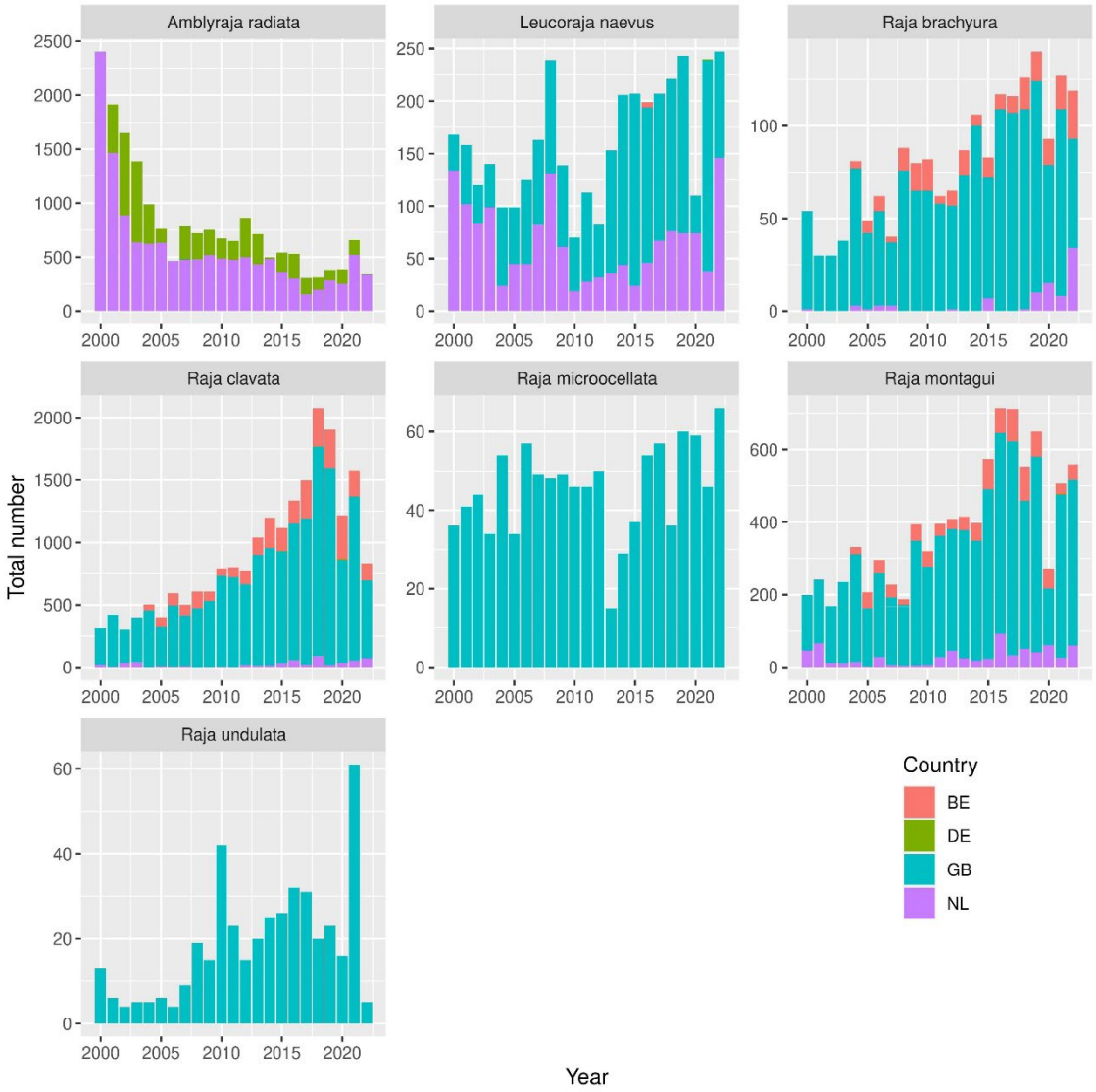

Figure A10.1: Total numbers of Rajiformes from BTS, DYFS & SNS data in DATRAS for the period 2000-2022. The panels are divided based on the different species. The colours show the different countries (purple=Netherlands; blue=UK; green=Germany; red=Belgium).

