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Regulation (EU) 2017/1004 of the European Parliament and of the Council of 17 May 2017

on the establishment of a Union framework for the collection, management and use of data in the fisheries sector and support for scientific advice regarding the Common Fisheries Policy and repealing Council Regulation (EC) No 199/2008 (recast)

Commission Implementing Decision (EU) 2019/909 of 18 Feb 2019

establishing the list of mandatory research surveys and thresholds for the purposes of the multiannual Union programme for the collection and management of data in the fisheries and aquaculture sectors

Commission Delegated Decision (EU) 2019/910 of 13 March 2019

establishing the multiannual Union programme for the collection and management of biological, environmental, technical and socioeconomic data in the fisheries and aquaculture sectors

Commission Implementing Decision (EU) 2016/1701 of 19 Aug 2016

laying down rules on the format for the submission of work plans for data collection in the fisheries and aquaculture sectors

German Work Plan for data collection in the fisheries and aquaculture sectors

2020-2021

Version 1.1 – 06 Nov 2019

[Bremerhaven/Rostock, 06 Nov 2019]

CONTENTS

Pilot Study 1: Relative share of catches of recreational fisheries compared to commercial fisheries

General comment: This Box fulfills paragraph 4 of Chapter V of the multi-annual Union programme and Article 2 and Article 4 paragraph (3) point (a) of this Decision.

Resume 2017-2019 and outlook

The pilot study was performed as planned by Germany within 2017-2019 and will be continued as regular data collection.

The pilot study conducted during 2017-2019 revealed that for some areas and species, marine recreational fisheries (MRF) catches represented a significant proportion of the total removals and thus should be collected regularly to underpin European fisheries management. This was the case for cod, salmon and sea trout in the Baltic Sea.

In the case of cod, the comaprison between the off-site 1-year-telephone-diary survey and the on-site stratified random access-point-intercept survey revealed that a national population survey is required at regular intervals (3-5 years) to quantify fishing effort and that an annual on-site intercept survey proves valuable to detect rapid and quick changes in catch rates (CPUE). The onboard sampling during charter boat trips was used to collect biological catch composition data (length measurements) for all caught and released species during the sampled trips of this sector. This survey component is indispensable to obtain unbiased length distriutions of caught and released MRF catch compositions. We will therfore continue with our annual on-site access-point-intercept survey in 2020 and beyond, as well as regular onboard sampling of MRF catches to obtain length distributions. As there have been substantial changes in MRF management regulations in recent years (introduction of a bag limit for cod), which also affect anglers' behaviour and thus exerted fishing effort, we are planning to conduct a large nationwide telephone survey in 2020/2021 to yield updated data on fishing effort in recreational fisheries. This survey shall also cover freshwater/inland fisheries to yield estimates on freshwater eel catches in Germany. Social indicators will be included to correct for angler heterogeneity in data collection and stock assessment.

In the case of salmon, the 1-year-telephone-diary survey revealed that this survey does not adeqautely cover the MRF for salmon in the Baltic Sea. We therefore invented a new dedicated salmon-camera survey to obtain near-census effort estimates from relevant salmon harbours and in association with stratified random angler-intercepts in those harbours to obatin catch rates and biological data (length distribution). MRF salmon catches proved to have a large interannual variability suggesting to conduct this dedicated survey on an annual basis. We will thus continue this remote camera survey with regular angler intercepts in 2020.

In the case of sea trout, the 1-year-telephone-diary survey could be used to obtain effort estimates for the MRF sea trout fishery. This survey was however not sufficient to yield annual variability and length distributions. Currently, the plan is to continue to use national population surveys for this specialized fishery and use the same data for intermittent years. The planned nationwide telephone survey in 2020 will provide updated data for sea trout catches in the Baltic Sea.

Altogether, the conducted pilot study (MRF surveys) was adequate to fullfill the DCF requirements and the continuity of it will satisfy the following end-users of the MRF data: ICES WGRFS, WGBFAS and WGBAST; DG MARE; EP; RCGs; PGECON; national governments and regional fisheries authorities, international and national angling bodies, national and local businesses and journalists.

Text Box 1E: Anadromous and catadromous species data collection in fresh water

General comment: This Box fulfills paragraph 2 points (b) and (c) of Chapter III of the multi-annual Union programme and Article 2 of this Decision.

Eel (*Anguilla anguilla*)

As required by Decisions 2019/909 and 2019/910, the data collection in all German Eel Management Units (EMUs) will be organised as follows:

- Biological variables (age, length, sex, maturity)
    - Sampling of silver eels from commercial catches
    - Timing and frequency of sampling commercial fisheries potentially affects catch composition (i.e. length and/or age composition) and will thus introduce a bias to the collected data. To proceed towards a sound sampling scheme, multiple samplings over an extended time period will be conducted in one EMU (Ems) to analyse seasonal variations in the catch composition. It is thus necessary to conduct additional age readings in this EMU and therefore no further age readings will be conducted in other EMUs.
    - Spawner quality assessed in sub-samples (e.g. contamination status, fat content, parasite infestation)
- Annual catch quantities in EMUs as reported by fishers
- Recruitment
    - Natural recruitment: regional (non-DCF) glass eel monitoring /ICES time series
    - Stocking: number of glass eels and elvers, as reported in national stocking statistics
    - Larval surveys in the spawning area of the European eel
- Abundance of standing stock and silver eel escapement
    - calculated via German Eel Model III (Oeberst & Fladung 2012)

Salmon (*Salmo salar*)

Based on the recent data collection, it was concluded in the German DCF Annual Report 2018 that German populations of *Salmo salar* do currently not contribute to the stock assessment by WGNAS and active data collection within the DCF framework is considered not feasible. However, available data and information from regional authorities will be collected annually and provided to relevant end-users in order to ensure regular updates on the state of German salmon populations.

References

Oeberst, R. & Fladung, E. 2012. German Eel Model (GEM II) for describing eel, *Anguilla anguilla* (L.), stock dynamics in the river Elbe system. Inf. Fish. Res. 59: 9-17. DOI: 10.3220/Infn59_09-17_2012

Pilot Study 2: Level of fishing and impact of fisheries on biological resources and marine ecosystem

General comment: This Box fulfills paragraph 3 point (c) of Chapter III of the multi-annual Union programme and Article 2 and Article 4 paragraph (3) point (b) of this Decision.

1. Aim of pilot study (Stomach sampling and analysis)

Improve availability of data and tools for estimating the level of fishing and the impact of fishing activities on marine biological resources

2. Duration of pilot study

24 months (1 Jan 2020 – 31 Dec 2021 - continuation)

3. Methodology and expected outcomes of pilot study

Fundamental changes in the importance of natural *vs.* fishing-induced mortality are observed while moving towards MSY management target. The comprehensive reduction of fishing mortality and successive recovery of fish stocks, especially of the larger predatory species, led to an increasing natural mortality as opposed to fishing mortality. Consequently, estimates of natural mortality become more important for stock assessments and forecasts. A DG MARE tender (Contract MARE/2012/02-SI2.632887) pilot study on stomach sampling in the North Sea and Baltic Sea was able to prove, in cooperation with the ICES Working Group on Multispecies Assessment Methods (WGSAM), that cost-effective sampling of stomachs is possible during existing surveys. It was possible to analyse stomachs in a cost-effective manner with the help of national labs and/or external contractors. Results of the fishPi project (MARE/2014/19) conclude that opportunistic stomach sampling on existing DCF surveys is a promising way forward. However, missing regional coordination was identified a major problem by the project. The lack of coordination leads to unbalanced sampling effort resulting in a lack of statistically sound sampling of all key species needed for food web characterisation and finally does not allow moving towards the Ecosystem Approach to Fisheries (EAF). Based on the lessons learned from the DG MARE pilot study and the fishPi project, Germany will in this pilot study establish a regular sampling scheme for stomachs on its vessels during international and national surveys in close cooperation with WGSAM, survey planning groups, regional coordination groups and international partner labs. The sampling will be carried out based on the guidelines from WGSAM to ensure that data can be used for multi-species modelling, assessments and advice.

Currently, the Regional Coordination Group for the North Atlantic, North Sea & Eastern Arctic (RCG NANSEA 2019) is discussing ways to move forward to implementing a regional coordinated stomach sampling programme. For this purpose, an intersessional subgroup on stomach sampling has been established to work on this matter. The experience from the German stomach data sampling trial will be discussed further at the regional coordination meetings (RCGs), survey planning groups and WGSAM during 2019, 2020 and 2021. If other countries agree, the rolling scheme can be easily harmonized with other countries. The aim is to cover finally the whole North Sea. However, this depends on the willingness of other countries. In any case, Germany will deliver an overview on its sampling scheme, associated costs and uncertainties inherent in final data products. This will give guidance on which basis Germany will establish a regular sampling scheme.

For the Baltic Sea, stomach data of cod, flounder, plaice, dab and turbot, collected during 2017-2019 in the western Baltic, will be analysed in 2020 within the scope of BSc MSc and PhD theses.

References

RCG NANSEA 2019. Report of the Regional Coordination Group North Atlantic, North Sea & Eastern Artic. 3-6 June 2019, Ghent, Belgium, 114 pp.

General comment: This Box fulfills paragraph 3 point (c) of Chapter III of the multi-annual Union programme and Article 2 and Article 4 paragraph (3) point (b) of this Decision.

1. Aim of pilot study (Impact of fishing activities on marine biological resources)

Improve availability of data and tools for estimating the level of fishing and the impact of fishing activities on marine biological resources and on marine ecosystems

2. Duration of pilot study

24 months (1 Jan 2020 – 31 Dec 2021- continuation)

3. Methodology and expected outcomes of pilot study

When it comes to assessing the impact of fishing on marine ecosystems, two aspects have to be considered: i) Bottom-contacting fishing gears potentially impact habitat quality and thus suitability and carrying capacity of marine ecosystems and ii) non-target species including rare and sensitive species are by-caught in the fishery potentially affecting ecosystem composition and functionality. Data on by-catch of the latter species in the different fisheries are still scarce. Incidental by-catch of elasmobranchs and marine mammals can only be quantified with large uncertainties. Germany will train observers to better distinguish between different shark, ray and skate species and will ensure that by-catch of non-commercial and sensitive species will be recorded during observer trips. Habitat degradation by fisheries needs to be assessed differently. First of all, the level of fishing by metier needs to be determined at highest geographical resolution, to assess the overlap of fishing and habitat. Secondly, the impact of different gear types on the specific habitat type needs to be classified to assess the impact of fishing on habitat quality. In this pilot study, Germany will adapt existing methodology as applied by ICES WGSFD and OSPAR to establish a routine monitoring of fishing impacts on marine habitats. Combining indices of fishing impact on habitats with by-catch information on rare and sensitive species will allow addressing the impact of fishing on marine ecosystems.

The information on biological as well as technical interactions (including by-catch of non-commercial and sensitive species and habitat impact) in mixed fisheries needs to be combined in integrated modelling approaches. Under the new CFP, management strategies need to the established that ensure the ecological, social and economic sustainability of fisheries. Management plans need to take into account the knowledge on biological and technical interactions in mixed fisheries to reach this goal. Based on the traditional (including economics) and new information from the DCF pilot study, Germany will help to develop and parameterise management strategy evaluation tools that account for ecosystem considerations for the North Sea together with institutes from other MS. This will allow an integrated impact assessment of management strategies and ensures that all available DCF data are utilised to provide the best possible advice.

In the first phase of this pilot study, international fishing effort data were analysed in the German Bight in order to quantify fishing pressure on the seafloor. For this, we followed a similar indicator and assessment framework as described in ICES (2017) and used the swept area ratio (SAR) as proxy for seafloor abrasion. However, some adaptations were necessary in order to obtain estimates that are temporally and spatially more precise for the southern North Sea. For example, based on data from 2012-2016, on average 45% of the German offshore areas and 62% of the coastal areas were fished with bottom-contacting gears with relatively little interannual variation. The completed small-scale SAR estimates can now be related to by-catch information on rare and sensitive species, helping to assess ecosystem effects of fisheries.
In 2018, Germany significantly contributed to the ICES WGSFD and WGFBIT, the latter developing models to determine the impact/status of the seabed. These models form the basis for the future advice in relation to fisheries impact on habitat quality, and the continuation of the Pilot Study helps to adapt them for a regional North Sea assessment and will ensure the incorporation of the results into a regular sampling by the MS.

References

ICES. 2017. Interim Report of the Working Group on Spatial Fisheries Data (WGSFD), 29 May – 2 June 2017, Hamburg, Germany. ICES CM 2017/SSGEPI: 16. 42 pp.

Text Box 1G: List of research surveys at sea

General Comment: This Box fulfills Chapter IV of the multi-annual Union programme and Article 2 and Article 7 paragraph (3) of this Decision. It is intended to specify which research surveys at sea set out in Table 10 of the multi-annual Union programme will be carried out. Member States shall specify whether the research survey is included in Table 10 of the multi-annual Union programme or whether it is an additional survey.

Mandatory surveys:

Baltic International Trawl Survey (BITS)

1. Objectives of the survey

Target species are demersal fish species, mainly Baltic cod and flatfish species (flounder, plaice, dab, brill and turbot). The main aim is to determine the year-class strength of the target species. Target data are abundances, weight and length distributions of all fishes and length-weight-age-sex-maturity data of commercially important species as well as hydrographic data (temperature, salinity and oxygen). The collected data are saved in a national SQL database and submitted to the ICES DATRAS database. In addition, cod stomachs and marine litter are sampled.

2. Description of the methods used in the survey. For mandatory surveys, link to the manuals. Include a graphical representation (map)

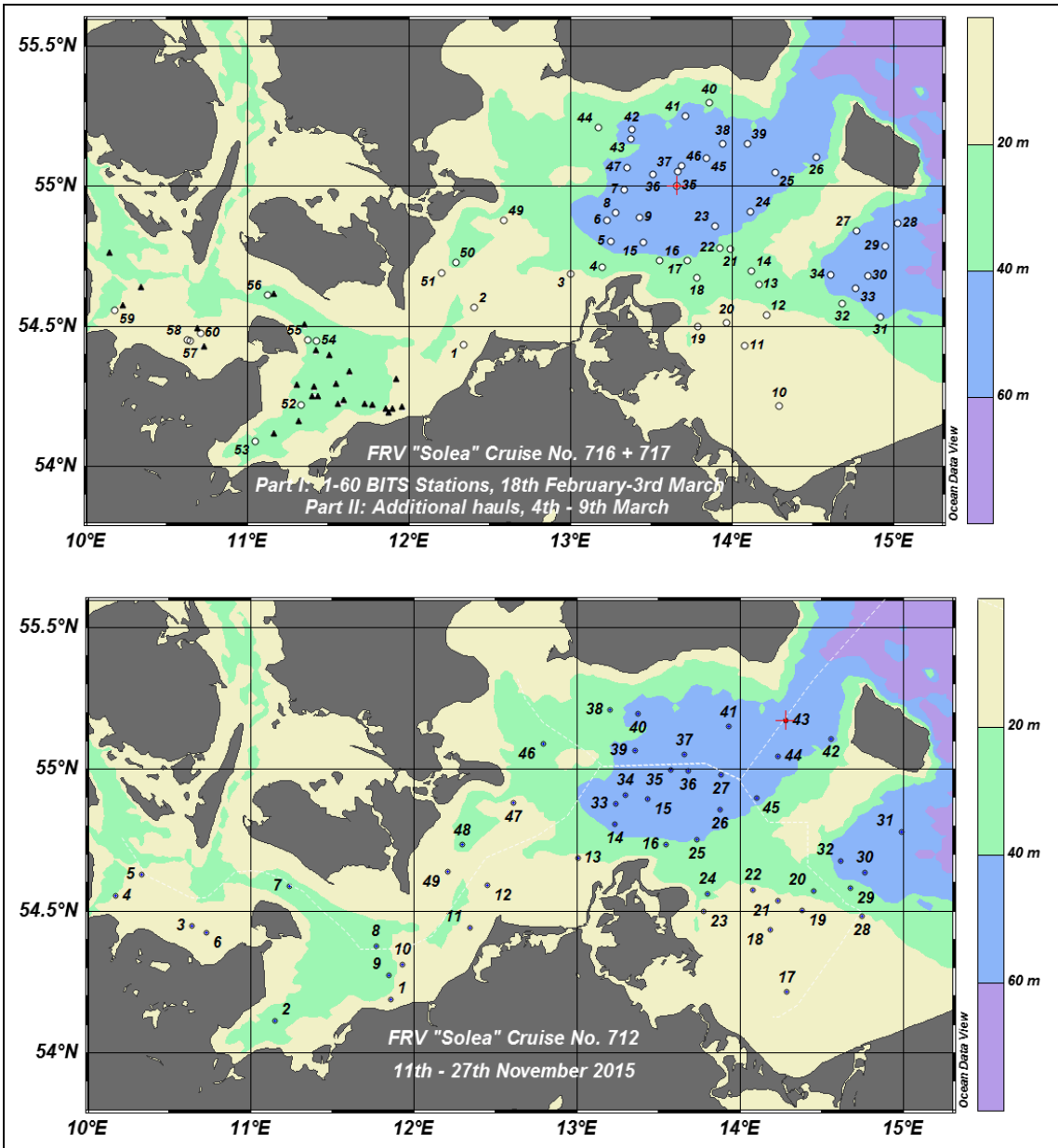
See survey manual: http://www.ices.dk/community/groups/Pages/WGBIFS.aspx

3. For internationally coordinated surveys, describe the participating Member States/vessels and the relevant international group in charge of planning the survey

Denmark (R/V DANA and R/V HAVFISKEN) and Sweden (R/V SVEA), Germany (R/V SOLEA), Lithuania (R/V DARIUS), Poland (R/V BALTICA), Latvia (R/V BALTICA), Finland (R/V ARANDA, Estonia (R/V BALTICA) and Russia (R/V ATLANTNIRO). ICES WGBIFS is coordinating the planning of this survey.

