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

Responsible National Bodies for implementation of Work Plan

National Institute for Aquatic Resources, DTU Aqua

in cooperation with

Institute of Food and Resource Economics, IFRO

Statistics Denmark, DST

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 Delegated Decision (EU) 2021/1167 of 16 July 2021

establishing the multiannual Union programme for the collection and management of biological, environmental, technical and socioeconomic data in the fisheries and aquaculture sectors from 2022

Commission Implementing Decision (EU) 2021/1168 of 16 July 2021

establishing the list of mandatory research surveys at sea and thresholds as part of the multiannual Union programme for the collection and management of data in the fisheries and aquaculture sectors from 2022

Commission Implementing Decision (EU) 2021/…

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

Denmark

Work Plan for data collection in the fisheries and aquaculture sectors

2022-2024

Kgs. Lyngby, Denmark, 25st November 2021, revised

Version 3

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SECTION 1: GENERAL INFORMATION

Data collection framework at national level

General comment: Use this text box to describe how data collection is organised in your Member State (institutions involved, contact information) and in which regional coordination groups (RCG) your Member State participates.

The Danish data collection programme is organised and carried out as in previous years' among the involved partners on the basis of area of national responsibility and expertise. Denmark has gradually implemented data collection methods and quality assurance systems as they have been developed through the various ICES expert and study groups and workshops. Therefore, in this work plan no major methodological changes compared to the previous years' work plans.

National institute of Aquatic Resources (DTU Aqua) is responsible for the following tasks:

Biological data on exploited biological resources caught by Union commercial and recreational fisheries

Data on the activity of Union fishing vessels within and outside Union waters

Data on the impact of Union fisheries on marine biological resources and marine ecosystems within and outside Union waters

Statistics Denmark (DST) for:

Socioeconomic data on fisheries

Socioeconomic and environmental data on aquaculture

and **Department of Food and Resource Economics (IFRO)** for:

Socioeconomic data on the fish processing sector

Organisational setup

In Denmark the National institute of Aquatic Resources (DTU Aqua), Technical University of Denmark is assigned as the coordinating institute for the DCF activities. Senior Fisheries Advisor Jørgen Dalskov, Head of section Public Sector Consultancy, DTU Aqua is assigned as the National Correspondent.

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The work in Denmark is carried out by three partners:

1. **National institute of Aquatic Resources (DTU Aqua)** is an institute under the Technical University of Denmark. The institute carries out research, monitoring and provides advice concerning sustainable exploitation of live marine and fresh water resources. Furthermore, the institute is responsible for providing data for ICES stock assessment work and participates in varies ICES assessment working groups, planning and expert groups

as well as in the ACOM work. The institute is having a public sector consultancy contract with the Danish Ministry for Agriculture, Fisheries and Food.

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www.aqua.dtu.dk

2. **Department of Food and Resource Economics (IFRO)** has its origins in the traditions and methodology developed in the Danish agriculture, forestry and food production sectors, in which the close consultative relationships developed between the private sector, public authorities and research institutions contributed significantly to positive outcomes. Research, education, research-based public-sector services and broader dissemination are IFRO's main tasks, particularly within the fields of environment, natural resources, global development, food and agriculture as well as consumption, bioethics and governance.

Danish Food and Resource Economics Institute (FOI)
Rolighedsvej 25
DK-1958 Frederiksberg C
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Phone: +45 35 28 68 00
www.foi.dk

3. **Statistics Denmark (DST)** The aim of the institution is to collect, process and publish statistical information on social and economic conditions. Additional DST contributes to the international statistical cooperation. Furthermore, DST is also actively involved in the statistical activities in the UN, OECD, IMF and in the Nordic countries, etc. DST is also carrying out statistical tasks for private and public customers.

Statistics Denmark
Sejrøgade 11
DK-2100 Copenhagen Ø
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Phone: +45 39 17 39 17
www.dst.dk

A Steering Group has been established with members from all four involved Institutes. The main objective of the Steering Group is to coordinate the work to be carried out according to the DCF.

Information on the Danish DCF activities can be found at:

https://www.dcf-denmark.dk/

(max. 1000 words)

Text Box 1a: Test studies description

General comment: This text box fulfils Chapter II, section 1.2 of the EU MAP Delegated Decision annex. This text box applies to the work plan and the annual report.

1. Aim of the test study

2. Duration of the test study

3. Methodology and expected outcomes of the test study

(max 900 words per study)

Text Box 1b: Other data collection activities

General comment: This text box applies to the work plan and the annual report. Use this text box to provide information on other data collection activities that relate to your EMFAF operational programme and need to be included in the work plan and the annual report. Describe activities that are funded by the DCF but fulfil objectives under other EMFAF priorities, like marine knowledge, or activities funded by the DCF, but without a direct link to the EU MAP specific requirements or WP template tables, like freshwater fisheries. You can also include one-off specific studies for a particular end-user need that do not enter the regular data collection.

RCG secretariat and website function 2021 and 2022

1. Aim of the data collection activity

Developing mechanisms to support the planning and execution of administrative tasks and the branding and online visibility of the RCGs, with the aim to establish a long term supportive structure.

Activity done under Project SecWeb (Mare 2020-08).

2. Duration of the data collection activity

01/01/2021 – 31/12/2022

3. Methodology and expected outcomes of the data collection activity

The Regional Coordination Groups (RCGs) are the main hub for regional coordination and cooperation between member states within the different regions. The RCGs should in accordance with Council regulation (EU) 2017/1004 aim at developing and implementing procedures, methods, quality assurance and quality control for collecting and processing data with a view to enabling the reliability of scientific advice to be further improved. The RCGs may further prepare draft regional workplan, complementing or replacing the national workplan MS submit to the Commission on a regular basis. The RCGs have further a key role to interact with end-users of scientific data (EU) 2017/1004 and to, after end-user consultation, coordinate and agree on details in data to be collected and managed on the regional level ((EU) 2021/1167).

All the above is of interest to all member states, active in one or more regions.

This project on developing the supporting tools is currently funded by the Commission. For the long term development of the tools to support the work of the RCGs, and as such support the different MS, suggestions were presented and discussed at the RCGs (NA NS&EA and Baltic) technical meetings in June 2020 & 2021 and presented to the NCs during the Decision meeting in September 2020&2021. In principal, the MS agrees, but the NCs requested more time to take this into account, and requested a better insight in what would be

provided before a national contribution for the funding decided. Therefore, within this project, the different business scenarios are further developed and will be presented to all member states.

Objectives of this activity is to:

1. Develop a framework and setup a secretariat in support of fluent administrative procedures of the RCGs and establish a suitable long-term financial script for that;
2. Promote good practices in communication within and among the RCGs and engaging with all the MS, and other stakeholders;
3. Develop and setup a website linked with existing (relevant) websites and SharePoint, and to improve the overall capacity to reach out to the member states and to a wider audience about past and present RCG work;
4. Identify tools to increase the visibility of the work and outputs of the RCGs

3. Methodology and expected outcomes of the data collection activity

WP 1: Setting up the secretariat in support to RCGs and ISSGs,

The tasks of the RCG secretariat are defined in coordination with RCGchairs. This includes the support to organize RCG meetings, reporting and communication tasks, as well as the follow up of the intersessional work. As a case study, a secretariat is set up to support the RCG NA NSEA & RCG Baltic .

WP2: Developing and operating a website

Based on a process of consultation with the RCG, MS and end-users are contacted to collect input for the website.
Within the website, a repository for documents need to be available where confidential information can be stored. This information is of high value for the members states and will be reachable by the MS..

WP3.Ensuring future operation and funding:

This WP takes into account the output from WP1& and WP2. Through the activities in this WP different business models for long term funding will be developed and presented.

Expected outcomes:

1. The provision of dedicated Secretariat support for the RCGs to ensure the efficient use of RCG MS resource allocation.

2. A website developed by the end of 2021 with following features:

- ✓ Integration – synchronization with third-party applications.
- ✓ Responsive – to serve content across multiple screens and platforms.
- ✓ User experience- maintain a consistently good user experience.
- ✓ Accessibility – All levels of society and end-users need to be able to access in a friendly used way .
- ✓ Retention- keep visitors coming back
- ✓ Links to protected part outside the website as repository for confidential documents

3. Visual identity for RCGs

4. Stakeholders database

5. Internal communication protocol

6. Integration of the results of the Mare2020/08 Annex I project

7. A business scenario acceptable for all MS in the different regions and COM to ensure the long-term existence of a secretariat and the RCG website

A detailed description of the secretariat functions, the implementation of the secretariat, the content of the website, the building blocks of the website and the business model for the provision of Secretariat role and website continuation (updating& maintenance) will be provided.

Future progress in continued support for regional coordination depends on the project's outcomes and the selected route to proceed and fund the required work. As regional coordination is the cornerstone of the collective approach to data collection, the continuation of the work may be embedded in a regional work plan in the future based on national input and support.

RCG secretariat and website function 2023 and onwards

1. Aim of the data collection activity

Follow-up for the Project SecWeb (Mare 2020-08) to have a long-term supportive structure for RCGs on administrative side. Functioning secretariat that gives administrative support for RCG and ISSG chairs and manage the RCG web page (https://www.fisheries-rcg.eu/)

2. Duration of the data collection activity

Starting from 2023

3. Methodology and expected outcomes of the data collection activity

A detailed description of the secretariat functions, the implementation of the secretariat, the content of the website, the building blocks of the website and the business model for the provision of Secretariat role and website continuation (updating & maintenance) will be provided at the end of Project SecWeb in 2022.

Comments: Future funding after 2022 still need to be determined. Dedicated agreement may be added in NWP in future revision

Baltic small pelagic RSP

1. Aim of the data collection activity

Regional sampling scheme coordinating sampling of the pelagic fisheries in the Baltic (fisheries targeting western Baltic herring, central Baltic herring, herring in Gulf of Bothnia, herring in Gulf of Riga and sprat)

The purpose of the sampling scheme is to collect length and biological variables samples for stock assessment

The sampling is coordinated by Denmark, Sweden, Poland, Lithuanian, Estonia, Latvia and Finland. Only Denmark and Sweden has implemented the plans into their WP, the rest are testing the suggested sampling plans in pilot studies.

2. Duration of the data collection activity

2022-2024

3. Methodology and expected outcomes of the data collection activity

Methodology:

A detailed description of the sampling protocol can be found in https://datacollection.jrc.ec.europa.eu/documents/10213/1239599/2021_RCG-NA-NSEA+and+RCG+Baltic_TM_partIII_decisions+recommendations.pdf/a48620eb-f12a-4e21-a90e-4d44851398de, page 126

Work on regional optimisation of sampling effort and development of estimators is still ongoing

Expected outcome: Solid inputs to stock assessment, including evaluation of data accuracy

(max 900 words per activity)

SECTION 2: BIOLOGICAL DATA

Text Box 2.3: Diadromous species data collection in freshwater

General comment: This Textbox fulfils Article 5(2)(a), Article 6 (3)(a), (b) and (c) of Regulation (EU) 2017/1004 and Chapter II, point 2.1(b) and point 2.3 of the EU MAP Delegated Decision annex. Use this text box to give an overview of the methodology used for the data collected from freshwater commercial fisheries for salmon, sea trout and eel, and from research surveys on salmon and sea trout in freshwater, and on eel in any relevant habitat including coastal waters.

Method selected for collecting data.

Eel

Recruitment

Monitoring glass eel recruitment in three small brooks, Klitmøller Å, Nors Å and Slette Å. The glass eel recruitment will be monitored in each brook by electrofishing (Moran-Zippin method) two or three stations, close to the seashore, repeated three times during the year (May –August).

In Hellebækken, at River Kolding Å and in River Gudenaa elvers will be caught by eel ladder traps at weirs from 1 April - 31 October.

In Vester Vedsted assessment of the standing stock (all year classes) will be done by electrofishing 4 river stations three times a year, providing a relative index of the standing stock.

Silver eel escapement

In River Klitmøller the silver eel-escapement will be measured using a trap catching out-migrating silver eel. The eel trap will be visited approximately 3 times a week from 1 September - 31 October.

In River Ribe, the silver eel escapement will be monitored using a capture fishery situated in the lower part of River Ribe. The efficiency of the fyke-net fishery will be estimated by the mark/recapture (Petersen) method. The mark/recapture will be repeated twice during the autumn.

Salmon / Sea trout

In order to follow the recruitment and status for the populations, information on parr abundance (density) and length distribution of salmon (Salmo salar) will be collected in 6 rivers in Western Jutland and sea trout (Salmo trutta) in 20 rivers in different streams across the country.

In order to follow the status for the populations, the number, sex and length composition of adult spawners entering the natal spawning stream will be collected for Atlantic salmon (Salmo salar) in 6 rivers in Western Jutland.

Information (number, length, weight, harvested or returned to the river, origin (wild or hatchery raised)) on freshwater recreational catch of salmon are collected from rivers with salmon populations by self-reporting by anglers in web-based systems.

MS should briefly describe the method for collecting the variables presented in Table 2.3. Detailed descriptions are to be included in Annex 1.1. If variables are not directly collected but estimated the method of estimation should be described here.

(max 250 words per species and area)

Text Box 2.4: Recreational Fisheries

General comment: This text box fulfils Article 5(2)(a), Article 6 (3)(a), (b) and (c) of Regulation (EU) 2017/1004 and Chapter II, point 2.2 of the EU MAP Delegated Decision annex. Use this text box to give an overview of the methodology used for the data collected on marine and freshwater recreational catches.

Description of the sampling scheme/survey according to Table 2.4.

Offsite questionnaire: the survey is an off-site recall web-based survey and is targeting all license holders (1 year license) with a Danish citizenship. A fishing license is mandatory in Denmark, for people between 18 – 65 years of age, when fishing in the sea. The target population is all recreational anglers/fishers in Denmark with a valid license. The survey is based on two sampling frames; one for passive gear licence holders and one for angling licenses. A simple random approach is used to get a subsample from the total list of license holders. PSU is the passive gear fisher or angler. The survey is conducted on a bi-annually basis. The respondents are asked e.g. to give information on their fishing effort and catches (harvested and released components) for all mandatory species according to the EU regulation. Around 3000 respondents from each sampling frame participate in the survey each year. The respondent rate is around 50%. The answers (mean catch per angler/fisher per year) are extrapolated to population level by multiplying with the total number of anglers/fishers) for a given year.

Onboard_interview: The on-site survey is targeting charter-boat anglers in the ICES SD23. The target population is all tour boat anglers in the ICES SD23. The sampling frame is a list of all the Danish charter boats in the ICES SD23. The coverage and the sampling intensity of the charter boats trips (PSU) is based on information on the number of trips for each boat in each quarter (strata). The sampling is probability proportional to size based (PPS); the more trips per quarter the higher the sampling effort. The survey gives information on the cod catches (harvested and released components) per trip per angler (SSU), biological information on the catches (age, length and weight). The information on cod catches/biological data is used to adjust offsite questionnaire survey data for cod in the western Baltic Sea (ICES SD22, 23 and 24) which is used in the stock assessment for the western Baltic cod.

Accesspoint_interview: The on-site survey is targeting salmon trolling anglers in the Baltic Sea sailing from the Island of Bornholm. The survey is an access-point survey, where a clerk interviews trolling anglers when they return to the harbour after a finished fishing trip. The sampling is not probability based. The survey gives

information on mean catches (harvested and released components) of Baltic Salmon per angler per trip and biological information (length and age).

(max 900 words per region)

Text Box 2.5: Sampling plan description for biological data

General Comment: This text box fulfils Article 5 (2)(a) and (b), Article 6 (3)(a), (b) and (c) of Regulation (EU) 2017/1004 and Chapter 2, point 2.1(a) and 4.1 of the EU MAP Delegated Decision annex. This text box complements Table 2.5.

This text box is complementary to information on the sampling schemes provided in the quality document (Annex 1.1). It serves to highlight additional information on sampling schemes and sampling frames that the Member State considers useful to understand the sampling design planned for the region and the implementation year(s).

Only commercial catches has been included in this section (table 2.5)

The commercial sampling in Denmark is conducted in six large programs sampling different components of the landings and at sea catches. The six samplings programs are:

1. DNK At-sea Observer - Active gears
2. DNK At-sea Observer – Passive
3. DNK Market sampling
4. DNK industrial sampling
5. DNK pelagic sampling - HUC
6. DNK EM - PETS sampling

In 2022 a new seventh sampling program will be included with CCTV vessels (DNK CCTV Observer - Active gears)

Further, the different sampling programs have several list/ strata. For detailed description se Annexes 1.1

1. DNK At-sea Observer - Active gears

Purpose: At-sea Observer Programme for length, age, weight data of landings of and discards of demersal species as well as for brown shrimps and deep water shrimp. All species caught are registered for total weight and length but only selected species for the area are collected for age and individual weight. The main aim of the observer trips is to measure the discarded part and only weight by species is recorded for the landed part.

Denmark has applied sex fleet lists (sampling frames) for the at sea observer programme with a similar selection design however, with different target species and effort. The vessel list are presently covering:

Location	Fishery	Area	Number of vessels
Bornholm	Trawler/seiner	Baltic	19
Hirtshals	Pandalus	North Sea/Skagerrak	8
Hirtshals	Trawler/seiner	North Sea	41
Hirtshals	Trawler/seiner	Skagerrak	122

Lyngby	Crangon	North Sea	18
Lyngby	Trawler/seiner	Baltic/ Skagerrak/ Kattegat	66

Effort allocation (observer trips) between the vessel lists are based on the total effort available allocated according to the numbers of trips in each vessel list group. Each stratum has incorporated a minimum number of 2 trips. Each vessel list is stratified by quarter. Each vessel on a given list has equal change of being selected.

The fishermen answers are recorded and refusal rates calculated for each vessel list.
Temporal Stratification: Quarterly

2. DNK At-Sea Observer – Passive

Purpose: At-sea Observer Programme for length, age, weight data of landings of and discards of demersal species. All species caught are registered for total weight and length but only selected species for the area are collected for age and individual weight. The main aim of the observer trips is to measure the discarded part and only weight by species is recorded for the landed part in area 27.3.b.23, 27.3.c.22 and 27.3.d.24. In 2023 27.3.a.21 is included.

A single fleet list is covering the whole sampled population within the selected area.

The fishermen answers are recorded and refusal rates calculated for each vessel list.
Temporal Stratification: Quarterly

3. DNK Market sampling

Purpose: Sampling scheme collecting biological samples from commercial landings at markets from a list of selected stocks according to table 2.1. Every year the species list is updated.
The harbours were grouped in a list with small and large harbours and only harbours where 80% of the landings of the selected stocks were included in the sampling programme based on the previous years landing data. If a harbour is not selected for one of these criteria it is not included in the sampling program, and harbours located in other countries are not sampled. The selected habours are ranked by weight of landings, percentage of total landings, number of landings by harbour and the costs of getting to the harbour. A total of 37 harbours/ landings sites have been selected based on 2019 data, and the list of selected harbours is updated annually based on the previous years data. Each harbour is therefore selected on a list of stocks (species * area) and at every marked visit all the selected species are targeted by the observer.

Temporal Stratification: Quarterly

4. DNK industrial sampling

Purpose: Sampling scheme aiming at the collecting of length and biological variables samples (length, weight and age) from fisheries targeting fish for reduction (blue whiting, horse mackerel, Norway pout, sand eel and sprat)
Two different sampling sources are used in this sampling program. The sampling sources are used in parallel.

1. Self-sampling (at-sea)
2. 3 parties samples (at shore)

The sampling program is combining the two different sampling sources to take refusal from self sampling into account as close to census samples are available from the 3 parties samples. However the samples obtained from the landing sites are not giving the same quality with no information on samples by haul and the quality of the fish is also much worse.

5. DNK pelagic sampling - HUC

Herring and Mackerel are landed for human consumption by Danish vessels. The sampling scheme aiming at the collecting of length and biological variables samples (length, weight and age) from fisheries targeting pelagic fish for human consumption (mackerel and herring).

Presently this sampling scheme is not designed in a way that follows the international recommendations. However, the main part (89% in average the last 3 years) of the landings in Denmark is landed in 2 landings sites that are covered in this program. At this 2 landing sites by flowing the AIS and with personal communication with the factory staff it has been possible to obtain samples from nearly all landings.

A large part (44% in average the last three years) of the landings of herring and mackerel conducted by Danish are landed abroad. Presently Denmark is setting up a self- sampling program to target the part of the landings not landed in Denmark. It is however still under development.

Denmark is participating in an international sampling project CatchSam which aims to improve this sampling.

6 DNK EM - PETS sampling

Denmark monitors the incidental capture of PETS (Protected, Endangered, and Threatened Species) in commercial gillnets using video-based electronic monitoring (EM) systems installed onboard a sample of the fleet. Sampling is not randomised; instead, participating gillnet fishers are volunteers and receive a compensation in the form of an additional quota. Historically, vessels in ICES areas IIIa20 (Skagerrak, IIIb23 (Øresund) and IIIc22 (Belt Sea) have formed most of the samples, but vessels in ICES areas IV (North Sea) and IIIa21 (Kattegat) are now also monitored. Vessels are selected according to their location and their average yearly fishing effort. The risk of PETS bycatch in the fishing métiers covered by the vessels is also taken into account. Nevertheless, while some areas remain largely under sampled (part of the North Sea and most of Kattegat), while no electronic monitoring is in place in the Baltic Proper at the present time.

Purpose: The Bycatch of PETS using video-based electronic monitoring programme aims at collecting fine-scale spatiotemporal data on the distribution and magnitude of unintentional captures of PET species in commercial gillnets and associate these to the corresponding fishing effort measured at haul level (e.g., as the product of soak duration and net length). All species of marine mammals, birds, and elasmobranchs (as well as chelonians) are registered and identified at the lowest taxon possible down to species level. Presently, captures of non-target fish are not registered. The main aim of this programme is to estimate species-specific bycatch rates in gillnets in Denmark.

Temporal Stratification: Quarterly

Additional information on sampling schemes: From 2022, more gillnet vessels will be included in the monitoring programme to cover areas with more limited or no historical data.

Additional information on sampling schemes

Member State may add specific contextual information related to a region and the implementation year(s), for instance highlighting new developments not yet detailed in the quality document, regional adaptation and/or perspectives for the future. Insert the information under the same sampling scheme identifier as in Table 2.5.

Additional description on sampling frames

Member State may add complementary description to what includes the 'Sampling frame description' column of Table 2.5. Insert the information under the same identifier and name as in columns 'Sampling frame identifier' and 'Sampling frame description' of Table 2.5, and in the same order (Sampling frame identifier + Sampling frame description).

(One text box (max. 1 000 words) per region/RFMO/RFO/IO)

Text Box 2.6: Research surveys at sea

General Comment: This Text box fulfils Article 5 (1)(b), Article 6 (3)(a), (b) and (c) of Regulation (EU) 2017/1004 and Chapters I and II of the EU MAP Implementing Decision. It is intended to specify which research surveys at sea set out in Table 2 of the EU MAP Implementing Decision will be carried out. Member States shall specify whether the research survey is included in Table 2 of the EU-MAP Implementing Decision or whether it is an additional survey.

(Use one text box per survey)

Name of the research survey

Baltic International Trawl Survey (BITS_Q1, BITS_Q4)

1. Objectives of the survey

The main aim of the BITS ground-trawl survey, conducted twice per year, i.e. in February-March and November-December is monitoring of the spatial distribution and abundance of cod, flounder, sprat and herring recruiting year-classes, and other less numerous fish species spatial distribution in a bottom zone of ICES areas 3aS and 3b-d. Moreover, the survey is focused on evaluation of the fishing efficiency (catch per unit of effort; cpue), and analysis of the Baltic ichthyofauna biodiversity taking hydrological parameters and its vertical and horizontal variations into account. The survey is further used to collect material on principal biological parameters for main fish species.

The survey is conducted with RV Havfisken in area 3aS in February/March (Q1) and October/November (Q4), and with RV Dana in area 3d in March (Q1) and in November (Q4).

Plankton sampling using a Bogo net is conducted from RV Dana in Q1 focussing on the estimation of the abundance of cod eggs.

2. Description of the survey design and methods used in the survey for each type of data collection as listed in Table 2.6 for this specific survey.

The survey design and sampling procedures are described in the survey manual:

http://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/2017/SISP7%20BITS%202017.pdf.

3. For internationally coordinated surveys, describe the participating Member States/vessels.

The participating Member states/vessels are listed in the survey manual (see above).

4. Where applicable, provide more details on the type of participation and/or threshold agreement applied.

NA

General Comment: This Text box fulfils Article 5 (1)(b), Article 6 (3)(a), (b) and (c) of Regulation (EU) 2017/1004 and Chapters I and II of the EU MAP Implementing Decision. It is intended to specify which research surveys at sea set out in Table 2 of the EU MAP Implementing Decision will be carried out. Member States shall specify whether the research survey is included in Table 2 of the EU-MAP Implementing Decision or whether it is an additional survey.

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(Use one text box per survey)

Name of the research survey

Baltic International Acoustic Survey (BIAS)

1. Objectives of the survey

Acoustic estimates of total biomass of herring and sprat in areas 3a and 3b-d. The survey is carried out in September/October.

2. Description of the survey design and methods used in the survey for each type of data collection as listed in Table 2.6 for this specific survey.

The survey design and methods are described in the survey manual:

https://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%208%20-%20Manual%20of%20International%20Baltic%20Acoustic%20Surveys%20(IBAS).pdf

3. For internationally coordinated surveys, describe the participating Member States/vessels.

The participating Member states and vessels are listed in the survey manual (see above).

4. Where applicable, provide more details on the type of participation and/or threshold agreement applied.

DNK participates with personnel on other MS (Germany) research vessel.

(max 450 words per survey)

General Comment: This Text box fulfils Article 5 (1)(b), Article 6 (3)(a), (b) and (c) of Regulation (EU) 2017/1004 and Chapters I and II of the EU MAP Implementing Decision. It is intended to specify which research surveys at sea set out in Table 2 of the EU MAP Implementing Decision will be carried out. Member States shall specify whether the research survey is included in Table 2 of the EU-MAP Implementing Decision or whether it is an additional survey.

(Use one text box per survey)

Name of the research survey

Kattegat Cod Survey (CODS_Q4)

1. Objectives of the survey

The survey is a combined Danish-Swedish fisherman-scientist survey. The goal of the Kattegat cod survey i to estimate the abundance, biomass and distribution of cod and to establish a fisheries independent time serie of catch and effort series. Furthermore, a recruitment index is established. The results have for the first tim been used in 2015, together with commercial catch and effort data, to strengthen the scientific advice on th cod stock in Kattegat. The survey is carried out in November/December.

2. Description of the survey design and methods used in the survey for each type of data collection as listed i Table 2.6 for this specific survey.

Storr-Paulsen, Marie (2021): Cod survey all years 2008 - 2019. Technical University of Denmark. Collection. https://doi.org/10.11583/DTU.c.5301650.v2

All years data and manuals are open source and can be found via DTU.data or by using the link above.

Initially, 4 commercial trawlers (2 Swedish and 2 Danish vessels) participated in the survey. In 2016, Swede continued to use commercial vessel whereas Denmark used the new research vessel RV Havfisken but with th same trawl as previously on the commercial vessels.
The survey is designed as a stratified random bottom trawl survey. The survey area is stratified in three strata based on information from commercial fishers on expected densities of cod: a stratum with expected high density of cod, a stratum with medium density and a stratum with low density. In 2010 and 2011, there was a minor re-stratification to adopt the areas to the catch information collected during the former years. In 2013 a fourth strata was added to better assure data from the area closed for fisheries. Each stratum is further subdivided in 5*5 nm squares. The high density, medium density and closed area stratum has been allocated relatively more stations than the other strata.

3. For internationally coordinated surveys, describe the participating Member States/vessels.

Survey planning and data analysis is conducted in close cooperation with Sweden and the survey results are provided to WGBIFS-ICES.

4. Where applicable, provide more details on the type of participation and/or threshold agreement applied.

NA

(max 450 words per survey)

General Comment: This Text box fulfils Article 5 (1)(b), Article 6 (3)(a), (b) and (c) of Regulation (EU) 2017/1004 and Chapters I and II of the EU MAP Implementing Decision. It is intended to specify which research surveys at sea set out in Table 2 of the EU MAP Implementing Decision will be carried out. Member States shall specify whether the research survey is included in Table 2 of the EU-MAP Implementing Decision or whether it is an additional survey.

(Use one text box per survey)

Name of the research survey

International Bottom Trawl Survey (IBTS_Q1, IBTS_Q3)

1. Objectives of the survey

The North Sea IBTS aim to provide ICES assessment and science groups with consistent and standardized data for examining spatial and temporal changes in (a) the distribution and relative abundance of fish and fish assemblages; and (b) the biological parameters of commercial fish species for stock assessment purposes. The main objectives of groundfish surveys coordinated by IBTS are:

- 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 age composition and biological parameters for selected species;
- To collect hydrographical, environmental, and marine litter information;
- To determine the abundance and distribution of clupeid post-larvae (Quarter 1).
- To be used as a platform to collect ichthyoplankton data.

The survey is carried out in January/February (Q1) and in July/August (Q3).

2. Description of the survey design and methods used in the survey for each type of data collection as listed in Table 2.6 for this specific survey.

The survey design and methods are described in the survey manual:

https://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%2010%20%E2%80%93%20Revision%2011_Manual%20for%20the%20North%20Sea%20International%20Bottom%20Trawl%20Surveys.pdf

3. For internationally coordinated surveys, describe the participating Member States/vessels.

The participating Member states and vessels are listed in the survey manual (see above).

4. Where applicable, provide more details on the type of participation and/or threshold agreement applied.

NA

(max 450 words per survey)

General Comment: This Text box fulfils Article 5 (1)(b), Article 6 (3)(a), (b) and (c) of Regulation (EU) 2017/1004 and Chapters I and II of the EU MAP Implementing Decision. It is intended to specify which research surveys at sea set out in Table 2 of the EU MAP Implementing Decision will be carried out. Member States shall specify whether the research survey is included in Table 2 of the EU-MAP Implementing Decision or whether it is an additional survey.

(Use one text box per survey)

Name of the research survey

North Sea Sandeels Survey (NSSS)

1. Objectives of the survey

The objective of the survey is to improve the scientific advice on sandeel. It provides the basis for setting a preliminary index for the sandeel fishery for the coming year. The data give are used for calculating a 0-group abundance index, which is used in the stock assessment. The survey is carried out in November/December.

2. Description of the survey design and methods used in the survey for each type of data collection as listed in Table 2.6 for this specific survey.

Storr-Paulsen, Marie; Degel, Henrik; van Deurs, Mikael; Olesen, Hans Jakob (2021): Sandeel survey 2020. Technical University of Denmark. Dataset. https://doi.org/10.11583/DTU.14798028.v1

Survey data and manuals from 2017 are open source and can be found via DTU.data or by using the link above.

The survey is conducted with chartered commercial vessels and the sampling of sandeels is conducted with a modified scallop dredge. Three replicates are taken at each station. The sandeels are sorted from the catches, representative subsamples are measured and age samples are taken. Planning is done on a national level.

3. For internationally coordinated surveys, describe the participating Member States/vessels.

NA

4. Where applicable, provide more details on the type of participation and/or threshold agreement applied.

NA

(max 450 words per survey)

General Comment: This Text box fulfils Article 5 (1)(b), Article 6 (3)(a), (b) and (c) of Regulation (EU) 2017/1004 and Chapters I and II of the EU MAP Implementing Decision. It is intended to specify which research surveys at sea set out in Table 2 of the EU MAP Implementing Decision will be carried out. Member States shall specify whether the research survey is included in Table 2 of the EU-MAP Implementing Decision or whether it is an additional survey.

(Use one text box per survey)

Name of the research survey

International Ecosystem Survey in the Nordic Seas (ASH; ICES acronym: IESNS)

1. Objectives of the survey

The International Ecosystem Survey in the Nordic Seas (IESNS) is an acoustic/pelagic trawl survey carried out in order to investigate distribution and migrations of the Atlanto-Scandian herring (ASH), blue whiting and other pelagic fish and to produce a biomass index for herring and a recruitment index for blue whiting for the ICES Working Group on Widely Distributed stocks (ICES WGWIDE). Furthermore, hydrographic conditions and plankton abundance in the Norwegian Sea and adjacent waters are monitored in order to investigate distribution and migration of herring and other pelagic fishes are influenced by environmental conditions.

The survey is carried out in April/May.

2. Description of the survey design and methods used in the survey for each type of data collection as listed in Table 2.6 for this specific survey.

The survey design and sampling protocol is described in the survey manual:

http://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%209%20Manual%20for%20International%20Pelagic%20Surveys%20(IPS).pdf

3. For internationally coordinated surveys, describe the participating Member States/vessels.

The participating Member states and vessels are listed in the survey manual (see above).

The survey is a joint EU survey conducted using the Danish R/V Dana where Denmark, Germany, Ireland, the Netherland and Sweden participate financially and scientific staff wise.

4. Where applicable, provide more details on the type of participation and/or threshold agreement applied.

NA

(max 450 words per survey)

General Comment: This Text box fulfils Article 5 (1)(b), Article 6 (3)(a), (b) and (c) of Regulation (EU) 2017/1004 and Chapters I and II of the EU MAP Implementing Decision. It is intended to specify which research surveys at sea set out in Table 2 of the EU MAP Implementing Decision will be carried out. Member States shall specify whether the research survey is included in Table 2 of the EU-MAP Implementing Decision or whether it is an additional survey.

(Use one text box per survey)

Name of the research survey

Mackerel Egg Survey (triennial) (NSMEGS)

1. Objectives of the survey

The survey aims at to estimate egg production and SSB for North Sea mackerel. The survey is conducted every third year, and the next survey is planned for 2022. Plankton sampling is performed to provided information on the distribution and abundance of mackerel eggs and some pelagic trawling is carried out for collecting adult female mackerel for fecundity estimates. The survey is carried out in May/June.