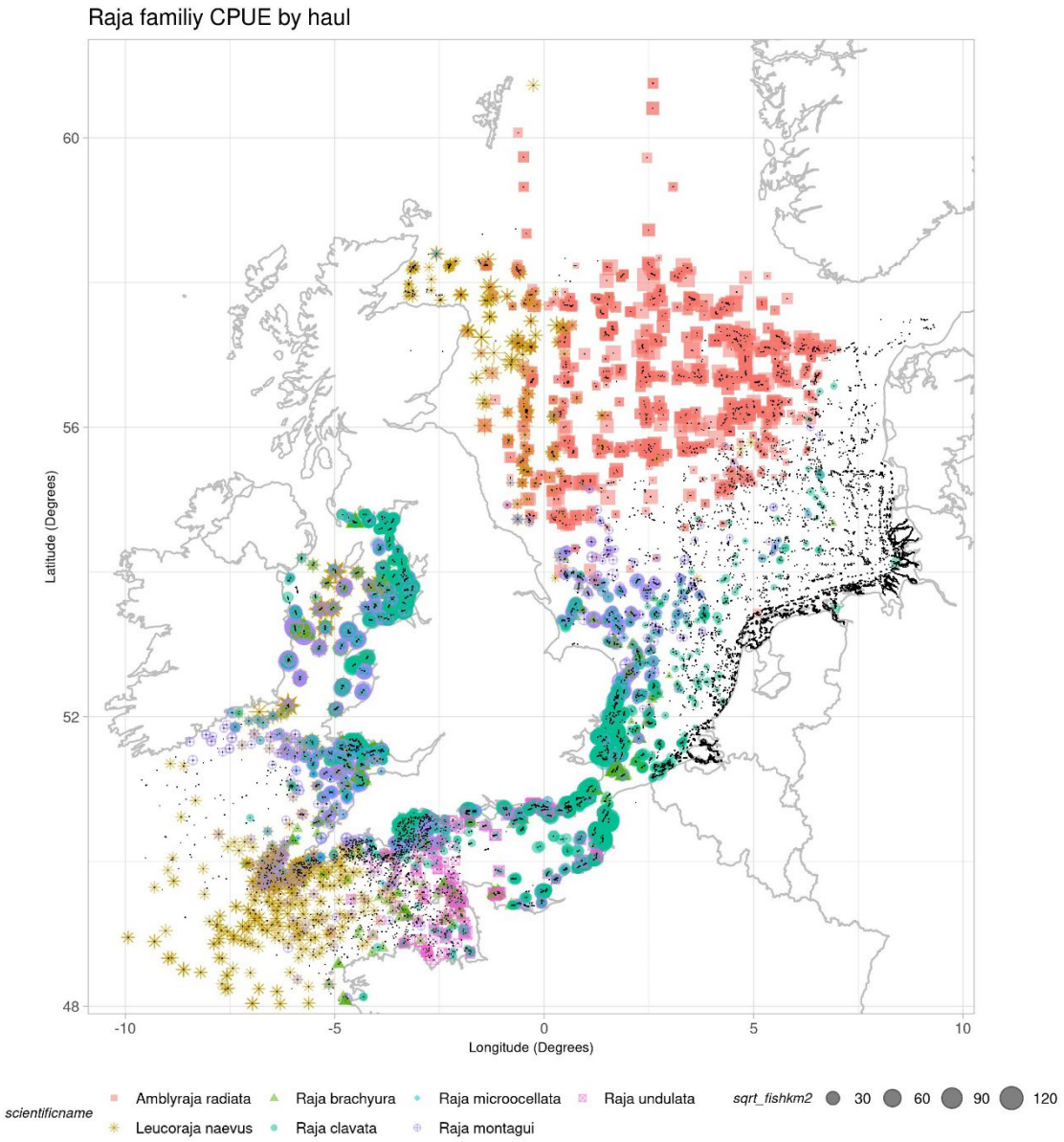

Figure A10.2: CPUE (square root of numbers/km²) by haul of Rajiformes from the BTS, SNS & DYFS (all years combined). The colours show the different species (see legend).

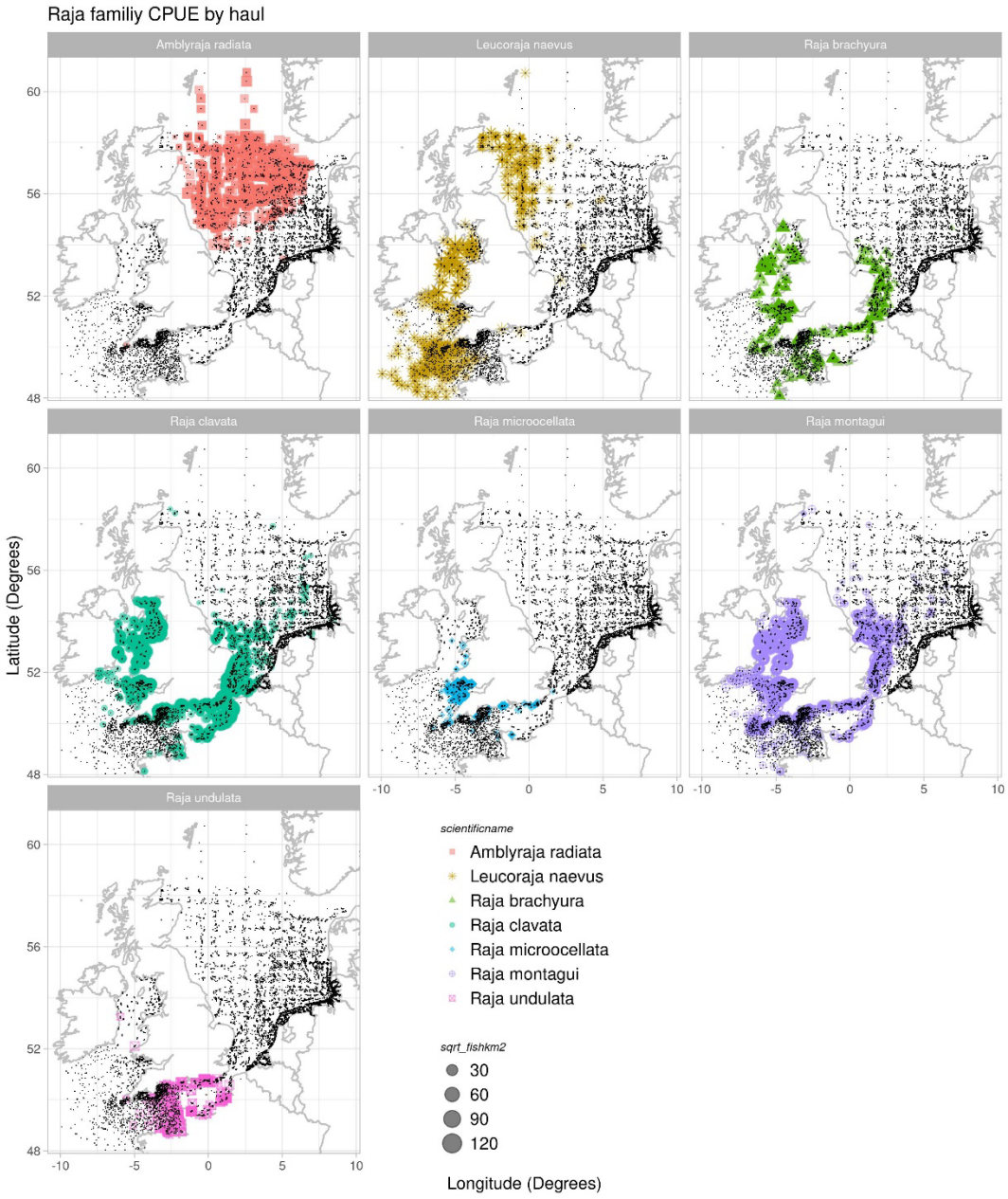

Figure A10.3: CPUE (square root of numbers/km²) by haul of Rajiformes from the BTS, SNS & DYFS for the period 2002-2022, all years combined. The colours show the different species (see legend).