4. Where applicable, describe the international task sharing (physical and/or financial) and the cost sharing agreement used

The ICES survey planning group (WGBIFS) assigns the tasks to the survey participants (e.g. coverage of certain areas in a certain time frame). Each participating country is responsible for the activities conducted on its national part of the international survey.



Map: Baltic International Trawl Survey (BITS): Example for trawling positions in the 1st quarter (upper panel) and in the 4th quarter (lower panel) in 2015

Baltic International Acoustic Survey (BIAS, Autumn)

1. Objectives of the survey

Target species are small pelagic fish species, mainly Baltic herring, sprat and additionally European anchovy. The main aim is to provide information on stock parameters of small pelagics in the Baltic Sea. Target data are biomass, weight and length distributions and length-weight-age-sex-maturity of small pelagic target species in the Kattegat and western Baltic Sea including Belt Sea, Sound and Arkona Sea as well as hydrographic data (temperature, salinity and oxygen). The data are saved in a national SQL database and storage in an ICES database is planned.

2. Description of the methods used in the survey. For mandatory surveys, link to the manuals. Include a graphical representation (map)

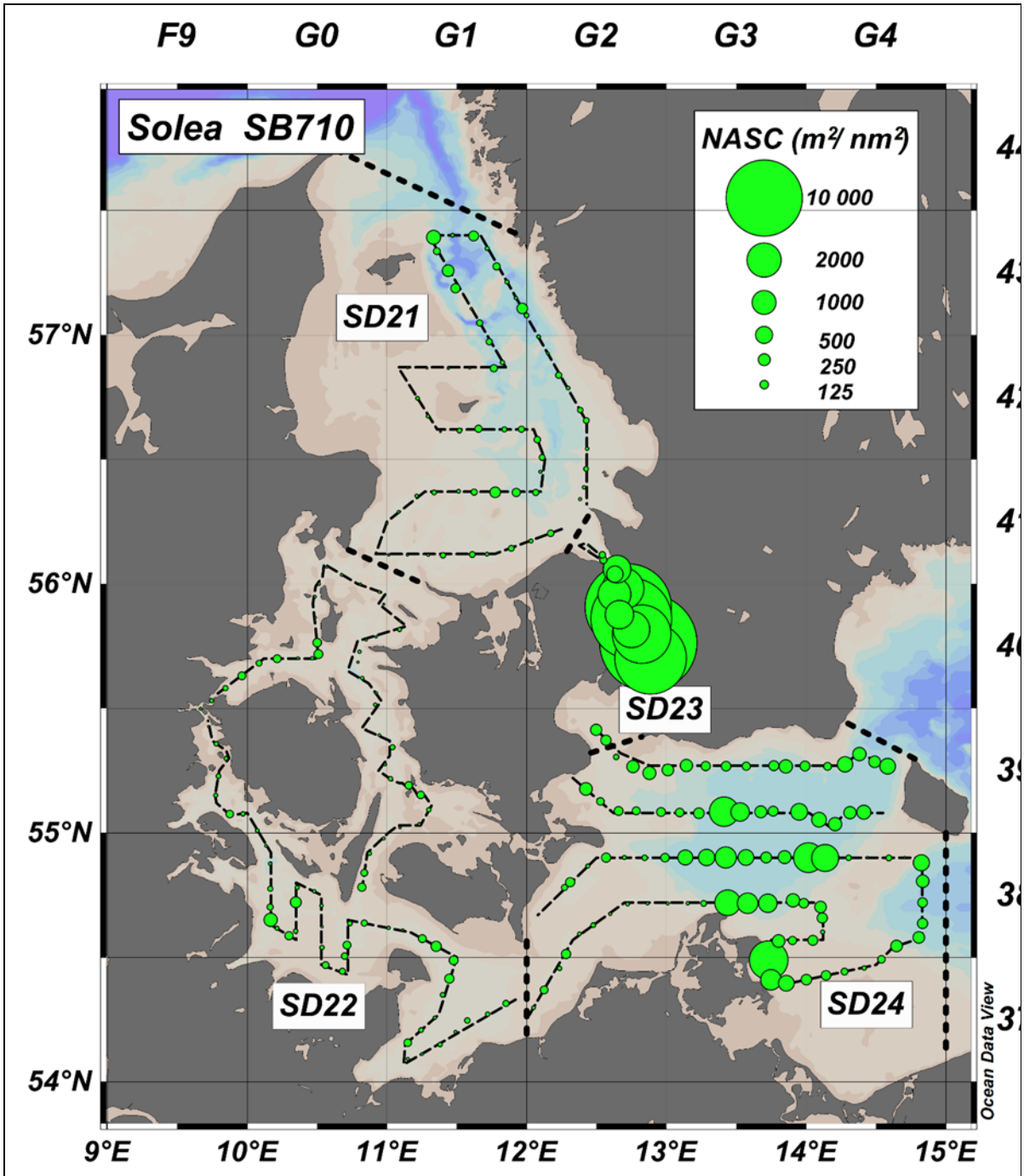
see survey manual: http://www.ices.dk/community/groups/Pages/WGBIFS.aspx

3. For internationally coordinated surveys, describe the participating Member States/vessels and the relevant international group in charge of planning the survey

Denmark (R/V DANA) and Sweden (R/V SVEA), Finland (R/V ARANDA), Germany (R/V SOLEA), Lithuania (R/V DARIUS), Latvia (R/V BALTICA), Poland (R/V BALTICA), Estonia (R/V ULRIKA) and Russia (R/V ATLANTNIRO). ICES WGBIFS is coordinating the planning of this survey.

4. Where applicable, describe the international task sharing (physical and/or financial) and the cost sharing agreement used

The ICES survey planning group (WGBIFS) assigns the tasks to the survey participants (e.g. coverage of certain areas in a certain time frame). Each participating country is responsible for the activities conducted on its national part of the international survey. Cost sharing: There is no particular cost sharing agreement in place yet for this survey.



Map: Baltic International Acoustic Survey (BIAS), October 2015: Example for cruise track and NASC values

Sprat Acoustic Survey (SPRAS)

1. Objectives of the survey

Target species is sprat. The main aim is to provide information on stock parameters of sprat in the Baltic Sea. Target data are biomass, weight and length distributions and length-weight-age-sex-maturity of sprat in the western Baltic Sea including Belt Sea, Sound, Arkona Sea and Bornholm Sea as well as hydrographic data (temperature, salinity and oxygen). The collected data are saved in a national SQL-database and storage in an international database is planned.

2. Description of the methods used in the survey. For mandatory surveys, link to the manuals. Include a graphical representation (map)

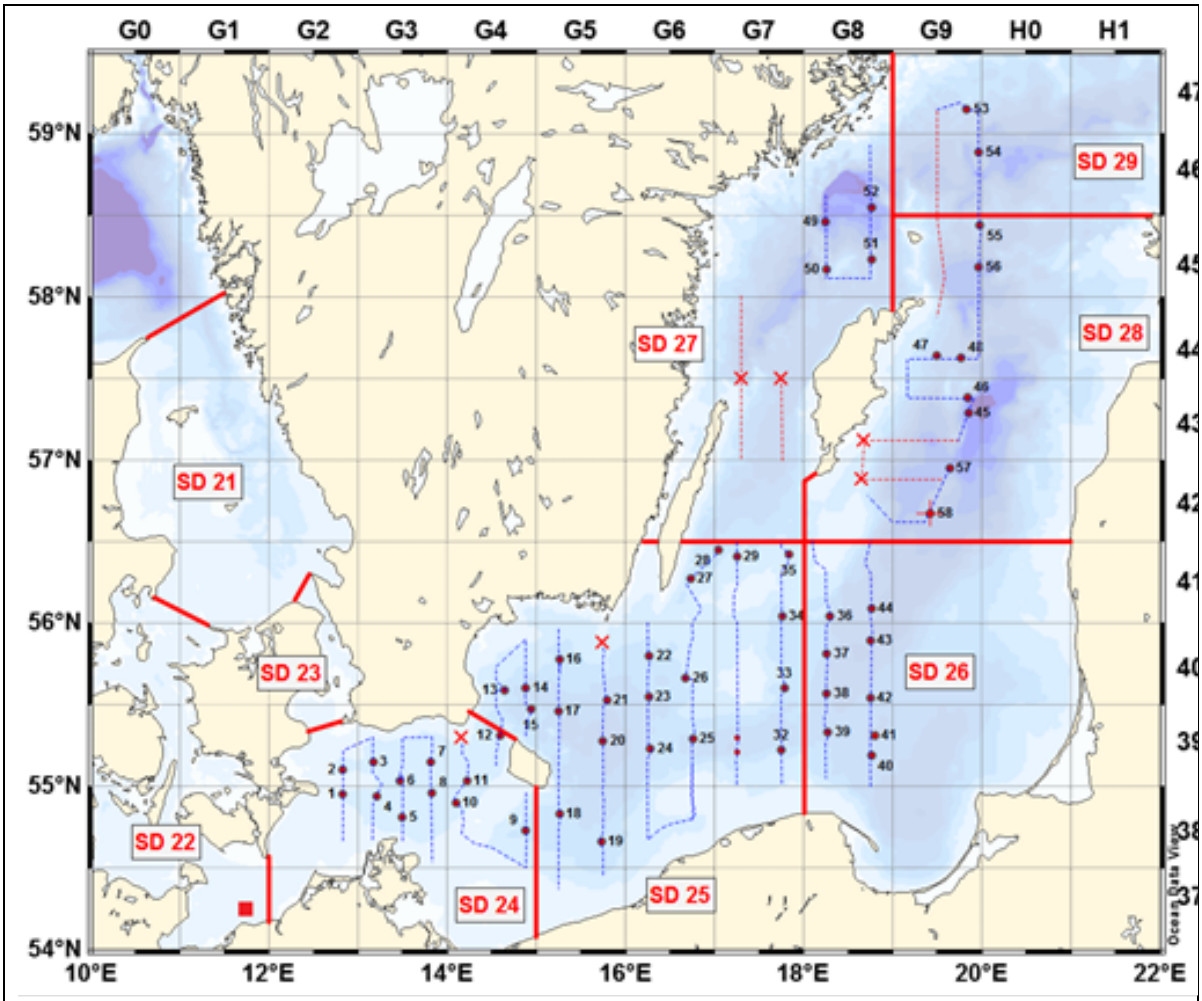
see survey manual: http://www.ices.dk/community/groups/Pages/WGBIFS.aspx

3. For internationally coordinated surveys, describe the participating Member States/vessels and the relevant international group in charge of planning the survey

Denmark (R/V DANA and R/V HAVFISKEN) and Sweden (R/V SVEA), Germany (R/V WALTER HERWIG), Lithuania (R/V DARIUS), Poland(R/V BALTICA), Latvia (R/V ULRICA), Estonia (R/V ULRICA) and Russia (R/V ATLANTNIRO). ICES WGBIFS is coordinating the planning of this survey.

4. Where applicable, describe the international task sharing (physical and/or financial) and the cost sharing agreement used

The ICES survey planning group (WGBIFS) assigns the tasks to the survey participants (e.g. coverage of certain areas in a certain time frame). Each participating country is responsible for the activities conducted on its national part of the international survey. Cost sharing: There is no particular cost sharing agreement in place yet for this survey.



Map: Sprat Acoustic Survey (SPRAS), February 2015: Example of a cruise track

Rügen Herring Larvae Survey (RHLS)

1. Objectives of the survey

Target species is the western Baltic spring-spawning herring. The main aim is to monitor the spawning activity of the spring-spawning herring of the Western Baltic Sea in its main spawning area, the Greifswald Bay. Target data are a high-resolution spatial and temporal records of the larval abundance during the entire spawning period as well as hydrographic data (temperature, salinity and oxygen). The collected data are stored nationally and in the ICES Fish Eggs and Larvae dataset.

2. Description of the methods used in the survey. For mandatory surveys, link to the manuals. Include a graphical representation (map)

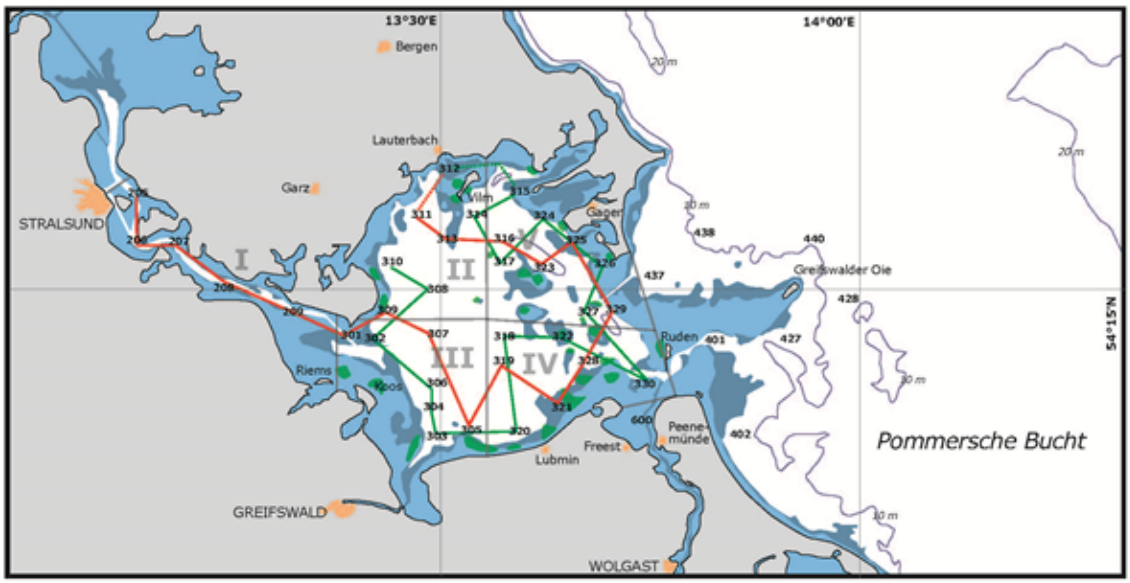
Manual is available on request.

3. For internationally coordinated surveys, describe the participating Member States/vessels and the relevant international group in charge of planning the survey

National survey only.

4. Where applicable, describe the international task sharing (physical and/or financial) and the cost sharing agreement used

National survey only.



