Ministry of the Environment, Republic of Estonia

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

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

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

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

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

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

Commission Implementing Decision (EU) 2021/…

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

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

2022-2027

Version 4 - 2021

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Data collection framework at national level

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

The Ministry of the Environment (MoE) is responsible for the implementation of the data collection in the fisheries and aquaculture sectors and coordinates the European Commission objectives between the data collection authorities.

Narva mnt 7, 15172 Tallinn, Estonia
Elo Rasmann (national correspondent): elo.rasmann@envir.ee
https://envir.ee/

The Estonian Marine Institute of the University of Tartu (EMI-UT) is the main contractual partner of the Ministry of the Environment in the implementation of the data collection program and has been doing this work since the beginning of the commitment. Estonian Marine Institute is responsible for all scientific surveys under the data collection program and its researchers have the obligation to take part in relevant ICES working groups and other scientific working groups, which assess the state of fish stocks and marine environment, develop methodologies and provide assessments.

Mäealuse 14, 12618 Tallinn, Estonia
Redik Eschbaum (responsible person): redik.eschbaum@ut.ee
https://mereinstituut.ut.ee/et

Estonian University of Life Sciences (EULS) assess the state of the eel stock in inland waters and participate in the work of the ICES Eel Working Group (WGEEL).

Kreutzwaldi 1, Tartu 51006, Estonia
Priit Bernotas: pbernotas@emu.ee
https://www.emu.ee/

Statistics Estonia (SE) has been collecting economic and social data on the fishing fleet since 2019, before that it was the obligation of EMI-UT. SE is the main data competence centre in Estonia and is also responsible for coordinating the system of classifications and for data governance in Estonia.

Tatari 51, 10134 Tallinn, Estonia
E-mail: stat@stat.ee
https://www.stat.ee/et

The Agriculture and Food Board (AFB) compiles catch and effort data and first sale price data of commercial fishery.

Estonia participates in the following regional coordination groups: RCG Baltic, RCG North Atlantic, North Sea & Eastern Arctic, RCG Long Distance Fishery (since 2022) and RCG on Economics Issues.

Link to the national data collection website: https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp

(max. 1000 words)

Text Box 1a: Test studies description

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

1. Aim of the test study

Aim of this test study is to get more stable input data for Gulf of Riga herring population assessment.

For that timing of the survey needs to be determined and either the Gulf of Riga Acoustic Herring Survey (GRAHS) accordingly amended or Baltic International Acoustic Survey (BIAS) survey could be extended to Gulf of Riga.

2. Duration of the test study

2022-2027

3. Methodology and expected outcomes of the test study

IBAS methodology is used for both BIAS and GRAHS surveys, but there are differences in survey effort and timing. GRAHS has 2-3x times more trawling and acoustic tracks. On time wise BIAS is conducted in September/October, GRAHS in July/August. This test study aims to assess the suitability of either extending BIAS survey to cover also the Gulf of Riga or postponing the GRAHS survey so it takes place later at the year. It was recommended by ICES WGBIFS to try this approach to avoid fluctuations in current Gulf of Riga survey results. Expected outcome is more stable assessment of Gulf of Riga herring population with hopefully new time series of results. Currently it is presumed that survey time later at autumn could give more stable results compared to survey conducted in August, but it needs to be tested.

This test study is conducted together with Latvia

(max 900 words per study)

Text Box 1b: Other data collection activities

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

1. Aim of the data collection activity

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

2. Duration of the data collection activity

Starting from 2023

3. Methodology and expected outcomes of the data collection activity

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

(max 900 words per activity)

Text Box 2.3: Diadromous species data collection in freshwater

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

Method selected for collecting data.

Salmon and sea trout.

There is no commercial fishery for salmon and sea trout in fresh waters.

The principal way of monitoring salmonid populations in rivers is electrofishing. Permanent monitoring sites, located in important parr rearing areas, are fished annually or biennially. The sites are fished twice to calculate fishing efficiency and parr densities are presented as individuals per 100 m^2. The results of this method are comparable to all neighbouring countries. Caught fish are measured and released after analyses

Atlantic salmon and sea trout smolt abundancy estimate in river Pirita is done by capture-mark-recapture method. Smolts are caught by trap-net at the river mouth throughout the migration season. Captured smolts are tagged by VIE (visible implant elastomer) and released 2 km upstream from the trap. Some of the tagged smolts will be recaptured during their descent towards the sea. This enables to estimate the overall smolt run size. Caught fish are measured and released after analyses.

Ascending Atlantic salmon and sea trout spawners are counted in river Pirita throughout the migration season. A fish fence (type: resistance board weir) covering the entire width of the river guides fish through an opening that has a fish counter. Vaki Riverwatcher with a camera tunnel is used.