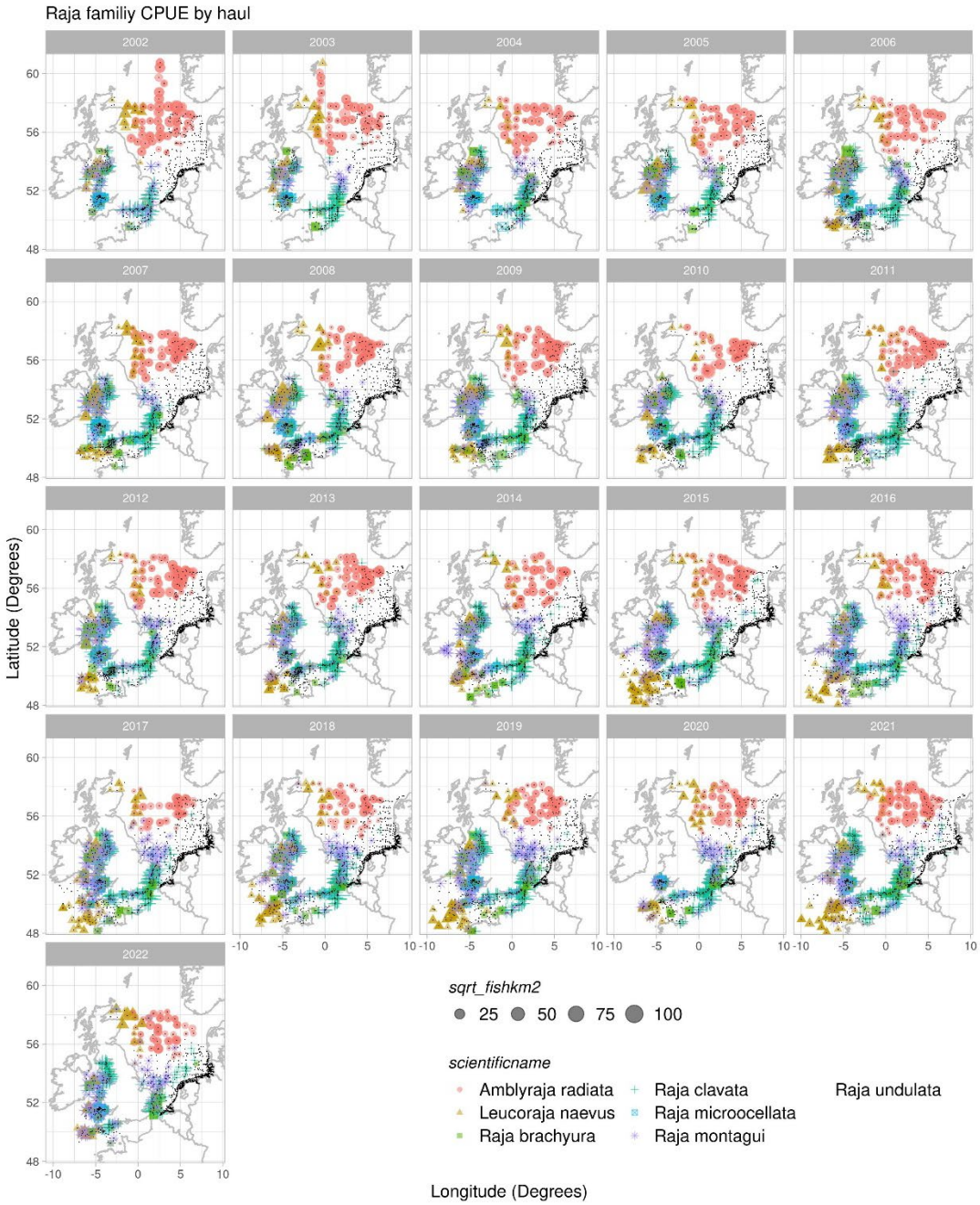

Figure A10.4: CPUE (square root of numbers/km²) by haul of Rajiformes from the BTS, SNS & DYFS for the period 2002-2022. The colours show the different species (see legend).

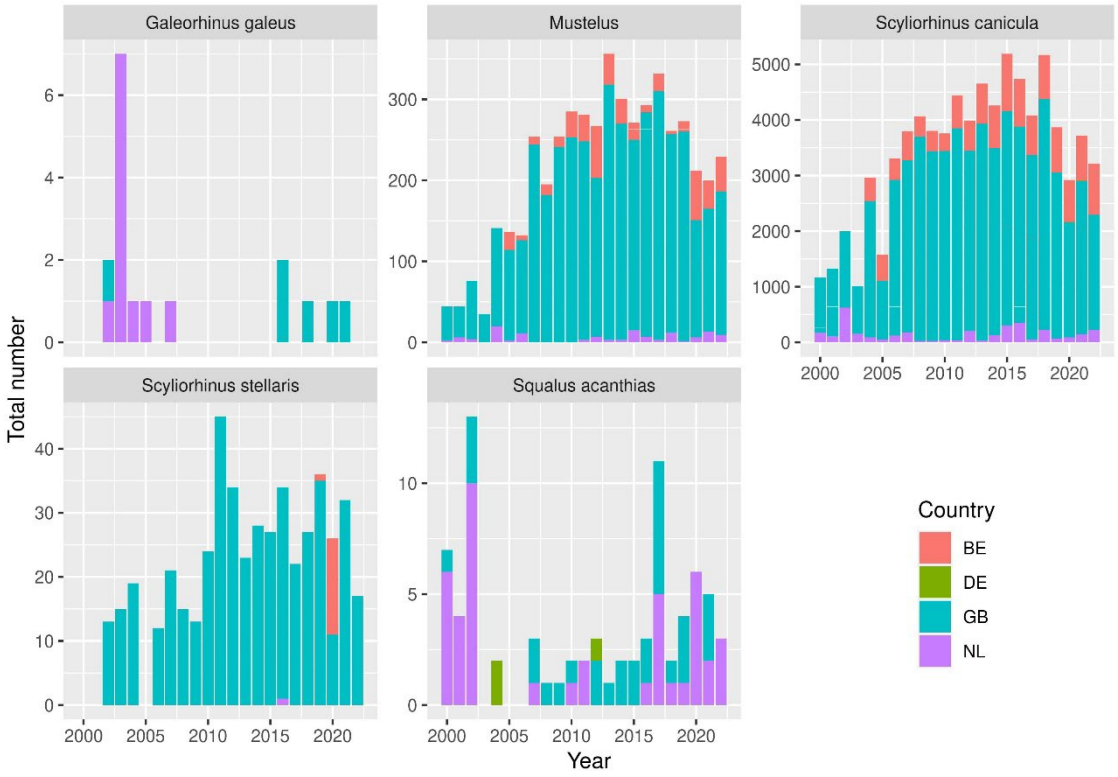

Figure A10.5: Total numbers of sharks and dogfish from BTS, SNS & DYFS data in DATRAS for the period 2000-2022. The panels are divided based on the different species. The colours show the different countries (purple=Netherlands; blue=UK; green=Germany; red=Belgium). Note the different y-axis scales per panel.

