Swedish Agency for Marine and Water Management

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 27 April 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 27 April 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) 2022/39 of 12 January 2022

laying down rules on the format and timetables for the submission of national work plans and annual reports for data collection in the fisheries and aquaculture sectors, and repealing Implementing Decisions (EU) 2016/1701 and (EU) 2018/1283

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

2025-2027

Version 1.0 – 2024

Gothenburg, 20241015

CONTENTS

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.

Outline the general framework of the national data collection programme in relation to the relevant sections of the EU MAP. If applicable, indicate major methodological changes in approach compared to previous year(s), and to which section(s) they apply.

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https://www.havochvatten.se/en/start.html

The following three institutions contribute the work described in the National Work Plan:

Swedish Agency for Marine and Water Management (SwAM)
https://www.havochvatten.se/en/start.html

Department for Digital Transformation, Division of IT Management & Assessment *and*
Department for Marine Management, Division of Fisheries Administration
Box 11 930
SE- 404 39 Gothenburg, Sweden
Tel +46 10 698 60 00

Swedish University of Agricultural Sciences (SLU)
http://www.slu.se/en/

Department of Aquatic Resources (SLU Aqua) with three institutes:

Institute of Marine Research (IMR)
Swedish University of Agricultural Sciences
Turistgatan 5
SE-453 30 Lysekil, Sweden
Tel + 46 18 67 10 00

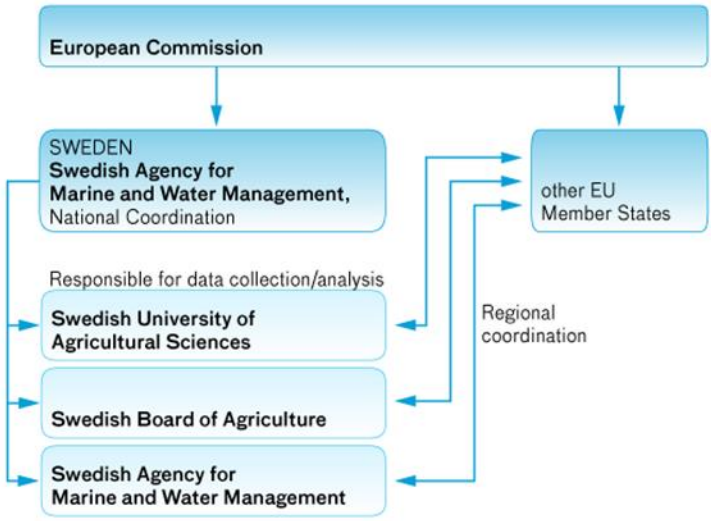
Institute of Freshwater Research (IFR)
Swedish University of Agricultural Sciences
Stångholmsvägen 2
SE-178 93 Drottningholm, Sweden
Tel + 46 18 67 10 00

Institute of Coastal Research (ICR)
Swedish University of Agricultural Sciences
Skolgatan 1
SE-742 42 Öregrund, Sweden
Tel + 46 18 67 10 00

Swedish Board of Agriculture
http://www.jordbruksverket.se/

Department of Agriculture and Analysis, Agriculture and Fisheries development Unit *and*
Department of Agriculture and Analysis, Food chain and Export Unit
SE-551 82 Jönköping, Sweden
Tel +46 771-223 223

The Swedish organization of DCF work:



The Swedish Agency for Marine and Water Management is responsible for the implementation of the DCF within Sweden.

The Swedish Agency for Marine and Water Management collects information on landings, fishing efforts, and economic data regarding Sweden's fishing fleet. The Agency also collects data on recreational fisheries. The Swedish Board of Agriculture assists the Swedish Agency for Marine and Water Management in data collection concerning aquaculture and processing industries. The Department of Aquatic Resources (SLU Aqua) at the Swedish University of Agricultural Sciences is responsible for the biological sampling on surveys (bottom/pelagic trawling, acoustic, UWTV), sea-sampling onboard commercial vessels, harbour sampling, and biological sampling of recreational fisheries. SLU Aqua is also responsible for storing, quality-checking, analyzing and delivering biological data to end users as well as participating and contributing in scientific working groups.

Sweden is participating in RCG NANSEA and RCG Baltic.

A website has been established to inform involved partners, the EU Commission and the public about the Swedish implementation of the EU Data Collection framework:

Data Collection Framework (DCF) - Data Collection Framework - Swedish Agency for Marine and Water Management (havochvatten.se) *(max. 1000 words)*

Text Box 1a: Test studies description

Region: Baltic

Test study: 1. Genetics

General comment: This text box fulfils Chapter II, section 1.2 of the EU MAP Delegated Decision annex.
Name of the regional test study: 1. Genetics Participation in RWP Baltic 2025-2027. *(max 250 words per study)*

Test study: 2. Diadromous species data collection

General comment: This text box fulfils Chapter II, section 1.2 of the EU MAP Delegated Decision annex.
Name of the regional test study: 2. Diadromous species data collection Participation in RWP Baltic 2025-2027. *(max 250 words per study)*

Test study: 3. Regionally coordinated stomach sampling program

General comment: This text box fulfils Chapter II, section 1.2 of the EU MAP Delegated Decision annex.
Name of the regional test study: 3. Regionally coordinated stomach sampling program Participation in RWP Baltic 2025-2027. *(max 250 words per study)*

Region: North Sea and Eastern Arctic

Test study: 1. Genetics

General comment: This text box fulfils Chapter II, section 1.2 of the EU MAP Delegated Decision annex.
Name of the regional test study: 1. Genetics Participation in RWP NANSEA 2025-2027.

(max 250 words per study)

Test study: 4. Diadromous species data collection

General comment: This text box fulfils Chapter II, section 1.2 of the EU MAP Delegated Decision annex.

Name of the regional test study: 4. Diadromous species data collection

Participation in RWP NANSEA 2025-2027.

(max 250 words per study)

Test study: eDNA as a complementary method for monitoring demersal fish

General comment: This text box fulfils Chapter II, section 1.2 of the EU MAP Delegated Decision annex.

Name of the national test study: eDNA as a complementary method for monitoring demersal fish

1. Aim of the test study

To evaluate the use of eDNA for monitoring demersal fish as a part of the IBTS. The long-term goal is to develop an effective method for monitoring species that occur in low densities or live in non-trawlable habitats and are therefore poorly represented in the present survey. The implementation of such a method could enable a reduction in survey effort and fish mortality without a loss of information on diversity in demersal fish communities.

2. Duration of the test study

2025

3. Methodology and expected outcomes of the test study

Samples for metabarcoding of demersal fish will be collected during IBTS in quarter 1 and quarter 3. Water samples are taken 0.5–2 m above the seafloor, filtered and stored frozen until DNA extraction. Library preparation and sequencing will be conducted in collaboration with the Department of Aquatic Sciences and Assessment at SLU, which has already been established. We will compare species composition and relative abundance in paired water samples and trawl catches to examine how well metabarcoding captures species distribution and diversity in the current monitoring. We will also compare species composition in eDNA samples from trawlable and non-trawlable areas to evaluate the potential added value that DNA metabarcoding can provide.

(max 900 words per study)

Region: All regions

Test study: Social Indicator- Indicator 1: Financial position (quantitative) and Indicator 7: well-being - financial security (quantitative)

General comment: This text box fulfils Chapter II, section 1.2 of the EU MAP Delegated Decision annex.

Name of the national test study: Social Indicator- Indicator 1: Financial position (quantitative) and Indicator 7: well-being - financial security (quantitative)

1. Aim of the test study
To compare average net income (self-employed/employee) with national averages in order to understand the financial position of fishers. With two different approaches on from a financial point and on from a material well-being point of view the two analyses can be done using the same data.

2. Duration of the test study
Since no additional data collection is need for this study the time for investigate this relationship is one year.

3. Methodology and expected outcomes of the test study
Statistical comparisons using economic data on income, wages and unpaid income e.g. from data collections framework and data on average income publicly available from Statistics Sweden. The expected outcome is that it will on average be lower for fishers resulting an a worse financial position and a lower material well-being than average in Sweden.

(max 900 words per study)

Text Box 1b: Other data collection activities

Region: Baltic, North Sea and Eastern Arctic

Activity: 1. RCGs Secretariat

General comment: Describe either activities that are funded by the DCF without a direct link to the EU MAP specific requirements or WP template tables, like marine knowledge, or activities funded by other financial instruments and/or programmes that relate to EU MAP requirements, like actions under the marine action plan. You can also include one-off specific studies for a particular end-user need that will not enter the regular data collection.

Name of the regional activity: 1. RCGs Secretariat

Participation in RWP Baltic 2025-2027 and in RWP NANSEA 2025-2027.

(max 250 words per study)

Activity: 2. Regional Data Base and Estimation System (RDBES)

General comment: Describe either activities that are funded by the DCF without a direct link to the EU MAP specific requirements or WP template tables, like marine knowledge, or activities funded by other financial instruments and/or programmes that relate to EU MAP requirements, like actions under the marine action plan. You can also include one-off specific studies for a particular end-user need that will not enter the regular data collection.

Name of the regional activity: 2. Regional Data Base and Estimation System (RDBES)

Participation in RWP Baltic 2025-2027 and in RWP NANSEA 2025-2027.

(max 250 words per study)

Activity: 3. Regional Coordination taking place in ISSGs and pan regional cooperation between RCGs.

General comment: Describe either activities that are funded by the DCF without a direct link to the EU MAP specific requirements or WP template tables, like marine knowledge, or activities funded by other financial instruments and/or programmes that relate to EU MAP requirements, like actions under the marine action plan. You can also include one-off specific studies for a particular end-user need that will not enter the regular data collection.

Name of the regional activity: 3. Regional Coordination taking place in ISSGs and pan regional cooperation between RCGs.

Participation in RWP Baltic 2025-2027 and in RWP NANSEA 2025-2027.

(max 250 words per study)

Activity: 4. Smart Dots

General comment: Describe either activities that are funded by the DCF without a direct link to the EU MAP specific requirements or WP template tables, like marine knowledge, or activities funded by other financial instruments and/or programmes that relate to EU MAP requirements, like actions under the marine action plan. You can also include one-off specific studies for a particular end-user need that will not enter the regular data collection.

Name of the regional activity: 4. Smart Dots

Participation in RWP Baltic 2025-2027 and in RWP NANSEA 2025-2027.

(max 250 words per study)

Activity: 5. Catch, effort and sampling Overviews for RCG Technical Meeting

General comment: Describe either activities that are funded by the DCF without a direct link to the EU MAP specific requirements or WP template tables, like marine knowledge, or activities funded by other financial instruments and/or programmes that relate to EU MAP requirements, like actions under the marine action

plan. You can also include one-off specific studies for a particular end-user need that will not enter the regular data collection.

Name of the regional activity: 5. Catch, effort and sampling Overviews for RCG Technical Meeting

Participation in RWP Baltic 2025-2027 and in RWP NANSEA 2025-2027.

(max 250 words per study)

SECTION 2: BIOLOGICAL DATA

Text Box 2.3: Diadromous species data collection in freshwater

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 2.1(b) and point 2.3 of the EU MAP Delegated Decision annex. Use this text box to give an overview of the methodology used to collect data from freshwater and inland commercial and recreational fisheries for salmon, sea trout and eel. Also include overview of data to be collected from research surveys on salmon, sea trout and eel in freshwater, and on eel in any relevant habitat including coastal waters.

Method selected for collecting data.

Eel

General: Most sampling schemes are run at an annual basis, when appropriate, schemes are run irregularly. Locations are exchanged for some schemes in order to cover as large part as possible of the Eel Management Unit (EMU: SE_Total). Biological data e. g., length, weight, sex-ratio, parasite numbers, Durif's silver index parameters (vertical and horizontal eye size and pectoral fin length) and otoliths are collected when necessary. Otoliths are prepared and analysed for data on age and otolith microchemistry (to determine whether the eels are natural recruiting or restocked, to determine habitat and/or freshwater origin, etc).
The Swedish eel management plan is currently being evaluated and changes are expected during the period 2025-2027, which in turn could require changes to the data collection program. As an example, the current plan has one EMU (SE_Total), this could be revised and changed to three EMU's (SE_East, SE_West, SE_Inland (currently used for some aspects in the national assessment), which will require changes to the DCF data collection. In addition, according to the ICES WKFEA roadmap, the aim is to have a first benchmark of a pan-European spatial stock assessment model in 2027. In relation to this, a new density analysis is tested, which could require additional data needs (for example fat content, contaminants, sampling eDNA, etc). Furthermore, the recently accepted EMFAF project DIASPARA aims at better aligning data needs and data collection and is set to contribute to the objectives of the DCF, see details in Text Box 1A in RWP BALTIC and RWP NANSEA.

The data from the methods described below are requested by a number of end users, including Data Calls, and are needed for stock assessment models (national and international).

Monitoring of juvenile eel, restocking, recruitment and electrofishing:
Restocking data eel: Collection of restocking data from organizations that restock eels. Data is collected on number of restocked eels per location per year. Eels are restocked in freshwater and coastal sites. According to the Swedish eel management plan, 2.5 million quarantined eels should be restocked yearly. The target number of 2.5 million restocked eels per year is however expected to be revised when the Swedish management plan is revised, as no government-funded releases have taken place since 2021.

Electrofishing eel: Electrofishing of eel to collect data on recruitment. Methods for data collection follow national standards, with the addition that the electrofishing should be targeted at eel. Streams are electrofished twice (repeated) using backpack or generator (differs between sites). Stop nets are not used. A sub-sample of eels are kept and dissected to collect biological data (as detailed above under "General"). The spatial coverage of the electrofishing program is under evaluation, and number of sites to sample may change due to new requirements as a result of DIASPARA (as detailed above under "General").

Recruitment eel: Collection of data on number of eels arriving to the coast, or migrating upstream in rivers, can be done using different methods. Eel collectors/traps at hydropower plants and dams is one method. Eels in the collector/trap are counted by external parties and the data is sent to SLU Aqua. Eels are also counted in the cooling water intake at nuclear power plants. A sub-sample of eels from the various collection methods are kept and dissected to collect biological data (as detailed above under "General"). Several eel collectors/traps will likely be affected by the nation-wide retrial of hydropower plants in Sweden, meaning that the data collection will be discontinued. There is hence a need to evaluate replacement methods, such as other forms of stationary traps and flexible/movable collectors (such as ELFI trap). This data collection is particularly important given that the longest data series in Europe on recruitment is from one of the Swedish hydropower collectors/traps.

Fisheries independent freshwater eel: A fisheries independent survey in freshwater is conducted at one location (lake Mälaren). At this site, Alizarin-marked and barium-marked eels have been stocked at two occasions and the naturally recruiting and restocked population is monitored via a fyke-net fishing program. CPUE is also calculated. The eels are dissected to collect biological data (as detailed above under "General"). Eels are occasionally tagged with e.g., PIT-tags and DST, when recaptured the data is used to verify estimated growth curves, movement, etc.

Fisheries independent coastal eel: A fisheries independent survey is conducted on the Swedish west coast. The survey runs yearly in August. The commercial fishery in this area is closed. The survey set-up includes catching a predefined number of yellow eels, all of which are length measured. Using length-stratification, a sub-sample of eels are kept and dissected to collect biological data (as detailed above under "General"). The maximum effort (gear-days) for this survey is pre-defined. Since the commercial fishery on the east coast is heavily restricted and in decline (see "fisheries dependent coastal eel" below), this means that a fisheries independent survey also on the east coast will be needed. In addition, due to the ongoing evaluation of the Swedish eel management plan (as detailed above under "General"), where the current one EMU (SE_Total) could be revised and changed to three EMU's (SE_East, SE_West, SE_Inland), this would require additional, dedicated, sampling on the east coast. To prepare for a fisheries independent program on the east coast, the current survey on the west coast will be evaluated, needs for potential changes to the current survey will be identified, and methods for a new survey on the east coast will be determined.

Fisheries dependent freshwater eel: Sampling from commercial fisheries in freshwater. Lakes to sample are selected based on areas from where there is a need of data. Eels are commercially fished using pound nets, and the fishers sample eel throughout the fishing season and store for later dissection. Eels are dissected to collect biological data (as detailed above under "General"). The fisheries dependent sampling program in freshwater has been evaluated, and based on that evaluation it was decreased. Currently, one fisher/lake is being sampled at an irregular interval.

Fisheries dependent coastal eel: Sampling from commercial fisheries in coastal waters is done in the sampling frames called *Passive PoundNets EEL 27.3.b.25 & 27*. This data collection is part of Sampling plan CommSelfAtSea – selected species/stocks, which is described in Text Box 2.5 and Annex 1.1.

Mark-recapture eel: Estimation of fisheries induced mortality through mark-recapture. Mainly eels from the coast are used in this survey, but also from freshwater. Eels are commercially fished using pound nets. They are marked/tagged on-site with an externally visible tag and data on length, weight, sex-ratio and Durif's silver index parameters (vertical and horizontal eye size and pectoral fin length) is collected. After tagging, the eels are released at the site of capture. When a commercial fisher catches a tagged eel, the tag is sent to SLU Aqua (together with accompanying data on where and when the eel was fished, and length and weight) and fishing induced mortality can be calculated. In addition to the external tag, eels are occasionally tagged also with internal tags e.g., PIT-tags, DST and similar, when recaptured the data is used to estimate growth curves, movement, etc. The aim is to tag eels at two-three locations along the Baltic coast on a site-rotating scheme. Due to a decreasing number of commercial fishers, this number can be difficult to reach. Sampling is

usually done annually but can be done irregularly due to lack of fishers and/or changes to the eel management plan.

Acoustic tagging eel: Estimation of silver eel escapement and fishing induced mortality (for double-tagged eels) through tagging with acoustic transmitters. This program runs side-by-side with the mark-recapture program. Eels to be tagged are commercially fished using pound nets. They are tagged on-site with an acoustic transmitter, surgically implanted in the body cavity. Some eels are double-tagged with an externally visible tag. Data on length, weight, sex-ratio and Durif's silver index parameters (vertical and horizontal eye size and pectoral fin length) is collected. After tagging, the eels are released at the site of capture. When a commercial fisher catches a tagged eel, the tag(s) is sent to SLU Aqua (together with accompanying data on where and when the eel was fished, and length and weight). Eels escaping from the Baltic Sea are logged via the acoustic receiver network deployed in the sound between Sweden and Denmark, and in the Danish Belt straights (all exits from the Baltic Sea are covered with receivers), generating data on silver eel escapement from the Baltic Sea. The aim is to tag eels at three-five locations along the Baltic coast annually, on a site-rotating scheme. Due to a decreasing number of commercial fishers, this number can be difficult to reach. Sampling is usually done annually but can be done irregularly due to lack of fishers and/or changes to the eel management plan.

Introduced populations eel: Eels have been introduced/restocked in several lakes and coastal areas in Sweden, some of them more than 40 years ago, and the populations have been monitored since. Data is collected on yellow eel standing stock and silver eel escapement (via fyke net surveys or sampling from outlet traps or fisheries). A sub-sample of eels are kept and dissected to collect biological data (as detailed above under "General"). The otoliths from these sites are particularly valuable since they constitute a source of otoliths with known age, and they are used internationally in age- reading calibrations. This monitoring is done when necessary (not yearly, due to the long life span of eels), and at a varying number of sites (rotating scheme).

Index river eel: It is a requirement that there should be one index river per EMU, and Sweden hence currently has one index river (EMU_Total). The Index river program is designed to provide full life history data on recruits, standing stock, and migrating individuals. A custom-made trap (Wolf-trap) is used to catch downstream migrating eels, when the trap is not in use, eels are counted in a fish counter (Vaki with camera). Eels are tagged with PIT-tags to investigate migration patterns, and to validate the function of the trap and camera counter system. A PIT-tag reader (Riverwatcher) is installed by the camera counter. A subset of eels caught in the Wolf trap are stored for later dissection to collect biological data (as detailed above under "General"). Recruitment is monitored via electrofishing and a collector/trap, additional recruitment data collection methods are being evaluated (e.g., ELFI). Due to the ongoing evaluation of the Swedish eel management plan (as detailed above under "General"), the addition of more index rivers in the near future is possible (if the management plan is changed to three EMU's (SE_East, SE_West, SE_Inland), that would require two more index rivers). Evaluations are ongoing to locate suitable index rivers.

(max 250 words per species and area)

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 2.1(b) and point 2.3 of the EU MAP Delegated Decision annex. Use this text box to give an overview of the methodology used to collect data from freshwater and inland commercial and recreational fisheries for salmon, sea trout and eel. Also include overview of data to be collected from research surveys on salmon, sea trout and eel in freshwater, and on eel in any relevant habitat including coastal waters.

Method selected for collecting data.

Salmon and sea trout

The data collection for salmon includes sampling of the different life stages of the species in both the Baltic Sea region and the North Sea and Eastern Arctic region. Electrofishing surveys targeting juveniles (parr),

trapping of out-migrating smolts and counting of ascending adult spawners is conducted annually in index and supplementary rivers. Furthermore, for salmon in the Baltic region, M74 incidence (fry mortality) in hatcheries for compensatory releases and genetic sampling aimed for analyses of mixed stock compositions in catches is carried out. For sea trout, the data collection is with a few exceptions focusing on the Baltic Sea region, comprising of sampling of parr, smolts and adults in selected waters. For both species, annual data on stocking, releases of young fish, are collected. Additionally, information on recreational riverine catches is compiled (see section 2.4 regarding surveys of recreational fisheries in the sea).

All data collection is performed according to end-user needs. Rivers where data is collected are spread among assessment units when the assessment work is based on such geographical division within a region. In surveys designed to collect information on one of the two species' life stages, information on the other species is also collected (e.g. when counting spawners in a salmon river, any presence of migrating trout is noted too).

A brief summary of each 'Sampling scheme identifier' follows below. Details by species and region are presented in Table 2.3 and in Annex 1.1.

Electrofishing Salmon-Sea trout:

Electrofishing targeting salmon is conducted annually in all Swedish rivers classified by ICES as having wild populations, whereas electrofishing targeting sea trout is conducted in a representative selection of sea trout rivers/tributaries/streams according to a partly rolling schedule. The aim is to collect information on density of parr representing a measure of recruitment success (year-class strength). Individual length and weight is measured and scale samples for age determination are collected from sub-samples of the sampled parr.

With a few exceptions, the data collection follows national standardized methodology. Streams are electrofished by repeated sampling using either a shore-based generator or backpack unit (method differs between sites). Stop nets are not used. The number of electrofishing sites per river is determined in order to cover areas of reproduction and depends on the size/length of river and eventual migration barriers. The number of electrofished sites fulfils the minimum requirement for an acceptable level of certainty for each river, with respect to smolt production estimates used for stock assessment.

Smolt trapping:

Estimates of salmon and sea trout smolt abundance are carried out annually using mark-recapture experiments on tagged smolts trapped with rotary smolt wheels, fyke nets or Wolf traps in a total of seven rivers. Individual length and weight are measured, and scale samples for age determination are collected from sub-samples distributed across the whole smolt migration season.

For salmon in the Baltic region, there is smolt trapping in three index rivers. In addition, smolt counting is performed annually in two non-index rivers according to a rolling scheme with different rivers studied over time, selected to fulfil current end-user needs. These two non-index salmon rivers are referred to as 'Rotating rivers' in Table 2.3 and in Annex 1.1. In the Baltic region, there is also smolt trapping in one sea trout river/tributary. For salmon in the North Sea and Eastern Arctic, smolts are counted in one (and the only) index river.

Spawner counting:

Counting of ascending salmon spawners is conducted annually using different types of methods (automatic counters and manual control) in different rivers.

Individual length is estimated/measured and, in some cases, sea age composition is estimated based on length data (i.e. one sea winter versus multi sea winter). Scale samples are collected from a sub-sample for age

determination from one or a few rivers per year. The collection of samples is spread across the migration season.

M74 monitoring:

Annual monitoring of the reproductive disorder M74 is conducted for salmon in the Baltic region. The incidence of M74 is followed via observations of mortality in brood stock fry at seven hatcheries together with measures of thiamine levels in unfertilized eggs from two hatcheries. The thiamine levels act as an early warning indicating the probability (risk) of M74 mortality in the following hatching year.

Genetic sampling:

Tissue samples (scales or fin clips) from adult salmon are collected and/or genotyped annually, with the aim to estimate catch compositions in the mixed stock coastal and open sea fisheries. Depending on how these fisheries develop, samples will either be collected from commercial and/or recreational fisheries in the Baltic Sea and/or along the Swedish west coast. Supplementary collection of tissue samples from fishery-independent surveys in rivers (parr and/or smolts) may also be necessary, to update the current genetic baseline(s) used for statistical mixed stock analyses (MSA) of adult catch samples.

Stocking data Salmon-Sea trout:

Census data on the number of stocked salmon and sea trout is collected annually using enquiries. The collected information is divided according to life stage, stock, and river and site of release. Salmon and sea trout are mainly stocked in freshwater (rivers), and with a few exceptions occasionally in coastal sites in close proximity to the mainland.

Data are collected for all occasions where stocking has occurred. Consequently, the amount of data (including the number of released individuals and sites) varies from year to year and cannot be specified in advance.

Recreational river catches Salmon-Sea trout:

Landed and released catches of salmon (SD 22-31 and 3a) and sea trout (SD 22-31) by anglers and subsistence fishermen in freshwater is estimated annually on the basis of data collected using enquiries, interviews and/or catch reports from fisheries management organisations and fishing water owners (often via online tools). In some cases, these reports are augmented with local expert estimates of unreported catches.

(max 250 words per species and area)

Text Box 2.4: Recreational Fisheries

Region: Baltic, North Sea and Eastern Arctic

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 to collect data on marine and freshwater recreational catches. For freshwater diadromous species, use Table and Text Box 2.3.

Participation in RWP Baltic 2025-2027 and RWP NANSEA 2025-2027.

(max 250 words per sampling scheme)

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.

Questionnaire (Sampling scheme identifier: RecSelfOnshore - Offsite SCB):

A web and postal questionnaire will be used to collect data (e.g., number of fishing days, gear days, catches and releases) from recreational fishing for a range of different species, including species listed in Table 4, Commission Delegated Decision (EU) 2021/1167, in the Swedish part of regions Baltic Sea and North Sea.

The primary sampling units are permanent residents in Sweden of age 16-80. The questionnaire will be sent out at three occasions each year, with questions on fishing activities and targeted species in the most recent four months. In the questionnaire, also releases are quantified, but currently no explicit distinction is made between released alive or dead (discards).

A panel approach is used in the sampling. From the target population, respondents are randomly selected for the first panel. To increase the number of answers a panel design is implemented. Both respondents who fish and non-fishers have a probability of being sampled in the upcoming panels. The population is stratified by six different geographical regions in Sweden and by age and gender. For details on the design, see Annex 1.1.

The first mailing to the target population contains login information to the web questionnaire. Three written remainders will be performed, again with login details, but also a written questionnaire. The sampling progress is closely monitored during each period. The response rate has been stable with low volatility the last 24 sampling periods (8 years).

The questionnaire will also be evaluated as a means of cost-efficiently estimating catch and effort in regions not yet covered by on-site surveys (e.g., subdivisions 25 and 27).

This questionnaire is a central part of Sweden data collection with regards to its DCF objectives on recreational catches, but also provides data for other end-uses. Sweden has an ongoing project where adjustments to the questionnaire will be considered that may improve its performance in terms of data collection for DCF purposes. Improvements to aspects such as the taxonomic, spatial and temporal resolution of estimates it can produce are being considered. These will need to be balanced against the obvious advantages of maintaining the consistency of time series and securing response rates. If adjustments are made, they will be included in future updates of the Swedish NWP.

(max 900 words per region)

Region: Baltic

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 to collect data on marine and freshwater recreational catches. For freshwater diadromous species, use Table and Text Box 2.3.

Recreational catches of salmon and sea trout in the Baltic Sea (Sampling scheme identifier in subheadings below)

Baltic Sea trolling salmon catches:

Estimates of Swedish trolling catches in the Baltic region are made annually based on an on-site study (using probability-sampling methods) in the most important trolling harbour during the high season. 'Harbourdays', stratified by weekday and weekend/holiday, are sampled randomly. During a sampled day, all trolling boats returning to harbour are interviewed, and data on landed and released catch is collected. The estimated total catch from this important trolling harbour is extrapolated to full season and all areas, based on assumptions about the spatial and temporal distribution of the trolling fishery from Swedish harbours.

Baltic Sea trap net salmon catches:

Estimates of total landed catch (per year) in this recreational fishery is carried out on a triennial basis. The next study is planned for 2027. Preliminary, the same methodology as in 2022-2024 will be used where information is collected from active recreational salmon trap net fishermen. Then, estimated catch for each of the identified trap nets is calculated by relating the collected information on location and fishing period to the monthly CPUE in the commercial trap net fisheries in the same area.

Baltic Sea angling sea trout catches:

Estimates of recreational sea trout coastal catches will be carried out in 2025-2027, based on an on-site study (using probability sampling methods) on selected areas of the coast during high season. During a sampled day, all fishermen are interviewed and data on landed and released catch is collected. The estimated catch from the sampled areas and time period will be extrapolated to relevant season(s) and relevant sections of the coast, using assumptions about the fishery. The first year(s), the study will be carried out on parts of the Swedish south coast, and if relevant, continued following year(s) on other parts of the Swedish coast.

(max 900 words per region)

Text Box 2.5: Sampling plan description for biological data

Region: Baltic

Sampling scheme name: Small Pelagics in the Baltic

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) of the EU MAP Delegated Decision annex. This text box complements Table 2.5.

Sampling scheme name (or identifier): Small Pelagics in the Baltic

Participation in RWP Baltic 2025-2027.

(max 250 words per sampling scheme)

Sampling scheme identifier: CommSelfAtSea - Selected species/stocks, sampling frame identifiers Passive PoundNets EEL - 27.3.b.25 & 27.3.b.27

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) of the EU MAP Delegated Decision annex. This text box complements Table 2.5.

Sampling scheme identifier: CommSelfAtSea - Selected species/stocks, sampling frame identifiers Passive PoundNets EEL - 27.3.b.25 & 27.3.b.27

Additional information on sampling schemes

The commercial fishery for eel in Baltic is heavily restricted and in decline. Significant management measures are likely to further restrict fishing activity for eel. To ensure a robust future assessment of eel on the Swedish Baltic coast a fisheries independent survey will be required. In addition, due to the ongoing evaluation of the Swedish eel management plan (as detailed above under "General" in text box 2.3), where the current one EMU (SE_Total) could potentially be revised and changed to three EMU's (SE_East, SE_West, SE_Inland), this would require additional, dedicated, sampling on the Baltic coast. In order to prepare for a fisheries independent program on the Baltic coast, the current survey on the west coast (text box 2.3) should be evaluated, needs for potential changes to the current survey should be identified, and methods for a new fisheries independent survey on the Baltic coast should be determined. With potential implementation 2028-2031 in complement to the current sampling scheme.

Additional description of sampling frames

No additional information.

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

Sampling schemes: CommSciObsAtSea - All species - Active Demersal Trawl - 27.3.b-d.22-29 and CommSelfOnShore - Selected species/stocks - Active Demersal Trawl Commercial Category COD - 27.3.b-d.22-29

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) of the EU MAP Delegated Decision annex. This text box complements Table 2.5.

Sampling schemes: CommSciObsAtSea - All species - Active Demersal Trawl - 27.3.b-d.22-29 and CommSelfOnShore - Selected species/stocks - Active Demersal Trawl Commercial Category COD - 27.3.b-d.22-29

Additional information on sampling schemes

Since 2019, no targeted cod fishery is allowed in the Baltic Sea and the TAC is restricted to bycatches of cod for both the Eastern and Western cod stock (EU 2023/2638). Consequently, there is no demersal trawl fishery carried out by the Swedish fleet in the Baltic Sea (Subdivision 27.3.b-d) and no targeted cod fishery by other gears. Since the stock status of the Baltic cod stocks is not expected to improve considerably in the next few years, Sweden is not planning to have any targeted sampling for cod in the area in 2025-2027. Sampling plans will be reactivated if the fishery is resumed.

Additional description of sampling frames

No additional information.

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

Region: North Sea and Eastern Arctic

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) of the EU MAP Delegated Decision annex. This text box complements Table 2.5.

Additional information on sampling schemes

All relevant information can be found in Annex 1.1.

Additional description of sampling frames

No additional information.