2. Description of the survey design and methods used in the survey for each type of data collection as listed in Table 2.6 for this specific survey.

The survey design and sampling procedures are describe in :

http://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%206%20-%20MEGS%20V1.3.pdf,

and

http://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%205%20-%20WGMEGS%20V11%20Manual%20for%20AEPM%20and%20DEPM%20fecundity.pdf.

3. For internationally coordinated surveys, describe the participating Member States/vessels.

The participating Member states and vessels are listed in the survey manual (see above).

4. Where applicable, provide more details on the type of participation and/or threshold agreement applied.

NA

(max 450 words per survey)

General Comment: This Text box fulfils Article 5 (1)(b), Article 6 (3)(a), (b) and (c) of Regulation (EU) 2017/1004 and Chapters I and II of the EU MAP Implementing Decision. It is intended to specify which research surveys at sea set out in Table 2 of the EU MAP Implementing Decision will be carried out. Member States shall specify whether the research survey is included in Table 2 of the EU-MAP Implementing Decision or whether it is an additional survey.

(Use one text box per survey)

Name of the research survey

NS Herring Acoustic Survey (NHAS; ICES acronym: HERAS)

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 and IIIa), West of Scotland herring (in 6aN), Malin Shelf herring (west of Scotland/Ireland in 4aN-S and 7b,c), North Sea sprat (in IV) and Sprat in IIIa (western Baltic). The derived estimates and age structure of herring and sprat are used as tuning indices in the respective assessments and are submitted annually to ICES-HAWG. The area allocated to Denmark is the Kattegat, Skagerrak and the eastern part of the North Sea north from 56°N.

The survey is carried out in June/July.

2. Description of the survey design and methods used in the survey for each type of data collection as listed in Table 2.6 for this specific survey.

The survey design and sampling procedures are described in the survey manual:

http://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%209%20Manual%20for%20International%20Pelagic%20Surveys%20(IPS).pdf.

3. For internationally coordinated surveys, describe the participating Member States/vessels.

The participating Member states and vessels are listed in the survey manual (see above).

4. Where applicable, provide more details on the type of participation and/or threshold agreement applied.

NA

(max 450 words per survey)

General Comment: This Text box fulfils Article 5 (1)(b), Article 6 (3)(a), (b) and (c) of Regulation (EU) 2017/1004 and Chapters I and II of the EU MAP Implementing Decision. It is intended to specify which research surveys at sea set out in Table 2 of the EU MAP Implementing Decision will be carried out. Member States shall specify whether the research survey is included in Table 2 of the EU-MAP Implementing Decision or whether it is an additional survey.

(Use one text box per survey)

Name of the research survey

Nephrops UWTV survey (UWTV3-4; Skagerrak/Kattegat)

1. Objectives of the survey

The purpose of the survey is to estimate the abundance of Nephrops in the Skagerrak and the Kattegat (Functional units 3 and 4). The survey is carried out in March/April.

2. Description of the survey design and methods used in the survey for each type of data collection as listed in Table 2.6 for this specific survey.

The survey design and method is described in the survey manual:

https://www.ices.dk/sites/pub/Publication%20Reports/Forms/DispForm.aspx?ID=37647

3. For internationally coordinated surveys, describe the participating Member States/vessels.

The survey is conducted in coordination with Sweden in respect to the share of area coverage and reporting to ICES WGNEPS.

4. Where applicable, provide more details on the type of participation and/or threshold agreement applied.

NA

(max 450 words per survey)

General Comment: This Text box fulfils Article 5 (1)(b), Article 6 (3)(a), (b) and (c) of Regulation (EU) 2017/1004 and Chapters I and II of the EU MAP Implementing Decision. It is intended to specify which research surveys at sea set out in Table 2 of the EU MAP Implementing Decision will be carried out. Member States shall specify whether the research survey is included in Table 2 of the EU-MAP Implementing Decision or whether it is an additional survey.

(Use one text box per survey)

Name of the research survey

Blue Whiting Survey (IBWSS)

1. Objectives of the survey

The survey aims to determine the distribution and abundance at age and length of the Northeast Atlantic blue whiting stock during the spawning season to the west of Britain and Ireland. This estimate is used as a tuning index by ICES to determine the size of the population and the results are submitted annually to ICES WGWIDE. The survey is carried out in March/April.

2. Description of the survey design and methods used in the survey for each type of data collection as listed in Table 2.6 for this specific survey.

The survey design and methods are described in the survey manual:

https://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%209%20Manual%20for%20International%20Pelagic%20Surveys%20(IPS).pdf

3. For internationally coordinated surveys, describe the participating Member States/vessels.

The participating Member states and vessels are listed in the survey manual (see above).

4. Where applicable, provide more details on the type of participation and/or threshold agreement applied.

DNK participates with personnel on other MS research vessels (Ireland: Celtic Explorer, The Netherlands: Tridens) and contributes to the survey costs.

(max 450 words per survey)

General Comment: This Text box fulfils Article 5 (1)(b), Article 6 (3)(a), (b) and (c) of Regulation (EU) 2017/1004 and Chapters I and II of the EU MAP Implementing Decision. It is intended to specify which research surveys at sea set out in Table 2 of the EU MAP Implementing Decision will be carried out. Member States shall specify whether the research survey is included in Table 2 of the EU-MAP Implementing Decision or whether it is an additional survey.

(Use one text box per survey)

Name of the research survey

Flatfish Survey in the Kattegat and Skagerrak (FFS)

1. Objectives of the survey

The objective of the survey is to establish a time series of catch and effort data independent of the commercial fishery for sole and plaice in the Kattegat and the southern Skagerrak. The survey has been initiated in 2004 and provides currently the main input data set for the 3a sole assessment conducted by ICES WGBFAS.
The survey is carried out in November.

2. Description of the survey design and methods used in the survey for each type of data collection as listed in Table 2.6 for this specific survey.

The survey was originally designed in order to establish fisheries independent CPUE indices by means of annual fishing at 120 fixed stations, 60 stations were placed by the fishermen and 60 by DTU-Aqua. In 2010 the total number of stations reduced to 116. In 2011 the survey was reduced further to 80 stations, all included in the originally set up, and in 2016 10 stations were added to the survey.

The survey is conducted with RV Havfisken and one chartered commercial vessel. Fishing is done at night with a Twin "Icelandic-sole-trawl" with 140 mm mesh and rockhopper type ground gear with 150 mm rubber discs and a cod end mesh size of 55 mm.

Planning is done on a national level.

3. For internationally coordinated surveys, describe the participating Member States/vessels.

NA

4. Where applicable, provide more details on the type of participation and/or threshold agreement applied.

Implementing decision rule.

(max 450 words per survey)

General Comment: This Text box fulfils Article 5 (1)(b), Article 6 (3)(a), (b) and (c) of Regulation (EU) 2017/1004 and Chapters I and II of the EU MAP Implementing Decision. It is intended to specify which research surveys at sea set out in Table 2 of the EU MAP Implementing Decision will be carried out. Member States shall specify whether the research survey is included in Table 2 of the EU-MAP Implementing Decision or whether it is an additional survey.

(Use one text box per survey)

Name of the research survey

Nephrops UWTV survey off Horns Rev (UWTV33)

1. Objectives of the survey

The purpose of the survey is to estimate the abundance of Nephrops off Horns Rev (Functional unit 33). The survey has been started in 2017 as no fishery-independent information existed for this area. The results are used by ICES WGNSSK for assessing the Nephrops stock in FU33. The survey is carried out in April/May.

2. Description of the survey design and methods used in the survey for each type of data collection as listed in Table 2.6 for this specific survey.

The survey design and method is described in the survey manual:

https://www.ices.dk/sites/pub/Publication%20Reports/Forms/DispForm.aspx?ID=37647

3. For internationally coordinated surveys, describe the participating Member States/vessels.

NA

4. Where applicable, provide more details on the type of participation and/or threshold agreement applied.

Implementing decision rule.

(max 450 words per survey)

4. Where applicable, provide more details on the type of participation and/or threshold agreement applied.

For Type of participation other than 'Financial' describe the type of participation, and/or the background of the type of participation in more detail.

(max 450 words per survey)

General Comment: This Text box fulfils Article 5 (1)(b), Article 6 (3)(a), (b) and (c) of Regulation (EU) 2017/1004 and Chapters I and II of the EU MAP Implementing Decision. It is intended to specify which research surveys at sea set out in Table 2 of the EU MAP Implementing Decision will be carried out. Member States shall specify whether the research survey is included in Table 2 of the EU-MAP Implementing Decision or whether it is an additional survey.

(Use one text box per survey)

Name of the research survey

Baltic Ichthyoplankton Survey

1. Objectives of the survey

The main aim of the Baltic Ichthyoplankton Surveys is monitoring of the spatial distribution and abundance of fish eggs and larvae. Several individual survey cruises are conducted each year in close collaboration between several institutes around the Baltic Sea. The surveys are conducted between March and November, aiming to cover the entire spawning season of the target species, Baltic cod. However, depending on the time of sampling, eggs and larvae of other species are caught as well, such as e.g. sprat, herring and flounder as well as several non-commercial species. As spawning of Baltic cod is presently mainly restricted to the Bornholm Basin due to the ambient hydrographic conditions, the main survey area is located in ICES SD 25, but some cruises also cover adjacent areas to account for potential spatial extension of spawning activity. In addition to the ichthyoplankton sampling, a number of trawl hauls are conducted to obtain information on the adult cod, in particular on their fecundity and sex ratios. Furthermore, hydrological parameters are recorded throughout the survey area via CTD casts, and their vertical and horizontal variations are taken into account during analysis and interpretation of survey results. The data resulting from these surveys are utilized to produce a fishery independent SSB estimate as well as a larval index, which are used in the stock assessment of Baltic cod.

As mentioned, several institutes are contributing to these surveys to cover the spawning season of Baltic cod from March to November. DTU Aqua is conducting a survey in June onboard polish RV Baltica, which is a joint survey with the National Marine Fisheries Research Institute (NMFRI) in Gdynia, Poland. In addition, ichthyoplankton sampling is also conducted at night time during the Danish Q1 and Q4 BITS surveys on RV DANA.

2. Description of the survey design and methods used in the survey for each type of data collection as listed in Table 2.6 for this specific survey.

Ichthyoplankton is sampled on a regularly spaced station grid consisting of 45 stations in the Bornholm Basin, with approximately 10 nautical miles between stations. The sampling gear is a Bongo net with an opening diameter of 60 cm and nets of 320 cm length, one net with 500 µm and one net with 335 µm mesh size. The gear is deployed at 3 knots ship speed in a double-oblique haul from the surface to 5 m above the sea floor. In addition, on each sampling station profiles of the ambient hydrographic conditions are obtained by CTD casts. Adult fish are sampled by different types of otter trawls, depending on the institute conducting the individual cruises.

3. For internationally coordinated surveys, describe the participating Member States/vessels.

a. DTU Aqua – National Institute of Aquatic Resources, Denmark, RV DANA & RV BALTICA (charter)
b. NMFRI – National Marine Fisheries Research Institute, Poland, RV BALTICA
c. GEOMAR – Helmholtz Centre for Ocean Research Kiel, Germany, RV ALKOR
d. IMF – Institute of Marine Ecosystem and Fishery Science, Hamburg University, Germany, RV ALKOR
e. TI-OSF – Thünen Institute of Baltic Sea Fisheries, Germany, RV CLUPEA

4. Where applicable, provide more details on the type of participation and/or threshold agreement applied.

NA

(max 450 words per survey)

SECTION 3: FISHING ACTIVITY DATA

Text Box 3.1: Fishing activity variables data collection strategy

General comment: This text box fulfils Article 5 (2)(c), Article 6 (3)(a), (b) and (c) of Regulation (EU) 2017/1004 and Chapter II point 3.1 of the EU MAP Delegated Decision annex. It is intended to describe the method used to derive estimates on representative samples where data are not to be recorded under the Control Regulation (EC) No 1224/2009 or where data collected under Regulation (EC) No 1224/2009 are not at the right aggregation level for the intended scientific use. Text Box 3.1 should be filled only in case complementary data collection is planned

The majority of the fishing activity variables data from Danish vessels are collected as census data in logbooks and sales notes. But some of the effort variables for passive gears are not filled in the Danish logbooks or filled in with an unreliable quality.

Therefore, complementary data will be collected to be able to report these variables. A list of vessels fishing with passive gears (for the vessels not reporting logbooks the gears are estimated via the metiers) will be made available based on previous years fishing activity. 60 vessels will be contacted, corresponding to 5% of the total number of vessels fishing with passive gears, to fill in a questionnaire.
For vessels fishing with gillnets questions will be asked regarding the last trip on target species, type of net, net length, number of nets, number of sets, soaking time, mesh size, net hight, use of pingers, fishing depth.
For vessels fishing with longlines questions will be asked regarding the last trip on target species, number of lines, number of hooks.
For vessels fishing with pots and traps questions will be asked regarding the last trip on target species, number of pots, soaking time.

In addition, this information will be combined with sales notes, with an estimated métier, fleet register, and AIS, BlackBox and EM data, where work will be done to develop or improve algorithms to assess fishing effort from the high-resolution geo-spatial data in combination with other data source.

(max. 900 words)

Text Box 3.2: Fishing activity variables data collection strategy (for inland eel commercial fisheries)

General comment: This text box fulfils Article 5(2)(c), Article 6(3)(a), (b) and (c) of Regulation (EU) 2017/1004 and Chapter II point 3.2 of the EU MAP Delegated Decision annex. It is intended to describe the methods and data sources used to estimate fishing capacity, effort and landings data.

MS is invited to describe inland eel commercial fisheries landings, effort and capacity data collection. Please list or describe e.g. number of fishing entities, fishing methods as well as associated units used.

The commercial inland eel fisheries consist of 22 entities with a licence to fish eel. The method to catch eel is fyke nets and pound nets. The total landing was 5.4 ton eel in 2020. Landings are reported in logbooks by the fishers. Each eel fishing licence (entity) can use a limited number of gear for fishing.

One commercial fishery is monitored, in this fishery data are collected on landing, eel stage (yellow silver), sex, length and weight.

(max. 900 words)

Text Box 4.2: Incidental catches of sensitive species

General Comment: This text box fulfils Article 5(2)(a) and (b), Article 6(3)(a), (b) and (c) of Regulation (EU) 2017/1004 and Chapter 2 point 4.1 of the EU-MAP Delegated Decision annex. This text box complements Table 2.5.

General Comment: This text box fulfils Article 5(2)(a) and (b), Article 6(3)(a), (b) and (c) of Regulation (EU) 2017/1004 and Chapter 2 point 4.1 of the EU-MAP Delegated Decision annex. This text box complements Table 2.5.

This text box is complementary to information on the sampling schemes provided in the quality document (Annex 1.1). It serves to highlight information on sampling schemes and sampling frames related to incidental catches of sensitive species.

The sampling scheme aiming at collecting incidental catches (bycatch) of protected, endangered, and threatened species (PETS) in gillnets, using video-based electronic monitoring systems installed onboard commercial vessels is described in Annex1.1 under the sampling scheme identifier DNK EM - PETS sampling.

Additional information on planning the observation of incidental catches of sensitive species (if already filled in in Annex 1.1, please indicate where it can be found):

- Has an assessment of the relative risk of bycatch for the different gear types/metiers taken place and been taken into account for the sampling design?

In Denmark, no general assessment of the relative risk of bycatch for the different gear types/metiers has been conducted, but bottom-set gillnets have been identified as the gears presenting the largest risk of incidental captures of PETS (turtles, marine mammals and sea birds) in the region in the literature and from interviews with fishers. Moreover, gillnet vessels in Denmark are often too small to require the filling of a logbook ending up in a general lack of knowledge on both the distribution and intensity of the fishing effort, as well as the amount of bycatch associated to these métiers. The bycatch monitoring programme using video-based electronic monitoring (EM) originally came has a solution to fill in this gap by monitoring active fishing vessels for extended durations and recording all incoming bycatches of PETS.

No Danish drift-net fisheries are conducted as there is a ban for using this gear type in areas where Danish fisheries are taking place.

- What are the gear types/metiers that present the highest risk of bycatch per species/taxa of PETS in a given region?

Cetaceans: bottom-set gillnets

Pinnipeds: bottom-set gillnets

Seabirds (diving species): bottom-set and drift- gillnets

[Seabirds (surface-feeding species): trawl fisheries (because of cable strikes) and longlines]

- What are the methods to calculate the observation effort?

A census of the data recorded with EM on gillnet vessels is analysed for bycatch of PETS.

- Does the sampling design and protocol follow the recommendations from relevant expert groups? Provide appropriate references. If there are no relevant expert groups, the design and protocol have to be explained in the text.

Using video-based EM allows to estimate bycatch rates at a fine spatiotemporal scale, thereby reducing the uncertainty in the estimates, as recommended by expert groups like ICES WGBYC.

Additional information on observer protocols (if already filled in in Annex 1.1, indicate where it can be found):

- Does the on-board observer protocol contain a check for rare specimens in the catch at opening of the cod-end? If YES is the observer instructed to indicate if the cod-end was NOT checked in a haul?

No

- In gill nets - and hook-and-line fisheries: does the on-board observer protocol instruct the observer to indicate how much of the hauling process has been observed for (large) incidental bycatches that slip out of the net?

Yes

- In large catches: does the protocol instruct to check for rare specimens during sorting of the catch (i.e. at conveyor belt)? Is the observer instructed to indicate what percentage of the sorting or hauling process has been checked at "haul level"?

The observers are instructed to check for rare specimens during sorting of the catch at conveyor belt, but presently it is not possible to indicate the percentage of the sorting process that has been checked.

Additional information on sampling schemes

Member State may add specific contextual information related to a region and the implementation year(s), for instance highlighting new developments not yet detailed in the quality document, regional adaptation and/or perspectives for the future. Insert the information under the same sampling scheme identifier as in Table 2.5.

Additional description on sampling frames

Member State may add complementary description to what includes the 'Sampling frame description' column of Table 2.5. Insert the information under the same identifier and name as in columns 'Sampling frame identifier' and 'Sampling frame description' of Table 2.5, and in the same order (Sampling frame identifier + Sampling frame description).

(One text box (max. 1 000 words) per region/RFMO/RFO/IO)

Text Box 4.3: Fisheries impact on marine habitats

General comment: This text box fulfils Article 5 paragraph 2(a) and 2(b), Article 6 paragraph 3(a), 3(b) and 3(c) of Regulation (EU) 2017/1004 and Chapter 2, section 4.2 of the EU MAP Delegated Decision annex. It contains information on additional studies on the fisheries impact on marine habitats. This text box applies to the work plan and the annual report.
The assessment of impact of fisheries on benthic marine habitats is based on standardized procedures agreed internationally through projects and ICES working groups. The fishing effort is assessed spatially combining VMS/AIS/BlackBox data with logbook/sales notes data. The fishing gear is assessed to be in contact with the seabed (i.e. fishing) when vessel speed is within defined fishery-specific speed ranges. To calculate the benthic

fishing pressure (swept area ratio), the gear width is estimated using relationships between vessel length or engine power and gear width found in the EU FP-7 Benthis project (Eigaard et al, 2016) which is multiplied with the fishing time and speed of the vessel. This method has also been implemented by ICES WGSFD. To assess the fishing impact of mobile bottom-contacting fishing gears on marine habitats, the fishing pressure map (SAR) is combined with a habitat-sensitivity layer.

In the ICES WGFBIT group, a Population Dynamic model estimates the fisheries impacts on benthic biomass, using VMS data reported to ICES. Denmark is actively participating in the working group and involved in running assessments for the Baltic Sea and North Sea. Where information and/or data are available, the methods and models will be updated.

Currently fishing pressure from the small-scale fishery, which is normally a coastal fishery, is not included in the standard procedures for ICES WGFBIT and ICES WGSFD. To fill the gap in coastal areas, Denmark will be actively participating in the ICES workshop on Geo-Spatial Data for Small-Scale Fisheries (WKSSFGEO) to improve fishing effort estimates for the small-scale fisheries where high resolution geospatial data are available (AIS/BlackBox).

1. Aim of the study

To improve the assessment of fisheries impact on coastal marine habitats

2. Duration of the study

With inputs from the ICES WKSSFGEO, which will run in November/December 2021, it is planned to continuously improve national methods for identifying fishing activity in high resolution geospatial data following development and agreement of standard methods.

3. Methodology and expected outcomes of the study

In the ICES WKSSFGEO the plan is to discuss issues of identifying fishing activities in different fisheries, agree on best practices, develop common R-scripts and quantifying the extent of small-scale fisheries.

This should then be picked up and implemented nationally in the standard data workflow for assessing fishing fisheries impacts on marine habitats, especially in coastal areas.

Reference:

Eigaard OR, Bastardie F, Breen M, et al. (2016) Estimating seabed pressure from demersal trawls, seines and dredges based on gear design and dimensions. ICES Journal of Marine Science, 73: i27-i43

(max 900 words per study)

Text Box 5.2: Economic and social variables for fisheries data collection

General comment: This Text box fulfils Article 5(2)(d), Article 6(3)(a), (b) and (c) of Regulation (EU) 2017/1004, and Chapter II point 5 of the EU MAP Delegated Decision annex. It is intended to specify data to be collected under Tables 7, 8 and 9 of the EU MAP Delegated Decision annex.

1. Description of clustering

Statistics Denmark plans to cluster two fleet segments. It concerns the fleet segment with 'Fishing technique': 'Dredges' and 'Length class': '10-< 12 m' and the fleet segment with 'Fishing technique': 'Dredges' and 'Length class': '12-< 18 m' which are grouped in the cluster named 'Dredges 12-< 18 m*'. The fleet segment with 'Fishing technique': 'Dredges' and 'Length class': '10-< 12 m' had a total population of 2 in 2019 and the fleet segment with 'Fishing technique': 'Dredges' and 'Length class': '12-< 18 m' had a total population of 30 in 2019. The reason for clustering of these two segments is that the fleet segment with 'Fishing technique': 'Dredges' and 'Length class': '10-< 12 m' may consist of a too small population (total population of 2 in 2019) making it impossible to publish economic data because of confidentiality. The criteria for merging the two fleet segments is that they have the same fishing technique. Beside that the length classes of the two fleet segments are in continuation of each other.

2. Description of activity indicator

Statistics Denmark uses an activity indicator to divide the fleet segment into the activity levels low active ('L') and active ('A'). The distinction between activity levels is based on a threshold value for the gross output (value of catch) of the individual vessels (the threshold value was 270.000 DKK equal to 36.270 EUR in 2019). The threshold value is set to cover the majority of the total value of the Danish Fishery (equivalent to 98 pct. in 2019).

3. Deviation from the RCG ECON (ex. PGECON) definitions

Statistics Denmark does not plan to deviate from variable definitions as listed in the 'EU MAP Guidance Document' on the DCF website.

(max. 900 words)

Text Box 6.1: Economic and social variables for aquaculture data collection

General comment: This text box fulfils Article 5(2)(e), Article 6(3)(a), (b) and (c) of Regulation (EU) 2017/1004, and Chapter II point 6 of the EU MAP Delegated Decision annex. It is intended to specify data to be collected under Tables 10 and 11 of the EU MAP Delegated Decision annex.
1. Description of the threshold application Statistics Denmark does not apply a threshold to the population of commercially active aquaculture farms in Denmark. 2. Deviation from the RCG ECON (ex. PGECON) definitions Statistics Denmark does not plan to deviate from variable definitions as listed in the 'EU MAP Guidance Document' on the DCF website. *(max. 900 words)*

Text Box 7.1: Economic and social variables for fish processing data collection

General comment: This text box fulfils Article 5(2)(f), Article 6(3)(a), (b) and (c) of Regulation (EU) 2017/1004, and Chapter II point 7 of the EU MAP Delegated Decision annex. MS should provide justification for complementary data collection for fish processing.

1. The Member State should provide justification for complementary data collection for fish processing in addition to EUROSTAT data.

The Danish fish processing industry is defined by the Business Register using NACE code 10.20. Enterprises engaging in fish processing in Denmark are highly specialized and only a small number of enterprises are identified as having fish processing as their non-main activity. The Danish fish processing industry consisted of approximately 100 enterprises employing around 4,000 persons. The enterprises can be divided on 3 segments according to the level of employment (less than 10, 10-49 and 50-249 employees). Furthermore, the industry can be segmented according to the main species used in production using the commodity produced as indicator.

The Danish data collection for the processing industry (NACE 10.20) 2014-2021 and the future data collection for 2022-2024 are built on data collected by Statistics Denmark to avoid multiple data collections. In order to provide the requested economic and social data under (Annex V to PGECON 2020 and Commission Delegated Decision (EU) 2021/1167 of 27 April 2021 table 9) and provide the best possible foundation for doing research and give advice related to the EU CFP and Danish governmental strategies, the following modification and improvement have been made to the basic data collection that justifies the continues and complementary data collection for the fish processing industry.

First of all, the following shortfalls are identified for the data available at Eurostat. Data collected and reported to Eurostat contains all enterprises, which main activity is fish processing (covered by NACE 10.20), which also means that activities not related to fish processing can be included. Data for enterprises, which main activity is not fish processing, but partly do fish processing, is not included. Not all economic variables listed in Annex V to PGECON 2020 are available at Eurostat. Data are only available at a total aggregated level, which does not allow for deeper analysis at a more disaggregated level. Socioeconomic variables are not collected. To overcome these shortfalls the Danish collection of data for the processing industry will be organized and structured as follows.

Data collected by Statistics Denmark according to the European Business Statistics Regulation and Regulation (EC) No 223/2009 are used as the foundation for the additional data collection of socioeconomic data for the fish processing sector. The type of data collection used for collection of the economic and social data is all based on census. The additional data collection and amendment of data is organized in a close cooperation between the Department of Food and Resource Economics, University of Copenhagen and Statistics Denmark.

In collaboration with Statistics Denmark, data from the Industry Commodity Statistics and the National Account Statistics are combined to deliver and comply with the variables listed in Annex V to PGECON 2020. Enterprises, which have other activities than fish processing, are split up into work place units and only units with fish processing are included to get the most accurate data for the fish processing sector activities. Furthermore, the enterprises are segmented according to employment (Eurostat), but also according to main species produced to allow for deeper analysis of the dependencies of different species coming from either fisheries or aquaculture. In addition to the economic data, social data on gender, age, education and nationality are collected and integrated with the economic data using data from Statistics Denmark's "Register-Based

Workforce Statistic" and "Labour Market Account Statistic" in accordance with Commission Delegated Decision (EU) 2021/1167 of 27 April 2021 table 9. Merging economic statistics and social data statistics requires knowledge at the enterprise and work place unit level in order to make a correct match. Thus, providing the social data requires that the matching economic data are available.

A continuous data collection of economic and social variables based on a consistent approach and methodology will avoid data series breaks, which allows for longer time series analysis of the sector. This provide opportunities for analyzing developments between small and large enterprise and developments within different segments of enterprises relying on different species for production.

2. Deviation from RCG ECON (ex. PGECON) definitions

To further improve the coverage of the fish processing statistics, enterprises, which do not have fish processing as their main activity, will be split up on work place units and the part that includes fish processing will be (if possible) integrated into the statistics at overall and at the different segmentations levels.

Based on the results from the Danish pilot study, the SECFISH (MARE/2016/22) project and PGECON recommendations, raw material input data for the processing industry by species and origin will not be collected. As an alternative, the output (Commodity Statistics) from the enterprises can be used as a proxy for the raw material input. Furthermore, it is used for the segmentation of the industry into species segments, which also indicate the input used.

ANNEX 1.1 - QUALITY REPORT FOR BIOLOGICAL DATA SAMPLING SCHEME

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS : DNK
Region: All regions
Sampling scheme identifier: salmon parr abundance
Sampling scheme type: Diadromous (scientific)
Observation type: SciObs (water body)
Time period of validity: 2022-2024
Short description (max 100 words): *e.g. sampling scheme aiming at collecting length samples from commercial landings on-shore for all species listed in Table 1 of the EU MAP Delegated Decision annex. The scheme covers mainland and all outermost regions ('RUP' in French, Portuguese, and Spanish).* In order to follow the recruitment and status for the populations, information on parr abundance (density) and length distribution of salmon (Salmo salar) will be collected in 6 rivers in Western Jutland.
Description of the population
Population targeted: Specify which are the primary sampling units (PSU), e.g. all national port*days (information present in former Table 4B). For research surveys: specify the main target species from a survey perspective (as opposed to Table 1 in the Annex to the Implementing Decision) and the main survey area. Information on salmon will be collected for populations in four rivers with genetically original populations (Rivers Storå, Skjern å, Varde å and Ribe å) and in two rivers with more recently established populations (rivers Kongeå and Sneum å). **Population sampled:** Specify which part of the target population will be sampled and specify which part of the target population is unreachable for sampling or excluded for some reason to explain, *e.g. major ports being listed as auctions excluding all minor ports and no sampling during the week-ends.* For research surveys at sea describe target species in single-species surveys or ecosystem component *(e.g. demersal, pelagic)* in multispecies surveys. Parr **Stratification:** Explain the logic taken to stratify the population and the number of strata generated, *e.g. population stratified in 3 geographical lots (from A to B, from B to C and from C to D). Each lot is then stratified by auction.*

Sampling will be done during late summer – autumn.
One river with genetically original population is surveyed continuous (annual) sampling (river Skjern), while the remaining rivers will be surveyed in turn (one river per year). The reason for sampling the river Skjern every year, is because this river has been studied more intensely in previous years and consequently more information is available for this river, compared to the other salmon rivers. In addition, previous studies amongst others indicate problems on the survival from egg to ½-year old fish. The rivers sampled in any one year is planned to be rivers where the abundance, sex and length distribution of the spawning population were sampled in the preceding year, also to enable estimation of survival from the egg stage to ½-year old parr.

Sampling design and protocols

Sampling design description: Describe how the sampling allocation is defined; how PSU and SSU are selected for sampling; indicate for which catch fraction the sampling scheme applies.

Four rivers selected for salmon parr are rivers with original populations.
One of these (river Skjern å), will be followed intensely with annual sampling of parr abundance, and, in addition the abundance, sex and size composition of adult spawning population (*Sampling scheme identifier: salmon spawning population*). In addition, the relative recruitment in terms of smolt production is determined bi-annually in one major tributary (*Sampling scheme identifier: smolt abundance*).
In the remaining five salmon rivers information on parr abundance in the year after sampling of the spawning population (*Sampling scheme identifier: salmon spawning population*). These rivers are assessed in turn over a five year cycle.

Is the sampling design compliant with the 4S principle?: Y/N/NA (NA for e.g. surveys and diadromous and recreational sampling schemes)

NA

Regional coordination: Indicate if the sampling design and protocols were developed as part of a regional or multi-lateral agreement, and if yes, refer to the agreement (table 1.3) and list all MS participating.

N

Link to sampling design documentation: Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, Member State shall provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the sampling design exists, Member State shall provide some details in the textbox.

No documentation is available for the sampling design regarding choice of rivers, but sites are selected as 1) representative sites suitable to serve as index sites and 2) sites likely to assess changes in geographic distribution in the river (salmon).
Documentation on electro fishing method and procedure for calculations:
Bohlin T., Hamrin S., Heggberget T.G., Rasmussen G., Saltveit S.J. (1989). Electrofishing — Theory and practice with special emphasis on salmonids. Hydrobiologia, 173, 9–43. (https://www.researchgate.net/publication/227323982_Electrofishing-Theory_and_Practice_with_Special_Emphasis_on_Salmonids)

Geertz-Hansen, P., A. Koed, et al. (2013). Manual til elektrofiskeri Vejledning til elektrofiskeri ved bestandsanalyser og opfiskning af moderfisk. DTU Aqua-rapport nr. 272-2013. Institut for Akvatiske Ressourcer, Danmarks Tekniske Universitet. 43 pp + bilag https://orbit.dtu.dk/en/publications/manual-til-elektrofiskeri-vejledning-til-elektrofiskeri-ved-besta.

Compliance with international recommendations: Indicate 'Y' (yes) if the sampling design is in line with international recommendations, and 'N' if not. If no relevant expert or coordination groups exist, the sampling design should be shortly explained in the text, and should be available upon request for the evaluators.

Y

Link to sampling protocol documentation: Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the sampling design exists, provide details on the sampling protocol in this textbox.

https://orbit.dtu.dk/en/publications/manual-til-elektrofiskeri-vejledning-til-elektrofiskeri-ved-besta

Compliance with international recommendations: Member State shall state 'Y' (yes) if the sampling protocol is in line with international recommendations, and 'N' if not. If no relevant expert or coordination groups exist, the sampling protocol should be shortly explained in the text, and should be available upon request for the evaluators.

Y

Sampling implementation

Recording of refusal rate: Indicate with 'Y' (yes) or 'N' (no), or 'NA' (not applicable, in case of research surveys). If 'N' (no), indicate when (year) documentation will be available.

NA

Monitoring of sampling progress within the sampling year: Indicate how sampling allocations are adjusted (if needed) and followed-up, what are the mechanisms in place to resolve issues and adopt mitigation measures during the sampling year?

The sample stratification and digitization process is monitored ontinously. In case of advert weather conditions (high precipitation) part of sampling may be delayed, or in rare cases have to be omitted.

Data capture

Means of data capture: short description (+ photo optionally). Indicate what are the means for collecting the data, e.g. scales, measuring board, dedicated software, ...

Standard electro fishing equipment, measuring board, handheld gps unit.
Collected parr are slightly anaesthetized and lengths are measured on analogous measuring boards. Results are recorded and stored on standard sheets (paper) together with habitat information. Subsequently data are stored electronically.