Recreational fishermen need a special licence to fish salmon and sea trout in rivers and are obliged to report the catches (census survey) to the Ministry of the Environment (entered to TEHA database). Obligation is to send in the report within 5 days after the licence is expired and it is impossible to get new fishing licence if reports of expired licences are not delivered. That way we get the total catch from the database TEHA (Science and Recreational Fisheries database) and we also see non-response rate.

Eel

Commercial fishery for eel exists in five lakes and is based on stocked eels. The commercial landing of eel in coastal waters of the Baltic Sea is very limited, average landings in the reference years (2018-2020) was only 1 tonne.

List of trusted fishermen are used for collecting information from freshwater commercial catches. Total length, weight and silvering stage are recorded for the individuals sampled from commercial catches.

Fishery independent study for eel at coastal areas is done during Coastal fish survey. The fyke nets used are 55 cm high with a semi-circular opening and a leader or wing that is 5 m long. They are made of 17 mm mesh in the arm and 10 mm mesh in the crib of yarn quality no. 210/12 in twisted nylon. Minimum of 80 fyke net days are fished in each of the 6 study areas along the Baltic Sea Estonian coast in July and August. Caught eels are measured for length and weight and otoliths for age reading are collected.

Fishery independent survey in inland waters are carried out in Lake Võrtsjärv. Fyke nets (mouth opening <3m, mesh size >38mm in the cod end) are used. Survey lasts usually from May until October, depending on water temperature. Fyke nets are controlled in every 3 days. Length (TL=mm), weight (g), age (from otolith), silvering stage (length of the pectoral fins and eye diameter) and infestation with parasites are recorded.

Annual data of eel restocking is collected with average weight (g) and total number of restocked individuals recorded.

Recreational fishermen need a special licence to fish eel with long line or harpoon gun in lakes where eels are stocked. With licence comes obligation to report the catches (census survey) to the Ministry of the Environment (entered to TEHA database). Obligation is to send in the report within 5 days after the licence is expired and it is impossible to get new fishing licence if reports of expired licences are not delivered. That way we get the total catch from the database TEHA (Science and Recreational Fisheries database) and we also see non-response rate. Catches made by recreational anglers and rod fishermen are based on regular recreational fishery phone survey questionnaire. Phone survey is conducted in every second year. For recreational anglers and rod fishermen, the catch volume and the confidence limits are calculated and documented from phone survey results.

Phone survey report about catches in 2020 is available at:
https://old.envir.ee/sites/default/files/harkal20_aruanne_parandatud29062021.pdf

(max 250 words per species and area)

Text Box 2.4: Recreational Fisheries

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

Recreational fishery in Estonia consists of 3 major parts:

1) Recreational fishermen using commercial gear (gill nets, trap nets, longlines) have an obligation to report the catches to the Ministry of the Environment.
2) Recreational fishermen need a licence to fish salmon and sea trout in rivers and are obliged to report the catches to the Ministry of the Environment. (Covered in text box 2.3)
3) Anglers and rod fishermen fishing in sea are not covered with compulsory catch reports. Their catches are estimated during phone survey every second year.

The main target species in the recreational fishery covered with compulsory catch reports are perch, pike-perch, flounder, whitefish, sea trout and salmon (among species listed in the Table 2.1).

Catch report system

Recreational fishermen that use commercial gear or are fishing on “salmonid”-rivers (part 1 and part 2) are obliged to report the catches (census survey) to the Ministry of the Environment (entered to TEHA database). Obligation is to send in the report within 5 days after the licence is expired and it is impossible to get new fishing licence if reports of expired licences are not delivered. That way we get the total catch from the database TEHA (Science and Recreational Fisheries database) and we also see non-response rate.

Phone survey

Catches made by recreational anglers and rod fishermen fishing in the sea (part 3) are based on regular recreational fishery phone survey questionnaire. Phone survey is conducted in every second year

Phone survey report about catches in 2020 is available at:
https://old.envir.ee/sites/default/files/harkal20_aruanne_parandatud29062021.pdf

For recreational anglers and rod fishermen fishing at sea, the catch volume and the confidence limits are calculated and documented from phone survey results.

(max 900 words per region)

Text Box 2.6: Research surveys at sea

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

Baltic International Trawl Survey (BITS Q4)

1. Objectives of the survey

Survey is included in Table 2 of the EU-MAP Implementing Decision. Target species are demersal fish species, mainly Baltic cod and flatfish species (flounder, plaice, dab, brill and turbot). The main aim is to determine the year-class strength of the target species. Target data are abundances, weight and length distributions of all fishes and length-weight-age-sex-maturity data of commercially important species as well as hydrographic data (temperature, salinity and oxygen). In addition, cod parasite infection load in livers and marine litter are sampled and marine mammal observations are recorded.

In Estonian survey area species as BLL, DAB and PLE are extremely rare.