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

Text Box 2.6: Research surveys at sea

Region: Baltic

Research survey: Baltic International Trawl Surveys – BITS_Q1

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 annex. It is intended to specify which research surveys at sea, as set out in Table 2 of the EU MAP Implementing Decision annex will be carried out. Member States shall specify whether the research survey is included in Table 2 of the EU MAP Implementing Decision annex or whether it is an additional survey.

Research survey: Baltic International Traw Surveys – BITS_Q1

Participation in RWP Baltic 2025-2027.

(max 450 words per survey)

Research survey: Baltic International Trawl Surveys – BITS_Q4

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 annex. It is intended to specify which research surveys at sea, as set out in Table 2 of the EU MAP Implementing Decision annex will be carried out. Member States shall specify whether the research survey is included in Table 2 of the EU MAP Implementing Decision annex or whether it is an additional survey.

Research survey: Baltic International Traw Surveys – BITS_Q4

Participation in RWP Baltic 2025-2027.

(max 450 words per survey)

Research survey: Baltic International Acoustic Surveys – BIAS

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 annex. It is intended to specify which research surveys at sea, as set out in Table 2 of the EU MAP Implementing Decision annex will be carried out. Member States shall specify whether the research survey is included in Table 2 of the EU MAP Implementing Decision annex or whether it is an additional survey.

Research survey: Baltic International Acoustic Surveys – BIAS

Participation in RWP Baltic 2025-2027.

(max 450 words per survey)

Research survey: Sprat Acoustic Surveys – SPRAS

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 annex. It is intended to specify which research surveys at sea, as set out in Table 2 of the EU MAP Implementing Decision annex will be carried out. Member States shall specify whether the research survey is included in Table 2 of the EU MAP Implementing Decision annex or whether it is an additional survey.

Research survey: Sprat Acoustic Surveys – SPRAS

Participation in RWP Baltic 2025-2027.

(max 450 words per survey)

Research survey: Sweden Sound Survey – SSS_Q1

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 annex. It is intended to specify which research surveys at sea, as set out in Table 2 of the EU MAP Implementing Decision annex will be carried out. Member States shall specify whether the research survey is included in Table 2 of the EU MAP Implementing Decision annex or whether it is an additional survey.
Research survey: Sweden Sound Survey – SSS_Q1 1. Objectives of the survey To estimate cod recruitment indices, cod abundance and to follow the development of flounder and other flatfish populations in the Sound SD23 The survey is a national survey and not mandatory. The spatial coverage of the stations is however coordinated with Denmark. The data are uploaded to the international ICES database DATRAS and available for the stock assessment analysis for cod in ICES WGBFAS. 2. Description of the survey design, vessel and methods used in the survey for each type of data collection as listed in Table 2.6 for this specific survey. The SSS survey is planned to be conducted in quarter 1 annually 2025-2027. In the Sound, 11 stations with one haul in each station is trawled by a small Swedish vessel (Hålabben) using a down scaled TV3 930 trawl, reduced to 30 % of original size. Except from the small trawl, the biological sampling is following the procedure manual of BITS survey. *(max 450 words per survey)*

Region: North Sea and Eastern Arctic

Research survey: International Bottom Trawl Survey (IBTS_Q1)

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 annex. It is intended to specify which research surveys at sea, as set out in Table 2 of the EU MAP Implementing Decision annex will be carried out. Member States shall specify whether the research survey is included in Table 2 of the EU MAP Implementing Decision annex or whether it is an additional survey.
Research survey: International Bottom Trawl Survey (IBTS_Q1) Participation in RWP NANSEA 2025-2027. *(max 450 words per survey)*

Research survey: International Bottom Trawl Survey (IBTS_Q3)

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 annex. It is intended to specify which research surveys at sea, as set out in Table 2 of the EU MAP Implementing Decision annex will be carried out. Member States shall specify whether the research survey is included in Table 2 of the EU MAP Implementing Decision annex or whether it is an additional survey.

Research survey: International Bottom Trawl Survey (IBTS_Q3)

Participation in RWP NANSEA 2025-2027.

(max 450 words per survey)

Research survey: Nephrops UWTV (UWTV3-4)

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 annex. It is intended to specify which research surveys at sea, as set out in Table 2 of the EU MAP Implementing Decision annex will be carried out. Member States shall specify whether the research survey is included in Table 2 of the EU MAP Implementing Decision annex or whether it is an additional survey.

Research survey: Nephrops UWTV (UWTV3-4)

Participation in RWP NANSEA 2025-2027.

National specifics:
UWTV Megafauna

To monitor species composition and abundance of larger epifauna of the seafloor in the Kattegat and Skagerrak, the survey design, coverage and film material from the Swedish part of the UWTV survey for Norway lobster *Nephrops norvegicus* is used. While counting Nephrops burrows from the videos, also data on larger epifauna is collected. The epifauna on soft bottoms is sensitive to bottom trawling and the habitat "Sea pens and burrowing megafauna" is worthy of protection according to OSPAR, as well as the MSFD as a status indicator for Descriptor 6 "Seafloor integrity".

(max 450 words per survey)

Research survey: Kattegat Cod Survey (CODS_Q4)

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 annex. It is intended to specify which research surveys at sea, as set out in Table 2 of the EU MAP Implementing Decision annex will be carried out. Member States shall specify whether the research survey is included in Table 2 of the EU MAP Implementing Decision annex or whether it is an additional survey.

Research survey: Kattegat Cod Survey (CODS_Q4)

Participation in RWP NANSEA 2025-2027.

National specifics Kattegat Cod Survey:
In recent years, access to the Skånska Kattegatt marine protected areas has been restricted, resulting in fewer sampled stations than originally planned in 2022. Adaptation of the survey plan allowed us to complete 39 of the 40 planned stations in 2023. However, we were only granted access to three stations within the protected area, with a reduced haul duration of 30 minutes instead of the nominal 60 minutes.

Non-destructive methods to replace bottom trawling in the Natura 2000 area Nordvästra Skånes havsområde, which includes the marine protected area Skånska Kattegatt, will be evaluated in agreement with the County Administrative Board. Collection of water samples for eDNA metabarcoding will be conducted annually

from 2025 to 2027, with 6 stations being sampled each year. Water samples are collected before, or in place of fishing the randomly selected survey squares within the protected area. A similar number of water samples are taken at trawl stations outside the protected area. One-liter water samples are taken 0.5-1 meter above the bottom using a Niskin water sampler. The samples are stored on ice and filtered upon returning to port at the end of each day. The filtered samples are stored frozen at -20°C and sent for analysis by the end of the survey period.

(max 450 words per survey)

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

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 annex. It is intended to specify which research surveys at sea, as set out in Table 2 of the EU MAP Implementing Decision annex will be carried out. Member States shall specify whether the research survey is included in Table 2 of the EU MAP Implementing Decision annex or whether it is an additional survey.

Research survey: International ecosystem Survey in the Nordic Seas (ASH; ICES acronym: IESNS)

Participation in RWP NANSEA 2025-2027.

(max 450 words per survey)

Region: North-East Atlantic

Research survey: IBWSS – Blue Whiting 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 annex. It is intended to specify which research surveys at sea, as set out in Table 2 of the EU MAP Implementing Decision annex will be carried out. Member States shall specify whether the research survey is included in Table 2 of the EU MAP Implementing Decision annex or whether it is an additional survey.

Research survey: IBWSS – Blue Whiting Survey

Participation in RWP NANSEA 2025-2027.

(max 450 words per survey)

SECTION 3: FISHING ACTIVITY DATA

Text Box 3.1: Fishing activity variables data collection strategy

Region: Baltic, North Sea and Eastern Arctic

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

Agreement in RWP Baltic 2025-2027 and RWP NANSEA 2025-2027 is applicable to MS.

(max 450 words)

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

Complementary data consist of 11% of the total collected data. It is collected on a census level for vessels under 10 meters concerning variables for fishing activity, additionaly data on these vessels are collected through national licensregistry data.

Logbook data are automatically checked when filled in regarding completeness and also regarding logic. The port inspection also checks and verifies logbook data for the specific trip when an inspection is performed. Finally there are also computerized routinely performed checks of the complete logbook data to find abnormal and exorbitant values for all trips.

(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.

In 2024 there are 43 commercial fishers in inland waters with a personal permit to fish eel. Commercial fisheries are allowed during a period of 120 days in total annually. All landings are reported monthly to Swedish Agency for Marine and Water Management. An eel fishing permit must be accompanied by conditions regarding the type of gear, the number of gear and the place where the fishing is carried out. The permit may only cover the types of gear and the number of gear granted in the eel fishing permit during the years 2009-2010. A change of fishing spot can be granted upon application to the Swedish Agency for Marine and Water Management. All landings, gear used and number of entities are registered, saved in a database and summarised annually at the Swedish Agency for Marine and Water Management. Due to the practice of keeping eels in fish corves after landing, the exact number of eel per gear is usually not known/reported. That data would be needed to calculate effort, and is an area in need of improvement. During the last couple years, about 80 tons eels are landed yearly in inland commercial fisheries. About 14 tons are yearly trap-and-transported from inland to coastal waters.

(max. 900 words)

Text Box 4.2: Incidental catches of sensitive species

Region: Baltic, North Sea and Eastern Arctic

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.

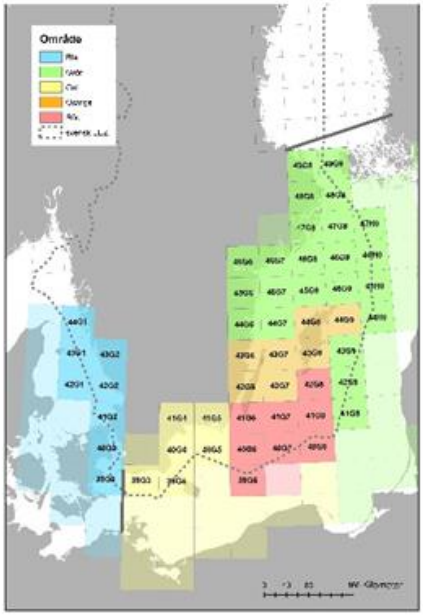
Participation in RWP Baltic 2025-2027 and RWP NANSEA 2025-2027.

(max 250 words per activity)

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.

National activities

Sweden did in 2017-2019 and 2020-2021 perform two pilot studies to examine needs and methods to complement the present sampling schemes to generate better knowledge on bycatches of Endangered, Threatened, and Protected (ETP) species in Swedish fisheries. Sweden did in 2020, after the termination of the first pilot study, include two new fisheries in the observer program (reference to table 2.5 Sampling scheme identifier - CommSciObsAtSea - All species, Sampling frame identifier Passive Demersal Nets - 27.3.a.21 and Sampling scheme identifier - CommSciObsAtSea - All species, Sampling frame identifier Passive Demersal Nets - 27.3.b.23). Sweden have further, based on the results from the pilot study 2020-2021, included a sampling scheme in which the monitoring is based on cameras (reference to table 2.5 Sampling scheme identifier - CommEMAtSea - PETS species, Sampling frame identifier Passive Demersal Nets - 27.3.a. and 27.3.b-d.22-29). Sweden has in 2022 initiated an extended observer program targeted towards observations of bycatches of sensitive species such as marine mammals and birds. This observer program will from 2023 and onwards be included in the sampling carried out under DCF (reference to table 2.5 Sampling scheme identifier - CommSciObsAtSea - All species, Sampling frame identifier Passive Nets - 27.3.a. and 27.3.b-d.22-29). The area (27.3.a. and 27.3.b-d.22-29) covered by this program is divided into five sub-areas identified on the basis of bycatch risk for harbor porpoises allowing sampling effort to be weighted towards sub-areas with assumed higher risk of bycatch of porpoises and sub-areas where potential bycatch of porpoises cause a larger risk to the population. The same sub-areas are used in the above-mentioned monitoring based on cameras. The overall aim is to cover a minimum of 5% of the gillnet effort in area 27.3.a and 27.3.b-d.22-29 by monitoring with either observers or cameras. The objective of this extended observer program as well as the camera monitoring is to generate information (and estimates) on bycatches of marine mammals and seabirds (dedicated program). Catches of all species for all catch fractions (including catch damaged by predators) will be recorded but no biological sampling and no length sampling will be carried out (except for the ETP species). The observer program covering 27.3.b.23 (reference to table 2.5 Sampling scheme identifier - CommSciObsAtSea - All species, Sampling frame identifier Passive Demersal Nets - 27.3.b.23), biological sampling and length sampling will be carried out, in addition to the sampling described for the extended program above.



Sub-areas (different colours) that constitutes basis for spatial strata.

The extension of the observer program and the sampling scheme based on cameras are both targeting gillnetters. The main reason for this is that gillnets and trammel nets are considered to be associated with relative high risks of bycatches of ETP species. The gillnet fleet is also diverse with e.g. different target species, assuming that there is a heterogeneity in bycatch risks within the fleet. This requires sufficient sampling coverage. Gillnetters constitutes further a fairly large part of the Swedish fisheries with passive gears. The other substantial part of the Swedish fishery with passive gears is fisheries with different pots and traps. These gears are however usually assumed to be associated with lesser risk of bycatch of ETP species. The use of longlines, that can be associated with bycatch of birds, is presently limited in Swedish fisheries. Most of the trawl fisheries are sampled within the observer program (see annex 1.1 and table 2.5).

To our knowledge it is presently unclear what observation effort the end-users need. The observation effort generated by the observer program, even when extended, is most likely too low. This is why Sweden from 2022 onwards has complemented the observer program with EM monitoring (Electronic Monitoring, eg camera systems). The observation effort in the camera scheme is eventually dependent on willingness from fishers to deploy cameras. The aim is to sample a minimum of 3% or a minimum of 400 trips with cameras each year.

A key element for the long-term success for the sampling with cameras is to make the selection of vessels to be sampled as representative for the fishery as possible. This is a challenge as vessels presently need to participate on a voluntary basis which means that we can't apply statistical selection methods. We are thereby constantly working to get vessels interested in the sampling program, allowing for a larger basis for the selection process. In the Swedish fisheries, a substantial amount of the gillnetters is so small that the camera systems can´t use the vessels power systems. Within the pilot study 2020-2021 we thereby adapted camera systems so they, were needed, can use external power sources. This means that also small vessels are included in the EM program.

Within the Swedish observer program two observers are generally deployed on each trip. This means that one observer can keep track of hauling operations (opening of the codend, for gillnet fisheries the entire hauling procedure). If this can´t (or only partly) be done the observers should note this in the trip report (including how large part that could be observed). Observers are further noting “drop-outs” (animals that slip out of nets before reaching the vessels) specifically. If the bycatch is a “drop-out” or not is also registered in the database. Observers are always instructed to indicate how large part of the sorting process that can be checked (this is essential for all species, not only ETP species). ETP species are always recorded if encountered. Observers are also instructed to take photos of bycatches of birds and seals to allow for species identification. In the dedicated

extended program, initiated 2022 and included in DCF 2023, only one observer is deployed at each trip. The manual for the observers in those trips clearly states that observations of bycatch is the priority.

Sweden is participating in ICES WGBYC and the RCG ISSG on bycatch and are amending protocols to consider new recommendations when needed.

Sweden is presently working to develop a data model for the camera data that also fits with the data model for the RDBES. This is essential for future sharing of ETP species data.

The Swedish national work plan will improve data collection planning and efforts, including relations to by-catch of sensitive species, in line with management principles stated in the Marine Action Plan.

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

Text Box 4.3: Fisheries impact on marine habitats

Region: Baltic, North Sea and Eastern Arctic

Study: Fishing distribution

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.

Name of the study: Fishing distribution
National studies

1. Aim of the study
Spatial fisheries data are essential to understanding interactions between fisheries and the ecosystem and thus have become a key issue in European maritime policies. In order to describe fishing distribution and considering its ecological footprint, VMS and logbook data is used.

2. Duration of the study
This work is ongoing and data collection, analyses and reporting of this data are conducted every year within Sweden. The data analyses are also done on an international level, in ICES Working Group on Spatial Fisheries Data (WGSFD) where Sweden is actively participating.

3. Methodology and expected outcomes of the study
Sweden collates and analyses spatial fisheries data in order to evaluate fishing effort, intensity, and frequency. On the international level much effort has been made in data compilation, quality control and harmonization. Standards for VMS and logbook data are defined, advice is provided for data requirement, and requests are answered from, for example, HELCOM and OSPAR. Analytical techniques are regularly reviewed and adjusted to meet criteria set up by other ICES expert groups, to fulfil policy requirements, and to anticipate future scientific questions.
In Sweden, small vessels which do not have VMS onboard are obliged to report spatial information in the monthly fishing journals making analyses of fisheries impact on marine habitats also from small scall fisheries possible. Sweden is making spatial data to end-users available upon request and in line with the appropriate regulations and data policies.

The Swedish national work plan will improve data collection planning and efforts, including impact of fishing on the seabed, in line with management principles stated in the Marine Action Plan.

(max 900 words per study)

SECTION 5: ECONOMIC AND SOCIAL DATA IN FISHERIES

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 the data to be collected under Tables 7, 8 and 9 of the EU MAP Delegated Decision annex.

1. **Description of clustering**

All segments in the Swedish fleet are clustered due to confidentiality reasons. If the amount of vessels are to small that presenting the information is not compliant with the secrecy policy; Sweden can not present information for segments containing small number of vessels. Based on the number of the vessels (length segments) and type of gear the vessels are added into clusters in order to create as homogenous clusters as possible.
Collecting data is on a census level but when reporting clustering is applied for economic variables but the confidentiality does not affect variables concerning capacity, landings or effort therefore Sweden will report information on segment level without clustering. The following segment are clustered into Demersal trawlers and/or demersal seiners in their respective length class:
Dredgers 10-< 12 m (3 vessels)
Pelagic trawlers 18-< 24 m (5 vessels)
Pelagic trawlers 24-< 40 m (11 vessels)
Pelagic trawlers 8-< 12 m (7 vessels)
Purse seiners 12-< 18 m (2 vessels)
Purse seiners 8-< 12 m (1 vessel)

The following segment are clustered into Drift and/or fixed netters in their respective length class:
Vessels using Polyvalent passive gears only 0-< 10 m (8 vessels)
Vessels using Polyvalent passive gears only 0-< 8 m (6 vessels)
Vessels using Polyvalent passive gears only 8-< 12 m (1 vessel)
Vessels using Pots and/or traps 0-< 10 m (191 vessels)
Vessels using Pots and/or traps 0-< 8 m (141 vessels)
Vessels using Pots and/or traps 10-< 12 m (37 vessels)
Vessels using Pots and/or traps 12-< 18 m (2 vessels)
Vessels using Pots and/or traps 8-< 12 m (9 vessels)
Vessels using active and passive gears 8-< 12 m (1 vessel)
Vessels using hooks 0-< 10 m (13 vessels)
Vessels using hooks 10-< 12 m (2 vessels)
Vessels using other Passive gears 0-< 10 m (4 vessels)

The vessels using passive gear are very similar when it comes to effort and and since the segments vary over years the clustering are done on vessels using Pots and/or traps 0-< 10 m, vessels using Pots and/or traps 0-< 8 m and, vessels using Pots and/or traps 10-< 12 m, for creating time series consistency.

Depending on the number of vessels in each segment these might changes over time and the clustering will change in number of vessels reported in ever cluster/segment.

2. Description of activity indicator

Not applicable.

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

No deviation.

(max. 900 words)

SECTION 6: ECONOMIC AND SOCIAL DATA IN AQUACULTURE

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.

RWP ECON 2025-2027

1. Description of the threshold application

For 2022 the Swedish production in weight was 1,08% of total production in all aquatic environments in the EU. The production by value in 2022 was 1,2% of total production in all aquatic environments in the EU.

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

No deviations from the variable definitions. However all may not be able to be reported due to confidentiality reasons. In order to reduce problems with confidentiality some segments may be further aggregated in the future.

(max. 900 words)

SECTION 7: ECONOMIC AND SOCIAL DATA IN FISH PROCESSING

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.

RWP ECON implementation years 2025-2027

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

Data regarding fish processing comes from official statistics collected yearly by Statistics Sweden. No complementary data collection which differ from predefined data sets will occur (data sets defined in Commission Implementing Decision (EU) 2016/1251 Table 11). It is of great importance to report data from the process industry in order to follow up on needs and general trends of the industry. The reporting under the framework for data collection allows a detailed picture of the fish processing industry to be presented. The detailed knowledge and the possibility to follow the progress of the industry would be lost without reporting under this framework.

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

No deviations from variable definitions as listed in 'EU MAP Guidance Document' will occur in the data collection.

(max. 900 words)

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.

Related to Table 2.3 [and Text Box 2.3] (Diadromous species data collection in freshwater)

Sampling scheme identifier: Monitoring of juvenile eels: restocking, recruitment and electrofishing

MS: SWE
Region: Other regions
Sampling scheme identifier: Monitoring of juvenile eels: Restocking data eel, Recruitment eel, Electrofishing eel
Sampling scheme type: Diadromous (scientific)
Observation type: Self water body
Time period of validity: 2025-2027
Short description (max 100 words): Data on restocking is collected in the form of number of restocked eels per release location per year. Recruitment is monitored by collecting data on number and/or biomass of eels collected in eel collectors/traps at hydropower plants and dams (young eels ascending rivers), and by electrofishing. Eels in the collector/trap are counted and/or weighed and released upstream, a sub-sample is kept from some sites annually and later dissected for additional data collection. Electrofishing is conducted using a standard protocol modified to target eel, a sub-sample is kept and later dissected for additional data collection.
Description of the population
Population targeted: PSU: Restocking: All individual eels restocked in freshwater and coastal sites. Recruitment and electrofishing: Individual eels in selected rivers. Main target species: European eel Main survey area: Restocking: All of Sweden, SE_Total Recruitment: SE_Total. Selected sites across Sweden

Electrofishing: SE_Inla. For several years, 15 sites in 14 rivers across the Swedish west coast were sampled. The electrofishing program was evaluated in 2023-2024. Based on the evaluation, changes to the program were made, and sites on the east coast were electrofished to investigate suitability for future inclusion in the program.

Population sampled:

Restocking: Data is collected on all individual glass eels being restocked.

Recruitment: Rivers with hydropower plants, dams and/or floodgates equipped with eel collectors/traps are sampled. Juvenile eels are sampled (elvers and yellow eel).

Electrofishing: Selected rivers with potential to host European eel. Juvenile eels are sampled (elvers and yellow eel).

Population unreachable for sampling:

For recruitment and electrofishing, it is difficult to sample all areas where juvenile eels might be found due to economical and practical reasons. Sampling sites are selected based on their potential to host the target population, and where there is a lack of data on recruitment from other sources. Sites are placed on a spatial gradient along the Swedish west coast and an expansion to include also the east coast is under investigation.

Stratification:

Restocking: NA. All individual eels being restocked are registered.

Recruitment and electrofishing: Rivers that have no hydropower plants or dams, or that have hydropower plants or dams without eel collectors/traps are not sampled since data is not collected there. Recruitment to some of these rivers is instead sampled within the electrofishing program. For electrofishing, rivers and sites are selected based on where more data is needed on recruitment, and where it is technically possible to perform electrofishing.

Sampling design and protocols

Sampling design description:

Restocking: NA. All individual eels being restocked are registered.

Recruitment and electrofishing: Rivers that have no hydropower plants or dams, or that have hydropower plants or dams without eel collectors/traps are not sampled since data is not collected there. Recruitment to some of these rivers is instead sampled within the electrofishing program. For electrofishing, rivers and sites are selected based on where more data is needed on recruitment, and where it is technically possible to perform electrofishing.

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

NA

Regional coordination:

N

Link to sampling design documentation:

Restocking: Data on number of restocked eels are collected by contacting Scandinavian Silver Eel (SSE), which is the only eel quarantine company in Sweden (i.e., all eels to be restocked comes from SSE). Organisations that

restock eel can also report their restocking actions themselves using a webform available here (page only available in Swedish):

https://www.slu.se/institutioner/akvatiska-resurser/radgivning/bevarandebiologi-och-invasiva-arter/utsattning-av-al/

Sampling design documentation can be found here:

https://www.slu.se/qualityassurance

Recruitment:

Sampling design documentation can be found here:

https://www.slu.se/qualityassurance

Electrofishing:

Sampling design documentation can be found here:

https://www.slu.se/qualityassurance

Additional information:

https://www.slu.se/en/departments/aquatic-resources1/databases/database-for-testfishing-in-streams/

Swedish standard, SS-EN 14011. Water quality - Sampling of fish with electricity. Swedish Institute for Standards. https://www.sis.se/en/produkter/environment-health-protection-safety/water-quality/examination-of-biological-properties-of-water/ssen14011/

Bergquist B, Degerman E, Petersson E, Sers B, Stridsman S and Winberg S. 2014. Standardiserat elfiske i vattendrag, en manual med praktiska råd (in Swedish). SLU Aqua reports 2014:15. Sveriges lantbruksuniversitet, Drottningholm. 165 s. ISBN: 978-91-576-9275-7

Degerman, E., Tamario, C., Watz, J., Nilsson, P. A., & Calles, O. 2019. Occurrence and habitat use of European eel (*Anguilla anguilla*) in running waters: lessons for improved monitoring, habitat restoration and stocking. Aquatic ecology, 53(4), 639-650.

Design follows international recommendations:

Restocking: NA, there are no international recommendations for sampling design regarding restocking. The sampling design consists of collecting data on all restocked eels in Sweden.

Recruitment: Y, there are international recommendations from WGEEL for sampling design on recruitment, those are followed.

Electrofishing: N, sampling design follows national standards, with modifications to specifically target eel.

Link to sampling protocol documentation:

Sampling protocol documentation is kept at the same place as the sampling design documentation described above.

Protocol follows international recommendations:

Restocking: NA, there are no international recommendations for sampling protocol regarding restocking. The sampling protocol consists of collecting data on all restocked eels in Sweden per site and year.

Recruitment: Y, there are international recommendations from WGEEL for sampling protocol on recruitment, those are followed.

Electrofishing: N, sampling protocol follows national standards, with modifications to specifically target eel.

Sampling implementation

Recording of refusal rate:

NA

Monitoring of sampling progress within the sampling year:

Restocking: Eels are primarily being restocked during summer and early autumn. Data on restocking numbers are delivered or asked for from SSE when all restocking has been completed that year. If any information is missing, the organisation that restock eel in a specific area is contacted and asked to provide data.

Recruitment: Data on recruitment numbers are delivered or asked for when the collectors/traps for each river have closed for the season and no more eels (no more data) will be collected that year. If a company that has an eel collector/trap has not reported any data, they are contacted and asked to provide data.

Electrofishing: Electrofishing is conducted during the summer. If a sampling site within a river would be impossible to electrofish, another close-by site can be selected. Data on several site descriptors are collected and can be used to standardize data collected from nearby sites. If no sites within a river are possible to electrofish (e.g., due to weather conditions or high water flow) then that cannot be resolved. In such cases, data would be missing for that year and the river would be electrofished the following year (if possible).

Data capture

Means of data capture:

Restocking: NA, no material is needed since the data collection is on number of restocked eels per site and year.

Recruitment: NA, no material is needed since the hydropower plants handle the material for the eel collector/traps via legal requirements (water court judgement). A sub-sample of eels are kept and later dissected to collect additional data.

Electrofishing: Methods for data collection follow national standards, modified to specifically target eel. Streams are electrofished using backpack or generator (differs between sites). All eels are length measured. Stop nets are not used. A sub-sample of eels are kept and later dissected to collect additional data.

Data capture documentation:

Data capture documentation is kept at the same place as the sampling design documentation described above.

Quality checks documentation:

Quality checks documentation is kept at the same place as the sampling design documentation described above. For recruitment data from eel collectors/traps, the primary data is collected by external companies and cannot be controlled or checked by SLU Aqua.

Data storage

National database:

Restocking and recruitment data is stored in a local Access database hosted by SLU Aqua, called “Sötebasen”.

Electrofishing data is stored in the public national electrofishing database, called “SERS”

https://www.slu.se/institutioner/akvatiska-resurser/databaser/elfiskeregistret/

International database:

Processed data is delivered to ICES via WGEEL Data Calls and stored in the WGEEL database.

Quality checks and data validation documentation:

Quality checks and data validation documentation is kept at the same place as the sampling design documentation described above. For recruitment data from eel collectors/traps, the primary data is collected by external companies and cannot be controlled or checked by SLU Aqua.

Sample storage

Storage description:

Restocking: NA, no samples are collected, only numeric data.

Recruitment and electrofishing: A subsample is dissected, and during dissections, data is collected immediately for soft tissues and those are hence not stored. Otoliths are stored for later age-and chemistry analysis (to determine restocked or natural recruit origin). Otoliths are stored at the Biological archive at SLU Aqua’s Institute of Freshwater Research, Drottningholm – Stockholm, Sweden. The samples are placed in a fireproof archive and handled according to SLU’s routines for quality assurance. Information about the biological archive can be found here:

https://www.slu.se/en/departments/aquatic-resources1/contact/research-infrastructure/biological-archive/

Sample analysis:

Restocking: NA, no samples are collected, only numeric data.

Recruitment and electrofishing: Dissection manual, age reading manual and manual to prepare otoliths for chemistry analysis are available at SLU Aqua’s quality assurance webpage:

www.slu.se/qualityassurance

Additional quality assurance information for age analysis of fish can be found here:

https://www.slu.se/en/departments/aquatic-resources1/contact/research-infrastructure/age-laboratories/quality-assurance-and-age-analysis-of-fish/

Data processing

Evaluation of data accuracy (bias and precision in the textbox.

Restocking and recruitment: Y, data processing is documented and is available at SLU Aqua’s quality assurance webpage:

www.slu.se/qualityassurance

Electrofishing: Y, data processing is documented and is available at the SERS webpage:

https://www.slu.se/en/departments/aquatic-resources1/databases/database-for-testfishing-in-streams/

Editing and imputation methods:

Restocking and recruitment: Y, data processing is documented and is available at SLU Aqua's quality assurance webpage:

www.slu.se/qualityassurance

Electrofishing: Y, data processing is documented and is available at the SERS webpage:

https://www.slu.se/en/departments/aquatic-resources1/databases/database-for-testfishing-in-streams/

Quality document associated to a dataset:

Restocking and recruitment: N

Electrofishing: N, there is no DOI, but an article number from the Swedish Institute for Standards: Article no: STD-34647.

https://www.sis.se/en/produkter/environment-health-protection-safety/water-quality/examination-of-biological-properties-of-water/ssen14011/

Validation of the final dataset:

Processed data is validated within Data Calls and the annual ICES WGEEL data working group meetings.

Sampling scheme identifier: Introduced populations eel

MS: SWE

Region: Other regions

Sampling scheme identifier: Introduced populations eel

Sampling scheme type: Diadromous (scientific)

Observation type: Self water body

Time period of validity: 2025-2027

Short description (max 100 words):

Eels have been introduced/restocked in several lakes and coastal areas in Sweden, some of them more than 40 years ago, and the populations have been monitored since. Data is collected on yellow eel standing stock and silver eel escapement (via fyke net surveys or sampling from outlet traps or fisheries). A sub-sample of eels are kept and dissected to collect additional data. The otoliths from eels from these sites are particularly valuable since they constitute a source of otoliths with known age, and they are used internationally in age- reading calibrations.

Description of the population

Population targeted:

PSU: Several sites across Sweden at irregular interval

Main target species: European eel

Main survey area: Selected sites in Sweden, SE_Total

Population sampled:

Yellow eel standing stock and/or silver eel escapement is monitored at selected sites where restocking/introductions of eel have taken place.

Stratification:

Only sites where restocking/introductions of eel have taken place, and where monitoring is possible due to practical reasons, are selected.

Sampling design and protocols

Sampling design description:

PSU: Sites where restocking/introductions of eel have taken place, and where monitoring is possible due to practical reasons, are selected.

SSU: Yellow eel standing stock and/or silver eel escapement is monitored.