Data capture documentation: Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g.

internal report). If no documentation on data capture (e.g. measuring protocols, maturity staging, manual for the data capture means etc.) exists, provide some details in the textbox. **Quality checks documentation:** Indicate with 'Y' (yes) or 'N' (no). If 'N' (no), indicate when (year) documentation will be available. Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the quality checks exists, provide some details in the text box. Abundance is compared to abundance for the site relevant in previous years (if available). Length distribution is compared to lengths on other sites in the river.
Data storage
National database: Provide the name of national database, if applicable. Otherwise, insert 'NA' (not applicable). Provide a link if the database is accessible through a website. NA International database: Provide the name of international database(s) and the organisation hosting the database, if applicable. Otherwise, insert 'NA' (not applicable). Provide a link if the database is accessible through a website. NA Quality checks and data validation documentation: Provide link to webpage where the documentation can be found. Otherwise, provide some details in the text box. NA.
Sample storage
Storage description: Indicate the type of soft tissues and hard parts stored (e.g. age structures, stomach, plankton, genetics) and the location used for samples storage; how long the samples are stored; how conservation and maintenance as well as access to samples are organised; whether the samples are stored under the auspices/responsibility of an international organization; if yes, which one. Provide a link to information on quantities of sampled stored by species/stock, geographic sub-area and by year. NA. Tissue samples are not collected. Sample analysis: Provide a brief description or the references to documents, including link to webpages (e.g. age reading manuals, EGs reports and protocols) if adequate, where information on the processing of the samples is provided. NA
Data processing
Evaluation of data accuracy (bias and precision): Indicate with 'Y' (yes) or 'N' (no). If 'N' (no), indicate when (year) documentation will be available. Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the evaluation of data accuracy exists, provide some details in the textbox.

Abundance is compared to abundance on each site investigated in previous years (if available). Length distribution is compared to lengths on other sites in the river.

Editing and imputation methods: Indicate with 'Y' (yes) or 'N' (no). If 'N' (no), indicate when (year) documentation will be available. Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the editing and imputation methods exists, provide some details in the textbox.

Quality document associated to a dataset: Is there a publication digital object identifier (DOI) created? Is there a document summarising the estimation process followed?

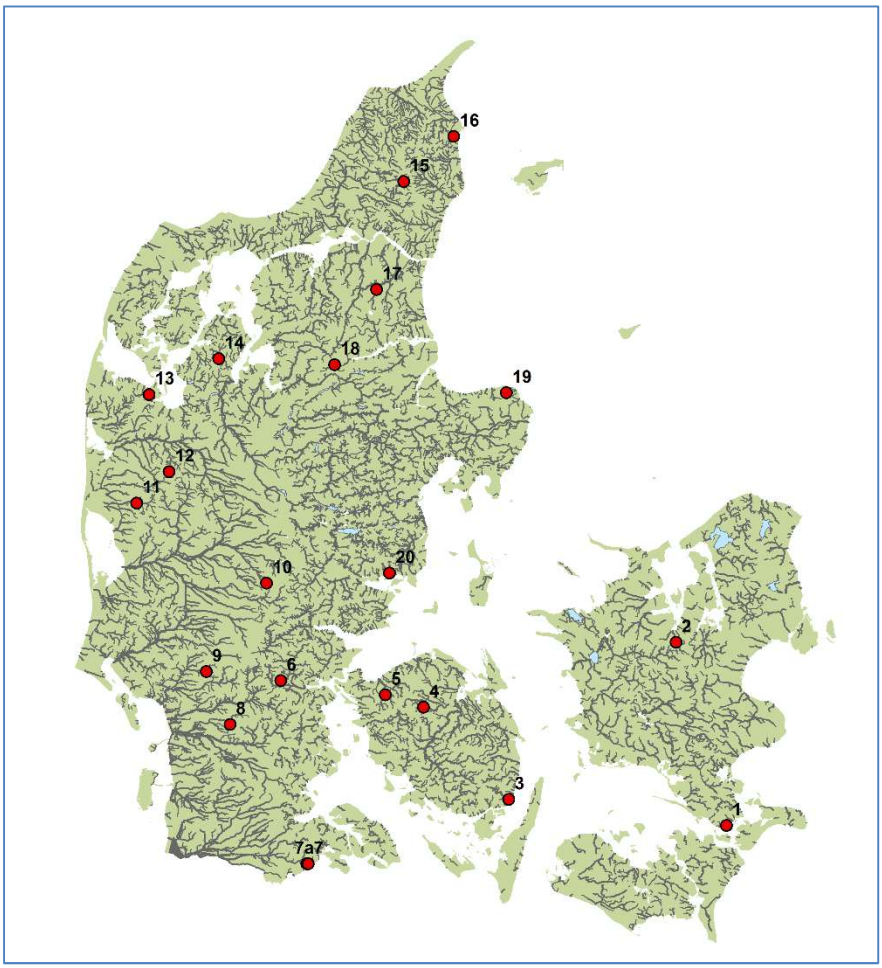
N

Validation of the final dataset: How are datasets validated (quality checked) before providing to end-user?

Data are not validated apart from described above.

MS : DNK
Region: All regions
Sampling scheme identifier: ssea trout parr abundance
Sampling scheme type: Diadromous (scientific)
Observation type: SciObs (water body)
Time period of validity: 2022-2024
Short description (max 100 words): *e.g. sampling scheme aiming at collecting length samples from commercial landings on-shore for all species listed in Table 1 of the EU MAP Delegated Decision annex. The scheme covers mainland and all outermost regions ('RUP' in French, Portuguese, and Spanish).* In order to follow the recruitment and status for the populations, information on parr abundance (density) and length distribution of sea trout (Salmo trutta)) will be collected in 6 rivers in Western Jutland and sea trout (Salmo trutta) in 20 rivers in different streams across the country.
Description of the population
Population targeted: Specify which are the primary sampling units (PSU), e.g. all national port*days (information present in former Table 4B). For research surveys: specify the main target species from a survey perspective (as opposed to Table 1 in the Annex to the Implementing Decision) and the main survey area. Sea trout abundance will be collected in 20 different rivers across the country (numbers refer to map below. 1. Lollikebæk, 2. Elverdamsåen, 3. Vejstrup Å, 4. Stavids Å, 5. Storå, 6. Kolding Å, 7. Fruebæk,

8. Ribe Å, 9. Sneum Å, 10. Skjern Å, 11. Hover Å, 12. Storåen, 13. Resenkær Å, 14. Vium Mølleå, 15. Rye Å, 16. Bamgsbo Å, 17. Lindenborg Å, 18. Onsild Å, 19. Brøndstrup Mølleå, 20. Møllebæk).



Population sampled: Specify which part of the target population will be sampled and specify which part of the target population is unreachable for sampling or excluded for some reason to explain, *e.g. major ports being listed as auctions excluding all minor ports and no sampling during the week-ends.* For research surveys at sea describe target species in single-species surveys or ecosystem component *(e.g. demersal, pelagic)* in multispecies surveys.

Parr

Stratification: Explain the logic taken to stratify the population and the number of strata generated, *e.g. population stratified in 3 geographical lots (from A to B, from B to C and from C to D). Each lot is then stratified by auction.*

Sampling will be carried out during late summer – autumn, when parr hatched in spring have reached a size enabling capture by electro-fishing.

Sampling in different parts of the country will allow both geographic and temporal assessment of sea trout populations.

Sampling design and protocols

Sampling design description: Describe how the sampling allocation is defined; how PSU and SSU are selected for sampling; indicate for which catch fraction the sampling scheme applies.

Rivers (PSU) selected for sea trout surveillance are typical sea trout rivers, with a good geographical coverage.
Sampling parr abundance will be carried out by electro fishing (removal method).
Is the sampling design compliant with the 4S principle?: Y/N/NA (NA for e.g. surveys and diadromous and recreational sampling schemes)

NA

Regional coordination: Indicate if the sampling design and protocols were developed as part of a regional or multi-lateral agreement, and if yes, refer to the agreement (table 1.3) and list all MS participating.

N.

Information on sea trout abundance is, together with habitat data, delivered to the ICES working group WGBAST.

Link to sampling design documentation: Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, Member State shall provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the sampling design exists, Member State shall provide some details in the textbox.

No documentation is available for the sampling design regarding choice of rivers, but they are all typical sea trout rivers. The geographic distribution allows detection of regional changes in status of sea trout populations.

The sites have been selected being representative sites and suited to serve as index sites.

Documentation on electro fishing method and procedure for calculations:
Bohlin T., Hamrin S., Heggberget T.G., Rasmussen G., Saltveit S.J. (1989). Electrofishing — Theory and practice with special emphasis on salmonids. Hydrobiologia, 173, 9–43. (https://www.researchgate.net/publication/227323982_Electrofishing-Theory_and_Practice_with_Special_Emphasis_on_Salmonids)

Geertz-Hansen, P., A. Koed, et al. (2013). Manual til elektrofiskeri Vejledning til elektrofiskeri ved bestandsanalyser og opfiskning af moderfisk. DTU Aqua-rapport nr. 272-2013. Institut for Akvatiske Ressourcer, Danmarks Tekniske Universitet. 43 pp + bilag
https://orbit.dtu.dk/en/publications/manual-til-elektrofiskeri-vejledning-til-elektrofiskeri-ved-besta.

Compliance with international recommendations: Indicate 'Y' (yes) if the sampling design is in line with international recommendations, and 'N' if not. If no relevant expert or coordination groups exist, the sampling design should be shortly explained in the text, and should be available upon request for the evaluators.

Y
(ICES. 2021. Baltic Salmon and Trout Assessment Working Group (WGBAST). ICES Scientific Reports. 3:26. 331 pp. https://doi.org/10.17895/ices.pub.7925)

Link to sampling protocol documentation: Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of

publication - e.g. internal report). If no documentation on the sampling design exists, provide details on the sampling protocol in this textbox.

https://orbit.dtu.dk/en/publications/manual-til-elektrofiskeri-vejledning-til-elektrofiskeri-ved-besta

Compliance with international recommendations: Member State shall state 'Y' (yes) if the sampling protocol is in line with international recommendations, and 'N' if not. If no relevant expert or coordination groups exist, the sampling protocol should be shortly explained in the text, and should be available upon request for the evaluators.

N –

Sampling protocol is in accordance with methods described in https://orbit.dtu.dk/en/publications/manual-til-elektrofiskeri-vejledning-til-elektrofiskeri-ved-besta.

Sampling implementation

Recording of refusal rate: Indicate with 'Y' (yes) or 'N' (no), or 'NA' (not applicable, in case of research surveys). If 'N' (no), indicate when (year) documentation will be available.

NA

Monitoring of sampling progress within the sampling year: Indicate how sampling allocations are adjusted (if needed) and followed-up, what are the mechanisms in place to resolve issues and adopt mitigation measures during the sampling year?
The sample stratification and digitization process is monitored on an on-going basis. In case of advert weather conditions (high precipitation) part of sampling may be delayed, or, in rare cases has to be omitted.

Data capture

Means of data capture: short description (+ photo optionally). Indicate what are the means for collecting the data, e.g. scales, measuring board, dedicated software, ...

Standard electro fishing equipment, measuring board, handheld gps unit.
Collected parr are slightly anaesthetized and lengths are measured on analogous measuring boards. Results are recorded on standard sheets (paper) together with habitat information. Subsequently data are stored electronically.

Data capture documentation: Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on data capture (e.g. measuring protocols, maturity staging, manual for the data capture means etc.) exists, provide some details in the textbox.

https://orbit.dtu.dk/en/publications/manual-til-elektrofiskeri-vejledning-til-elektrofiskeri-ved-besta

Quality checks documentation: Indicate with 'Y' (yes) or 'N' (no). If 'N' (no), indicate when (year) documentation will be available. Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the quality checks exists, provide some details in the text box.

N

Abundances are compared to abundances for the site relevant in previous years (if available). Length distribution is compared to lengths on other sites in the river.
Data storage
National database: Provide the name of national database, if applicable. Otherwise, insert 'NA' (not applicable). Provide a link if the database is accessible through a website. NA International database: Provide the name of international database(s) and the organisation hosting the database, if applicable. Otherwise, insert 'NA' (not applicable). Provide a link if the database is accessible through a website. NA Quality checks and data validation documentation: Provide link to webpage where the documentation can be found. Otherwise, provide some details in the text box. NA.
Sample storage
Storage description: Indicate the type of soft tissues and hard parts stored (e.g. age structures, stomach, plankton, genetics) and the location used for samples storage; how long the samples are stored; how conservation and maintenance as well as access to samples are organised; whether the samples are stored under the auspices/responsibility of an international organization; if yes, which one. Provide a link to information on quantities of sampled stored by species/stock, geographic sub-area and by year. NA. Tissue samples are not collected. Sample analysis: Provide a brief description or the references to documents, including link to webpages (e.g. age reading manuals, EGs reports and protocols) if adequate, where information on the processing of the samples is provided. NA
Data processing
Evaluation of data accuracy (bias and precision): Indicate with 'Y' (yes) or 'N' (no). If 'N' (no), indicate when (year) documentation will be available. Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the evaluation of data accuracy exists, provide some details in the textbox. Abundance is compared to abundance on each site investigated in previous years (if available). Length distribution is compared to lengths on other sites in the river. **Editing and imputation methods:** Indicate with 'Y' (yes) or 'N' (no). If 'N' (no), indicate when (year) documentation will be available. Provide a link to a webpage where the documentation can be found.

If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the editing and imputation methods exists, provide some details in the textbox. Quality document associated to a dataset: Is there a publication digital object identifier (DOI) created? Is there a document summarising the estimation process followed? N Validation of the final dataset: How are datasets validated (quality checked) before providing to end-user? Data are not validated apart from described above.

MS : DNK
Region: North Sea and Eastern Arctic
Sampling scheme identifier: salmon smolt abundance
Sampling scheme type: Diadromous (scientific)
Observation type: SciObs (water body)
Time period of validity: 2022-2024
Short description (max 100 words): *e.g. sampling scheme aiming at collecting length samples from commercial landings on-shore for all species listed in Table 1 of the EU MAP Delegated Decision annex. The scheme covers mainland and all outermost regions ('RUP' in French, Portuguese, and Spanish).* Salmon (*Salmo salar*) smolt migration from a tributary to the River Skjern Å will be sampled by trapping out migrating smolt. The aim of the sampling is to observe variations in smolt production (abundance), smolt age and size composition and the timing of migration. Combined with estimates of the parr population in the tributary, calculating survival from parr to smolt will be possible.
Description of the population
Population targeted: Specify which are the primary sampling units (PSU), e.g. all national port*days (information present in former Table 4B). For research surveys: specify the main target species from a survey perspective (as opposed to Table 1 in the Annex to the Implementing Decision) and the main survey area. One major tributary of the river Skjern Å (river Omme Å) will be sampled for salmon smolts. **Population sampled:** Specify which part of the target population will be sampled and specify which part of the target population is unreachable for sampling or excluded for some reason to explain, *e.g. major ports being listed as auctions excluding all minor ports and no sampling during the week-ends.* For research surveys at sea describe target species in single-species surveys or ecosystem component *(e.g. demersal, pelagic)* in multispecies surveys. Out migrating salmon smolts from the tributary Omme Å will be sampled.

Stratification: Explain the logic taken to stratify the population and the number of strata generated, *e.g. population stratified in 3 geographical lots (from A to B, from B to C and from C to D). Each lot is then stratified by auction.*

The sampling in one tributary of the river system will serve as a cost-effective index of the total smolt abundance from the entire river system and possibly also reflect the trend in the other salmon rivers.

Sampling design and protocols

Sampling design description: Describe how the sampling allocation is defined; how PSU and SSU are selected for sampling; indicate for which catch fraction the sampling scheme applies.

Sampling will be done biannually in a major tributary to the river Skjern Å. The entire catch will be measured. Sampling will be carried out in the whole smolt-migration period from April to June. Each smolt will be measured (TL) and it will be noted if it is of wild or hatchery origin. A subsample of the smolts, will be marked and released upstream the trap to estimate trap efficiency.

Is the sampling design compliant with the 4S principle?: Y/N/NA (NA for e.g. surveys and diadromous and recreational sampling schemes)

NA

Regional coordination: Indicate if the sampling design and protocols were developed as part of a regional or multi-lateral agreement, and if yes, refer to the agreement (table 1.3) and list all MS participating.

N

Link to sampling design documentation: Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, Member State shall provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the sampling design exists, Member State shall provide some details in the textbox.

Sampling smolt during their seaward migration provides essential information for estimating the actual production of any given salmon river. Smolt traps are usually situated in the lower part of the rivers and are operated during the entire migration period.

Compliance with international recommendations: Indicate 'Y' (yes) if the sampling design is in line with international recommendations, and 'N' if not. If no relevant expert or coordination groups exist, the sampling design should be shortly explained in the text, and should be available upon request for the evaluators.

The smolt trap will be positioned in the lower part of the tributary and operated every day during the period 1. April through 31. May.
Trapping of migrating smolt in rotary screw traps is a widely used and tested method, which has been standard for many decades, especially in the USA. The design to be used here has been used and tested in research projects in the Danish salmon rivers since 2000.

Link to sampling protocol documentation: Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the sampling design exists, provide details on the sampling protocol in this textbox.

The catch will be collected every morning and the length of the fish recorded.

In order to determine the efficiency of the trap a fraction of the catch will be visually marked and released upstream the trap.

Compliance with international recommendations: Member State shall state 'Y' (yes) if the sampling protocol is in line with international recommendations, and 'N' if not. If no relevant expert or coordination groups exist, the sampling protocol should be shortly explained in the text, and should be available upon request for the evaluators.

N
Position of the trap and period for operation is in accordance with the general method applied for estimating smolt number.

Sampling implementation

Recording of refusal rate: Indicate with 'Y' (yes) or 'N' (no), or 'NA' (not applicable, in case of research surveys). If 'N' (no), indicate when (year) documentation will be available.

NA

Monitoring of sampling progress within the sampling year: Indicate how sampling allocations are adjusted (if needed) and followed-up, what are the mechanisms in place to resolve issues and adopt mitigation measures during the sampling year?

The operation and sampling will be monitored continuously during the entire period. The trap will be tended every day during the period and twice a day during peak run time.

Data capture

Means of data capture: short description (+ photo optionally). Indicate what are the means for collecting the data, e.g. scales, measuring board, dedicated software, ...

Smolt trap (rotary screw type), measuring board
Collected smolt are sedated and lengths are measured on analogous measuring boards. Results are recorded on standard sheets (paper). Subsequently data are stored electronically.

Data capture documentation: Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on data capture (e.g. measuring protocols, maturity staging, manual for the data capture means etc.) exists, provide some details in the textbox.

N
Protocol for operation of the trap and sampling of biological data will be produced before sampling is initiated

Quality checks documentation: Indicate with 'Y' (yes) or 'N' (no). If 'N' (no), indicate when (year) documentation will be available. Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the quality checks exists, provide some details in the text box.

Y
Trap efficiency will be estimated

Data storage
National database: Provide the name of national database, if applicable. Otherwise, insert 'NA' (not applicable). Provide a link if the database is accessible through a website. NA **International database:** Provide the name of international database(s) and the organisation hosting the database, if applicable. Otherwise, insert 'NA' (not applicable). Provide a link if the database is accessible through a website. NA **Quality checks and data validation documentation:** Provide link to webpage where the documentation can be found. Otherwise, provide some details in the text box. NA.
Sample storage
Storage description: Indicate the type of soft tissues and hard parts stored (e.g. age structures, stomach, plankton, genetics) and the location used for samples storage; how long the samples are stored; how conservation and maintenance as well as access to samples are organised; whether the samples are stored under the auspices/responsibility of an international organization; if yes, which one. Provide a link to information on quantities of sampled stored by species/stock, geographic sub-area and by year. NA. Tissue samples are not collected. Sample analysis: Provide a brief description or the references to documents, including link to webpages (e.g. age reading manuals, EGs reports and protocols) if adequate, where information on the processing of the samples is provided. NA
Data processing
Evaluation of data accuracy (bias and precision): Indicate with 'Y' (yes) or 'N' (no). If 'N' (no), indicate when (year) documentation will be available. Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the evaluation of data accuracy exists, provide some details in the textbox. Y The number of smolt and inter-annual variations will be compared to the abundance estimates collected on electro fishing sites sampled in the scheme 'parr abundance'. **Editing and imputation methods:** Indicate with 'Y' (yes) or 'N' (no). If 'N' (no), indicate when (year) documentation will be available. Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the editing and imputation methods exists, provide some details in the textbox.

Standard methods are used to estimate trap efficiency and thus calculate the total smolt run from the trap catches. This is very simple and can be found in several scientific publications.

Quality document associated to a dataset: Is there a publication digital object identifier (DOI) created? Is there a document summarising the estimation process followed?

N

Validation of the final dataset: How are datasets validated (quality checked) before providing to end-user?

Data are validated by experienced researchers from DTU Aqua before made public available.

MS : DNK
Region: All regions
Sampling scheme identifier: salmon spawning population
Sampling scheme type: Diadromous (scientific)
Observation type: SciObs (water body)
Time period of validity: 2022-2024
Short description (max 100 words): *e.g. sampling scheme aiming at collecting length samples from commercial landings on-shore for all species listed in Table 1 of the EU MAP Delegated Decision annex. The scheme covers mainland and all outermost regions ('RUP' in French, Portuguese, and Spanish).* In order to follow the status for the populations, the number, sex and length composition of adult spawners entering the natal spawning stream will be collected for Atlantic salmon (Salmo salar) in 6 rivers in Western Jutland.
Description of the population
Population targeted: Specify which are the primary sampling units (PSU), e.g. all national port*days (information present in former Table 4B). For research surveys: specify the main target species from a survey perspective (as opposed to Table 1 in the Annex to the Implementing Decision) and the main survey area. Salmon in four rivers debouching into the North Sea. **Population sampled:** Specify which part of the target population will be sampled and specify which part of the target population is unreachable for sampling or excluded for some reason to explain, *e.g. major ports being listed as auctions excluding all minor ports and no sampling during the week-ends.* For research surveys at sea describe target species in single-species surveys or ecosystem component *(e.g. demersal, pelagic)* in multispecies surveys. Adult salmon in their home river. **Stratification:** Explain the logic taken to stratify the population and the number of strata generated, *e.g. population stratified in 3 geographical lots (from A to B, from B to C and from C to D). Each lot is then stratified by auction.*

Sampling will be done during late autumn – early winter, prior to spawning. Surveys will be conducted in four rivers with genetically original populations (Rivers Storå, Skjern å, Varde å and Ribe å) and in two rivers with recently established populations (rivers Kongeå and Sneum å).
The river Skjern å will be sampled every year, while the remaining rivers will be sampled in turn; one river per year.
The reason for sampling the river Skjern annually is that this river has been studied more intensely in previous years and consequently more information is available for this river, compared to the other salmon rivers.

Sampling design and protocols

Sampling design description: Describe how the sampling allocation is defined; how PSU and SSU are selected for sampling; indicate for which catch fraction the sampling scheme applies.

The number of spawners will be determined by mark-recapture (Petersen method). 200 salmon collected by electro fishing in October - early November will be tagged and returned to the river. Approx. 3-4 weeks later eletro fishing is repeated and tagged / untagged fish will be recorded separately for calculation of the entire spawning population. The spawning run (number of fish entering the stream) will be calculated by adding the number of fish removed by angling.

One river with genetically original population is surveyed continuous (annual) sampling (river Skjern), while the remaining rivers are fished in turn (one river per year in turn).

Is the sampling design compliant with the 4S principle?: Y/N/NA (NA for e.g. surveys and diadromous and recreational sampling schemes)

NA

Regional coordination: Indicate if the sampling design and protocols were developed as part of a regional or multi-lateral agreement, and if yes, refer to the agreement (table 1.3) and list all MS participating.

N

Link to sampling design documentation: Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, Member State shall provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the sampling design exists, Member State shall provide some details in the textbox.

Documentation on electro fishing method and procedure for calculations:

Bohlin T., Hamrin S., Heggberget T.G., Rasmussen G., Saltveit S.J. (1989). Electrofishing — Theory and practice with special emphasis on salmonids. Hydrobiologia, 173, 9–43. (https://www.researchgate.net/publication/227323982_Electrofishing-Theory_and_Practice_with_Special_Emphasis_on_Salmonids)

Geertz-Hansen, P., A. Koed, et al. (2013). Manual til elektrofiskeri Vejledning til elektrofiskeri ved bestandsanalyser og opfiskning af moderfisk. DTU Aqua-rapport nr. 272-2013. Institut for Akvatiske Ressourcer, Danmarks Tekniske Universitet. 43 pp + bilag
https://orbit.dtu.dk/en/publications/manual-til-elektrofiskeri-vejledning-til-elektrofiskeri-ved-besta.

Compliance with international recommendations: Indicate 'Y' (yes) if the sampling design is in line with international recommendations, and 'N' if not. If no relevant expert or coordination groups exist, the sampling design should be shortly explained in the text, and should be available upon request for the evaluators.

Y
Information on spawner abundance is in compliance with requests from NASCO

Link to sampling protocol documentation: Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the sampling design exists, provide details on the sampling protocol in this textbox.

Geertz-Hansen, P., A. Koed, et al. (2013). Manual til elektrofiskeri Vejledning til elektrofiskeri ved bestandsanalyser og opfiskning af moderfisk. DTU Aqua-rapport nr. 272-2013. Institut for Akvatiske Ressourcer, Danmarks Tekniske Universitet. 43 pp + bilag
https://orbit.dtu.dk/en/publications/manual-til-elektrofiskeri-vejledning-til-elektrofiskeri-ved-besta

Compliance with international recommendations: Member State shall state 'Y' (yes) if the sampling protocol is in line with international recommendations, and 'N' if not. If no relevant expert or coordination groups exist, the sampling protocol should be shortly explained in the text, and should be available upon request for the evaluators.

N

Sampling implementation

Recording of refusal rate: Indicate with 'Y' (yes) or 'N' (no), or 'NA' (not applicable, in case of research surveys). If 'N' (no), indicate when (year) documentation will be available.

NA

Monitoring of sampling progress within the sampling year: Indicate how sampling allocations are adjusted (if needed) and followed-up, what are the mechanisms in place to resolve issues and adopt mitigation measures during the sampling year?
The sample stratification and digitization process is monitored on an on-going basis.

Sampling process is monitored continuously.

Data capture

Means of data capture: short description (+ photo optionally). Indicate what are the means for collecting the data, e.g. scales, measuring board, dedicated software, ...

Standard electro fishing equipment, measuring board, gps, tagging equipment, tag reading equipment.
During tagging the position of capture is recorded, the salmon are measured on analogous measuring boards and length and sex are recorded.
A PIT tag is inserted in the dorsal musculature. In the field results are recorded on standard sheets (paper)
During recapture all salmon are measured, and scanned for tags. If the salmon are tagged, the position of recapture is recorded. All salmon are measured and sex recorded.
Subsequently data are stored electronically.

Data capture documentation: Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on data capture (e.g. measuring protocols, maturity staging, manual for the data capture means etc.) exists, provide some details in the textbox.

N
No written protocol

Quality checks documentation: Indicate with 'Y' (yes) or 'N' (no). If 'N' (no), indicate when (year) documentation will be available. Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the quality checks exists, provide some details in the text box.

N

Data storage

National database: Provide the name of national database, if applicable. Otherwise, insert 'NA' (not applicable). Provide a link if the database is accessible through a website.

NA

International database: Provide the name of international database(s) and the organisation hosting the database, if applicable. Otherwise, insert 'NA' (not applicable). Provide a link if the database is accessible through a website.

NA

Quality checks and data validation documentation: Provide link to webpage where the documentation can be found. Otherwise, provide some details in the text box.

N

Sample storage

Storage description: Indicate the type of soft tissues and hard parts stored (e.g. age structures, stomach, plankton, genetics) and the location used for samples storage; how long the samples are stored; how conservation and maintenance as well as access to samples are organised; whether the samples are stored under the auspices/responsibility of an international organization; if yes, which one. Provide a link to information on quantities of sampled stored by species/stock, geographic sub-area and by year.

NA. Tissue samples are not collected.

Sample analysis: Provide a brief description or the references to documents, including link to webpages (e.g. age reading manuals, EGs reports and protocols) if adequate, where information on the processing of the samples is provided.

NA

Data processing

Evaluation of data accuracy (bias and precision): Indicate with 'Y' (yes) or 'N' (no). If 'N' (no), indicate when (year) documentation will be available. Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the evaluation of data accuracy exists, provide some details in the textbox.

Y
Spawning run is calculated with 95 % C.L.
(example https://www.fiskepleje.dk/nyheder/2019/02/laks_storaa_opgang_i_2018??id=920eb70e-9439-4de5-b28d-a293157d9add)

Editing and imputation methods: Indicate with 'Y' (yes) or 'N' (no). If 'N' (no), indicate when (year) documentation will be available. Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the editing and imputation methods exists, provide some details in the textbox.

Quality document associated to a dataset: Is there a publication digital object identifier (DOI) created? Is there a document summarising the estimation process followed?

N

Validation of the final dataset: How are datasets validated (quality checked) before providing to end-user?

N

MS : DNK
Region: North Sea
Sampling scheme identifier: SciObs_yellow_recruits
Sampling scheme type: Diadromous (scientific)
Observation type: SciObs water body
Time period of validity: 2022-2024
Short description (max 100 words): Annual collection of data on young eel ascending three River basins, River Gudenaa. River Heelbækken, river Kolding. The data are collected from eel ladder traps in connection with weirs in the rivers.
Description of the population
Population targeted: The European eel (*Anguilla anguilla*) is distributed across the majority of coastal countries in Europe and North Africa. At the continental scale, eels have a wide and scattered distribution and are found in virtually all types of water bodies from rivers and lakes to estuaries and coastal waters. The European eel is panmictic and thought to spawn in the Sargasso sea. **Population sampled:** Inland waters (River basins). **Stratification:** River basins on the East and West coast of Denmark

Sampling design and protocols
Sampling design description: Each eel ladder trap for ascending eel trap will be visited 3 times a week from 1 April - 31 October. **Is the sampling design compliant with the 4S principle?:** NA **Regional coordination:** NA **Link to sampling design documentation:** NA **Compliance with international recommendations:** NA **Link to sampling protocol documentation:** NA **Compliance with international recommendations:** The Joint EIFAAC/ICES/GFCM Working group on eels (WGEEL)
Sampling implementation
Recording of refusal rate: NA **Monitoring of sampling progress within the sampling year:** NA
Data capture
Means of data capture: Ascending eel captured in the eel ladder traps will be weighed and in subsamples, individual eel will be length measured. **Data capture documentation:** **Quality checks documentation:**

MS : DNK
Region: North Sea
Sampling scheme identifier: SciObs_glass_recruits
Sampling scheme type: Diadromous (scientific)
Observation type: SciObs water body
Time period of validity: 2022-2024
Short description (max 100 words): Annual collection of data on Glass eel ascending three River basins. The data are collected by electrofishing three small rivers. River Klitmøller, river Nors aa and river Slette aa.
Description of the population
Population targeted: The European eel (Anguilla anguilla) is distributed across the majority of coastal countries in Europe and North Africa. At the continental scale, eels have a wide and scattered distribution and are found in virtually all types of water bodies from rivers and lakes to estuaries and coastal waters. The European eel is panmictic and thought to spawn in the Sargasso sea. **Population sampled:** **Inland waters (River basins).** **Stratification:** River basins on the West coast of Denmark
Sampling design and protocols
Sampling design description: Glass eel ascending into small rivers will be monitored by electrofishing two or three river stations, three times a year. Each river station will be electro fished minimum two times in order to calculate efficiency of electrofishing. Captured eel counted separately for each electrofishing run and the number of eels at each station calculated using the removal method (Moran-Zippin method). **Is the sampling design compliant with the 4S principle?:** **NA** **Regional coordination:** **NA** **Link to sampling design documentation:** **NA** **Compliance with international recommendations:** **NA** **Link to sampling protocol documentation:** **NA** **Compliance with international recommendations:** The Joint EIFAAC/ICES/GFCM Working group on eels (WGEEL)

Sampling implementation
Recording of refusal rate: **NA** **Monitoring of sampling progress within the sampling year:** **NA**
Data capture
Means of data capture: Average densities (eel/m2) of pigmented glass eel will be estimated during the month May to August. Data will be the average from 3 electrofishing surveys per year (Moran-Zippin method). Length measured of captured eels. **Data capture documentation:** **Quality checks documentation:**

MS : DNK
Region: North Sea
Sampling scheme identifier: SciObs_yellow_standing stock
Sampling scheme type: Diadromous (scientific)
Observation type: SciObs water body
Time period of validity: 2022-2024
Short description (max 100 words): Annual collection of data on standing stock of yellow eel in a small river basin River Vester Vedsted. The data will be collected by electrofishing four river stations.
Description of the population
Population targeted: The European eel (*Anguilla anguilla*) is distributed across the majority of coastal countries in Europe and North Africa. At the continental scale, eels have a wide and scattered distribution and are found in virtually all types of water bodies from rivers and lakes to estuaries and coastal waters. The European eel is panmictic and thought to spawn in the Sargasso sea. **Population sampled:** Inland waters (River basins). **Stratification:** River basins on the East coast of Denmark
Sampling design and protocols
Sampling design description: Standing stock of yellow eel will monitored by electrofishing four river stations, three times a year. Each river station will be electro fished minimum two times. Captured eel counted separately for each electrofishing run and the number of eels at each station calculated using the removal method (Moran-Zippin method).