The results are used by the ICES WGBFAS for assessment of the Baltic cod and flounder stocks on routinely basis.

Survey takes place in October/November.

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

Estonia follows the methods agreed for the BITS by the ICES Baltic International Fish Survey Working Group (WGBIFS) described in the Manual for the Baltic International Trawl Surveys (BITS).

http://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20%28SISP%29/SISP%207%20-%20Manual%20for%20the%20Baltic%20International%20Trawl%20Surveys%20%28BITS%29.pdf

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

The participating countries use their research vessel or chartered fishing vessel and the standard gear. Estonia is participating in the 4th quarter (autumn) survey using the chartered Estonian fishing vessel and TV2-520 trawl.

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

The ICES survey planning group (WGBIFS) assigns the tasks to the survey participants (e.g. coverage of certain areas in a certain time frame). Each participating country is responsible for the activities conducted on its national part of the international survey. 10 fish hauls is maximum expected number for Estonia, however the actual number may differ by year.

(max 450 words per survey)

Baltic International Acoustic Survey (BIAS)

1. Objectives of the survey

Survey is included in Table 2 of the EU-MAP Implementing Decision. Target species of the Baltic International Acoustic Survey (BIAS) are small pelagic fish species, mainly Baltic herring and sprat. The main aim is to provide information on stock parameters of small pelagics in the Baltic Sea. Target data are biomass, weight and length distributions and length-weight-age-sex-maturity of small pelagics, as well as hydrographic data (temperature, salinity and oxygen).

Survey takes place in September/October.

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

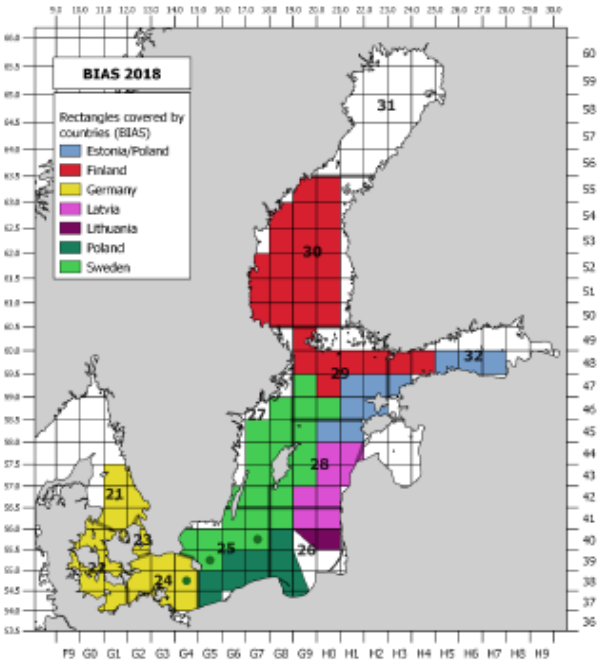
Baltic International Acoustic Survey (BIAS) is carried out in September/October. Surveys is carried out according to the agreed Manual of International Baltic Acoustic Surveys (IBAS): https://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%208%20-%20Manual%20of%20International%20Baltic%20Acoustic%20Surveys%20(IBAS).pdf

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

Each MS performs the survey in its EEZ on its own or shared research vessel. Estonia is chartering the Polish Research vessel BALTICA. The overall coordination of the surveys is done by the WGBIFS in order to secure the full coverage of the Baltic Sea.

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

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



Map: Baltic International Acoustic Survey (BIAS), Sep/Oct 2018: Survey areas by country.

(max 450 words per survey)

Gulf of Riga Acoustic Herring Survey GRAHS

1. Objectives of the survey

Survey is included in Table 2 of the EU-MAP Implementing Decision. The aim of the survey is to obtain the fisheries-independent information for tuning analytical stock assessment models for Baltic herring in the Gulf of Riga (Gulf of Riga herring). Target data are biomass, weight and length distributions and length-weight-age-sex-maturity of Baltic herring, as well as hydrographic data (temperature, salinity and oxygen). The information obtained during the survey is used by the Baltic Fisheries Assessment Working Group of the ICES (WGBFAS).

Survey takes place in July/August.

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

Survey will be carried out following the agreed Manual of International Baltic Acoustic Surveys (IBAS) (https://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%208%20-%20Manual%20of%20International%20Baltic%20Acoustic%20Surveys%20(IBAS).pdf) The surveys are coordinated and the results are discussed by the ICES WGBIFS annually. The survey is carried out in July-August annually in order to cover the period after main spawning season when most of the stock has left the near-coast spawning grounds.

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

The survey is carried out jointly by the Latvian and Estonian scientists on the chartered Latvian fishing vessel.

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

Estonia and Latvia share the tasks of work and also the survey costs on this joint survey.