Map: Rügen Herring Larvae Survey (RHLS), March-June 2015: Cruise track and station plan

International Bottom Trawl Survey, Quarter 1 (IBTS Q1)

1. Objectives of the survey
   - To determine the distribution and relative abundance of pre-recruits of the main commercial species with a view of deriving recruitment indices;
   - To monitor changes in the stocks of commercial fish species independently of commercial fisheries data;
   - To monitor the distribution and relative abundance of all fish species and selected invertebrates;
   - To collect data for the determination of biological parameters for selected species;
   - To collect hydrographical and environmental information;
   - To determine the abundance and distribution of late herring larvae in order to provide the ICES Herring Assessment Working Group (HAWG) with a recruitment index for the North Sea herring stock.
   - To collect fish eggs in conjunction with the MIK sampling to determine principal spawning grounds of winter spawning fish in the North Sea
2. Description of the methods used in the survey. For mandatory surveys, link to the manuals. Include a graphical representation (map)

Bottom trawling with a standard GOV trawl; CTD casts; Plankton net haul with a MIK net and the attachment MIKeyM net;

Survey manuals
ICES 2015: Manual for the International Bottom Trawl Survey, Revision IX. SISP 10
http://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%2010%20-%20Manual%20for%20the%20International%20Bottom%20Trawl%20Surveys%20-%20Revision%20IX.pdf
ICES 2017. Manual for the Midwater Ring Net sampling during IBTS Q1. Series of ICES Survey Protocols SISP 2. 25 pp. http://doi.org/10.17895/ices.pub.3434
ICES 2018. Manual for egg survey for winter spawning fish in the North Sea. Series of ICES Survey Protocols SISP 13. 19 pp. http://doi.org/10.17895/ices.pub.5225

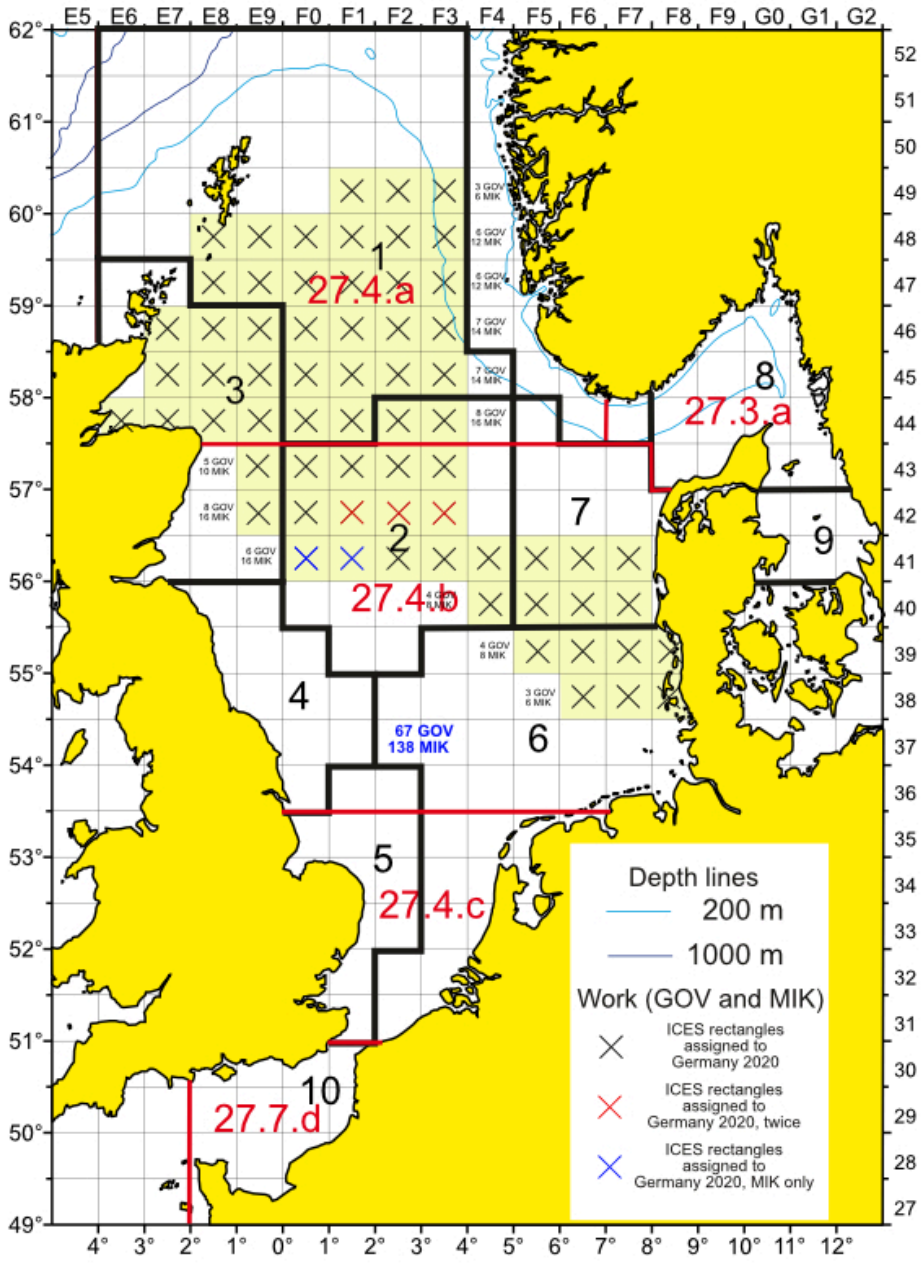
3. For internationally coordinated surveys, describe the participating Member States/vessels and the relevant international group in charge of planning the survey

France: RV Thalassa, The Netherlands: RV Tridens, Germany: FRV Walther Herwig III, Denmark: RV Dana, Sweden: RV Svea, Norway: RV G.O. Sars, Scotland: RV Scotia

Coordinating body is the ICES International Bottom Trawl Survey Working Group (IBTSWG).

4. Where applicable, describe the international task sharing (physical and/or financial) and the cost sharing agreement used

Individual tasks to the survey participants (e.g. coverage of certain areas in a certain time frame) are allocated by the IBTSWG. Each participating country is responsible for the activities conducted on its national part of the international survey. Cost sharing: There is no particular cost sharing agreement in place yet for this survey.



Map: International Bottom Trawl Survey (IBTS) in the North Sea: German Coverage (Q1)

International Bottom Trawl Survey, Quarter 3 (IBTS Q3)

1. Objectives of the survey

The main objective of the IBTS Q3 is to provide abundance indices of the target species haddock, cod, saithe, herring, sprat whiting, mackerel and Norway pout in the North Sea and the Skagerrak. Germany participates as one of six nations in the internationally coordinated survey. Apart from abundance indices, information on individual length, weight and age is collected for the target species. Additional age data are obtained for selected fish species to be evaluated for future use in assessments (e.g. plaice). Furthermore, abundance, weight and length data are collected for all fish species caught. This serves the second objective to obtain information on changes in the distribution of fish species, in the composition of regional groundfish assemblages and on their biodiversity.

2. Description of the methods used in the survey. For mandatory surveys, link to the manuals. Include a graphical representation (map)

Types of data collected include biological data for the groundfish community, as well as additional data on the bycatch of benthic invertebrates. The German part of the survey includes a dedicated sampling programme of benthic epifauna and sediments. Further accompanying data recorded include information on stations and gear performance, hydrographic data, observations of weather and sea state. Additionally, quantitative observations of seabirds at sea are conducted. The data are stored locally in databases in the national institutes and submitted to public international databases at ICES. - A detailed description of the survey methods can be found in the corresponding survey manual: http://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20%28SISP%29/SISP%2010%20-%20Manual%20for%20the%20International%20Bottom%20Trawl%20Surveys%20-%20Revision%20IX.pdf

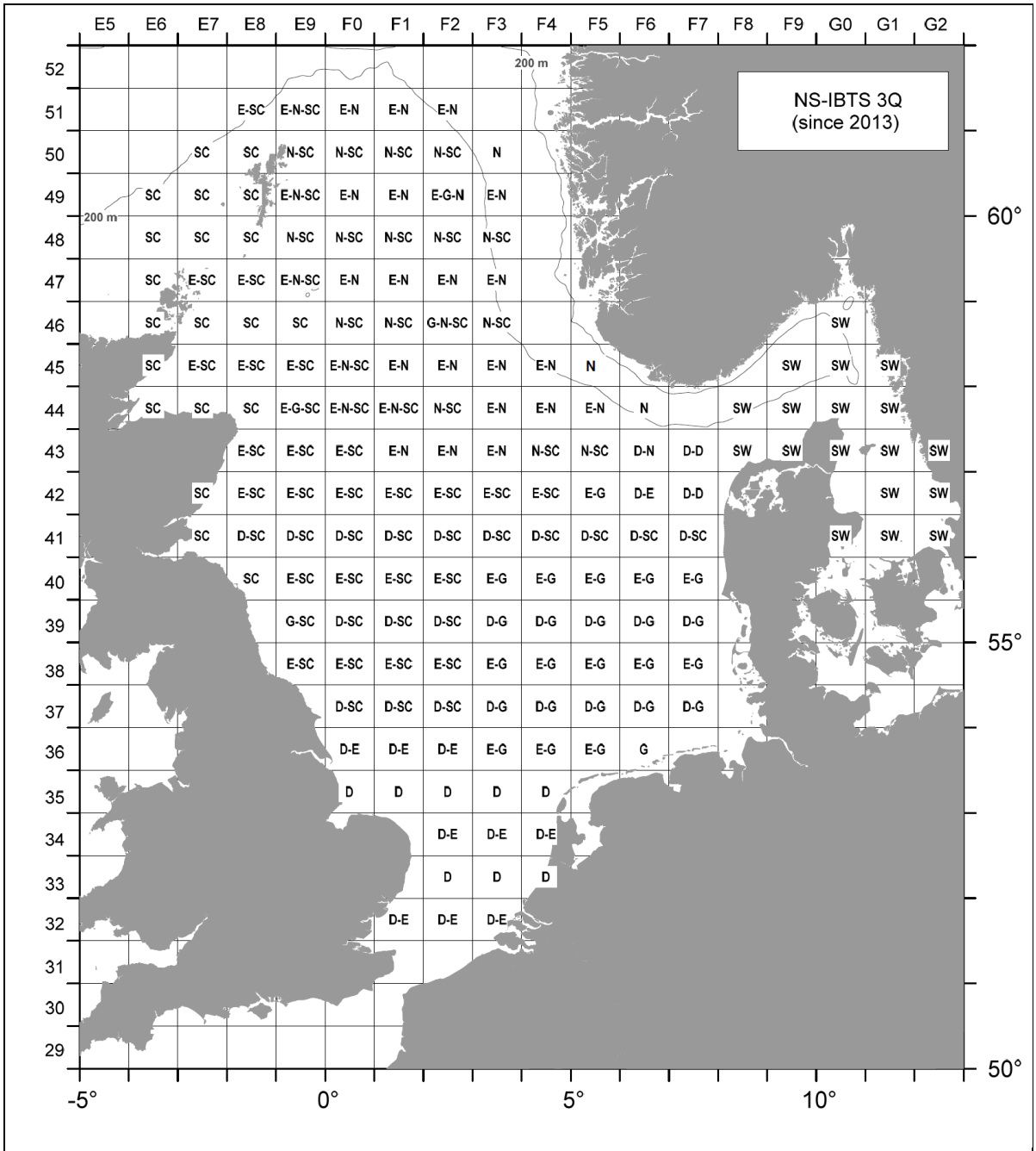
3. For internationally coordinated surveys, describe the participating Member States/vessels and the relevant international group in charge of planning the survey

UK England: RV Endeavour, Germany: FRV Walther Herwig III, Denmark: RV Dana, Sweden: RV Svea, Norway: RV G.O. Sars, UK Scotland: RV Scotia

Coordinating body is the ICES IBTSWG.

4. Where applicable, describe the international task sharing (physical and/or financial) and the cost sharing agreement used

Individual tasks to the survey participants (e.g. coverage of certain areas in a certain time frame) are allocated by the IBTSWG. Each participating country is responsible for the activities conducted on its national part of the international survey. Cost sharing: There is no particular cost sharing agreement in place yet for this survey.



Map: International Bottom Trawl Survey (IBTS) in the North Sea (Q3): Survey Grid

North Sea Beam Trawl Survey (BTS)

1. Objectives of the survey

Target species of this survey are mainly sole and plaice but also associated species. The survey provides densities (abundance and biomass) indices for the target species as well as hydrographic data.

2. Description of the methods used in the survey. For mandatory surveys, link to the manuals. Include a graphical representation (map)

All surveys coordinated by WGBEAM are carried out with a beam trawl. Depending on the local circumstances and the ship's capacity, the width and rigging of the beam trawls varies. Germany uses a light 7.2 m beam trawl.

Manual: http://www.ices.dk/marine-data/Documents/DATRAS%20Manuals/WGBEAM_Manual.pdf

3. For internationally coordinated surveys, describe the participating Member States/vessels and the relevant international group in charge of planning the survey

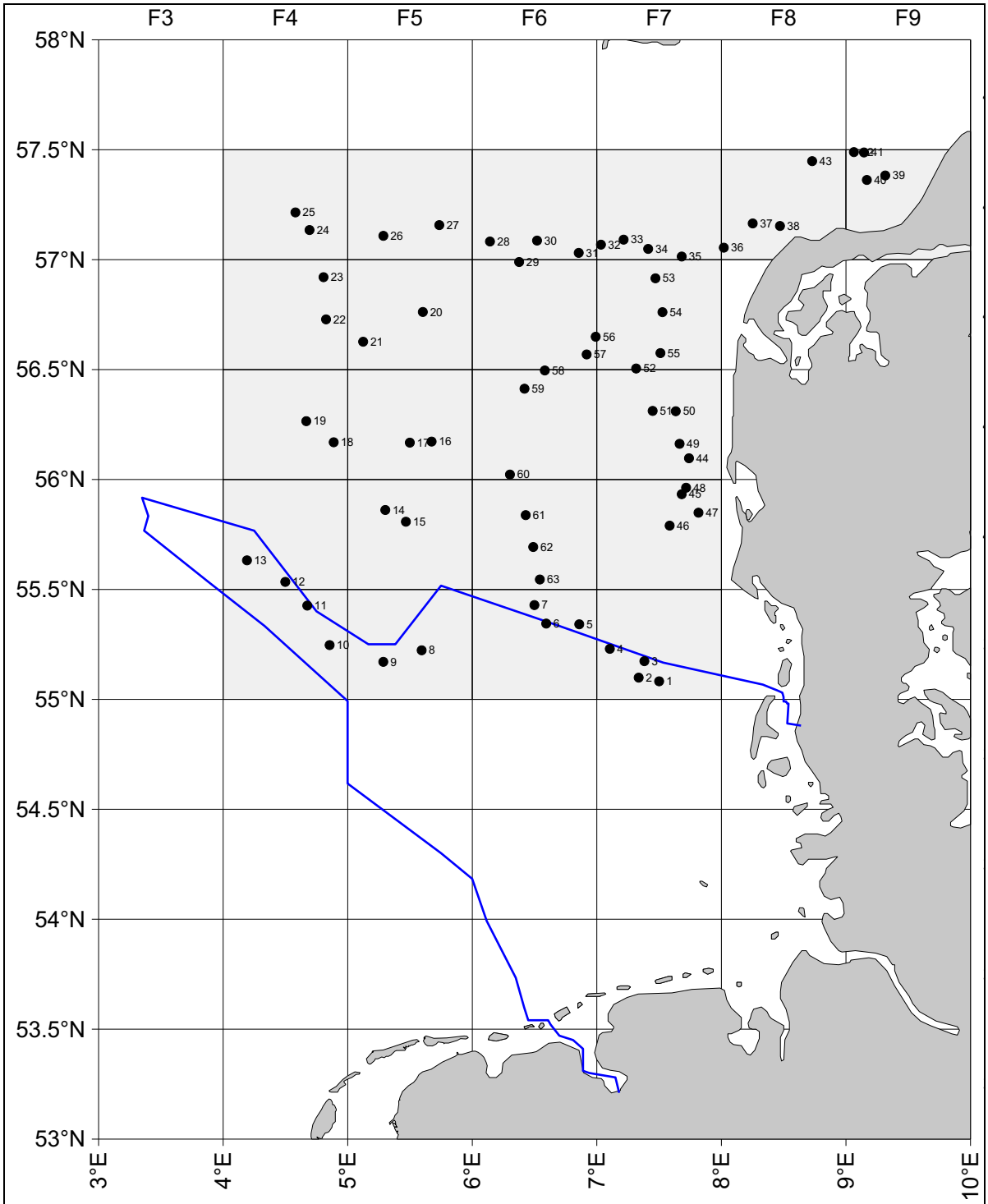
The Beam Trawl Survey in the North Sea and Eastern English Channel are carried out by Belgium, Germany, Netherlands and UK-Cefas.

The research vessels are BELGICA for Belgium, SOLEA for Germany, TRIDENS for The Netherlands and CEFAS ENDEAVOUR for the UK.

The survey planning group is the ICES WGBEAM.

4. Where applicable, describe the international task sharing (physical and/or financial) and the cost sharing agreement used

Individual tasks to the survey participants (e.g. coverage of certain areas in a certain time frame) are allocated by the WGBEAM. Each participating country is responsible for the activities conducted on its national part of the international survey. Cost sharing: There is no particular cost sharing agreement in place yet for this survey.



Map: North Sea Beam Trawl Survey (BTS): Station plan

Demersal Young Fish Survey (DYFS)

1. Objectives of the survey

The aim of the survey is to provide abundance indices of sole, plaice, whiting and cod as well as of other demersal young fish and brown shrimp. The indices are part of a time series which started in the early 1970's. The collected data are stored locally in a national data base and will be submitted to the ICES DATRAS. Data are used by ICES WGNSSK, WGBEAM and WGCRAN and are relevant to the trilateral Wadden Sea Monitoring Programme (TMAP). Comparable investigations are conducted by NED and BEL. The German part of the survey consists of short trips on chartered commercial cutters and the RV Clupea yearly in September/October.