Is the sampling design compliant with the 4S principle?: NA **Regional coordination:** NA **Link to sampling design documentation:** NA **Compliance with international recommendations:** NA **Link to sampling protocol documentation:** NA **Compliance with international recommendations:** The Joint EIFAAC/ICES/GFCM Working group on eels (WGEEL)
Sampling implementation
Recording of refusal rate: NA **Monitoring of sampling progress within the sampling year:** NA
Data capture
Means of data capture: Average densities (eel/m2) of yellow eel (elvers) will be estimated during the month May to August. Data will be the average from 3 electrofishing surveys per year (Moran-Zippin method). Length measured of all captured eels. **Data capture documentation:** **Quality checks documentation:**

MS : DNK
Region: North Sea
Sampling scheme identifier: SciObs_Commercial_Silver eel escapement
Sampling scheme type: Diadromous (commercial)
Observation type: SciObs water body
Time period of validity: 2022-2024
Short description (max 100 words): Escapement of out-migrating silver eel (biomass), tag-recapture experiment.

Description of the population
Population targeted: The European eel (*Anguilla anguilla*) is distributed across the majority of coastal countries in Europe and North Africa. At the continental scale, eels have a wide and scattered distribution and are found in virtually all types of water bodies from rivers and lakes to estuaries and coastal waters. The European eel is panmictic and thought to spawn in the Sargasso sea. **Population sampled:** Inland waters (River basin). **Stratification:** River basin on the West coast of Denmark.
Sampling design and protocols
Sampling design description: In River Ribe Å an estimate of silver eel escapement from the river will be obtained in cooperation with an eel fishery situated in the lower part of River Ribe. During autumn, a tag recapture experiment will take place to estimate silver eel escapement from the River basin. **Is the sampling design compliant with the 4S principle?:** **Regional coordination:** **Link to sampling design documentation:** **Compliance with international recommendations:** **Link to sampling protocol documentation:** **Compliance with international recommendations:** The Joint EIFAAC/ICES/GFCM Working group on eels (WGEEL).
Sampling implementation
Recording of refusal rate: None **Monitoring of sampling progress within the sampling year:** None
Data capture
Means of data capture: Escapement of silver eel: The efficiency of the fyke-net fishery will be estimated by the mark/recapture (Petersen) method. Eels will be tagged with passive integrated tags (PIT) and released upstream the fykenet fishery. All the fyke-net captured eel will be scanned for PIT tags and the fyke-net efficiency calculated. Knowing the efficiency and the total catch of the fyke-net fishery, the absolute number of the out migrating silver eel-run in River Ribe can be estimated. The mark/recapture will be repeated twice during the autumn. **Data capture documentation:** **Quality checks documentation:**

MS : DNK
Region: All regions
Sampling scheme identifier: Self water body_Diadromous
Sampling scheme type: Diadromous (recreational)
Observation type: Self water body
Time period of validity: 2022-2024
Short description (max 100 words): *e.g. sampling scheme aiming at collecting length samples from commercial landings on-shore for all species listed in Table 1 of the EU MAP Delegated Decision annex. The scheme covers mainland and all outermost regions ('RUP' in French, Portuguese, and Spanish).* Information on freshwater recreational catches of salmon are will be collected from rivers with salmon populations. Data will be collected from existing web-based systems where anglers are obliged to report catches.
Description of the population
Population targeted: Specify which are the primary sampling units (PSU), e.g. all national port*days (information present in former Table 4B). For research surveys: specify the main target species from a survey perspective (as opposed to Table 1 in the Annex to the Implementing Decision) and the main survey area. Information on salmon will be collected for populations in four rivers with genetically original populations and in four additional rivers with more recently established populations. PSU are the rivers Storå, Skjern Å, Varde å and Ribe Å, Kongeå, Sneum Å, Brede Å and Vidå). **Population sampled:** Specify which part of the target population will be sampled and specify which part of the target population is unreachable for sampling or excluded for some reason to explain, *e.g. major ports being listed as auctions excluding all minor ports and no sampling during the week-ends.* For research surveys at sea describe target species in single-species surveys or ecosystem component *(e.g. demersal, pelagic)* in multispecies surveys. All recreational freshwater catches of adult salmon **Stratification:** Explain the logic taken to stratify the population and the number of strata generated, *e.g. population stratified in 3 geographical lots (from A to B, from B to C and from C to D). Each lot is then stratified by auction.*
Sampling design and protocols
Sampling design description: Describe how the sampling allocation is defined; how PSU and SSU are selected for sampling; indicate for which catch fraction the sampling scheme applies. Catch opportunities in each of the eight rivers with salmon populations are regulated by qoutas. The actual catch in each of the rivers (PSU) is followed continuously throughout the fishing season by mandatory web-based self-reporting by the anglers. **Is the sampling design compliant with the 4S principle?:** Y/N/NA (NA for e.g. surveys and diadromous and recreational sampling schemes) NA

Regional coordination: Indicate if the sampling design and protocols were developed as part of a regional or multi-lateral agreement, and if yes, refer to the agreement (table 1.3) and list all MS participating.

N

Link to sampling design documentation: Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, Member State shall provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the sampling design exists, Member State shall provide some details in the textbox.

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Compliance with international recommendations: Indicate 'Y' (yes) if the sampling design is in line with international recommendations, and 'N' if not. If no relevant expert or coordination groups exist, the sampling design should be shortly explained in the text, and should be available upon request for the evaluators.

Y

Link to sampling protocol documentation: Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the sampling design exists, provide details on the sampling protocol in this textbox.

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Compliance with international recommendations: Member State shall state 'Y' (yes) if the sampling protocol is in line with international recommendations, and 'N' if not. If no relevant expert or coordination groups exist, the sampling protocol should be shortly explained in the text, and should be available upon request for the evaluators.

N
Catches in each river separately are already collected continuously throughout the fishing season in web-based systems. At the end of the fishing season total catches will be collected by DTU Aqua.

Sampling implementation

Recording of refusal rate: Indicate with 'Y' (yes) or 'N' (no), or 'NA' (not applicable, in case of research surveys). If 'N' (no), indicate when (year) documentation will be available.

NA

Monitoring of sampling progress within the sampling year: Indicate how sampling allocations are adjusted (if needed) and followed-up, what are the mechanisms in place to resolve issues and adopt mitigation measures during the sampling year?

NA

Data capture

Means of data capture: short description (+ photo optionally). Indicate what are the means for collecting the data, e.g. scales, measuring board, dedicated software, ...

Local management units will report catches directly to DTU Aqua.

Data capture documentation: Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on data capture (e.g. measuring protocols, maturity staging, manual for the data capture means etc.) exists, provide some details in the textbox. **Quality checks documentation:** Indicate with 'Y' (yes) or 'N' (no). If 'N' (no), indicate when (year) documentation will be available. Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the quality checks exists, provide some details in the text box.
Data storage
National database: Provide the name of national database, if applicable. Otherwise, insert 'NA' (not applicable). Provide a link if the database is accessible through a website. NA International database: Provide the name of international database(s) and the organisation hosting the database, if applicable. Otherwise, insert 'NA' (not applicable). Provide a link if the database is accessible through a website. NA Quality checks and data validation documentation: Provide link to webpage where the documentation can be found. Otherwise, provide some details in the text box. NA.
Sample storage
Storage description: Indicate the type of soft tissues and hard parts stored (e.g. age structures, stomach, plankton, genetics) and the location used for samples storage; how long the samples are stored; how conservation and maintenance as well as access to samples are organised; whether the samples are stored under the auspices/responsibility of an international organization; if yes, which one. Provide a link to information on quantities of sampled stored by species/stock, geographic sub-area and by year. NA Sample analysis: Provide a brief description or the references to documents, including link to webpages (e.g. age reading manuals, EGs reports and protocols) if adequate, where information on the processing of the samples is provided. NA
Data processing
Evaluation of data accuracy (bias and precision): Indicate with 'Y' (yes) or 'N' (no). If 'N' (no), indicate when (year) documentation will be available. Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the evaluation of data accuracy exists, provide some details in the textbox. NA

Editing and imputation methods: Indicate with 'Y' (yes) or 'N' (no). If 'N' (no), indicate when (year) documentation will be available. Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the editing and imputation methods exists, provide some details in the textbox.

Quality document associated to a dataset: Is there a publication digital object identifier (DOI) created? Is there a document summarising the estimation process followed?

Validation of the final dataset: How are datasets validated (quality checked) before providing to end-user?

MS : DNK

Region: North Sea

Sampling scheme identifier: SciObs_Silver eel escapement

Sampling scheme type: Diadromous (scientific)

Observation type: SciObs water body

Time period of validity: 2022-2024

Short description (max 100 words):
Monitoring escapement of out-migrating silver eel (biomass) fixed silver eel trap, Klitmøller AA.

Description of the population

Population targeted:
The European eel (*Anguilla anguilla*) is distributed across the majority of coastal countries in Europe and North Africa. At the continental scale, eels have a wide and scattered distribution and are found in virtually all types of water bodies from rivers and lakes to estuaries and
coastal waters. The European eel is panmictic and thought to spawn in the Sargasso sea.

Population sampled:
Inland waters (River basins).

Stratification: River basin on the West coast of Denmark.

Sampling design and protocols

Sampling design description:
A silver eel trap in river Klitmøller Å will be visited 3 times a week from 1 September - 31 October. Captured eel will be counted. Length and weight measured from subsamples.

Is the sampling design compliant with the 4S principle?:

Regional coordination:

Link to sampling design documentation:

Compliance with international recommendations: **Link to sampling protocol documentation:** **Compliance with international recommendations:** The Joint EIFAAC/ICES/GFCM Working group on eels (WGEEL).
Sampling implementation
Recording of refusal rate: None **Monitoring of sampling progress within the sampling year:** None
Data capture
Means of data capture: Captured eel will be counted and length and weight will be measured in subsamples. **Data capture documentation:** **Quality checks documentation:**

MS : DNK
Region : North Sea and Baltic Sea
Sampling scheme identifier : offsite_questionnaire
Sampling scheme type: recreational (off site surveys)
Observation type: SelfOnShore
Time period of validity : 2022 - 2024
Short description (max 100 words): Sampling scheme aims at collecting catch data (harvested and released components) for the mandatory species (Table 3, Commission Delegated Decision (EU) 2019/910) from the recreational fisheries in Denmark. The data is collected via an off-site web based questionnaire sent out to a subsample of national license holders by Statistics Denmark. The ca. 6000 yearly respondents (ca. 50%) constitutes the basis for the extrapolation to population level (the yearly total Danish catches of the mandatory species).
Description of the population

Population targeted: All Danish recreational anglers/fishers with a valid 1 year fishing license

Population sampled: Subsamples of the total populations of the two types of Danish license holders.

Stratification: Two different types of 1 year licenses are available in Denmark. Each type being a sampling frame for the survey and the total population stratified accordingly into the two types; passive gear fishing and angling.

Temporal and geographical stratification is applied (responses on quarterly catches per ICES SD area).

AR comment: Indicate any deviations.

Sampling design and protocols

Sampling design description:

PSU (Angler or passive gear fisher) is selected by a simple random approach. Both harvested and released components are included in the sampling scheme.

Is the sampling design compliant with the 4S principle?: NA

Regional coordination: No regional coordination. However, Germany scale the Danish recreational catches in SD22 & SD24 for the ICES stock assessment. This agreement is not formalized.

Link to sampling design documentation: The survey is described in ICES Journal of Marine Science, Volume 69, Issue 2, March 2012, Pages 323–330, https://doi.org/10.1093/icesjms/fss005

Compliance with international recommendations: N (it is not recommended to use a recall based questionnaire survey to collect catch data, if the recall period is up to 6 months. However, the Danish recreational catch data included in stock assessment for the western Baltic cod is adjusted by using an on-site survey).

Link to sampling protocol documentation: ICES Journal of Marine Science, Volume 69, Issue 2, March 2012, Pages 323–330, https://doi.org/10.1093/icesjms/fss005

AR comment: Indicate any deviations.

Sampling implementation

Recording of refusal rate: Y

Monitoring of sampling progress within the sampling year: In the off-site survey we are aiming at a minimum respondent rate of ca. 50%. If the 50% is not reached a prolonged period for the respondents to access the questionnaire is possible. Reminders in form of follow up letters are also sent to the non-respondents.

AR comment: Indicate any deviations.

Data capture

Means of data capture: Subsamples are created with SAS Proc SurveySelect (Statistics Denmark) and respondents answers are analysed using R Core Team (2017). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. URL https://www.R-project.org/.

Data capture documentation:

Quality checks documentation: Y (ICES. 2015. Report of the Working Group on Recreational Fisheries Surveys

(WGRFS), 1–5 June 2015, Sukarrieta, Spain. ICES CM 2015\SSGIEOM:10. 111 pp)

AR comment: Indicate any deviations.

Data storage

National database: Fiskeline

International database: NA.

Quality checks and data validation documentation: Input data coming from statistics Denmark (respondent answers) is being quality checked for typos and outliers before included in the catch estimation analysis.

AR comment: Indicate any deviations.

Sample storage

NA

AR comment: Indicate any deviations.

Data processing

Evaluation of data accuracy (bias and precision): Y. Precision of the estimates for the total catches for the mandatory species is calculated as RSE values for each ICES SD area and quarter.

The bias in the survey has been evaluated (ICES. 2015. Report of the Working Group on Recreational Fisheries Surveys (WGRFS), 1–5 June 2015, Sukarrieta, Spain. ICES CM 2015\SSGIEOM:10. 111 pp)

Editing and imputation methods: N

Quality document associated to a dataset: Is there a publication digital object identifier (DOI) created? N

Is there a document summarising the estimation process followed?

ICES Journal of Marine Science, Volume 69, Issue 2, March 2012, Pages 323–330, https://doi.org/10.1093/icesjms/fss005

Orio, A., Karpushevskaia, A., Nielsen, A., Sundelöf, A., Berg, C. W., Albertsen, C. M., ... Heimbrand, Y. (2019). Benchmark Workshop on Baltic Cod Stocks (WKBALTCOD2). International Council for the Exploration of the Sea (ICES). ICES Scientific Report, No. 9, Vol.. 1 https://doi.org/10.17895/ices.pub.4984

Validation of the final dataset: How are datasets validated (quality checked) before providing to end-user? Quality checks of all respondents data before entering the analysis. Output from analysis of the total catches checked by number of answers giving basis for the analysis together with the RSE.

AR comment: Indicate any deviations.

MS : DNK

Region: Baltic Sea

Sampling scheme identifier: accesspoint_interview

Sampling scheme type: recreational on site surveys

Observation type: SciObsOnShore

Time period of validity: 2022 - 2024

Short description (max 100 words): The survey and the sampling scheme aim at collecting Baltic Salmon catch data (harvested and released components) from trolling boat anglers in the ICES SD 24 and 25 and to collect biological samples (i.e. length, weight and age data) from the catches. The access point survey data is used to adjust the mean catch per trip from the recall web based questionnaire survey (offsite_questionnaire) before extrapolating to total catch for the population. No total effort estimates are gathered or estimated from the survey.

Description of the population

Population targeted: The target population is salmon trolling anglers fishing for salmon in the Baltic Sea (ICES SD24/25) and returning to a harbour on the Island of Bornholm. The harbours are the Primary Sampling Units (PSU), the boats the Secondary Sampling Units (SSU) and anglers are Tertiary Sampling Units (TSU).

Population sampled: All harbours (PSU) which are used by trolling boats (SSU) on the Island of Bornholm during the salmon trolling season (September – June).

Stratification: No stratification

Sampling design and protocols

Sampling design description:

Sampling of the harbours is not probability based. The sampling effort is increased during the peak season of the trolling fishery for salmon and visits are primarily conducted to the most frequently used harbours/boat hauling ramps. When the weather allows for salmon trolling during the fishing season an observer, living at the Island of Bornholm, drives to several different locations to interview anglers when returning from their fishing trip.

Sampling at the individual access point follows a protocol. At the access point the observer interviews all the anglers using a fixed set of questions (questionnaire). The questions are primarily focusing on catch and effort related to the recent ended trip. The angler is asked to give information on his/her catch on the trip (harvested and released components) and the length of the trip. All landed/harvested salmon are length measured (cm), weighted (gram) and scales are collected for age reading.

Is the sampling design compliant with the 4S principle?: NA **Regional coordination:** N **Link to sampling design documentation:** N Sampling documentation is not published. Documentation will be available in 2022. **Compliance with international recommendations:** N Since the survey is not using a probability based approach it is not following guidelines described by the ICES WGRFS. **Link to sampling protocol documentation:** N Sampling documentation is not published. Documentation will be available in 2022. **Compliance with international recommendations:** N
Sampling implementation
Recording of refusal rate: Y The number of anglers refusing to participate in the survey is collected. **Monitoring of sampling progress within the sampling year:** The sampling is intensified during the high peak season for the trolling salmon fishery (April and May).
Data capture
Means of data capture: All landed salmon are measured and weighted and scales collected. Data from the interviews are uploaded to a survey server (Survey Gizmo - Alchemer) and later uploaded to the national database. **Data capture documentation:** Data captured using tablets installed with the survey tool Gizmo – Alchemer survey software. **Quality checks documentation:** Quality checks on the stored data are done on a random basis throughout the sampling, but all data is checked before being used in any further analysis.

Data storage
National database: NA **International database:** NA **Quality checks and data validation documentation:** NA
Sample storage
Otoliths are stored in the National Institute for Aquatic Resources for age reading. Samples are stored according to normal procedures for cod otoliths. Age reading is done according to Vitale, F., Worsøe Clausen, L., and Ní Chonchúir, G. (Eds.) 2019. Handbook of fish age estimation protocols and validation methods. ICES Cooperative Research Report No. 346. 180 pp. http://doi.org/10.17895/ices.pub.5221
Data processing
Evaluation of data accuracy (bias and precision): Y; Precision for each of the quarterly total catch estimate is calculated. Bias has not been evaluated. **Editing and imputation methods:** N **Quality document associated to a dataset:** Is there a publication digital object identifier (DOI) created? Is there a document summarising the estimation process followed? The estimation process is described in ICES. 2019. Benchmark Workshop on Baltic Cod Stocks (WKBALTCOD2). ICES Scientific Reports. 1:9. 310 pp. http://doi.org/10.17895/ices.pub.4984 **Validation of the final dataset:** Datasets are validated (quality checked) by looking through all individual catches (all respondents/participants) before being used in the calculation of the estimate for the total catches.

MS : DNK
Region: All regions
Sampling scheme identifier: DNK At-sea Observer - Active gears
Sampling scheme type: Commercial fishing trip
Observation type: SciObsAtSea
Time period of validity: 2022-2024 (the design is valid back to 2015)
Short description (max 100 words): *e.g. sampling scheme aiming at collecting length samples from commercial landings on-shore for all species listed in Table 1 of the EU MAP Delegated Decision annex. The scheme covers mainland and all outermost regions ('RUP' in French, Portuguese, and Spanish).* Sampling scheme aiming at the collecting of samples for estimation of discard (amount, length, weight and age) from fisheries with seine, bottom trawl and beam trawl targeting demersal fish and crustaceans (Nephrops, Pandalus shrimps and Crangon crangon) for human consumption in area 27.3 and 27.4. Denmark has a single beam trawler targeting demersal fish with large mesh, but the program do not intent to cover that fishery. All species caught are registered for total weight and length but only selected species for the area are collected for age and individual weight. The main aim of the observer trips is to measure the discarded part and only weight by species is recorded for the landed part except for crustaceans were length and weight samples from the landed part (Nephrops, Pandalus shrimps and Crangon crangon) are also obtained in this sampling scheme. The program is set up as an at-sea observer program.
Description of the population
Population targeted: *Specify which are the primary sampling units (PSU), e.g. all national port*days (information present in former Table 4B). For research surveys: specify the main target species from a survey perspective (as opposed to Table 1 in the Annex to the Implementing Decision) and the main survey area.* PSU: Fishing trip (vessel * day) Target population: All Danish fishing trip conducting a fishery with seine, bottom trawl or beam trawl targeting demersal fish and crustaceans (Nephrops, Pandalus shrimps and Crangon crangon) for human consumption in area 27.3 and 27.4. Denmark has a single beam trawler targeting demersal fish with large mesh, but the program do not intent to cover that vessel. **Population sampled:** *Specify which part of the target population will be sampled and specify which part of the target population is unreachable for sampling or excluded for some reason to explain, e.g. major ports being listed as auctions excluding all minor ports and no sampling during the week-ends. For research surveys at sea describe target species in single-species surveys or ecosystem component (e.g. demersal, pelagic) in multispecies surveys.* A description of how the sampling frames are created can be found in Observer_at_sea_sampling_frame_2020, www.dcf-denmark.dk Sampled: All vessels predominantly participating in the fisheries described in 'Target population'. The vessels are found by excluding all vessels predominantly fishing in another fishery e.g. fisheries with passive gears or fisheries targeting fish for reduction or small pelagic. Predominance is determined by assigning each fishing trip to one of the following activities (in the order specified):

1. Fishing outside area 27 -> outside area 27.3 and 27.4
2. Fishing for mussels -> mussels
3. Fishing with passive gears -> passive (passive gears are sampled in a separate program)
4. Targeting fish for reduction or small pelagic -> reduction_SPF
5. Fishing with TBB >= 120 -> TBB>120
6. Fishing outside area 27.3 and 27.4 -> outside area 27.3 and 27.4

If a vessel spends more than 95 % of its trips in a single one of these category, then the vessel is excluded from the sampling frame. All other vessels are included.

Excluded:
None-predominantly: Due to the threshold on 95% of the trips some of the excluded vessels may be a part of the target population at rare occasions.
Inactive: Vessel with a low activity are excluded, since these are too hard to arrange a trip with. The criteria for inactivity is less than 50 days at sea and earning less than 26,845 Euro a year.
Too small: Vessel with an overall length less than 9.5 meters are excluded, since these are too small to allow for observers on-board.

In 2020, 43 were excluded due to inactivity and 207 were excluded due to size.

Stratification: *Explain the logic taken to stratify the population and the number of strata generated, e.g. population stratified in 3 geographical lots (from A to B, from B to C and from C to D). Each lot is then stratified by auction.*

The stratification takes the following into account

Location of homeport: DTU Aqua has two facilities for sampling of commercial fisheries. Each harbour is assigned to a facility based on logistic e.g. distance. The vessels home port is used to assign a vessel to a harbour. This is mainly a logistic stratification, which ensures short distance from lab to vessel and independence between facilities.
Main area and fishery: A vessels is assigned to a strata based on where most of fishing takes places. This secures that relevant areas and fisheries are covered, without over stratification.

From 2015-2020 the sampling frame was stratified the following way

Location	Fishery	Area	Number of vessels
Bornholm	Trawler/seiner	Baltic	19
Hirtshals	Pandalus	North Sea/Skagerrak	8
Hirtshals	Trawler/seiner	North Sea	41
Hirtshals	Trawler/seiner	Skagerrak	122
Lyngby	Crangon	North Sea	18
Lyngby	Trawler/seiner	Baltic/ Skagerrak/ Kattegat	66

In 2022 a CCTV strata will be added.

Sampling design and protocols

Sampling design description: Describe how the sampling allocation is defined; how PSU and SSU are selected for sampling; indicate for which catch fraction the sampling scheme applies.

Sampling allocation between strata is proportional to number of trips within a stratum the year before, with a minimum of 2 trips per strata. Each vessel on a given list has equal change of being selected.

A fishing trip (PSU) is selected with UPSWOR (Unequal Probability Sampling Without Replacement) the following way

1. Selecting a vessels from the list of vessels. This is done with SRSWR in a excel sheet created for this
2. The observer ask for the next trip from the vessel

The result is UPSWOR selection of the PSU, since the selection of the trip is nested within the selection of a vessel.

For vessels conducting 1 days trip, it is part of the sampling scheme to take 2 trips in a row.

The fishing operation (SSU) is selected with NPJS, the instruction is as many as possible, but with a minimum of 1 haul per day.

Catch fraction: Other. Weight per species is recorded for all fractions (Catches (All fractions)). Lengths are in general only recorded for the discard part (Catches (DIS fraction)), except for crustaceans where length are measured for all fractions (Catches (All fractions)). As a supplement our observers often record the weight of the landings on fishing operations, where they don't have time to record discard amount and length per species.

Part of the fishing operation observed – relevant in relation to PETS: The sorting of catch.

Is the sampling design compliant with the 4S principle?: *Y/N/NA (NA for e.g. surveys and diadromous and recreational sampling schemes)*
Y

Regional coordination: *Indicate if the sampling design and protocols were developed as part of a regional or multi-lateral agreement, and if yes, refer to the agreement (table 1.3) and list all MS participating.*
No

Link to sampling design documentation: *Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, Member State shall provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the sampling design exists, Member State shall provide some details in the textbox.*

https://www.dcf-denmark.dk/manuals-documentation
"manual for oparbejdning af fangster på kommercielle fartøjer"

Compliance with international recommendations: Indicate 'Y' (yes) if the sampling design is in line with international recommendations, and 'N' if not. If no relevant expert or coordination groups exist, the sampling design should be shortly explained in the text, and should be available upon request for the evaluators.
Y Ref to ICES reports

Y

Denmark initiated the work to improve the sampling design of the commercial on board sampling following the outcomes of ICES WKACCU, WKPRECISE, WKCATCH, WKPICS and SGPIDS. This outcome has since 2011 led to a gradually change from an ad-hoc sampling programme to a statistically sound sampling (4S) in the observer programme where trips/vessel are the primary sampling unit within some pre-defined fleet lists. The vessel list has been selected according to the home harbour and the main gear type (fleet group) and each lists accounts of unique vessels based on the fishery from the previous year, indicating that the same vessel cannot be present in more than one list.

Link to sampling protocol documentation: Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the sampling design exists, provide details on the sampling protocol in this textbox.

https://www.dcf-denmark.dk/-/media/sites/dcf/manuals/manual-til-oparbejdning-af-fangster-paa-kommercielle-fartoejer-dk.pdf?la=da&hash=25EFD1E5649C762F9FC9C58AED19D2E82B8D5DD3
protocol only exist in Danish

Compliance with international recommendations: Member State shall state 'Y' (yes) if the sampling protocol is in line with international recommendations, and 'N' if not. If no relevant expert or coordination groups exist, the sampling protocol should be shortly explained in the text, and should be available upon request for the evaluators.

Y

Denmark initiated the work to improve the sampling design of the commercial on board sampling following the outcomes of ICES WKACCU, WKPRECISE, WKCATCH, WKPICS and SGPIDS3. The Danish on board sampling program has implemented the recommendation from SGPIDS3 on refusal categories and the sampling design recommended by WKPICS3.

https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2013/WKPICS3/01%20WKPICS313.pdf

https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2013/SGPIDS/SGPIDS13.1.pdf

Sampling implementation

Recording of refusal rate: Indicate with 'Y' (yes) or 'N' (no), or 'NA' (not applicable, in case of research surveys). If 'N' (no), indicate when (year) documentation will be available.

Y
When a vessel is selected for an observer trip the vessel has to be contacted by the observer and asked for participation on the next conducted fishing trip. The fishermen answers are recorded and refusal rates calculated for each vessel list.

Monitoring of sampling progress within the sampling year: Indicate how sampling allocations are adjusted (if needed) and followed-up, what are the mechanisms in place to resolve issues and adopt mitigation measures during the sampling year?

If a vessel is selected by one list and is conducting another fishery however, still part of the observer program, the trip is still conducted. If the vessel is conducting a fishery presently not included in the observer program the trip is not selected.

Data capture

Means of data capture: short description (+ photo optionally). Indicate what are the means for collecting the data, e.g. scales, measuring board, dedicated software,

Presently, at the sampling sites and electronic weight and an analogue measuring board are used for data collection. Data are entered manually to the Fishline data base via a desktop application.

Data capture documentation: Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on data capture (e.g. measuring protocols, maturity staging, manual for the data capture means etc.) exists, provide some details in the textbox.

In the Neprops fishery electronic measuring has been developed with an automatic upload to the database. An age reading quality assurance manual can be found here: age-reading-quality-assurance-manual-2021

Presently, electronic weight and an analogue measuring board are used for data collection. Data are entered manually to the Fishline data base via a desktop application.

Maturity manuals are available at www.dcf-denmark

Quality checks documentation: *Indicate with 'Y' (yes) or 'N' (no). If 'N' (no), indicate when (year) documentation will be available. Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the quality checks exists, provide some details in the text box.*

Y
Routine check per trip and quarter: Different relevant checks are done as a routine on all at-sea observer trips, both per trip and quarter, www.dcf-denmark "discardtjek_kvartal_rapport" and "discardtrip_rapport"

N – documentation will be available in 2023

Routine check at a yearly basis: The following outliers are checked (visually, extreme percentage)

- Age and weight per length (individual measurements)
- Discards weights per haul and species compared to an estimated weight based on the length distribution of the sample
-

An age reading quality assurance manual can be found here: age-reading-quality-assurance-manual-2021

Data storage
National database: *Provide the name of national database, if applicable. Otherwise, insert 'NA' (not applicable). Provide a link if the database is accessible through a website.*

FishLine

International database: *Provide the name of international database(s) and the organisation hosting the database, if applicable. Otherwise, insert 'NA' (not applicable). Provide a link if the database is accessible through a website.*

Data are uploaded to international databases where requested in data calls:
ICES RDB and ICES RDBES – disaggregated data
ICES InterCatch and STECF FDI hosted by JRC – resulting estimates

Quality checks and data validation documentation: *Provide link to webpage where the documentation can be found. Otherwise, provide some details in the text box.*

FisheLine: Some of the numeric fields in our national database has constrains, so only realistic values can be entered e.g. wind direction, but most of the numeric fields is only constrained by the length of the field in the database, which often is set unrealistically high e.g. mesh size is numeric (5,1). We have implemented a set-up, so it is possible to set realistic values for age, length and weight per species, but the set-up has only been used in a short period, since the technicians was tired of all the warnings. All categorical information have defined code lists in our national database, except skipper contact details. All forms has a free text field for remarks. Rectangles are constrained within areas in our national database. A mapping function allows for ad-hoc check of positions.

RDB: ICES Regional Database

RDBES: https://github.com/ices-tools-dev/RDBES
Sample storage
Storage description: Indicate the type of soft tissues and hard parts stored (e.g. age structures, stomach, plankton, genetics) and the location used for samples storage; how long the samples are stored; how conservation and maintenance as well as access to samples are organised; whether the samples are stored under the auspices/responsibility of an international organization; if yes, which one. Provide a link to information on quantities of sampled stored by species/stock, geographic sub-area and by year.
Sample analysis: Provide a brief description or the references to documents, including link to webpages (e.g. age reading manuals, EGs reports and protocols) if adequate, where information on the processing of the samples is provided.

DTU Aqua has an otolith archive were all otoliths are labelled and stored. Information with year, survey, haul, and fishID is printed on each otolith bag.
Pictures of otoliths are for selected species stored in a closed folder system with information including year, survey, haul, and fishID.
Genetics are stored with similar information and additional a QR code is printed on the label.

Sample analysis:
An age reading quality assurance manual can be found here: age-reading-quality-assurance-manual-2021

Data processing
Evaluation of data accuracy (bias and precision): Indicate with 'Y' (yes) or 'N' (no). If 'N' (no), indicate when (year) documentation will be available. Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the evaluation of data accuracy exists, provide some details in the textbox.

N – documentation will be available in 2023

Evaluation is not done as a routine

DTU Aqua is actively involved in ICES expect groups developing estimators for commercial catches, e.g. WGRDBES-EST, WGCATCH and WKRATIO

Editing and imputation methods: *Indicate with 'Y' (yes) or 'N' (no). If 'N' (no), indicate when (year) documentation will be available. Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the editing and imputation methods exists, provide some details in the textbox.*

N – documentation will be available in 2023

Editing:
Overall, if inconsistencies or discrepancies are found then data are checked e.g. against original papers, re-reading of ages, census data. If no error is found, then the value is accepted. In rare case, when an outlier is spotted just before submission of data and it has a strong influence on the result, then the sample is left out and checked afterwards.

Imputation:
Missing sampling of a domain: The domains (quarter, fleet) match the primary end-user, ICES AWG's, so according to guidance the gaps are left blank
Gaps in age length key: Imputed with average or model
Gaps in weight length key: Imputed with model

Quality document associated to a dataset: *Is there a publication digital object identifier (DOI) created? Is there a document summarising the estimation process followed?*

No DOI
The estimation process more or less follows procedure documented in ICES CM 2008/R:26

Validation of the final dataset: *How are datasets validated (quality checked) before providing to end-user?*
Comparison of estimated mean weight per length / Age vs. total weight (SOP check on results). If extreme, this is often due to an outlier.
Estimated total amount of discard and numbers at length per stock, area and fishery are compared visually with a time series. If great difference, then these are investigated. If errors, then these are corrected, if no errors, then the results are accepted

MS : DNK
Region: All regions
Sampling scheme identifier: DNK At-sea Observer - Passive
Sampling scheme type: Commercial fishing trip
Observation type: SciObsAtSea
Time period of validity: 2022-2024
Short description (max 100 words): *e.g. sampling scheme aiming at collecting length samples from commercial landings on-shore for all species listed in Table 1 of the EU MAP Delegated Decision annex. The scheme covers mainland and all outermost regions ('RUP' in French, Portuguese, and Spanish).* Sampling scheme aiming at the collecting of samples for estimation of discard (amount, length, weight and age) from gillnetters targeting demersal fish for human consumption fisheries in area 27.3.b.23,

27.3.c.22 and 27.3.d.24. Include 27.3.a.21 in 2023. All species caught are registered for total weight and length but only selected species for the area are collected for age and individual weight. The main aim of the observer trips is to measure the discarded part and only weight by species is recorded for the landed part

Description of the population

Population targeted: *Specify which are the primary sampling units (PSU), e.g. all national port*days (information present in former Table 4B). For research surveys: specify the main target species from a survey perspective (as opposed to Table 1 in the Annex to the Implementing Decision) and the main survey area.*

PSU: Fishing trip (vessel * day)
Target population: All Danish fishing trip conducting a fishery with a gillnet

Population sampled: Specify which part of the target population will be sampled and specify which part of the target population is unreachable for sampling or excluded for some reason to explain, *e.g. major ports being listed as auctions excluding all minor ports and no sampling during the week-ends.* For research surveys at sea describe target species in single-species surveys or ecosystem component *(e.g. demersal, pelagic)* in multispecies surveys.