(max 450 words per survey)

Sprat Acoustic Survey (SPRAS)

1. Objectives of the survey

Survey is included in Table 2 of the EU-MAP Implementing Decision. Target species is sprat. The main aim is to provide information on stock parameters of sprat in the Baltic Sea. Target data are biomass, weight and length distributions and length-weight-age-sex-maturity of sprat as well as hydrographic data (temperature, salinity and oxygen).

Survey takes place in May.

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

The Baltic Acoustic Spring Survey (SPRAS) is carried out annually in May. Survey is carried out by the agreed Manual of International Baltic Acoustic Surveys (IBAS) (https://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%208%20-%20Manual%20of%20International%20Baltic%20Acoustic%20Surveys%20(IBAS).pdf). The survey is annually coordinated and the results discussed by the ICES WGBIFS.

The acoustic survey covers the main area of sprat distribution in the Baltic. Each statistical rectangle of the area under investigation is allocated to one particular country by the Baltic International Fish Survey Working Group (WGBIFS), thus each country has a mandatory responsible area.

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

Each MS performs the survey in its EEZ on its own or shared research vessel. Estonia is chartering the Polish Research vessel BALTICA for SPRAS surveys. The overall coordination of the coming surveys is done by the WGBIFS in order to secure the full coverage of the Baltic Sea.

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

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

(max 450 words per survey)

Estonian Fish Larvae Survey

1. Objectives of the survey

This national survey has been conducted annually since 1947 to study the distribution and abundance of fish larvae and juveniles with the aim to provide primary information on herring yearclass abundance and to understand the affecting environmental background. Results of the survey is used for early estimation of the spawning success and yearclass potential of herring, but also commercially important percids (perch and pikeperch) and smelt. Data on abundance and distribution of the spring spawning herring larvae in the Gulf of Riga is used to calculate larval herring index N2. The rationale for this approach is that (i) the eggs and larvae of a species should be in direct proportion to the biomass of the adults, (ii) estimating the abundance of eggs or larvae is either more accurate or less costly than estimating the abundance of adults, and (iii) ichthyoplankton surveys provide data on a different group of species than trawl surveys for adults. Data of the survey is used nationally for Baltic herring and smelt stock assessment and for assessment of the state of important spawning grounds.

Survey takes place in May till July.

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

Nine fixed stations are visited weekly (May-July). Hensen larval fish net is used for 10 min. hauls in NE of the Gulf of Riga in commercially important fish spawning and nursery grounds.

Larvae and juveniles are collected using research vessels of the Estonian Marine Institute. Larvae are identified, measured and counted. Plankton samples and environmental data are collected and analysed.

Details of the survey design is described in following paper:
https://www.sciencedirect.com/science/article/abs/pii/S016578361000281X

Mesozooplankton samples are collected according to HELCOM manual:

https://helcom.fi/media/publications/Guidelines-for-monitoring-of-mesozooplankton.pdf

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

N/A

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

N/A

(max 450 words per survey)

Gulf of Riga Fish survey

1. Objectives of the survey

Objective of this national survey is to collect fisheries independent data for tuning the pikeperch and perch VPA assessment and get abundance index and biological data about other commercially important species (smelt, cyprinids).

Trawl survey in the Pärnu Bay was conducted already in earlier decades (since 1950s) and resumed 2009. Data of the survey is used nationally for stock assessment of many coastal fish species including perch and pikeperch.

Survey takes place in May and September till December.

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

Research vessel of the Estonian Marine Institute AURELIE is used for trawling. The trawl (working depth 0.3 m from the bottom) is pulled with the speed of 3 knots for 30 minutes. The trawl mouth is 2 m high and 6 m wide, distance between doors is 20 m and maximum distance between the 8.2 m long trawl wings is 12 m. Mesh size is 60 mm (knot to knot), at the tip of the trawl wings, 45 mm at the trawl mouth and decreases gradually to 10 mm at the codend. Six fixed trawl transects are situated three to eight km from shore (water depth five to nine m) to cover the entire length of the Pärnu Bay. All fixed stations are fished in May, September, October, November and December. The survey is coordinated and the results are discussed by the HELCOM FISH-PRO annually. Survey is carried out following the manual of HELCOM: (https://portal.helcom.fi/meetings/FISH-PRO%20III%201-2019-592/MeetingDocuments/4-1%20Updated%20guidelines%20for%20coastal%20fish%20monitoring.pdf)

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

N/A

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

N/A

(max 450 words per survey)

Coastal fish survey

1. Objectives of the survey

National annual survey started in 1992, now in 10 fixed areas. Data on abundance, relative year class strength, size and age distribution, structure of coastal fish assemblages are used in routine basis for giving advice for main commercially important species (also those not namely listed in the National WP). Most of our coastal fish are listed in Commission Delegated decision (EU) 2021/1167 Table 2 as relevant to HELCOM. Additional data on bycatch (incl. birds), seal damage to catch, distribution and abundance of alien species, microplastics in fish stomachs is collected. Data from the survey is used to calculate HELCOM and Marine Strategy Framework Directive fish indicators. Collected information (CPUE, age and length distribution, age-length keys for commercial species etc) form the basis for advice for commercially important stocks (perch, pikeperch, flounder, cyprinids) including fisheries independent data for tuning the flounder, pikeperch and perch analytical assessment.