2. Description of the methods used in the survey. For mandatory surveys, link to the manuals. Include a graphical representation (map)

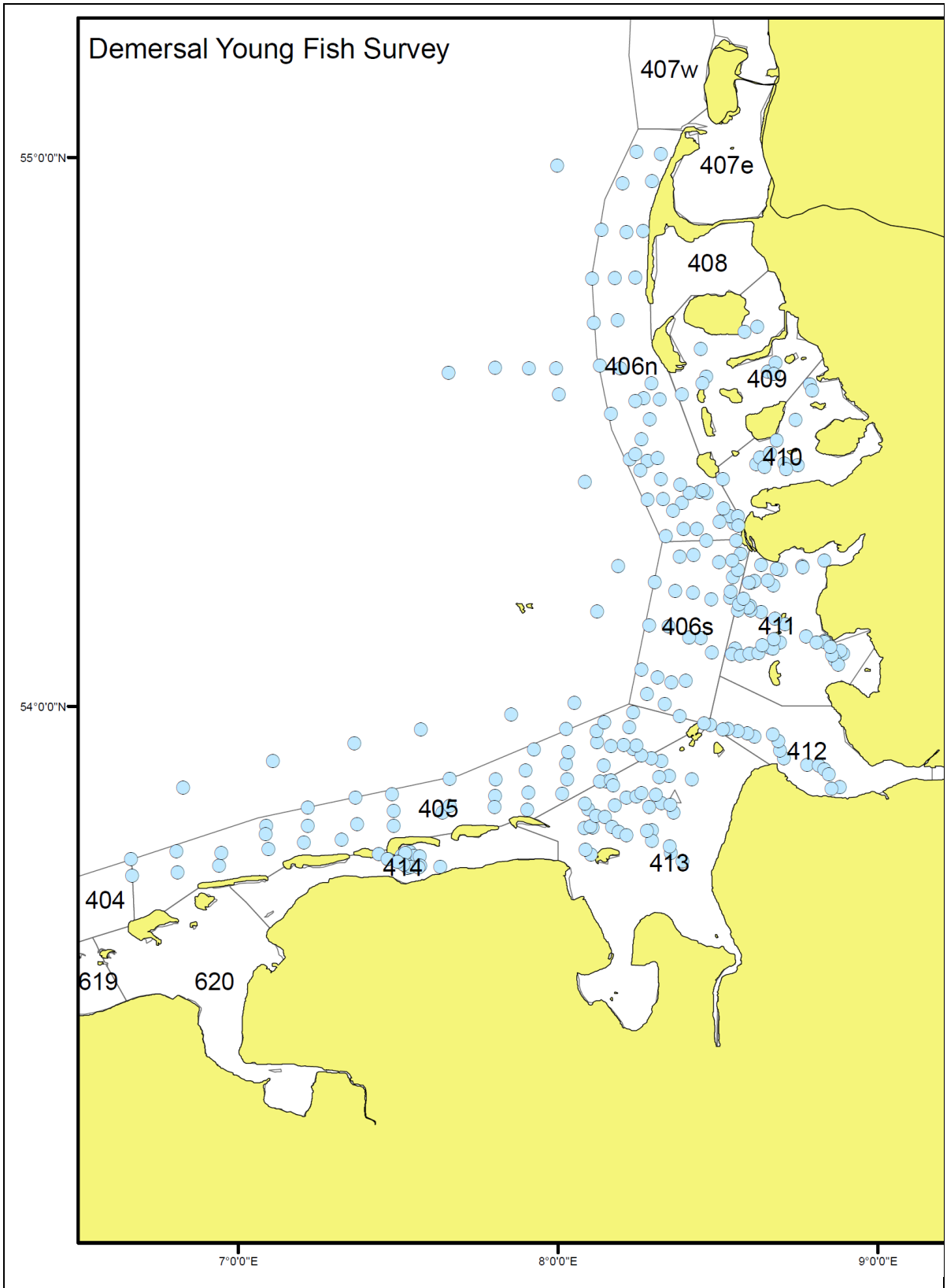
Steel 3m-shrimp-beam trawl without tickler chain, 20mm codend. An electronic mini sensor for time, temperature and pressure (turbidity optional) is attached. The whole catch is weighted and sorted, unless for the exceptional case of a very large catch, when only a sub-sample is processed. Length distributions are recorded for all finfish species caught, measured to the cm below. Herring and sprat are measured to the 0.5 cm. Survey manual:
http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/SSGIEOM/2015/01%20WGBEAM%20-%20Report%20of%20the%20Working%20Group%20on%20Beam%20Trawl%20Surveys%20%28WGBEAM%29.pdf

3. For internationally coordinated surveys, describe the participating Member States/vessels and the relevant international group in charge of planning the survey

This survey is coordinated by the ICES Working Group on Beam Trawl Surveys (WGBEAM). Participating countries are The Netherlands, Germany and Belgium. The Netherlands cover the area from the Dutch to the Danish coast with the RV Isis. In the Dutch Wadden Sea area, the RVs Stern and Waddenzee are used and the Scheldt Estuary is covered by the RV Schollevaar. Germany operates with chartered commercial shrimp cutters in the German Wadden Sea and operates along the German coast with the RV Clupea. Belgium operates along the Belgium coast with the RV Broodwinner. For further details, see the WGBEAM reports, e.g.:
http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/SSGIEOM/2015/01%20WGBEAM%20-%20Report%20of%20the%20Working%20Group%20on%20Beam%20Trawl%20Surveys%20%28WGBEAM%29.pdf).

4. Where applicable, describe the international task sharing (physical and/or financial) and the cost sharing agreement used

Individual tasks to the survey participants (e.g. coverage of certain areas in a certain time frame) are allocated by WGBEAM. Each participating country is responsible for the activities conducted on its national part of the international survey. Cost sharing: There is no particular cost sharing agreement in place yet for this survey.



Map: Demersal Young Fish Survey (DYFS): Station grid

International Herring Larvae Surveys (IHLS)

1. Objectives of the survey

The main objective of the survey is helping to assess the herring stocks in the North Sea. The results of the herring larvae surveys are used to calculate an overall biomass index of the SSB of North Sea autumn-spawning herring as well as the relative contribution of different stock components on the total herring reproduction. The surveys monitor the annual distribution and abundance of herring larvae at the main spawning locations, the length frequency of herring larvae, as well as ambient water temperature and salinity. All relevant herring larvae data are stored together with basic hydrographic information in the ICES eggs and larvae database. The surveys are conducted annually during autumn and winter.

2. Description of the methods used in the survey. For mandatory surveys, link to the manuals. Include a graphical representation (map)

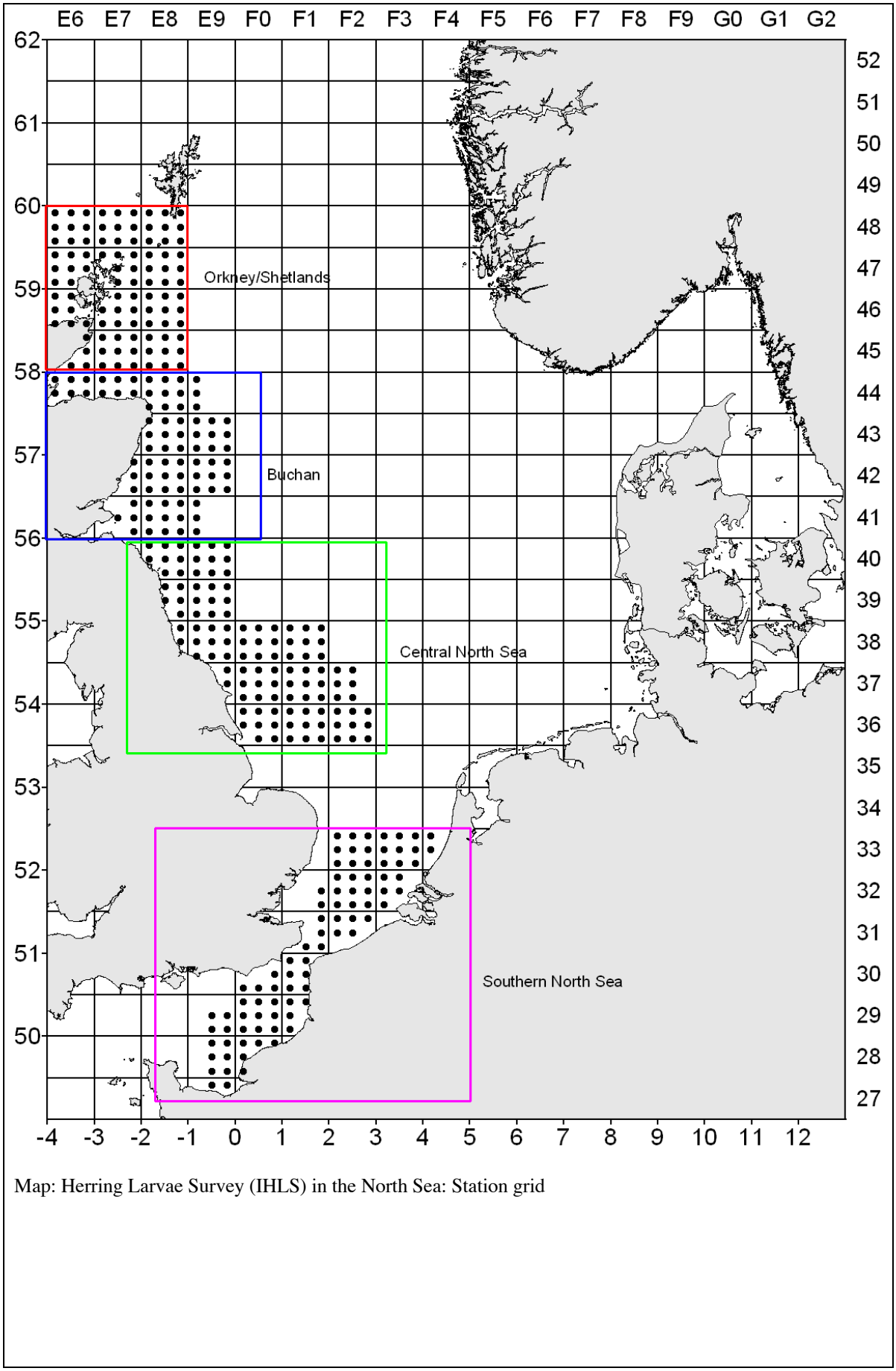
Herring larval abundance is surveyed at the major herring spawning grounds in the North Sea, e.g. in the Orkney/Shetland area, the Buchan region, the Central North Sea and the Southern North Sea. Standard gears are high-speed GULF samplers, deployed in a double oblique manner to near the sea bed and back to surface. Stations are located on a 10 by 10 nautical miles grid. This grid includes every square that is known to contain herring larvae less than 10 mm. Herring larvae are sorted from the samples and length-measured. The number of larvae per m^2 at each station is used to calculate mean numbers of larvae per m^2 for each ICES rectangle (consist of nine IHLS stations in total). These values are raised by the sea surface corresponding to the relevant rectangle and summed over the total area to obtain larvae abundance indices. The manual of the IHLS is available as Annex 7 to the ICES WGIPS Report 2010.

3. For internationally coordinated surveys, describe the participating Member States/vessels and the relevant international group in charge of planning the survey

Germany and The Netherlands participate in the IHLS sampling. With regard to the prevailing weather conditions, they most frequently use larger research vessels, e.g. FRV "Walther Herwig III" and RV "Tridens". The parental committee for the IHLS is the ICES Working Group on International Pelagic Surveys (WGIPS).

4. Where applicable, describe the international task sharing (physical and/or financial) and the cost sharing agreement used

Individual tasks to the survey participants (e.g. coverage of certain areas in a certain time frame) are allocated by WGIPS. Each participating country is responsible for the activities conducted on its national part of the international survey. Cost sharing: There is no particular cost sharing agreement in place yet for this survey.



Map: Herring Larvae Survey (IHLS) in the North Sea: Station grid

North Sea Herring Acoustic Survey (NHAS)

1. Objectives of the survey

The survey aims to provide an annual estimate of the distribution, abundance and population structure to inform the assessment of the following herring and sprat stocks: Western Baltic spring-spawning herring (in ICES Divisions IV and IIIa), North Sea autumn-spawning herring (in IV, IIIa and VIId), West of Scotland herring (in VIaN), Malin Shelf herring (west of Scotland/Ireland in VIaN-S and VIIb,c), North Sea sprat (in IV) and sprat in IIIa (Skagerrak/Kattegat). The derived estimates and age structure of herring and sprat are used as tuning indices in the respective assessments and are submitted annually to the ICES Herring Assessment Working Group (HAWG).

2. Description of the methods used in the survey. For mandatory surveys, link to the manuals. Include a graphical representation (map)

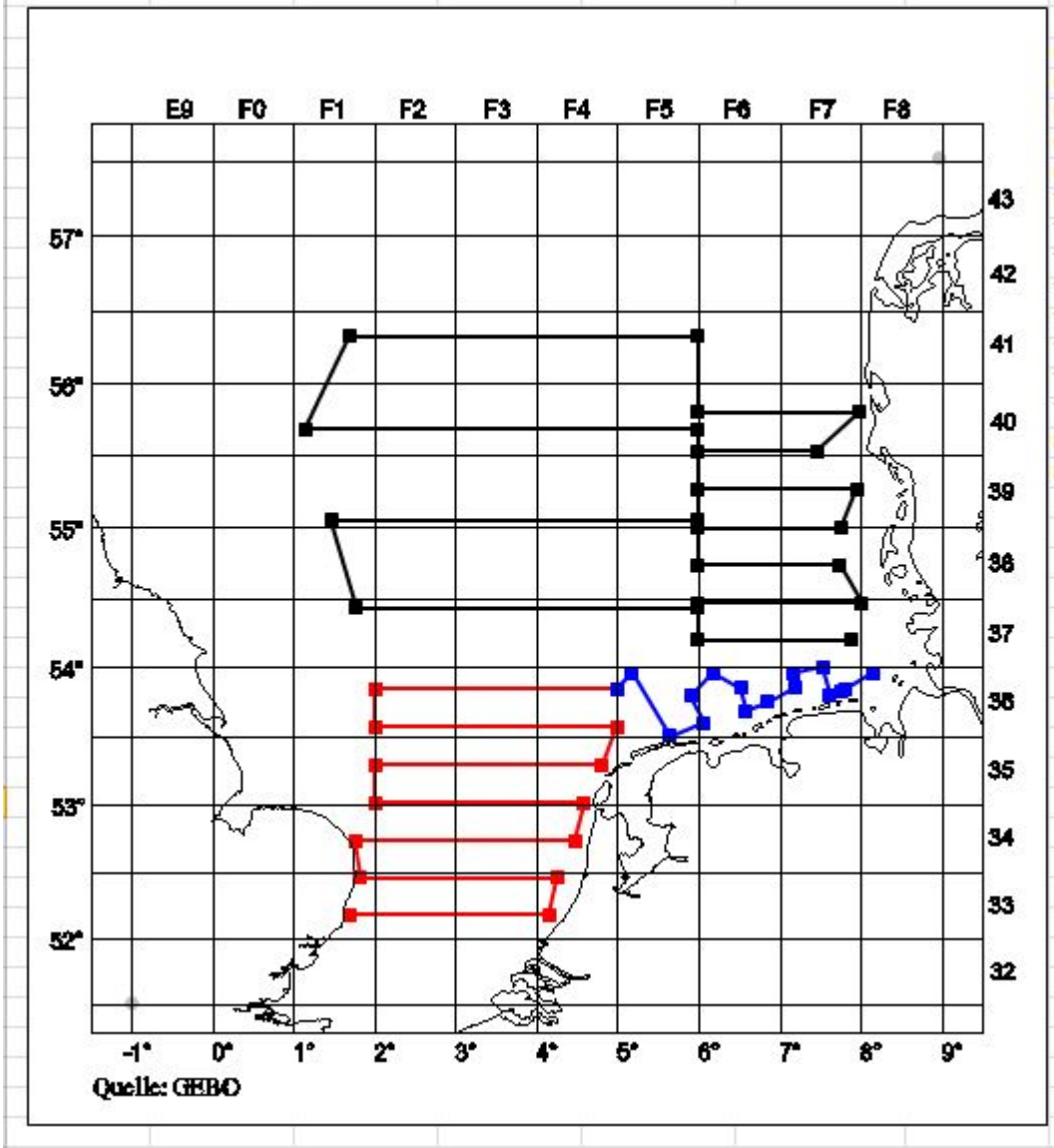
Types of data collected include 1nm NASCs for clupeid fish (acoustic data), age and length distribution for all clupeids in the investigation area, maturity at age. Survey manual: http://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20%28SISP%29/SISP%209%20Manual%20for%20International%20Pelagic%20Surveys%20%28IPS%29.pdf

3. For internationally coordinated surveys, describe the participating Member States/vessels and the relevant international group in charge of planning the survey

Participants (countries/vessels) of this internationally coordinated survey include: IRL (RV "Celtic Explorer"), SCO (RV "Scotia"), NOR (RV "Johan Hjort"), DEN (RV "Dana"), NED (RV "Tridens"), GER (FRV "Solea"). The survey is planned, coordinated and evaluated by the ICES Working Group on International Pelagic Surveys (ICES WGIPS).