If a vessel spends >= 95 % of the trips in the gillnets category, then it is included. Vessels already included in the trawler / seiner sampling frame will not be included.

Some of the vessels selected in the step above are too small to have an observer on board, so vessels less than 8 meters are excluded from the sampling frame.

Vessels with very low activity, so vessels earning less than 50,000 dkk or having less than 50 days at sea a year are also excluded from the sampling frame.

Stratification: Explain the logic taken to stratify the population and the number of strata generated, *e.g. population stratified in 3 geographical lots (from A to B, from B to C and from C to D). Each lot is then stratified by auction.*

No stratification

Sampling design and protocols

Sampling design description: Describe how the sampling allocation is defined; how PSU and SSU are selected for sampling; indicate for which catch fraction the sampling scheme applies.

A fishing trip (PSU) is selected with UPSWOR (Unequal Probability Sampling Without Replacement) the following way

1. Selecting a vessels from the list of vessels. This is done with SRSWR in a excel sheet created for this purpose
2. The observer ask for the next trip from the vessel

The result is UPSWOR selection of the PSU, since the selection of the trip is nested within the selection of a vessel.

For vessels conducting 1 days trip, it is part of the sampling scheme to take 2 trips in a row.

The fishing operation (SSU) is selected with NPJS, the instruction is as many as possible, but with a minimum of 1 haul per day.

Catch fraction: Other. Weight per species is recorded for all fractions (Catches (All fractions)). Lengths are in general only recorded for the discard part (Catches (DIS fraction)), except for crustaceans where length are measured for all fractions (Catches (All fractions)). As a supplement our observers often record the weight of the landings on fishing operations, where they don't have time to record discard amount and length per species.

Part of the fishing operation observed – relevant in relation to PETS: The sorting of catch and hauling check wgcatch report from 2019

Is the sampling design compliant with the 4S principle?: Y/N/NA (NA for e.g. surveys and diadromous and recreational sampling schemes)
Y

Regional coordination: Indicate if the sampling design and protocols were developed as part of a regional or multi-lateral agreement, and if yes, refer to the agreement (table 1.3) and list all MS participating.

N

Link to sampling design documentation: Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, Member State shall provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the sampling design exists, Member State shall provide some details in the textbox.

https://www.dcf-denmark.dk/manuals-documentation "Manual for oparbejdning af fangster på kommercielle fartøjer"

Compliance with international recommendations: Indicate 'Y' (yes) if the sampling design is in line with international recommendations, and 'N' if not. If no relevant expert or coordination groups exist, the sampling design should be shortly explained in the text, and should be available upon request for the evaluators.

Y
Denmark initiated the work to improve the sampling design of the commercial on board sampling following the outcomes of ICES WKACCU, WKPRECISE, WKCATCH, WKPICS and SGPIDS. This outcome has since 2011 led to a gradually change from an ad-hoc sampling programme to a statistically sound sampling (4S) in the observer programme where trips/vessel are the primary sampling unit within some pre-defined fleet lists. The vessel list has been selected according to the home harbour and the main gear type (fleet group) and each lists accounts of unique vessels based on the fishery from the previous year, indicating that the same vessel cannot be present in more than one list.

https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2013/WKPICS3/01%20WKPICS313.pdf

https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2013/SGPIDS/SGPIDS13.1.pdf

Link to sampling protocol documentation: Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the sampling design exists, provide details on the sampling protocol in this textbox.

https://www.dcf-denmark.dk/manuals-documentation

Compliance with international recommendations: Member State shall state 'Y' (yes) if the sampling protocol is in line with international recommendations, and 'N' if not. If no relevant expert or coordination groups exist, the sampling protocol should be shortly explained in the text, and should be available upon request for the evaluators.
Y

Denmark initiated the work to improve the sampling design of the commercial on board sampling following the outcomes of ICES WKACCU, WKPRECISE, WKCATCH, WKPICS and SGPIDS

Sampling implementation

Recording of refusal rate: Indicate with 'Y' (yes) or 'N' (no), or 'NA' (not applicable, in case of research surveys). If 'N' (no), indicate when (year) documentation will be available.

Y

Monitoring of sampling progress within the sampling year: Indicate how sampling allocations are adjusted (if needed) and followed-up, what are the mechanisms in place to resolve issues and adopt mitigation measures during the sampling year?

If a vessel is selected by one list and is conducting another fishery however, still part of the observer program, the trip is still conducted. If the vessel is conducting a fishery presently not included in the observer program the trip is not selected.

Data capture

Means of data capture: short description (+ photo optionally). Indicate what are the means for collecting the data, e.g. scales, measuring board, dedicated software, ...

Presently, at the sampling sites and electronic weight and an analogue measuring board are used for data collection. Data are entered manually to the Fishline data base via a desktop application.

Data capture documentation: Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on data capture (e.g. measuring protocols, maturity staging, manual for the data capture means etc.) exists, provide some details in the textbox.

An age reading quality assurance manual can be found here: age-reading-quality-assurance-manual-2021

Presently, electronic weight and an analogue measuring board are used for data collection. Data are entered manually to the Fishline data base via a desktop application.

Maturity manuals are available at www.dcf-denmark

Quality checks documentation: Indicate with 'Y' (yes) or 'N' (no). If 'N' (no), indicate when (year) documentation will be available. Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the quality checks exists, provide some details in the text box.

An age reading quality assurance manual can be found here: age-reading-quality-assurance-manual-2021

Data storage

National database: Provide the name of national database, if applicable. Otherwise, insert 'NA' (not applicable). Provide a link if the database is accessible through a website.

FishLine

International database: Provide the name of international database(s) and the organisation hosting the database, if applicable. Otherwise, insert 'NA' (not applicable). Provide a link if the database is accessible through a website.

Data are uploaded to international databases where requested in data calls:
ICES RDB and ICES RDBES – disaggregated data
ICES InterCatch and STECF FDI hosted by JRC – resulting estimates

Quality checks and data validation documentation: Provide link to webpage where the documentation can be found. Otherwise, provide some details in the text box.

FisheLine: Some of the numeric fields in our national database has constrains, so only realistic values can be entered e.g. wind direction, but most of the numeric fields is only constrained by the length of the field in the database, which often is set unrealistically high e.g. mesh size is numeric (5,1). We have implemented a set-up, so it is possible to set realistic values for age, length and weight per species, but the set-up has only been used in a short period, since the technicians was tired of all the warnings. All categorical information have defined code lists in our national database, except skipper contact details. All forms has a free text field for remarks. Rectangles are constrained within areas in our national database. A mapping function allows for ad-hoc check of positions.

RDB: ICES Regional Database

RDBES: https://github.com/ices-tools-dev/RDBES

Sample storage

Storage description: Indicate the type of soft tissues and hard parts stored (e.g. age structures, stomach, plankton, genetics) and the location used for samples storage; how long the samples are stored; how conservation and maintenance as well as access to samples are organised; whether the samples are stored under the auspices/responsibility of an international organization; if yes, which one. Provide a link to information on quantities of sampled stored by species/stock, geographic sub-area and by year.

Sample analysis: Provide a brief description or the references to documents, including link to webpages (e.g. age reading manuals, EGs reports and protocols) if adequate, where information on the processing of the samples is provided.

DTU Aqua has an otolith archive were all otoliths are labelled and stored. Information with year, survey, haul, and fishID is printed on each otolith bag.

Pictures of otoliths are for selected species stored in a closed folder system with information including year, survey, haul, and fishID.

Genetics are stored with similar information and additional a QR code is printed on the label.

Sample analysis:
An age reading quality assurance manual can be found here: age-reading-quality-assurance-manual-2021

Data processing

Evaluation of data accuracy (bias and precision): Indicate with 'Y' (yes) or 'N' (no). If 'N' (no), indicate when (year) documentation will be available. Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the evaluation of data accuracy exists, provide some details in the textbox.

N – documentation will be available in 2023

Evaluation is not done as a routine

DTU Aqua is actively involved in ICES expect groups developing estimators for commercial catches, e.g. WGRDBES-EST, WGCATCH and WKRATIO

Editing and imputation methods: Indicate with 'Y' (yes) or 'N' (no). If 'N' (no), indicate when (year) documentation will be available. Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the editing and imputation methods exists, provide some details in the textbox.

N – documentation will be available in 2023

Editing:
Overall, if inconsistencies or discrepancies are found then data are checked e.g. against original papers, re-reading of ages, census data. If no error is found, then the value is accepted. In rare case, when an outlier is spotted just before submission of data and it has a strong influence on the result, then the sample is left out and checked afterwards.

Imputation:
Missing sampling of a domain: The domains (quarter, fleet) match the primary end-user, ICES AWG's, so according to guidance the gaps are left blank
Gaps in age length key: Imputed with average or model
Gaps in weight length key: Imputed with model

Quality document associated to a dataset: Is there a publication digital object identifier (DOI) created? Is there a document summarising the estimation process followed?

No DOI
The estimation process more or less follows procedure documented in ICES CM 2008/R:26

Validation of the final dataset: How are datasets validated (quality checked) before providing to end-user?

Comparison of estimated mean weight per length / Age vs. total weight (SOP check on results). If extreme, this is often due to an outlier.
Estimated total amount of discard and numbers at length per stock, area and fishery are compared visually with a time series. If great difference, then these are investigated. If errors, then these are corrected, if no errors, then the results are accepted

MS : DNK
Region: All regions
Sampling scheme identifier: DNK industrial sampling
Sampling scheme type: Commercial fishing trip
Observation type: SelfAtSea
Time period of validity: 2022-2024 (the design is valid back to 2021)
Short description (max 100 words): *e.g. sampling scheme aiming at collecting length samples from commercial landings on-shore for all species listed in Table 1 of the EU MAP Delegated Decision annex. The scheme covers mainland and all outermost regions ('RUP' in French, Portuguese, and Spanish).* Sampling scheme aiming at the collecting of length and biological variables samples (length, weight and age) from fisheries targeting fish for reduction in a self-sampling scheme combined with samples in land. Length are measured on all species encountered in the samples. Biological variables are taken on the target species and by-catch of herring in the fishery for Norway pout and sprat. The program is set up as a combination of samples from self-sampling and samples from buyers on-shore, see 'Sampling design and protocols'. Observation type is set to 'SelfAtSea', since that is the aim for the vessels taken most of the landings (vessels with length overall >= 24 meters) The self-sampling is supplemented with a close to census sampling from the landing sites. All landings to industrial purposes in Denmark is sampled by the factory / 3. Company and from most of the landings DTU Aqua is getting 1 sample as well. This gives the opportunity to conduct quality check on the self-sampling as well as to have a sampling on the vessels (below 24 meters) outside the sampling frame.
Description of the population

Population targeted: *Specify which are the primary sampling units (PSU), e.g. all national port*days (information present in former Table 4B). For research surveys: specify the main target species from a survey perspective (as opposed to Table 1 in the Annex to the Implementing Decision) and the main survey area.*

PSU: Fishing trip
Target population: All Danish fishing trip conducting a fishery targeting fish for reduction
Ammodytes, Carpos aper, Clupea harengus, Mollotus villousus, Micromesistius poutassou, Sardina pilchardus, Scomber scombrus, spattus sprattus, Trachurus trachurus, Trisopterus esmarkii

Population sampled: *Specify which part of the target population will be sampled and specify which part of the target population is unreachable for sampling or excluded for some reason to explain, e.g. major ports being listed as auctions excluding all minor ports and no sampling during the week-ends. For research surveys at sea describe target species in single-species surveys or ecosystem component (e.g. demersal, pelagic) in multispecies surveys.*

Census on all industrial fish landed in Denmark. If a sample is a very low quality the sample is not worked up. Bad quality can both be the state of the fish and if important information is missing in the sampling scheme.

For vessels selected for self-sampling the vessels above 24 meters relatively covering different amounts of the stock (green covered, red not covered)

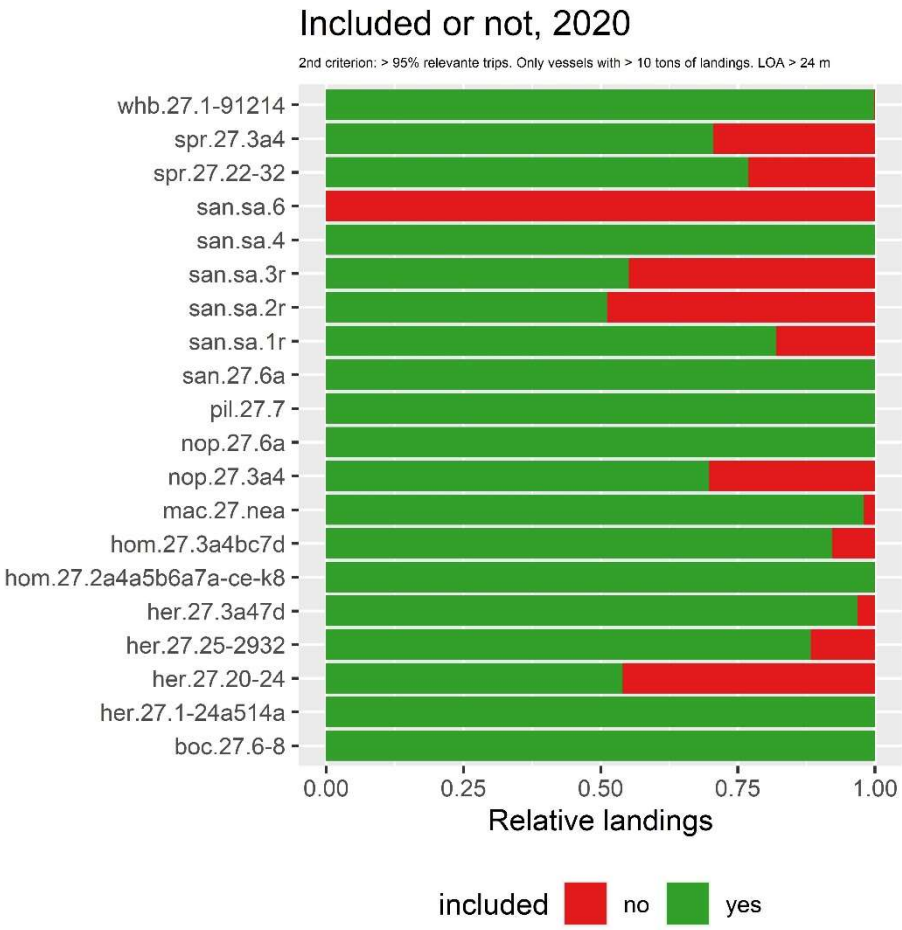

Figure 1. Relative amount of stock covered by self-sampling

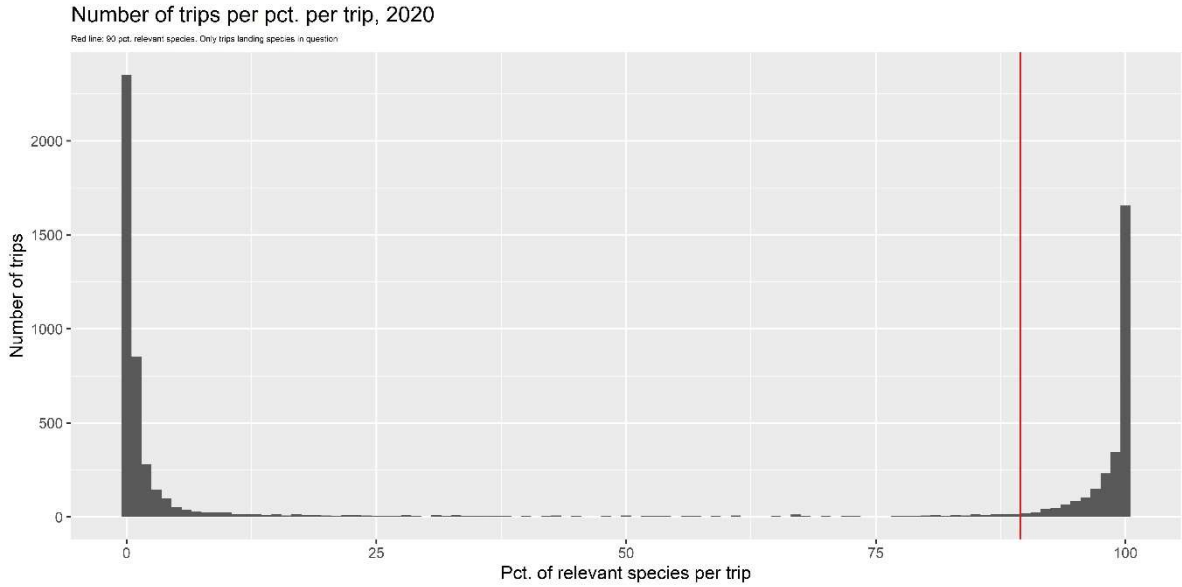

Figure 2. Indicating the a small part of the trips have a targeted fishery.

Stratification: *Explain the logic taken to stratify the population and the number of strata generated, e.g. population stratified in 3 geographical lots (from A to B, from B to C and from C to D). Each lot is then stratified by auction.*

The sampling is stratified per year and vessels above and below 24 meter vessel size.

Sampling design and protocols

Sampling design description: Describe how the sampling allocation is defined; how PSU and SSU are selected for sampling; indicate for which catch fraction the sampling scheme applies.

Two different sampling sources are used in this sampling program. The sampling sources are used in parallel.

3. Self-sampling
4. 3 parties samples

1) All pelagic vessels fishing for industry purposes have been selected for self sampling if they fit the following criteria:

- >24 meters,
- vessel landing > 10 t pelagic fish,
- threshold of 95 % relevant species by trip,
- in 2021: 32 pelagic vessels in the Danish fleet

2) In Denmark it has since 2002 April, been mandatory sampling all industrial landings to ensure correct species allocation in the sale notes. https://fiskeristyrelsen.dk/erhvervsfiskeri/kontrol/krav-til-proevetagning-sortering-og-vejning-om-bord-mm/ as an extra task this sampling companies have been

asked to provide a sample for this sampling program. This part of the program do not target size specific vessels.

Is the sampling design compliant with the 4S principle?: *Y/N/NA (NA for e.g. surveys and diadromous and recreational sampling schemes)*
Y

RCG NANSEA RCG Baltic 2021. Regional Coordination Group North Atlantic, North Sea & Eastern Arctic and Regional Coordination Group Baltic. 2021. Part I Report, 78 pgs. Part II Decisions and Recommendations, 16 pgs. Part III, Intersessional Subgroup (ISSG) 2020-2021 Reports, 350 pgs. (https://datacollection.jrc.ec.europa.eu/docs/rcg)

Regional coordination: *Indicate if the sampling design and protocols were developed as part of a regional or multi-lateral agreement, and if yes, refer to the agreement (table 1.3) and list all MS participating.*
Y
For the Baltic part (Baltic SPF regional) this sampling program has been used as a case study. Denmark has decided to use the same program for all the industrial landings. The agreement for the Baltic SPF regional is not binding for 2022.

Link to sampling design documentation: *Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, Member State shall provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the sampling design exists, Member State shall provide some details in the textbox.*

RCG NA NS&EA RCG Baltic 2021. Regional Coordination Group North Atlantic, North Sea & Eastern Arctic and Regional Coordination Group Baltic. 2021. Part I Report, 78 pgs. Part II Decisions and Recommendations, 16 pgs. Part III, Intersessional Subgroup (ISSG) 2020-2021 Reports, 350 pgs. (https://datacollection.jrc.ec.europa.eu/docs/rcg)

Compliance with international recommendations: Indicate 'Y' (yes) if the sampling design is in line with international recommendations, and 'N' if not. If no relevant expert or coordination groups exist, the sampling design should be shortly explained in the text, and should be available upon request for the evaluators.
Y Ref to ICES reports

Link to sampling protocol documentation: Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the sampling design exists, provide details on the sampling protocol in this textbox.

RCG NA NS&EA RCG Baltic 2021. Regional Coordination Group North Atlantic, North Sea & Eastern Arctic and Regional Coordination Group Baltic. 2021. Part I Report, 78 pgs. Part II Decisions and Recommendations, 16 pgs. Part III, Intersessional Subgroup (ISSG) 2020-2021 Reports, 350 pgs. (https://datacollection.jrc.ec.europa.eu/docs/rcg)

Compliance with international recommendations: Member State shall state 'Y' (yes) if the sampling protocol is in line with international recommendations, and 'N' if not. If no relevant expert or coordination groups exist, the sampling protocol should be shortly explained in the text, and should be available upon request for the evaluators.

Sampling implementation

Recording of refusal rate: Indicate with 'Y' (yes) or 'N' (no), or 'NA' (not applicable, in case of research surveys). If 'N' (no), indicate when (year) documentation will be available.
Y

Monitoring of sampling progress within the sampling year: Indicate how sampling allocations are adjusted (if needed) and followed-up, what are the mechanisms in place to resolve issues and adopt mitigation measures during the sampling year?

As the sampling is conducted as self-sampling and at all landing sites this ensures that the sampling is following the fisheries.

Data capture

Means of data capture: short description (+ photo optionally). Indicate what are the means for collecting the data, e.g. scales, measuring board, dedicated software,
Presently, at the sampling sites and electronic weight and an analogue measuring board are used for data collection. Data are entered manually to the Fishline data base via a desktop application.

Data capture documentation: Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on data capture (e.g. measuring protocols, maturity staging, manual for the data capture means etc.) exists, provide some details in the textbox.

www.dcf-denmark.dk (Manual til oparbejdning af industriprøver)
Presently, electronic weight and an analogue measuring board are used for data collection. Data are entered manually to the Fishline data base via a desktop application.
An age reading quality assurance manual can be found here: www.dcf-denmark, age-reading-quality-assurance-manual-2021

Maturity manuals are available at www.dcf-denmark

Quality checks documentation: *Indicate with 'Y' (yes) or 'N' (no). If 'N' (no), indicate when (year) documentation will be available. Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the quality checks exists, provide some details in the text box.*

N – documentation will be available in 2022

Routine check at a yearly basis: The following outliers are checked (visually)

- Age and weight per length (individual measurements)

Data storage

National database: *Provide the name of national database, if applicable. Otherwise, insert 'NA' (not applicable). Provide a link if the database is accessible through a website.*

FiskeLine

International database: *Provide the name of international database(s) and the organisation hosting the database, if applicable. Otherwise, insert 'NA' (not applicable). Provide a link if the database is accessible through a website.*

Data are uploaded to international databases where requested in data calls:
ICES RDB and ICES RDBES – disaggregated data
ICES InterCatch and STECF FDI hosted by JRC – resulting estimates

Quality checks and data validation documentation: *Provide link to webpage where the documentation can be found. Otherwise, provide some details in the text box.*

FiskeLine: Some of the numeric fields in our national database has constrains, so only realistic values can be entered e.g. wind direction, but most of the numeric fields is only constrained by the length of the field in the database, which often is set unrealistically high e.g. mesh size is numeric (5,1). We have implemented a set-up, so it is possible to set realistic values for age, length and weight per species, but the set-up has only been used in a short period, since the technicians was tired of all the warnings. All categorical information have defined code lists in our national database, except skipper contact details. All forms has a free text field for remarks. Rectangles are constrained within areas in our national database. A mapping function allows for ad-hoc check of positions.

RDB: ICES Regional Database

RDBES: https://github.com/ices-tools-dev/RDBES

Sample storage

Storage description: Indicate the type of soft tissues and hard parts stored (e.g. age structures, stomach, plankton, genetics) and the location used for samples storage; how long the samples are stored; how conservation and maintenance as well as access to samples are organised; whether the samples are stored under the auspices/responsibility of an international organization; if yes, which one. Provide a link to information on quantities of sampled stored by species/stock, geographic sub-area and by year.

Sample analysis: Provide a brief description or the references to documents, including link to webpages (e.g. age reading manuals, EGs reports and protocols) if adequate, where information on the processing of the samples is provided.

DTU Aqua has an otolith archive were all otoliths are labelled and stored. Information with year, survey, haul, and fishID is printed on each otolith bag.

Pictures of otoliths are for selected species stored in a closed folder system with information including year, survey, haul, and fishID.

Genetics are stored with similar information and additional a QR code is printed on the label.

Sample analysis:
An age reading quality assurance manual can be found here: age-reading-quality-assurance-manual-2021

Data processing

Evaluation of data accuracy (bias and precision): Indicate with 'Y' (yes) or 'N' (no). If 'N' (no), indicate when (year) documentation will be available. Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the evaluation of data accuracy exists, provide some details in the textbox.

N – documentation will be available in 2022 (as part of the RCG work conducted)

RCG NA NS&EA RCG Baltic 2021. Regional Coordination Group North Atlantic, North Sea & Eastern Arctic and Regional Coordination Group Baltic. 2021. Part I Report, 78 pgs. Part II Decisions and Recommendations, 16 pgs. Part III, Intersessional Subgroup (ISSG) 2020-2021 Reports, 350 pgs. (https://datacollection.jrc.ec.europa.eu/docs/rcg)

DTU Aqua is actively involved in ICES expect groups developing estimators for commercial catches, e.g. WGRDBES-EST, WGCATCH and WKRATIO. Further, the RCG ISSG developing the regional sampling program 'Baltic SPF regional' will develop design based estimators, which can be adopted to similar sampling schemes like this one.

Editing and imputation methods: *Indicate with 'Y' (yes) or 'N' (no). If 'N' (no), indicate when (year) documentation will be available. Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the editing and imputation methods exists, provide some details in the textbox.*

Y – for sprat and sand eel

N – All other species. Documentation will be available in 2023

Editing:
Overall, if inconsistencies or discrepancies are found then data are checked e.g. against original papers, re-reading of ages, census data. If no error is found, then the value is accepted. In rare case, when an outlier is spotted just before submission of data and it has a strong influence on the result, then the sample is left out and checked afterwards.

Imputation:
Missing sampling of a domain: The domains (quarter, fleet) match the primary end-user, ICES AWG's, so according to guidance the gaps are left blank
Gaps in age length key: Imputed with average or model
Gaps in weight length key: Imputed with model

Quality document associated to a dataset: *Is there a publication digital object identifier (DOI) created? Is there a document summarising the estimation process followed?*

No DOI
The estimation process more or less follows procedure documented in ICES CM 2008/R:26

Validation of the final dataset: *How are datasets validated (quality checked) before providing to end-user?*
Comparison of estimated mean weight per length / age vs. total weight (SOP check on results). If extreme, this is often due to an outlier.

MS : DNK

Region: All regions

Sampling scheme identifier: DNK Market sampling

Sampling scheme type: Commercial by category

Observation type: SciObsOnShore

Time period of validity: 2022-2024

Short description:

Sampling scheme collecting biological samples from commercial landings at markets for a list of selected stocks.

Description of the population

Population targeted:

The PSU is national markets*weeks.

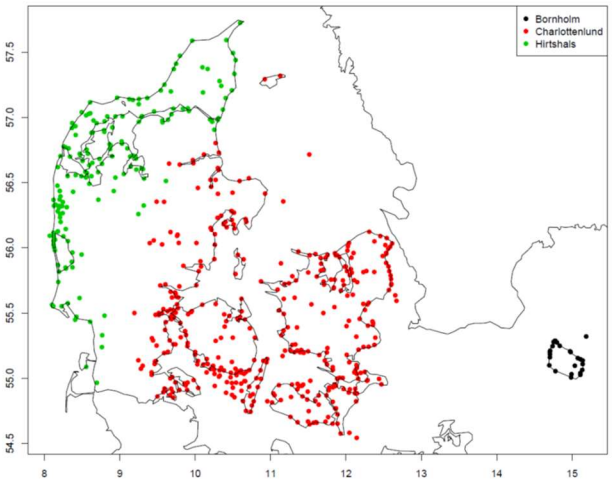

Fig. 1: Harbour sites in the sampling frame. Of these, 37 harbours covering 80% of total landings of the sampled stocks were selected for sampling based in 2019 data.

Population sampled:

The harbours were grouped in a list with small and large harbours and only harbours where 80% of the landings of the selected stocks were included in the sampling programme based on the previous years landing data. If a harbour is not selected for one of these criteria it is not included in the sampling program, and harbours located in other countries are not sampled. The selected habours are ranked by weight of landings, percentage of total landings, number of landings by harbour and the costs of getting to the harbour. Four visits are planned per quarter to the 7 harbours with the highest ranking. For the rest of the selected harbours, one visit per quarter is planned. Each harbour on the list has been given a time period where a visit has to be conducted and sampled for the selected species/stocks. A total of 37 harbours/ landings sites have been selected based on 2019 data, and the list of selected harbours is updated annually based on the previous years data. Due to the quarterly stratification, a harbour can change between being one of the largest harbour and the smaller harbours between quarters. Landings by Danish vessels in foreign countries are not sampled.

Stock	Species	Area
COD-23	Cod	23
COD-22+24	Cod	22, 24

COD-2532	Cod	25-32
COD-21	Cod	3aS
COD-43AN	Cod	3aN, 4
PLE-2123	Plaice	21-23
PLE-2432	Plaice	24-32
PLE-4	Plaice	4
PLE-3AN	Plaice	3aN
DAB-2232	Dab	22-32
DAB-43A	Dab	3a, 4
TUR-43a	Turbot	3a, 4
SAI-43A	Saithe	3a, 4
LIN-43A	Ling	3a, 4
HKE-43A	Hake	3a, 4
HAD-43A	Haddock	3a, 4
WIT-43A	Witch flounder	3a, 4
ANG-4	Anglerfish	4
LEM-4	Lemon sole	4
CAT-4	Catfish	4

Stratification:

The harbours/landing sites are geographical stratified to take into account 2 different locations of staff. One group is located in Hirtshals in the Northern part of Jylland (green in figure 1) and the other group is located in Lyngby in the eastern part of the country. The sampling is further stratified by quarter

Sampling design and protocols

Sampling design description:

The PSUs are calculated by the end of the year for selecting markets*14 days period to be sampled. The selection of markets has been described in section "population sampled". At a harbour visit the fish boxes (SSU) are selected as one box of each commercial size sorting per selected species which is measured for length, individual weight and age. For flatfish species only 2 fish per cm is measured for length, weight and age. There are presently no guidelines for how the boxes are selected within a market visit and for some harbours sampling fish boxes has been selected by the Danish fishery control agency or bought at the action. This sampling scheme is for landings of human consumption for selected stocks (EU MAP 2021/1167 table 1)

Is the sampling design compliant with the 4S principle?:
Y, harbours selection (PSU) are in accordance with the 4S principles. However, the selection of the SSU (fish boxes) are presently not selected randomly.

Regional coordination:
No

Link to sampling design documentation:
www.dcf-denmark.dk (Manual for harbour sampling of fish for human consumption conducted by DTU Aqua)

Compliance with international recommendations:
Y (partly) see sampling design description.
The sampling period for the PSU is a 14 day period * landing site (and not as recommended a given day).

Selection (SSU) of a given fish box is presently not conducted in a random way. For each harbour /auction a list with selected stocks (species * area) have been appointed and 1 box per sorting size for a given stock should be collected if they are available the given day. In small harbours it is possible to collect over several day (2-3 days), with all relevant information on landing dates, vessel ID ect.

https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2013/WKPICS3/01%20WKPICS313.pdf

Link to sampling protocol documentation:
Harbour sampling manual

Sampling implementation

Recording of refusal rate:
N, presently we have full compliance in all harbours. However, for SSU sometimes the relevant fish has been sold and this is presently not properly documented as a kind of refusal.

Monitoring of sampling progress within the sampling year:
In most cases this is not relevant in the market sampling program as 80% off all landings sites are included and this will reflect the fishery. However, sometimes, especially with very low landings events, additional measures are taken and the relevant fishery is directly targeted to archive samples. This is the case with herring in the Western Baltic, Cod in SD 23 and Kattegat cod.

Data capture

Means of data capture:
Presently, at the sampling sites and electronic weight and an analogue measuring board are used for data collection. Data are entered manually to the Fishline data base via a desktop application.

Data capture documentation: Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on data capture (e.g. measuring protocols, maturity staging, manual for the data capture means etc.) exists, provide some details in the textbox.

Harbour sampling manual

Presently, electronic weight and an analogue measuring board are used for data collection. Data are entered manually to the Fishline data base via a desktop application.
An age reading quality assurance manual can be found here: www.dcf-denmark, age-reading-quality-assurance-manual-2021

Quality checks documentation:
Y, an R script is run every quarter to ensure all information from the market samples are available and correct. It has following quality checks, but is continuously improved:

1. Check for missing information
    - Method
    - Multiple Ships (Y, N)
    - Type
    - Ship ID
    - Logbook nr.
2. Check length-weight relationship
    - By species. Is there any points that is outside the prediction interval, of linear model over the previous 4 years data from the same quarter? (using log(weight) & log(length)
3. Check age-length relationship
    - By species. Is there any points that is outside the prediction interval, of polynomial model over the previous 4 years data from the same quarter?

Data storage

National database:
FishLine

International database:
Data are uploaded to international databases where requested in data calls:
ICES RDB and ICES RDBES – disaggregated data
ICES InterCatch and STECF FDI hosted by JRC – resulting estimates

Quality checks and data validation documentation:
FiskeLine: Some of the numeric fields in our national database has constrains, so only realistic values can be entered e.g. wind direction, but most of the numeric fields is only constrained by the length of the field in the database, which often is set unrealistically high e.g. mesh size is numeric (5,1). We have implemented a set-up, so it is possible to set realistic values for age, length and weight per species, but the set-up has only been used in a short period, since the technicians was tired of all the warnings. All categorical information have defined code lists in our national database, except skipper contact details. All forms has a free text field for remarks. Rectangles are constrained within areas in our national database. A mapping function allows for ad-hoc check of positions.