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

NA

Regional coordination:

N

Link to sampling design documentation:

Sampling design and documentation is documented and is available at SLU Aqua's quality assurance webpage:

www.slu.se/qualityassurance

And in the following publications:

- Jacobson, P., Wickström, H., Tärnlund, S., Reizenstein, M. and Sundin, J. 2023. Ålen i Fardume träsk - sammanställning över data från 1980–2022. Aqua Notes 2023:2. Sveriges lantbruksuniversitet, Uppsala. ISBN: 978-91-8046-802-2. https://doi.org/10.54612/a.52399ldqvh

- Jacobson, B., Wickström, H., Strömquist, J., Persson, J. 2024. Ålmärkningsprojekt i sjön Ymsen – sammanställning av data från 1998–2022. Aqua Notes 2024:3. Sveriges lantbruksuniversitet, Uppsala. ISBN: 978-91-8046-710-0. https://doi.org/10.54612/a.1bbflv35va

- Myrenås, E., Jacobson, P. 2024. Utvärdering av ålyngelutsättningar i Mälaren och Ymsen. Aqua Notes 2024:4. Sveriges lantbruksuniversitet, Uppsala. ISBN: 978-91-8046-711-7. https://doi.org/10.54612/a.senksngfup

- Wickström, H., Westin, L. and Clevestam, P., 1996. The biological and economic yield from a long-term eel-stocking experiment. Ecology of Freshwater Fish, 5(3), pp.140-147.

- Holmgren, K., Wickström, H. and Clevestam, P., 1997. Sex-related growth of European eel, *Anguilla anguilla*, with focus on median silver eel age. *Canadian Journal of Fisheries and Aquatic Sciences*, *54*(12), pp.2775-2781.

Design follows international recommendations:

NA, there are no international recommendations for sampling design regarding monitoring introduced eel populations. Data is however used by ICES WGEEL. Otoliths with known age are also essential for age reading intercalibration workshops, such as previous and future WKAREA workshops.

ICES. 2011. Report of the Workshop on Age Reading of European and American Eel (WKAREA2), 22-24 March 2011, Bordeaux, France. ICES CM 2011/ACOM:43. 35 pp.

Link to sampling protocol documentation:

Sampling protocol documentation is kept at the same place as the sampling design documentation described above.

Protocol follows international recommendations:

NA, there are no international recommendations for sampling design regarding monitoring introduced populations. Data is however used by ICES WGEEL. Otoliths with known age are also essential for age reading intercalibration workshops, such as previous and future WKAREA workshops.

ICES. 2011. Report of the Workshop on Age Reading of European and American Eel (WKAREA2), 22-24 March 2011, Bordeaux, France. ICES CM 2011/ACOM:43. 35 pp.

Sampling implementation

Recording of refusal rate:

NA

Monitoring of sampling progress within the sampling year:

NA, the sampling frequency is irregular.

Data capture

Means of data capture:

Data collection methods vary depending on whether yellow eel standing stock and/or silver eel escapement is monitored. For monitoring and sampling, traps, fyke net fishing or sampling from fisheries is used.

Data capture documentation:

Data capture documentation is kept at the same place as the sampling design documentation described above.

Quality checks documentation:

Quality checks documentation is kept at the same place as the sampling design documentation described above.

Data storage

National database:

Dissection data is stored in a local Access database hosted by SLU Aqua, called “Sötebasen”. Data on silver eel escapement and/or yellow eel standing stock (CPUE), when available, is kept on the SLU Aqua restricted server and work is in progress for this data to be imported to Sötebasen during 2024-2027.

International database:

Processed data is delivered to ICES via WGEEL Data Calls and stored in the WGEEL database.

Quality checks and data validation documentation:

Quality checks and data validation documentation is kept at the same place as the sampling design documentation described above.

Sample storage

A subsample is dissected, and during dissections, data is collected immediately for soft tissues and those are hence not stored. Otoliths are stored for later age- and chemistry analysis (to determine restocked or natural recruit origin). Otoliths are stored at the Biological archive at SLU Aqua's Institute of Freshwater Research, Drottningholm – Stockholm, Sweden. The samples are placed in a fireproof archive and handled according to SLU's routines for quality assurance. Information about the biological archive can be found here:

https://www.slu.se/en/departments/aquatic-resources1/contact/research-infrastructure/biological-archive/

Sample analysis:

Dissection manual, age reading manual and manual to prepare otoliths for chemistry analysis are available at SLU Aqua's quality assurance webpage:

www.slu.se/qualityassurance

Additional quality assurance information for age analysis of fish can be found here:

https://www.slu.se/en/departments/aquatic-resources1/contact/research-infrastructure/age-laboratories/quality-assurance-and-age-analysis-of-fish/

Data processing

Evaluation of data accuracy (bias and precision):

Y. Evaluation of data accuracy is described in documents kept at the same place as the sampling design documentation described above.

Editing and imputation methods:

Y, data processing is documented and is available at SLU Aqua's quality assurance webpage:

www.slu.se/qualityassurance

Quality document associated to a dataset:

Y, data processing is documented and is available at SLU Aqua's quality assurance webpage:

www.slu.se/qualityassurance

Validation of the final dataset:

Processed data is validated within Data Calls and the annual ICES WGEEL data working group meetings, and age reading intercalibration working groups (e.g., WKAREA).

Sampling scheme identifier: Index river eel

MS: SWE

Region: Other regions

Sampling scheme identifier: Index river eel

Sampling scheme type: Diadromous (scientific)

Observation type: Self water body

Time period of validity: 2025-2027

Short description (max 100 words

It is a requirement that there should be one index river per EMU, Sweden currently has one EMU (EMU_Total) and hence has one index river. The Index river program should provide full life history data on recruits, standing stock, and migrating individuals. The Index river program was set up in 2019. It is currently being evaluated if Sweden should be divided into three EMU's, instead of the current one. Based on this and other end-user needs, a total of three index rivers would be suitable for Sweden, and evaluations for two new index rivers will be conducted during 2025-2027.

Description of the population

Population targeted:

PSU: River Kävlingeån, south of Sweden.

Main target species: European eel

Main survey area: SE_Inla

Population sampled:

Part of the target population sampled: juvenile and adult eel (elvers, yellow eel, silver eel) in river Kävlingeån.

Part of the target population unreachable for sampling: In case of flooding events, all eels might not swim through counter or trap and hence would be unsampled.

Stratification:

The sampling site is not stratified. The index river Kävlingeån has been selected based on suitability to monitor as many life-history parameters as possible. Within the river-lake system it is possible to monitor recruitment (via data from an eel collector and electrofishing), yellow eel standing stock (commercial catches of eel, other types of collection methods are also possible in Lake Vombsjön), silver eel production (detections in fish counter (VAKI) and Wolf-trap in the river detecting/catching descending eel). Via PIT-tagging studies it is also possible to validate catch frequencies in fish counter and in the Wolf-trap. Historical catch data from the Wolf-trap is also available.

Sampling design and protocols

Sampling design description:

PSU: River-lake system selected based on suitability to fit all different sampling types within one system.

SSU: Juvenile/elver, yellow eel, silver eel, any eel being electrofished, caught in trap, counted in camera counter or caught in fyke net fishing is part of the survey.

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

NA

Regional coordination:

N

Link to sampling design documentation:

Annual reports (in Swedish) describing data collection related to the trap and fish counter can be found at the SLU Quality Assurance webpage:

www.slu.se/qualityassurance

The river system Kävlingeån and the Wolf-trap (escapement trap) is described in the following reports/publications:

Fiskevårdsteknik AB. Kävlingeån - miljöanpassning av vandringshinder. Unr 30.415.

URL: https://kavlingean.se/files/Kaevlingeaan_Kallelse_Protokoll-2017/Kaevlingeaans-vattenvaardsprogram/2017/Bilaga-1_Slutrapport-miljoeanpassning.pdf

Eklöv A. Förstudie avseende utvandringslösningar för havsöring och ål förbi kraftverken i Kävlingeån. Lund 2010-04-29. Eköv Fisk- och Fiskevård AB. 1–24.

Data collection on recruits (from trap/counter and electrofishing) is described in this Annex in the section detailing monitoring of juvenile eels: restocking, recruitment and electrofishing.

Design follows international recommendations:

NA, there are no international recommendations for sampling design regarding index rivers.

Link to sampling protocol documentation:

Sampling protocol documentation is kept at the same place as the sampling design documentation described above.

Protocol follows international recommendations:

NA, there are no international recommendations for sampling protocol regarding index rivers.

Sampling implementation

Recording of refusal rate:

NA

Monitoring of sampling progress within the sampling year:

Eels are sampled year around in the camera counter – trap system. If there is a lot of ice in the winter, the camera counter must be removed. Very few eels (most likely none) will be active in such cold weather meaning that the data loss in such an event would be very low. If the trap and camera counter are flooded, eels may pass on the side and remain unsampled. The data from the counter is continuously updated and available via fiskdata.se for users with access (log-in requirement).

Data capture

Means of data capture:

A custom-made trap (Wolf-trap) is used to catch descending eels, when the trap is not in use, eels are counted in a fish counter (VAKI). Eels are tagged with PIT-tags to investigate migration patterns, and to validate and the function of the trap and camera counter system. A PIT-tag reader (Riverwatcher) is installed by the camera counter. A subset of the eels caught in the Wolf trap are stored for later dissection to collect additional data.

Data capture documentation:

Data capture documentation is kept at the same place as the sampling design documentation described above.

Quality checks documentation:

Y. Quality checks documentation is kept at the same place as the sampling design documentation described above.

Data storage

National database:

Recruitment data and dissection data is stored in a local Access database hosted by SLU Aqua, called "Sötebasen".

Electrofishing data is stored in the national electrofishing database, called "SERS"

https://www.slu.se/institutioner/akvatiska-resurser/databaser/elfiskeregistret/

Data from the camera counter and trap is kept in an external database and accessed via a log-in account at www.fiskdata.se

International database:

Processed data is delivered to ICES via WGEEL Data Calls and stored in the WGEEL database.

Quality checks and data validation documentation

Quality checks and data validation documentation is kept at the same place as the sampling design documentation described above.

Sample storage

Storage description:

A subsample is dissected, and during dissections, data is collected immediately for soft tissues and those are hence not stored. Otoliths are stored for later age-and chemistry analysis (to determine restocked or natural recruit origin). Otoliths are stored at the Biological archive at SLU Aqua's Institute of Freshwater Research, Drottningholm – Stockholm, Sweden. The samples are placed in a fireproof archive and handled according to SLU's routines for quality assurance. Information about the biological archive can be found here:

https://www.slu.se/en/departments/aquatic-resources1/contact/research-infrastructure/biological-archive/

Sample analysis:

Dissection manual, age reading manual and manual to prepare otoliths for chemistry analysis are available at SLU Aqua's quality assurance webpage:

www.slu.se/qualityassurance

Additional quality assurance information for age analysis of fish can be found here:

https://www.slu.se/en/departments/aquatic-resources1/contact/research-infrastructure/age-laboratories/quality-assurance-and-age-analysis-of-fish/

Data processing

Evaluation of data accuracy (bias and precision):

Y, data processing is documented and is available at SLU Aqua's quality assurance webpage:

www.slu.se/qualityassurance

Electrofishing documents are available at the SERS webpage:

https://www.slu.se/en/departments/aquatic-resources1/databases/database-for-testfishing-in-streams/

Editing and imputation methods:

Y, data processing is documented and is available at SLU Aqua's quality assurance webpage:

www.slu.se/qualityassurance

Quality document associated to a dataset:

N

Validation of the final dataset:

Processed data is validated within Data Calls and the annual ICES WGEEL data working group meetings.

Sampling scheme identifier: Fisheries independent freshwater eel

MS: SWE

Region: Other regions

Sampling scheme identifier: Fisheries independent freshwater eel

Sampling scheme type: Diadromous (scientific)

Observation type: Self water body

Time period of validity: 2025-2027

Short description (max 100 words):

A fisheries independent survey in freshwater is conducted at one location (lake Mälaren). At this site, Alizarin-marked and barium-marked eels have been stocked at two occasions and the naturally recruiting and restocked population is monitored via a scientific fyke-net fishing program. CPUE is also calculated. The eels are dissected to collect additional data. Eels are occasionally tagged with e.g., Passive Integrated Transponder-tags (PIT-tags) or Data Storage Tags (DST), when recaptured the data is used to verify estimated growth curves, movement, etc.

Description of the population

Population targeted:

PSU: One site in Lake Mälaren

Main target species: European eel

Main survey area: SE_Inla, Sotholmsviken in Lake Mälaren.

Population sampled:

Part of the target population sampled: eel in Sotholmsviken, Mälaren.

Part of the target population unreachable for sampling: Any eel not being caught in the fyke nets will be unsampled.

Stratification:

Five fyke net-links with 16 fyke nets (16 "cod ends", 8 paired fyke nets) per fyke net-link are distributed at the sampling site. Position and number of fyke nets is fixed between years.

Sampling design and protocols

Sampling design description:

PSU: Sotholmsviken, Lake Mälaren is selected based on the location where the marked eels were released, and the sites suitability for fyke net fishing and long-term monitoring.

SSU: yellow and silver eel are caught in the fyke net fishing

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

NA

Regional coordination:

N

Link to sampling design documentation:

Sampling design documentation can be found here:

https://www.slu.se/qualityassurance

Documentation can also be found in the following publication:

- Myrenås, E., Jacobson, P. 2024. Utvärdering av ålyngelutsättningar i Mälaren och Ymsen. Aqua Notes 2024:4. Sveriges lantbruksuniversitet, Uppsala. ISBN: 978-91-8046-711-7. https://doi.org/10.54612/a.senksngfup

Design follows international recommendations:

NA, there are no international recommendations for sampling design regarding fisheries independent monitoring.

Link to sampling protocol documentation:

Sampling protocol documentation is kept at the same place as the sampling design documentation described above.

Protocol follows international recommendations:

NA, there are no international recommendations for sampling design regarding fisheries independent monitoring.

Sampling implementation

Recording of refusal rate:

NA

Monitoring of sampling progress within the sampling year:

The site is sampled in May-July when the eels are active and can hence be caught in the fyke nets. Exact starting time is set by water temperature (>10°C, usually around mid May), the sampling ends in July after emptying the fyke nets around 15-20 times, yielding an annual effort of ~4700 fyke net fishing days. Issues that could affect the monitoring include severe storms or similar extreme weather events. Under such (unlikely) events, the sampling cannot take place that specific year (if the extreme weather is long-lasting).

Data capture

Means of data capture:

Eels are monitored and captured using fyke-nets. All eels caught are dissected for additional data collection. Eels are occasionally tagged with e.g., PIT-tags or DST, to verify estimated growth curves.

Data capture documentation:

Data capture documentation is kept at the same place as the sampling design documentation described above.

Quality checks documentation:

Quality checks documentation is kept at the same place as the sampling design documentation described above.

Data storage

National database:

Data is stored in a local Access database hosted by SLU Aqua, called “Sötebasen”.

International database:

Processed data is delivered to ICES via WGEEL Data Calls and stored in the WGEEL database.

Quality checks and data validation documentation:

Quality checks and data validation documentation is kept at the same place as the sampling design documentation described above.

Sample storage

Storage description

A subsample is dissected, and during dissections, data is collected immediately for soft tissues and those are hence not stored. Otoliths are stored for later age-and chemistry analysis (to determine restocked or natural recruit origin). Otoliths are stored at the Biological archive at SLU Aqua’s Institute of Freshwater Research, Drottningholm – Stockholm, Sweden. The samples are placed in a fireproof archive and handled according to SLU’s routines for quality assurance. Information about the biological archive can be found here:

https://www.slu.se/en/departments/aquatic-resources1/contact/research-infrastructure/biological-archive/

Sample analysis:

Dissection manual, age reading manual and manual to prepare otoliths for chemistry analysis are available at SLU Aqua's quality assurance webpage:

www.slu.se/qualityassurance

Additional quality assurance information for age analysis of fish can be found here:

https://www.slu.se/en/departments/aquatic-resources1/contact/research-infrastructure/age-laboratories/quality-assurance-and-age-analysis-of-fish/

Data processing

Evaluation of data accuracy (bias and precision):

Y, data processing is documented and is available at SLU Aqua's quality assurance webpage:

www.slu.se/qualityassurance

Documentation can also be found in the following publication:

- Myrenås, E., Jacobson, P. 2024. Utvärdering av ålyngelutsättningar i Mälaren och Ymsen. Aqua Notes 2024:4. Sveriges lantbruksuniversitet, Uppsala. ISBN: 978-91-8046-711-7. https://doi.org/10.54612/a.senksngfup

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, the document is available at SLU Aqua's quality assurance webpage:

www.slu.se/qualityassurance

Documentation can also be found in the following publication:

- Myrenås, E., Jacobson, P. 2024. Utvärdering av ålyngelutsättningar i Mälaren och Ymsen. Aqua Notes 2024:4. Sveriges lantbruksuniversitet, Uppsala. ISBN: 978-91-8046-711-7. https://doi.org/10.54612/a.senksngfup

Quality document associated to a dataset:

N

Validation of the final dataset:

Processed data is validated within Data Calls and the annual ICES WGEEL data working group meetings.

Sampling scheme identifier: Fisheries independent coastal eel

MS: SWE

Region: North Sea and Eastern Arctic and the Baltic Sea

Sampling scheme identifier: Fisheries independent coastal eel

Sampling scheme type: Diadromous (scientific)

Observation type: SciObsAtSea

Time period of validity: 2025 – 2027

Short description: (max 100 words):

A fisheries independent survey is conducted on the Swedish west coast. The commercial fishery in this area is closed. The survey runs yearly in August to monitor the eel stock in this area. All eels are length measured and, using length-stratification, a sub-sample of eels are kept and dissected to collect additional data. There is a need to evaluate the possibilities for a fisheries independent survey also on the east coast.

Description of the population

Population targeted:

PSU and main survey area (North Sea and Eastern Arctic): two sites in SD20 and one site in SD21.

PSU and main survey area (Baltic Sea): one site in SD23.

Main target species: European eel.

Population sampled:

Part of target population sampled: European eel caught in the three sites in SD20-21 and one site in SD23.

Part of target population unreachable for sampling: European eel not caught in fyke or pound nets and eels outside of the sites in SD20-21 and SD23.

Stratification:

The population is stratified into three sites in SD20-21 (Fjällbacka, Stenungsund [SD 20] and Vendelsö [SD 21]) and one site in SD23 (Barsebäck). At each site, fyke nets are distributed and a subsample from the total catch is length-stratified and individual biometry measurements are taken.

Sampling design and protocols

Sampling design description:

PSU: The three sites are selected based on the areas being part of the ongoing national and regional environmental assessment programmes for fish in coastal waters.

SSU: Yellow and silver eel.

Is the sampling design compliant with the 4S principle?

NA

Regional coordination:

N

Link to sampling design documentation:

Sampling design and protocol documentation is currently stored as internal documents at SLU Aqua. After going through a review in 2024–2025, they will be available at SLU Aqua's Quality Assurance webpage:

https://www.slu.se/qualityassurance

Information regarding fisheries independent coastal monitoring can also be found here:

https://www.slu.se/faktablad-kustfisk

Design follows international recommendations:

NA, there are no international recommendations for sampling design regarding fisheries independent monitoring.

Link to sampling protocol documentation:

Sampling protocol documentation is kept at the same place as the sampling design documentation described above.

Protocol follows international recommendations:

NA, there are no international recommendations for sampling protocol regarding fisheries independent monitoring.

Sampling implementation

Recording of refusal rate:

NA

Monitoring of sampling progress within the sampling year:

Sites are sampled in August for 10 days, until the minimum sampling goals are met. The sampling period can be extended if necessary, depending on the amount of eel caught.

Data capture

Means of data capture:

Fyke nets (10 links with 5 paired fyke nets per link). Onboard sampling requires equipment such as measuring boards, buckets, protocols, rubber boots, life jackets etc. Standard dissection equipment is used for ageing (by analysing otholiths in the lab).

Data capture documentation:

Data capture documentation is kept at the same place as the sampling design documentation described above.

Quality checks documentation:

Quality checks documentation is kept at the same place as the sampling design documentation described above.

Data storage

National database:

Data is stored in a public national database (KUL) hosted by SLU Aqua.

https://www.slu.se/en/departments/aquatic-resources1/databases/database-for-coastal-fish-kul/

International database:

Processed data is delivered to ICES via WGEEL Data Calls and stored in the WGEEL database.

Quality checks and data validation documentation:

Quality checks and data validation documentation is kept at the same place as the sampling design documentation described above.

Sample storage

Storage description:

A subsample is dissected, and during dissections, data is collected immediately for soft tissues and those are hence not stored. Otoliths are stored for later age-and chemistry analysis (to determine restocked or natural recruit origin). Otoliths are stored at the Biological archive at SLU Aqua's Institute of Coastal Research, Öregrund, Sweden. The samples are placed in a fireproof archive and handled according to SLU's routines for quality assurance.

Sample analysis:

Sampling analysis documentation is currently stored as internal documents at SLU Aqua. After going through a review in 2024–2025, they will be available at SLU Aqua's Quality Assurance webpage:

https://www.slu.se/qualityassurance

Additional quality assurance information for age analysis of fish can be found here:

https://www.slu.se/en/departments/aquatic-resources1/contact/research-infrastructure/age-laboratories/quality-assurance-and-age-analysis-of-fish/

Data processing

Evaluation of data accuracy (bias and precision):

N. Data processing documentation is currently stored as internal documents at SLU Aqua. After going through a review in 2024–2025, they will be available at SLU Aqua's Quality Assurance webpage:

https://www.slu.se/qualityassurance

Editing and imputation methods:

N. Data processing documentation is currently stored as internal documents at SLU Aqua. After going through a review in 2024–2025, they will be available at SLU Aqua's Quality Assurance webpage:

https://www.slu.se/qualityassurance

Quality document associated to a dataset:

N.

Validation of the final dataset:

Processed data is validated within Data Calls and the annual ICES WGEEL data working group meetings.

Sampling scheme identifier: Fisheries dependent freshwater eel

MS: SWE

Region: Other regions

Sampling scheme identifier: Fisheries dependent freshwater eel

Sampling scheme type: Diadromous (commercial)

Observation type: SciObs water body

Time period of validity: 2025-2027

Short description (max 100 words):

Sampling from commercial fisheries in freshwater. Lakes to sample are selected based on areas from where there is a need of data, and that have active commercial fishers. Eels are commercially fished using pound nets, and the fishers sample eel throughout the fishing season and store for later dissection. Eels are dissected to collect additional data. The fisheries dependent sampling program in freshwater has been evaluated, and based on that evaluation it was decreased. Currently, one fisher/lake is being sampled per year.

Description of the population

Population targeted:

PSU: Lakes with active commercial fishers

Main target species: European eel

Main survey area: SE_Inal

Population sampled:

Part of the target population sampled: Commercially fished eel from different sites.

Part of the target population unreachable for sampling: Any eel not being caught in the pound nets will be unsampled.

Stratification:

The eels are sampled throughout the fishing season to cover the entire season. Lakes with missing data are targeted for sampling. By default, only lakes with active fishers can be sampled.

Sampling design and protocols

Sampling design description:

PSU: Sites are selected based on where there are still active commercial fishers that catch enough eel. Priority is given to sites where there is a lack of data.

SSU: Both yellow eel and silver eel are caught in the freshwater fisheries.

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

NA

Regional coordination:

N

Link to sampling design documentation:

Documentation is available at SLU Aqua's quality assurance webpage:

www.slu.se/qualityassurance

Design follows international recommendations:

NA, there are no international recommendations for sampling design regarding commercial sampling.

Link to sampling protocol documentation:

Sampling protocol documentation is kept at the same place as the sampling design documentation described above.

Protocol follows international recommendations:

NA, there are no international recommendations for sampling design regarding commercial sampling.

Sampling implementation

Recording of refusal rate:

NA

Monitoring of sampling progress within the sampling year:

Eels are sampled throughout the fishing season. If a fisher would catch few or no eels one season, that site would remain unsampled for that specific year.

Data capture

Means of data capture:

Eels are commercially fished using pound nets. For the dissection, material typical for dissection is used.

Data capture documentation:

Data capture documentation is kept at the same place as the sampling design documentation described above.

Quality checks documentation:

Quality checks documentation is kept at the same place as the sampling design documentation described above, however, aspects regarding primary data cannot be controlled or checked by SLU Aqua since it is collected by external fishers.

Data storage

National database:

Dissection data is stored in a local Access database hosted by SLU Aqua, called "Sötebasen".

International database:

Processed data is delivered to ICES via WGEEL Data Calls and stored in the WGEEL database.

Quality checks and data validation documentation:

Quality checks and data validation documentation is kept at the same place as the sampling design documentation described above. Aspects regarding primary data cannot be validated by SLU Aqua since it is collected by external fishers.

Sample storage

Storage description:

A subsample is dissected, and during dissections, data is collected immediately for soft tissues and those are hence not stored. Otoliths are stored for later age-and chemistry analysis (to determine restocked or natural recruit origin). Otoliths are stored at the Biological archive at SLU Aqua's Institute of Freshwater Research, Drottningholm – Stockholm, Sweden. The samples are placed in a fireproof archive and handled according to SLU's routines for quality assurance. Information about the biological archive can be found here:

https://www.slu.se/en/departments/aquatic-resources1/contact/research-infrastructure/biological-archive/

Sample analysis:

Dissection manual, age reading manual and manual to prepare otoliths for chemistry analysis are available at SLU Aqua's quality assurance webpage:

www.slu.se/qualityassurance

Additional quality assurance information for age analysis of fish can be found here:

https://www.slu.se/en/departments/aquatic-resources1/contact/research-infrastructure/age-laboratories/quality-assurance-and-age-analysis-of-fish/

Data processing

Evaluation of data accuracy (bias and precision):

Y, data processing is documented and is available at SLU Aqua's quality assurance webpage:

www.slu.se/qualityassurance

Editing and imputation methods:

Y, data processing is documented and is available at SLU Aqua's quality assurance webpage:

www.slu.se/qualityassurance

Quality document associated to a dataset:

N

Validation of the final dataset:

Processed data is validated within Data Calls and the annual ICES WGEEL data working group meetings.

Sampling scheme identifier: Mark-recapture eel and Acoustic tagging eel

MS: SWE

Region: Other regions

Sampling scheme identifier: Mark-recapture eel and Acoustic tagging eel

Sampling scheme type: Diadromous (commercial)

Observation type: SciObsOnShore

Time period of validity: 2025-2027

Short description (max 100 words):

Estimation of fishing induced mortality through mark-recapture (of Carlin-tagged eels and double tagged eels), and estimation of silver eel escapement from the Baltic Sea (through tagging with acoustic transmitters that are registered in receivers deployed in all exits from the Baltic Sea). Eels are mainly tagged at the coast, but also in freshwater. Eels are commercially fished using pound nets. The aim is to tag eels at two-three locations along the Baltic coast annually, on a site-rotating scheme. Due to a decreasing number of commercial fishers, this number can be difficult to reach.

Description of the population

Population targeted:

PSU: Mainly coastal sites in the Baltic Sea, but also freshwater sites

Main target species: European eel

Main survey area: SE_East and SE_Inla

Population sampled:

Part of the target population sampled: eel at different locations along the Baltic coast and in freshwater.

Part of the target population unreachable for sampling: Any eel not being caught by commercial fishers will be unsampled, since the eels used for tagging are purchased from commercial eel fishers.

Stratification:

The aim is to tag eels at two-three locations along the Baltic coast annually, on a running scheme, to cover as large proportion of the geographical area as possible and for statistical reasons. Freshwater sites are selected based on locations with trap and transport and sites with restocked eel. Due to a decreasing number of commercial fishers, the number of locations can be difficult to reach.

Sampling design and protocols

Sampling design description:

PSU: Coastal sites in the Baltic Sea are selected based on where there are still active commercial fishers that catch enough eel. The aim is to tag eel at different sites along the coast to cover as large proportion of the geographical area as possible and for statistical reasons. Freshwater sites are selected based on locations with trap and transport and sites with restocked eel.

SSU: Silver eel are targeted because that is the migrating life stage, and migrating eels are relevant to this program.

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

NA

Regional coordination:

N, however regional coordination is under development (Pan-Baltic coordination).

Link to sampling design documentation:

Sampling design documentation can be found here:

https://www.slu.se/qualityassurance

And in the following publications:

Sampling design is documented in the following publications:

- Tambets, M., Kärgenberg, E., Järvalt, A., Økland, F., Kristensen, M.L., Koed, A. and Bernotas, P., 2021. Migrating silver eels return from the sea to the river of origin after a false start. *Biology Letters*, *17*(9), p.20210346.

- Sjöberg, N.B., Wickström, H., Asp, A. and Petersson, E., 2017. Migration of eels tagged in the Baltic Sea and Lake Mälaren—in the context of the stocking question. *Ecology of Freshwater Fish*, *26*(4), pp.517-532.

- Dekker, W. and Sjöberg, N.B., 2013. Assessment of the fishing impact on the silver eel stock in the Baltic using survival analysis. *Canadian Journal of Fisheries and Aquatic Sciences*, *70*(12), pp.1673-1684.

Design follows international recommendations:

Y. Sampling design is in compliance with international recommendations, described in the publications listed above under “sampling design and documentation”.

Link to sampling protocol documentation:

Sampling protocol documentation is kept at the same place as the sampling design documentation described above.

Protocol follows international recommendations:

Y. The sampling protocol is in compliance with international recommendations, described in the publications listed above under “sampling design and documentation”.

Sampling implementation

Recording of refusal rate:

NA

Monitoring of sampling progress within the sampling year:

Fishing for eel usually takes place in late summer and autumn. Eels are usually tagged early in the autumn, when the fishers have caught enough eel, and when there’s still time left on the fishing season (to enable measuring the fisheries induced mortality). If there is no commercial fishing, or no fishing for trap and transport, tagging will most likely not take place, since obtaining eel from any other source is currently very difficult (there is no fisheries independent monitoring along the east coast).

Data capture

Means of data capture:

Eels to be tagged are commercially fished using fyke nets or pound nets. They are tagged on-site with an externally visible Carlin tag and/or an internal acoustic transmitter surgically implanted in the body cavity. Data on length, weight, sex-ratio (all eels caught in the commercial fishery are female), and Durif's silver index parameters is collected. The eels are then released at the site of capture. The tagging is described in the following publications:

- Sjöberg, N.B., Wickström, H., Asp, A. and Petersson, E., 2017. Migration of eels tagged in the Baltic Sea and Lake Mälaren—in the context of the stocking question. *Ecology of Freshwater Fish*, *26*(4), pp.517-532.

- Dekker, W. and Sjöberg, N.B., 2013. Assessment of the fishing impact on the silver eel stock in the Baltic using survival analysis. *Canadian Journal of Fisheries and Aquatic Sciences*, *70*(12), pp.1673-1684.

- Tambets, M., Kärgenberg, E., Järvalt, A., Økland, F., Kristensen, M.L., Koed, A. and Bernotas, P., 2021. Migrating silver eels return from the sea to the river of origin after a false start. *Biology Letters*, *17*(9), p.20210346.

Data capture documentation:

Data capture documentation is kept at the same place as the sampling design documentation described above.

Quality checks documentation:

Quality checks documentation is kept at the same place as the sampling design documentation described above.

Data storage

National database:

Information on tagged eels (e.g., length, weight, sex-ratio, Durif's silver index) and recaptured Carlin-tagged eels is stored in a local Access database hosted by SLU Aqua, called "Sötebasen". Data from the acoustic receivers are stored in the database of the European Tracking Network.

https://europeantrackingnetwork.org/en

International database:

Processed data on Carlin-tagged eels is delivered to ICES via WGEEL Data Calls and stored in the WGEEL database. Data from the acoustic receivers are stored in the database of the European Tracking Network.

https://europeantrackingnetwork.org/en

Quality checks and data validation documentation:

Quality checks and data validation documentation is kept at the same place as the sampling design documentation described above.

Sample storage

Storage description:

NA

Sample analysis:

NA
Data processing
Evaluation of data accuracy (bias and precision): Y, data processing is documented and is available at SLU Aqua's quality assurance webpage: www.slu.se/qualityassurance And in the following publications: - Sjöberg, N.B., 2015. *Eel migration-results from tagging studies with relevance to management* (Doctoral dissertation, Department of Ecology, Environment and Plant Sciences, Stockholm University). - Tambets, M., Kärgenberg, E., Järvalt, A., Økland, F., Kristensen, M.L., Koed, A. and Bernotas, P., 2021. Migrating silver eels return from the sea to the river of origin after a false start. *Biology Letters*, *17*(9), p.20210346. **Editing and imputation methods:** Y. Editing and imputation methods are documented and is available at SLU Aqua's quality assurance webpage: www.slu.se/qualityassurance And in the following publications: - Sjöberg, N.B., 2015. *Eel migration-results from tagging studies with relevance to management* (Doctoral dissertation, Department of Ecology, Environment and Plant Sciences, Stockholm University). - Tambets, M., Kärgenberg, E., Järvalt, A., Økland, F., Kristensen, M.L., Koed, A. and Bernotas, P., 2021. Migrating silver eels return from the sea to the river of origin after a false start. *Biology Letters*, *17*(9), p.20210346. **Quality document associated to a dataset:** N. Not for a document summarising the estimation process. **Validation of the final dataset:** Processed data is validated within Data Calls and the annual ICES WGEEL data working group meetings.