4. Where applicable, describe the international task sharing (physical and/or financial) and the cost sharing agreement used

Individual tasks to the survey participants (e.g. coverage of certain areas in a certain time frame) are allocated by WGIPS. Each participating country is responsible for the activities conducted on its national part of the international survey. Cost sharing: There is no particular cost sharing agreement in place yet for this survey.



Map: North Sea Herring Acoustic Survey (NHAS): Cruise tracks

International Redfish Trawl and Acoustic Survey (REDTAS, actual name: International Deep Pelagic Ecosystem Survey (IDEEPS))

1. Objectives of the survey

This cruise is part of a co-ordinated effort of ICES to undertake an International Deep Pelagic Ecosystem Survey in the Irminger Sea and adjacent waters in June/July, estimating the abundance and biomass of the pelagic beaked redfish (*Sebastes mentella*) stocks and conducting additional observations relevant to integrated ecosystem assessment in the area.

2. Description of the methods used in the survey. For mandatory surveys, link to the manuals. Include a graphical representation (map)

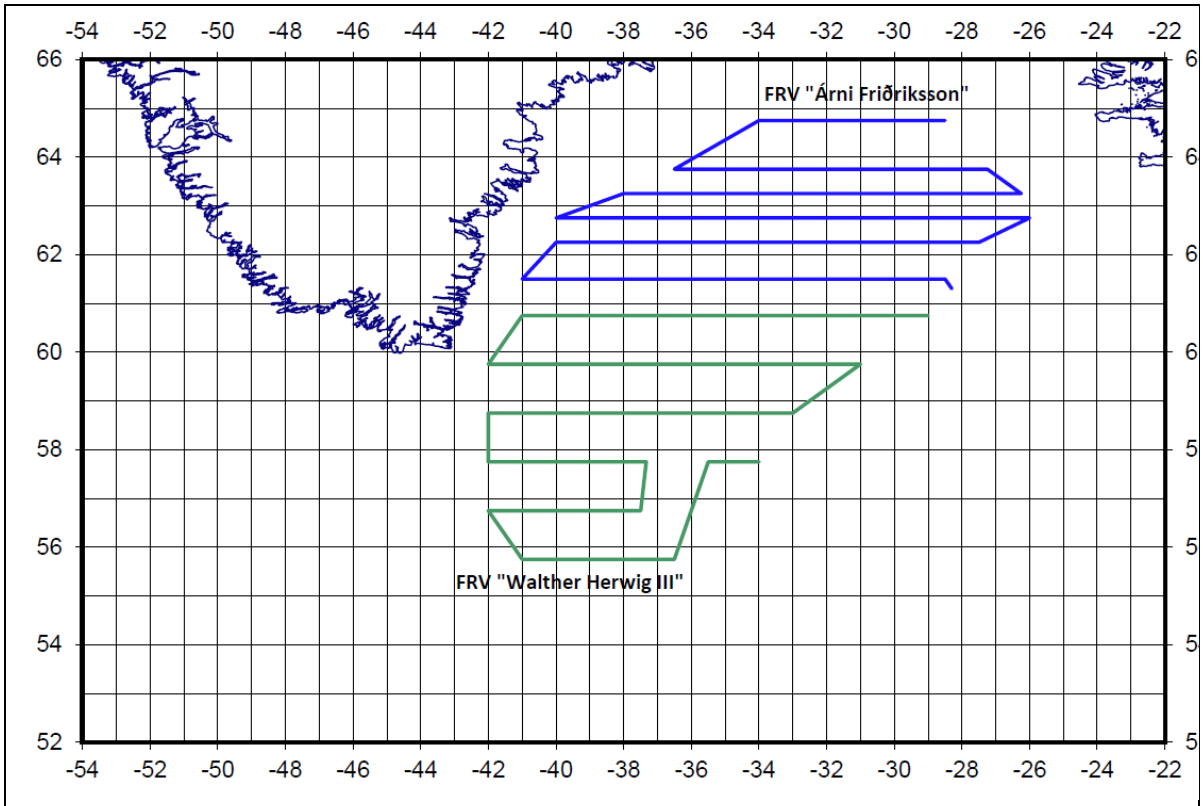
The international trawl/acoustic survey on pelagic redfish in the Irminger Sea and adjacent waters in June/July is generally carried out by three vessels from Germany, Iceland and Russia (currently only Russia and Germany participate in the survey). In the depth zone that can be surveyed by hydroacoustic measurements, i.e. shallower than the deep-scattering layer (DSL; down to about 350 m), hydroacoustic measurements and identification trawls are carried out. Within and below the DSL (down to about 950 m), redfish abundance is estimated by trawls. Biological are collected from the redfish caught in the pelagic trawls and hydrographical measurements are taken on regular stations on the survey tracks. For details, see: http://www.ices.dk/community/groups/Pages/WGIDEEPS.aspx

3. For internationally coordinated surveys, describe the participating Member States/vessels and the relevant international group in charge of planning the survey

The survey takes place every three years and is scheduled to be a joint survey by Germany with the FRV “Walther Herwig III” and by Russia (RV “Vilnyus”). The main objective of the survey and the international co-operation of the survey are planned by the “ICES Working Group on International Deep Pelagic Ecosystem Surveys (WGIDEEPS – former name: Working Group on Redfish Surveys)” which usually meets late January/early February of the survey year.

4. Where applicable, describe the international task sharing (physical and/or financial) and the cost sharing agreement used

Individual tasks to the survey participants (e.g. coverage of certain areas in a certain time frame) are allocated by WGIDEEPS. Each participating country is responsible for the activities conducted on its national part of the international survey. Cost sharing: There is no particular cost sharing agreement in place yet for this survey.



Map: Deep Pelagic Ecosystem Survey: Hydroacoustic transects in 2015

Greenland Groundfish Survey (GGS)

1. Objectives of the survey

The objective is to obtain data for the assessment of cod, demersal redfish and other demersal species in Greenland.

2. Description of the methods used in the survey. For mandatory surveys, link to the manuals. Include a graphical representation (map)

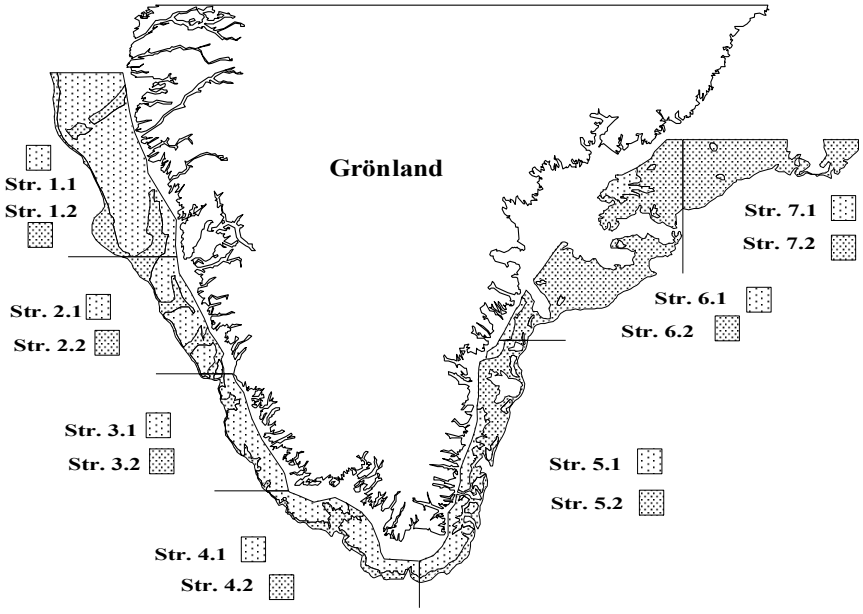
Demersal trawling, plankton sampling and CTD casts for physical oceanographic measurements along standard transects are carried out. Manual available at www.thuenen.de. The German groundfish survey started in 1982 and was primarily designed for the assessment of cod, but covers the entire groundfish fauna down to 400 m depth. It is carried out annually during the 4th quarter and provides the only fishery-independent information about the abundance & biomass of groundfish off Greenland (ICES Div. XIVb and NAFO Div. 1B-1F). Designed as a stratified random survey, the hauls are allocated to 14 strata (7 geographic areas * 2 depth strata, 0-200m, 201-400m) off West and East Greenland. The fishing gear used is a standardised 140-feet bottom trawl. Biological data from the catches (length distributions for all species, individual weights, gonad and liver weights as well as sex and maturity for the commercial species) are collected, population data raised to the total surveyed area and submitted to the ICES North-Western Working Group (NWWG) and NAFO Scientific Council and used in the respective stock assessments. In addition, hydrographic (CTD) and weather data are collected. The survey is carried out every October/November on FRV "Walther Herwig III".

3. For internationally coordinated surveys, describe the participating Member States/vessels and the relevant international group in charge of planning the survey

The survey is regularly evaluated through ICES NWWG. DEU is the only EU Member State to undertake this survey. The current vessel used for the survey is FRV Walther Herwig III.

4. Where applicable, describe the international task sharing (physical and/or financial) and the cost sharing agreement used

No task sharing with other countries for the autumn survey. Greenland conducts a parallel spring survey with its own vessel. Data from the two seasons are combined in assessment.



Map: Greenland Groundfish Survey (GGS): Sampling strata

International Mackerel and Horse Mackerel Egg Survey (MEGS)

1. Objectives of the survey

The main objective of this triennial survey is to produce both an index and a direct estimate of the biomass of the North East Atlantic mackerel stock and an egg production index of the southern and western horse mackerel stocks.

2. Description of the methods used in the survey. For mandatory surveys, link to the manuals. Include a graphical representation (map)

The general method is to quantify the freshly spawned eggs in the water column on the spawning grounds and to determine the fecundity of the females. This is done by sampling sufficient numbers of gonads before during and after the spawning. These are then histologically analysed. In combination, the realised fecundity (potential fecundity minus atresia) of the females and the actual number of freshly spawned eggs in the water render an estimate of the spawning stock biomass.

Survey Manual: ICES 2014. Manual for the mackerel and horse mackerel egg surveys (MEGS): sampling at sea. Series of ICES Survey Protocols. SISP 6 - MEGS V1.3. 62 pp.

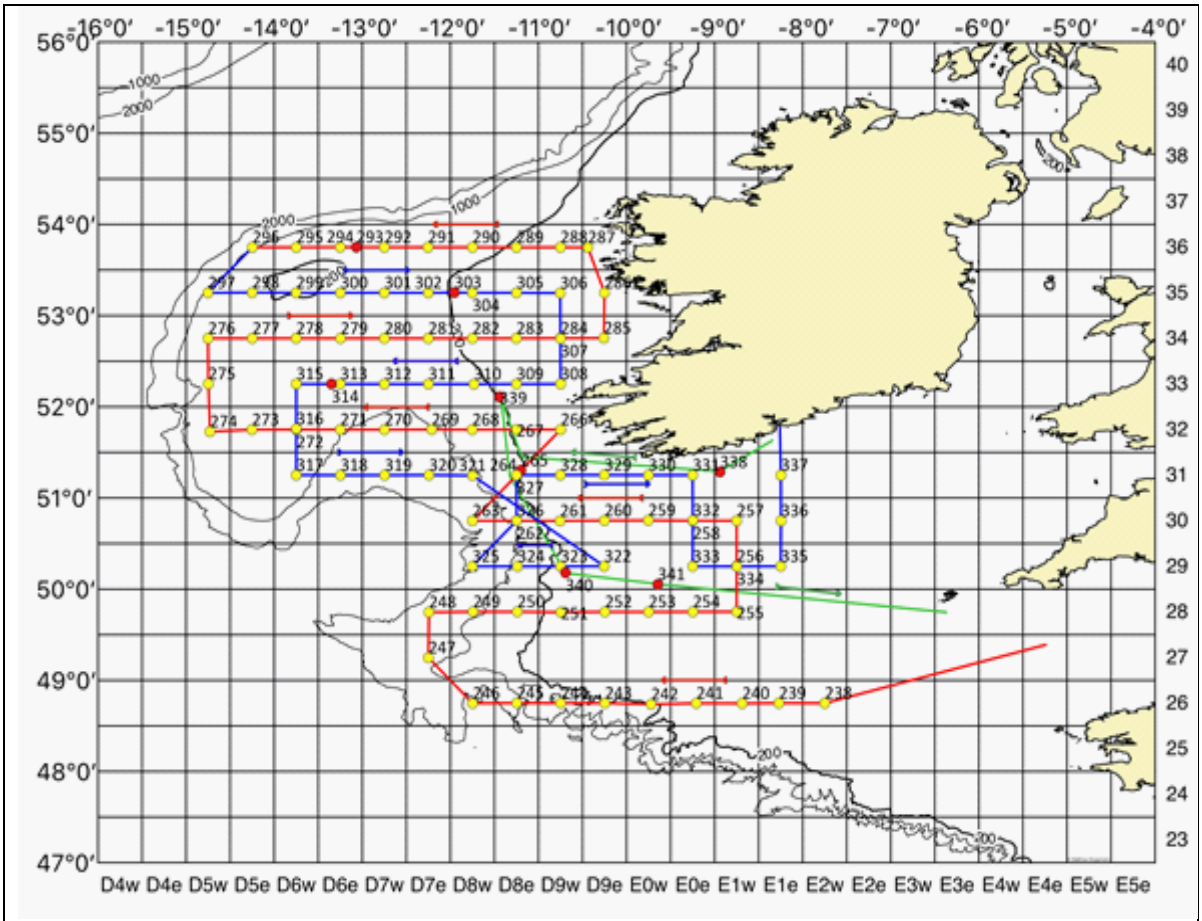
3. For internationally coordinated surveys, describe the participating Member States/vessels and the relevant international group in charge of planning the survey

Portugal: RV Noruega, Spain: RV Vizconde de Eza + RV Ramon Margalef, The Netherlands: RV Tridens, Germany: FRV Walther Herwig III (in 2019 Danish RV Dana was chartered), Ireland: RV Celtic Explorer + RV Corystes (2019), Faroe Islands: RV Magnus Hendersson, Iceland: RV Bjarni Saemundsson; UK Scotland: RV "Scotia" plus chartered vessels, Norway: chartered vessel Brennholm (2019)

Coordinating body is the ICES Working Group on Mackerel and Horse Mackerel Egg Surveys (WGMEGS).

4. Where applicable, describe the international task sharing (physical and/or financial) and the cost sharing agreement used

Individual tasks to the survey participants (e.g. coverage of certain areas in a certain time frame) are allocated by WGMEGS. Each participating country is responsible for the activities conducted on its national part of the international survey. Cost sharing: There is no particular cost sharing agreement in place yet for this survey.



Map: International Mackerel and Horse Mackerel Egg Survey (MEGS): German Coverage 2016 (yellow circles = positions of plankton hauls; red = positions of fishing hauls)

<u>Non-mandatory surveys</u>:

Fehmarn Juvenile Cod Survey (FEJUCS)

1. Objectives of the survey

Target species is the western Baltic cod. The main aim is to monitor the cohort strengths of age-0 and age-1 cod during autumn in the Western Baltic Sea. Target data are length-frequency distributions of undersized cod caught in commercial pound nets located near Fehmarn (the centre of the main spawning area of western Baltic cod). The collected data are stored and processed nationally.

2. Description of the methods used in the survey. For mandatory surveys, link to the manuals. Include a graphical representation (map)

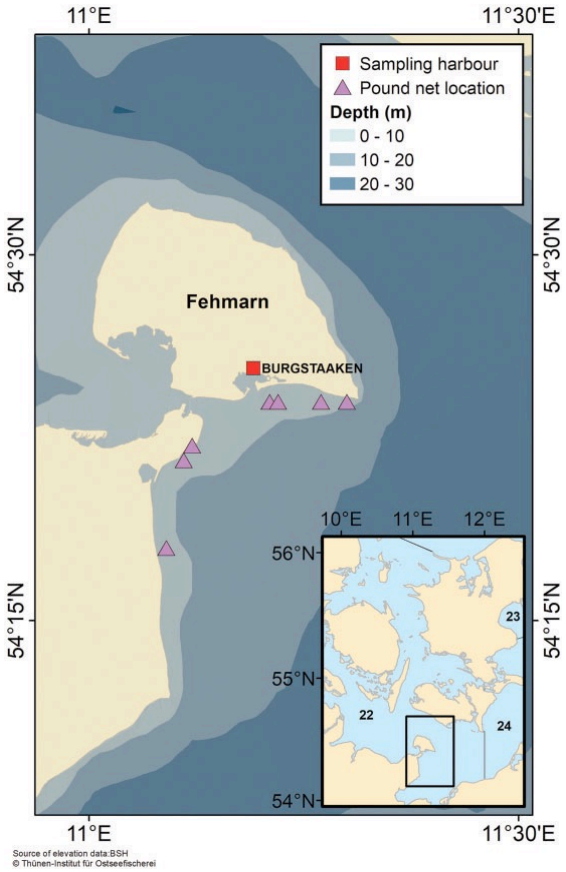
The method is described in the Working Document Number 18, p. 293-310 of ICES 2019, Benchmark Workshop on Baltic Cod Stocks (WKBALTCOD2). ICES Scientific Reports. 1:9. 310 pp. http://doi.org/10.17895/ices.pub.4984.