RDB: ICES Regional Database
RDBES: https://github.com/ices-tools-dev/RDBES

Sample storage

Storage description:

DTU Aqua has an otolith archive were all otoliths are labelled and stored. Information with year, survey, haul, and fishID is printed on each otolith bag.

Pictures of otoliths are for selected species stored in a closed folder system with information including year, survey, haul, and fishID.

Genetics are stored with similar information and additional a QR code is printed on the label.

Sample analysis:
An age reading quality assurance manual can be found here: age-reading-quality-assurance-manual-2021

Data processing

Evaluation of data accuracy (bias and precision):
N – documentation will be available in 2023

Evaluation is not done as a routine

Editing and imputation methods:
N – documentation will be available in 2023

Editing:
Overall, if inconsistencies or discrepancies are found then data are checked e.g. against original papers, re-reading of ages, census data. If no error is found, then the value is accepted. In rare case, when an outlier is spotted just before submission of data and it has a strong influence on the result, then the sample is left out and checked afterwards.

Imputation:
Missing sampling of a size sorting strata: Since size sorting category is hidden within the domain (fleet) asked for by the primary end-user, ICES AWG's, then missing values are imputed from other strata. The procedure is not documented, but everything done is documented in SAS or R scripts.
Gaps in age length key: Imputed with average or model
Gaps in weight length key: Imputed with model

Quality document associated to a dataset:
No DOI
The estimation process more or less follows procedure documented in ICES CM 2008/R:26

Validation of the final dataset: How are datasets validated (quality checked) before providing to end-user?
Comparison of estimated mean weight per length/age vs. total weight (SOP check on results). If extreme, this is often due to an outlier.
Amount of landings are compared with official records (sale slips)
Numbers at length/age per stock, area and fishery are compared visually with a time series. If great difference, then these are investigated. If errors, then these are corrected, if no errors, then the results are accepted

MS : DNK

Region: All regions

Sampling scheme identifier: DNK pelagic sampling - HUC

Sampling scheme type: Commercial fishing trip
Observation type: SciObsOnShore
Time period of validity: 2022-2024
Short description (max 100 words): *e.g. sampling scheme aiming at collecting length samples from commercial landings on-shore for all species listed in Table 1 of the EU MAP Delegated Decision annex. The scheme covers mainland and all outermost regions ('RUP' in French, Portuguese, and Spanish).* Sampling scheme aiming at the collecting of length and biological variables samples (length, weight and age) from fisheries targeting pelagic fish for human consumption (mackerel and herring) Length are measured on all species encountered in the samples. Biological variables are taken based on length stratified method. This sampling scheme has still not been developed to follow international recommendations and the 4S principals. This will be conducted in 2022.
Description of the population
Population targeted: *Specify which are the primary sampling units (PSU), e.g. all national port*days (information present in former Table 4B). For research surveys: specify the main target species from a survey perspective (as opposed to Table 1 in the Annex to the Implementing Decision) and the main survey area.* PSU: Fishing trip Target population: All Danish fishing trip conducting a pelagic fishery targeting fish herring or mackerel. **Population sampled:** *Specify which part of the target population will be sampled and specify which part of the target population is unreachable for sampling or excluded for some reason to explain, e.g. major ports being listed as auctions excluding all minor ports and no sampling during the week-ends. For research surveys at sea describe target species in single-species surveys or ecosystem component (e.g. demersal, pelagic) in multispecies surveys.* **Stratification:** *Explain the logic taken to stratify the population and the number of strata generated, e.g. population stratified in 3 geographical lots (from A to B, from B to C and from C to D). Each lot is then stratified by auction.*
Sampling design and protocols
Sampling design description: Describe how the sampling allocation is defined; how PSU and SSU are selected for sampling; indicate for which catch fraction the sampling scheme applies. **Is the sampling design compliant with the 4S principle?:** *Y/N/NA (NA for e.g. surveys and diadromous and recreational sampling schemes)* N

Regional coordination: *Indicate if the sampling design and protocols were developed as part of a regional or multi-lateral agreement, and if yes, refer to the agreement (table 1.3) and list all MS participating.*
N

Link to sampling design documentation: *Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, Member State shall provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the sampling design exists, Member State shall provide some details in the textbox.*

All relevant vessels are monitored by the AIS for vessels entering the harbor of Skagen were close to 95 % of the landings are sampled and in Hirtshals 10% of the landings are sampled. Information on planned future landings in the harbour is received from the factory if one or more EU vessels are present in the harbors samples are collected. The main part of the landings in Jylland are in one of the two harbors Skagen or Hirtshals

Compliance with international recommendations: Indicate 'Y' (yes) if the sampling design is in line with international recommendations, and 'N' if not. If no relevant expert or coordination groups exist, the sampling design should be shortly explained in the text, and should be available upon request for the evaluators.
Y Ref to ICES reports

N in 2022 a new updated manual and sampling program will be developed.

Link to sampling protocol documentation: Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the sampling design exists, provide details on the sampling protocol in this textbox.

https://www.dcf-denmark.dk/manuals-documentation Harbour sampling of large pelagic (Herring and Markel)

Compliance with international recommendations: Member State shall state 'Y' (yes) if the sampling protocol is in line with international recommendations, and 'N' if not. If no relevant expert or coordination groups exist, the sampling protocol should be shortly explained in the text, and should be available upon request for the evaluators.
N

Sampling implementation

Recording of refusal rate: Indicate with 'Y' (yes) or 'N' (no), or 'NA' (not applicable, in case of research surveys). If 'N' (no), indicate when (year) documentation will be available.
N

Monitoring of sampling progress within the sampling year: Indicate how sampling allocations are adjusted (if needed) and followed-up, what are the mechanisms in place to resolve issues and adopt mitigation measures during the sampling year?

The vessels are followed on AIS.

Data capture

Means of data capture: short description (+ photo optionally). Indicate what are the means for collecting the data, e.g. scales, measuring board, dedicated software,

Presently, at the sampling sites and electronic weight and an analogue measuring board are used for data collection. Data are entered manually to the Fishline data base via a desktop application.

Data capture documentation: Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on data capture (e.g. measuring protocols, maturity staging, manual for the data capture means etc.) exists, provide some details in the textbox.

www.dcf-denmark.dk (Harbour sampling of large pelagic (Herring and Markel)
Presently, electronic weight and an analogue measuring board are used for data collection. Data are entered manually to the Fishline data base via a desktop application.
An age reading quality assurance manual can be found here: www.dcf-denmark, age-reading-quality-assurance-manual-2021

Quality checks documentation: *Indicate with 'Y' (yes) or 'N' (no). If 'N' (no), indicate when (year) documentation will be available. Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the quality checks exists, provide some details in the text box.*

N in 2022 a new updated manual for this sampling program will be initiated.

Routine check at a yearly basis: The following outliers are checked (visually)

- Age and weight per length (individual measurements)

Data storage

National database: *Provide the name of national database, if applicable. Otherwise, insert 'NA' (not applicable). Provide a link if the database is accessible through a website.*

FiskeLine

International database: *Provide the name of international database(s) and the organisation hosting the database, if applicable. Otherwise, insert 'NA' (not applicable). Provide a link if the database is accessible through a website.*

Data are uploaded to international databases where requested in data calls:
ICES RDB and ICES RDBES – disaggregated data
ICES InterCatch and STECF FDI hosted by JRC – resulting estimates

Quality checks and data validation documentation: *Provide link to webpage where the documentation can be found. Otherwise, provide some details in the text box.*

FiskeLine: Some of the numeric fields in our national database has constrains, so only realistic values can be entered e.g. wind direction, but most of the numeric fields is only constrained by the length of the field in the database, which often is set unrealistically high e.g. mesh size is numeric (5,1). We have

implemented a set-up, so it is possible to set realistic values for age, length and weight per species, but the set-up has only been used in a short period, since the technicians was tired of all the warnings. All categorical information have defined code lists in our national database, except skipper contact details. All forms has a free text field for remarks. Rectangles are constrained within areas in our national database. A mapping function allows for ad-hoc check of positions.

RDB: ICES Regional Database

RDBES: https://github.com/ices-tools-dev/RDBES

Sample storage

Storage description: Indicate the type of soft tissues and hard parts stored (e.g. age structures, stomach, plankton, genetics) and the location used for samples storage; how long the samples are stored; how conservation and maintenance as well as access to samples are organised; whether the samples are stored under the auspices/responsibility of an international organization; if yes, which one. Provide a link to information on quantities of sampled stored by species/stock, geographic sub-area and by year.

Sample analysis: Provide a brief description or the references to documents, including link to webpages (e.g. age reading manuals, EGs reports and protocols) if adequate, where information on the processing of the samples is provided.

DTU Aqua has an otolith archive were all otoliths are labelled and stored. Information with year, survey, haul, and fishID is printed on each otolith bag.

Pictures of otoliths are for selected species stored in a closed folder system with information including year, survey, haul, and fishID.

Genetics are stored with similar information and additional a QR code is printed on the label.

Sample analysis:
An age reading quality assurance manual can be found here: age-reading-quality-assurance-manual-2021

Data processing

Evaluation of data accuracy (bias and precision): Indicate with 'Y' (yes) or 'N' (no). If 'N' (no), indicate when (year) documentation will be available. Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the evaluation of data accuracy exists, provide some details in the textbox.

N

DTU Aqua is actively involved in ICES expect groups developing estimators for commercial catches, e.g. WGRDBES-EST, WGCATCH and WKRATIO. Further, the RCG ISSG developing the regional sampling program 'Baltic SPF regional' will develop design based estimators, which can be adopted to similar sampling schemes like this one.

Editing and imputation methods: *Indicate with 'Y' (yes) or 'N' (no). If 'N' (no), indicate when (year) documentation will be available. Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the editing and imputation methods exists, provide some details in the textbox.*

Editing:
Overall, if inconsistencies or discrepancies are found then data are checked e.g. against original papers, re-reading of ages, census data. If no error is found, then the value is accepted. In rare case, when an outlier is spotted just before submission of data and it has a strong influence on the result, then the sample is left out and checked afterwards.

Imputation:
Missing sampling of a domain: The domains (quarter, fleet) match the primary end-user, ICES AWG's, so according to guidance the gaps are left blank
Gaps in age length key: Imputed with average or model
Gaps in weight length key: Imputed with model

Quality document associated to a dataset: *Is there a publication digital object identifier (DOI) created? Is there a document summarising the estimation process followed?*

No DOI
The estimation process more or less follows procedure documented in ICES CM 2008/R:26

Validation of the final dataset: *How are datasets validated (quality checked) before providing to end-user?*
Comparison of estimated mean weight per length / age vs. total weight (SOP check on results). If extreme, this is often due to an outlier.

MS : DNK
Region: All regions
Sampling scheme identifier: DNK EM - PETS sampling
Sampling scheme type: Commercial fishing trip
Observation type: EMAtSea
Time period of validity: 2022-2024
Sampling scheme collecting incidental captures (bycatch) of non-target protected, endangered, and threatened species (PETS) in gillnets, using video-based electronic monitoring systems installed onboard commercial vessels. In the reference period, the fishing activity, including effort and bycatch of PETS was entirely recorded and analysed for 10 vessels, in areas ICES IV, IIIa, IIIb, and IIIc. Bycaught animals are identified at species level and fishing effort is calculating as the product of soaking time and net length for each individual haul. The main part of the EM vessels are below 12 meters.
Description of the population
Population targeted: The PET species targeted in this monitoring programme are all marine mammals, birds, non-commercial elasmobranchs, and chelonians captured incidentally in Danish commercial gillnets. The PSU is fishing vessel. Figure 1 shows the sampling effort distribution during the reference period.

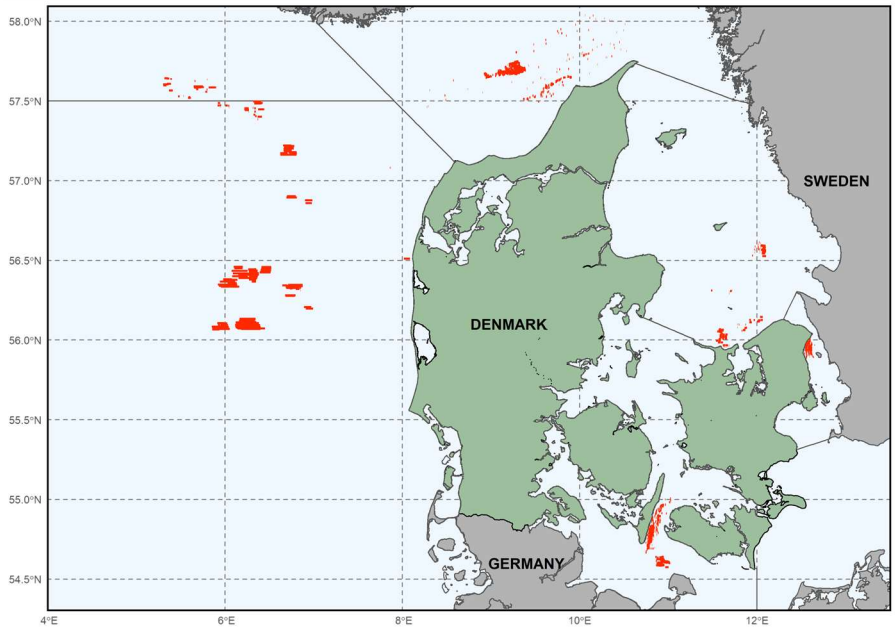

Fig. 1 Location of the hauls recorded in the Danish bycatch monitoring programme, using electronic monitoring with videos on commercial gillnetters. Data from 2018 to 2020. Hauls are indicated represented as red lines. Delimitations between ICES areas are marked as plain grey lines.

Population sampled:
All air-breathing and elasmobranch PET species (i.e., not fish) captured incidentally in gillnets.

Stratification:
The sampling units (commercial vessels) were selected opportunistically based on the list of volunteering gillnet vessels whose main fishing location and/or home harbour was situated in ICES areas IV, IIIa, IIIb, and IIIc. This excluded *de facto* from the monitoring programme the fraction of the fishing boats whose vessel master was refractory to video monitoring. Moreover, vessels fishing only seasonally with gillnets or during limited periods of the year were also excluded. No participating vessel was originating from the Baltic Proper and the island of Bornholm during the reference period. There were more volunteers than EM systems available during the reference period, so new EM monitoring effort was directed towards areas where few historical bycatch data existed (namely the North Sea and Kattegat) using vessels that had registered more fishing effort in the previous years than the fleet average in these areas. Average fishing effort of the sampled fleet represented approximately 2.3% of the total fishing effort of the entire Danish gillnet commercial fleet (in fishing days) during the reference period.

Sampling design and protocols

Sampling design description:
As described in the previous section, the PSUs are the commercial fishing vessels using gillnets as their primary gear most of the year in the North Sea, Skagerrak, and Western Baltic, since gillnets have been identified in Denmark as the most problematic gear with regards to bycatch of PETS.

From the primary stratification level (vessel), the SSU are – by increasing resolution level – fishing trip, fishing day and individual haul within each fishing day. A census of the fishing activity recorded with EM was analysed for bycatch of PETS. This means that the videos of every haul in the EM database was watched through by a trained EM analyst. Any bycaught animal was marked (associating the position and time of the bycatch within each SSU/PSU) as either bird, mammal, or

elasmobranch (or chelonian, but none was caught). Identification of the animals at species-level (and for some species sexing and aging) was done afterwards independently of the EM analysing process. As a result, bycatch rates could be estimated for each species in each ICES statistical area (provided that enough data had been collected in for that species in the considered stratum).

Is the sampling design compliant with the 4S principle?:
N (selection of PSU is not random).

Regional coordination:
N

Link to sampling design documentation:
Manual for video-based electronic monitoring of bycatch in gillnets (updated manual has been added to homepage).

HELCOM report "Bycatch in Baltic Sea commercial fisheries: High-risk areas and evaluation of measures to reduce bycatch"
Scientific journal article "Assessing seabird bycatch in gillnet fisheries using electronic monitoring"

Compliance with international recommendations:
Y (partly) see earlier description

Link to sampling protocol documentation:
Manual for video-based electronic monitoring of bycatch in gillnets
HELCOM report "Bycatch in Baltic Sea commercial fisheries: High-risk areas and evaluation of measures to reduce bycatch"
Scientific journal article "Assessing seabird bycatch in gillnet fisheries using electronic monitoring"

Compliance with international recommendations:
N. There is presently no protocol to sample bycatch of PETS in gillnets agreed upon at international level. However, in the absence of reliable fine-scale data on PETS bycatch in most fisheries in the EU, fine-scale species-specific bycatch rates as estimated in the Danish long-term bycatch electronic monitoring programme provide essential data to model and forecast the effects of fishing on affected PETS populations in the region, following notably the recommendations of OSPAR (https://oap.ospar.org/en/ospar-assessments/intermediate-assessment-2017/biodiversity-status/) and HELCOM (https://helcom.fi/baltic-sea-trends/indicators/) biodiversity indicators, both in line with MSFD D1C1 criterium.

Sampling implementation

Recording of refusal rate:
NA, the sampling design is based on voluntary participation of fishers.

Monitoring of sampling progress within the sampling year:
At least twice a month, incoming EM data are controlled for every vessel. If technical issues are encountered (no data or faulty video or positional data), the fishers are contacted, and a technician is sent onboard to fix the potential issues. If the EM system is turned off manually or impaired with, this constitutes a breach to the contract, so the incriminating fishers are first contacted to explain the situation, their EM data are compared to landings declarations and/or logbook, and if this constitutes a breach in the contract indeed, they are excluded from the EM monitoring and lose their additional

quota. Moreover, contracts are renewed on a yearly basis. Therefore, fishers have the possibility to renew or end the EM data collection each year.

Data capture

Means of data capture:
The hardware of an EM system consists of a control box installed in the wheelhouse, associated with 2 to 4 waterproof rugged closed-circuit television (CCTV) cameras recording the activity on deck from different angles, and linked to a position sensor (GPS receiver). Recorded data are stored onboard and uploaded to a dedicated server automatically every time the vessel is in an area covered with Wi-Fi or GSM/3G/4G mobile network (e.g., the harbour). Analyses of the temporal and spatial characteristics of the fishing trips are done using a dedicated electronic monitoring analyser software (EM analyser), here Anchorlab BlackBox Analyzer (https://www.anchorlab.net/EFM.aspx?tab=Analyzer). Simply put, the recordings made on-board the fishing vessels are stored in a database that associated time, GPS positions and videos. For the end-user, EM analysers presents one or several fishing trips at a time for each vessel, displaying alongside a map with the GPS trace, a timeline indicating the instantaneous vessel speed, and the video recordings from the different cameras. The EM analyst interacts with the software by putting annotations and notes along the time line, which can be extracted as a database with the geo-localisation of each fishing operation and bycatch event, associated with additional operational and ecological parameters.

Data capture documentation:
Manual for video-based electronic monitoring of bycatch in gillnets

Quality checks documentation:
Y. New raw EM data are checked for every vessel at least twice a month manually (check if the data are uploaded on the server, and if they are correct in terms of video quality, number of cameras recording, GPS recording and cleanliness of the lenses). Logs of the quality check are kept on a separate spreadsheet (not available online).

Additionally, between five and ten percent of the processed video data from EM analysts are checked at random every quarter for missing fishing activity and bycatch events (not available online).

Data storage

National database:
NA

International database:
NA, but the processed (aggregated) PETS bycatch data are reported notably to ICES WGBYC and ICES WKMOMA.

Quality checks and data validation documentation:
WGBYC: https://www.ices.dk/community/groups/Pages/WGBYC.aspx
WKMOMA: https://www.ices.dk/community/groups/Pages/WKMOMA.aspx

Sample storage

Storage description:

Raw electronic monitoring data with videos from 2013 to 2021 are stored and backed up on private secured servers at DTU Lyngby (Denmark). Access to the data through an EM analyser software is restricted to authorised EM users to avoid potential data loss and tampering. Previous EM data within

the bycatch monitoring project have now been deleted. The analysed EM database, containing all analysed EM data since 2010, is also stored and backed up on private secured servers at DTU Lyngby (Denmark). Since 2019, a dataset of images from on-board monitoring cameras that have been annotated with object bounding boxes is also maintained.

Sample analysis:
Manual for video-based electronic monitoring of bycatch in gillnets
HELCOM report "Bycatch in Baltic Sea commercial fisheries: High-risk areas and evaluation of measures to reduce bycatch"
Scientific journal article "Assessing seabird bycatch in gillnet fisheries using electronic monitoring"

Data processing

Evaluation of data accuracy (bias and precision):
No, not in a systematic way, but this is the subject of investigation, with one or several scientific publications planned in 2022.

Editing and imputation methods:
HELCOM report "Bycatch in Baltic Sea commercial fisheries: High-risk areas and evaluation of measures to reduce bycatch"
Scientific journal article "Assessing seabird bycatch in gillnet fisheries using electronic monitoring"

Quality document associated to a dataset: Is there a publication digital object identifier (DOI) created? Is there a document summarising the estimation process followed?
No.

Validation of the final dataset: How are datasets validated (quality checked) before providing to end-user?
A quality-control is in place at several levels in the electronic monitoring dataset:

- Video data quality are scaled from 1 (very good picture quality) to 4 (unexploitable videos, due to e.g., dirt on the lens, obstacles placed in the field of view, etc…) for each haul.
- Processed EM data are merged with logbooks and sales notes data to control that the fishers respect the contract and keep the EM system on each time they are out. Potential missing fishing trips – for instance due to technical failures – are flagged.
- Each bycatch EM analysist is subject to a 10% random check by a senior analyst each quarter.
- A series of R scripts specifically look into potential outliers and/or mistakes in the EM dataset (e.g., abnormally long or short soak durations, gear positions, wrong species entries, etc…). The process of checking is automatised, but it is necessary for a human operator to fix the flagged issues manually. This is done at least once every quarter.

MS : DNK

Region: Baltic Sea (Area 3)

Sampling scheme identifier: BITS_Q1

Sampling scheme type: Research survey at sea

Observation type:

Time period of validity: 2022-2024

Short description (max 100 words):

The main aim of the Baltic International Trawl Survey (BITS) is to determine the year-class strength of the commercially important fish species in the Baltic Sea. The target data are abundances, weight and length distributions of all fishes and length-weight-age-sex-maturity data of target species as well as hydrographic data

(temperature, salinity and oxygen). In addition, marine litter and various biological samples (e.g. recording of infestation of with liver worms) are sampled for national and international studies.

Description of the population

Population targeted:
The target species are mainly Baltic cod *(Gadus morhua*) and the flatfish species flounder (*Platichthys flesus*), plaice (*Pleuronectes platessa*), dab (*Limanda limanda*), turbot (*Scophthalmus maximus*) and brill (*Scophthalmus rhombus*). Denmark is responsible for sampling in areas 3aS and 3d.

Population sampled:
All BITS target species including non-commercial demersal species.

Stratification:
The international trawl surveys are carried out in form of a stratified random survey. The ICES subdivisions and depth layers within eight ICES subdivisions (SD21-SD28) are used as strata. Six layers between 10 to 120 m (10 – 39 m, 20 – 39 m, 40 – 59 m, 60 – 79 m, 80 – 99 m and 100 – 120 m) depending on ICES subdivision are covered by the surveys in aggregated areas in nm² by 10-m depth layers and ICES rectangles.

Sampling design and protocols

Sampling design description:
The numbers of planned stations of all participating countries are summarized for the western Baltic area (ICES Subdivisions 22–24) and for the eastern Baltic area (ICES Subdivisions 25–28). Then the total number of planned trawl stations is allocated to subdivisions according to the area and the 5 years running mean of the CPUE derived from the BITS survey in spring for each region. The number of planned stations of each the ICES Subdivision is then allocated to the depth layers
.

Is the sampling design compliant with the 4S principle?:
NA (research survey)

Regional coordination:
The BITS Survey sampling design is a regional agreement developed by the ICES Working Group on Baltic International Fish Survey (WGBIFS) with the participation of Denmark, Germany, Latvia, Poland, Sweden (all from 1991), Russia (from 1995), Estonia (from 1996) and Lithuania (from 2005).

Link to sampling design documentation:
https://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP7%20BITS%202017.pdf

Compliance with international recommendations:
Y

Link to sampling protocol documentation:
https://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP7%20BITS%202017.pdf

Compliance with international recommendations:
Y

Sampling implementation

Recording of refusal rate:
NA

Monitoring of sampling progress within the sampling year:
NA

Data capture

Means of data capture:
Measuring boards, scales, dissection equipment, tubs & buckets, different sampling protocols, national fish data database software (Fiskeline), CTD probe with data processing software.

Data capture documentation:
https://www.ices.dk/sites/pub/Publication%20Reports/Forms/DispForm.aspx?ID=37133

Quality checks documentation:
Y

Data storage

National database:
Fiskeline

International database:
ICES DATRAS
https://www.ices.dk/data/data-portals/Pages/DATRAS.aspx

Quality checks and data validation documentation:
Quality checks for data validation run when the data is uploaded from the national server to ICES-DATRAS.

Sample storage

Otoliths are dry stored in archive

Sample analysis:
https://www.ices.dk/sites/pub/Publication%20Reports/Forms/DispForm.aspx?ID=37133

Data processing

Evaluation of data accuracy (bias and precision
Y

Data capture occurs according to BITS standards in its manual,
https://www.ices.dk/sites/pub/Publication%20Reports/Forms/DispForm.aspx?ID=37133

Target data is collected strictly according to ICES-DATRAS requirements,
https://datras.ices.dk/Data_products/ReportingFormat.aspx

Editing and imputation methods:
Y

ICES Data validation performed upon data submissions is mostly automated, and produces data quality reports with quality flagged data for the submitter to verify if the data need any correction.

https://www.ices.dk/data/tools/Pages/data-validation.aspx

Quality document associated to a dataset:
All data quality control checks performed by the online screening programmes, or by ICES data officers before data are uploaded to the thematic portals are documented in the Quality Control Database (QC DB).

Validation of the final dataset:
When the data are used in the assessment, the assessment report and the associated management advice provide comments on the quality of the data, which is fed back to the data submitter and the ICES Data Centre.

MS : DNK

Region: Baltic Sea (Area 3)

Sampling scheme identifier: BITS_Q4

Sampling scheme type: Research survey at sea

Observation type:

Time period of validity: 2022-2024

Short description (max 100 words):

The main aim of the Baltic International Trawl Survey (BITS) is to determine the year-class strength of the commercially important fish species in the Baltic Sea. The target data are abundances, weight and length distributions of all fishes and length-weight-age-sex-maturity data of target species as well as hydrographic data (temperature, salinity and oxygen). In addition, marine litter and various biological samples (e.g. recording of infestation of with liver worms) are sampled for national and international studies.

Description of the population

Population targeted:
The target species are mainly Baltic cod *(Gadus morhua*) and the flatfish species flounder (*Platichthys flesus*), plaice (*Pleuronectes platessa*), dab (*Limanda limanda*), turbot (*Scophthalmus maximus*) and brill (*Scophthalmus rhombus*). Denmark is responsible for sampling in areas 3aS and 3d.

Population sampled:
All BITS target species including non-commercial demersal species.

Stratification:
The international trawl surveys are carried out in form of a stratified random survey. The ICES subdivisions and depth layers within eight ICES subdivisions (SD21-SD28) are used as strata. Six layers between 10 to 120 m (10 – 39 m, 20 – 39 m, 40 – 59 m, 60 – 79 m, 80 – 99 m and 100 – 120 m) depending on ICES subdivision are covered by the surveys in aggregated areas in nm² by 10-m depth layers and ICES rectangles.

Sampling design and protocols

Sampling design description:
The numbers of planned stations of all participating countries are summarized for the western Baltic area (ICES Subdivisions 22–24) and for the eastern Baltic area (ICES Subdivisions 25–28). Then the total number of planned trawl stations is allocated to subdivisions according to the area and the 5 years running mean of the CPUE derived from the BITS survey in spring for each region. The number of planned stations of each the ICES Subdivision is then allocated to the depth layers
.

Is the sampling design compliant with the 4S principle?:

NA (research survey)

Regional coordination:
The BITS Survey sampling design is a regional agreement developed by the ICES Working Group on Baltic International Fish Survey (WGBIFS) with the participation of Denmark, Germany, Latvia, Poland, Sweden (all from 1991), Russia (from 1995), Estonia (from 1996) and Lithuania (from 2005).

Link to sampling design documentation:
https://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP7%20BITS%202017.pdf

Compliance with international recommendations:
Y

Link to sampling protocol documentation:
https://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP7%20BITS%202017.pdf

Compliance with international recommendations:
Y

Sampling implementation

Recording of refusal rate:
NA

Monitoring of sampling progress within the sampling year:
NA

Data capture

Means of data capture:
Measuring boards, scales, dissection equipment, tubs & buckets, different sampling protocols, national fish data database software (Fiskeline), CTD probe with data processing software.

Data capture documentation:
https://www.ices.dk/sites/pub/Publication%20Reports/Forms/DispForm.aspx?ID=37133

Quality checks documentation:
Y

Data storage

National database:
Fiskeline

International database:
ICES DATRAS
https://www.ices.dk/data/data-portals/Pages/DATRAS.aspx

Quality checks and data validation documentation:
Quality checks for data validation run when the data is uploaded from the national server to ICES-DATRAS.

Sample storage
Otoliths are dry stored in archive Sample analysis: https://www.ices.dk/sites/pub/Publication%20Reports/Forms/DispForm.aspx?ID=37133
Data processing
Evaluation of data accuracy (bias and precision Y Data capture occurs according to BITS standards in its manual, https://www.ices.dk/sites/pub/Publication%20Reports/Forms/DispForm.aspx?ID=37133 Target data is collected strictly according to ICES-DATRAS requirements, https://datras.ices.dk/Data_products/ReportingFormat.aspx **Editing and imputation methods:** Y ICES Data validation performed upon data submissions is mostly automated, and produces data quality reports with quality flagged data for the submitter to verify if the data need any correction. https://www.ices.dk/data/tools/Pages/data-validation.aspx **Quality document associated to a dataset:** All data quality control checks performed by the online screening programmes, or by ICES data officers before data are uploaded to the thematic portals are documented in the Quality Control Database (QC DB). **Validation of the final dataset:** When the data are used in the assessment, the assessment report and the associated management advice provide comments on the quality of the data, which is fed back to the data submitter and the ICES Data Centre.

MS : DNK
Region: Baltic Sea (Area 3a)
Sampling scheme identifier: CODS_Q4
Sampling scheme type: Research survey at sea
Observation type:
Time period of validity: 2022-2024
Short description (max 100 words): The survey is a combined Danish-Swedish fisherman-scientist survey. The goal of the Kattegat cod survey is to estimate the abundance, biomass and distribution of cod and to establish a fisheries independent time series of catch and effort series. Furthermore, a recruitment index is established. The results have for the first time been used in 2015, together with commercial catch and effort data, to strengthen the scientific advice on the cod stock in Kattegat.
Description of the population

Population targeted:
Cod (*Gadus morhua*) in area 3aS

Population sampled:
Cod (*Gadus morhua*) in area 3aS

Stratification:
The survey is designed as a stratified random bottom trawl survey. The survey area is stratified in three strata based on information from commercial fishers on expected densities of cod: a stratum with expected high density of cod, a stratum with medium density and a stratum with low density. In 2010 and 2011, there was a minor re-stratification to adopt the areas to the catch information collected during the former years. In 2013 a fourth strata was added to better assure data from the area closed for fisheries. Each stratum is further subdivided in 5*5 nm squares. The high density, medium density and closed area stratum has been allocated relatively more stations than the other strata.

Sampling design and protocols

Sampling design description:
Number of trawl hauls allocated to strata depends on cod density in previous years, and 40 stations are allocated every year.

Is the sampling design compliant with the 4S principle?:
NA (research survey)

Regional coordination: The survey design and protocols are developed in cooperation with Sweden.

Link to sampling design documentation:
All survey data and documentation is available as open source
https://doi.org/10.11583/DTU.c.5301650.v2

Compliance with international recommendations:
Y

Link to sampling protocol documentation:
All survey data and documentation is available as open source
https://doi.org/10.11583/DTU.c.5301650.v2

Compliance with international recommendations:
Y

Sampling implementation

Recording of refusal rate:
NA

Monitoring of sampling progress within the sampling year:
NA

Data capture

Means of data capture:

Traditional catches (otter board trawl); working-up on board: sorting, length measurements on measuring board. Determination of individual weights for selected species; dissection of sole to obtain biological data.

Data capture documentation:
https://doi.org/10.11583/DTU.c.5301650.v2

Quality checks documentation:
Y.
Upon working up the catch, data are scrutinized by the cruise leader onboard. If irregularities are discovered these are rectified in the raw data.

Data storage

National database:
Raw data are stored in the national database "Fiskeline". Fiskeline is not accessible from a website. Raw data are as well available on the DTU data website https://doi.org/10.11583/DTU.c.5301650.v2

International database: N

Quality checks and data validation documentation:
DTU data website https://doi.org/10.11583/DTU.c.5301650.v2

Sample storage

Storage description: Storage of otoliths at the national institutes involved in the survey

When punched in into the national database (Fiskeline) several checks are made including species name evaluation and work up sampling strategy consistency in connection with raising from sampling level to total catch. Various plots of length and age information are made and outliers are investigated in the raw data.