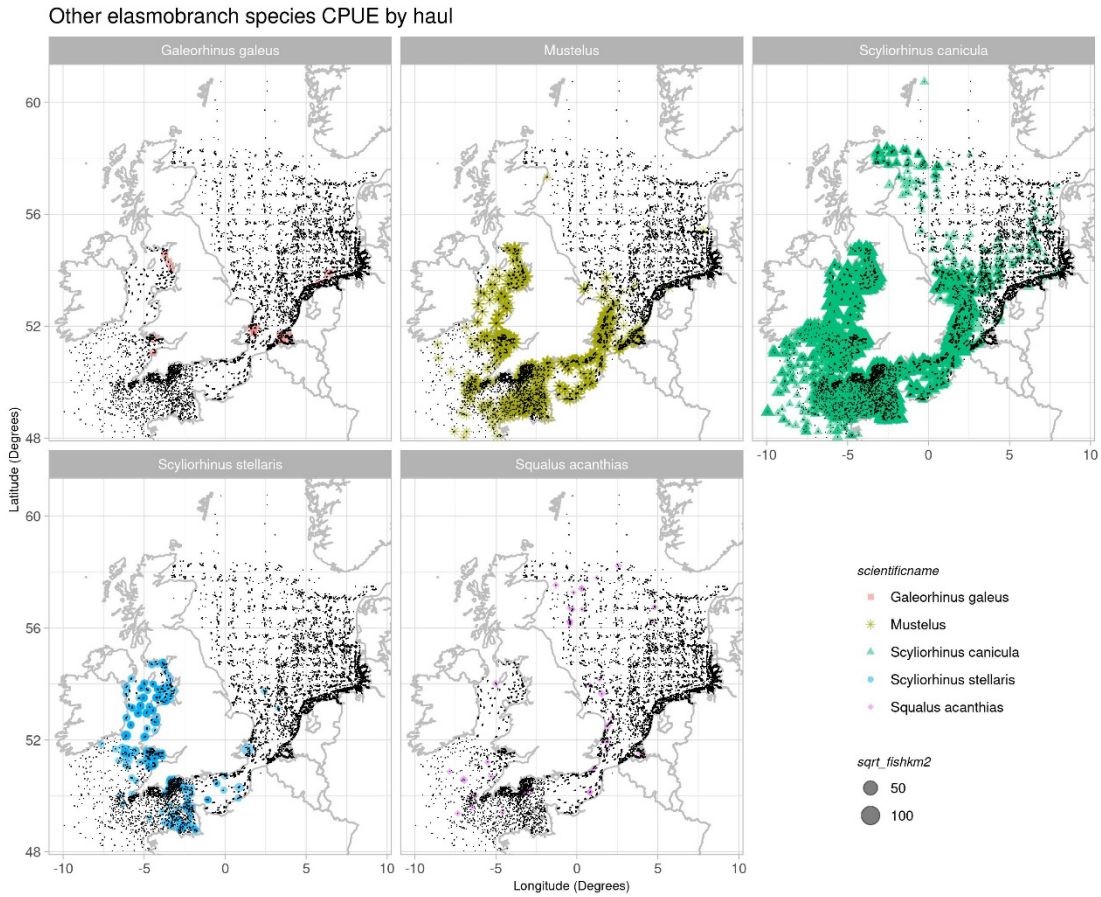

Figure A10.6: CPUE (square root of numbers/km²) by haul of sharks and dogfish from the BTS, SNS & DYFS (all years combined). The colours show the different species (see legend).

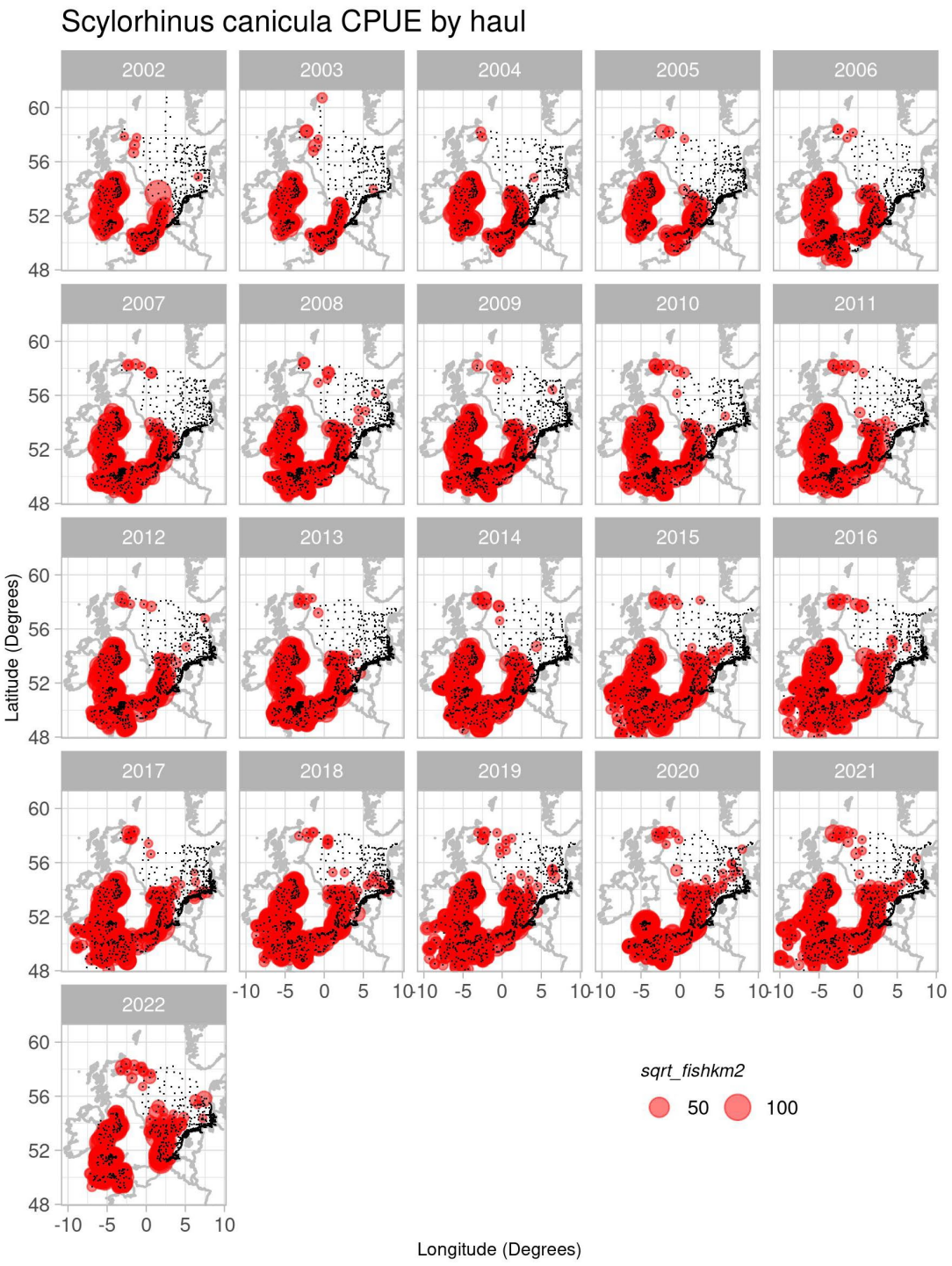

Figure A10.7: CPUE (square root of numbers/km²) by haul of the small spotted dogfish (Scyliorhinus canicula) from the BTS, SNS & DYFS for the years 2002-2022. The red colours show the CPUE while the black show trawl stations (see legend).