Sampling scheme identifier: Electrofishing Salmon-Sea trout

MS : SWE
Region: All regions
Sampling scheme identifier: Electrofishing Salmon-Sea trout
Sampling scheme type: Diadromous (scientific)
Observation type: SciObs water body
Time period of validity: 2025-2027

Short description:

To monitor reproduction success (year-class strength), estimates of salmon and sea trout parr abundance are made based on results from annual electrofishing in rivers that flow into the North Sea and Eastern Arctic, and the Baltic Sea region respectively.

Description of the population

Population targeted:

Main target species: *Salmo salar* and *Salmo trutta.*

Main survey area: Swedish west coast and the Swedish side of the Baltic Sea**.**

PSU: Selected rivers.

Population sampled:

Part of the target population sampled: Salmon juveniles (parr) present in sites in rivers with wild salmon populations. Sea trout parr are monitored for a representative selection of sea trout rivers/tributaries/streams. When (sea) trout parr are encountered in salmon rivers they are sampled and vice versa.

Part of the target population unreachable for sampling: All nursery areas cannot be sampled in each river/water course, but sampling sites (suitable to host salmon and/or sea trout) have been selected to be representative for various parts of the river in question.

Stratification:

Electrofishing targeting salmon is conducted annually in Swedish rivers classified by ICES as having a wild population.

Swedish west coast (24 wild rivers): Ätran/Högvadsån, Strömsån, Enningdalsälven, Örekilsälven, Bäveån, Arödsån, Bratteforsån, Anråse å, Göta älv, Säveån, Kungsbackaån, Rolfsån, Löftaån, Viskan, Himleån, Tvåkersån, Törlan, Suseån, Nissan, Fylleån, Genevadsån, Lagan, Stensån and Rönneå. Each of these rivers holds (at least) one unique salmon population.

Baltic Sea (15 wild salmon rivers): Torneälven, Kalixälven, Råneälven, Åbyälven, Byskeälven, Kågeälven, Rickleån, Sävarån, Ume/Vindeläven, Öreälven, Lögdeälven, Ljungan, Testeboån, Emån and Mörrumsån2, (Wild salmon river Piteälven is very difficult to electrofish, and therefore not included).

Electrofishing targeting **sea trout** is conducted according to a partly rolling schedule in a representative selection of sea trout rivers/tributaries/streams flowing into the Swedish west coast and the Baltic Sea respectively. Number of watercourses in which region is not predetermined. Instead, electrofishing at a fixed total number of sites is planned for each year (in total 100 sites in both regions, preliminary 88 in the Baltic and 12 in North Sea and Eastern Arctic). The reason for the limited sites at the Swedish west coast (North Sea and Eastern Arctic) is the existence of additional annual monitoring programs performed by others (data available for analyses within DCF).

Sampling design and protocols

Sampling design description:

PSU: River

SSU: Site (Electrofishing site)

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

NA

Regional coordination:

N

Link to sampling design documentation

Information compiled on

https://www.slu.se/en/departments/aquatic-resources1/databases/database-for-testfishing-in-streams/

(link to this webpage on www.slu.se/qualityassurance)

Design follows international recommendations:
Y. Sampling design follows national standards corresponding to international recommendations regarding sampling design for electrofishing targeting salmon and/or sea trout. WGBAST, WGNAS, (ICES) and NASCO request the data collected.

Link to sampling protocol documentation:

Information compiled on

https://www.slu.se/en/departments/aquatic-resources1/databases/database-for-testfishing-in-streams/

(link to this webpage on www.slu.se/qualityassurance)

Protocol follows international recommendations:
Y. Sampling design follows national standards corresponding to international recommendations regarding sampling design for electrofishing targeting salmon and/or sea trout. WGBAST, WGNAS, (ICES) and NASCO request the data collected.

Sampling implementation

Recording of refusal rate:

NA

Monitoring of sampling progress within the sampling year:

Electrofishing is only conducted once a year at each site, in the autumn. If it is impossible to electrofish (e.g. due to weather conditions or too high or too low water flow) the sampling may be suspended until the following year. Timing of the electrofishing should be as similar as possible between years, e.g. the aim is to fish as close to a certain date each year as possible.

Data capture

Means of data capture:

The data collection follows the national standardized methodology. Streams are electrofished by repeated sampling using either a shore-based generator or backpack unit (method differs between sites). Stop nets are not used. The number of electrofishing sites fulfils the minimum requirement for an acceptable level of certainty for each river, with respect to smolt production or population status estimates used for stock assessment.

A smartphone application for data entering in the field has been developed and the app is currently in its final test phase.

Data capture documentation:

Information compiled on

https://www.slu.se/en/departments/aquatic-resources1/databases/database-for-testfishing-in-streams/

(link to this webpage on www.slu.se/qualityassurance)

Quality checks documentation:

Y. Information compiled on

https://www.slu.se/en/departments/aquatic-resources1/databases/database-for-testfishing-in-streams/

(link to this webpage on www.slu.se/qualityassurance)

Data storage

National database:

SERS

Information compiled on

https://www.slu.se/en/departments/aquatic-resources1/databases/database-for-testfishing-in-streams/

(link to this webpage on www.slu.se/qualityassurance)

Data are available here https://dvfisk.slu.se/home (information in Swedish only).

International database:

NA. Processed data delivered to ICES (WGBAST, WGNAS) and NASCO.

Quality checks and data validation documentation:

Y. Quality checks are included in the national data hosting that SLU has for electrofishing data after a special assignment from Swedish Agency Marine and Water Management.

Information compiled on

https://www.slu.se/en/departments/aquatic-resources1/databases/database-for-testfishing-in-streams/

(link to this webpage on www.slu.se/qualityassurance)

Sample storage

Storage description:

Scales samples (dried) for age determination are stored in paper sample bags in a fire-proof archive at the Freshwater Institute of the Swedish University of Agricultural Sciences (no end date of storage).

https://www.slu.se/en/departments/aquatic-resources1/contact/research-infrastructure/biological-archive/

In detail, all bags are stamped with an eight-digit number including the first four the numbers show the serial number and the last four the number of the individual sample in the series. The serial number includes the year and a serial number. These numbers are found in the database where all information about a series is available. The sample bags are sorted into cardboard boxes by year, serial number and individual number. (see link to analysis manual below).

Sample analysis:

Age determination is described here https://www.slu.se/institutioner/akvatiska-resurser/kontakt/forskningsinfrastuktur/alderslaboratorier/Metodhandbok-for-aldersanalys-av-fisk/ (in Swedish). See also www.slu.se/qualityassurance.

Data processing

Evaluation of data accuracy (bias and precision):

Y. Information compiled on www.slu.se/qualityassurance)

Editing and imputation methods:

Y. Information compiled on www.slu.se/qualityassurance)

Quality document associated to a dataset:

No DOI. Information compiled on www.slu.se/qualityassurance)

Validation of the final dataset:

Information compiled on www.slu.se/qualityassurance)

Sampling scheme identifier: Smolt trap

MS : SWE

Region: All regions

Sampling scheme identifier: Smolt trap

Sampling scheme type: Diadromous (scientific)

Observation type: SciObs water body

Time period of validity: 2025-2027

Short description:

Annual estimates of salmon and sea trout smolt abundance are conducted using mark-recapture experiments on tagged smolts, which are trapped in seven rivers with rotary smolt wheels, fyke nets, or Wolf traps. Individual length and weight are measured, and scale samples for age determination are collected from sub-samples distributed across the whole smolt migration season.

For salmon in the Baltic region, there is smolt trapping in three index rivers. In addition, smolt counting is performed annually in two non-index rivers according to a rolling scheme with different rivers studied over time, selected to fulfil current end-user needs. These two non-index salmon rivers are referred to as ‘Rotating rivers’

below and in Table 2.3. In the Baltic region, there is also smolt trapping in one sea trout river/tributary. For salmon in the North Sea and Eastern Arctic, smolts are counted in one index-river. In this region, the sampling program is revised during 2025-2027 and changes to the sampling will likely occur.

The counting of descending smolts are conducted by external operators (different ones in different rivers) and results/data are delivered to SLU. The external operators (mainly local County Administrative Boards) follow standardized instructions developed by SLU regarding capture, registrations, tagging, scale sampling, release, etc.

Description of the population

Population targeted:

Main target species: *Salmo salar* and *Salmo trutta*.

Main survey area: Baltic Sea: Vindelälven, Testeboån, Mörrumsån, Hartijoki and two Rotating rivers. Swedish west coast: Ätran/Högvadsån.

Population sampled:

Part of the target population sampled: smolt (young salmonids transitioning from freshwater to saltwater).

Part of the target population unreachable for sampling: in some rivers part of the smolt production occurs at rearing habitat located downstream of the trap. Smolt traps are placed as near the estuary as possible, but for practical reasons it is sometimes impossible to cover all rearing habitats.

Stratification:

Stratification: River.

For (sea) trout, one river. For salmon, one index river per assessment unit (AU 1-4) in ICES SD 22-31 and one in 3a, plus sampling in two Rotating rivers (in varying Baltic salmon assessment units). The selection of rivers with smolt counting is based on end-used needs.

Sampling design and protocols

Sampling design description:

PSU: River (index or non-index). SSU: Abundance of smolts.

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

NA

Regional coordination:

N

Link to sampling design documentation:

www.slu.se/qualityassurance

Design follows international recommendations:
Y, sampling requested and accepted ICES (WGBAST, WGNAS) and NASCO.

Link to sampling protocol documentation:

www.slu.se/qualityassurance

Protocol follows international recommendations:
Y, sampling requested and accepted ICES (WGBAST, WGNAS) and NASCO.

Sampling implementation

Recording of refusal rate:

NA

Monitoring of sampling progress within the sampling year:

Each smolt trap is monitored and managed on a daily basis throughout the smolt migration season. If repairing is needed, this is dealt with immediately to ensure that the trap will continue catching smolt properly and overall, so that as much of the migration season as possible will be covered. However, malfunctioning due to more extreme water flow conditions (too high or too low) is not always possible to adjust for.

Data capture

Means of data capture: Abundance: Smolt trap

Mark-recapture: Individual pit-tags

Length: Measuring board

Weight: Scale

Data capture documentation:

www.slu.se/qualityassurance.

Quality checks documentation:

Y, www.slu.se/qualityassurance.

Data storage

National database:

Sötebasen.

Ongoing work to make aggregated data on descending smolts publicly available via the SLU website.

International database:

Processed data delivered to ICES

Quality checks and data validation documentation:

Standard checks included in the national database routines. Further, see https://github.com/SLU-Aqua-diadromous/Smoltreg

Sample storage

Storage description:

Scales samples (dried) for age determination are stored in paper sample bags in a fire-proof archive at the Freshwater Institute of the Swedish University of Agricultural Sciences (no end date of storage).

https://www.slu.se/en/departments/aquatic-resources1/contact/research-infrastructure/biological-archive/

In detail, all bags are stamped with an eight-digit number including the first four the numbers show the serial number and the last four the number of the individual sample in the series. The serial number includes the year and a serial number. These numbers are found in the database where all information about a series is available. The sample bags are sorted into cardboard boxes by year, serial number and individual number. (see link to analysis manual below).

Sample analysis:

Age determination is described here https://www.slu.se/institutioner/akvatiska-resurser/kontakt/forskningsinfrastuktur/alderslaboratorier/Metodhandbok-for-aldersanalys-av-fisk/ (in Swedish). See also www.slu.se/qualityassurance.

Data processing

Evaluation of data accuracy (bias and precision):

Y, see *Mäntyniemi & Romakkaniemi 2002. Canadian Journal of Fisheries and Aquatic Sciences, 59(11): 1748-1758* (DOI: 10.1139/F02-146)

Editing and imputation methods:

Y, https://github.com/SLU-Aqua-diadromous/Smoltreg

Quality document associated to a dataset:

DOI: 10.1139/F02-146

https://github.com/SLU-Aqua-diadromous/Smoltreg

Validation of the final dataset:

Scripts in R are used to evaluate and validate the smolt trap data (which are delivered in Excel format by the operators). Eventual errors, e.g. typos, are identified, corrected and formatted into files suitable for import into the national database Sötebasen. The scripts are available here: https://github.com/SLU-Aqua-diadromous/Smoltreg

Sampling scheme identifier: Spawner counter

MS: SWE

Region: All regions

Sampling scheme identifier: Spawner counter

Sampling scheme type: Diadromous (scientific)

Observation type: SciObs water body

Time period of validity: 2025-2027

Short description:

Counting of ascending salmon (spawning adults) is conducted annually in five Swedish rivers, four flowing into the Baltic Sea and one flowing into the Swedish west coast. Data on migrating trout are also collected.

Different types of methods are used in different rivers (either automatic counters or manual counting). Individual length is estimated and, in some cases, also sea age composition (one or multi sea winter) based on length. Scale samples for age determination are collected from selected sub-samples.

Description of the population

Population targeted:

Main target species: *Salmo salar*

Main survey area: Vindelälven, Testeboån, Mörrumsån, Kalixälven (Baltic Sea region) and Ätran/Högvadsån (North Sea and Eastern Arctic region).

Population sampled:

Part of the target population sampled: spawning/migrating adults.

Part of the target population unreachable for sampling: some individuals may pass beyond or beside the reach of the fish counter.

Stratification:

Stratification: River. One river per WGBAST Assessment Unit (AU) in SD 22-31 (AU 1-4) and one river in 3a. All except one of the Baltic rivers (Kalixälven) are appointed as index rivers by ICES. Collection of scale samples stratified by time of capture.

Sampling design and protocols:

Sampling design description:

Selected rivers (PSU) where fish is counted (SSU) either when passing automatic counters (camera or sonar) or when checked manually in a fishway.

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

NA

Regional coordination:

N

Link to sampling design documentation:

Overall documentation in the national monitoring manual for fish counting data: Undersökningstyp: Fisk i rinnande vatten - fiskräknare (tunnelräknare) (havochvatten.se) (in Swedish).

Ongoing work on compilation of detailed documentation per river.

In Ätran/Högvadsån, the sampling program is revised during 2025-2027 and changes to the sampling will likely occur.

Design follows international recommendations:
Y, sampling accepted by ICES.

Data used by ICES (WGBAST, WGTRUTTA, WGNAS) and NASCO.

Link to sampling protocol documentation:

Overall, in Undersökningstyp: Fisk i rinnande vatten - fiskräknare (tunnelräknare) (havochvatten.se) (in Swedish). Ongoing work on compilation of detailed documentation per river.

Protocol follows international recommendations:
Y, sampling accepted by ICES.

Data used by ICES (WGBAST, WGTRUTTA, WGNAS) and NASCO.

Sampling implementation

Recording of refusal rate:

NA

Monitoring of sampling progress within the sampling year:

Each counters is continuously monitored and managed throughout the spawner migration season. If repairing is needed, this is dealt with immediately to ensure that the counter is functional and will cover as much of the migration season as possible.

Data capture

Means of data capture:

Fish is counted when passing a fish counter either automatic counters (camera or sonar) or when checked manually in a fishway.

Optical camera counters provide detailed information (e.g., species determination, length automatically calculated, sea age composition can be estimated from fish length). These counters are installed where there is a limited area that the fish must pass e.g., fish ladders. Sonar counters emit sound waves and act more like an echo sounder and is relatively often used as a complement to an optical camera system. This technology makes it possible to count fish on a larger area, up to about 75 m, and also in streams with a lot of debris. A disadvantage with sonar technology is that it is not possible to distinguish salmon from trout in the dataset.

The counting of ascending individuals are conducted by external consultants (different consultants in different rivers) and data and estimates are delivered to SLU.

Data capture documentation:

Overall in Undersökningstyp: Fisk i rinnande vatten - fiskräknare (tunnelräknare) (havochvatten.se) (in Swedish).

Ongoing work on compilation of detailed documentation per river. Currently, documentation is partially available e.g. http://fiskdata.se (in Swedish).

Quality checks documentation:

N. All data collected from the fish counters are (with a few exceptions) interpreted manually at some stage where individual fish are checked. Further, data analysis from the automatic counters is performed with software specifically developed as a working tool to facilitate monitoring of operations, remote data capture, quality checks, review, interpretation and storage of data and in some cases also compilation of data and presentation of results.

Data storage

National database:

Sötebasen (SLU has been assigned as national data host). Work with the aim to jointly store Swedish fish counter data in here is underway.

Currently data from some rivers are hosted and available at http://fiskdata.se or else on local server. Ongoing work to make statistics on ascending adults publicly available in 2025-2027 via the SLU website.

International database:

Processed data delivered to ICES

Quality checks and data validation documentation:

Ongoing work, see links above under Data capture.

Sample storage

Storage description:

Scales samples (dried) for age determination are stored in paper sample bags in a fire-proof archive at the Freshwater Institute of the Swedish University of Agricultural Sciences (no end date of storage).

https://www.slu.se/en/departments/aquatic-resources1/contact/research-infrastructure/biological-archive/

Sample analysis:

https://www.slu.se/institutioner/akvatiska-resurser/kontakt/forskningsinfrastuktur/alderslaboratorier/Metodhandbok-for-aldersanalys-av-fisk/ (in Swedish)

Data processing

Evaluation of data accuracy (bias and precision):

N. Ongoing work, see links above under Data capture.

Editing and imputation methods:

N. Ongoing work, see links above under Data capture.

Quality document associated to a dataset:

No DOI

N. Ongoing work, see links above under Data capture.

Validation of the final dataset: Data accuracy is validated by e.g. comparing numbers and species distribution during a migration season to previous years' seasons.

Sampling scheme identifier: M74 monitoring

MS :SWE
Region: Baltic Sea
Sampling scheme identifier: M74 monitoring
Sampling scheme type: Diadromous (scientific)
Observation type: SciObs water body
Time period of validity: 2025-2027
Short description: M74 is a reproductive disorder in salmon where fry die shortly after hatching due to thiamine deficiency. In the monitoring of M74 in Baltic salmon, the incidence of M74 is followed via observations of mortality in brood stock fry at seven hatcheries. In addition, measures of thiamine levels in unfertilized eggs from two hatcheries are conducted. The thiamine levels act as an early warning indicating the probability (risk) of M74 mortality in the following hatching year.
Description of the population
Population targeted: Main target species: *Salmo salar* Main survey area: Dalälven, Ljusnan, Indalsälven, Ångermanälven, Ume/Vindelälven, Skellefteälven and Luleälven (7 rivers that flow into the Baltic Sea) **Population sampled:** Part of the target population sampled: Salmon egg and fry from the selected salmon brood stock river populations. Part of the target population unreachable for sampling: neither wild salmon populations, nor all brood stock populations are sampled. **Stratification:** River.
Sampling design and protocols

Sampling design description:

The monitoring of M74 incidence in salmon constitutes of data on hatchery success from seven Baltic river populations. This monitoring is complemented by analyses of thiamine in unfertilized salmon eggs (which is used as a system for early warning) from two of the seven M74 monitored river populations.

PSU: river populations in the Baltic Sea

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

NA

Regional coordination:

N

Link to sampling design documentation:

N. The prevalence of M74 is examined each year in seven different salmon river populations in hatcheries. The river system/hatcheries that are included in this monitoring is a compilation of hatcheries that are conducting M74 evaluations within their own routines and delivers data to SLU on a volontary basis. A reference hatching is also performed, where eggs from each female in the brood stock fishery is hatched at a normal rate but without the eggs receiving thiamine treatment (used to counteract M74).

Thiamine analyses are conducted by sampling of unfertilized eggs from two of the seven M74 monitored river populations. Here, about 1 tablespoon of eggs are collected, frozen and transported from the compensatory hatcheries in Dalälven and Ume/Vindelälven for thiamine analyses at SLU.

Design follows international recommendations:
Data are requested and used by WGBAST, but no formal recommendations on sampling design are yet available.

Link to sampling protocol documentation:

Hatching success: See www.slu.se/qualityassurance (in Swedish)

Thiamine status: Will be available in

Larsson, M; Balk, L; Dahlgren, E; Vryonidis, E; Lindqvist, D. (preliminary 2024). A liquid chromatography mass spectrometric method and a fluorometric 96 well plate assay for determination of thiamine in salmonid eggs. Accepted with revisions to Journal ACS Omega in August 2024.

Protocol follows international recommendations:
N. Data are requested and used by WGBAST, but no formal recommendations on sampling protocol are yet available.

Sampling implementation

Recording of refusal rate:

NA

Monitoring of sampling progress within the sampling year:

Sampling progress during a specific year is not monitored.

Data capture

Means of data capture:

Data on M74 incidence are recorded by observations of hatching success of fry.

Data on thiamine status of unfertilized salmon eggs are collected through analyzes of concentrations of thiamine.

Data capture documentation:

Hatching success: See www.slu.se/qualityassurance (in Swedish);

Thiamine status: Will be available in *Larsson, M et al. (preliminary 2024)*, see above.

Quality checks documentation:

Hatching success: Y. Partly in www.slu.se/qualityassurance (in Swedish);

Thiamine status: Y. Will be available in *Larsson, M et al. (preliminary 2024)*, see above.

Data storage

National database:

NA. Data stored at local server.

International database:

Data delivered to WGBAST.

Quality checks and data validation documentation:

Hatching success: Not yet available. The aim is to have this documented in 2025;

Thiamine status: Not yet available. The aim is to have this documented in 2025.

Sample storage

Storage description: No samples are stored.

Sample analysis:

Hatching success:

- Up to2024,a so-called forecast hatching was conducted at one of the hatcheries (at river Dalälven), where the hatching of eggs from Dalälven and Ljusnan was accelerated to get an early forecast of the current year's M74 outcome. This was done by placing 200 eggs in water heated to about 7 degrees, thereby the forecast eggs hatch earlier than in the normal hatchery. After a certain number of days, it is possible to observe signs of M74 syndrome in the developing fry.
- In the other six hatcheries, and now also for river Dalälven, no forecast hatching is done, but a reference hatching where eggs from each female in the brood stock fishery is hatched at a normal rate but without the eggs receiving thiamine treatment (used to counteract M74). See www.slu.se/qualityassurance (in Swedish).

Thiamine status:

- In short, about 1 tablespoon of unfertilized eggs are collected, frozen and transported from the compensatory hatcheries in Dalälven and Ume/Vindelälven for thiamine analyses at SLU, Sweden. Methods on chemical analyses of thiamine ill be available in *Larsson, M et al. (preliminary 2024)*, see above.

Data processing
Evaluation of data accuracy (bias and precision): Hatching success: N. Not yet available. The aim is to have this documented in 2025; Thiamine status: Y. Will be available in *Larsson, M et al. (preliminary 2024)*, see above. **Editing and imputation methods:** Hatching success: N. Not yet available. The aim is to have this documented in 2025; Thiamine status: N. Not yet available. The aim is to have this documented in 2025. **Quality document associated to a dataset:** No DOI. No estimates are made. Hatching success: Not yet available. The aim is to have this documented in 2025; Thiamine status: Not yet available. The aim is to have this documented in 2025. **Validation of the final dataset:** Hatching success: Incidence of M74 and amounts of individual salmon included in the sampling are compiled and compared. If outliers or deviating values are identified the hatcheries are contacted to validate the data in order to ensure that the M74 measurements are reliable. Thiamine status: Will be available in *Larsson, M et al. (preliminary 2024)*, see above.

Sampling scheme identifier: Genetic sampling

MS :SWE
Region: All regions
Sampling scheme identifier: Genetic sampling
Sampling scheme type: Biological parameters specific
Observation type: SelfOnShore, SciObs water body
Time period of validity: 2025-2027

Short description:

Tissue samples (scales or fin clips) from adult salmon are collected and/or genotyped annually, with the aim to estimate catch compositions in the mixed stock coastal and open sea fisheries. Depending on how these fisheries develop, samples will either be collected from commercial and/or recreational fisheries in the Baltic Sea and/or along the Swedish west coast. Supplementary collection of tissue samples from fishery-independent surveys in rivers (parr and/or smolts) may also be necessary, to update the current genetic baseline(s) used for statistical mixed stock analyses (MSA) of adult catch samples.

Preliminary, the 2025-2027 data collection will focus on data collection of commercial coastal fisheries in the Baltic Sea (described below).

Description of the population

Population targeted:

Target stock: Baltic salmon (*Salmo salar).*

Population sampled:

Adult salmon will be sampled from catches in the commercial mixed stock trap net fishery targeting salmon from different river populations during spawning migration season. The sampling will focus on specific locations in coastal areas during time periods when the fishery is most intense. In addition, to identify certain salmon population's migration pattern, sampling in an extended geographical area during time periods when salmon are less abundant and/or the salmon fisheries is closed can be conducted.

Stratification:

To be decided on an annual basis depending on the current management regulations and in accordance with end-user needs (ICES). Applies both in space and time.

Sampling design and protocols

Sampling design description:

PSU: Selected locations in relevant coastal areas.

SSU: All or a subsample (depending on size of the catch) of landed salmon in these locations.

To get information on stock composition from the whole migration period, sampling of salmon caught outside the ordinary fishing season will preliminary also be conducted (here all sampled fish will be released back into the sea).

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

NA

Regional coordination:

N

Link to sampling design documentation:

Documentation on local server. The aim is to refine and develop the collection of the genetic salmon data and therefore the approach may change from year to year in the coming program period and before final documentation of the sampling protocol can be in place.

Design follows international recommendations:
Y, Sampling is requested by WGBAST.

Link to sampling protocol documentation:

Documentation on local server. Work in progress.

Protocol follows international recommendations:
Y, Sampling is accepted by WGBAST.

Sampling implementation

Recording of refusal rate:

Y. Information on eventual non-responses from fishermen is compiled year by year.

Monitoring of sampling progress within the sampling year:

No adjustments to the sampling allocation are done within a year. However, the sampling scheme and allocation is evaluated after each sampling season and necessary changes are implemented the following year to fulfil the aims of the genetic sampling.

Data capture

Means of data capture:

Tissue samples (scales and/or fin clips). Information on length, weight, sex, adipose finclipping etcetera of each sampled individual is also collected and written on the scale sample envelops.

Data capture documentation:

Documentation on local server.

Quality checks documentation:

N. Documentation on local server. Work in progress to document different aspects of the data quality checks properly. E.g. tissue samples are manually checked at arrival against field protocol and length-weight-regression are plotted to identify outliers.

Data storage

National database:

Will be included in the national database Sötebasen. Work in progress.

International database:

Joint Swedish and Finnish work ongoing on the genetic baseline(s) for Baltic salmon.

Quality checks and data validation documentation:

Will be included in the national database Sötebasen. Work in progress.

Sample storage

Storage description:

Scales samples (dried) are stored in paper sample bags (envelops) in a fire-proof archive at the Freshwater Institute of the SLU Aqua (no end date of storage).

https://www.slu.se/en/departments/aquatic-resources1/contact/research-infrastructure/biological-archive/

Fin clips preserved in ethanol are also stored at the Institute of Freshwater research, SLU Aqua.

Sample analysis:

Genetic and statistical analyses performed as described in Whitlock et al 2018. https://besjournals.onlinelibrary.wiley.com/doi/abs/10.1111/2041-210X.12946

Data processing

Evaluation of data accuracy (bias and precision):

N, but partly covered in: Whitlock et al 2018. https://besjournals.onlinelibrary.wiley.com/doi/abs/10.1111/2041-210X.12946

Draft documentation is also available on local server. Work in progress to develop and document the different aspects of data accuracy further.

Editing and imputation methods:

N, but partly covered in: Whitlock et al 2018. https://besjournals.onlinelibrary.wiley.com/doi/abs/10.1111/2041-210X.12946

Draft documentation is also available on local server. Work in progress to develop and document the different aspects of data handling further.

Quality document associated to a dataset:

Genetic and statistical analyses performed as described in Whitlock et al 2018. https://besjournals.onlinelibrary.wiley.com/doi/abs/10.1111/2041-210X.12946

Further documentation summarizing estimation processes is available on local server.

Validation of the final dataset:

Genetic analyses follow standard protocols (Whitlock et al 2018, Söderberg et al 2019, Söderberg et al 2020, Söderberg & Ek 2021) and quality checks, e.g. a minimum of 8 samples are always run twice to check for errors.

Estimates of catch composition and other parameters provided to end-users are produced as described in Whitlock et al 2018. https://besjournals.onlinelibrary.wiley.com/doi/abs/10.1111/2041- 210X.12946

Söderberg, L., Östergren, J., Palm, S. (2019). Genetisk analys av avelsfisk. Lax och havsöring 2017- 2018 från svenska kompensationsodlingar. Aqua reports 2019:18. Institutionen för akvatiska resurser, Sveriges lantbruksuniversitet, Drottningholm Lysekil Öregrund. 53 s.

Söderberg, L., Lind, E., Degerman, E., Palm, S. (2020). Genetisk särart och variation hos svenska bestånd av Atlantlax. PROMEMORIA, SLU ID: SLU.aqua.2018.5.5-19. Institutionen för akvatiska resurser, Sveriges lantbruksuniversitet, Drottningholm. 28 s.

Söderberg, L., Ek, C. (2021). Genetisk analys av lax och havsöring kramad 2020 i svenska kompensationsodlingar. PROMEMORIA, SLU ID: SLU.aqua.2018.5.2-353. Institutionen för akvatiska resurser, Sveriges lantbruksuniversitet, Drottningholm. 49 s.

Sampling scheme identifier: Stocking data Salmon-Sea trout

MS: SWE

Region: All regions

Sampling scheme identifier: Stocking data Salmon-Sea trout

Sampling scheme type: Diadromous (scientific)

Observation type: SciObs water body

Time period of validity: 2025-2027

Short description:

Collection of data on number of stocked salmon and sea trout per life stage, site (location of release) and year respectively. Salmon and sea trout are stocked in freshwater and occasionally in coastal sites.

Description of the population

Population targeted:

Census data for all stocked salmon and sea trout are collected from all Swedish waters where stocking take place.

Population sampled:

NA. Census data, hence, the whole target population is sampled.

Stratification:

NA.

Sampling design and protocols

Sampling design description:

Census data on number of stocked salmon and sea trout are collected annually.

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

NA.

Regional coordination:

N.

Link to sampling design documentation:

https://www.slu.se/qualityassurance

Design follows international recommendations:
N. No international recommendations regarding sampling design for stocking data are yet in place. Data are requested by WGBAST, WGTRUTTA and WGNAS (ICES/NASCO).

Link to sampling protocol documentation:

https://www.slu.se/qualityassurance

Protocol follows international recommendations:
N. No international recommendations regarding sampling protocol documentation for stocking data are yet in place. Data are requested by WGBAST, WGTRUTTA and WGNAS (ICES/NASCO).

Sampling implementation

Recording of refusal rate:

Y. Eventual non-responses are recorded.

Monitoring of sampling progress within the sampling year:

N. Data from a sampling year are always collected after the stocking have been finalized.

Data capture

Means of data capture:

Annual enquiries are addressed to all relevant bodies responsible for and/or performing the releases to whom a questionnaire (a standard template) is distributed.

Data capture documentation:

https://www.slu.se/qualityassurance

Quality checks documentation:

N. Draft documentation on local server. The aim is to have the different aspects of the quality checks properly documented in 2025.

Data storage

National database:

NA. A new solution for data storage is planned for during the upcoming WP period where data will be included in a national database for improved quality assurance and data retrieval.

International database:

NA. Aggregated data delivered to ICES and NASCO.

Quality checks and data validation documentation:

Documentation on local server. Work in progress to develop quality checks and data validation and e.g. the latest annual data set is compared to data from previous years to identify eventual outliers. The aim is to have the different aspects of the quality checks and data validation properly documented in 2025.

Sample storage

Storage description:

NA (neither samples nor any other biological variables are collected).

Sample analysis:

NA.

Data processing

Evaluation of data accuracy (bias and precision):

N. Draft documentation on local server. The aim is to have the different aspects of the data accuracy properly documented in 2025.