Data processing

Evaluation of data accuracy (bias and precision): N (2024)

Editing and imputation methods: N (2024)

Quality document associated to a dataset: N

Validation of the final dataset:
Quality check by scientist before upload and validated by ICES after uploading to database

MS : DNK
Region: North Sea (Area 3a and 4)
Sampling scheme identifier: IBTS_Q1
Sampling scheme type: Research survey at sea
Observation type:
Time period of validity: 2022-2024
Short description (max 100 words): The North Sea IBTS aim to provide ICES assessment and science groups with consistent and standardized data for examining spatial and temporal changes in (a) the distribution and relative abundance of fish and fish assemblages; and (b) the biological parameters of commercial fish species for stock assessment purposes. The main objectives of groundfish surveys coordinated by IBTS are: - 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 age composition and biological parameters for selected species; - To collect hydrographical, environmental, and marine litter information; - To determine the abundance and distribution of clupeid post-larvae (IBTS_Q1). - To be used as a platform to collect ichthyoplankton data (IBTS_Q1).
Description of the population
Population targeted: Main target species, for which detailed biological data are obtained: herring, sprat, mackerel, cod, haddock, whiting, Norway out, saithe, plaice. Survey area: North Sea incl. Skagerrak. **Population sampled:** Demersal fish communities including non-commercial species, plus commercially targeted invertebrates and cephalopods. **Stratification:** Systematic division of survey area into ICES rectangles; random distribution of hauls within trawlable area of each rectangle; if possible, sampling of each rectangle by two different ships/nations.
Sampling design and protocols
Sampling design description: All fish species, cephalopods and larger (commercially used) invertebrates are recorded, either from the entire catch or from a representative subsample. **Is the sampling design compliant with the 4S principle?:** NA (research survey) **Regional coordination:** International coordination trough ICES-IBTSWG, Participating nations IBTS_Q1: Denmark, Germany, Norway, France, Scotland, Sweden, Netherlands; IBTS_Q3: Denmark, England, Germany, Norway, Scotland, Sweden

Link to sampling design documentation:
https://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%2010%20%E2%80%93%20Revision%2011_Manual%20for%20the%20North%20Sea%20International%20Bottom%20Trawl%20Surveys.pdf

Compliance with international recommendations:
Y; Coordination through ICES International Bottom Trawl Survey Working Group (IBTSWG); https://www.ices.dk/community/groups/pages/ibtswg.aspx

Link to sampling protocol documentation:
https://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%2010%20%E2%80%93%20Revision%2011_Manual%20for%20the%20North%20Sea%20International%20Bottom%20Trawl%20Surveys.pdf

Compliance with international recommendations:
Y; Coordination through ICES International Bottom Trawl Survey Working Group (IBTSWG); https://www.ices.dk/community/groups/pages/ibtswg.aspx

Sampling implementation

Recording of refusal rate:
NA

Monitoring of sampling progress within the sampling year:
Survey coordination during the ongoing operation trough the Q1 and Q3 survey coordinator of the IBTSWG

Data capture

Means of data capture:
Traditional catches (otter board trawl); working-up in laboratory: sorting at conveyor belt, length measurements on measuring board (partly with electronic boards); determination of individual weights for selected species; dissection to obtain biological data, tissue samples for genetic analyses or stomach contents.

Data capture documentation:
https://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%2010%20%E2%80%93%20Revision%2011_Manual%20for%20the%20North%20Sea%20International%20Bottom%20Trawl%20Surveys.pdf

Quality checks documentation:
ICES Data Centre performing quality checks on uploaded survey data

Data storage

National database:
Fiskeline

International database: ICES DATRAS https://www.ices.dk/data/data-portals/Pages/DATRAS.aspx **Quality checks and data validation documentation:** Quality checks for data validation run when the data is uploaded from the national server to ICES-DATRAS.
Sample storage
Storage description: Storage of otoliths at the national institutes involved in the survey. Storage of other samples at the participating institutes' and based on their own decision. Sample analysis: https://www.ices.dk/community/groups/pages/ibtswg.aspx
Data processing
Evaluation of data accuracy (bias and precision): No comprehensive analysis available, but several aspects analysed and documented in reports of the ICES IBTSWG (https://www.ices.dk/community/groups/pages/ibtswg.aspx), and the ICES Working Group on Improving use of Survey Data for Assessment and Advice (WGISDAA, https://www.ices.dk/community/groups/Pages/WGISDAA.aspx). Additional analyses regarding integration for the ecosystem approach: https://www.ices.dk/community/groups/Pages/WGISUR.aspx **Editing and imputation methods:** Information on data uploading process and option for data screening: https://datras.ices.dk/Data%20submission/Default.aspx **Quality document associated to a dataset:** None, accept for information given in annual ICES-IBTSWG reports **Validation of the final dataset:** ICES Data Centre performing quality checks on uploaded survey data

MS : DNK
Region: North Sea (Area 3a and 4)
Sampling scheme identifier: IBTS_Q3
Sampling scheme type: Research survey at sea
Observation type:
Time period of validity: 2022-2024
Short description (max 100 words): The North Sea IBTS aim to provide ICES assessment and science groups with consistent and standardized data for examining spatial and temporal changes in (a) the distribution and relative abundance of fish and fish assemblages; and (b) the biological parameters of commercial fish species for stock assessment purposes. The main objectives of groundfish surveys coordinated by IBTS are: - 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 age composition and biological parameters for selected species;
- To collect hydrographical, environmental, and marine litter information;
- To determine the abundance and distribution of clupeid post-larvae (IBTS_Q1).
- To be used as a platform to collect ichthyoplankton data (IBTS_Q1).

Description of the population

Population targeted:
Main target species, for which detailed biological data are obtained: herring, sprat, mackerel, cod, haddock, whiting, Norway out, saithe, plaice.
Survey area: North Sea incl. Skagerrak.

Population sampled:
Demersal fish communities including non-commercial species, plus commercially targeted invertebrates and cephalopods.

Stratification:
Systematic division of survey area into ICES rectangles; random distribution of hauls within trawlable area of each rectangle; if possible, sampling of each rectangle by two different ships/nations.

Sampling design and protocols

Sampling design description:
All fish species, cephalopods and larger (commercially used) invertebrates are recorded, either from the entire catch or from a representative subsample.

Is the sampling design compliant with the 4S principle?:
NA (research survey)

Regional coordination:
International coordination trough ICES-IBTSWG,
Participating nations IBTS_Q1: Denmark, Germany, Norway, France, Scotland, Sweden, Netherlands; IBTS_Q3: Denmark, England, Germany, Norway, Scotland, Sweden

Link to sampling design documentation:
https://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%2010%20%E2%80%93%20Revision%2011_Manual%20for%20the%20North%20Sea%20International%20Bottom%20Trawl%20Surveys.pdf

Compliance with international recommendations:
Y; Coordination through ICES International Bottom Trawl Survey Working Group (IBTSWG); https://www.ices.dk/community/groups/pages/ibtswg.aspx

Link to sampling protocol documentation:
https://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%2010%20%E2%80%93%20Revision%2011_Manual%20for%20the%20North%20Sea%20International%20Bottom%20Trawl%20Surveys.pdf

Compliance with international recommendations:
Y; Coordination through ICES International Bottom Trawl Survey Working Group (IBTSWG); https://www.ices.dk/community/groups/pages/ibtswg.aspx

Sampling implementation

Recording of refusal rate:
NA

Monitoring of sampling progress within the sampling year:
Survey coordination during the ongoing operation trough the Q1 and Q3 survey coordinator of the IBTSWG

Data capture

Means of data capture:
Traditional catches (otter board trawl); working-up in laboratory: sorting at conveyor belt, length measurements on measuring board (partly with electronic boards); determination of individual weights for selected species; dissection to obtain biological data, tissue samples for genetic analyses or stomach contents.

Data capture documentation:
https://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%2010%20%E2%80%93%20Revision%2011_Manual%20for%20the%20North%20Sea%20International%20Bottom%20Trawl%20Surveys.pdf

Quality checks documentation:
ICES Data Centre performing quality checks on uploaded survey data

Data storage

National database:
Fiskeline

International database:
ICES DATRAS
https://www.ices.dk/data/data-portals/Pages/DATRAS.aspx

Quality checks and data validation documentation:
Quality checks for data validation run when the data is uploaded from the national server to ICES-DATRAS.

Sample storage

Storage description: Storage of otoliths at the national institutes involved in the survey. Storage of other samples at the participating institutes' and based on their own decision.

Sample analysis:
https://www.ices.dk/community/groups/pages/ibtswg.aspx

Data processing

Evaluation of data accuracy (bias and precision):
No comprehensive analysis available, but several aspects analysed and documented in reports of the ICES IBTSWG (https://www.ices.dk/community/groups/pages/ibtswg.aspx), and the ICES Working Group on Improving use of Survey Data for Assessment and Advice (WGISDAA, https://www.ices.dk/community/groups/Pages/WGISDAA.aspx). Additional analyses regarding integration for the ecosystem approach: https://www.ices.dk/community/groups/Pages/WGISUR.aspx

Editing and imputation methods:
Information on data uploading process and option for data screening:
https://datras.ices.dk/Data%20submission/Default.aspx

Quality document associated to a dataset: None, accept for information given in annual ICES-IBTSWG reports

Validation of the final dataset: ICES Data Centre performing quality checks on uploaded survey data

MS : DNK
Region: North Sea (Area 4a and 4b)
Sampling scheme identifier: NSSS
Sampling scheme type: Research survey at sea
Observation type:
Time period of validity: 2022-2024
Short description (max 100 words): The survey is a trawl survey targeting sand ell when they are buried in the sediment during night time. A modified mussel dredge is used. The objective of the survey is to improve the scientific advice on sand eel. It provides the basis for setting a preliminary index for the sand eel fishery for the coming year. The data are used for calculating a 0-group abundance index, which is used in the annual stock assessment.
Description of the population
Population targeted: The target species is Ammodytes marinus (Lesser sand eel). The survey is conducted in the North Sea incl. Skagerrak. **Population sampled:** Ammodytes marinus (Lesser sand eel). **Stratification:** The so called Sand eel fishing banks has been identified prior to the initialization of the survey time series. These banks have been identified based on historical information about the commercial fishery and investigation of the sediment in order to identify potential suitable areas where sand eels are buried during winter. A fixed number of stations at fixed locations are fished on each bank
Sampling design and protocols
Sampling design description: The sampling design is a fixed grid design stratified in the defined Sand eel fishing banks. The sampling scheme applies to the whole population of Lesser sand ell in the north Sea and Skagerrak. **Is the sampling design compliant with the 4S principle?:** NA (research survey) **Regional coordination:** No regional coordination as only DEN is carrying out the survey. **Link to sampling design documentation:** The file "Manual Tobisskrabetogtet.docx" can be found on: https://www.dcf-denmark.dk/manuals-documentation **Compliance with international recommendations:** Y **Link to sampling protocol documentation:** The file "Manual Tobisskrabetogtet.docx" can be found on: https://www.dcf-denmark.dk/manuals-documentation **Compliance with international recommendations:** Y (HAWG)

Sampling implementation
Recording of refusal rate: NA **Monitoring of sampling progress within the sampling year:** NA
Data capture
Means of data capture: Scales, measuring board. **Data capture documentation:** The file "Manual Tobisskrabetogtet.docx" can be found on: https://www.dcf-denmark.dk/manuals-documentation **Quality checks documentation** Y. Upon working up the catch, data are scrutinized by the cruise leader onboard. If irregularities are discovered these are rectified in the raw data. Further details can be found in the file "Manual Tobisskrabetogtet.docx" can be found on: https://www.dcf-denmark.dk/manuals-documentation

Data storage
National database: Raw data are stored in the national database "Fiskeline". Fiskeline is not accessible from a website. Raw data are as well available on the DTU data website https://doi.org/10.11583/DTU.14798028.v1 **International database:** At present no international database for Sand eel dredge data are available. **Quality checks and data validation documentation:** When punched in into the national database (Fiskeline) several checks are made including species name evaluation and work up sampling strategy consistency in connection with raising from sampling level to total catch. Various plots of length and age information are made and outliers are investigated in the raw data.
Sample storage
Storage description: Otoliths from the samples brought back to the lab are stored dry in archive at DTU-Aqua Otoliths library. Information about the amount of samples stored are available on request to the DTU-Aqua. Annual sampling effort is as well forwarded to the ICES HAWG. Sample analysis: The annual ICES assessment WG. https://www.ices.dk/sites/pub/Publication%20Reports/Forms/DispForm.aspx?ID=37880
Data processing
Evaluation of data accuracy (bias and precision): The use of raw survey data is part of the assessment process, which is carried out by ICES. The accuracy of the survey estimates are not formally calculated as the assessment of sand eel in the North

Sea is of category 5 and no analytical stock assessment. The quality and accuracy of the assessment including survey data and other input is described in
ICES. 2017. Report of the Benchmark on Sandeel (WKSand 2016), 31 October - 4 November 2016, Bergen, Norway. ICES CM 2016/ACOM:33. 319 pp.

Editing and imputation methods:
Y. During the survey the results are registered in Excel sheets. These shits are continuously forwarded to key persons for inspection and check during the survey. Imputation to the national database is made by hand from the Excel sheets. No imputation is made for survey data. The process during the survey is described in the file "Manual Tobisskrabetogtet.docx" can be found on: https://www.dcf-denmark.dk/manuals-documentation

Quality document associated to a dataset:
N

Validation of the final dataset:
As row data are submitted no further quality assurance are made beside the assurance made during the collecting and imputation process.

MS : DNK

Region: Norwegian Sea (Area 2a)

Sampling scheme identifier: ASH

Sampling scheme type: Research survey at sea

Observation type:

Time period of validity: 2022-2024

Short description (max 100 words):

The International Ecosystem Survey in the Nordic Seas (IESNS) is an acoustic/pelagic trawl survey carried out in order to investigate distribution and migrations of the Atlanto-Scandian herring (ASH), blue whiting and other pelagic fish and to produce a biomass index for herring and a recruitment index for blue whiting for the ICES Working Group on Widely Distributed stocks (ICES WGWIDE). Furthermore, hydrographic conditions and plankton abundance in the Norwegian Sea and adjacent waters are monitored in order to investigate distribution and migration of herring and other pelagic fishes are influenced by environmental conditions.

Description of the population

Population targeted:
Atlanto-Scandian herring / Norwegian spring-spawning herring and blue whiting

Population sampled:
Atlanto-Scandian herring and blue whiting and other pelagic and mesopelagic fish including cephalopods

Stratification:
A predetermined cruise track is used based on previous area coverage and supplemented with adaptive surveying where and when time allows. The survey abundance index is determined from predetermined survey coverage alone and should not include additional adaptive strata. The survey should begin in the South (62°N) and work in a northerly then easterly direction into the Barents Sea.

Sampling design and protocols

Sampling design description:
The survey is based on a stratified systematic transect design. CTD and WP2 plankton stations are taken in regular distance intervals. The allocation of transects and sampling positions to be covered by Denmark is done during the planning meetings of ICES-WGIPS.

Is the sampling design compliant with the 4S principle?:
NA (research survey)

Regional coordination:
International coordination trough ICES-WGIPS,
EU MS: Denmark is providing the research vessel, Germany and the Netherlands participate with personal and contributes to the survey costs
Other countries: Norway, Iceland, Faroes, Russia

Link to sampling design documentation:
http://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%209%20Manual%20for%20International%20Pelagic%20Surveys%20(IPS).pdf

Compliance with international recommendations:
Y

Link to sampling protocol documentation:
http://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%209%20Manual%20for%20International%20Pelagic%20Surveys%20(IPS).pdf

Compliance with international recommendations:
Y

Sampling implementation

Recording of refusal rate:
NA

Monitoring of sampling progress within the sampling year:
NA

Data capture

Means of data capture:
Hydroacoustic measurements with an echsounder (38 kHz (towed body and hull mounted) and other frequencies with hull mounted transducers),
Pelagic trawl, measurement boards, scales,
CTD,
WP2 plankton net; dry weight of zooplankton in 3 size categories

Data capture documentation:
https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/Fisheries%20Resources%20Steering%20Group/2021/WGWIDE/18%20WGWIDE%20Report%202021%20-Annex%206%20Working%20Documents.pdf

Quality checks documentation:
Y

https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/Fisheries%20Resources%20Steering%20Group/2021/WGWIDE/18%20WGWIDE%20Report%202021%20-Annex%206%20Working%20Documents.pdf

Data storage

National database:
Pelagic Trawl data: Fiskeline
NA for other data

International database:
WGNAPES: https://www.ices.dk/data/data-portals/Pages/acoustic.aspx, PGNAPES,
ICES Acoustic trawl database: https://www.ices.dk/data/data-portals/Pages/acoustic.aspx

Quality checks and data validation documentation:
https://acoustic.ices.dk/validationrules

Sample storage

Storage description:

Otoliths are store dry in archive

Sample analysis:
See survey manual
http://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%209%20Manual%20for%20International%20Pelagic%20Surveys%20(IPS).pdf
and annual post-cruise meeting reports to ICES-WGWIDE, e.g.
https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/Fisheries%20Resources%20Steering%20Group/2021/WGWIDE/18%20WGWIDE%20Report%202021%20-Annex%206%20Working%20Documents.pdf

Data processing

Evaluation of data accuracy (bias and precision):
Y for acoustic measurements through calibration, see annual post-cruise meeting reports to ICES.WGWIDE, e.g
https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/Fisheries%20Resources%20Steering%20Group/2021/WGWIDE/18%20WGWIDE%20Report%202021%20-Annex%206%20Working%20Documents.pdf

Editing and imputation methods:
NA

Quality document associated to a dataset: None

Validation of the final dataset:
Quality check by scientist before upload and validated by ICES after uploading to database

MS : DNK

Region: North Sea (Area 4)
Sampling scheme identifier: NSMEGS
Sampling scheme type: Research survey at sea
Observation type:
Time period of validity: 2022-2024
Short description (max 100 words): The survey aims at to estimate egg production and SSB for North Sea mackerel. The survey is conducted every third year, and the next survey is planned for 2022. Plankton sampling is performed to provide information on the distribution and abundance of mackerel eggs and some pelagic trawling is carried out for collecting adult female mackerel for fecundity estimates.
Description of the population
Population targeted: Mackerel **Population sampled:** Mackerel **Stratification:** The North Sea is considered as one single stratum.
Sampling design and protocols
Sampling design description: The survey follows a transect design at which plankton stations are spaced with a distance of 10 nautical miles and one pelagic trawl haul should be conducted on each transect if the egg sampling indicate the presence of spawning adults. The allocation of the survey area and period is done by ICES-WGMEGS. **Is the sampling design compliant with the 4S principle?:** NA (research survey) **Regional coordination:** The survey is coordinated by ICES-WGMEGS with Denmark as the only EU MS in the North Sea in 2022. Other participating countries in NSMEGS are UK England and, as part of the North Atlantic MEGS, possibly the Faroes and/or UK Scotland and Norway. **Link to sampling design documentation:** The survey design and sampling procedures are describe in : http://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%206%20-%20MEGS%20V1.3.pdf, and http://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%205%20-%20WGMEGS%20V11%20Manual%20for%20AEPM%20and%20DEPM%20fecundity.pdf. **Compliance with international recommendations:**

Y

Link to sampling protocol documentation:
http://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%206%20-%20MEGS%20V1.3.pdf,

and

http://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%205%20-%20WGMEGS%20V11%20Manual%20for%20AEPM%20and%20DEPM%20fecundity.pdf.

Compliance with international recommendations:
Y

Sampling implementation

Recording of refusal rate:
NA

Monitoring of sampling progress within the sampling year:
NA

Data capture

Means of data capture:
Standard plankton sorting equipment
Scales and measuring boards for pelagic trawl samples

Data capture documentation:
http://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%205%20-%20WGMEGS%20V11%20Manual%20for%20AEPM%20and%20DEPM%20fecundity.pdf.

Quality checks documentation:
ICES. 2021. Working Group on Mackerel and Horse Mackerel Egg Surveys (WGMEGS).
ICES Scientific Reports. 3:82. 40pp. https://doi.org/10.17895/ices.pub.8249

Data storage

National database:
Pelagic trawl data: Fiskeline
Other data: NA

International database:
https://www.ices.dk/data/data-portals/Pages/Eggs-and-larvae.aspx

Quality checks and data validation documentation:
Quality check by scientist before upload and validated by ICES after uploading to database

Sample storage

Storage description:

Mackerel egg (and other species) are kept conserved in ethanol.

Sample analysis:
As specified in the manuals:
http://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%206%20-%20MEGS%20V1.3.pdf,

and

http://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%205%20-%20WGMEGS%20V11%20Manual%20for%20AEPM%20and%20DEPM%20fecundity.pdf

Data processing

Evaluation of data accuracy (bias and precision):
Y
Annual reports to ICES-WGWIDE, e.g.:
https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/Fisheries%20Resources%20Steering%20Group/2021/WGWIDE/18%20WGWIDE%20Report%202021%20-Annex%206%20Working%20Documents.pdf

Editing and imputation methods:
NA

Quality document associated to a dataset: None

Validation of the final dataset:
Annual reports to ICES-WGWIDE, e.g.:
https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/Fisheries%20Resources%20Steering%20Group/2021/WGWIDE/18%20WGWIDE%20Report%202021%20-Annex%206%20Working%20Documents.pdf

MS : DNK
Region: North Sea (Area 3a, 4)
Sampling scheme identifier: NHAS
Sampling scheme type: Research survey at sea
Observation type:
Time period of validity: 2022-2024
Short description (max 100 words): 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 and IIIa), West of Scotland herring (in 6aN), Malin Shelf herring (west of Scotland/Ireland in 4aN-S and 7b,c), North Sea sprat (in IV) and Sprat in IIIa (western Baltic). The derived estimates and age structure of herring and sprat are used as tuning indices in the respective assessments and are submitted annually to ICES-HAWG. The area allocated to Denmark is the Kattegat, Skagerrak and the eastern part of the North Sea (east from 6°E between 56°N and 58°N).
Description of the population
Population targeted: North Sea herring and sprat **Population sampled:** North Sea herring and sprat and other pelagic and demersal species in the North Sea, Skagerrak and Kattegat **Stratification:** The survey area is bound to the east by the Norwegian, Danish, Swedish and German coastline and to the west by the shelf edge between 200 and 400 m depth. By carrying out the coordinated survey at the same time from the Kattegat to Donegal, all herring in these areas are covered simultaneously, reducing uncertainty due to area boundaries.
Sampling design and protocols
Sampling design description: A stratified, systematic, parallel transect design with random starting points is used in this survey. Survey stratification is based on ICES statistical rectangles with a range of 1 degree in latitude and 2 degrees in longitude. Each ICES rectangle should be covered with a minimum of one transect and with higher intensity where historically a high abundance or variability of abundance has been detected. Transect spacings of 7.5 and 15 nautical miles are used in the areas covered by Ireland and Scotland. In the Norwegian area a spacing of 15 nm is used, Danish area is covered with 10–15 nm spaced transects and the southern areas covered by the Netherlands and Germany typically uses a spacing of 15–30 nm. Transects should preferably run perpendicular to the greatest gradients in fish density which are generally related to gradients in bottom topography and hydrography. This means that transects will normally be run perpendicular to the coast. Ships' speed during the survey should be kept at 10–12 knots. If species identification depends on recognition of schools on the echogram, the survey will have to be interrupted during periods in the 24-hour cycle when the schools disperse. This occurs during the hours of darkness, depending on the area. When schools disperse during darkness, some of the herring may rise to the surface and get above the transducer. This is consideration is valid in most of the survey area covered in this survey with the exception of the Kattegat/Skagerrak covered by Denmark where herring is found in dispersed layers mixed with other fish at all times. **Is the sampling design compliant with the 4S principle?:** NA (Research survey) **Regional coordination:**

International coordination trough ICES-WGIPS,
EU MS: Denmark, Germany, the Netherlands
Other countries: Norway, UK Scotland

Link to sampling design documentation:
https://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%209%20Manual%20for%20International%20Pelagic%20Surveys%20(IPS).pdf

Compliance with international recommendations:
Y

Link to sampling protocol documentation: P
https://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%209%20Manual%20for%20International%20Pelagic%20Surveys%20(IPS).pdf

Compliance with international recommendations:
Y

Sampling implementation

Recording of refusal rate:
NA

Monitoring of sampling progress within the sampling year:
NA

Data capture

Means of data capture:
Hydroacoustic measurements with an echsounder (38 kHz (towed body and hull mounted) and other frequencies with hull mounted transducers),
Pelagic trawl, measurement boards, scales,
CTD,
WP2 plankton net; dry weight of zooplankton in 3 size categories

Data capture documentation:
https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/Fisheries%20Resources%20Steering%20Group/2021/WGWIDE/18%20WGWIDE%20Report%202021%20-Annex%206%20Working%20Documents.pdf

Quality checks documentation:
Y
https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/Fisheries%20Resources%20Steering%20Group/2021/WGWIDE/18%20WGWIDE%20Report%202021%20-Annex%206%20Working%20Documents.pdf

Data storage

National database:
Pelagic Trawl data: Fiskeline

NA for other data

International database:
WGNAPES: https://www.ices.dk/data/data-portals/Pages/acoustic.aspx, PGNAPES,
ICES Acoustic trawl database: https://www.ices.dk/data/data-portals/Pages/acoustic.aspx

Quality checks and data validation documentation:
https://acoustic.ices.dk/validationrules

Sample storage

Storage description:

Otoliths are store dry in archive

Sample analysis:
See survey manual
http://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%209%20Manual%20for%20International%20Pelagic%20Surveys%20(IPS).pdf
and annual post-cruise meeting reports to ICES-WGWIDE, e.g.
https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/Fisheries%20Resources%20Steering%20Group/2021/WGWIDE/18%20WGWIDE%20Report%202021%20-Annex%206%20Working%20Documents.pdf

Data processing

Evaluation of data accuracy (bias and precision):
Y for acoustic measurements through calibration, see annual post-cruise meeting reports to ICES.WGWIDE, e.g
https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/Fisheries%20Resources%20Steering%20Group/2021/WGWIDE/18%20WGWIDE%20Report%202021%20-Annex%206%20Working%20Documents.pdf

Editing and imputation methods:
NA

Quality document associated to a dataset: None

Validation of the final dataset:
Quality check by scientist before upload and validated by ICES after uploading to database

MS : DNK

Region: Skagerrak (Area 3a)

Sampling scheme identifier: UWTV3-4

Sampling scheme type: Research survey at sea

Observation type:

Time period of validity: 2022-2024

Short description (max 100 words):

The purpose of the survey is to estimate the abundance of Norway lobster (*Nephrops norwegicus*) in the Skagerrak and the Kattegat (Functional units 3 and 4).

Description of the population

Population targeted: Norway lobster (*Nephrops norwegicus*) in FU 3&4

Population sampled: Norway lobster (*Nephrops norwegicus*) in FU 3&4

Stratification:
The survey area is divided in 9 strata based on VMS and sediment data with a small-scale grid consisting of potential sampling positions (elements) having a spatial resolution of 0.7 nm (0.67' lat * 1.33' lon)

Sampling design and protocols

Sampling design description:
Stratified random buffered sampling, allocation of number of stations to the 9 strata based on the strata contribution to the overall error coefficient of variation in preceding years, buffer depending of stratum area and number of stations to be sampled in the stratum, total number of stations chosen to ensure an overall CV < 10%

Is the sampling design compliant with the 4S principle?:
NA (Research survey)

Regional coordination:
The survey is coordinated by ICES-WGNEPS and the survey area in FU 3&4 is shared between Denmark (western Skagerrak and north-western Kattegat) and Sweden (Eastern Skagerrak and eastern Kattegat)

Link to sampling design documentation:
https://www.ices.dk/sites/pub/Publication%20Reports/Forms/DispForm.aspx?ID=37647

Compliance with international recommendations: I
Y

Link to sampling protocol documentation:
https://www.ices.dk/sites/pub/Publication%20Reports/Forms/DispForm.aspx?ID=37647

Compliance with international recommendations:
Y
.

Sampling implementation

Recording of refusal rate: NA

Monitoring of sampling progress within the sampling year: NA

Data capture

Means of data capture:
Presence of *Nephrops* burrows from underwater video tracks analysed and counted manually on HD screens according to ICES-WGNEPS standards.

Data capture documentation:
https://www.ices.dk/sites/pub/Publication%20Reports/Forms/DispForm.aspx?ID=37647

Quality checks documentation: Y Annual ICES-WGNEPS reports: https://www.ices.dk/community/groups/Pages/WGNEPS.aspx

Data storage
National database: NA **International database:** NA **Quality checks and data validation documentation:** NA, database is still under development
Sample storage
Storage description: Video and GPS data files as well as the results of the analyses and quality checking and are stored on DTU Aqua's secure server Sample analysis: https://www.ices.dk/sites/pub/Publication%20Reports/Forms/DispForm.aspx?ID=37647
Data processing
Evaluation of data accuracy (bias and precision): Y **Editing and imputation methods:** Y **Quality document associated to a dataset:** Annual ICES-WGNEPS reports: https://www.ices.dk/community/groups/Pages/WGNEPS.aspx **Validation of the final dataset:** Quality check by scientist before reporting to ICES-WGNEPS and presentation of quality check results on ICES-WGNEPS annual meetings.

MS : DNK
Region: North Sea (Area 3a)
Sampling scheme identifier: FFS
Sampling scheme type: Research survey at sea
Observation type:
Time period of validity: 2022-2024
Short description (max 100 words): The objective of the survey is to establish a time series of catch and effort data independent of the commercial fishery for sole and plaice in the Kattegat and the southern Skagerrak. The survey has been initiated in 2004 and provides currently the main input data set for the 3a sole assessment conducted by ICES WGBFAS.
Description of the population
Population targeted: Sole (*Solea solea*) in area 3a **Population sampled:** Sole and other flatfish **Stratification:** None
Sampling design and protocols
Sampling design description: The survey was originally designed in order to establish fisheries independent CPUE indices by means of annual fishing at 120 fixed stations, 60 stations were placed by the fishermen and 60 by DTU-Aqua. In 2010 the total number of stations reduced to 116. In 2011 the survey was reduced further to 80 stations, all included in the originally set up, and in 2016 10 stations were added to the survey. **Is the sampling design compliant with the 4S principle?:** NA (Research survey) **Regional coordination:** N (National survey) **Link to sampling design documentation:** The file "Manual Tungesurvey.docx" can be found on: https://www.dcf-denmark.dk/manuals-documentation **Compliance with international recommendations:** Y (WGBFAS) **Link to sampling protocol documentation:** The file "Manual Tungesurvey.docx" can be found on: https://www.dcf-denmark.dk/manuals-documentation **Compliance with international recommendations:** Y (WGBFAS)

Sampling implementation
Recording of refusal rate: NA **Monitoring of sampling progress within the sampling year:** NA (scientific survey)
Data capture
Means of data capture: Traditional catches (otter board trawl); working-up on board: sorting, length measurements on measuring board. Determination of individual weights for selected species; dissection of sole to obtain biological data. **Data capture documentation:** The file "Manual Tungesurvey.docx" can be found on: https://www.dcf-denmark.dk/manuals-documentation **Quality checks documentation:** Upon working up the catch, data are scrutinized by the cruise leader onboard. If irregularities are discovered these are rectified in the raw data

Data storage
National database: Raw data are stored in the national database "Fiskeline". Fiskeline is not accessible through a website. **International database:** NA **Quality checks and data validation documentation:** The file "Manual Tungesurvey.docx" can be found on: https://www.dcf-denmark.dk/manuals-documentation
Sample storage
Storage description: Otoliths from the samples brought back to the lab are stored dry in archive at DTU-Aqua Otoliths library. Information about the amount of samples stored are available on request to the DTU-Aqua. Annual sampling effort is as well forwarded to the ICES WGBFAS. Sample analysis: ICES WGBFAS annual assessment report https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/Fisheries%20Resources%20Steering%20Group/2021/HAWG_publication%20with%20multiple%20files/HAWG%202021_Full%20report.pdf
Data processing
Evaluation of data accuracy (bias and precision) Data are processed on national basis. An annual index (number at age) is calculated based on a GAM model. The model is describe in: Berg, C.W. and Kristensen, K. 2012. Spatial age-length key modelling using continuation ratio logits. Fisheries Research, 129:119-126. And Vinther, M. and J. Boje. 2015. Sole survey indices. Working doc 2, IBPSOLKAT 2015.

The accuracy of the survey estimates are calculated as part of the assessment procedure (SAM assessment model). The accuracy of the assessment including survey data and other input is described in: ICES. 2015a. Report of the Inter-Benchmark Workshop on Sole in Division IIIa and Subdivisions 22–24 (Skagerrak and Kattegat, Western Baltic Sea), 1 July–31 October 2015, by correspondence. ICES CM 2015/ACOM:57. 36 pp.

Editing and imputation methods:
During the survey the obtained data are registered in hard copies on paper. These data are later punched in into the national database. No imputation is made for survey data. The process on board is described in the file "Manual Tungesurvey.docx" can be found on: https://www.dcf-denmark.dk/manuals-documentation

Quality document associated to a dataset:
N.

Validation of the final dataset:
Overall, if inconsistencies or discrepancies are found then data are checked e.g. against original papers, re-reading of ages, census data. If no error is found, then the value is accepted. In rare case, when an outlier is spotted just before submission of data and it has a strong influence on the result, then the sample is left out and checked afterwards.
The assessment process including survey data and other input is described in:
ICES. 2015a. Report of the Inter-Benchmark Workshop on Sole in Division IIIa and Subdivisions 22–24 (Skagerrak and Kattegat, Western Baltic Sea), 1 July–31 October 2015, by correspondence. ICES CM 2015/ACOM:57. 36 pp.