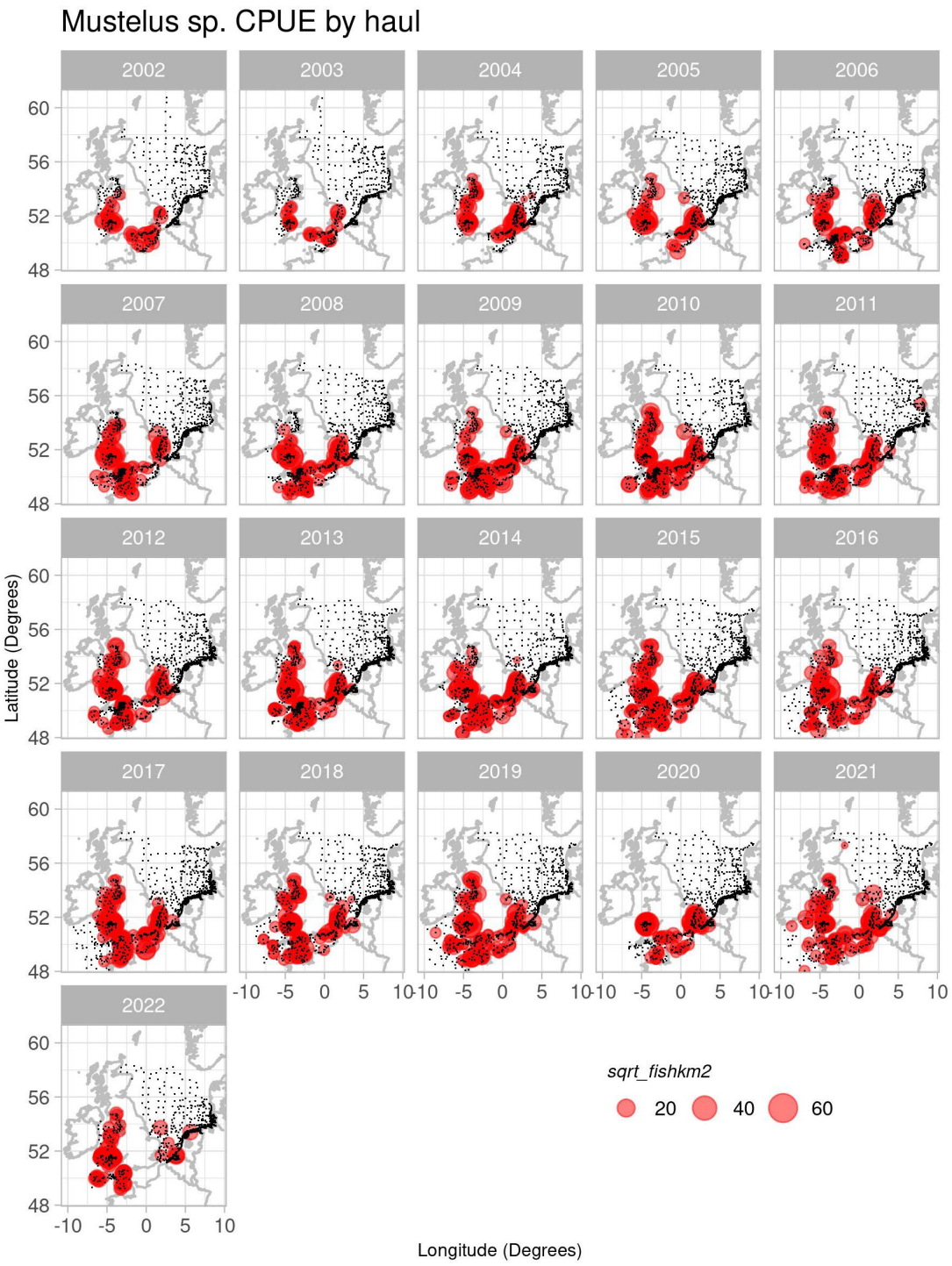

Figure A10.8: CPUE (square root of numbers/km²) by haul of the smooth-hound species (Mustelus sp.) from the BTS, SNS & DYFS for the period 2002-2022. The red colours show the CPUE while the black show trawl stations (see legend).