Editing and imputation methods:

N. Draft documentation on local server. The aim is to have the different aspects of the data handling properly documented in 2025.

Quality document associated to a dataset:

No DOI yet created. No estimations are made, hence documentation of these not relevant.

Validation of the final dataset:

Data accuracy is validated by comparing number of stocked individuals between years to identify eventual outliers (in overall magnitude). However, it is difficult to identify consistent shortcomings since both number of sites and number of stocked salmon and sea trout per life stage respectively can differ from year to year.

Sampling scheme identifier: Recreational river catches Salmon-Sea trout

MS : SWE

Region: All regions

Sampling scheme identifier: Recreational river catches Salmon-Sea trout

Sampling scheme type: Recreational (off site surveys)

Observation type: Self water body

Time period of validity: 2025-2027

Short description:

Total yearly catches of anadromous Salmon and Sea trout (+ catch and release) caught by recreational anglers during the freshwater phase. Catch data are collected from the organizations managing the fishery in the river. The management organizations are enquired to report actual catch reports and expert estimate of non-reported catch.

Description of the population

Population targeted:

Organisations managing recreational angling in all rivers identified as wild salmon rivers by WGNAS or WGBAST.

Population sampled:

Census of all known organizations (freshwater fishing rights are owned and managed by landowners, who either individually or in collaboration with other landowners, sell permits to fish in specific areas). Not reached are some small areas where no organized fishing occurs, these areas are small and the catches are assumed negligible. For Sea trout catches in (smaller) rivers not identified as wild salmon rivers are not included.

Stratification:

None

Sampling design and protocols

Sampling design description:

PSU: Census of all known organiszations.

Sampling area: SE_Inla

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

NA

Regional coordination:

N

Link to sampling design documentation

https://www.slu.se/qualityassurance

Design follows international recommendations:
Y, sampling accepted by ICES.

Description of sampling design is available at www.slu.se/qualityassurance

Relevant expert or coordination groups for this sampling: Data requested by WGBAST, WGNAS and NASCO.

Link to sampling protocol documentation:

https://www.slu.se/qualityassurance

Protocol follows international recommendations:
Y, sampling accepted by ICES.

Relevant expert or coordination groups for this sampling: Data used by WGBAST, WGNAS and NASCO.

Sampling implementation

Recording of refusal rate:

N. Refusals are registered for some parts of the data collection. Full refusal documentation will be possible first after legal obligation for recreational catch reporting is implemented.

Monitoring of sampling progress within the sampling year:

Catch and C&R statistics are compiled at the end of the year. Reporting is voluntary.

Data capture

Means of data capture:

Mailed enquiries and phone interviews.

Data capture documentation: https://www.slu.se/qualityassurance **Quality checks documentation:**

N. One major disadvantage of voluntary reporting is that it is very difficult to identify and follow up on shortcomings in reporting.

Data storage

National database:

NA

International database:

Aggregated data delivered to ICES and NASCO

Quality checks and data validation documentation:

One major disadvantage of voluntary reporting is that it is very difficult to identify and follow up on shortcomings in reporting.

Sample storage

Storage description:

NA

Sample analysis:

NA

Data processing

Evaluation of data accuracy (bias and precision):

N. The catch and C&R estimates of salmon is of varying quality depending on river/organization (Björkvik et al., 2014). In some rivers there is both a culture and an infrastructure to collect catch reports and close to 100% of all fish caught are reported, in other rivers the willingness to report can be very low.

Björkvik, E., Dannewitz, J., Palm, S., Stridsman, S., & Östergren, J. (2014). Översyn av fångststatistiken inom fritidsfisket efter lax i Östersjön (No. SLU.aqua.2014.5.5-334) (s. 17). Drottningholm: SLU Aqua.

Editing and imputation methods:

In recreational fishing, where a large proportion of the catch is released, the weight is often not reported. Scripts are used to impute missing weights.

Quality document associated to a dataset:

No DOI.

N. One major disadvantage of voluntary reporting is that it is very difficult to follow up and identify shortcomings in reporting.

Validation of the final dataset:

Data accuracy is validated by comparing numbers to previous years to identify outliers but it is difficult to follow up and identify consistent shortcomings in the recreational catch reporting as it is voluntary.

Related to Table 2.4 [and Text Box 2.4] (Recreational fisheries)

Sampling scheme identifier: RecSelfOnshore - Offsite SCB

MS: SWE

Region: Baltic Sea and North Sea and Eastern Arctic

Sampling scheme identifier: RecSelfOnshore - Offsite SCB

Sampling scheme type: recreational (off site surveys)

Observation type: SelfOnShore

Time period of validity: 2025-2027

Short description (max 100 words):
A web and postal questionnaire aiming at collecting data (e.g. number of fishing days, gear days and catches) from recreational fishing for several species, including the species listed in Table 4, Commission Delegated Decision (EU) 2021/1167, in the Swedish part of regions Baltic Sea and North Sea.

Description of the population

Population targeted:
The primary sampling units are permanent residents in Sweden of age 16-80. The questionnaire will be sent out at three occasions each year, with questions regarding fishing activities in the most recent four months. The periods consist of fishing during January-April (tertial 1), May-August (tertial 2) and September-December (tertial 3) respectively. For tertial 1 and 3 the number of questionnaires is 5 600 per tertial. Tertial 2 have the double amount of questionnaires, 10 800.

Population sampled:

A panel approach is used in the sampling. From the target population, respondents are randomly selected for the first panel (ca. 43% of the total number of questionnaires). To increase the number of answers a panel design is implemented. Both respondents who fish and non-fishers have a probability of being sampled in the upcoming panels (ca 19% of the total amount of questionnaires for each panel).

Stratification:
The population is stratified by six different geographical regions in Sweden and by age and gender.

Sampling design and protocols

Sampling design description:
The sampling design is a one-stage panel approach. For each four-month period (Jan-Apr, May-Aug, Sep-Dec) or survey round, a sample of Swedish residents (PSUs) is selected. The sample for a given survey round is composed of four panels. One panel consists of a new stratified simple random sample of individuals from the Register of the Total Population (RTB). The remaining three panels consist of individuals selected in earlier survey rounds; mainly individuals who reported that they had been fishing. The aim of this rather complex design is to secure inclusion of as many anglers as possible in the sample, even though anglers are quite rare in the sampling frame (the RTB). For details on the design, see the survey documentation. The sampling scheme applies to the catch fractions "retained" and "released".

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

Regional coordination:
No

Link to sampling design documentation:
https://www.havochvatten.se/download/18.5a0c1a2c18fa6d6097b7aded/1717155835132/officiell-statistik-kvalitetsdeklaration-2023.pdf

https://www.havochvatten.se/download/18.5a0c1a2c18fa6d6097b7adee/1717155835152/officiell-statistik-statistikens-framstallning-2023.pdf

Design follows international recommendations:

Y

Link to sampling protocol documentation:
https://www.havochvatten.se/download/18.5a0c1a2c18fa6d6097b7aded/1717155835132/officiell-statistik-kvalitetsdeklaration-2023.pdf

https://www.havochvatten.se/download/18.5a0c1a2c18fa6d6097b7adee/1717155835152/officiell-statistik-statistikens-framstallning-2023.pdf

Protocol follows international recommendations:

Y

Sampling implementation

Recording of refusal rate:
Y

Monitoring of sampling progress within the sampling year:

The first mailing to the target population contains login information to the web questionnaire. Three written remainders will be performed, again with login details, but also a written questionnaire. The sampling progress is closely monitored during each period. The response rate has been stable with low volatility the last 24 sampling periods (8 years).

Data capture

Means of data capture:
Web and paper questionnaire.

Data capture documentation:
https://www.havochvatten.se/download/18.5a0c1a2c18fa6d6097b7aded/1717155835132/officiell-statistik-kvalitetsdeklaration-2023.pdf

https://www.havochvatten.se/download/18.5a0c1a2c18fa6d6097b7adee/1717155835152/officiell-statistik-statistikens-framstallning-2023.pdf

Quality checks documentation:
Y

https://www.havochvatten.se/download/18.5a0c1a2c18fa6d6097b7aded/1717155835132/officiell-statistik-kvalitetsdeklaration-2023.pdf

https://www.havochvatten.se/download/18.5a0c1a2c18fa6d6097b7adee/1717155835152/officiell-statistik-statistikens-framstallning-2023.pdf

Data storage

National database:
Statistics Sweden, SCB -Statistical Database

International database:
N/A

Quality checks and data validation documentation:
https://www.havochvatten.se/download/18.5a0c1a2c18fa6d6097b7aded/1717155835132/officiell-statistik-kvalitetsdeklaration-2023.pdf

https://www.havochvatten.se/download/18.5a0c1a2c18fa6d6097b7adee/1717155835152/officiell-statistik-statistikens-framstallning-2023.pdf

Sample storage

Storage description:

NA

Sample analysis:

NA

Data processing

Evaluation of data accuracy (bias and precision):
Y

https://www.havochvatten.se/download/18.5a0c1a2c18fa6d6097b7aded/1717155835132/officiell-statistik-kvalitetsdeklaration-2023.pdf

https://www.havochvatten.se/download/18.5a0c1a2c18fa6d6097b7adee/1717155835152/officiell-statistik-statistikens-framstallning-2023.pdf

Editing and imputation methods:

Y. On internal server. See also:
https://www.havochvatten.se/download/18.5a0c1a2c18fa6d6097b7aded/1717155835132/officiell-statistik-kvalitetsdeklaration-2023.pdf

https://www.havochvatten.se/download/18.5a0c1a2c18fa6d6097b7adee/1717155835152/officiell-statistik-statistikens-framstallning-2023.pdf

Quality document associated to a dataset:

Has a publication digital object identifier (DOI) been created?
N
Is there a document summarising the estimation process that has been followed?
Y

Validation of the final dataset:

Validation is described in detail in chapter 2.6 here:
https://www.havochvatten.se/download/18.5a0c1a2c18fa6d6097b7adee/1717155835152/officiell-statistik-statistikens-framstallning-2023.pdf

Sampling scheme identifier: Baltic Sea trolling catches salmon

MS : SWE
Region: Baltic Sea
Sampling scheme identifier: Baltic Sea trolling catches salmon
Sampling scheme type: recreational (on site surveys)
Observation type: SciObsOnShore
Time period of validity: 2025-2027
Short description: Estimates of Swedish trolling catches in the Baltic region are made annually based on an on-site study (using probability-sampling methods) in Simrishamn, the most important Swedish trolling harbor, during the high season from March to April or May. 'Harbor days', divided by weekdays and weekends/holidays, are either sampled randomly or divided across the season to ensure temporal coverage. During a sampled day, one fishermen per trolling boat returning to harbor are interviewed (voluntary participation), and data on landed and released catch is collected. The estimated total catch from this important trolling harbor is interpolated to estimate the effort and catch during days between sampling. These estimates are then summed up for the whole season, i.e. March to April or May. The aim is to refine and develop the collection of the recreational salmon catch data and therefore the approach may change during 2025-2027.
Description of the population

Population targeted:

Trolling boats returning to Simrishamn harbor after fishing

Population sampled:

Trolling boats returning after fishing during sampling days.

Part of the target population is unreachable for sampling: Trolling boats returning after fishing during days when no sampling occur.

Stratification:

Sampling days are divided between weekdays and weekends/holidays, to ensure that enough days were sampled on weekends/holidays when fishing is assumed to be more intense.

Sampling design and protocols

Sampling design description:

PSU: Trolling boats returning to Simrishamn harbor after fishing

SSU: Trolling boats returning to Simrishamn harbor after fishing during sampling days.

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

NA

Regional coordination:

N

Link to sampling design documentation

N, Documentarian on local server.

Design follows international recommendations:
Y, sampling accepted by ICES.

Relevant expert or coordination groups for this sampling: Data used by WGBAST and WGTRUTTA.

Link to sampling protocol documentation:

N, Documentarian on local server.

Protocol follows international recommendations:
Y, sampling accepted by ICES.

Relevant expert or coordination groups for this sampling: Data used by WGBAST and WGTRUTTA.

Sampling implementation

Recording of refusal rate:

The number of boats refusing to participate is recorded. The catch for these non-participating boats is estimated as the average catch of the participating boats on the same day.

Monitoring of sampling progress within the sampling year:

No adjustments to the sampling allocation are done within a year.

Data capture

Means of data capture:

Catch reports, counting of trolling boats and interviews (species, length, weight, sex, wild/reared origin, C&R) in Simrishamn.

Data capture documentation:

Documentarian on local server. The aim is to have the different aspects of the data processing and quality checks properly documented in 2025.

Quality checks documentation:

N. Documentarian on local server. The aim is to have the different aspects of the data processing and quality checks properly documented in 2025.

Data storage

National database:

No national database has yet been developed. Development work is in progress. Data stored on local server.

International database:

Aggregated data delivered to ICES

Quality checks and data validation documentation:

Documentarian on local server. Work in progress to create national database.

Sample storage

Storage description:

NA (no samples are collected)

Sample analysis:

NA (no samples are collected)

Data processing

Evaluation of data accuracy (bias and precision):

It is difficult to follow up and identify bias and precision in the questionnaire answers as it is voluntary and depend on the truthfulness of the answers.

Editing and imputation methods:

Documentarian on local server.

Quality document associated to a dataset:

N, no DOI.

Validation of the final dataset:

Data accuracy is validated by comparing numbers to previous years to identify outliers but it is difficult to follow up and identify consistent shortcomings in the recreational catch reporting as it is voluntary.

Sampling scheme identifier: Baltic Sea trap net catches salmon

MS : SWE

Region: Baltic Sea

Sampling scheme identifier: Baltic Sea trap net catches salmon

Sampling scheme type: recreational (off site surveys)

Observation type: SelfOnShore

Time period of validity: 2025-2027

Short description:

Estimates of total landed catch (per year) in this recreational fishery will be carried out on a triennial basis. The next survey is planned for 2027 where the same methodology as in 2022-2024 preliminary will be used. This methodology is based on that recreational trap net fishermen after the salmon fishing season a specific year are being interviewed about where and when they have been fishing. Estimated landed catch for each of the identified trap nets is then calculated by relating collected information (location and fishing period) to the monthly CPUE in the commercial trap net fisheries in the same area. Prior contacting the group of fishermen, information on active fishermen is collected via interviews and enquiries addressed to a selected group of people in relevant coastal areas, e.g. active commercial fishermen and recreational trap net fishermen known to have been active previous years.

The overall aim is to refine and develop the collection of the recreational salmon catch data and therefore the approach may change.

Description of the population

Population targeted:

The total population of active recreational coastal trap net fishermen targeting salmonids during the salmon spawning migration period is planned to take part in the survey.

Main target species: Baltic salmon *Salmo salar*

Main survey area: SD 30-31

Population sampled:

Part of the target population sampled: All active recreational coastal trap net fishermen targeting salmon are planned to be included in the survey.

Part of the target population is unreachable for sampling: Eventual refusals to respond to the survey will have an impact on the census approach. As will difficulties identifying and getting in contact with the entire target population.

Stratification:

Stratification: Geographically the survey is focusing on SD 30-31 where the vast majority of salmon in recreational trap net fishery are caught.

Sampling design and protocols

Sampling design description:

PSU: Recreational coastal trap net fishermen. SSU: Number of trap nets (where and when)

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

NA

Regional coordination:

N

Link to sampling design documentation:

Draft documentation on local server. The sampling design has a census approach where data are planned to be collected from the whole targeted population. The aim is to refine and develop the collection of the recreational salmon catch data and therefore the approach may change during the program period and before final documentation can be in place.

Design follows international recommendations:
N (no internal recommendation regarding sampling design of this fishery is yet available).

Relevant expert or coordination groups for this sampling: Mainly WGBAST (ICES).

Link to sampling protocol documentation:

Draft documentation on local server. The sampling protocol of the enquiry/enquires consists of interview questions in a standardized format together with general instructions on how the results are compiled.

Protocol follows international recommendations:
N (no internal recommendation regarding sampling protocol of this fishery is yet available)

Relevant expert or coordination groups for this sampling: Mainly WGBAST (ICES).

Sampling implementation

Recording of refusal rate:

Y. Information on eventual non-responses is compiled year by year.

Monitoring of sampling progress within the sampling year:

No adjustments to the sampling allocation are done within a year. However, methods to collect and estimate the recreational catches of salmon are under revision and development and may change during the program period.

Data capture

Means of data capture:

By interviewing all identified recreational coastal salmon trap net fishermen, location and fishing period of each trap net is collected by year. The fishermen are also asked to summarize their total (landed) catch of salmon during the trap net fishing season. Staff from the regional County Administrative Boards are responsible for this work.

Data capture documentation:

N. Draft documentation on local server including a manual with interview questions in a standardized format.

Quality checks documentation:

N. Ongoing work. Draft documentation on local server.

Data storage

National database:

No national database is yet in place. Ongoing work to develop an existing or eventual new national database is underway. Data stored on local server.

International database:

Aggregated data delivered to ICES.

Quality checks and data validation documentation:

Documentation on local server. Work in progress to develop quality checks and data validation.

Sample storage

Storage description:

NA (no samples are collected)

Sample analysis:

NA

Data processing

Evaluation of data accuracy (bias and precision):

N. Work ongoing. Draft documentation on local server.

Editing and imputation methods:

N. Work ongoing. Draft documentation on local server.

Quality document associated to a dataset:

N (no DOI yet created)

N Draft documentation summarizing eventual estimation process is stored on local server.

Validation of the final dataset

Data accuracy is validated by comparing number of identified fishermen and the information they supply to information collected previous years. However, it is difficult to follow up and identify consistent shortcomings in the recreational catch and effort reporting as it is voluntary.

Sampling scheme identifier: Baltic Sea angling catches sea trout

MS : SWE

Region: Baltic Sea

Sampling scheme identifier: Baltic Sea angling catches sea trout

Sampling scheme type: recreational (on site surveys)

Observation type: SciObsOnShore

Time period of validity: 2025-2027

Short description:

Estimates of recreational sea trout coastal catches will be carried out in 2025-2027, based on an on-site study (using probability sampling methods) on selected areas of the coast during high season. During a sampled day, all fishermen willing to participate are interviewed and data on landed and released catch is collected. The estimated catch from the sampled areas and time period will be extrapolated to relevant season(s) and relevant sections of the coast, using assumptions about the fishery. The first year(s), the study will be carried out on parts of the Swedish south coast, and if relevant, continued following year(s) on other parts of the Swedish coast.

Description of the population

Population targeted:

Recreational sea trout fishermen.

Population sampled:

Part of the target population sampled: Selection of fishermen are interviewed during fishing.

Part of the target population is unreachable for sampling: Survey will be restricted to the most important coastal areas on the Swedish south coast for fishing during subsampled days of the fishing seasons.

Stratification:

Stratification: The time period will be stratified in weekdays and weekend/holidays and equal number of area*days will be sampled in each strata. Stratification will be done to ensure that enough days are sampled on weekends/holidays when fishing is assumed to be more intense.

Sampling design and protocols

Sampling design description:

PSU: areas*days

SSU: fishermen interviewed during fishing

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

NA

Regional coordination:

N

Link to sampling design documentation:

Follows recommendations in Pollock et al. 1994.

Angler survey methods and their applications in fisheries management | SpringerLink

The methods to estimate catch and effort are under development and may change from year to year in the coming program period.

Design follows international recommendations:

Y, sampling accepted by ICES and Follows recommendations in Pollock et al. 1994.

(Pollock, K. H., Jones, C. M., & Brown, T. L. (1994). *Angler survey methods and their applications in fisheries management*. American Fisheries Society.)

Relevant expert or coordination groups for this sampling: Data used by WGBAST and WGTRUTTA.

Link to sampling protocol documentation:

Angler survey methods and their applications in fisheries management | SpringerLink

Protocol follows international recommendations:

Y, sampling accepted by ICES.

Relevant expert or coordination groups for this sampling: Data used by WGBAST

Sampling implementation

Recording of refusal rate:

Number of fishermen refusing to participate is registered. The catch on refusing fishermen is imputed as the mean catch on participating fishermen on the same day.

Monitoring of sampling progress within the sampling year:

No adjustments to the sampling allocation are done within a year. However, methods to estimate catch from recreational fishermen are under development and may change from year to year in the coming program period

Data capture

Means of data capture:

Catch reports, counting of fishermen and interviews (species, length, weight, sex, wild/reared origin, C&R) in stratified coastal areas.

Data capture documentation:

Pollock, K. H., Jones, C. M., & Brown, T. L. (1994). Angler survey methods and their applications in fisheries management. American Fisheries Society

Quality checks documentation:

Documentarian on local server. The aim is to have the different aspects of the data processing and quality checks properly documented.

Data storage

National database:

No national database has yet been developed. Development work is in progress. Data stored on local server.

International database:

Aggregated data delivered to ICES (WGBAST and WGTRUTTA)

Quality checks and data validation documentation:

Documentarian on local server. Work in progress to create national database.

Sample storage

Storage description:

NA (no samples are collected)

Sample analysis:

NA

Data processing
Evaluation of data accuracy (bias and precision): Documentarian on local server. The aim is to have the different aspects of the data processing and quality checks properly documented. **Editing and imputation methods:** Documentarian on local server. **Quality document associated to a dataset:** N **Validation of the final dataset** Data accuracy is validated by comparing numbers to previous years to identify outliers but it is difficult to follow up and identify consistent shortcomings in the recreational catch reporting as it is voluntary.

Related to Table 2.5 [and Text Box 2.5, 4.2] (Sampling plan description for biological data/ Incidental catches of sensitive species)

Sampling scheme identifier: Baltic SPF regional

MS : SWE
Region: Baltic Sea
Sampling scheme identifier: Baltic SPF regional
Sampling scheme type: Commercial fishing trip
Observation type: SelfAtSea
Time period of validity: 2025-2027 ~~fully implemented~~
Short description (max 100 words): See RWP Baltic 2025-2027
Description of the population
Population targeted: **Population sampled:** **Stratification:**
Sampling design and protocols
Sampling design description: **Is the sampling design compliant with the 4S principle?:** **Regional coordination:** This is a regional coordination of sampling in the Baltic. **Link to sampling design documentation:** **Design follows international recommendations:**

Link to sampling protocol documentation: **Protocol follows international recommendations:**
Sampling implementation
Recording of refusal rate: **Monitoring of sampling progress within the sampling year:**
Data capture
Means of data capture: **Data capture documentation:** **Quality checks documentation:**
Data storage
National database: **International database:** **Quality checks and data validation documentation:**
Sample storage
Storage description: **Sample analysis:**
Data processing
Evaluation of data accuracy (bias and precision): **Editing and imputation methods:** **Quality document associated to a dataset:** **Validation of the final dataset:**

Sampling scheme identifier: CommSelfAtSea – Selected species/stocks

MS: SWE
Region: All regions
Sampling scheme identifier: CommSelfAtSea – selected species/stocks
Sampling scheme type: Commercial fishing trip
Observation type: SelfAtSea
Time period of validity: 2025-2027
Short description: The sampling scheme aims to collect length and age samples at-sea from selected species/stocks (herring, sprat, northern shrimp, eel) from the catches of Swedish commercial vessels operating in ICES Subareas 27.3 and 27.4 using self-sampling. The scheme encompasses a set of sub-schemes: a) small-pelagic targeting herring and sprat in 27.3.a-d.20-29 and 27.4, b) small pelagic targeting herring in 27.3.d.30-31, c) small pelagic targeting vendance in 27.3.d.31, d) demersal northern shrimp trawlers without fish tunnel in 27.3.a,

and c) eel in poundnets in 27.3.d.25 and 27.3.d.27. The sub-schemes distribute and operationalize sampling activities between the three labs involved in sampling.

Description of the population

Population targeted:

All Swedish vessels participating in the a) herring and sprat fisheries of Subareas 27.3 and 27.4, b) vendance fishery in Subdivision 27.3.d.31, c) northern shrimp fishery in Division 27.3.a. and Subarea 27.4, and d) poundnet fishery in Subdivisions 27.3.d.25 and 27.3.d.27. Primary sampling unit are vessel, vessel*week, weeks or vessel*month, depending on the sub-scheme (see details under Sampling design description)

Population sampled:

The small-pelagic targeting herring and sprat in 27.3.a-d.20-29 and 27.4 sub-scheme samples fishing trips from the most important Swedish vessels participating in consumption and industrial small-pelagic fisheries for herring and sprat. A part of the sampling carried out in this sub-scheme is regionally coordinated under RCG Baltic.

The small pelagic targeting herring in 27.3.d.30-31 sub-scheme samples fishing trips from the most important Swedish vessels participating in consumption and industrial small-pelagic fisheries for herring.

The small pelagic sub-scheme targeting vendace in 27.3.31 sub-scheme samples fishing trips from the main Swedish vessels participating in the small pelagic vendace fishery.

The eel in poundnets in 27.3.d.25 and 27.3.d.27 sub-scheme samples fishing trips from the main eel fishery using passive pound nets.

The demersal northern shrimp trawlers without fish tunnel in 27.3.a sub-scheme samples fishing trips from vessels involved in the northern shrimp trawl fishery without fish tunnel in Division 27.3.a.

Out of the frame of this sampling scheme are the Swedish vessels not included in its sampling frame. A significant proportion of the activity of these out-of-frame vessels is covered by other sampling schemes.

Stratification:

The small-pelagic targeting herring and sprat in 27.3.a-d.20-29 and 27.4 sub-scheme is stratified into 6 non-overlapping lists of vessels. The stratification aims to achieve good spatial coverage over the broad geographical range of the fisheries as well as adequate number of samples and representation of fishing for human consumption and industrial uses. The following strata are considered:

1. Main vessels participating in the herring and sprat fisheries using active gears with main catches both in the Central Baltic and in the North Sea, 27.3.a-d.20-29, 27.4. These vessels are sampled in regionally coordinated way.
2. Main vessels participating in the herring and sprat fisheries using active gears with main catches mostly in the Central Baltic and South Baltic, 27.3.d.24-29. These vessels are sampled in regionally coordinated way.
3. Main vessels participating in the herring and sprat fisheries using active gears with main catches mostly in the North Sea, 27.3.a, 27.4
4. Main vessels participating in the herring fishery using passive gears with main catches in the South Baltic, 27.3.b-d.23-24
5. Main vessels participating in the herring fishery using passive gears with main catches in the Central Baltic, 27.3. d.25-29
6. Main vessels participating in the herring and sprat fisheries using active gears with main catches in 27.3.a during Q1 and Q4

The small pelagic targeting herring in 27.3.d.30-31 sub-scheme is stratified into two regions in the Gulf of Bothnia. The basis for this stratification is to achieve good spatial coverage over the broad geographical range of the fisheries as well as adequate number of samples and representation of fishing for human consumption and industrial uses. The following strata are considered:

1. Main Swedish vessels participating in the herring fishery using active gears in subdivisions 27.3.d.30, not elsewhere included.
2. Main Swedish vessels participating in the herring fishery using passive gears in subdivisions 27.3.d.30.
3. Main Swedish vessels participating in the herring fishery using passive gears in subdivisions 27.3.d.31

The small pelagic sub-scheme targeting vendance in 27.3.31 is stratified into 5 areas. The basis for this stratification is to achieve a good spatial coverage of the main geographical range of the fishery. The following strata are considered:

1. Main Swedish vessels participating in the vendace fishery using active gears in subdivisions 27.3.d.31, area 1.
2. Main Swedish vessels participating in the vendace fishery using active gears in subdivisions 27.3.d.31, area 2.
3. Main Swedish vessels participating in the vendace fishery using active gears in subdivisions 27.3.d.31, area 3.
4. Main Swedish vessels participating in the vendace fishery using active gears in subdivisions 27.3.d.31, area 4.
5. Main Swedish vessels participating in the vendace fishery using active gears in subdivisions 27.3.d.31, area 5.

The eel in poundnets in 27.3.d.23 and 27.3.d.25,27 sub-scheme is stratified in to 2 subdivisions. The basis for this stratification is to achieve a good spatial coverage of the main geographical range of the fishery. The following strata are considered:

1. Swedish vessels participating in the eel fishery using passive pound nets in subdivisions 27.3.b.25.
2. Swedish vessels participating in the eel fishery using passive pound nets in subdivisions 27.3.b.27.

27.3.b.23 previously included in this sampling scheme is sampled in Fisheries independent coastal eel (see text box 2.3). After closure of the fishery which has now been reopened. The current closed period covers the peak migration and few fishers remain and use smaller gear types.

The demersal northern shrimp trawlers without fish tunnel in 27.3.a sub-scheme consists of a single stratum containing the vessels fishing northern shrimp with trawls without fish tunnel. The remainder of the northern shrimp fishery is covered under scheme CommSciObsAtSea. The basis for this separation is the low level of fish discards observed in this fishery.

Sampling design and protocols

Sampling design description:

The small pelagic sub-scheme targeting herring and sprat in 27.3.a-d.20-29 and 27.4 is a stratified multi-stage cluster sampling design where a random draw of vessels is taken using SRSWOR from pre-defined lists every week of each quarter. In such a set-up vessel*week is considered the PSU. Each week vessels are contacted and asked to collect samples from a trip starting the following week (SSU). In each haul/set (TSU) registering herring or sprat in the trip a sample of 3-5 kg (QSU) is collected from the catch. In the lab the boxes are stratified by subdivision and a subsample of 2 to 4 hauls analyzed.

The small pelagic targeting herring in 27.3.d.30-31 sub-scheme is a stratified multi-stage cluster sampling design where vessels are selected systematically without replacement, or on an ad-hoc basis, from lists of vessels active in the trawl (SD30) or gillnet fishery (SD30-31), respectively. PSUs are Vessel*week (trawl fishery) and vessel*month (gillnet fishery). Trips (2SU) are selected ad-hoc from a hypothetical list of trips (trawl fishery) or from a list of trips from the fishermen (gillnet). In the trawl fishery, 1 box (4SU) of unsorted 20-25kg catch is sampled from a hypothetical list of hauls (3SU) selected by the fishermen, In the gillnet fishery, one box (3SU) 20kg landings and 5kg discard is randomly sampled from the catch of the trip. (See sampling overview table below.)

The small pelagic sub-scheme targeting vendance in 27.3.31 is a stratified multi-stage cluster sampling design where 3 weeks (PSU) for sampling are selected systematically without replacement (w. 1, 3 and 5) from the vendace spawning period in September-October, in five local fishing areas in SD31. From a list of vessels fishing in the area, 1 vessel pair (per week/per local area, 2SU) is randomly selected, and from one unsorted landing from a random vessel trip (3SU), a random subsample (about 10 liters) is taken for estimation of the total catch composition in terms of size and weight. (See sampling overview table below.)

The eel in poundnets in 27.3.d.25 and 27.3.d.27 sub-scheme: Sampling is set up by contacting preselected fishermen. In connection with their silver eel pound net fishery, the fishermen sign up on a yearly basis for

1) a number of métier sampling trips and 2) collection of eels for stock sampling. Additionally, it is possible to sign up for recording effort and eel landings in a voluntary daily logbook. These data are a complement to the official landing statistics and may also include discards and seal- and bird-induced damage. Each fisherman can have several vessels. Observers choose which trip they visit the fishermen to perform the métier sampling. Set-up: 1 fisherman in SD 25 and SD 27 respectively.

Note that the commercial fishery for eel in Baltic is heavily restricted and in decline. Significant management measures are likely to further restrict fishing activity for eel. To ensure a robust future assessment of eel on the Swedish Baltic coast a fisheries independent survey will be required. In addition, due to the ongoing evaluation of the Swedish eel management plan (as detailed above under "General" in text box 2.3), where the current one EMU (SE_Total) could potentially be revised and changed to three EMU's (SE_East, SE_West, SE_Inland), this would require additional, dedicated, sampling on the Baltic coast. In order to prepare for a fisheries independent program on the Baltic coast, the current survey on the west coast (text box 2.3) should be evaluated, needs for potential changes to the current survey should be identified, and methods for a new fisheries independent survey on the Baltic coast should be determined. With potential implementation 2028-2031 in complement to the current sampling scheme.

The demersal northern shrimp trawlers without fish tunnel in 27.3.a sub-scheme: A stratified multi-stage cluster sampling design is used. Each quarter a random draw of vessels (PSUs) is taken from a pre-defined list using UPSWOR proportional to number of trips the vessels did in the fishery*area combination during previous year. Selected vessels are then informed, and a trip date agreed (SSU). In the last haul (TSU) of that trip, one box of unsorted catches is collected from the catch by the fishermen (QSU). The box, considered representative of shrimp-like species, is analysed in the lab

An overview of sampling design, including details on sampling protocol for biological variables, is given in tables below.