Survey takes place in May till August, in October and in November.

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

Annual gill-net survey in defined areas along the Estonian coast, in fixed (Pärnu, Hiiumaa, Kõiguste and Küdema) or random stations (Narva-Jõesuu, Vilsandi, Kihnu, Matsalu, Käsmu, Vaindlo). Each station consists of a series of gill nets of fixed mesh sizes and construction. 6-72 stations are fished in each area. Additionally in six areas (Vilsandi, Kihnu, Kõiguste, Matsalu, Saarnaki and Käsmu) minimum 80 standard fyke net/days are fished for eel CPUE and length distribution.

Methods: Thoresson, 1995, HELCOM 2015 (http://www.helcom.fi/Documents/Action%20areas/Monitoring%20and%20assessment/Manuals%20and%20Guidelines/Guidelines%20for%20Coastal%20fish%20Monitoring%20of%20HELCOM.pdf)

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

N/A

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

N/A

(max 450 words per survey)

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.
Freshwater eel fishery (10-35 t/year, 2006-2020) – occurs in Narva RBD. All of the eel caught is of restocked background. The gear used consists mostly of fyke nets, very seldom long lines are used. The total capacity of the freshwater fishery in 2020 was 359 commercial fishermen/companies. 85 commercial fishermen/companies of the freshwater fishery reported eel in their catch. In the freshwater fishery 96% (35.8 t) of the eel was caught from Lake Võrtsjärv by 48 fisher-men/companies (averaging 745.1 kg per company/fisherman, CPUE per gear/night = 0.8 kg). This information is collected by the Estonian Ministry of Rural Affairs. Register is updated every year and is available online. Records are kept over the number and type of gears used. Data from fishermen logbooks are collected once a month and uploaded twice a year. *(max. 900 words)*

Text Box 4.2: Incidental catches of sensitive species

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

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

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

Yes.

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

Gill nets present the highest risk of bycatch to diving waterbirds and fyke nets are the risk to the seals in the Baltic Sea.

Baltic pelagic trawlers, targeting sprat and herring, are considered as low risk for PETS bycatch.

- What are the methods to calculate the observation effort?

There is census approach: registering bycatch is mandatory by the law for all fishermen and data are included in the Estonian Fisheries Information System. Addition to that we carry out direct questioning of the crew to collect information about sighting/catching whales (*Phocoena phocoena*) in our Baltic trawl fisheries (exclusively pelagic trawls for sprat and herring). This coverage is the same as for sampling schemes identified as OnShoreCommercialPelagic and OnShoreCommercialPelagicGOR. For our long distance fleet we use on-board observers to collect data on any bycatch. In NAFO area on-board observer coverage is 100% and in NEAFC the coverage has been between 10 to 20%.

Bycatch information is recorded during all surveys, including our rather large scale gill net survey (Coastal Fish Survey).

Recreational fishermen fishing with commercial gear are also obliged to report any occurred bycatch.

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

Sampling design and protocol does not follow the recommendations from relevant expert groups, although ICES WGBYC reports are monitored. Planned number of PSUs for trawls (OSF PEL, GOR PEL) in Table 2.5 cover the direct questioning of the crew about seeing or catching the whales *(Phocoena phocoena).* Trips are checked and the crew is questioned in ports by the staff of the EMI-UT during taking the herring and sprat samples. No mammal nor bird bycatch have been registered since the beginning of the commitment.

Observers covering our long distance fleet have an obligation to monitor hauling on deck to notice and register any bycatch event. It is also noted down when observer was not present during the hauling.

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

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

Yes and if the codend was not checked in a haul, observers should indicate it in the report. Observer is instructed to report all bycatch in haul, not only mammals or birds or sensitive species.

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

There is no dedicated observer programme for gill net nor hook-and-line fishery in Estonia. Data are collected through log books. In gill net fishery only small boats (below 12m) are used and it is seldom possible to put observers on board for safety reasons. Using CCTV or any other similar approach is not yet possible due to lack of national legislation that would allow it. Work on changing the legislation is ongoing, but progress has been rather slow due to strong resistance from different groups. Hook-and-line is seldom used nowadays as main species fished by this technique was eel.

All fishermen are obliged to report all bycatches and all alive specimens of incidental catch should be released.

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

Y, Y.