3. For internationally coordinated surveys, describe the participating Member States/vessels and the relevant international group in charge of planning the survey

National survey only.

4. Where applicable, describe the international task sharing (physical and/or financial) and the cost sharing agreement used

National survey only.



Map: Fehmarn Juvenile Cod Survey (FEJUCS): location of pound nets sampled in September-December 2013-2018.

Cod in the Baltic (CoBalt)

1. Objectives of the survey

Target species is Baltic cod. The main aim is to monitor the reproductive activities of western and eastern Baltic cod. Target data are abundances, weight and length distributions of all fishes and length-weight-age-sex-maturity data of cod as well as hydrographic data (temperature, salinity and oxygen). The collected data are saved in a national SQL database. In addition, cod stomachs are sampled.

2. Description of the methods used in the survey. For mandatory surveys, link to the manuals. Include a graphical representation (map)

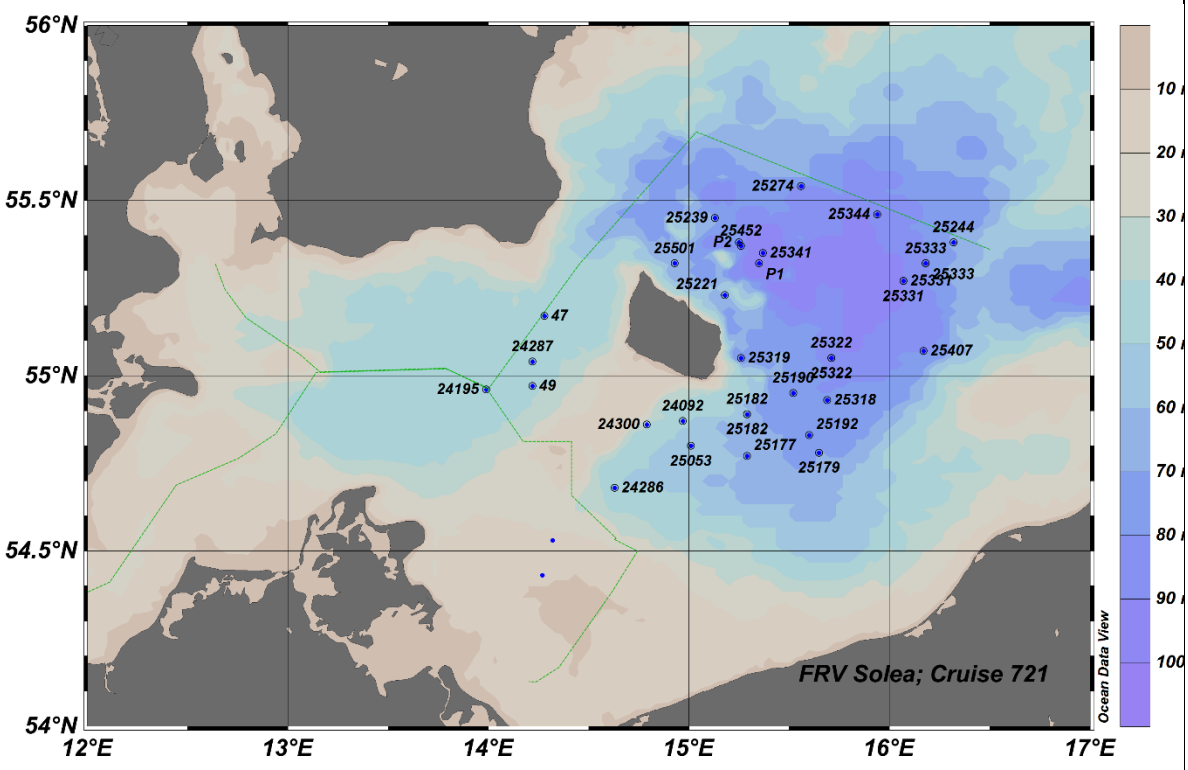
The used methods are standard BITS methods, which are described in the BITS survey manual: http://www.ices.dk/community/groups/Pages/WGBIFS.aspx

3. For internationally coordinated surveys, describe the participating Member States/vessels and the relevant international group in charge of planning the survey

National survey only.

4. Where applicable, describe the international task sharing (physical and/or financial) and the cost sharing agreement used

National survey only.



Map: Cod in the Baltic Survey (CoBalt): Positions of fishing hauls

National Bottom Trawl Survey in the Baltic (BaltBox)

1. Objectives of the survey

Target species are demersal fish species. The main aim is the qualitative and quantitative recording of distribution and composition of the demersal fish fauna in the German EEZ of the Baltic Sea. Target data are abundances, weight and length distributions of all fishes and length-weight-age-sex-maturity data of Baltic cod, flounder, plaice, dab, turbot and brill as well as hydrographic data (temperature, salinity and oxygen). The data are saved in a national SQL database. In addition, cod stomachs are sampled.

2. Description of the methods used in the survey. For mandatory surveys, link to the manuals. Include a graphical representation (map)

The used methods are standard BITS methods, which are described in the BITS survey manual: http://www.ices.dk/community/groups/Pages/WGBIFS.aspx

3. For internationally coordinated surveys, describe the participating Member States/vessels and the relevant international group in charge of planning the survey

National survey only.

4. Where applicable, describe the international task sharing (physical and/or financial) and the cost sharing agreement used

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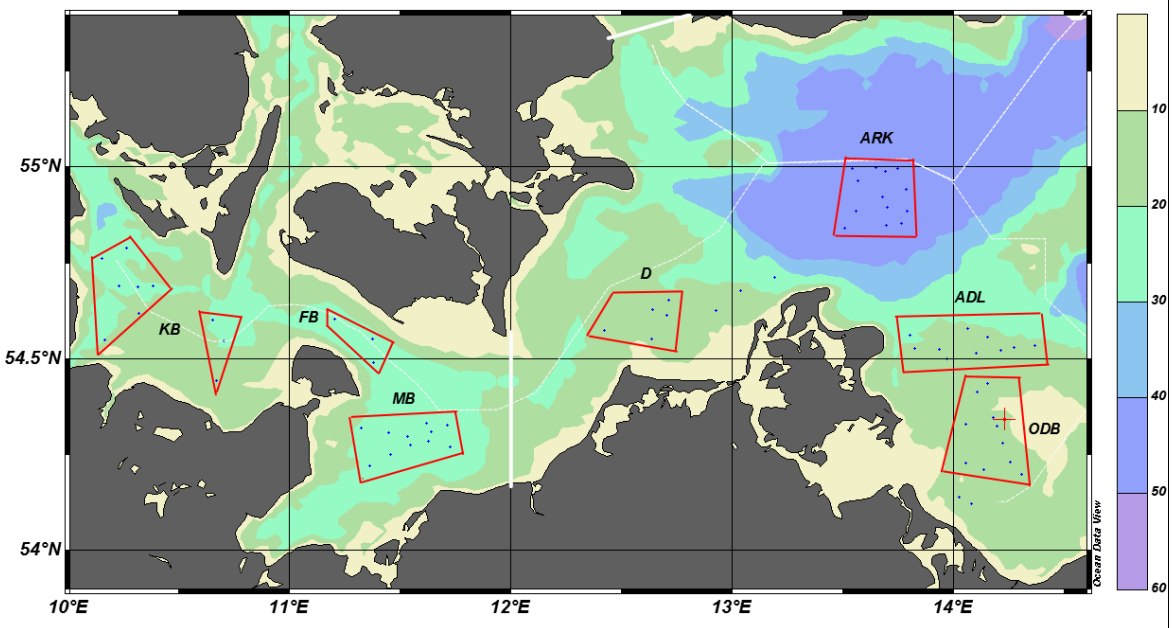


Map: National Bottom Trawl Survey in the Baltic (BaltBox) June 2015: Station Plan with fishing boxes

German Small-Scale Bottom Trawl Survey (GSBTS)

1. Objectives of the survey

The GSBTS is a national survey that is conducted once a year in the third quarter with high-frequency sampling of groundfish species within narrow spatial units (ca. 21 hauls within 10 x 10 nm rectangles, so-called "Boxes").

It is designed as a programme to complement the IBTS Q3 with information on small-scale processes (e.g. predator-prey interactions) and local distribution patterns and biodiversity measures on selected, typical North Sea habitats.

2. Description of the methods used in the survey. For mandatory surveys, link to the manuals. Include a graphical representation (map)

Types of data collected include biological data for the groundfish community, as well as additional data on the bycatch of benthic invertebrates. The GSBTS includes a dedicated sampling programme of benthic epifauna and sediments. Further accompanying data recorded include information on stations and gear performance, hydrographic data, observations of weather and sea state. Additionally, quantitative observations of seabirds at sea are conducted.

The data are so far stored locally in a national database.

For survey methods, see Ehrich et al. 2007. -20 years of the German Small-Scale Bottom Trawl Survey (GSBTS): A review. Senckenbergiana maritima. 37(1): 13-82.

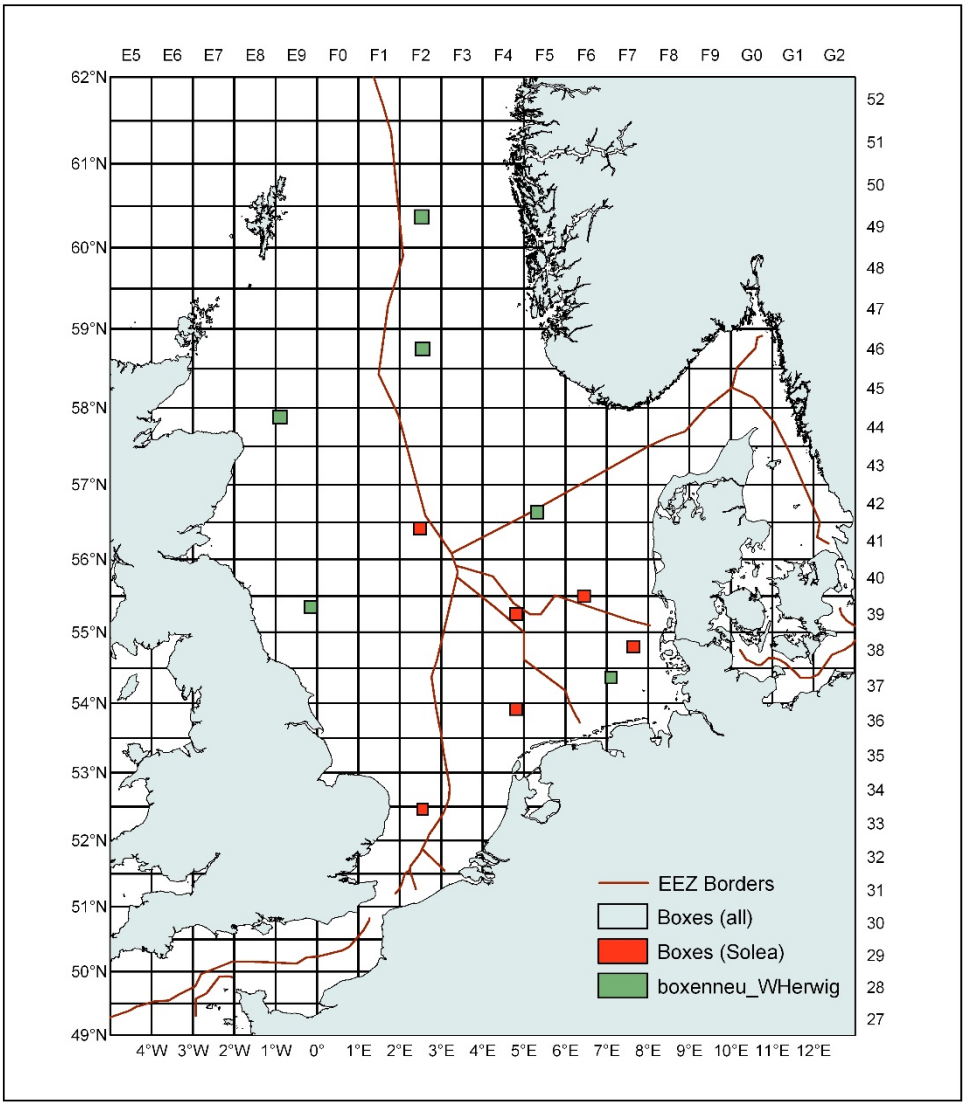
For an evaluation of the survey, see ICES WKECES report: http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/SSGESST/2012/WKECES12.pdf

3. For internationally coordinated surveys, describe the participating Member States/vessels and the relevant international group in charge of planning the survey

At present, the GSBTS is conducted by Germany alone, although it covers habitats throughout the North Sea, in several national EEZs. It is the goal of the survey operators to turn it into an internationally coordinated survey which can provide information on biological processes necessary to support the assessment of fish stocks with knowledge about ecosystem functionality and ecosystem services.

4. Where applicable, describe the international task sharing (physical and/or financial) and the cost sharing agreement used

National survey only



Map: German Small Scale Bottom Trawl Survey (GSBTS) – Positions of “Boxes”

German Autumn Survey in the Exclusive Economic Zone (GAS EEZ)

1. Objectives of the survey
   - To determine the distribution and relative abundance of demersal fish species;
   - To monitor changes in the stocks of commercial fish species independently of commercial fisheries data;
   - To monitor the distribution and relative abundance of all fish species and invertebrates
   - To collect hydrographical data (temperature, salinity and oxygen);
   - To collect data on marine litter.

2. Description of the methods used in the survey. For mandatory surveys, link to the manuals. Include a graphical representation (map)

The survey takes place every year alternately with beam trawl (7 meter) and otter bottom trawl (cod hopper). A fixed station pattern has been fished since 2004. Sorting of the catch follows the standard IBTS methods, which are described in the IBTS survey manual (ICES 2015: Manual for the International Bottom Trawl Survey, Revision IX. SISP 10).

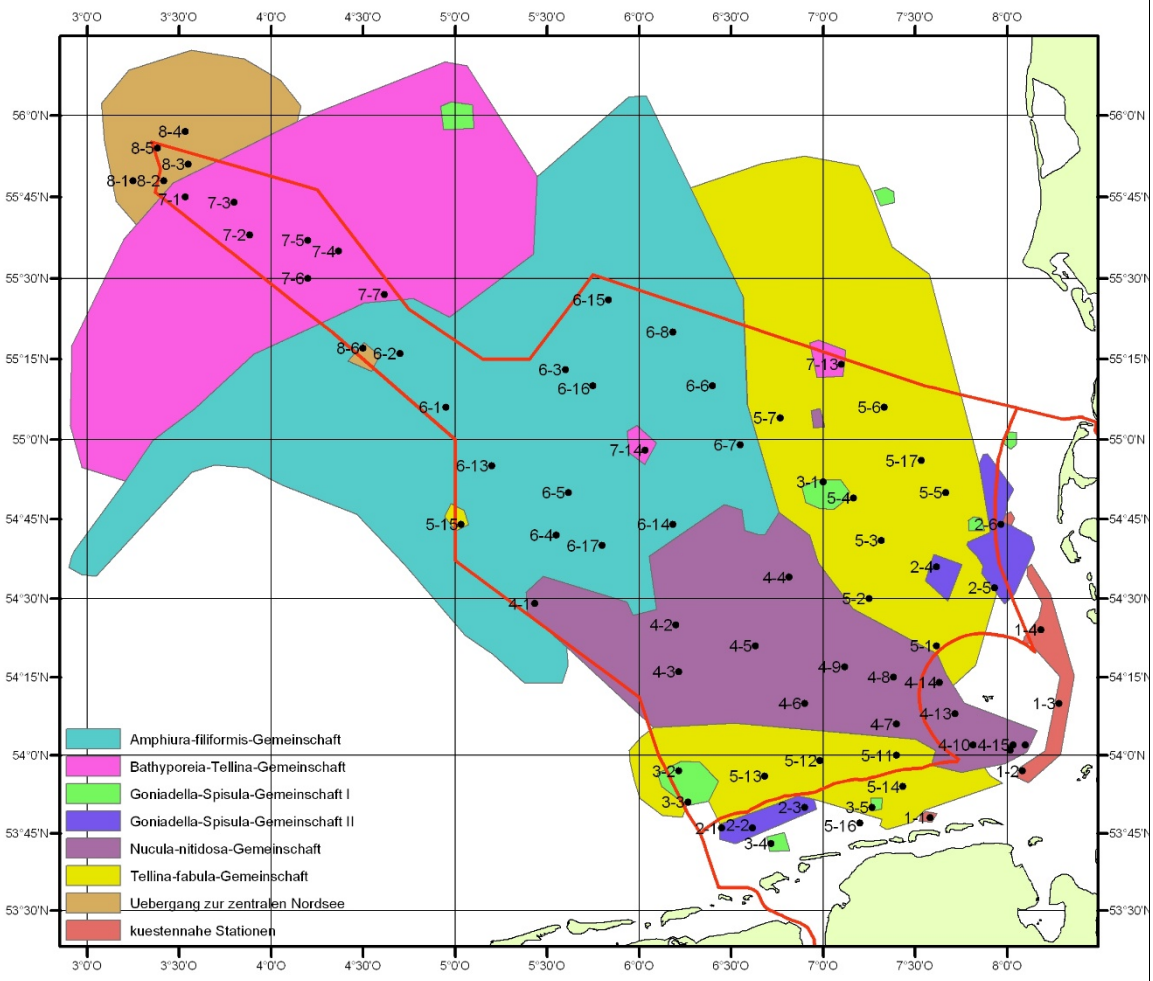
The data are so far stored locally in a national database.