The small-pelagic targeting herring and sprat in 27.3.a-d.20-29 and 27.4 sub-scheme

	Sampling frame	**Sampling unit**	**Stratification**	**Selection Method**	**Sampling effort**
1SU	List of weeks* main vessels participating in the herring and sprat large scale fisheries using active gears with main catches both in the Central Baltic and in the North Sea)	Vessel*week	Quarterly	Weekly random draw from vessel list with equal probability without replacement	1-5 (dependent on stratum)
2SU	Hypothetical list of trips from vessel	Fishing Trip	---	A trip the following week	1 (per vessel)
3SU	Hypothetical list of hauls in trip	Haul	During the trip: none In the lab: By subdivision	During the trip: census In the lab: Simple random sampling among hauls arriving from each subdivision	During the trip: census In the lab: 2-4 hauls containing sprat and/or herring per subdivision
4SU	Hypothetical list of baskets in haul	Basket	---	1 basket from every haul	1 final basket (per haul)
5SU	Hypothetical list of individuals caught in basket	Individuals	---	Random subsample	Max 50 individuals per species.

					Length and age are determined for all individuals sampled (*)

(*) Herring samples from 27.3.a and 27.4 are further characterized with regards to the presence of nematodes; Herring samples from 27.3.d are further characterized with regards to intestinal fat, nematodes, and *Ichthyophonus*.

Small pelagic targeting herring in 27.3.d.30-31 sub-scheme

Stratum: Passive SmallPelagics HER - 27.3.d.30, Passive SmallPelagics HER - 27.3.d.31

	Sampling frame	Sampling unit	Stratification	Selection Method	Sampling effort
1SU	Hypothetical list of **vessel*weeks from** vessels active in the fishery	Vessel*Week	Quarter	Systematic (every fourth week, randomly select the first week); vessels selected without replacement	3
2SU	Hypothetical list of trips	Trip	---	Ad-hoc	1 Trip
3SU	Hypothetical list of hauls in trip	Haul	---	Ad-hoc (selected by the fishermen)	1 haul
4SU	Hypothetical list of boxes	Box	---	20-25 kg unsorted	1 box
5SU	Individuals in the box	Individual	Species	Census (length of all species)	---

Stratum: Active SmallPelagics HER - 27.3.d.30

	Sampling frame	Sampling unit	Stratification	Selection Method	Sampling effort
1SU	List of vessels active in the gillnetter fisheries	Vessel*Month	Quarter	Ad-hoc	3
2SU	List of trips from fishermen	Trip	---	Ad-hoc	1 (month) In total 6 trips in one year
3SU	Catch of the trip	Box	Landings (20kg) and discards (5kg)	Ad-hoc (random)	1
4SU	Individuals in the sample (box)	Individuals	Species Biology (only Herring): Length	Census (all lengths measured)	Length: all ind. Biology: 20 ind

			stratified (half cm)	Biology: Random sampling within length class until quarterly goals are achieved	(otoliths, length (mm), weights, maturity, sex) per size class and quarter

Small pelagic sub-scheme targeting vendance in 27.3.31

	Sampling frame	Sampling unit	Stratification	Selection Method	Sampling effort
1SU	List of weeks of the year (Sept-Oct 5 weeks)	Week		Systematic (1st, 3rd and 5th week samples)	3 weeks
2SU	List of vessels (fishing in the area)	Vessels	Five fishing areas within subdivision 31	"Random" selection from vessel list	1 vessel pairs (per week/per area)
3SU	Hypothetical list of trips (from that vessel)	Trip landing		Ad-hoc (convenience)	1 (per vessel)
4SU	Hypothetical list of bins of the landed fish	Bin	Species Biology (only Herring): Length stratified (half cm)	From the middle of the landing	1 bin
5SU	Hypothetical list of 10 L bucket in the bin	Bucket 10 L	---	Ad-hoc	1 bucket
6SU	All individuals in the bucket	Individual (species, individual length, weight and sex)	All length and recorded 0.5 cm groups	Census	Length: all individuals in bucket
7SU	Vendace in the bucket	Individual (Weight of gonads, maturity, age)		Ad-hoc	65-70 in the bucket

The demersal northern shrimp trawlers without fish tunnel in 27.3.a sub-scheme

Sampling frame	Sampling unit	Stratification	Selection Method	Sampling effort

1SU	List of vessels active in the fishery during previous year	Vessel*quarter	Quarterly	random draw from vessel list with unequal probability (probability proportional to number of trips) without replacement	3 (per quarter)
2SU	Hypothetical list of trips from vessel	Fishing Trip	---	ad-hoc	1 (per vessel)
3SU	Hypothetical list of hauls in trip	Haul	---	Last haul	1 (per vessel)
4SU	Hypothetical list of individuals caught in haul	Individuals	Species group (Shrimps)	Sample from the catch taken by fishermen	10 kg sample Sorting by species All species: weight and number Biological analysis of a subsample [length, weight, sex, maturity, parasites]: *Pandalus borealis*

Is the sampling design compliant with the 4S principle?
The small-pelagic targeting herring and sprat in 27.3.a-d.20-29 and 27.4 sub-scheme: Y
The small pelagic targeting herring in 27.3.d.30-31 sub-scheme: Y
The small pelagic sub-scheme targeting vendance in 27.3.31: Y
The eel in poundnets in 27.3.d.25,27 sub-scheme: NA
The demersal northern shrimp trawlers without fish tunnel in 27.3.a sub-scheme: Y
Regional coordination:.
Strata of small pelagic sub-scheme that targeting the herring and sprat fisheries with active gears in the Central Baltic: Y
All remainder: N
Link to sampling design documentation:
The main details of sampling design are given under section “sampling design description” (above). Online documentation accessible to public will be prepared during 2025-2027.
Some additional information:
The small-pelagic targeting herring and sprat in 27.3.a-d.20-29 and 27.4 sub-scheme: Report of the RCG ISSG on small pelagic in the Baltic Sea to the Regional Coordination Group Baltic Meeting 7-11 June 2021.
The demersal northern shrimp trawlers without fish tunnel in 27.3.a sub-scheme:
Design follows international recommendations:

The small-pelagic targeting herring and sprat in 27.3.a-d.20-29 and 27.4 sub-scheme: Y
The small pelagic targeting herring in 27.3.d.30-31 sub-scheme: Y

The small pelagic sub-scheme targeting vendance in 27.3.31: Y
The eel in poundnets in 27.3.d.25,27 sub-scheme: Y
The demersal northern shrimp trawlers without fish tunnel in 27.3.a sub-scheme: Y

Link to sampling protocol documentation:

The main details of the sampling protocols are given under section "sampling design description" (above). Online documentation accessible to public will be prepared during 2025-2027.

Some additional information:

The small-pelagic targeting herring and sprat in 27.3.a-d.20-29 and 27.4 sub-scheme: Report of the RCG ISSG on small pelagic in the Baltic Sea to the Regional Coordination Group Baltic Meeting 7-11 June 2021.
The small pelagic targeting herring in 27.3.d.30-31 sub-scheme: Internal manual of procedures.
The small pelagic sub-scheme targeting vendance in 27.3.31: Internal manual of procedures.
The eel in poundnets in 27.3.d.25,27 sub-scheme: Internal manual of procedures.
The demersal northern shrimp trawlers without fish tunnel in 27.3.a sub-scheme: Internal manual of procedures.

Protocol follows international recommendations:

The small-pelagic targeting herring and sprat in 27.3.a-d.20-29 and 27.4 sub-scheme: Y
The small pelagic targeting herring in 27.3.d.30-31 sub-scheme: Y
The small pelagic sub-scheme targeting vendance in 27.3.31: Y
The eel in poundnets in 27.3.d.25,27 sub-scheme: Y
The demersal northern shrimp trawlers without fish tunnel in 27.3.a sub-scheme: Y

Sampling implementation

Recording of refusal rate:

The small-pelagic targeting herring and sprat in 27.3.a-d.20-29 and 27.4 sub-scheme: Y
The small pelagic targeting herring in 27.3.d.30-31 sub-scheme: Y
The small pelagic sub-scheme targeting vendance in 27.3.31: N. None has turned up so far and therefore a routine for this has not yet been established (the sampling is performed by a sub-contractor). For future work, a routine will be developed during 2025-2027.
The eel in poundnets in 27.3.d.25,27 sub-scheme: Y
The demersal northern shrimp trawlers without fish tunnel in 27.3.a sub-scheme: Y

Monitoring of sampling progress within the sampling year:

The small-pelagic targeting herring and sprat in 27.3.a-d.20-29 and 27.4 sub-scheme: Routine follow-up meetings are organized between staff responsible for the different parts of the sub-scheme. In these meetings checks are kept on progress and issues in vessel contacts, sample shipment/arrival to lab, sample inventorying, biological sampling and data logging. Departures from original plan documented and adjustments made to the sampling design and sampling routines when needed. Staff involved in stock coordination and assessment of the main stocks participates is kept informed of main changes in data ahead of assessment season.

The small pelagic targeting herring in 27.3.d.30-31 sub-scheme: contact with the gillnet fishermen in SD30 are kept during the fishing season in order to follow up on progress and monitor potential changes and/or cancellations of fishing trips. Reserve lists of fishermen are kept in case of such events. Currently, only two vessels are trawling in SD30-31 and both are part of the sampling scheme.

The small pelagic sub-scheme targeting vendance in 27.3.31: New trips can be added to the scheme and sampled if selected original ones are cancelled.

The eel in poundnets in 27.3.d.25,27 sub-scheme: New trips can be added to the scheme and sampled if selected original ones are cancelled.

The demersal northern shrimp trawlers without fish tunnel in 27.3.a sub-scheme: Sample collection, arrival to lab and processing are closely monitored on a weekly basis to secure quarterly goals are achieved. Departures from expectations trigger compensatory measures to secure data to end-users (e.g., sampling additional trips).

Data capture

Means of data capture:

The small-pelagic targeting herring and sprat in 27.3.a-d.20-29 and 27.4 sub-scheme: data capture is made in paper forms. Electronic balances and measuring boards are used in sampling.
The small pelagic targeting herring in 27.3.d.30-31 sub-scheme: data capture is made in paper forms. Waterproof scale to weigh the catch. Measuring board, buckets, protocols, safety equipment life jackets and field clothes, such as rubber boots, big plastic bags, freezers etc. GPS for position. Standard dissection equipment is used for ageing.
The small pelagic sub-scheme targeting vendance in 27.3.31: data capture is made in paper forms. Waterproof scale to weigh the catch. Measuring board, buckets, protocols, safety equipment life jackets and field clothes, such as rubber boots, big plastic bags, freezers etc. GPS for position. Standard dissection equipment is used for ageing.
The eel in poundnets in 27.3.d.25,27 sub-scheme: data capture is made in paper forms. Waterproof scale to weigh the catch. Measuring board, buckets, protocols, safety equipment life jackets and field clothes, such as rubber boots, big plastic bags, freezers etc. GPS for position. Standard dissection equipment is used for ageing.
The demersal northern shrimp trawlers without fish tunnel in 27.3.a sub-scheme: a minimum of paper forms are used. Data capture is generally made using electronic calipers and balances linked directly to the database (FD2).

Data capture documentation:

The small-pelagic targeting herring and sprat in 27.3.a-d.20-29 and 27.4 sub-scheme:
The small pelagic targeting herring in 27.3.d.30-31 sub-scheme:
The small pelagic sub-scheme targeting vendance in 27.3.31:
The eel in poundnets in 27.3.d.25,27 sub-scheme:
The demersal northern shrimp trawlers without fish tunnel in 27.3.a sub-scheme:
Data capture documentation can be found in the field manuals at www.slu.se/qualityassurance.

Quality checks documentation:

The small-pelagic targeting herring and sprat in 27.3.a-d.20-29 and 27.4 sub-scheme: NA
The small pelagic targeting herring in 27.3.d.30-31 sub-scheme: Internal routine checks on main variables are run as data is stored in database FD2.
The small pelagic sub-scheme targeting vendance in 27.3.31: Internal routine checks on main variables are run as data is stored in database FD2.
The eel in poundnets in 27.3.d.25, 27 sub-scheme: NA. Documentation will be available during 2025-2027.
The demersal northern shrimp trawlers without fish tunnel in 27.3.a sub-scheme: Internal routine checks on main variables are run as data is stored in database FD2.

Data storage

National database:

The small-pelagic targeting herring and sprat in 27.3.a-d.20-29 and 27.4 sub-scheme: FD2
The small pelagic targeting herring in 27.3.d.30-31 sub-scheme: FD2
The small pelagic sub-scheme targeting vendance in 27.3.31: KUL/FD2
The eel in poundnets in 27.3.d.25,27 sub-scheme: KUL
The demersal northern shrimp trawlers without fish tunnel in 27.3.a sub-scheme: FD2

International database:

Small pelagic sub-scheme targeting the herring and sprat fisheries: RDB/RDBES at ICES
The small pelagic targeting herring in 27.3.d.30-31 sub-scheme: InterCatch, RDB/RDBES at ICES
The small pelagic sub-scheme targeting vendance in 27.3.31: RDB/RDBES at ICES
The eel in poundnets in 27.3.d.25,27 sub-scheme: RDB/RDBES at ICES
Demersal sub-scheme targeting northern shrimp trawl fishery without fish tunnel: RDB/RDBES at ICES

Quality checks and data validation documentation:

Internal routine checks on main variables are in place for all schemes within the database FD2 and RDBES.
The small-pelagic targeting herring and sprat in 27.3.a-d.20-29 and 27.4 sub-scheme: Internal routine checks on main variables are in place for all schemes within the database FD2 and RDBES. Complementary checks and outlier analysis are carried out on trip, haul, catch and biological variables using reports from FD2 and R scripts.

The small pelagic targeting herring in 27.3.d.30-31 sub-scheme: Internal routine checks on main variables are in place for all schemes within the database FD2 and RDBES.
The small pelagic sub-scheme targeting vendance in 27.3.31: Internal routine checks on main variables are in place for all schemes within the database FD2 and RDBES.
The eel in poundnets in 27.3.d.25, 27 sub-scheme: Internal routine checks on main variables are in place for all schemes within the database KUL and RDBES.
The demersal northern shrimp trawlers without fish tunnel in 27.3.a sub-scheme: Internal routine checks on main variables are in place for all schemes within the database FD2 and RDBES. Complementary checks and outlier analysis are carried out on trip, haul, catch and biological variables using reports from FD2 and R scripts.

Sample storage

Storage description:
All recent otoliths (and scales in programmes where these are collected) are registered, stored and archived at Havsfiskelaboratoriet in Lysekil. To prevent a large accumulation of archived biological material, samples are sent to the National Archives of Gothenburg at 5 to 10-year intervals. Two archive accounting systems are in place: an older one that contains mostly material from 1929-2012; and a new archive system covering all governmental institutions that runs from 2013 to present. For the small pelagic targeting herring in 27.3.d.30-31 and the small pelagic sub-scheme targeting vendance in 27.3.31sub-schemes, otholiths are stored and archived at Kustlaboratoriet in Öregrund, where also all biological material is registered in the database Oden.
The eel in poundnets in 27.3.d.25, 27 sub-scheme: Whole fish is stored in freezers both at the fishermen and later in freezers at our lab before dissection. When otholits are removed they are stored in the lab and in a safe before they are sent to the age lab. The frozen fish can be stored up to 4 months before sampling, and the otholits are to be age read within 8 months after the first metier sampling. Conservation of the fish (freezing) is usually an agreement between the fisherman and his/her contact at SLU because the fisherman usually has better storage space. Otholiths are stored and archived at Kustlaboratoriet in Öregrund, where also all biological material is registered in the database Oden
Sample analysis:
Biological analysis of the different stocks follows the guidelines established by ICES WGBIOP and associated workshops: https://www.ices.dk/community/Pages/PGCCDBS-doc-repository.aspx.
Information on age preparation and processing, including handbook, is available online https://www.slu.se/institutioner/akvatiska-resurser/kontakt/forskningsinfrastuktur/alderslaboratorier/Metodhandbok-for-aldersanalys-av-fisk/
Additional information:
Small pelagic sub-scheme targeting vendance in 27.3.31 and Eel in poundnets in 27.3.d.25,27 sub-scheme: Sample analysis documentation is currently stored as internal documents at SLU Aqua. After going through a review in 2025-2027, they will be publically available at SLU Aqua's webpage.

Data processing

Evaluation of data accuracy (bias and precision):
Small-pelagic targeting herring and sprat in 27.3.a-d.20-29 and 27.4 sub-scheme, Small pelagic sub-scheme targeting vendance in 27.3.31 and Eel in poundnets in 27.3.d.25,27 sub-scheme: Documentation on analyses done to evaluate data accuracy, including potential biases and precision, will be prepared and made available to the general public during the 2025-2027 period. Additional documentation will be available in RDBES scripts and outputs when that system is in production.
Demersal sub-scheme targeting northern shrimp trawl fishery without fish tunnel: Documentation on analyses done to evaluate data accuracy, including potential biases and precision, will be prepared and made available to the general public during the 2022-2024 period. Additional documentation will be available in RDBES scripts and outputs when that system is in production. Some information on accuracy of estimates produced on the Swedish shrimp fisheries can be found in the form of reports and working documents of the Joint NAFO/ICES Pandalus Assessment Working Group (NIPAG).
Editing and imputation methods:

Small pelagic sub-scheme targeting the herring and sprat fisheries, Small pelagic sub-scheme targeting vendance in 27.3.31 and Eel in poundnets in 27.3.d.25,27 sub-scheme: Documentation on data editing and imputation will be prepared and made available to the general public within the 2025-2027 period. Additional documentation will be available in RDBES scripts and outputs when that system is in production.
Demersal sub-scheme targeting northern shrimp trawl fishery without fish tunnel: Documentation of data editing and imputation will be prepared and made available to the general public within the 2022-2024 period. Additional documentation will be available in RDBES scripts and outputs when that system is in production.

Quality document associated to a dataset:

Small pelagic sub-scheme targeting the herring and sprat fisheries, Small pelagic sub-scheme targeting vendance in 27.3.31 and Eel in poundnets in 27.3.d.25,27 sub-scheme: Documentation of the estimation process will be made available during 2025-2027. Additional documentation will be available in RDBES scripts and outputs when that system is in production.
Demersal sub-scheme targeting northern shrimp trawl fishery without fish tunnel: Work on documenting estimation methods used in this sub-scheme is planned for 2022-2024. Additional documentation will be available in RDBES scripts and outputs when that system is in production. Some information on the main methods used in the production of estimates of the Swedish shrimp fisheries can be found in the form of reports and working documents of the Joint NAFO/ICES Pandalus Assessment Working Group (NIPAG).

Validation of the final dataset:

Small pelagic sub-scheme targeting the herring and sprat fisheries: Final validation takes place when data is compiled at ICES stock coordination level. Work on documenting national level validation routines is planned for 2025-2027.
Small pelagic sub-scheme targeting vendance in 27.3.31: Final validation takes place when data is compiled at the national level annual stock assessment, performed by SLU Aqua at the request of HaV.
Eel in poundnets in 27.3.d.25, 27 sub-scheme: Final validation takes place when data is compiled at ICES WGEEL data meetings.
Demersal sub-scheme targeting northern shrimp trawl fishery without fish tunnel: Final validation takes place when data is compiled at ICES stock coordination level. Work on documenting national level validation routines is being planned for 2022-2024.

Sampling scheme identifier: CommSciObsAtSea – All species

MS: SWE

Region: All regions

Sampling scheme identifier: CommSciObsAtSea – All species

Sampling scheme type: Commercial fishing trip

Observation type: SciObsAtSea

Time period of validity: 2025-2027

Short description:

The sampling scheme aims to collect volume of landings, discards, and bycatches of ETP species, alongside length and age samples from selected species/stocks caught by Swedish commercial vessels operating active and passive gears to target demersal resources in ICES Subareas 27.3 and 27.4 using scientific observers at-sea.

Description of the population

Population targeted:

All Swedish vessels participating in the active and passive fisheries of Subareas 27.3 and 27.4. The PSU is vessel or week.

Population sampled:

Swedish vessels participating in the following active or passive fisheries:

- Northern shrimp fishery using demersal trawl equipped with fish tunnel in subdivision 27.3.a and 27.4
- Norway lobster fishery using demersal trawls equipped using grid in subdivision 27.3.a.20
- Norway lobster fishery using demersal trawls equipped using grid in subdivision 27.3.a.21
- Mixed fishery using demersal trawl in subdivision 27.3.a.20
- Mixed fishery using demersal trawl in subdivision 27.3.a.21
- Norway lobster fishery using pots in subdivision 27.3.a
- Fishery for demersal species using demersal gill or trammel nets in subdivision 27.3.a.21
- Fishery for demersal species using demersal gill or trammel nets in subdivision 27.3.b.23
- Small-pelagic fishery using active gears to target sprat and herring in subdivisions 27.3.d.25-29
- Fisheries with gill or trammel nets in subdivision 27.3.a. and 27.3.b-d.22-29

Not included in sampling are some weeks of the year (e.g., Christmas) and similar fisheries occurring in other subdivisions, and some specific gear*area combinations which catch characterization have not been particularly relevant to main end-users. The most important out-of-frame components are covered by other sampling schemes.

Stratification:

The scheme is to the most extent stratified by area and gear. The basis for stratification is ensuring geographical coverage of the ICES subdivisions alongside existing knowledge on the most common patterns of gear use by vessels operating in each Subdivision. In some cases where patterns in activity across subdivisions are similar, subdivisions were merged. The following strata are considered:

- Active Demersal TrawlPanTun - 27.3.a, 27.4.a
- Active Demersal TrawlNepGrid - 27.3.a.20
- Active Demersal TrawlNepGrid - 27.3.a.21
- Active Demersal TrawlMix - 27.3.a.20
- Active Demersal TrawlMix - 27.3.a.21
- Passive Demersal NepPots - 27.3.a
- Passive Demersal Nets - 27.3.a.21
- Passive Demersal Nets - 27.3.b.23
- Active small pelagic trawls – 27.3.d.25-29 Q1, Q4
- Passive Nets - 27.3.a. and 27.3.b-d.22-29*

*) The stratum Passive Nets - 27.3.a. and 27.3.b-d.22-29 is to some extent overlapping with two other strata (Passive Demersal Nets - 27.3.b.23 and Passive Demersal Nets - 27.3.a.21) but have a different protocol as the main objective within this stratum is to collect data on bycatches of sensitive species such as marine mammals and birds.

Sampling design and protocols

Sampling design description:

All strata but “Passive Demersal Nets - 27.3.b.23”, “Passive Demersal Nets - 27.3.a.21”, “Active small pelagic trawls – 27.3.d.25-29” and “Passive Nets - 27.3.a. and 27.3.b-d.22-29”: A stratified multi-stage cluster sampling

design is used. Each quarter a random draw of vessels (PSUs) is taken from a pre-defined list using UPSWOR proportional to number of trips carried out in that fishery*area combination the previous year. Vessels are sent a letter and a trip date agreed (SSU). Observers are deployed and quantify landings and discards of all species in all hauls (TSU), taking lengths and biological samples (QSU) from a selected number of species and stocks.

Strata "Passive Demersal Nets - 27.3.b.23" and "Passive Demersal Nets - 27.3.a.21" - A stratified multi-stage cluster sampling design is used. A random draw of vessels (PSUs) is taken from the pre-defined lists for each stratum using SRSWOR and trip selection (SSU) are non-probabilistic based on convenience. Sampling hierarchy differs between sensitive species and other species. Sensitive species: On each haul (TSU) eventual bycatch of sensitive species are registered (QSU). All other species: Landings and discards are quantified on each trip (TSU), taking lengths and biological samples (QSU) from a selected number of species and stocks.

Stratum "Active small pelagic trawls – 27.3.d.25-29 Q1, Q4" - A stratified multi-stage cluster sampling design is used. The objective of this stratum is related with method development for by-catch monitoring in this fleet which trips are long and hard to sample with observers at sea. Vessel selection (PSU) and trip selection (SSU) are non-probabilistic based on convenience. Hauls (TSU) are sampled for species composition (multiple baskets) with species present counted, weighed and measured. Different methods of quantification of by-catches will be tested (e.g., cameras).

Stratum "Passive Nets - 27.3.a. and 27.3.b-d.22-29" – A stratified multistage cluster sampling design is used. The area is divided into five sub-areas identified on the basis of bycatch risk for harbor porpoises. Each vessel is assigned to a sub-stratum (statistically: spatial strata based on the sub-areas) depending on its spatial fishing pattern during the previous year. A random draw of vessels (PSUs) is taken from the pre-defined lists for each sub-stratum using SRSWR. The objective of this stratum is primarily to observe potential bycatches of marine mammals, seabirds and other sensitive species. Catches of all species for all catch fractions (including catch damaged by predators) will be recorded but no biological sampling and no length sampling will be carried out (except for the sensitive species).

An overview of sampling design, including details on sampling protocol for biological variables, is given in the tables below.

Stratum: Passive Demersal Nets - 27.3.b.23 and Passive Demersal Nets 27.3.a.21

Sensitive species

	Sampling frame	**Sampling unit**	**Stratification**	**Selection Method**	**Sampling effort**
1SU	List of vessels active in the demersal gillnet fishery during previous year	Vessel*quarter	---	random sample without replacement	2-3 (per quarter dependent on stratum)
2SU	Hypothetical list of trips from vessel	Fishing Trip	---	ad-hoc (dependent on staff availability)	1 (per vessel)
3SU	Hypothetical list of hauls/sets in trip	Haul	---	Census	Census
4SU	All individuals of sensitive species	Individuals	---	Census	Census

	bycaught in the set				

All other species

	Sampling frame	Sampling unit	Stratification	Selection Method	Sampling effort
1SU	List of vessels active in the demersal gillnet fishery during previous year	Vessel	---	random sample without replacement	2-3 (per quarter dependent on stratum)
2SU	Hypothetical list of weekly trips from vessel	Fishing trip	---	ad-hoc (dependent on staff availability)	1 (per vessel)
3SU	All individuals in the trip	Individuals (Length, weight and age)	Species x Catch fraction PLE biology: also 1 cm length classes	Length: Census (random sample if too large) Biology: Census (random sample if too large)	Length: all individuals Biology: COD landings and discards: all otoliths and weights PLE discards: 3 otoliths and individual weights per trip and length class

Stratum: Active small pelagic trawls – 27.3.d.25-29 Q1, Q4

	Sampling frame	Sampling unit	Stratification	Selection Method	Sampling effort
1SU	List of vessels active in the fishery	Vessel	Quarterly (Q1 and Q4 only)	Convenience sample	6 (per quarter)
2SU	Hypothetical list of trips from vessel	Fishing Trip	---	ad-hoc (dependent on staff availability)	1 (per vessel)
3SU	Hypothetical list of hauls in trip	Haul	---	Census	Census
4SU	Target species: hypothetical list of buckets	Target species: Bucket By-catch: chunk	---	Target species: Systematic sampling	Target species: Variable

	By-catch: minutes of film or other (to be defined)	of minutes or other		By-catches: To be defined	By-catches: To be defined
5SU	Hypothetical list of individuals caught in haul	Individuals	Species	Target species: census or subsample without replacement By-catch: to be determined	Target species lengths: all By-catch: to be determined

Stratum: Passive Nets - 27.3.a. and 27.3.b-d.22-29

	Sampling frame	**Sampling unit**	**Stratification**	**Selection Method**	**Sampling effort**
1SU	List of vessels active in the fishery	Vessel	Annual, Sub-area	random draw from vessel lists with equal probability with replacement	Aim to cover 2% of fishing effort. Approx 152
2SU	Hypothetical list of trips from vessel	Fishing trip	---	ad-hoc (dependent on staff availability)	1
3SU	Hypothetical list of sets in trip	Set	---	Census	Census Total weight by species and catch fraction (landings, discards, fish damaged by predators) will be recorded at trip level for all species that are not considered sensitive.
4SU	All individuals of sensitive species bycaught in the set	Individuals	---	Census	Census

All other strata

	Sampling frame	Sampling unit	Stratification	Selection Method	Sampling effort
1SU	List of vessels active in the fishery during previous year	Vessel*quarter	Quarterly	random draw from vessel list with unequal probability (probability proportional to number of trips; draw without replacement)	3-5 (per quarter dependent on stratum)
2SU	Hypothetical list of trips from vessel	Fishing Trip	---	ad-hoc (dependent on staff availability)	1 (per vessel)
3SU	Hypothetical list of hauls/sets in trip	Haul	---	Census	~~Census~~ Census
4SU	Hypothetical list of individuals caught in haul/set	Individuals	Species x Catch Fraction x Commercial Size Category (*) Biology: also 1cm length classes	Length: Census (random sample if too large) Biology: Census (random sample if too large); sampling stops when trip goals are achieved	Length: all individuals Biology: COD discards: 3 otoliths and individual weights (per size class and trip) PLE discards: 3 otoliths and individual weights (per size class and trip)

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

Active small pelagic trawls – 27.3.d.25-29 Q1, Q4: N

All other strata: Y

Regional coordination:

N

Link to sampling design documentation:

The main details of sampling design are given under section “sampling design description” (above). Online documentation accessible to public will be prepared during 2024-2025.

Design follows international recommendations:

Y

Link to sampling protocol documentation:

The main details of sampling design are given under section “sampling design description” (above). Online documentation accessible to the public will be prepared during 2024-2025.

Protocol follows international recommendations:

Y

Sampling implementation

Recording of refusal rate:

Y

Monitoring of sampling progress within the sampling year:

Debriefing meetings with teams of scientific observers after their trips. Meetings twice a year with all observers. When problems are noticed, compensatory actions are taken to secure data to end-users (e.g., sampling additional trips).

The sampling schemes focusing on incidental catches of sensitive species are followed up continuously during the year. Each quarter, vessels are included in the sampling frame if fishing activity ≥ an average of 10 days at sea each preceding quarter. Within the project there are monthly meetings where both scientists and scientific observers attend, in order to follow up on the data collection and documentation.

Data capture

Means of data capture:

Data capture is made in paper forms or with an internally developed electronic registration system, E-reg. Electronic balances and measuring boards are used during sampling. On small vessels active in the passive gear fishery, electronic balances may be replaced by smaller analogue or digital scales.

Data capture documentation:

Documentation of data capture in E-reg will be available at the quality assurance web page in 2022. www.slu.se/qualityassurance

Quality checks documentation:

Documentation on quality checks, that are made directly at data capture, in E-reg is available at the quality assurance web page: www.slu.se/qualityassurance

Data storage

National database:

FD2

International database:

RDB/RDBES at ICES

Quality checks and data validation documentation:

Routine checks on main variables are in place for all schemes with the database FD2 and RDBES. A set of complementary checks and outlier analysis on main variables are carried out via R scripts.

Sample storage

Storage description:

All recent otoliths (and scales in programmes where these are collected) are registered, stored and archived at Havsfiskelaboratoriet in Lysekil. To prevent a large accumulation of archived biological material, samples are sent to the National Archives of Gothenburg at 5 to 10-year intervals. Two archive accounting systems are in place: an older one that contains mostly material from 1929-2012; and a new archive system covering all governmental institutions that runs from 2013 to present.

Sample analysis:

Biological analysis of the different stocks follows the guidelines established by ICES WGBIOP and associated workshops: https://www.ices.dk/community/Pages/PGCCDBS-doc-repository.aspx.

Information on age preparation and processing, including handbook, is available online

https://www.slu.se/institutioner/akvatiska-resurser/kontakt/forskningsinfrastuktur/alderslaboratorier/Metodhandbok-for-aldersanalys-av-fisk/

Data processing

Evaluation of data accuracy (bias and precision):

Work on documenting possible biases and precision in scheme is planned for 2022-2027. Additional documentation will be available in RDBES scripts and outputs when that system is in production. Some information related to biases and precision in these fisheries can be found in documentation submitted over the years to several EGs, including WGBFAS, WGNSSK, WGBYC, WGCATCH, WKPICS and SGPIDS, among other.

Editing and imputation methods:

Documentation on data editing and imputation will be available in RDBES scripts and outputs when that system is in production. Information on some of the estimation and imputation methods more routinely considered can be found in documentation submitted over the years to several EGs, including WGBFAS, WGNSSK, WGCATCH, WKPICS and SGPIDS, among other.