Additional information on sampling schemes

Pilot study about bird and seal bycatch in our coastal fishery is ongoing (conducted during the period 2020-2021). Results of the pilot study will be compared to a similar study conducted in 2007-2009 (part of a LIFE project). Based on this study results and analyses a decision will be made on how often this kind of bycatch study should be conducted in the future.

Additional description on sampling frames

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

Text Box 4.3: Fisheries impact on marine habitats

General comment: This text box fulfils Article 5 paragraph 2(a) and 2(b), Article 6 paragraph 3(a), 3(b) and 3(c) of Regulation (EU) 2017/1004 and Chapter 2, section 4.2 of the EU MAP Delegated Decision annex. It contains information on additional studies on the fisheries impact on marine habitats. This text box applies to the work plan and the annual report.

At the moment no additional studies are planned to address the fisheries impact on marine habitats. As there are no active bottom trawlers in our Baltic Sea fleet, so we do not study fishery's impact to the sea floor.

(max 900 words per study)

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

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

1. Description of clustering

Estonia has two clustered fleet segments. In both cases the segments added were with same fishing techniques and were merged for confidentiality reasons. Clusters were named after the biggest segment in terms of number of vessels.

Clustered fleet segments:

1) Pelagic trawlers 24-<40 m* – this segment catches sprat and herring in the Baltic Sea. Vessels of three length classes are merged. The number of vessels in each length class in 2020 was as follows:
    a. 12-<18 m one vessel,
    b. 18-<24 m six vessels and
    c. 24-<40 m 20 vessels.
2) Demersal trawlers and/or demersal seiners 40 m or larger* – this segment operates in the NAFO and NEAFC areas. Vessels of two length classes are merged. The number of vessels in both length classes in 2020 was as follows:
    a. 24-<40 m one vessel and
    b. 40 m or larger five vessels.

2. Description of activity indicator

Estonia does not use the activity indicator

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

No deviations are planned.

(max. 900 words)

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

General comment: This text box fulfils Article 5(2)(e), Article 6(3)(a), (b) and (c) of Regulation (EU) 2017/1004, and Chapter II point 6 of the EU MAP Delegated Decision annex. It is intended to specify the data to be collected under Tables 10 and 11 of the EU MAP Delegated Decision annex.
Estonia will not collect data on the aquaculture. As established by Commission Implementing Decision (EU) 2021/1168 it is not mandatory for Member States to collect social, economic and environmental data on aquaculture if their total aquaculture production is less than 1 % of total Union aquaculture production. According to the latest EUROSTAT data from 2019 the Estonian aquaculture production (1062 t) was below the threshold, accounting for 0,001% of the total aquaculture production of EU in 2019. *(max. 900 words)*

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

General comment: This text box fulfils Article 5(2)(f), Article 6(3)(a), (b) and (c) of Regulation (EU) 2017/1004, and Chapter II point 7 of the EU MAP Delegated Decision annex. The Member State should provide justifications for complementary data collection for fish processing.
According to the EU MAP the collection of data on the processing industry is optional. Because similar data is already collected by Statistics Estonia and forwarded to EUROSTAT, Estonia will not collect data on the processing industry to avoid the duplication in data collection. *(max. 900 words)*

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

OnShoreCommercialCoastal

MS: EST
Region: Baltic Sea
Sampling scheme identifier: OnShoreCommercialCoastal
Sampling scheme type: Commercial fishing trip
Observation type: SciObsOnShore
Time period of validity: 2022-2027
Short description (max 100 words): Sampling scheme aiming at collecting biological samples from commercial landings on-shore about selected species in costal fishery using passive gears and small boats (<12m). The scheme covers areas SD28-32.
Description of the population
Population targeted: PSU is month and sampling is species specific and evenly distributed by catch volumes along the coastal area. In total 4 species are sampled in different sub areas: *Platichthys flesus* (SD28-29, 32), *Perca fluviatilis* (SD28.1), *Sander lucioperca* (SD28.1) and *Clupea harengus* (caught with FPN during spawning season in SD28.1, 29, 32). **Population sampled:** Active fishing months when relevant species are fished are covered. Some months with no or very low catches are excluded. **Stratification:** *Platichthys flesus* in SD29 and SD32 and *Platichthys flesus* in SD28, and *Clupea harengus* in SD28.1 and *Clupea harengus* in SD29 and 32 are stratified because belonging to the different management units.
Sampling design and protocols
Sampling design description: Method of PSU selection is NPJS. Selection of month takes place based on the individual expert judgement taking into account the fishing effort and catch volume of selected coastal fish species. Sampling scheme follow the Hierarchy 8 in RDBES: sampling time (month) is the primary sampling unit (PSU) and vessel is the secondary sampling unit (SSU). Sampling scheme applies to all fractions, excl. PETS. **Is the sampling design compliant with the 4S principle?:** N

Regional coordination: N

Link to sampling design documentation: https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid

Compliance with international recommendations: Y

Link to sampling protocol documentation: https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid

Compliance with international recommendations: Y

Sampling implementation

Recording of refusal rate: Y

Monitoring of sampling progress within the sampling year: On weekly basis online catch and landings reports are used to evaluate the fishing activity in different areas and quota exhaustion. This data is compared against the number of samples collected to assure the implementation of sampling program.