3. For internationally coordinated surveys, describe the participating Member States/vessels and the relevant international group in charge of planning the survey

National survey only

4. Where applicable, describe the international task sharing (physical and/or financial) and the cost sharing agreement used

National survey only



Map: German Autumn Trawl Survey (GAS EEZ) – Positions of hauls within different faunal zones.

Eel Larvae Survey

1. Objectives of the survey

A) Regular and standardized monitoring of larval eel (*Anguilla anguilla*) abundance in the Sargasso Sea as a basis for the establishment of a stock-recruitment relationship and stock assessment.

B) Larval abundance and distribution in the Sargasso Sea in relation to glass eel recruitment and hydrographic conditions in order to evaluate the effect of climate change on larval survival, retention and drift.

Data on larval abundance in the spawning area are poor and the existence of a stock-recruitment-relationship is unproven. Until today, European eel stock assessment is largely based on fluctuations in glass eel recruitment along European coasts. However, the age of arriving glass eels is scientifically disputed with estimations reaching between 1 and 3 years. In addition, oceanic factors influencing larval survival until metamorphosis into glass eel stages are still debated as potential drivers for the eel stock decline. The regular monitoring of larval abundance in the Sargasso Sea is aiming to provide information that is required to evaluate whether management measures (e.g. increase of spawner escapement) increase the reproduction success of *A. anguilla*. By comparing larval abundances with glass eel recruitment of the following years, the surveys also provide insights into the effect of oceanic factors on eel stock development. It is investigated how climatic changes affect the survival and distribution of eel larvae and to what extent the drift towards European waters might be impeded by hydrographic conditions.

2. Description of the methods used in the survey. For mandatory surveys, link to the manuals. Include a graphical representation (map)

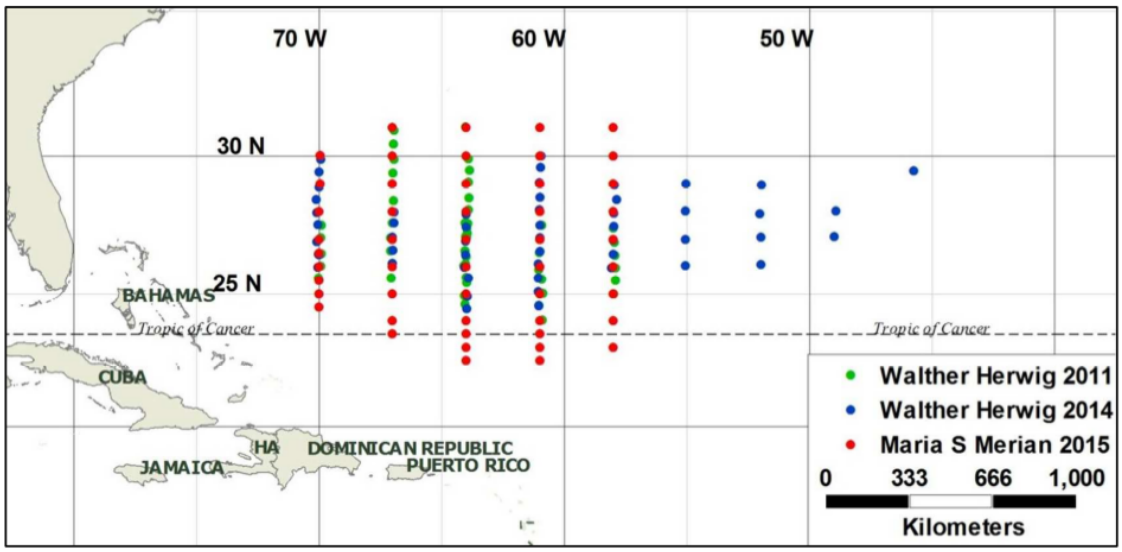
The study area ranges from 31° - 22°N and 70° - 50°W. Inside this area, a core sampling area is defined in accordance with larval distribution. Sampling takes place with an Isaac Kidd Midwater Trawl (net opening 6.3 m^2, mesh size 500 μm) at approximately 50 stations along north-south transects. Species identification and length measurements of all leptocephalus larvae are done on board. Hydrographic conditions are monitored by CTD throughout the sampling area.

3. For internationally coordinated surveys, describe the participating Member States/vessels and the relevant international group in charge of planning the survey

National survey only

4. Where applicable, describe the international task sharing (physical and/or financial) and the cost sharing agreement used

National survey only



Map: Eel Larvae Survey, sampled transects in 2011, 2014 and 2015. In 2017 (FRV Walther Herwig III cruise WH404), the transects at 64°, 61° and 58°W were sampled (not shown).

Text Box 2A: Fishing activity variables data collection strategy

General comment: This Box fulfills paragraph 4 of Chapter III of the multi-annual Union programme and Article 2, Article 4 paragraph (2) point (b) and Article 5 paragraph (2) of this Decision. It is intended to describe the method used to derive estimates on representative samples where data are not to be recorded under Regulation (EU) No 1224/2009 or where data collected under Regulation (EU) No 1224/2009 are not at the right aggregation level for the intended scientific use.

1. Description of methodologies used to cross-validate the different sources of data

Depending on the variable, the source is either the logbook (for effort) or the sales notes (for value of landings). The logbooks are also used to determine the metier. There is, however, no duplicate provision of data from separate sources which would require cross-validation.

2. Description of methodologies used to estimate the value of landings

The value of landings is taken directly from sales notes. In the case of missing entries for the value, it is being estimated using prices achieved at the same time in the same region with the same gear at the same place. In the case of missing hits, the criteria of similarity (e.g. "same place") are reduced until a hit is achieved.

3. Description of methodologies used to estimate the average price (it is recommended to use weighted averages, trip by trip)

Prices are estimated using figures from the sales notes. In order to get the price per kg, the revenue is divided by the mass sold. In the case of missing entries for revenue, it is estimated as described before.

4. Description of methodologies used to plan collection of the complementary data (sample plan methodology, type of data collected, frequency of collection etc)

For vessels without logbooks, effort variables are estimated on the basis of a questionnaire which is sent together with the survey on fleet economic variables (stratified random sampling). Gear size and days at sea are requested. These data are compared with the sales notes which always refer to a certain time period. The sum of these periods is related to the survey result. The ratio of both figures is used estimate the fleet segment total by multiplying it with the total of the time periods derived from the sales notes.

All other fishing activity data are collected according to the standards as provided by the Control Regulation (1224/2009).

Text Box 3A: Population segments for collection of economic and social data for fisheries

General comment: This Box fulfills paragraph 5 points (a) and (b) of Chapter III of the multi-annual Union programme and Article 2, Article 4 paragraphs (1), (2) and (5) and Article 5 paragraph (2) of this Decision. It is intended to specify data to be collected under Tables 5(A) and 6 of the multi-annual Union programme.

1. Description of methodologies used to choose the different sources of data

Data sources are chosen based upon availability and accessibility. Whenever data are available which are collected under a different legislation (transversal data), these are being used (fleet register, logbooks sales notes). Data which are not covered by the sources mentioned above, are collected through the following sources:

i. an accountancy network which consists of about 160 vessels providing a comprehensive set of economic data annually (covering beam trawlers 12-24 m, demersal trawlers 12-24 m, and fixed netters between 8 and 18 m)
ii. a questionnaire which is sent by mail to owners of small-scale fisheries vessels < 10m ("probability proportional to size" sampling), requesting "socio-economic" data on an enterprise level, and
iii. a questionnaire for the segments "Beam trawlers: 10-12 m*and 24-40 m*"; "Demersal trawlers 24-40 m and >40 m" and "Pelagic trawlers > 40 m*" referring to individual vessels.

All surveys are carried out on a voluntary basis. The selection under (ii) is related to the vessel owner. Most fishermen own only one vessel. In case that an owner is selected for sampling and owns more than one vessel, questionnaires will be sent for each individual vessel. However, fishermen owning more than one smaller vessel do not file expenses and employment data separated by vessel. Therefore, this group will be sampled on an enterprise basis, and only effort and physical value data will be surveyed on a vessel basis.

2. Description of methodologies used to choose the different types of data collection

Methodologies are chosen by means of segment size and importance. Segments with few vessels, but high importance for certain fisheries or in terms of total landings, are sampled exhaustively. This applies to most segments >24m. Other segments are sampled on the basis of "probability proportional to size" sampling ("size" refers to the value of landings). The bigger the segment (in terms of no. of vessels), the smaller the sample rate.

3. Description of methodologies used to choose sampling frame and allocation scheme

The sampling frame is the target population. The target population is the fleet on 31st December plus all vessels having reported any activity (landings declaration) during the year. Vessels are allocated to a segment gear by using logbook information or, for vessels without logbooks, main gear in the fleet register.

As approved for previous periods, vessels targeting mainly blue mussels are excluded from the fishing fleet, as their activity is defined as aquaculture (using seed mussels) and their figures are reported in the aquaculture section.

4. Description of methodologies used for estimation procedures

A correlation analysis is being performed between data which are available exhaustively (capacity, landings,

and in most cases effort) and those data from the surveys. The Pearson correlation coefficient is used as a first indicator of which factor has the most influence on the variable which has to be estimated. As a result of this analysis, a scheme is being developed, which includes not only correlation aspects, but also considerations of meaningfulness. For instance, energy costs are likely to be dependent upon both the vessel size and some effort parameter, but not so much on value of landings – even if the correlation analysis might indicate something else.

	Basis for estimation				
Variable type to be estimated	GT	kW	fishing days	days at sea	value of landings
Direct subsidies		X			
Other income		X			
Wages and salaries of crew	X		X		X
Imputed value of unpaid labour	X		X		X
Energy costs	X		X		
Repair and maintenance costs	X				X
Variable costs	X		X		
Non-variable costs	X	X			
Investments in physical capital					X
Debt/asset ratio					X
Engaged crew				X	
FTE National				X	

Estimation for segments with sampling results

In a next step, the values are estimated for the segment for which sampled data are available. It has turned out that the fractions, which the sample represents within the considered segment, are in most cases quite similar, e.g. in TBB1218 the sample represents about 41% of the number of vessels, 41% of LoA, 44% of GT, 41% of kW, 52% of weight of landings, 49% of revenues and 45% of days at sea (example from 2008).

In other words, estimations are in most cases quite robust, no matter which factor is used for estimation. Nonetheless, the estimator is chosen with respect to the scheme above. In cases where more than one variable is indicated as basis for estimation, the average of the fraction will be applied.

Estimation for segments without sampling results

According to the experience in previous years, there is a chance that for a segment or a variable no responses are obtained. In this case, the basis for estimation will be a regression analysis of segments with the same fishing technique and an adjacent length class or with the same length class and a similar fishing technique, depending upon which version delivers the highest r^2. The final choice can be done only when the data are available.

5. Description of methodologies used on data quality

In accordance with the STECF report on quality aspects (SGECA 09-02), the coefficient of variation will be used as indicator of accuracy.

In addition, Germany is testing an alternative clustering approach to find a more suitable segmentation procedure, based on fishing pattern rather than on main gear class. The aim is to achieve segments with less variability.

Pilot Study 3: Data on employment by education level and nationality

General comment: This Box fulfills paragraph 5 point (b) and paragraph 6 point (b) of Chapter III of the multi-annual Union programme and Article 2 and Article 3 paragraph (3) point (c) of this Decision. It is intended to specify data to be collected under Table 6 of the multi-annual Union programme.
The pilot study was performed as planned by Germany within 2017-2019 and will be continued as regular data collection.

Text Box 3B: Population segments for collection of economic and social data for aquaculture

General comment: This Box fulfills paragraph 6 points (a) and (b) of Chapter III of the multi-annual Union programme and Article 2, Article 4 paragraphs (1) and (5) and Article 5 paragraph (2) of this Decision. It is intended to specify data to be collected under Tables 6 and 7 of the multi-annual Union programme.

Background: 2,584 German aquaculture farms produced more than 31,800 tons of fish, crustaceans, molluscs and other aquatic organisms in 2018 (Destatis 2019). The main species are rainbow trout, common carp and blue mussels. According to the last tentative assumed Eurostat aquaculture production data, this represents a share of 2.2 % of the total EU-28 production (STECF-18-19). Taking into account the defined thresholds of the EU MAP (Implementing Decision 2016/1251, chapter V 6.), social and economic data on aquaculture will be collected, while environmental data on aquaculture will not be collected.

1. Description of methodologies used to choose the different sources of data

The Federal Statistical Office in Germany (Destatis) coordinates an annual aquaculture census on production data (volume, species, number of farms, used fish farming technique per federal state). These data do not provide further economic facts on aquaculture. Notwithstanding, it can be seen as a starting point for a planned evaluation on economic and social performance of the sector. In case of the German on-bottom blue mussel cultures, the Federal Office for Agriculture and Food (Bundesanstalt für Landwirtschaft und Ernährung, BLE) collects data on landings, crew and other logbook entries. Further, the German Federal Employment Agency (Bundesagentur für Arbeit, BA) collects monthly data on employment; but not on non-paid labour, which plays an important role in freshwater aquaculture in particular. The BA data covers information about number of permanent employees, causal contracts, apprentices, sex and nationalities. Regarding the data situation and the requirements of DCF, there are two different data resources to analyse the economic and social performance of the sector: assembly of already existing secondary data (data on employment and production/landings) from diverse sources and a collection of primary data done by the Thünen-Institute.

2. Description of methodologies used to choose the different types of data collection

A triangulation (mixed-method-approach) is applied. First, data on production and employment is collected by third party agencies via census (Destatis, BA, BLE) and collated by the Thünen-Institute according to DCF requirements. Second, data on economics and social variables are collected via survey (standardised questionnaire). Third, it is planned to build up a network of representative farms (according to the typical farm approach, cf. PGECON 2019). The typical farms will be used as supplementary data source for farm economics and labour characteristics (social variables) to balance shortcomings of the survey (e.g. insufficient response behaviour in case of some variables).

3. Description of methodologies used to choose sampling frame and allocation scheme

While Destatis coordinates the census of production data in Germany, the data itself is collected by the 16 state offices of statistics in Germany. Due to the strict interpretation and application of data protection law, the responsible state authorities rejected to give Thünen-Institute access to the diverse fish farmer address bases. As described in Germany's annual report for data collection in the fisheries and aquaculture sectors 2017-2019 from May, 2019 and approved through the letter of acceptance of annual report from EC MARE/C3 Joost Paardekooper from July 12th, 2018, the original planned two-stage sampling process including the planned threshold (cf. German Work Plan for data collection in the fisheries and aquaculture

sectors 2017-2019) could not be applied, because the Thünen-Institute has no access to freshwater fish farmers' addresses combined with information about cultured species and volume. Alternatively, an own database has been built up. Here are freshwater aquaculture enterprises listed, which addresses is available via public sources. After the undertaken survey 2018, new information from respondees lead to cleanse the established address database. Several entries were deleted, because the addresses were invalid or interviewees had objections according to data protection regulation (EU) 2016/679 of the European Parliament and the Council. This cleansing process is ongoing and will exclude part-time and hobby farms in future. At the end, only professional operations will be considered as fish farms "whose primary activity is [are] defined according to the European classification of economic activities" (Decision 2016/1251, Chapter III 6.a). At the time of this report, the address database considers 766 addresses. In 2018, the Thünen-Institute received 146 responses for freshwater aquaculture enterprises in 2018, which represent around 20 percent of the total German fresh water aquaculture production.

Due to cleansing process the exact sample frame is still variable, but will oscillate between 200 and 400 companies. For the current workplan, the assumed number of 300 cases is applied, whereof the main species trout and carp farms have an almost equal share. For the marine sector, all approx. 10 companies holding licenses are surveyed by questionnaire.

In addition, a small network of representative farms will be build up, which is chosen by purpose sampling (PGECON 2019).