Quality document associated to a dataset:

Documentation of the estimation process will be available in e.g. RDBES scripts and outputs when that system is in production. Some information on estimation and imputation methods routinely considered in analysis of these fisheries can be found in documentation submitted over the years to several EGs, including WGBFAS, WGNSSK, WGCATCH, WKPICS and SGPIDS, among other.

Validation of the final dataset:

Final validation takes place when data is compiled at ICES stock coordination level. Work on documenting national level validation routines will continue in 2025-2027.

Sampling scheme identifier: CommSelfOnShore - Selected species/stocks

MS: SWE

Region: All regions

Sampling scheme identifier: CommSelfOnShore - Selected species/stocks

Sampling scheme type: Commercial by category

Observation type: SelfOnShore

Time period of validity: 2025-2027

Short description:

Sampling scheme that aims to collect length, length-weight relationship, age, maturity and stock composition information from selected species/stocks (cod, herring, sprat) caught by Swedish commercial vessels operating in ICES Subareas 27.3 and 27.4 using self-sampling onshore by buyers or control. The objective of this sampling scheme is to routinely provide data on landings of some key species and stocks (e.g., cod) which frequently are not sampled enough within at-sea sampling schemes. The scheme is also used as a sampling back-up when probabilistic sampling appears to fail providing the minimal information required by end-user.

Description of the population

Population targeted:

Swedish landings of target species*area*commercial_category combinations. The PSU is Fishing trip x species combinations in most strata.

Population sampled:

Routine: Swedish landings of the following species*area*commercial_category combinations:

- Size categories of cod landed from the Swedish fisheries in subdivision 27.3.a.20
- Size categories of cod landed from the Swedish fisheries in subdivision 27.3.a.21

Back-up to probabilistic schemes:

- Unsorted landings of herring and sprat landed from the Swedish fisheries in subdivision 27.3.a.20-21, 27.3.b.23 and 27.3.d.24-29

Not included in routine sampling are buyers located in places other than Gothenburg.

Stratification:

The scheme is stratified by species and area. Basis for stratification is ensuring data availability on landings of trips fishing over the most important ICES subdivisions for assessment of target stocks.

The following strata are considered in the routine programme:

- Commercial Category COD - 27.3.a.20
- Commercial Category COD - 27.3.a.21

The following strata are considered in the back-up programme:

- Commercial Category - HER, SPR - 27.3.a.20
- Commercial Category - HER, SPR - 27.3.a.21
- Commercial Category - HER, SPR - 27.3.a.23
- Commercial Category - HER, SPR - 27.3.a.24
- Commercial Category - HER, SPR - 27.3.a.25
- Commercial Category - HER, SPR - 27.3.a.26
- Commercial Category - HER, SPR - 27.3.a.27
- Commercial Category - HER, SPR - 27.3.a.28.2
- Commercial Category - HER, SPR - 27.3.a.29

Sampling design and protocols

Sampling design description:

The scheme uses a stratified multi-stage cluster sampling design to obtain samples for each species*area combination.

Strata All Commercial Category COD - 27.3.a.20, 27.3.a.21: Each quarter, first hand buyers are asked to select among the landings they possess of each target species and area (PSU) and select 1 size category (SSU) and then 1 box from that size category (TSU) until sampling targets are achieved. Buyers are requested to spread the sampling over time.

An overview of sampling design, including details on sampling protocol for biological variable, is given in tables below.

Strata Commercial Category COD - 27.3.a.20, 27.3.a.21 (stratified by area and species)

	Sampling frame	**Sampling unit**	**Stratification**	**Selection Method**	**Sampling effort**
1SU	Hypothetical list of fishing trips with landings of cod from target subdivision during year	Fishing trip x species	Quarter and Subdivision (20, 21)	ad-hoc selection by first-hand buyer until sampling targets are achieved. It is requested that trips are spread in time.	Variable
2SU	List of size categories of cod in fishing trip	Size category	---	ad-hoc selection by first-hand buyer until sampling targets are achieved. It is requested that size categories are	1 size category

				spread across trips (i.e., only 1-2 size categories are sampled per trip)	
2SU	List of boxes in size category	Box	---	ad-hoc selection by first-hand buyer until sampling targets are achieved	1 box (size 1 to 4) ½ to 1 box (size 5)
3SU	Cod individuals in box	Biology of individuals (individual length, weight and age)	---	ad-hoc selection by first-hand buyer until sampling targets are achieved	All fish are sampled for weight and otoliths until the following quarter*subdiv targets are achieved: Size 1: 50 indiv. Size 2: 50 indiv. Size 3: 100 indiv. Size 4: 100 indiv. Size 5: 100 indiv.

Backup: Strata All Commercial Category – HER, SPR (stratified by area and species)

	Sampling frame	**Sampling unit**	**Stratification**	**Selection Method**	**Sampling effort**
1SU	Hypothetical list of fishing trips with landings of herring or sprat from target subdivision during year	Fishing trip x species	Quarter and Subdivision (20, 21)	ad-hoc selection by first-hand buyer or control until targets achieved; it is requested that samples are spread out in quarter	Variable
2SU	Individuals landed on fishing trip	Box	---	ad-hoc selection by first-hand buyer or control	1 Box
3SU	Herring individuals in box	Biology of individuals (Individual length, weight, age, maturity.	---	Census or subsamples (50-150 per box when boxes are large and many boxes	Herring: Max individuals per Quarter and Subdivision

	Herring only: nematodes)	are available) until sampling targets are achieved	Herring: n = 650 SD20, 21 n = 400 SD24-29S n = 800 SD29N-31 Sprat: n = 400 SD20, 21 n = 500 24-29S n = 800 SD29N-31

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

Remaining strata: N*

*Possibilities of changing the sampling design of "Commercial Category COD - 27.3.a.20, 27.3.a.21" to a more probabilistic/4S will be explored during the 202~~2~~5-202~~4~~4 period.

Regional coordination:

N

Link to sampling design documentation:

Details of sampling design are given under section "sampling design description" (above). Online documentation will be prepared during 2024-2025.

Design follows international recommendations:

N*

*Possibilities of changing the sampling design of "Commercial Category COD - 27.3.a.20, 27.3.a.21" to a more probabilistic/4S will be explored during the 2025-2027 period.

Link to sampling protocol documentation:

Main details of sampling protocols are given under section "sampling design description" (see above). Online documentation will be prepared during 2024-2025

Protocol follows international recommendations:

Y

Sampling implementation

Recording of refusal rate:

N

Monitoring of sampling progress within the sampling year:

Sample acquisition, sample collection, arrival to lab and processing are closely monitored on a weekly basis to secure quarterly goals are achieved. Departures from expectations lead to compensatory actions to secure data to end-users (e.g., sampling additional trips).

Data capture

Means of data capture:

Data capture is made in paper forms. Electronic balances and measuring boards are used during sampling.

Data capture documentation:

Documentation of data capture will be available at the quality assurance web page in 2022. www.slu.se/qualityassurance

Quality checks documentation:

Internal routine checks on main variables are run as data is stored in database FD2.

Data storage

National database:

FD2

International database:

RDB/RDBES at ICES

Quality checks and data validation documentation:

Internal routine checks on main variables are in place for all schemes within the database FD2 and RDBES. Complementary checks and outlier analysis are carried out on trip, catch and biological variables using reports from FD2 and R scripts.

Sample storage

Storage description:

All recent otoliths (and scales in programmes where these are collected) are registered, stored and archived at Havsfiskelaboratoriet in Lysekil. To prevent a large accumulation of archived biological material, samples are sent to the National Archives of Gothenburg at 5 to 10-year intervals. Two archive accounting systems are in place: an older one that contains mostly material from 1929-2012; and a new archive system covering all governmental institutions that runs from 2013 to present.

Sample analysis:

Biological analysis of the different stocks follows the guidelines established by ICES WGBIOP and associated workshops: https://www.ices.dk/community/Pages/PGCCDBS-doc-repository.aspx.

Information on age preparation and processing, including handbook, is available online

https://www.slu.se/institutioner/akvatiska-resurser/kontakt/forskningsinfrastuktur/alderslaboratorier/Metodhandbok-for-aldersanalys-av-fisk/

Data processing

Evaluation of data accuracy (bias and precision):

Work on documenting possible biases and precision in scheme is planned for 2025-2027 period. Additional documentation will be available in RDBES scripts and outputs when that system is in production. Some information related to biases and precision in these fisheries can be found in documentation submitted over the years to several EGs, including HAWG, WGBFAS, WGNSSK, WGCATCH, WKPICS and SGPIDS, among other.

Editing and imputation methods:

Documentation on data editing and imputation will be available in RDBES scripts and outputs when that system is in production Information on some of the estimation and imputation methods routinely considered in these fisheries can be found in documentation submitted over the years to several EGs, including HAWG, WGBFAS, WGNSSK, WGCATCH, WKPICS and SGPIDS, among other.

Quality document associated to a dataset:

Work on documenting estimation methods used in this sub-scheme is planned for 2025-2027. Some information on estimation and imputation methods routinely considered in analysis of these fisheries can be found in documentation submitted over the years to several EGs, including HAWG, WGBFAS, WGNSSK, WGCATCH, WKPICS and SGPIDS, among other.

Validation of the final dataset:

Final validation takes place when data is compiled at ICES stock coordination level. Work on documenting national level validation routines will continue in 2025-2027.

Sampling scheme identifier: CommEMAtSea - PETS species

MS: SWE

Region: All regions

Sampling scheme identifier: CommEMAtSea - PETS species

Sampling scheme type: Commercial fishing trip

Observation type: EMAtSea

Time period of validity: 2023-2024

Short description:

The sampling scheme aims to collect data on bycatches of ETP species (number) caught by Swedish commercial vessels operating gillnets and trammel nets to target demersal, freshwater or pelagic species in 27.3.a (Kattegat and Skagerrak) and subdivisions 27.3.b-d.22-29 (Baltic) using cameras. The reason for using cameras is to increase sampling coverage to get better estimates of bycatches of sensitive species such as marine mammals and birds. The sampling scheme is designed to generate as good estimates for harbor porpoise as possible

(spatial strata based on risk for bycatches) but data on all mammals, birds and elasmobranchs species will be collected.

Description of the population

Population targeted:

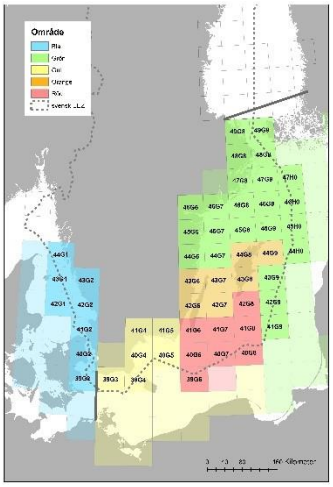
All Swedish vessels participating in the gillnet and trammel net fisheries for demersal, freshwater or pelagic species in 27.3.a (Kattegat and Skagerrak) and subdivisions 27.3.b-d.22-29 (Baltic). The PSU is vessel.

Population sampled:

Swedish vessels participating in the gillnet and trammel net fisheries for demersal, freshwater or pelagic species in 27.3.a (Kattegat and Skagerrak) and subdivisions 27.3.b-d.22-29 (Baltic). Vessels will participate in the sampling on a voluntary basis.

Stratification:

The area is divided into sub-areas based on distribution of the porpoise populations in the area. Vessels are assigned to spatial strata based on where they fished the majority of the time the preceding year.



Sub-areas (different colours) that constitutes basis for spatial strata.

Sampling design and protocols

Sampling design description:

All vessels, with an activity level equal to or above 20 trips the preceding year, participating in the fishery will be contacted and asked for interest to participate in the sampling. Vessels that have participated in previous years will also be contacted even though they do not meet the criteria of an activity level equal to or above 20 days. Track will be kept on positive / negative response. Participating vessels will sign a contract, and agreements will be made on number of trips to sample (sampling by camera will be accompanied with a limited protocol for self-sampling). The number of trips to sample will be dependent on the activity level of the vessel, the heterogeneity of the fishing pattern of the vessel and the main area of fishing for the individual vessel. Effort will be made to spread out sampling effort between different sub- areas, vessels and fisheries. If the number of interested vessels exceeds available resources, priority will be given to vessels fishing in sub-areas with assumed

higher risk of bycatch of porpoises and areas where potential bycatch of porpoises constitutes a larger risk to the population.

	Sampling frame	Sampling unit	Stratification	Selection Method	Sampling effort
1SU	List of vessels	Vessels	Annual, Sub-area	ad-hoc (voluntary basis)	20-30
2SU	Hypothetical list of trips by vessel for the participating gillnetters based on level of activity previous year.	Trip	---	Census or ad-hoc dependent on the activity level of the vessel, the heterogeneity of the fishing pattern of the vessel and the main sub-area of fishing for the individual vessels	Dependent on vessel
3SU	Hypothetical list of sets in trip	Set	---	Census	Census Total weight or number by species and catch fraction (landings, discards, fish damaged by predators) will be reported by fishermen through self-sampling protocol at trip level for all species that are not considered sensitive.
4SU	All individuals of sensitive species	Individuals	---	Census	Census, but dependent on camera quality and function

Is the sampling design compliant with the 4S principle

N

Regional coordination:

N

Link to sampling design documentation:

The main details of sampling design are given under section “sampling design description” (above). Online documentation accessible to the general public will be prepared during 2024-2025. Documentation of sampling design is also available in “Uppdrag att inrätta ett övervakningsprogram för bifångst av tumlare - Slutrapport av regeringsuppdrag N2022/01229” (https://www.havochvatten.se/download/18.7e1b3528187e1dcb7e4d961e/1684325446711/ru-1914-2022-uppdrag-att-inratta-overvakningprogra-bifangst-tumlare-redovisning.pdf) (swedish).

Design follows international recommendations:

NA

Link to sampling protocol documentation:

The main details of sampling design are given under section “sampling design description” (above). Online documentation accessible to the general public will be prepared during 2024-2025 (Aqua report).

Protocol follows international recommendations:

NA

Sampling implementation

Recording of refusal rate:

NA

Monitoring of sampling progress within the sampling year:

Sampling progress is closely monitored by assigned members of staff. Continuous follow-up on the sampling progress within the EM program is needed to make the monitoring as representative for the fishery as possible. This includes production of spatial coverage maps and analysing the fishing pattern reported by the fishery in logbooks or journals. Camera systems are moved between vessels to allow for as high participation and coverage as possible. The monitoring of sampling progress also includes regular contacts with participating vessels to sort out different problems and regular quality checks of received film material as well as other types of data. It also includes regular contact with the part of the fishery that is included in the sampling scheme but that do not actively participate in the sampling program, in order to increase the number of participating vessels over the year.

The team analyzing imagery collected in the EM program has meetings on a monthly basis, to make sure as high consensus as possible in EM review.

Data capture

Means of data capture:

Two different types of camera systems are used within the electronic monitoring sampling scheme, one system from SpotX and one system that has been developed internally specifically for this program, LPScam. Each fishing trip are also self-reported by fishermen in an extended protocol, describing gear characteristics, the use and function of acoustic deterrent devices and the catch (discard, landed and predator damaged) as well as eventual bycatch.

Anchorlab BlackBox Analyzer (BBA) is used in EM review, to capture data from the films.

Data capture documentation:

Documentation of data capture is stored internally and will be available upon request. It will also be available as part of the report that will be prepared in 2024-2025.

Quality checks documentation:

Internal routine checks on main variables using R scripts are run continuously throughout the year.

This includes a set of checks for **missing values**, e.g., missing and duplicated trips, missing information on camera qualities and how large part of the haul that could not be observed, missing specimens and missing pingers. Species identification of observed bycatch is carried out by assigned members of staff, and participating fishermen are instructed to show the bycatch to the camera, to allow for a more secure species identification.

The data is also quality checked in SQL scripts when imported to the database FD2.

Data storage

National database:

Data from the EM review is stored in FiskData2. Reports from the analyzed films are stored on a NAS (Network Attached Storage).

International database:

Between 2022 and 2024 work has been done to develop the data model, allowing the data to be uploaded to ICES RDBES. A subset of data was successfully uploaded to ICES RDBES in 2022, and work will continue to upload data from 2023 and onwards.

Quality checks and data validation documentation:

Documentation on quality checks and data validation will be available as a part of the report that will be prepared in 2024-2025.

Sample storage

Storage description:

Personal data are removed from films, using a masking model and the films are then stored on a Network Attached Storage for a maximum of three months.

Sample analysis:

Anchorlabs Black Box Analyzer (BBA) is used to analyze films.

Data processing

Evaluation of data accuracy (bias and precision):

Bias needs to be evaluated as the sampling scheme will be based on vessels that participate on a voluntary basis. This evaluation of bias will include risk assessments of fisheries (are there particular parts of the fisheries (targets species, season and areas) that have a higher risk of bycatch) and a comparison between the activities of the vessels within the sampling scheme and the entire fleet. We will also compare results from the observer program (in fisheries/areas where we have both observers and cameras) with results from the camera sampling scheme. The analysis of bias will be documented.

Editing and imputation methods:

Estimation at population level has not yet been made. However, work will continue to investigate the possibilities of using both model- and design-based approach and will at the end be dependent on the results from the sampling and the analysis of bias.

Quality document associated to a dataset:

Documentation of the estimation process will be available in e.g. RDBES scripts and outputs when that system is in production.

Validation of the final dataset:

Work on documenting national level validation routines will continue in 2025-2027.

Related to Table 2.6 [and Text Box 2.6] (Research surveys at sea)

Sampling scheme identifier: Baltic International Traw Surveys – BITS_Q1 , BITS_Q4

MS : SWE
Region: Baltic Sea
Sampling scheme identifier: Baltic International Traw Surveys – BITS_Q1 , BITS_Q4
Sampling scheme type: Research survey at sea
Observation type: SciObsAtSea
Time period of validity: 2025-2027
Short description: An internationally coordinated bottom trawl survey to provide ICES working groups with data (survey index) for stock assessment for cod, flounder and other flatfish in the Baltic proper areas.
Description of the population
Population targeted: Cod, flounder, plaice. **Population sampled:** Demersal **Stratification:** ICES subdivisions and depth intervals
Sampling design and protocols
Sampling design description:

In the manual:

BITS manual

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

NA

Regional coordination:

Y, BITS is coordinated by ICES WGBIFS. Participating countries are Denmark, Sweden, Germany, Estonia, Latvia. Lithuania and Poland.

Link to sampling design documentation:

https://datras.ices.dk/documents/manuals/manuals.aspx

Design follows international recommendations:

Y

Link to sampling protocol documentation:

https://ices-library.figshare.com/articles/report/SISP_7_-_Manual_for_the_Baltic_International_Trawl_Surveys_BITS_/19050986?file=33873371

Protocol follows 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:

Data is captured in an internally developed electronic registration system, Sve-reg, by connected scales and by registrating lengths, measured on a common measuring board or a connected electronic measuring board. Other data (sex, maturity etc) is also registered in the system. Data is stored in the national database FD2.

Data capture documentation:

Documentation of data capture in Sve-reg is available at the quality assurance web page,

www.slu.se/qualityassurance

Quality checks documentation:

Documentation on quality checks that are made directly at data capture in Sve-reg is available at the quality assurance web page,

www.slu.se/qualityassurance

Data storage

National database:

FD2

International database:

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

Quality checks and data validation documentation:

National quality checks in Fiskdata2; www.slu.se/qualityassurance.

International quality checks DATRAS: https://datsu.ices.dk/web/selRep.aspx

Sample storage

Storage description:

All recent otoliths are registered, stored and archived at Havsfiskelaboratoriet in Lysekil. To prevent a large accumulation of archived biological material, samples are sent to the National Archives of Gothenburg at 5-10 year intervals. Two archive accounting systems are in place: an older one that contains mostly material from 1929-2012; and a new archive system covering all governmental institutions that runs from 2013 to present.

Sample analysis:

Biological analysis of the different stocks follows the guidelines established by ICES WGBIOP and associated workshops: https://www.ices.dk/community/Pages/PGCCDBS-doc-repository.aspx.

Data processing

Evaluation of data accuracy (bias and precision):

https://www.ices.dk/data/data-portals/Pages/DATRAS-Docs.aspx

Editing and imputation methods:

Partly

Quality document associated to a dataset:

N

Validation of the final dataset:

Final data set is screened automatically by DATRAS when submitted to this ICES database.

Survey indices are produced by ICES Data Centre.

https://www.ices.dk/data/Documents/DATRAS/Indices_Calculation_Steps_BITS.pdf

Sampling scheme identifier: Baltic International Acoustic Surveys – BIAS

MS : SWE

Region: Baltic Sea

Sampling scheme identifier: Baltic International Acoustic Surveys – BIAS

Sampling scheme type: Research survey at sea

Observation type: SciObsAtSea

Time period of validity: 2025-2027

Short description:

International hydroacoustic surveys have been conducted in the Baltic Sea since 1978 by the Institute of Marine Research (IMR) in Lysekil, Sweden. IMR currently belonging to the Department of Aquatic Resources, Swedish University of Agricultural Sciences is responsible for the Swedish part of Baltic international acoustic survey (BIAS).

The BIAS survey is co-ordinated and managed by the ICES working group WGBIFS. The main objective of BIAS is to produce an index of abundance for the herring and sprat resources in the Baltic Sea. The survey provides data to amongst other the ICES Baltic Fisheries Assessment Working Group (WGBFAS).

Description of the population

Population targeted:

Sprat and herring in the Baltic sea in SD27 and a parts of SD25-29

Population sampled:

Pelagic

Stratification:

No stratification, Surveyed area limited by the 10m depth curve.

Sampling design and protocols

Sampling design description:

The survey is based on hydro acoustic transects of 60 nautical miles in each statistical rectangle according to the survey manual. In each statistical rectangle 2 fishing hauls are performed to classify species composition and length distribution of all caught species.

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

NA

Regional coordination:

BIAS is coordinated by ICES WGBIFS, participating countries is Finland**,** Estonia, Germany, Latvia, Lithuania, Poland and Sweden. Bilateral agreement for the collection of biological samples and cooperation during BIAS is established between Finland and Sweden, see table 1.3.

Link to sampling design documentation:

Sampling design documentation can be found in the IBAS manual:

ICES. 2017. Manual for the International Baltic Acoustic Surveys (IBAS). Version 2. Series of ICES Survey Protocols (SISP) 8. 47 pp. https://doi.org/10.17895/ices.pub.3368

Design follows international recommendations:

Y

Link to sampling protocol documentation:

Sampling protocol documentation can be found in the IBAS manual

ICES. 2017. Manual for the International Baltic Acoustic Surveys (IBAS). Version 2. Series of ICES Survey Protocols (SISP) 8. 47 pp. https://doi.org/10.17895/ices.pub.3368

Protocol follows 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:

Acoustic data is collected with scientific echo sounder EK80 (38 kHz). For fish sampling Sweden use calibrated field scales (Marel M1100) and manual measuring boards. A special software (Sve-reg) developed by the institute is used to register data. For the hydro acoustic sampling Sweden follows the IBAS manual and use Simrad EK80 38kHz, and the software tool LSSS for acoustic data scrutinization.

Data capture documentation:

Sweden follows the IBAS manual regarding data capture, IBAS manual.

Quality checks documentation:

Y, www.slu.se/qualityassurance

Data storage

National database:

FD2, for biological data

International database:

ICES acoustic trawl DB, https://acoustic.ices.dk

ICES WGBIFS IBAS-DB, numbers and mean weights per age and area

Quality checks and data validation documentation:

National quality checks in FD2; www.slu.se/qualityassurance
International quality checks (biological data) DATRAS: https://datsu.ices.dk/web/selRep.aspx
International quality checks ICES acoustic trawl DB: https://acoustic.ices.dk/validationrules

Sample storage

Storage description:

All recent otoliths are registered, stored and archived at Havsfiskelaboratoriet in Lysekil. To prevent a large accumulation of archived biological material, samples are sent to the National Archives of Gothenburg at 5-10 year intervals. Two archive accounting systems are in place: an older one that contains mostly material from 1929-2012; and a new archive system covering all governmental institutions that runs from 2013 to present.

Sample analysis:

Biological analysis of the different stocks follows the guidelines established by ICES WGBIOP and associated workshops: https://www.ices.dk/community/Pages/PGCCDBS-doc-repository.aspx.

Data processing

Evaluation of data accuracy (bias and precision):

See the WGBIFS reports regarding survey variance:
http://www.ices.dk/community/groups/Pages/WGBIFS.aspx

Editing and imputation methods:

Imputation is done rarely; it is estimated to occur in less than 0.5 % of the aged clupeids. At this stage it is done manually by comparing to species, length, haul or area, there are plans on using a script for the imputation in the future. Editing is very rare, an odd species of fish can in some situations be deleted or the target strength be guessed, this is estimated to occur in less than 0.1‰ of the fishes in a certain haul.

Quality document associated to a dataset:

Y

Validation of the final dataset:

There are quality checks made in the ICES database, see https://acoustic.ices.dk/validationrules

There are quality checks made on the data stored in the WGBIFS IBAS db, although there is no known documentation over those. Also quality checks are made on local level (for instance by responsible fish lab crew leader (automatic controls within Fiskdata2) also expert knowledge type quality checks are made by the responsible analyst, furthermore in the whole data collecting and analysing line various checks both qualitative and quantitative are made, normally those have not been documented yet, but consists of amongst other; tools in software (LSSS), new checking scripts from December 2020 WGBIFS meeting at sharepoint for WG, spreadsheet checks like age-length, length-weight, etc.

Sampling scheme identifier: Sprat Acoustic Surveys – SPRAS

MS : SWE

Region: Baltic Sea

Sampling scheme identifier: Sprat Acoustic Surveys – SPRAS

Sampling scheme type: Research survey at sea

Observation type: SciObsAtSea

Time period of validity: 2025-2027

Short description:

Internationally coordinated hydro acoustic survey targeting herring and spawning sprat in the Baltic Sea to provide data for stock assessment through the ICES working group WGBFAS.

Description of the population

Population targeted:

Sprat and herring in the Baltic Sea in SD27 and a part of SD28

Population sampled:

Pelagic

Stratification:

No stratification. Surveyed area limited by the 10m depth curve.

Sampling design and protocols

Sampling design description:

The survey is based on hydro acoustic transects of 60 nautical miles in each statistical rectangle according to the survey manual. In each statistical rectangle 2 fishing hauls are performed to classify species composition and length distribution of all caught species.

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

NA

Regional coordination:

SPRAS is a coordinated survey by ICES WGBIFS with Estonia, Germany, Latvia, Lithuania, Poland and Sweden.

Link to sampling design documentation:

Sampling design is described in the IBAS manual:

ICES. 2017. Manual for the International Baltic Acoustic Surveys (IBAS). Version 2. Series of ICES Survey Protocols (SISP) 8. 47 pp. https://doi.org/10.17895/ices.pub.3368

Design follows international recommendations:

Y

Link to sampling protocol documentation:

Sampling design is described in the IBAS manual:

IBAS manual

Protocol follows 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:

Acoustic data is collected with scientific echo sounder EK80 (38 kHz). For fish sampling Sweden use calibrated field scales (Marel M1100) and manual measuring boards. A special software (Sve-reg) developed by the institute is used to register data. Hydro acoustic sampling Sweden follow IBAS manual and use Simrad EK80 software tool and LSSS for acoustic data analysis.

Data capture documentation:

Sweden follows the IBAS manual regarding data capture.

Documentation of Sve-reg (the electronic sampling system) is available on the quality documentation webpage, www.slu.se/qualityassurance

Quality checks documentation:

Y

Documentation of the quality controls made in Sve-reg at data capture is available on the quality documentation webpage, www.slu.se/qualityassurance

Data storage

National database:

FD2 (not accessible through a website)

International database:

ICES acoustic trawl DB, https://acoustic.ices.dk'
ICES WGBIFS IBASdb, numbers and mean weights per age and area.

Quality checks and data validation documentation:

National quality checks in FD2; www.slu.se/qualityassurance

International quality checks (biological data) DATRAS: https://datsu.ices.dk/web/selRep.aspx

International quality checks ICES acoustic trawl DB: https://acoustic.ices.dk/validationrules

Sample storage

Storage description:

All recent otoliths registered, stored and archived at Havsfiskelaboratoriet in Lysekil. To prevent a large accumulation of archived biological material, samples are sent to the National Archives of Gothenburg at 5-10 year intervals. Two archive accounting systems are in place: an older one that contains mostly material from 1929-2012; and a new archive system covering all governmental institutions that runs from 2013 to present.

Sample analysis:

Biological analysis of the different stocks follows the guidelines established by ICES WGBIOP and associated workshops: https://www.ices.dk/community/Pages/PGCCDBS-doc-repository.aspx.

Data processing

Evaluation of data accuracy (bias and precision):

See the WGBIFS reports regarding survey variance:
http://www.ices.dk/community/groups/Pages/WGBIFS.aspx

Editing and imputation methods:

Imputation is done rarely; it is estimated to occur in less than 0.5 % of the aged clupeids. At this stage it is done manually by comparing to species, length, haul or area, there are plans on using a script for the imputation in the future. Editing is very rare, an odd species of fish can in some situations be deleted or the target strength be guessed, this is estimated to occur in less than 0.1‰ of the fishes in a certain haul.

Quality document associated to a dataset:

N

Validation of the final dataset:

There are quality checks made in the ICES database, see https://acoustic.ices.dk/validationrules

There are quality checks made on the data stored in the WGBIFS IBAS db, although there is no known documentation over those.

Sampling scheme identifier: Sweden Sound Survey – SSS_Q1

MS : SWE

Region: Baltic Sea

Sampling scheme identifier: Sweden Sound Survey – SSS_Q1

Sampling scheme type: Research survey at sea

Observation type: SciObsAtSea

Time period of validity: 2025-2027

Short description:

National demersal trawl survey in SD23, in the sound between Sweden and Denmark.

Description of the population

Population targeted:

Cod and flounder in SD23

Population sampled:

Demersal

Stratification:

Stratification by depth strata.

Sampling design and protocols

Sampling design description:

The Swedish sound survey use the same sampling design as BITS.

BITS manual

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

NA

Regional coordination:

N

Link to sampling design documentation:

Sampling design is described in the BITS manual:

ICES. 2017. SISP 7 - Manual for the Baltic International Trawl Surveys (BITS). Version 2. Series of ICES Survey Protocols. 95 pp. http://doi.org/10.17895/ices.pub.2883

Design follows international recommendations:

Y

Link to sampling protocol documentation:

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

Protocol follows 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:

For fish sampling Sweden use calibrated field scales (Marel M1100) and manual measuring boards. A special software (E-reg) developed by the institute is used to register data. Other data (sex, maturity etc) is also added in the system.

Data capture documentation:

Documentation of E-reg (the electronic sampling system) is available on the quality documentation webpage, www.slu.se/qualityassurance

Quality checks documentation:

Y

Documentation of the quality controls made in E-reg at data capture is available on the quality documentation webpage, www.slu.se/qualityassurance

Data storage

National database:

FD2 (not accessible through a website)

International database:

DATRAS, https://www.ices.dk/data/data-portals/Pages/DATRAS.aspx

Quality checks and data validation documentation:

National quality checks in FD2; www.slu.se/qualityassurance

International quality checks (biological data) DATRAS: https://datsu.ices.dk/web/selRep.aspx

Sample storage

Storage description:
All recent otoliths are registered, stored and archived at Havsfiskelaboratoriet in Lysekil. To prevent a large accumulation of archived biological material, samples are sent to the National Archives of Gothenburg at 5-10 year intervals. Two archive accounting systems are in place: an older one that contains mostly material from 1929-2012; and a new archive system covering all governmental institutions that runs from 2013 to present.

Sample analysis:

Biological analysis of the different stocks follows the guidelines established by ICES WGBIOP and associated workshops: https://www.ices.dk/community/Pages/PGCCDBS-doc-repository.aspx.

Data processing

Evaluation of data accuracy (bias and precision):

N.

Editing and imputation methods:

N. No date available.

Quality document associated to a dataset:

N

Validation of the final dataset:

Final data set is screened automatically by DATRAS when submitted to this ICES database.

Survey indices are produced by ICES Data Centre.

https://www.ices.dk/data/Documents/DATRAS/Indices_Calculation_Steps_BITS.pdf

No formal quality check before end user.