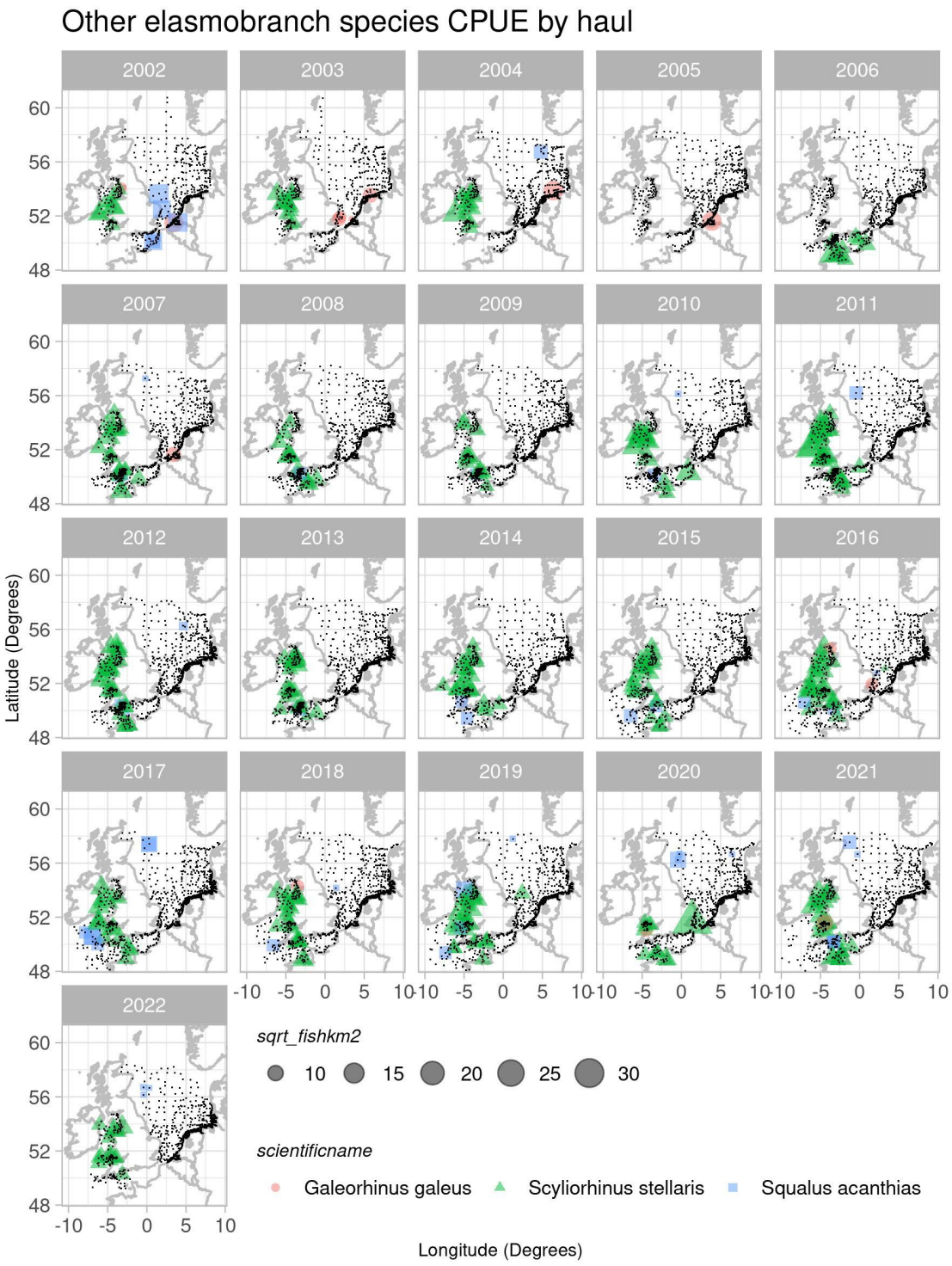

Figure A10.9: CPUE (square root of numbers/km²) by haul of the tope shark (Galeorhinus galeus), nursehound (Scyliorhinus stellaris) & spiny dogfish (Squalus acanthias) from the BTS, SNS & DYFS for the years 2002-2022. The colours show the CPUE by species while the black show trawl stations (see legend).

Annex 11: DATRAS related

Annex 11.1 CPUE products and flexfile; current

Table A11.1: Current situation CPUE products and flexfile

Flexfile (all)	CPUE per length per hour and swept area (WGBEAM)	CPUE per length per hour (IBTSWG, WGBIFS)
RecordType	Survey	Survey
Survey	Year	Year
Quarter	Quarter	Quarter
Country	Country	Country
Ship	Ship	Ship
Gear	Gear	Gear
SweepLngt	SweepLngt	HaulNo
GearEx	GearEx	HaulDur
DoorType	DoorType	ShootLat
StNo	StNo	ShootLong
HaulNo	HaulNo	DateTime
Year	Month	Depth
Month	Day	Area
Day	TimeShot	SubArea
TimeShot	DepthStratum	DayNight
DepthStratum	HaulDur	AphiaID
HaulDur	DayNight	Species
DayNight	ShootLat	Sex
ShootLat	ShootLong	LngtClass
ShootLong	HaulLat	CPUE_number_per_hour
HaulLat	HaulLong	DateofCalculation
HaulLong	StatRec	
StatRec	Depth	
Depth	HaulVal	
HaulVal	StdSpecRecCode	
HydroStNo	BySpecRecCode	
StdSpecRecCode	DataType	
BySpecRecCode	Netopening	
DataType	Rigging	
Netopening	Tickler	
Rigging	Distance	
Tickler	Warplngt	
Distance	TowDir	
Warplngt	WindDir	
Warpdia	WindSpeed	
WarpDen	SwellDir	
DoorSurface	SwellHeight	
DoorWgt	ICESArea	
DoorSpread	AphiaID	

Flexfile (all)	CPUE per length per hour and swept area (WGBEAM)	CPUE per length per hour (IBTSWG, WGBIFS)
WingSpread	Species	
Buoyancy	SpecVal	
KiteDim	Sex	
WgtGroundRope	SubFactor	
TowDir	LngtClass	
GroundSpeed	HLNoAtLngt	
SpeedWater	NoPerHaul	
SurCurDir	BeamWidth	
SurCurSpeed	DistanceDerived	
BotCurDir	CPUE_number_per_hour	
BotCurSpeed	SweptArea_km2	
WindDir	CPUE_number_per_km2	
WindSpeed		
SwellDir		
SwellHeight		
SurTemp		
BotTemp		
SurSal		
BotSal		
ThermoCline		
ThClineDepth		
CodendMesh		
SecchiDepth		
Turbidity		
TidePhase		
TideSpeed		
PelSampType		
MinTrawlDepth		
MaxTrawlDepth		
Cal_Distance		
Cal_DoorSpread		
Cal_WingSpread		
BeamWidth		
DSflag		
WSflag		
DistanceFlag		
SweptAreaDSKM2		
SweptAre-aWSKM2		
SweptAre-aBWKM2		
DateofCalculation		

Annex 11.2 CPUE products and flexfile; proposed

Table 11.2: Proposed situation CPUE products and flexfile

CPUE per length per hour and swept area (all)	Flexfile (all)
Survey	RecordType
Year	Survey
Quarter	Quarter
Country	Country
Ship	Ship
Gear	Gear
StNo	SweepLngt
HaulNo	GearEx
HaulDur	DoorType
ShootLat	StNo
ShootLong	HaulNo
DateTime	Year
Depth	Month
DepthStratum	Day
StatRec	TimeShot
Area	DepthStratum
SubArea	HaulDur
DayNight	DayNight
AphiaID	ShootLat
Species	ShootLong
Sex	HaulLat
LngtClass	HaulLong
CPUE_number_per_hour	StatRec
SweptArea_km2	Depth
CPUE_number_per_km2	HaulVal
DateofCalculation	HydroStNo
	StdSpecRecCode
	BySpecRecCode
	DataType
	Netopening
	Rigging
	Tickler
	Distance
	Warplngt
	Warpdia
	WarpDen
	DoorSurface
	DoorWgt
	DoorSpread
	WingSpread
	Buoyancy
	KiteDim
	WgtGroundRope

CPUE per length per hour and swept area (all)	Flexfile (all)
	TowDir
	GroundSpeed
	SpeedWater
	SurCurDir
	SurCurSpeed
	BotCurDir
	BotCurSpeed
	WindDir
	WindSpeed
	SwellDir
	SwellHeight
	SurTemp
	BotTemp
	SurSal
	BotSal
	ThermoCline
	ThClineDepth
	CodendMesh
	SecchiDepth
	Turbidity
	TidePhase
	TideSpeed
	PelSampType
	MinTrawlDepth
	MaxTrawlDepth
	Cal_Distance
	Cal_DoorSpread
	Cal_WingSpread
	BeamWidth
	DSflag
	WSflag
	DistanceFlag
	SweptAreaDSKM2
	SweptAreaWSKM2
	SweptAreaBWKM2
	SweptAreaBeamwidthKM2
	DateofCalculation