MS : DNK
Region: Skagerrak (Area 4b)
Sampling scheme identifier: UWTV33
Sampling scheme type: Research survey at sea
Observation type:
Time period of validity: 2022-2024
Short description (max 100 words): The purpose of the survey is to estimate the abundance of Norway lobster (*Nephrops norwegicus*) Off Horns Rev (Functional unit 33). The survey is carried out every second year and the next survey is planned for 2023.
Description of the population
Population targeted: Norway lobster (*Nephrops norwegicus*) in FU 33 **Population sampled:** Norway lobster (*Nephrops norwegicus*) in FU 33 **Stratification:** The survey area is considered as one single stratum based on VMS and sediment data with a small-scale grid consisting of potential sampling positions (elements) having a spatial resolution of 0.7 nm (0.67' lat * 1.33' lon)
Sampling design and protocols
Sampling design description:

Random buffered sampling, buffer depending of stratum area and number of stations to be sampled in the stratum, total number of stations chosen to ensure an overall CV < 10%

Is the sampling design compliant with the 4S principle?:
NA (Research survey)

Regional coordination:
The survey is coordinated by ICES-WGNEPS and Denmark is the only EU MS participating in the survey

Link to sampling design documentation:
https://www.ices.dk/sites/pub/Publication%20Reports/Forms/DispForm.aspx?ID=37647

Compliance with international recommendations: I
Y

Link to sampling protocol documentation:
https://www.ices.dk/sites/pub/Publication%20Reports/Forms/DispForm.aspx?ID=37647

Compliance with international recommendations:
Y
.

Sampling implementation

Recording of refusal rate: NA

Monitoring of sampling progress within the sampling year: NA

Data capture

Means of data capture:
Presence of *Nephrops* burrows from underwater video tracks analysed and counted manually on HD screens according to ICES-WGNEPS standards.

Data capture documentation:
https://www.ices.dk/sites/pub/Publication%20Reports/Forms/DispForm.aspx?ID=37647

Quality checks documentation:
Y
Annual ICES-WGNEPS reports: https://www.ices.dk/community/groups/Pages/WGNEPS.aspx

Data storage

National database: NA

International database: NA

Quality checks and data validation documentation: NA, database is still under development

Sample storage

Storage description: Video and GPS data files as well as the results of the analyses and quality checking and are stored on DTU Aqua's secure server Sample analysis: https://www.ices.dk/sites/pub/Publication%20Reports/Forms/DispForm.aspx?ID=37647
Data processing
Evaluation of data accuracy (bias and precision): Y **Editing and imputation methods:** Y **Quality document associated to a dataset:** Annual ICES-WGNEPS reports: https://www.ices.dk/community/groups/Pages/WGNEPS.aspx **Validation of the final dataset:** Quality check by scientist before reporting to ICES-WGNEPS and presentation of quality check results on ICES-WGNEPS annual meetings.

Note: For BIAS and IBWSS which area surveys on which DNK participates on other MS research vessel see Annex 1.1of the corresponding MS (BIAS: Germany, IBWSS: Netherlands, Ireland).

MS : DNK
Region: Baltic Sea (Area 3)
Sampling scheme identifier: Baltic Ichthyoplankton Survey
Sampling scheme type: Research survey at sea
Observation type:
Time period of validity: 2022-2024
Short description (max 100 words): The main aim of the Baltic Ichthyoplankton Surveys is monitoring of the spatial distribution and abundance of fish eggs and larvae, with Baltic cod as the main target species. In addition to the ichthyoplankton sampling, a number of trawl hauls are conducted to obtain information on the adult cod, in particular on their fecundity and sex ratios. Furthermore, hydrological parameters are recorded throughout the survey area via CTD casts. The data resulting from these surveys are utilized to produce a fishery independent SSB estimate as well as a larval index, which are used in the stock assessment of Baltic cod.
Description of the population
Population targeted: The main target species is Baltic cod *(Gadus morhua*). However, depending on the time of sampling, eggs and larvae of other species are caught as well, such as e.g. sprat (*Sprattus sprattus*), herring (*Clupea harengus*) and flounder (*Platichthys flesus*) as well as several non-commercial species. **Population sampled:** Same as described above under "Population targeted".

Stratification:
The surveys are carried out on a regularly spaced station grid in the main spawning areas of Baltic cod, with approximately 10 nautical miles between sampling stations.

Sampling design and protocols

Sampling design description:
Several individual survey cruises are conducted each year in close collaboration between several institutes around the Baltic Sea. The surveys are conducted between March and November, aiming to cover the entire spawning season of the target species, Baltic cod. As spawning of Baltic cod is presently mainly restricted to the Bornholm Basin in ICES SD 25 due to the ambient hydrographic conditions, this area is also the main survey area which is covered by a standard station grid consisting of 45 stations. In addition, some cruises also cover adjacent areas to account for potential spatial extension of spawning activity.

Is the sampling design compliant with the 4S principle?:
A fixed station allocation is used in the design

Regional coordination:
The Baltic Ichthyoplankton Surveys consist of several individual survey cruises, which are conducted each year in close collaboration between several institutes around the Baltic Sea. Participating nations are Denmark, Germany and Poland.

Link to sampling design documentation:
The Baltic Ichthyoplankton Surveys and the applied sampling design and sampling procedures as well as sample and data analyses have been reviewed and evaluated by ICES WGALES (Working Group on Atlantic Fish Larvae and Eggs Surveys):

ICES. 2018. Report of the Working Group on Atlantic Fish Larvae and Eggs Surveys (WGALES). 22-26 October. Lyngby, Denmark. ICES CM 2018/EOSG:04. 56 pp.

https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/EOSG/2018/WGALES/WGALES%20report%202018.pdf

Compliance with international recommendations:
Y

Link to sampling protocol documentation:
NA

Compliance with international recommendations:
NA

Sampling implementation

Recording of refusal rate:
NA

Monitoring of sampling progress within the sampling year:
NA

Data capture
Means of data capture: Sorting equipment, stereo microscopes, different sampling protocols, CTD probe with data processing software. **Data capture documentation:** NA **Quality checks documentation:** NA

Data storage
National database: NA **International database:** NA so far, but potential future implementation into ICES egg and larvae database **Quality checks and data validation documentation:** NA
Sample storage
Samples are stored in archive
Data processing
Evaluation of data accuracy (bias and precision NA **Editing and imputation methods:** NA **Quality document associated to a dataset:** NA **Validation of the final dataset:** NA

ANNEX 1.2 - QUALITY REPORT FOR SOCIOECONOMIC DATA SAMPLING SCHEME

The quality report fulfils Article 6 (3) (d) of the Regulation (EU) 2017/1004. This document is intended to specify data to be collected under chapter II, points 3, 5, 6, and 7 of the Delegated Decision annex: Socioeconomic data on fisheries, aquaculture and any complementary data collection of fishing activity and fish processing. Use this document to describe quality aspects of the data collection process (design, sampling implementation, data capture, data storage and data processing etc.). The annex should be filled for each sampling scheme. Where applicable, use the handbook on sampling design (Deliverable 2.1 from MARE/2016/22 SECFISH study), available on the DCF website.

Survey Specifications
Sector name refers to socio economic data on fisheries, aquaculture and any complementary data collection of fishing activity and processing as given in the EU MAP Delegated Decision annex. *Sampling scheme refers to survey technique: by census, by sampling, random or non-random, other (with explanation). If sampling then outline sampling design.* *Variables refer to Tables 7, 9 and 10 of the EU MAP Delegated Decision annex.* *Supra region refers to Table 2 of the EU MAP Implementing Decision annex. If the sampling scheme is the same in all supra regions put 'All Supra regions'.*
Sector name(s): Fishing activity variables
Sampling scheme: Sampling - NPS
Variables: Variables in table 6 (Commission Delegated Decision (EU) 2021/1167 of 27 April 2021): Length of nets (m) * soak time (days), Number of nets/length, Number of hooks, Number of lines, Number of pots, traps
Supra region(s): Baltic Sea; North Sea; Eastern Arctic; NAFO; extended North Western waters (ICES areas 5, 6 and 7) and extended South Western waters (ICES areas 10, 12 and 14)
Survey planning
Vessels using passive gears: gillnet, longlines and pots and traps
Survey design and strategy
The majority of the fishing activity variables data from Danish vessels are collected as census data in logbooks and sales notes. But some of the effort variables for passive gears are not filled in the Danish logbooks or filled in with an unreliable quality. Therefore, complementary data will collected to be able to report these variables. A list of vessels fishing with passive gears (for the vessels not reporting logbooks the gears are estimated via the metiers) will be made available based on previous years fishing activity. 60 vessels will be contacted, corresponding to 5% of the total number of vessels fishing with passive gears, to fill in a questionnaire. For vessels fishing with gillnets questions will be asked regarding the last trip on target species, type of net, net length, number of nets, number of sets, soaking time, mesh size, net hight, use of pingers, fishing depth. For vessels fishing with longlines questions will be asked regarding the last trip on target species, number of lines, number of hooks. For vessels fishing with pots and traps questions will be asked regarding the last trip on target species, number of pots, soaking time.

In addition, this information will be combined with sales notes, with an estimated métier, fleet register, and AIS, BlackBox and EM data, where work will be done to develop or improve algorithms to assess fishing effort from the high-resolution geo-spatial data in combination with other data source.
Estimation design
This survey is new, so the estimation design is not fully developed yet. This will be done in 2022.
Error checks
This survey is new, so the methods for checking data is not fully developed yet. This will be done in 2022, including checks for outliers in the information.
Data storage and documentation
A form for filling in the questionnaire will be developed in the SurveyXact software before the end of 2021. Data can be extracted and analysed, but it has not been developed yet.
Revision
Not planned yet
Confidentiality
Procedures for handling confidential data are well established within DTU Aqua. Data are stored at a drive with restricted access. If DTU employees need data extractions, they need to sign a data confidentiality declaration, and a personal drive is created for the user with the data extraction. When publishing data, it should not be possible to identify individual vessels, by aggregating data and/or restricting information related to the data.

Survey Specifications
Sector name refers to socio economic data on fisheries, aquaculture and any complementary data collection of fishing activity and processing as given in the EU MAP Delegated Decision annex. *Sampling scheme refers to survey technique: by census, by sampling, random or non-random, other (with explanation). If sampling then outline sampling design.* *Variables refer to Tables 7, 9 and 10 of the EU MAP Delegated Decision annex. Supra region refers to Table 2 of the EU MAP Implementing Decision annex. If the sampling scheme is the same in all supra regions put 'All Supra regions'.*
Sector name(s): Socioeconomic data on fisheries
Sampling scheme: NPS - Non-probability sample survey
Variables: Economic variables from Table 7 (Commission Delegated Decision (EU) 2021/1167 of 27 April 2021). Consumption of fixed capital, Energy consumption, Energy costs, Full-time equivalent (FTE), Gross debt, Gross value of landings, Income from leasing out quota or other fishing rights, Investments in tangible assets (net purchase of assets), Lease/rental payments for quota or other fishing rights, Operating subsidies, Other income, Other non-variable costs, Other variable costs, Paid labour, Personnel costs, Repair and maintenance costs, Subsidies on investments, Total hours worked per year (optional), Total value of assets, Unpaid labour, Value of physical capital, Value of quota and other fishing rights, Value of unpaid labour.

Supra region(s): Baltic Sea; North Sea; Eastern Arctic; NAFO; extended North Western waters (ICES areas 5, 6 and 7) and extended South Western waters (ICES areas 10, 12 and 14)

Survey planning

The Danish fishing fleet is defined by the *Danish Fleet Register* from the *Danish Fisheries Agency*, covering all active and inactive vessels. The population is derived from the *Danish Fleet Register* and split up into the segments described in Table 5.1 and Table 5.2.

The non-probability sample survey is applied to economic data for the population with normal activity level (Activity indicator 'A'). Variables included are those that can be derived from the financial accounts.

Survey design and strategy

Economic data are collected from financial accounts.

The sample sizes of the segments are determined by the accessibility of data. It is not possible to collect data on a probability sample survey for all segments; hence a non-probability sample survey is the survey method chosen. Financial accounts are available for the parts of the segments marked with the activity indicator 'A'.

Financial accounts are collected from the accountants on a voluntary basis. All fishery companies that participate have to accept the use of their financial accounts.

Financial accounts are collected from the accountants in a balanced account form in a spread sheet. Statistics Denmark distributes the spread sheets by encrypted E-mail. Statistics Denmark provides a secure data upload facility, to ensure the confidentiality of the collected accounts, and to fulfil the national GDPR legislation.

Estimation design

Corrected and finalized accounts are merged with register data. Individual accounts are then simulated for all units which are not included in the sample. That is done using a massimputation methodology derived from the SAS program Proc MassImputation from the BANFF package. The program finds the nearest donor using a standardized relative measurement based on selected criteria parameters. That is repeated three times with selection of criteria parameters (for instance different species composition). The resulting three donors are used to calculate an average account. Finally, the economic variables in the average account are scaled by a factor to ensure that the gross output (value of catch) in the resulting balanced account match registered gross output for the simulated unit.

Statistics Denmark aims to avoid non-responses by having a strong relationship and communication with all responders. However, it is not always possible to collect all selected accounts from the accountants. In this case Statistics Denmark aims to select an alternate account covering the same segment.

Error checks

Statistics Denmark uses a database to keep track of the individual units in the fleet. Rules are established to ensure, that vessels do not occur more than one time. Respondent errors are eliminated by validating all accounts in a specially developed application containing multiple validation checks. Possible errors are discussed with the accountants by E-mail or by phone and corrected if possible. Statistics Denmark aims to obtain a large degree of automation in the processing of data, minimizing the factor of human error.

Data storage and documentation
Data are stored in a MS SQL database. Documentation on the used methodology can be found here: https://www.dst.dk/en/Statistik/dokumentation/documentationofstatistics/account-statistics-for-fishery
Revision
Statistics Denmark reviews the methodologies each year during compilation of the statistics, to determine whether the methodologies used are still appropriate. The method used to collect data, validate data and calculate imputed values has been reviewed and accepted by Statistics Denmark's methodology team.
Confidentiality
Statistics Denmark meets the Code of Practice for European Statistics including principle 5 on Statistical Confidentiality and Data protection. https://www.dst.dk/Site/Dst/SingleFiles/GetArchiveFile.aspx?fi=6380868453&fo=0&ext=kvaldel Reported data to JRC (DCF partner) and external users are only aggregated data.

Survey Specifications
Sector name refers to socio economic data on fisheries, aquaculture and any complementary data collection of fishing activity and processing as given in the EU MAP Delegated Decision annex. *Sampling scheme refers to survey technique: by census, by sampling, random or non-random, other (with explanation). If sampling then outline sampling design.* *Variables refer to Tables 7, 9 and 10 of the EU MAP Delegated Decision annex. Supra region refers to Table 2 of the EU MAP Implementing Decision annex. If the sampling scheme is the same in all supra regions put 'All Supra regions'.*
Sector name(s): Socioeconomic data on fisheries
Sampling scheme: C - Census
Variables: Economic variables from Table 7 (Commission Delegated Decision (EU) 2021/1167 of 27 April 2021): Days at sea, Mean age of vessels, Mean LOA of vessels, Number of fishing enterprises/units, Number of vessels, Total vessel power, Total vessel tonnage. Social Variables from Table 9 (Commission Delegated Decision (EU) 2021/1167 of 27 April 2021): Employment by age, Employment by employment status, Employment by gender, Employment by level of education, Employment by nationality, FTEs by gender, Unpaid labour by gender.
Supra region(s): Baltic Sea; North Sea; Eastern Arctic; NAFO; extended North Western waters (ICES areas 5, 6 and 7) and extended South Western waters (ICES areas 10, 12 and 14)
Survey planning

The Danish fishing fleet is defined by the *Danish Fleet Register* from the *Danish Fisheries Agency*, covering all active and inactive vessels. The population is derived from the *Danish Fleet Register* and split up into the segments described in Table 5.1 and Table 5.2.

All census data are register data.

Survey design and strategy

Data sources are: *Danish Fleet Register* (logbooks, sales notes and other) and *Register-Based Labour Force Statistics* and *Labour Market Account Statistics*.

Sample size for census data are all registered vessels in the *Danish Fleet Register*.

The *Danish Fleet Register* is transferred from the *Danish Fisheries Agency* through secure upload facilities provided by Statistics Denmark.

Register-Based Labour Force Statistics and *Labour Market Account Statistics* are national statistics developed by Statistics Denmark, and available through internal channels.

Estimation design

No estimations occur on census data. However, census data are used in the estimation of individual accounts which are not included in the sample.

Error checks

Statistics Denmark uses a database to keep track of the individual units in the fleet. Rules are established to ensure, that vessels do not occur more than one time. Respondent errors are eliminated by validating all accounts in a specially developed application containing multiple validation checks. Possible errors are discussed with those responsible for the relevant national register.
Statistics Denmark aims to obtain a large degree of automation in the processing of data, minimizing the factor of human error.

Data storage and documentation

Data are stored in Oracle database and MS SQL database.

Documentation on the used methodology can be found here:
https://www.dst.dk/en/Statistik/dokumentation/documentationofstatistics/account-statistics-for-fishery

Revision

Statistics Denmark reviews the methodologies each year during compilation of the statistics, to determine whether the methodologies used are still appropriate. The method used to collect data, validate data and calculate imputed values has been reviewed and accepted by Statistics Denmark's methodology team.

Confidentiality

Statistics Denmark meets the Code of Practice for European Statistics including principle 5 on Statistical Confidentiality and Data protection.
https://www.dst.dk/Site/Dst/SingleFiles/GetArchiveFile.aspx?fi=6380868453&fo=0&ext=kvaldel

Reported data to JRC (DCF partner) and external users are only aggregated data.

Survey Specifications
Sector name refers to socio economic data on fisheries, aquaculture and any complementary data collection of fishing activity and processing as given in the EU MAP Delegated Decision annex. *Sampling scheme refers to survey technique: by census, by sampling, random or non-random, other (with explanation). If sampling then outline sampling design.* *Variables refer to Tables 7, 9 and 10 of the EU MAP Delegated Decision annex. Supra region refers to Table 2 of the EU MAP Implementing Decision annex. If the sampling scheme is the same in all supra regions put 'All Supra regions'.*
Sector name(s): Socioeconomic data on fisheries
Sampling scheme: IND - Indirect survey
Variables: Economic variables from Table 7 (Commission Delegated Decision (EU) 2021/1167 of 27 April 2021): Consumption of fixed capital, Energy consumption, Energy costs, Full-time equivalent (FTE), Gross debt, Gross value of landings, Income from leasing out quota or other fishing rights, Investments in tangible assets (net purchase of assets), Lease/rental payments for quota or other fishing rights, Operating subsidies, Other income, Other non-variable costs, Other variable costs, Paid labour, Personnel costs, Repair and maintenance costs, Subsidies on investments, Total hours worked per year (optional), Total value of assets, Unpaid labour, Value of physical capital, Value of quota and other fishing rights, Value of unpaid labour.
Supra region(s): Baltic Sea; North Sea; Eastern Arctic; NAFO; extended North Western waters (ICES areas 5, 6 and 7) and extended South Western waters (ICES areas 10, 12 and 14)
Survey planning
The Danish fishing fleet is defined by the *Danish Fleet Register* from the *Danish Fisheries Agency*, covering all active and inactive vessels. The population is derived from the *Danish Fleet Register* and split up into the segments described in Table 5.1 and Table 5.2. Indirect survey is applied to economic data for the population with activity indicator 'L'
Survey design and strategy
Data sources are: *Danish Fleet Register* (logbooks, sales notes and other) and financial accounts from the segments with activity indicator 'A' Segments marked with activity indicator 'L' contain vessels that are not obliged to keep accountancy therefore a method to impute the economic variables of the segments is used and described under 'Estimation design'.
Estimation design
Economic variables for the low activity part of the segments are imputed using a calculated scaling factor to ensure that the gross output for the imputed segment match registered gross output for the active part of the segment. Data on production and on vessel characteristics are derived from the *Danish Fleet Register* and available for all vessels. Hence, it is possible to calculate the scaling factor between the average gross output of the segment with activity level 'A' and the average gross output of the segment with activity level 'L'. The scaling factor is used to scale the economic values of an average account for the part of the segment with activity level

'A' to create the economic values of an average account for the part of the segment with activity level 'L'.
Error checks
Statistics Denmark uses a database to keep track of the individual units in the fleet. Rules are established to ensure, that vessels do not occur more than one time. Statistics Denmark aims to obtain a large degree of automation in the processing of data, minimizing the factor of human error.
Data storage and documentation
Data are stored in a MS SQL database. Documentation on the used methodology can be found here: https://www.dst.dk/en/Statistik/dokumentation/documentationofstatistics/account-statistics-for-fishery
Revision
Statistics Denmark reviews the methodologies each year during compilation of the statistics, to determine whether the methodologies used are still appropriate. The method used to collect data, validate data and calculate imputed values has been reviewed and accepted by Statistics Denmark's methodology team.
Confidentiality
Statistics Denmark meets the Code of Practice for European Statistics including principle 5 on Statistical Confidentiality and Data protection. https://www.dst.dk/Site/Dst/SingleFiles/GetArchiveFile.aspx?fi=6380868453&fo=0&ext=kvaldel Reported data to JRC (DCF partner) and external users are only aggregated data.

Survey Specifications
'Sector name' refers to socio economic data on fisheries, aquaculture and any complementary data collection for fishing activities and processing, as in the EU MAP Delegated Decision annex. *'Sampling scheme' refers to the survey technique: by census, by sampling, random or non-random, other (with explanation). If sampling, then outline sampling design.* *'Variables' refer to Tables 7, 9 and 10 of the EU MAP Delegated Decision annex.* *'Supra region' refers to Table 2 of the EU MAP Implementing Decision annex. If the sampling scheme is the same in all supra regions, put 'All supra regions'.*
Sector name(s): Socioeconomic and environmental data on aquaculture
Sampling scheme: NPS - Non-probability sample survey
Variables: Economic variables from Table 10 (Commission Delegated Decision (EU) 2021/1167 of 27 April 2021): Other income, Personnel costs, Energy costs, Raw material: livestock costs, Raw material: feed costs, Repair and maintenance costs, Other operating costs, Operating subsidies, Subsidies on investments, Consumption of fixed capital, Total value of assets, Financial income, Financial expenditures, Investments in tangible, assets

(net purchase of assets), Gross debt, Livestock used, Fish feed used, Paid labour, Number of enterprises by size category

Supra region(s): All regions

Survey planning

The *Danish Aquaculture Register* from the *Danish Fisheries Agency* defines the overall population of aquaculture farms. Statistics Denmark selects the commercially active farms to form the population for the data collection of socioeconomic and environmental data.

Survey design and strategy

Data sources are financial accounts

All economic variables collected from financial accounts are based on a non-probability sample survey.

Financial accounts are collected from the aquaculture company's accountants on a voluntary basis. All aquaculture companies that participate have to accept the use of their financial accounts.

Financial accounts are collected from the accountants in a balanced account form in a spread sheet. Statistics Denmark distributes the spread sheets by encrypted E-mail. Statistics Denmark provides a secure data upload facility, to ensure the confidentiality of the collected accounts, and to fulfill the national GDPR legislation.

Estimation design

The part of the population not represented in the sample is estimated using a simulation model where every item of the account is calculated on the basis of production information from the *Aquaculture Register* from the *Danish Fisheries Agency* and the submitted accounts divided in representative segments. Subsequently, all results are aggregated in the relevant segments. Furthermore, accounts for some companies have been collected from the *Danish Business Authority* in order to get a more accurate estimate of *gross output*, *assets* and *liabilities*.

Statistics Denmark aims to avoid non-responses by having a strong relationship and communication with all responders. However, it is not always possible to collect all selected accounts from the accountants. In this case Statistics Denmark aims to select an alternate account covering the same segment.

Error checks

Statistics Denmark uses a database to keep track of the individual aquaculture farms. Respondent errors are eliminated by validating all accounts in a specially developed application containing multiple validation checks. Possible errors in financial data are discussed by E-mail or by phone with the accountants and corrected if possible. Statistics Denmark aims to obtain a large degree of automation in processing data, minimising the factor of human error.

Data storage and documentation

Data are stored in a MS SQL database.

Documentation on the used methodology can be found here:

https://www.dst.dk/en/Statistik/dokumentation/documentationofstatistics/accounts-statistics-for-aquaculture

Revision

Statistics Denmark reviews the methodologies each year during compilation of the statistics, to determine whether the methodologies used are still appropriate. The method used to collect data, validate data and calculate imputed values has been reviewed and accepted by Statistics Denmark's methodology team.

Confidentiality

Statistics Denmark meets the Code of Practice for European Statistics including principle 5 on Statistical Confidentiality and Data protection.
https://www.dst.dk/Site/Dst/SingleFiles/GetArchiveFile.aspx?fi=6380868453&fo=0&ext=kvaldel

Reported data to JRC (DCF partner) and external users are only aggregated data.

Survey Specifications

'Sector name' refers to socio economic data on fisheries, aquaculture and any complementary data collection for fishing activities and processing, as in the EU MAP Delegated Decision annex.
'Sampling scheme' refers to the survey technique: by census, by sampling, random or non-random, other (with explanation). If sampling, then outline sampling design.
'Variables' refer to Tables 7, 9 and 10 of the EU MAP Delegated Decision annex.
'Supra region' refers to Table 2 of the EU MAP Implementing Decision annex. If the sampling scheme is the same in all supra regions, put 'All supra regions'.

Sector name(s): Socioeconomic and environmental data on aquaculture

Sampling scheme: C - Census

Variables:
Economic variables from Table 10 (Commission Delegated Decision (EU) 2021/1167 of 27 April 2021):
Gross sales per species, Value of unpaid labour, Weight of sales per species, Unpaid labour, Number of hours worked by employees and unpaid workers (optional)

Social variables as listed in Table 9 (Commission Delegated Decision (EU) 2021/1167 of 27 April 2021):
Employment by gender, FTEs by gender, Unpaid labour by gender, Employment by age, Employment by level of education, Employment by nationality, Employment by employment status, Full-time equivalent (FTE).

Supra region(s): All regions

Survey planning

The *Danish Aquaculture Register* from the *Danish Fisheries Agency* defines the overall population of aquaculture farms. Statistics Denmark selects the commercially active farms to form the population for the data collection of socioeconomic and environmental data.
To combine economic and social variables, the enterprises identified above are matched with Statistics Denmark's *Register-Based Labour Force Statistics* and *Labour Market Account Statistics*.

Survey design and strategy
Data sources are: *Danish Aquaculture Register* from the *Danish Fisheries Agency*, *Register-Based Labour Force Statistics* and *Labour Market Account Statistics*, Environmental data from the *Danish Veterinary and Food Administration*. All data from the *Danish Aquaculture Register* are census data. Social data are register data which are census. Environmental data are census.
Estimation design
All data are census data. No estimation occur.
Error checks
Statistics Denmark uses a database to keep track of the individual aquaculture farms. Statistics Denmark aims to obtain a large degree of automation in processing data, minimising the factor of human error.
Data storage and documentation
Data are stored in a MS SQL database. Documentation on the used methodology can be found here: https://www.dst.dk/en/Statistik/dokumentation/documentationofstatistics/accounts-statistics-for-aquaculture
Revision
Statistics Denmark reviews the methodologies each year during compilation of the statistics, to determine whether the methodologies used are still appropriate. The method used to collect data, validate data and calculate imputed values has been reviewed and accepted by Statistics Denmark's methodology team.
Confidentiality
Statistics Denmark meets the Code of Practice for European Statistics including principle 5 on Statistical Confidentiality and Data protection. https://www.dst.dk/Site/Dst/SingleFiles/GetArchiveFile.aspx?fi=6380868453&fo=0&ext=kvaldel Reported data to JRC (DCF partner) and external users are only aggregated data.

Survey Specifications
Sector name refers to socio economic data on fisheries, aquaculture and any complementary data collection of fishing activity and processing as given in the EU MAP Delegated Decision annex. *Sampling scheme refers to survey technique: by census, by sampling, random or non-random, other (with explanation). If sampling then outline sampling design.* *Variables refer to Tables 7, 9 and 10 of the EU MAP Delegated Decision annex.* *Supra region refers to Table 2 of the EU MAP Implementing Decision annex. If the sampling scheme is the same in all supra regions put 'All Supra regions'.*
Sector name(s): Fish processing industry
Sampling scheme: Census - C
Variables: Social variables listed in Table 9 (Commission Delegated Decision (EU) 2021/1167 of 27 April 2021) and economic variables listed in Annex V to PGECON 2020 (excluding raw material)
Supra region(s): DNK
Survey planning
1. Provide a short description of the population to which the sampling scheme applies The Danish fish processing industry is defined by the Business Register using NACE code 10.20. The Danish data collection is based on data from the Account Statistics and the Industry Commodity Statistics collected by Statistics Denmark. In a close collaboration between the Department of Food and Resource Economics (IFRO) and Statistics Denmark, data from the Industrial Commodity- and Account Statistics are combined to make sure that all enterprises processing fish are covered by this data collection and to comply with the economic data variables listed in Annex V to PGECON 2020. Enterprises, which have other activities than fish processing, are split up into work place units and only units with fish processing are included to get the most accurate data for the fish processing sector activities. The combination of the two statistics allows for a segmentation of enterprises based on their production of commodities. This way more information in relation to species dependencies can be deducted from the established data set for the processing industry. To combine economic and social data variables, the enterprises identified as fish processors above are matched with Statistics Denmark's "Register-Based Workforce Statistic" and "Labour Market Account Statistic". Merging these information's the social variables listed in table 9 (Commission Delegated Decision (EU) 2021/1167 of 27 April 2021) can be provided. Data for the processing industry concerning the year 2020 will be available in September 2022 (1½ years of time lag). Data for 2021 and 2022 will be available in September 2023 and September 2024.
Survey design and strategy

1. List data sources, e.g. interviews, registers, log books, sales notes, VMS, financial accounts etc.
Data collected by Statistics Denmark are a combination of register data, financial accounts and questionnaires. The Account Statistic collected by Statistics Denmark are essentially aggregations of items of the annual accounts of business enterprises, notably items of the profit and loss account, the balance sheet and the statement of fixed assets. The accounts statistics are a reliable indicator of the activity level and of the structure of the Danish business sector. The highest data quality is achieved at the enterprise level, primarily because the enterprises prepare their annual accounts at that level. The Statistics are based on questionnaires, the Central Customs and Tax Administration (SLS-E data), and the business register.

2. Describe how the sample sizes were determined.
The population is defined on the basis of Statistics Denmark's Central Business Register covering all businesses in Denmark (ESR).

3. Describe survey methods and distribution, e.g. questionnaire forms by post, by email, on a website, by phone, access to other datasets, etc.
The data collected from all sources are combined in such a way that a complete set of accounting items is obtained for each business enterprise. In Denmark, enterprises are legally obliged to answer questionnaires from Statistics Denmark. Thus, the combination of register data and mandatory questionnaires make a solid foundation for the collection of data for the fish processing industry.

4. Describe the role of auxiliary information, if any, in the strategy, e.g. for validation, cross referencing, as a fall-back data source, etc.
See the above description

Estimation design

1. Describe method of calculating population estimate from sample.
The Account Statistics covers the whole population defined by the Business Register NACE 10.20. Data for the Account Statistics is collected from different sources and combined in such a way that a complete set of accounting items is computed for each business enterprise.

2. Describe method of calculating derived data, e.g. imputed values.
No estimation is therefore necessary because data are based on census and a full set of account for all business enterprises are created.

3. Describe treatment of non-responses.
In Denmark, enterprises are legally obliged to answer questionnaires from Statistics Denmark. Thus, non-responses is not an issue.

Error checks

1. Describe potential errors and how and where in the process these are detected, avoided or eliminated, e.g. data duplication, double counting, respondent error, upload error, processing error, etc.
The data collected for the processing industry give a complete coverage of all enterprises covered by NACE 10.20. The accounts statistics are a reliable indicator of the activity level and of the structure of the Danish processing industry sector. The highest data quality is achieved at the enterprise level, primarily because the enterprises prepare their annual accounts at that level. Quality reports are available on the website of Statistics Denmark. (See below)

Data storage and documentation

1. Describe how the data are stored.
Micro data is stored at Statistics Denmark databases and are confidential.
Aggregated data for the fish processing industry, and data distributed on employment and species segments are stored at IFRO.

2. Provide a link to the webpage where additional methodological documentation can be found, if any.

Statistics Denmark:
Statistics Denmark, Commodity statistics:
https://www.dst.dk/da/Statistik/dokumentation/statistikdokumentation/industriens-koeb-af-varer-og-tjenester
Statistics Denmark, Account Statistics:
https://www.dst.dk/da/Statistik/dokumentation/statistikdokumentation/regnskabsstatistik-for-private-byerhverv
Statistics Denmark: Labour Market Account (register data):
https://www.dst.dk/en/Statistik/dokumentation/documentationofstatistics/labour-market-account
Department of Food and Resource Economics (IFRO):
For a presentation of the basic data collection and analysis of the processing industry - Economic Situation of the Danish Fishery 2005: Data collection and validation. Segmentation and analysis of the industry.
http://ifro.ku.dk/publikationer/ifro_serier/fiskeriets_okonomi/

Revision

1. Describe the frequency of the methodology review, e.g. revision of segmentation, survey method per segment, per variable, etc.
The data documentation provided by Statistics Denmark contains a describe the frequency of the methodology review etc.

Confidentiality

1. Are procedures for confidential data handling in place and documented?
Yes, documentation by Statistics Denmark. All micro data are confidential and handled and stored by Statistic Denmark in accordance with rules and regulation of data handling.

2. Are protocols to enforce confidentiality between DCF partners in place and documented?
Yes, reported data to DCF partner are only aggregated data that have been controlled by Statistics Denmark in accordance with rules and regulation of data handling and storage.

3. Are protocols to enforce confidentiality with external users in place and documented?
Yes, reported data to external users are only aggregated data that have been controlled by Statistics Denmark in accordance with rules and regulation of data handling and storage.

4. Are there any issues with publication of data due to confidentiality reasons? Provide an explanation.
Only aggregated data that have been controlled by Statistics Denmark in accordance with rules and regulation of confidentiality can be published.