Data capture

Means of data capture: Measuring board, scales, tools to collect age reading structures like operculums and otoliths.

Data capture documentation: https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid

Quality checks documentation: Y, https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid

Data storage

National database: EMI-UT

International database: In aggregated form, the data is transmitted to Intercatch and the detailed data to Fishframe or RDB database.

Quality checks and data validation documentation: https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid

Sample storage

Storage description: Age registering samples are stored in EMI-UT archive permanently. Archive is accessible to the stuff of EMI-UT and to another scientist on request. The work is ongoing to digitize the data in archive and make the information about the stored materials available through the Web.

Sample analysis: Thoresson, G. 1996. Guidelines for coastal monitoring. Kustrapport 1: 1-35. https://www.ices.dk/community/Pages/PGCCDBS-doc-repository.aspx Estonia uses SmartDots age reading platform, which facilitates age readings based on otolith images and takes part in intercalibration workshops.
Data processing
Evaluation of data accuracy (bias and precision): Y, https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid **Editing and imputation methods:** Y, https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid **Quality document associated to a dataset:** N **Validation of the final dataset:** Deviations are checked by length/weight, age/weight, age/length scatter plots by visual inspection.

SelfOnShoreCommercialCoastalSalmon

MS: EST
Region: Baltic Sea
Sampling scheme identifier: SelfOnShoreCommercialCoastalSalmon
Sampling scheme type: Commercial fishing trip
Observation type: SelfOnShore
Time period of validity: 2022-2027
Short description (max 100 words): self-sampling scheme aiming at collecting biological samples from commercial landings on-shore about *Salmo salar* and *Salmo trutta* in costal fishery using passive gears and small boats (<12m). The scheme covers areas SD28-32.
Description of the population
Population targeted: PSU is month and sampling is species specific and covers relevant areas. In total 2 species are sampled in different sub areas: *Salmo salar* (SD22-31 and 32) and *Salmo trutta* (SD22-32). **Population sampled:** active fishing months when relevant species are fished are covered. Some months with no or very low catches are excluded. **Stratification:** *Salmo salar* in SD22-31 and SD32 is stratified because belonging to the different management units.
Sampling design and protocols
Sampling design description: Method of PSU selection is NPJS. Selection of month takes place based on the individual expert judgement taking into account the fishing effort and catch volume of selected fish species. Sampling scheme follow the Hierarchy 8 in RDBES: sampling time (month) is the primary

sampling unit (PSU) and vessel is the secondary sampling unit (SSU). Sampling scheme applies to all fractions, excl. PETS.

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

Regional coordination: N

Link to sampling design documentation: https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid

Compliance with international recommendations: Y

Link to sampling protocol documentation: https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid

Compliance with international recommendations: Y

Sampling implementation

Recording of refusal rate: Y

Monitoring of sampling progress within the sampling year: Recruited fishermen are interviewed on weekly or monthly bases about their success to collect the samples. If sampling program is hindered by low numbers more fishermen are recruited.

Data capture

Means of data capture: Measuring board, scales, tools to collect age reading structures like operculums and otoliths.

Data capture documentation: https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid

Quality checks documentation: Y, https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid

Data storage

National database: EMI-UT

International database: In aggregated form, the data is transmitted to Intercatch and the detailed data to Fishframe or RDB database.

Quality checks and data validation documentation: https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid

Sample storage

Storage description: Age registering samples are stored in EMI-UT archive permanently. Archive is accessible to the stuff of EMI-UT and to another scientist on request. The work is ongoing to digitize the data in archive and make the information about the stored materials available through the Web.

Sample analysis: Estonia takes part in intercalibration workshops. https://www.ices.dk/community/Pages/PGCCDBS-doc-repository.aspx
Data processing
Evaluation of data accuracy (bias and precision): Y, https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid **Editing and imputation methods:** Y, https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid **Quality document associated to a dataset:** N **Validation of the final dataset:** Deviations are checked by length/weight, age/weight, age/length scatter plots by visual inspection.