Sampling scheme identifier: International Bottom Trawl Survey (IBTS_Q1 , IBTS_Q3)

MS : SWE

Region: North Sea and Eastern Arctic

Sampling scheme identifier: International Bottom Trawl Survey (IBTS_Q1 , IBTS_Q3)

Sampling scheme type: Research survey at sea

Observation type: SciObsAtSea

Time period of validity: 2025-2027

Short description:

An internationally coordinated bottom trawl survey to provide ICES working groups with data (survey index) for stock assessment for several fish species in Skagerrak, Kattegat and parts of the North Sea.

Description of the population

Population targeted:

Cod, Haddock, Herring, Sprat, Whiting, Norway Pout, Plaice, Mackerel - 27.3a; 27.4

Population sampled:

Demersal

Stratification:

ICES statistical rectangles

Sampling design and protocols

Sampling design description:

The statistical squares are allocated to the countries by the survey coordinator and agreed on at the annual IBTSWG. Within each square 2 hauls should be performed, preferably by two different countries which for logistical reasons isn't always possible. The cruise leader is free to choose any haul (or two) to tow in the square but usually follows a list of plausible hauls in the rectangle (excerpt from Datras) for safety reasons. In quarter 1, Sweden is following a fixed design in the Skagerrak and the Kattegat for historical reasons and in quarter 3 Sweden has a depth stratification in the Skagerrak.

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

NA

Regional coordination:

The survey is coordinated by IBTSWG, including Germany, Denmark, The Netherlands, France and Sweden. In total IBTS is conducted by five EU member countries and three non-EU countries (UK-England, UK-Scotland, Norway),

Link to sampling design documentation:

ICES. 2020. Manual for the North Sea International Bottom Trawl Surveys. Series of ICES Survey Protocols SISP 10-IBTS 10, Revision 11. 102 pp. https://doi.org/10.17895/ices.pub.7562

Design follows international recommendations:

Y

Link to sampling protocol documentation:

https://www.ices.dk/community/groups/Pages/IBTSWG.aspx

Protocol follows 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:

Trawldata collected from Kongsberg MDM500 system onboard is delivered to on-board trawl database Svepa. The catch is through a national catch data system Sve-reg, fish measurements and sex/maturity judging are

manual and punched directly onto a touch screen into Sve-reg and weights are captured automatically. Both systems feed into a copy of the Oracle database FD2 which post-cruise updates the land-based main database FD2.

Data capture documentation:

Documentation of data capture in Sve-reg is available at the quality assurance web page, www.slu.se/qualityassurance

Quality checks documentation:

Y

National quality checks in FD2; www.slu.se/qualityassurance

Documentation on quality checks, that are made directly at data capture, in Sve-reg is available at the quality assurance web page, www.slu.se/qualityassurance

Data storage

National database:

FD2

International database:

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

Quality checks and data validation documentation:

National quality checks in FD2; www.slu.se/qualityassurance.

International quality checks DATRAS: https://datsu.ices.dk/web/selRep.aspx

Sample storage

Storage description:

All recent otoliths are registered, stored and archived at Havsfiskelaboratoriet in Lysekil. To prevent a large accumulation of archived biological material, samples are sent to the National Archives of Gothenburg at 5-10 year intervals. Two archive accounting systems are in place: an older one that contains mostly material from 1929-2012; and a new archive system covering all governmental institutions that runs from 2013 to present.

Sample analysis:

Biological analysis of the different stocks follows the guidelines established by ICES WGBIOP and associated workshops: https://www.ices.dk/community/Pages/PGCCDBS-doc-repository.aspx.

Data processing

Evaluation of data accuracy (bias and precision):

Y

https://www.ices.dk/data/data-portals/Pages/DATRAS-Docs.aspx

Editing and imputation methods:

N

Quality document associated to a dataset:

N

Validation of the final dataset:

Final data set is screened automatically by DATRAS when submitted to this ICES database.

Survey indices are produced by ICES Data Centre.

https://www.ices.dk/data/Documents/DATRAS/Indices_Calculation_Steps_IBTS.pdf

Sampling scheme identifier: Nephrops UWTV (UWTV3-4)

MS: SWE

Region: North Sea & Eastern Arctic

Sampling scheme identifier: Nephrops UWTV (UWTV3-4)

Sampling scheme type: Research survey at sea

Observation type: EMAtSea

Time period of validity: 2025-2027

Short description:

The joint Swedish and Danish survey is a UWTV survey (UWTV3-4) conducted to provide estimates of Norwegian lobster (*Nephrops norvegicus*) burrow densities used for the estimation of total abundance. The survey is conducted in spring and repeated annually. Data is collected using a sledge mounted video camera. A sledge is towed behind research vessels included in the survey. Video recording from 200 m long segments of *Nephrops* habitat are collected at approximately 200 stations in the Kattegat and Skagerrak area.

Description of the population

Population targeted:

Nephrops norvegicus in 27.3.a.20 and 27.3.a.21

Population sampled:

Demersal

Stratification:

The survey area is stratified into 9 subareas defined as fishing grounds in principle geographically separated areas of suitable *Nephrops* habitat. One of the strata is defined by gear restriction.

Sampling design and protocols

Sampling design description:

The survey is based on a stratified random design with approximately 200 stations distributed within a predefined grid (of approximately 10000 stations). Each year the number of stations allocated to each stratum is calculated by minimizing the variance using the previous year's results.

Is the sampling design compliant with the 4S principle?

NA

Regional coordination:

UWTV3-4 is a joint survey by Sweden & Denmark

Link to sampling design documentation:

Dobby, H., Doyle, J., Jónasson, J., Jonsson, P., Leocádio, A., Lordan, C., Weetman, A., and Wieland, K. 2021. ICES Survey Protocols – Manual for Nephrops underwater TV surveys, coordinated under ICES Working Group on Nephrops Surveys (WGNEPS). ICES Techniques in Marine Environmental Sciences Vol. 65. 44 pp. **https://doi.org/10.17895/ices.pub.8014**

Design follows international recommendations:

Y

Link to sampling protocol documentation:

Dobby, H., Doyle, J., Jónasson, J., Jonsson, P., Leocádio, A., Lordan, C., Weetman, A., and Wieland, K. 2021. ICES Survey Protocols – Manual for Nephrops underwater TV surveys, coordinated under ICES Working Group on Nephrops Surveys (WGNEPS). ICES Techniques in Marine Environmental Sciences Vol. 65. 44 pp. **https://doi.org/10.17895/ices.pub.8014**

Protocol follows 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:

Full HD-video recordings and associated positional ship / sledge transponder data.

Data capture documentation:

Dobby, H., Doyle, J., Jónasson, J., Jonsson, P., Leocádio, A., Lordan, C., Weetman, A., and Wieland, K. 2021. ICES Survey Protocols – Manual for Nephrops underwater TV surveys, coordinated under ICES Working Group on Nephrops Surveys (WGNEPS). ICES Techniques in Marine Environmental Sciences Vol. 65. 44 pp. **https://doi.org/10.17895/ices.pub.8014**

Quality checks documentation:

Dobby, H., Doyle, J., Jónasson, J., Jonsson, P., Leocádio, A., Lordan, C., Weetman, A., and Wieland, K. 2021. ICES Survey Protocols – Manual for Nephrops underwater TV surveys, coordinated under ICES Working Group on Nephrops Surveys (WGNEPS). ICES Techniques in Marine Environmental Sciences Vol. 65. 44 pp. **https://doi.org/10.17895/ices.pub.8014**

Data storage

National database:

Raw video recordings saved on multiple, geographically portable hard drives. Analysis and resulting files are stored locally on SLU server.

International database:

No international database at present but will be uploaded to ICES run database in the future.

Quality checks and data validation documentation:

NA

Sample storage

Storage description:

NA

Sample analysis:

NA

Data processing

Evaluation of data accuracy (bias and precision):

Different steps in the burrow counting analysis are found here:

Dobby, H., Doyle, J., Jónasson, J., Jonsson, P., Leocádio, A., Lordan, C., Weetman, A., and Wieland, K. 2021. ICES Survey Protocols – Manual for Nephrops underwater TV surveys, coordinated under ICES Working Group on Nephrops Surveys (WGNEPS). ICES Techniques in Marine Environmental Sciences Vol. 65. 44 pp. **https://doi.org/10.17895/ices.pub.8014**.

Editing and imputation methods:

NA (no imputation is applied if missing stations typically variance increase)

Quality document associated to a dataset:

Annual ICES WGNEPS report

Validation of the final dataset:

Dobby, H., Doyle, J., Jónasson, J., Jonsson, P., Leocádio, A., Lordan, C., Weetman, A., and Wieland, K. 2021. ICES Survey Protocols – Manual for Nephrops underwater TV surveys, coordinated under ICES Working Group on Nephrops Surveys (WGNEPS). ICES Techniques in Marine Environmental Sciences Vol. 65. 44 pp. **https://doi.org/10.17895/ices.pub.8014**

Sampling scheme identifier: Kattegat Cod Survey (CODS_Q4)

MS: SWE

Region: North Sea & Eastern Arctic

Sampling scheme identifier: Kattegat Cod Survey (CODS_Q4)

Sampling scheme type: Research survey at sea

Observation type: SciObsAtSea

Time period of validity: 2025-2027

Short description:

The joint Swedish and Danish survey was initiated in 2008 to provide data for monitoring trends in abundance, biomass, recruitment and distribution of Kattegat cod.

Description of the population

Population targeted:

Cod in 27.3.a.21

Population sampled:

Demersal

Stratification:

Survey area stratified into high, medium and low-density strata based on information from the commercial fishery. In 2013 an additional stratum covering the closed area in south-eastern Kattegat was implemented.

Sampling design and protocols

Sampling design description:

The survey is based on a stratified random design with 80 hauls distributed within a survey grid of 5×5 nautical mile squares. Each participating vessel is assigned 20 or 40 random survey squares, distributed across all strata. Within each square, the skipper decides on the best way to fish at the location, e.g., set position and tow direction. The haul is the PSU. Each haul is sorted, and all species are recorded, length measured and weighted. In case of large catches subsampling is performed. Biological samples (age and weight) are collected for cod (see table 2.2).

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

NA

Regional coordination:

CODS_Q4 was developed as a joint survey by Sweden and Denmark starting in 2008. There is no formal bi-lateral agreement, however.

Link to sampling design documentation:

ICES. 2020. Baltic Fisheries Assessment Working Group (WGBFAS). ICES Scientific Reports. 2:45. 643 pp. http://doi.org/10.17895/ices.pub.6024

WDO3 Joint Swedish and Danish survey for cod in the Kattegat, November-December 2019.

Design follows international recommendations:

Y

Link to sampling protocol documentation:

ICES. 2020. Baltic Fisheries Assessment Working Group (WGBFAS). ICES Scientific Reports. 2:45. 643 pp. http://doi.org/10.17895/ices.pub.6024.

WDO3 Joint Swedish and Danish survey for cod in the Kattegat, November-December 2019.

Protocol follows 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:

On-board observers on Swedish ships use calibrated field scales and manual measuring boards. A software for electronic data capture (E-reg) developed by the institute is used to register data.

Data capture documentation:

Documentation of data capture in E-reg (the electronic sampling system) will be available at the quality assurance web page in 2022. www.slu.se/qualityassurance

Quality checks documentation:

Y

Documentation on quality checks, that are made directly at data capture, in E-reg, will be available at the quality assurance web page in 2022. www.slu.se/qualityassurance

Data storage

National database:

FD2

International database:

DATRAS has agreed to host the data, and the migration process is underway. Quality checks and documentation regarding data validation, accuracy, imputation, and index estimation will be available on the DATRAS website upon the data's public release.

Quality checks and data validation documentation:

National quality checks in FD2: www.slu.se/qualityassurance

Sample storage

Storage description:

Otoliths stored dry, genetic samples stored in 70% ethanol.

All recent otoliths (and scales in programmes where these are collected) are registered, stored and archived at Havsfiskelaboratoriet in Lysekil. To prevent a large accumulation of archived biological material, samples are sent to the National Archives of Gothenburg at 5-10 year intervals. Two archive accounting systems are in place: an older one that contains mostly material from 1929-2012; and a new archive system covering all governmental institutions that runs from 2013 to present.

Sample analysis:

Biological analysis of the different stocks follows the guidelines established by ICES WGBIOP and associated workshops: https://www.ices.dk/community/Pages/PGCCDBS-doc-repository.aspx.

Data processing

Evaluation of data accuracy (bias and precision):

N, documentation will be available on the DATRAS website once the data is released, see above.

Editing and imputation methods:

N, documentation will be available on the DATRAS website once the data is released, see above.

Quality document associated to a dataset:

N, documentation will be available on the DATRAS website once the data is released, see above.

Validation of the final dataset:

N, documentation of index estimation will be available on the DATRAS website once the data is released, see above.

Related to Table 4.1 [and Text Box 1.A] (Stomach sampling and analysis)

Sampling scheme identifier: Regional stomach content sampling

MS : SWE
Region: North-East Atlantic: North Sea, Skagerrak and Kattegat
Sampling scheme identifier: Regional stomach content sampling
Sampling scheme type: Research survey at sea
Observation type: SciObsAtSea (Scientific observer at sea on commercial or scientific vessels)
Time period of validity: 2025-2027
Short description (max 100 words):

See RWP NANSEA 2025-2027
Description of the population
Population targeted: **Population sampled:** **Stratification:**
Sampling design and protocols
Sampling design description: **Is the sampling design compliant with the 4S principle?:** **Regional coordination:** **Link to sampling design documentation:** **Design follows international recommendations:** **Link to sampling protocol documentation:** **Protocol follows international recommendations:**
Sampling implementation
Recording of refusal rate: **Monitoring of sampling progress within the sampling year:**
Data capture
Means of data capture: **Data capture documentation:** **Quality checks documentation:**
Data storage
National database: **International database:** **Quality checks and data validation documentation:**
Sample storage
Storage description: **Sample analysis:**
Data processing:
Evaluation of data accuracy (bias and precision): **Editing and imputation methods:** **Quality document associated to a dataset:** **Validation of the final dataset:**

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.

Provide information under each point in all sections.

Please indicate sampling scheme identifier (e.g combination of 'sector' and 'sampling scheme' or 'variables' from the annex table). Each identifier is unique and can be used only once; records with identical scheme identifiers are overwritten in the platform. Do not add any tables others than from the template.

Create a first survey specification record as a reference to the regional WP, add 'RWP ECON' in the 'sector name' field and leave the other fields empty.

Sampling scheme identifier: RWP_ECON

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): RWP ECON
Sampling scheme:
Variables:
Supra region(s):
Survey planning
Survey design and strategy
Estimation design
Error checks
Data storage and documentation
Revision

Confidentiality

Sampling scheme identifier: Fisheries - Capacity, Effort, Landings, Economic and, social variables

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): Fisheries
Sampling scheme: Census
Variables: Capacity, Effort, Landings, Economic and, social variables
Supra region(s): All regions.
Survey planning
Census The population includes all active vessels in the Swedish fleet, and census for inactive vessels.
Survey design and strategy
1. Data sources: Logbooks, monthly journals, sales notes, national fleet register, questionnaire and, tax declarations. 2. Sample sizes: Census, determined by the number of licensees. 3. Survey methods: Questionnaires are send out to fishermen by e-mail and by mail which gives them the possibility to hand in their answers electronically via a web-formula. The questionnaires are sent out to the licensees' official address which is updated yearly with the Swedish post agency. To access the web-formula a unique code for each signal is needed and are given to them via mail. This method is used both for economic and social variables. 4. Additional information used in the survey strategy: Logbook data and sales notes are automatically checked when filled in regarding completeness and also regarding logic. In addition, random checks are performed later on catches landed compared to those sold and also given geographic positions compared to VMS data. The port inspection also checks and verifies logbook data for the specific trip when an inspection is performed. Finally there are also computerized routinely performed checks of the complete logbook data to find abnormal and exorbitant values for all trips. Journal data are automatically checked when filled in regarding completeness and also regarding logic. Since the data is on monthly bases no further checks can be done on administrational or field bases. There are computerized routinely performed checks of the complete journal data to find abnormal and exorbitant values for all trips. The information on the fishermen's registered company is then used and merged with register data form Statistics Sweden on tax declaration on economics variables. The information form the tax declarations in then compared with the catch value in order to distinguish deviations. If deviations appears adjustment are made by using the share of the catch value in relation to the declared turnover.
Estimation design

1. Calculation method for population estimate: NA due to census.
2. Calculation method for derived data: NA due to census.
3. Nonresponse handling: If there are missing values in the collected data, estimated/imputed values are made. A simple linear model is use to estimate the missing values. For each missing variable a suitable estimation is done by adding control variables such as year, vessels size, gear, gross tonnage, kW, subdivision etc. by each segment in order to get as realistic estimated value as possible.

Error checks

Before merging the data it is investigated thoroughly for duplicates in reporting, some leave comments on questionnaires if their tax declarations represents more than one vessel. If that it is the case then the additional variables are adjusted to the share of catch value if nothing else is stated. Errors are checked manually by investigating each variable visually do detect outliers. For each variable there are certain intervals that flag if there are values outside of this interval. If outliers are detected it is replaced with an estimated value instead.

Data storage and documentation

1. Data storage: Digital data are stored on an institutional fileserver with access limited to persons who are in charge of the data collection and processing and backups are created daily. Economic data is stored in locked folder where only individuals with approved authority has access since there is confidential information concerning the economic variables on vessel level. Aggregated data is available at the homepage of Swedish Agency for Marine and Water Management, https://www.havochvatten.se/data-kartor-och-rapporter/data-och-statistik/sok-oppna-data.html.
2. Documentation: Documentations is done on regular basis and stored internally at Swedish Agency for Marine and Water Management who also is working on making the documentation publicly available.

Revision

The methodology of collecting data is yearly reviewed, yet since everything is at census level the collection scheme has not been adjusted. The questionnaire is reviewed yearly however, only marginal adjustment has been made due to not losing continuity over time. The estimation methods on non-responses are reviewed on a regular basis.

Confidentiality

1. Are procedures for confidential data handling in place and documented? Yes, following Directive 2016/680 of the EU Parliament and Council.
2. Are protocols to enforce confidentiality between DCF partners in place and documented? Yes, following Directive 2016/680 of the EU Parliament and Council.
3. Are protocols to enforce confidentiality with external users in place and documented? Yes.
4. Are there any issues with publication of data due to confidentiality reasons? Provide an explanation. Before the data is clustered the economics variables contains confidential information. Therefore only experts working with DCF and the economic data have access to it. There are protocols in place when it comes to external users. By making data calls it can be delivered after the experts have aggregated it in a suitable way. If someone make a data call wanting access to the data with confidential information and legal assessment is done to question the risk of exposing the privacy information before delivering to external part. At segment level there are issues publishing data, however before delivering the data to the commission clustering has been done, which makes is possible to publish without having any issues with confidentiality.

Sampling scheme identifier: Aquaculture - All economic and social variables

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): Aquaculture
Sampling scheme: Census
Variables: All economic and social variables
Supra region(s): All regions
Survey planning
The survey includes all aquaculture enterprises. The population is decided on information from the national aquaculture register which is cross-referenced to income tax declarations. All enterprises with an income of over 50% is part of the population.
Survey design and strategy
1. Data sources: Data will be collected by Statistics Sweden and the Swedish board of Agriculture in three ways. Statistics Sweden: Income tax declarations from every enterprise whose main source of income (more than 50 %) comes from aquaculture will be compiled from official registers. Statistics Sweden: A questionnaire (Q1) about farming techniques, investments, production value and volume, costs that are not specified in the income tax declaration, social vaiables and mortality will be sent to all aquaculture enterprises. The questionnaire is to be filled out online. Swedish board of Agriculture: Data on subsidies will be collected from the Swedish board of Agriculture existing systems, the managing authority of the European Maritime, Fisheries and Aquaculture Fund (EMFAF), and will be compiled by Swedish board of Agriculture. Data on treatments will be collected from official records. From 2021 the questionnaire is a mandatory survey in Sweden with support from national legislation. *2.* Sample sizes: The survey includes all aquaculture enterprises. The population is decided on information from the national aquaculture register which is cross-referenced to income tax declarations. All enterprises with an income of over 50% is part of the population. *3.* Survey methods: A questionnaire (Q1) about farming techniques, investments, production value and volume, costs that are not specified in the income tax declaration, social variables and mortality will be sent to all aquaculture enterprises. The questionnaire is to be filled out online.

4. Additional information used in the survey strategy: N/A

Estimation design

1. Calculation method for population estimate: A questionnaire (Q1) about farming techniques, investments, production value and volume, costs that are not specified in the income tax declaration, social vaiables and mortality will be sent to all aquaculture enterprises (Census). The questionnaire will make it possible to compare information on value of aquaculture production with declared income from income tax declarations. These comparisons are needed to be able to classify the aquaculture farming as main acitivity of the enterprise or not.
2. Calculation method for derived data: *N/A*
3. Nonresponse handling: Non-respondents will be contacted and asked to fill out the questionnaire. Missing data will be checked and imputed to give an estimation of the whole aquaculture sector. The imputation is done with data from previous years related to the development for the current year.

Error checks

Data is collected, estimated and cross-checked by Statistics Sweden which ensures the consistency and quality of final data. Questionnaire is evaluated by Statistics Sweden. They conduct telephone interviews with aquaculture enterprises when there are incomplete answers, unreasonable answers or non-responses. Results are checked for bias.

Data storage and documentation

1. Data storage: Data is stored at Statistics Sweden as well as in a database at the Swedish Board of Agriculture
2. Documentation:

(https://www.scb.se/hitta-statistik/statistik-efter-amne/jord-och-skogsbruk-fiske/vattenbruk/vattenbruk/)
(https://statistik.sjv.se/PXWeb/pxweb/sv/Jordbruksverkets%20statistikdatabas/?rxid=5adf4929-f548-4f27-9bc9-78e127837625).
Methodology and quality reports can be found at https://www.scb.se/hitta-statistik/statistik-efter-amne/jord-och-skogsbruk-fiske/vattenbruk/vattenbruk/

Revision

The methodology on sampling is revised continuously to minimise bias in the data. Methodology on variables and segmentation follow EU legislation and guidelines by RCGECON.

Confidentiality

1. Are procedures for confidential data handling in place and documented? All raw data are handled by Statistics Sweden. Data delivered to the Swedish Board of Agriculture and thereafter to JRC is checked for confidentiality by Statistics Sweden.
2. Are protocols to enforce confidentiality between DCF partners in place and documented? Yes, Statistics Sweden has protocols for confidentiality.
3. Are protocols to enforce confidentiality with external users in place and documented? Yes, Statistics Sweden has protocols for confidentiality.

4. Are there any issues with publication of data due to confidentiality reasons? Provide an explanation. Since Sweden has a small aquaculture industry segments are clustered, both with respect to specie as well as technique, due to confidentiality.

Sampling scheme identifier: Fish processing - Operating subsidies, Energy costs, Subsidies on investments

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
Sampling scheme: Non-probability sample for 3 variables
Variables: Operating subsidies, Energy costs, Subsidies on investments
Supra region(s): Not included in this data collection
Survey planning
The population of the sampling schemes is the fish processing industry in Sweden. The data comes mainly from official statistics that has been collected and processed by Statistics Sweden through the SRU register which is maintained by Statistics Sweden and consists of income tax declarations in Sweden. Part of the data will be collected from the Statistical Business Register which is a central register consisting of information on all registered enterprises in Sweden. It is also maintained by Statistics Sweden.
Survey design and strategy

1. Data sources: Data on variables energy costs and subsidies will be collected from answers from a questionnaire sent out by Statistics Sweden based on PPS-selection in the Statistical Business Register. The Statistical Business Register is also used. The questionnaire is used as a base for estimating an allocation key for variables not included in the financial accounts.

2. Sample sizes: The sampling method for the variables collected with probability sample survey is Probability Proportional to Size (PPS sampling) where the sum of total income and total costs is used to select which enterprises that will be sampled.
3. Survey methods: The questionnaire is sent out to respondents by Statistics Sweden.
4. Additional information used in the survey strategy: All data is collected, estimated and checked by Statistics Sweden which ensures the consistency of the final data. It is not possible for Sweden to separate data on subsidies to a reasonable cost, therefore data will be collected for the variable group Operating Subsidies and Subsidies on Investments.

Estimation design

1. Calculation method for population estimate: All data is collected, estimated and checked by Statistics Sweden which ensures the consistency of the final data. Data on variables energy costs and subsidies will be collected from answers from a questionnaire sent out by Statistics Sweden based on PPS-selection in the Statistical Business Register. The questionnaire is used as a base for estimating the variables (including energy costs and income from subsidies) not included in the financial account.
2. Describe method of calculating population estimate from sample. The sampling method for the variables collected with probability sample survey is Probability Proportional to Size (PPS sampling) where the sum of total income and total costs is used to select which enterprises that will be sampled.
3. Calculation method for derived data: N/A.
4. Nonresponse handling: Non-respondents will be contacted and asked to fill out the questionnaire.

Error checks

A data quality evaluation is carried out by Statistics Sweden before delivering data to the Board of Agriculture, who conducts a macro evaluation upon delivery to ensure no abnormal or implausible changes have occurred by comparing the new data with previous years.

For variables subsidies and energy costs collected through the probability sample survey CV values are estimated to display the uncertainties due to sampling. A possible shortfall is that, although data is collected, processed and ensured by Statistics Sweden, some variables are not available through financial accounts. The variables affected by this possible shortfall are subsidies and energy costs. The reason for this is that those variables were solely collected through questionnaires and there is a certain range of uncertainty of these variables and it is also difficult to control if they are correct. There are some shortfalls when it comes to subsidies, but the best available method is used which provide comparable data over time. Data are collected through Statistics Sweden's standardized method to obtain the financial information for the processing industry and the possible shortfalls will most certainly not decline using another (not yet known) method since the data are based on official statistics for Sweden.

Data storage and documentation

1. Data storage: Data is stored by Statistics Sweden and then delivered to The Board of Agriculture. The Board of Agriculture will deliver the data to the Swedish Agency for Marine and Water Management for the yearly national data calls. The data is stored at computers belonging to the authorities and until processed only affected employees will have access to the data.

Revision

Sampled data is reviewed on a micro level by Statistics Sweden regarding summations, plausibility and relationships between variables. Outliers that may have a large effect on the estimation are checked and evaluated. The sample data is later aggregated, checked and evaluated at a macro level. In the last step no difference is made between sample and census data. The aforementioned methodology review takes place annually.

Confidentiality

1. Are procedures for confidential data handling in place and documented? Data is collected in wider size segments than suggested intervals (master code list). Enterprises with ≥ 250 employees will be clustered with enterprises with 50-249 employees due to confidentiality reasons. Fish processing in Sweden is a small industry hence, too detailed figures on economics regarding businesses would give away sensitive business information.
2. Are protocols to enforce confidentiality between DCF partners in place and documented? Yes, Statistics Sweden have protocols in place to ensure confidentiality.
3. Are protocols to enforce confidentiality with external users in place and documented? Yes, Statistics Sweden have protocols in place to ensure confidentiality.
4. Are there any issues with publication of data due to confidentiality reasons? Provide an explanation. No issues.

Sampling scheme identifier: Fish processing - Census for 18 variables

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

Sampling scheme: Census for 18 variables

Variables: Turnover, other income, personnel costs, purchase of fish and other raw material, other operational costs, consumption of fixed capital, total value of assets, financial income, financial expenditure, net investments, debt, number of persons employed, FTE national, number of enterprises, employment by gender, employment by age, employment by education level, employment by nationality.

Supra region(s): Not included in this data collection

Survey planning

The population of the sampling schemes is the fish processing industry in Sweden. The data comes from official statistics that has been collected and processed by Statistics Sweden through the SRU register which is maintained by Statistics Sweden and consists of income tax declarations in Sweden. Part of the data will be collected from the Statistical Business Register which is a central register consisting of information on all registered enterprises in Sweden. It is also maintained by Statistics Sweden. Another part of the data will be collected from Labour market statistics, which is a central register that is maintained by Statistics Sweden.

Survey design and strategy

- Data sources: SRU register, Statistical Business Register, Labour market statistics
- Sample sizes: Census
- Survey methods: Registers mentioned above.

Estimation design

1. Calculation method for population estimate: All companies are the population for these variables..
2. Calculation method for derived data: N/A
3. Nonresponse handling: N/A

All data is collected, estimated and checked by Statistics Sweden which ensures the consistency of the final data.

Error checks

A data quality evaluation is carried out by Statistics Sweden before delivering data to the Board of Agriculture, who conducts a macro evaluation upon delivery to ensure no abnormal or implausible changes have occurred by comparing the new data with previous years.

Data storage and documentation

Data is stored by Statistics Sweden and then delivered to The Board of Agriculture. The Board of Agriculture will deliver the data to the Swedish Agency for Marine and Water Management for the yearly national data calls. The data is stored at computers belonging to the authorities and until processed only affected employees will have access to the data.

Revision

Census data from the Swedish Tax Agency and the Statistical Business Register is evaluated by Statistics Sweden although not to such a large extent as sample data. The evaluation of census data mostly consists of reviewing suspiciously extreme values that may be small or large. The aforementioned methodology review takes place annually.

Confidentiality

1. Are procedures for confidential data handling in place and documented? Data is collected in wider size segments than suggested intervals (master code list). Enterprises with ≥ 250 employees will be clustered with enterprises with 50-249 employees due to confidentiality reasons. Fish processing in Sweden is a

small industry hence, too detailed figures on economics regarding businesses would give away sensitive business information.

2. Are protocols to enforce confidentiality between DCF partners in place and documented? Yes, Statistics Sweden have protocols in place to ensure confidentiality.
3. Are protocols to enforce confidentiality with external users in place and documented? Yes, Statistics Sweden have protocols in place to ensure confidentiality.
4. Are there any issues with publication of data due to confidentiality reasons? Provide an explanation. No issues.

Sampling scheme identifier: Fish processing - Unpaid labour

Survey Specifications

Sector name(s): Fish processing

Sampling scheme: Expert evaluation, 1 variable

Variables: Unpaid labour

Supra region(s): Not included in this data call

Survey planning

The population of the sampling schemes is the fish processing industry in Sweden. The data comes mainly from official statistics that has been collected and processed by Statistics Sweden through the SRU register which is maintained by Statistics Sweden and consists of income tax declarations in Sweden. Part of the data will be collected from the Statistical Business Register which is a central register consisting of information on all registered enterprises in Sweden. It is also maintained by Statistics Sweden.

Survey design and strategy

1. Data sources: Data on one variable (unpaid labour) will be based on an expert evaluation made by the component authority Statistics Sweden. The reason for this is that there is not possible to use any regular data collection scheme for that variable.
2. Sample sizes: N/A
3. Survey methods: N/A

Estimation design

All data is collected, estimated and checked by Statistics Sweden which ensures the consistency of the final data.

1. Calculation method for population estimate: Data on one variable (unpaid labour) will be based on an expert evaluation made by the component authority Statistics Sweden. The reason for this is that there is not possible to use any regular data collection scheme for that variable.
2. Calculation method for derived data: *N/A*

Error checks

A data quality evaluation is carried out by Statistics Sweden before delivering data to the Board of Agriculture, who conducts a macro evaluation upon delivery to ensure no abnormal or implausible changes have occurred by comparing the new data with previous years.

Data storage and documentation

Data is stored by Statistics Sweden and then delivered to The Board of Agriculture. The Board of Agriculture will deliver the data to the Swedish Agency for Marine and Water Management for the yearly national data calls. The data is stored at computers belonging to the authorities and until processed only affected employees will have access to the data.

Revision

Expert evaluation may be revised when needed.

Confidentiality

1. Are procedures for confidential data handling in place and documented? Data is collected in wider size segments than suggested intervals (master code list). Enterprises with ≥ 250 employees will be clustered with enterprises with 50-249 employees due to confidentiality reasons. Fish processing in Sweden is a small industry hence, too detailed figures on economics regarding businesses would give away sensitive business information.
2. Are protocols to enforce confidentiality between DCF partners in place and documented? Yes, Statistics Sweden have protocols in place to ensure confidentiality.
3. Are protocols to enforce confidentiality with external users in place and documented? Yes, Statistics Sweden have protocols in place to ensure confidentiality.
4. Are there any issues with publication of data due to confidentiality reasons? Provide an explanation. No issues.