Annex 11.3 Species validity coding

Table A11.3: Proposed descriptions (by WGDG) for specval values

Code (SpecVal)	Current Description	WGDG proposal
0	Invalid information	Invalid information. Use in data products: no.
1	Valid information for use in DATRAS data products	Representative length information (length measurements, numbers and category catch weights). Use in data products: yes.
2	Partly valid information	Representative length information only for commercial/assessed species. Full set of species to be completed next year after a two-years ban to allow national data use. Use in data products: yes, only for commercial/assessed species.
3	Length composition incomplete	Deprecate
4	No length measurements only total number	Total number only. No length measurements or category catch weight. Use in data products: yes.
5	Observed only, not measured, not counted, but only presence/absence is registered	Presence/absence only. No length measurements, numbers or category catch weights. Use in DATRAS products: ??
6	No length measurements, only category catch weight	Category catch weight only. No length measurements or numbers. Use in DATRAS products: ??
7	No length measurements, only total number and category catch weight	Numbers and category catch weights only. No length measurements. Use in DATRAS products: yes.
8	Only volume (litre) registered	Volume only. No length measurements, numbers or category catch weights. Use in DATRAS products: ??
9	Valid information available but not recorded in the file	Representative length information (length measurements, numbers and category catch weights). Use in DATRAS products: no.
10	No category catch weight, only total numbers and length composition	Length measurements and numbers only. No category catch weights. Use in data products:??

Annex 11.4 DATRAS product descriptions

Table A11.4: Proposed DATRAS product descriptions (by WGDG)

Order	Data product current name	WGDG suggestion	Description
1	Exchange Data	Unaggregated trawl and biological information	This is the data as submitted following the unified data format. For further detail on each survey please visit the SISPs library.
2	CPUE per length per haul per hour	CPUE per length per haul per hour	Provides Catch in numbers per length class and hour of hauling per haul. Available for all species. Uses LngtClass in mm. This Data product can be requested per Survey Area.
3	CPUE per length per hour and swept area	CPUE per length per swept area	Provides Catch in numbers per length class and hour of hauling and swept area. Available for all species.
4	FlexFile	Swept Area trawl information	This data product provides HH data with DoorSpread and WingSpread based Swept Area as calculated following algorithms provided by the submitters.
5	CPUE per age per haul per hour	CPUE per age per haul per hour	Provides Catch in numbers per Age and hour of hauling per haul. Available for standard species only. This Data product can be requested per Survey Area.

Order	Data product current name	WGDG suggestion	Description
6	CPUE per length per subarea	CPUE per length per subarea	Provides Catch in numbers per length class and hour of hauling per survey DepthStratum or ICES statistical Rectangle. Available for all species. Uses LngtClass in mm. This Data product can be requested per Survey Area.
7	CPUE per length per area	CPUE per length per area	Provides Catch in numbers per length class and hour of hauling per survey Area. Available for all species. Uses LngtClass in mm. This Data product can be requested per Survey Area.
8	CPUE per age per subarea	CPUE per age per subarea	Provides Catch in numbers per Age and hour of hauling survey DepthStratum or ICES statistical Rectangle. Available for standard species only. This Data product can be requested per Survey Area.
9	CPUE per age per area	CPUE per age per area	Provides Catch in numbers per Age and hour of hauling per survey Area. Available for standard species only. This Data product can be requested per survey Area.
10	ALK	Age Length Key	Age Length Key. Provides Catch in numbers (CANoAtLngt) per Age and LngtClass (in mm) in short format. Available for standard species only. This Data product is provided per survey Area.
11	SMALK	Age Length Key by Sex and Maturity	Sex Maturity Age Length Key. Provides Catch in numbers (CANoAtLngt) per Age, Sex, Maturity and LngtClass (in mm). Available for all species. For Beam Trawl Surveys CANoATLngt per Age is provided in short format. For the other surveys CANoATLngt per Age is provided in long format and calculated per survey Area.
12	Indices	Age-based indices by area	Allocation of ALK to the length based CPUE data. By species-specific areas.
13	Litter Exchange Data	Unaggregated litter data	This is the litter data as submitted following the unified data format.
14	Litter Assessment Output	Litter Assessment Output	This data product rearranges the Litter Data format with a single row for each haul and LT PARAM combination.
15	Swept area Assessment Output	Adhoc: Swept area Assessment Output	Output for OSPAR request, merging DATRAS Swept Area data product and other approaches.
16	Sensitive species abundance indices	Adhoc: Sensitive species abundance indices	Output for OSPAR request.