4. Description of methodologies used for estimation procedures

For production and for some social variables, there is no estimation necessary (cf. point 1.), as the data are based on a census from Destatis, BA or BLE. In case of economic data gained via sample or the network of representative farms, standard statistic parameters will be applied within the true population to a certain degree of confidence. Main reference for estimation will be the total production per species, production system and farm size.

5. Description of methodologies used on data quality

The quality of available production, landing, logbook and employment data can be regarded as high due to the fact that Destatis, BA and BLE data are conducted via census. Destatis sets thresholds, which exclude fish farms with a scale <0.3 ha or with a volume <200 m^3 (Destatis 2019). The same thresholds are applied for the address database used by Thünen-Institute. The planned sample for DCF economic data on freshwater aquaculture follows the common practices of statistics with linked sampling errors. The sampling errors will be expressed by standard error, coefficient of variation and confidence interval. Due to the experience of the Thünen-Institute regarding economic surveys for fisheries and (marine) aquaculture and an internal review process of the development of a well understandable questionnaire, measurement errors are not expected. Economic data collection is not mandatory for fish farmers in Germany and thus a low response rate is experienced. As a consequence, data collection activities include communication strategies (announcements in fish farmer magazines, personal introduction of the project to local research stations and fish farmer meetings) as well as mail reminders. Further, the planned network of representative farms will balance low response rates of the survey.

References

Bundesagentur für Arbeit (2018) Beschäftigte nach ausgewählten Wirtschaftsklassen nach Klassifizierung der Wirtschaftszweige (WZ 2008). German Federal Employment Agency, internal report, Nürnberg, July, 2016.

Destatis (2019) Land- und Forstwirtschaft, Fischerei. Erzeugung in Aquakulturbetrieben 2018. German Federal Statistical Office (Destatis), Fachserie 3 (4.6), Destatis, Wiesbaden.

Planning Group on Economic Issues (PGECON), PGECON 2019 Report, Slovenia, May 6th-10th, 2019, Online available: https://datacollection.jrc.ec.europa.eu/docs/pgecon.

Pilot Study 4: Environmental data on aquaculture

General comment: This Box fulfills paragraph 6 point (c) of Chapter III of the multi-annual Union programme and Article 2 and Article 4 paragraph (3) point (d) of this Decision. It is intended to specify data to be collected under Table 8 of the multi-annual Union programme.
No data collection planned due to threshold (see background text at the beginning of Text Box 3B).

Text Box 3C: Population segments for collection of economic and social data for the processing industry

General comment: This Box fulfills footnote 6 of paragraph 1.1(d) of Chapter III of the multi-annual Union programme, Article 2, Article 4 paragraphs (1) and (5) and Article 5 paragraph (2) of this Decision. It is intended to specify data to be collected under Table 11 of the multi-annual Union programme.

1. Description of methodologies used to choose the different sources of data

In Germany, the fish processing sector is part of the industry. Almost 80-90% of employment and turnover belong to companies with 20 and more employees. Therefore, already existing data collection schemes with the emphasis on these larger companies are used. Additional data in particular for the social variables are gathered by the Federal Employment Agency. These data are almost all based on census. In order to avoid doubling data collection, these primary data are used for the purpose of the data collection in the processing sector. For some variables, data are not available via other administrative bodies. In these cases, the Institute of Sea Fisheries conducts an additional survey and will make also use of published financial statements of the companies.
The Federal Statistical Office in Germany (Destatis) holds a database with data on turnover, number of enterprises and employees belonging to the social security scheme. Destatis further collects data on Investment and sales on a census basis with a threshold of companies with 20 employees and conducts a probability sample survey on several cost items and employment data.
The Federal Employment Agency registers all persons employed in Germany. Additional characteristics like gender, age etc. are collected as well. If data on employment figures are not sufficient or - as in the case of unpaid labour – maybe not fully covered by the Employment Agency, additional data collection on a triennial basis for social data and annually for economic data will be executed by the Institute of Sea Fisheries.
For the raw material input by species and origin, some experience in data collection exists at the institute from former years. In order to enhance quality, a pilot study will be conducted. The aim is to make use of data already stored for traceability purposes in the sector. It is intended to check the quality and availability of these data and eventually conduct an own survey to obtain reliable pictures of the raw material input by species and origin. Meetings with industry representatives will form the starting point.

2. Description of methodologies used to choose the different types of data collection

The already existing data collections by the Federal Statistical Office and the Federal Employment Agency are well established and provide reliable and validated time series. Respective quality reports are available on request or already on the respective websites. A report about the overall description of the organisation of the survey, the various segments, and the quality aspects of both data types - primary and secondary data - will be provided. Given the experience from former years, data on variables that are not covered by other administrative bodies are more or less well achievable by questionnaire and eventual telephone recall, so this methodology will be maintained.
For the volume of raw material by species and origin, no such regular collection scheme is established, so a pilot study will be conducted.

3. Description of methodologies used to choose sampling frame and allocation scheme

In many cases, where data are already covered by regular data collection, decision on sampling frame and allocation scheme have been made already years ago, e.g. on the European level for Structural Business Statistics (SBS) data, or census is conducted.
For the data collection conducted by the Institute of Sea Fisheries, the principles are cost effectiveness and

avoiding double data collection burden for the enterprises. On the other hand, the requirement is to obtain reliable data representing development and status quo of the sector. So a sampling frame concentrating on the large companies with 20 and more employees (representing 80-90% of the sectors turnover and employment) will be set up, and together with published financial statements, 20% sampling rate seems to be appropriate.

4. Description of methodologies used for estimation procedures

For some economic data and for some social variables, there is no estimation necessary because data are based on census and past experience shows no problems with non-response. In case of economic data gained via sample (cf. Table 3C), standard statistic parameters will be applied to calculate the range of values/volumes within the true population.
The pilot study conducted has shown a need for further collaboration with the industry and the industry organisation in order to provide a better basis to the use of the data and improve the procedure to gather them. Further contact is foreseen with firms that have shown interest, and subsequent approximations could be taken to others members of the industry. Therefore, to improve the success rate, non-probability sampling (purpose-sampling) could be employed in addition to probability sampling.

For the non-main activity sector, the population is unclear due to a lack a definition of the activity according to the EU-MAP in the official register of the ministry. The size of the population will be gradually estimated through the answers to the survey, which allows to distinguish among firms that have fish processing as their main activity, those who have it as a non-main activity and those who do not have it at all. Further efforts could be deployed to better define the population according to the EU-MAP, e.g. through exploring the possibility of using a different data source of administrative origin.

5. Description of methodologies used on data quality

The quality of available secondary data can be regarded as very high due to the fact that Destatis' data on fish processing industry are collected under European SBS standards and ARGE's data collection on employment is conducted via census. Destatis sets thresholds for specific cost data (20 and more employees, cf. Table 3C for details), but the stratified random sampling covering around 40% of the sectors larger companies allows high quality of the data. Due to the experience of the Thünen Institute regarding economic surveys for fisheries, (marine) aquaculture and fish processing, measurement errors are not expected. Some data are collected by the Institute of Sea Fisheries (cf. Table 3C), including the pilot study on raw material. As answering to this questionnaire is not mandatory for the companies, a low response rate is considered. As a consequence, a focus of data collection will include communication strategies in advance (announcements in fish sector magazines, personally introduction of the project to the association of fish processors) as well as mail reminder. Quality will be assessed by response rate and the sampling errors will be expressed by standard error and coefficient of variation.

References

ARGE (2018) Beschäftigte nach ausgewählten Wirtschaftsklassen der Wirtschaftszweige (WZ 2008). German Federal Employment Agency, internal report, Nuernberg, June, 2018.

Destatis (2017) Beschäftigte, Umsatz und Investitionen der Unternehmen und Betriebe des Verarbeitenden Gewerbes sowie des Bergbaus und der Gewinnung von Steinen und Erden, Fachserie 4 Reihe 4.2.1 - 2018 Destatis, Wiesbaden.

Destatis (2017) Kostenstruktur der Unternehmen des Verarbeitenden Gewerbes, Fachserie 4 Reihe 4.3 – 2019 Destatis, Wiesbaden.

Text Box 4A: Sampling plan description for biological data

General Comment: This Box fulfills Article 3, Article 4 paragraph (4) and Article 8 of this Decision and forms the basis for the fulfilment of paragraph 2 point (a)(i) of Chapter III of the multi-annual Union programme. This Table refers to data to be collected under Tables 1(A), 1(B) and 1(C) of the multi-annual Union programme.

General remark

Germany is conducting two approaches for the North Sea / North Atlantic (Institute of Sea Fisheries, Bremerhaven) and the Baltic Sea region (Institute for Baltic Sea Fisheries, Rostock) to account for the nature of the fisheries in the different regions.

a) North Sea / North Atlantic regions:

Table 4C lists all fleet segments operating in the North Sea and North Atlantic regions with average landings >100t per year. Overall, approx. 220 vessels are operating in these regions, the majority belonging to the brown shrimp fleet. All other segments operating in the North Sea and North Atlantic consist of only a few vessels (on average 2 to 5 vessels). The same vessels can be listed in more than one segment. For instance, the same pelagic trawlers are targeting North Sea herring or blue whiting in ICES Div. VIb depending on the season.

The sampling frames for biological data are described in Table 4B. Vessels to sample are selected from a telephone list. However, the approach is an opportunistic randomised PSU selection and not fully probability-based due to the low number of vessels within one segment. The primary sampling unit is the vessel x trip, the secondary sampling unit is the haul, the tertiary sampling unit is the fish in the haul.

The only fleet segment with a greater number of vessels is the brown shrimp fishery, yet the target species is not assessed by ICES and there is no TAC. Some segments in the high-seas fisheries might consist only of one trip of a three-month duration by a huge vessel and high catch leading to a nearly exhaustive sampling of the segment.

Overall, the sampling frame is designed to fulfil the sampling obligations according to Table 1A and to understand the catch compositions of the important fisheries in these regions qualitatively and quantitatively as well as to enable and secure the data delivery to the assessment groups. Adaptations to the selected fisheries will be carried out after regional work plans and/or agreements have been established.

For the North Sea and North Atlantic, sampling is undertaken by at-sea-sampling only. This is because in the harbours of the German North Sea coast, there are hardly any auctions and direct fish sales. Landings are directly transferred from the vessel to different processing plants in Germany, but also to processing plants in foreign countries. Overall, 64%, 69% and 68% of the German landings occurred in foreign countries in 2016, 2017 and 2018, respectively. Therefore, it is virtually impossible to sample at harbours.

Sampling strata by regions:

1) North Sea and Eastern Arctic

Fishing ground: Eastern Arctic (ICES Sub-areas I and II)

Arctic 1 – (Factory trawlers)
Target species: Saithe and cod. Peak season: 1st and 3rd quarter. Area: Northeast Arctic waters. Duration of trips: 4 weeks to 3 months.

Arctic 2 - (Pelagic freezer trawlers)
Target species: Atlanto-Scandian herring. Peak season: August to November. Area: Norwegian Sea. Duration of trips: 3 to 4 weeks.

Fishing ground: North Sea and Skagerrak (ICES Sub-area IV and Divisions IIIa and VIId)

North Sea 1 – (Small beam trawlers)
Target species: Brown shrimp. Peak season: March to October with peaks in the 2nd and 3rd quarter. Area: German North Sea coastal waters. Duration of trips: 1 to 3 days.

North Sea 2 – (Pelagic freezer trawlers)
Target species: Herring, mackerel. Peak season: Restricted fishing season for mackerel in the North Sea – January/February and 4th quarter; Herring – 3rd quarter/December. Area: North Sea and English Channel. Duration of trips: 3 to 4 weeks.

North Sea 3 – (Otter trawlers, pair trawlers and seine trawlers)
Target species: Saithe, cod, haddock. Peak season: All year round. Area: Northern North Sea and Skagerrak. Duration of trips: 1 to 2 weeks.

North Sea 4 – (Beam trawlers)
Target species: Sole and plaice. Peak season: All year round. Area: Southern North Sea. Duration of trips: 4 to 6 days.

North Sea 5 – (Otter trawlers)
Target species: Flatfish. Peak season: All year round. Area: Central and southern North Sea. Duration of trips: 5 to 8 days.

2) North Atlantic and NAFO

Fishing ground: NAFO areas

North Atlantic 1 (Factory trawlers)
Target species: Greenland halibut and cod. Peak season: 3rd/4th quarter. Area: West Greenland (NAFO Div. 1D). Duration of trips: 6 weeks to 3 months.

Fishing grounds: Western waters (ICES Sub-areas VI-VIII, mainly West of Scotland and West of Ireland)

North Atlantic 2 (Pelagic freezer trawlers)
Target species: Mackerel, horse mackerel, blue whiting, herring. Peak season: March to June/October/November. Area: West British waters and Bay of Biscay. Duration of trips: 3 to 4 weeks.

Fishing ground: Iceland, Greenland and Irminger Sea (ICES Sub-areas XII and XIV and Division Va)

North Atlantic 3 (Factory trawlers)
Target species: Greenland halibut and cod. Peak season: 2nd/3rd quarter. Area: East Greenland (ICES Div. XIVb). Duration of trips: 4 weeks to 3 months.

North Atlantic 4 (Factory trawlers)
Target species: Redfish. Peak season: 2nd/3rd quarter. Area: Irminger/Labrador Sea (ICES Sub-areas XII and XIV, NAFO Sub-areas 1-2). Duration of trips: 4 weeks to 3 months.

b) Baltic Sea:

The German fisheries in the Baltic Sea are separated into three fleet segments: 1) Demersal fish, 2) Sprat, 3) Herring.

The demersal fleet is further subdivided into 1a) passive SD2224, 1b) active SD2224, 1c) active SD2532. Each year, a list of vessels is produced using the landings data from the previous year (e.g. the lists for 2020 are compiled in 2019 with data from 2018). The lists are sorted by total landings per vessel. The fleet segment lists of 1a, 1b and 1c include all vessels that contributed ~60%, ~90 and ~90% of the total landings, respectively. The list of vessels is then randomised by assigning a random number to each vessel on a list. The sequence of the random number determines the sequence of contacting the vessel. There is only one list for the entire year. If all vessels from a list have been contacted before the year ended, the same list is used again. Sampling is conducted all year-round and the effort is distributed according to fishing seasons. Each phone call with fishers is documented since 2010. This forms the basis for our recordings of success/non-response/rejection/refusal rates. In addition, we record if the sample is random or based on expert knowledge. Expert knowledge partly is used to ensure efficient sampling coverage of periods/strata with very low landings, e.g. demersal species in quarter 3. Flounder, plaice and other flatfishes and fish species are sampled as part of the demersal sampling programme mainly targeting cod. However, if a vessel is selected, any fishing trip is sampled, except for trips targeting freshwater species, herring or sprat (see below).

An at-sea observer catch sampling programme (including concurrent sampling of landings, discards and unwanted by-catches) is conducted for the demersal fleet segments. In addition, a self-sampling programme with fishers is used to collect biological and catch data; unsorted commercial catch samples of usually 150-300 kg from the last or last but one haul are purchased. Diagnostics show that sampled trips are representative of the overall national population of vessels. In addition, opportunistic sampling of landed discards (BMS cod and plaice under the landing obligation) is conducted.

The primary sampling unit is the vessel x trip, the secondary sampling unit is the haul, the tertiary sampling unit is the fish in the haul. The métier of a sample is assigned *ex-post*. Each sample is raised from the haul to trip level. Replicate samples from the same métier are averaged and raised to all trips of the métier within a stratum (e.g. all landings of quarter 1-SD22-GNS).

The sprat catches mainly originate from two pelagic trawlers. Since 2013, we have a self-sampling programme where each vessel provides one frozen catch sample (5 kg) from each trip. This covers the ICES subdivisions 25-29. In addition, the minor sprat catches in SD22 and SD24 are sampled opportunistically upon expert knowledge and notification from the few fishers that are temporarily targeting sprat.

The fleet targeting herring is subdivided into 3a) passive SD2224, 3b) active SD24. For 3a, five major ports around the Greifswald Bay - the major fishing ground - are sampled using 50 kg unsorted catch samples from a vessel per port. Samples from the ports are taken from a known group of fishers which is considered representative for the respective fleet given that similar mesh sizes are used. For 3b, a 50 kg unsorted catch sample is taken from an arbitrary (pair) trawler landing in the only German herring processing plant in Neu-Mukran, Rügen island. During the herring season (Nov-Apr), each week either 3a or 3b is sampled. The day of the week is selected according to wind and logistic considerations. In addition, to estimate the by-catches of cod (and other species) of the herring trawlers, the by-catch of 3b landed in Neu-Mukran is sampled once bi-weekly since 2014.

The assessment input data for small pelagics are prepared by quarter, gear (for herring: gillnet, trapnet, pelagic trawl; for sprat: pelagic trawl) and ICES Subdivision (for herring: 22 and 24; for sprat: 22, 24, 25-29). The landings are raised by the corresponding total length/age-length distributions of the commercial samples.