Annex 12: Shrimp sample size

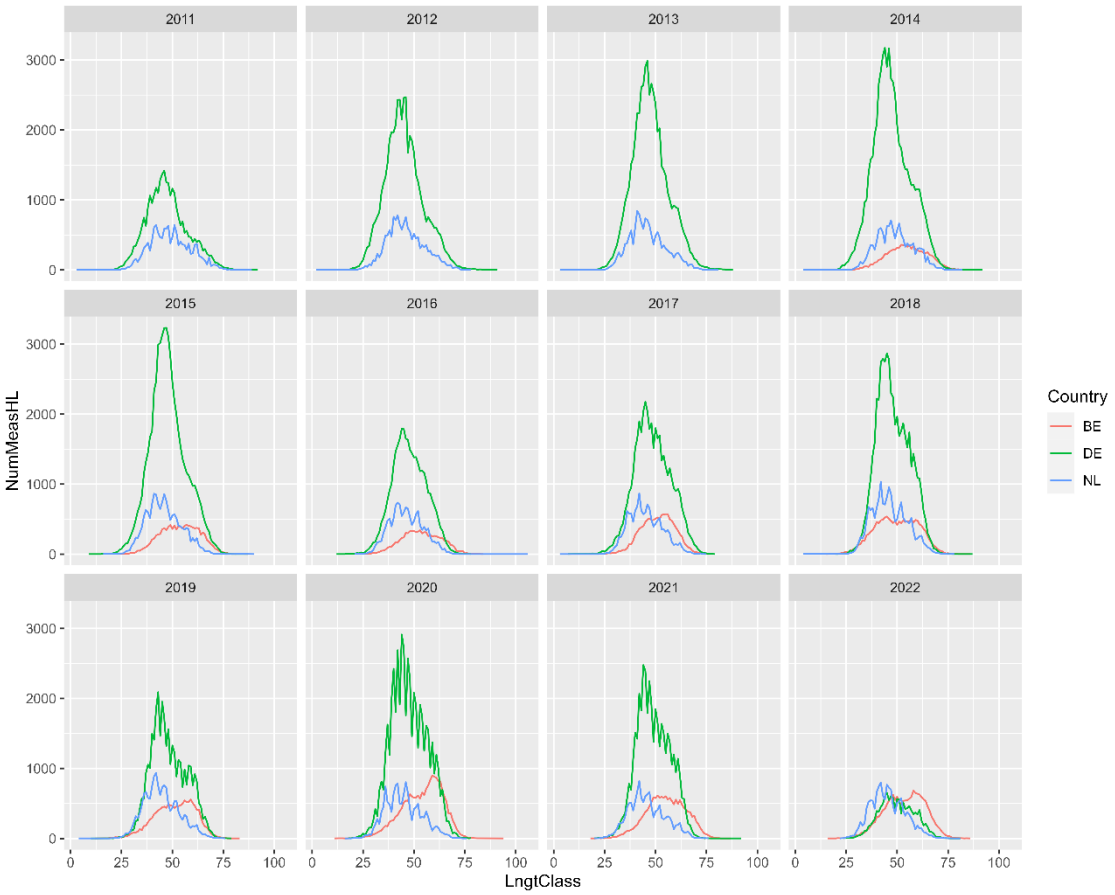

Figure A12.5: *Crangon crangon* Length frequency distribution by country during DYFS surveys 2011-2022

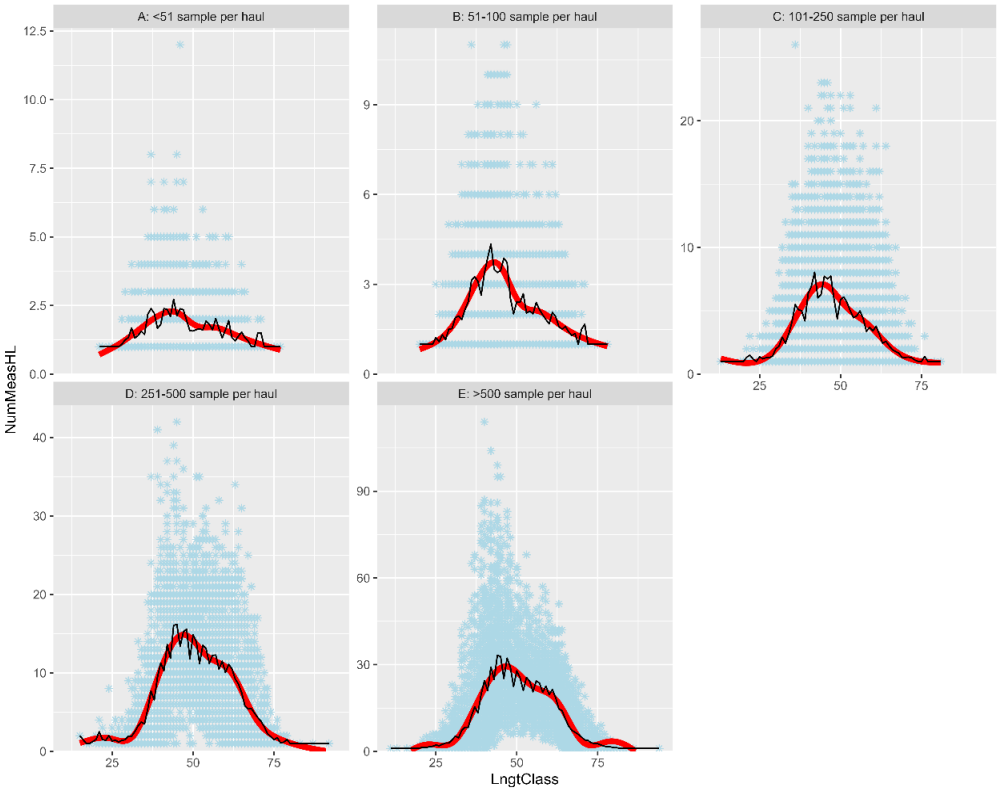

Figure A12.6: *Crangon crangon* Length frequency distribution by sub sample size during all DYFS surveys 2020-2022. Smoothed mean (red line) and mean (black line).

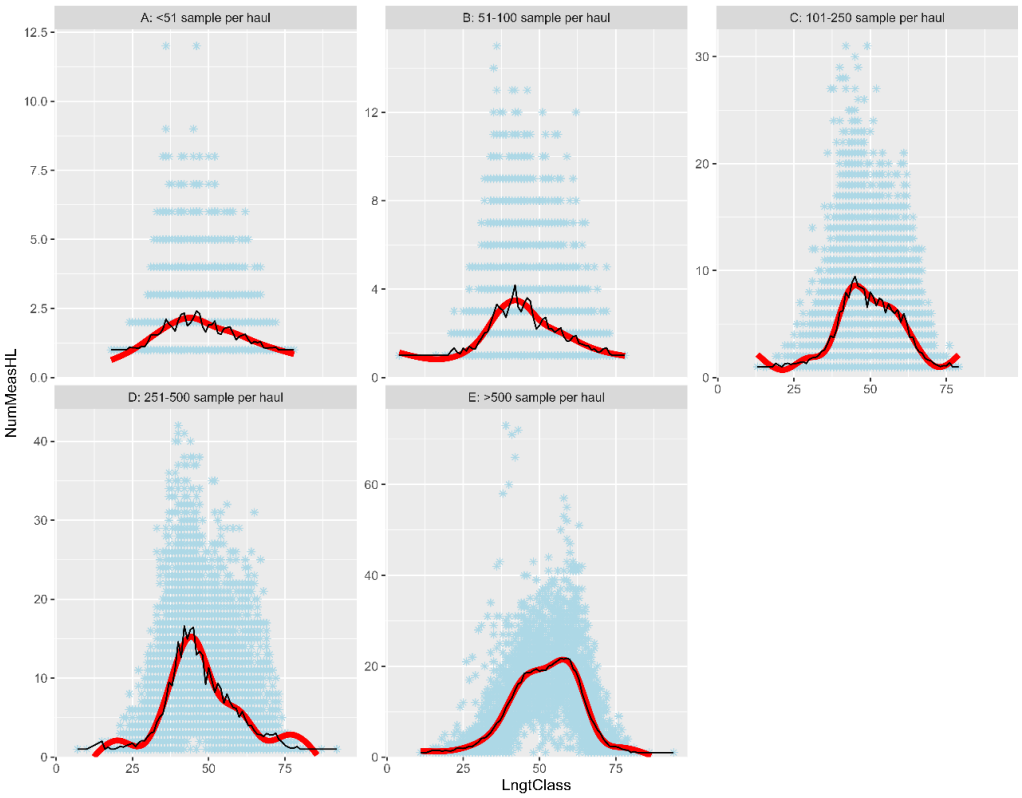

Figure A12.7: Crangon crangon Length frequency distribution by sub sample size during all DYFS surveys 2017-2021. Smoothed mean (red line) and mean (black line).