OnShoreCommercialPelagic

MS: EST
Region: Baltic Sea
Sampling scheme identifier: OnShoreCommercialPelagic
Sampling scheme type: Commercial fishing trip
Observation type: SciObsOnShore
Time period of validity: 2022-2027
Short description (max 100 words): sampling scheme aiming at collecting biological samples from commercial landings on-shore about *Clupea harengus* and *Sprattus sprattus* in Baltic Sea pelagic trawlers (vessels 12-40m boats). The scheme covers areas SD25-29, 32.
Description of the population
Population targeted: PSU is week. Average number of PSU during the reference years was calculated as the sum of subareas. E.g. the number of weeks in 2020 when fishing was conducted was as follows: SD 28.2 - 34 weeks; SD29 - 37 weeks, SD32 - 44 weeks. The total number of weeks in 2020 when fishing was ongoing is calculated as the sum of weeks in all subareas (34+37+44=115). Same is done for all reference years and then divided by 3 to get the average per reference time period. **Population sampled:** On average 2 weeks per month per area are sampled during the active fishing period. No weeks are excluded during the planning. **Stratification:** The fishing area consists of multiple subareas (SD29, 28.2, 32) and each of these is sampled separately, as the aim is to get detailed description of the fisheries per subarea, even though all these subareas belong under one stock unit (Central Baltic herring stock and Baltic sprat stock unit)
Sampling design and protocols
Sampling design description: Primary sampling unit (PSU) is time unit of week. Method of PSU selection is NPJS. Sampling scheme for these segments follow the Hierarchy 8 in RDBES: sampling time (weeks) is the primary sampling unit (PSU) and vessel is the secondary sampling units (SSU). For the pelagic fisheries (OSF PEL, GOR PEL) our sampling strategy is that in every month when active fishing is ongoing (this depends on the year and subarea) subset of week(s) are sampled (PSU=week).

Sampling scheme applies to all fractions (crews are interviewed about the presence of whales, while collecting the fish sample). **Is the sampling design compliant with the 4S principle?:** N **Regional coordination:** Y, Multi-lateral agreement with Finland, see table 1.3. **Link to sampling design documentation:** https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid **Compliance with international recommendations:** Y **Link to sampling protocol documentation:** https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid **Compliance with international recommendations:** Y
Sampling implementation
Recording of refusal rate: Y **Monitoring of sampling progress within the sampling year:** On weekly basis online catch and landings reports are used to evaluate the fishing activity in different areas and quota exhaustion. This data is compared against the number of samples collected to assure the implementation of the sampling program.
Data capture
Means of data capture: Measuring board, scales, tools to collect otoliths. **Data capture documentation:** https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid **Quality checks documentation:** Y, https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid

Data storage
National database: EMI-UT **International database:** In aggregated form, the data is transmitted to Intercatch and the detailed data to Fishframe or RDB database. **Quality checks and data validation documentation:** https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid
Sample storage
Storage description: Age registering samples are stored in EMI-UT archive permanently. Archive is accessible to the stuff of EMI-UT and to another scientist on request. The work is ongoing to digitize the data in archive and make the information about the stored materials available through the Web.

Sample analysis: https://www.ices.dk/community/Pages/PGCCDBS-doc-repository.aspx EMI-UT uses SmartDots age reading platform, which facilitates age readings based on otolith images and takes part in intercalibration workshops.
Data processing
Evaluation of data accuracy (bias and precision): Y, https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid **Editing and imputation methods:** Y, https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid **Quality document associated to a dataset:** N **Validation of the final dataset:** Deviations are checked by length/weight, age/weight, age/length scatter plots by visual inspection.

OnShoreCommercialPelagicGOR

MS: EST
Region: Baltic Sea
Sampling scheme identifier: OnShoreCommercialPelagicGOR
Sampling scheme type: Commercial fishing trip
Observation type: SciObsOnShore
Time period of validity: 2022-2027
Short description (max 100 words): sampling scheme aiming at collecting biological samples from commercial landings on-shore about *Clupea harengus* in Gulf of Riga pelagic trawlers (vessels 12-40m boats). The scheme covers the Gulf of Riga.
Description of the population
Population targeted: PSU is week. **Population sampled:** On average 2 weeks per month is sampled during the fishing period. No weeks are excluded during the planning. **Stratification:** There is no stratification.
Sampling design and protocols
Sampling design description: Primary sampling unit (PSU) is time unit of week. Method of PSU selection is NPJS. Sampling scheme follow the Hierarchy 8 in RDBES: sampling time (week) is the primary sampling unit (PSU) and vessel is the secondary sampling units (SSU). Our sampling strategy is that in every month when fishing is ongoing (this depends on the year) subset of week(s) are sampled (PSU=week). Sampling scheme applies to all fractions (crews are interviewed about the presence of whales, while collecting the fish sample). **Is the sampling design compliant with the 4S principle?:** N **Regional coordination:** N

Link to sampling design documentation: https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid

Compliance with international recommendations: Y

Link to sampling protocol documentation: https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid

Compliance with international recommendations: Y

Sampling implementation

Recording of refusal rate: Y

Monitoring of sampling progress within the sampling year: On weekly basis online catch and landings reports are used to evaluate the fishing activity and quota exhaustion. This data is compared against the number of samples collected to assure the implementation of the sampling program.

Data capture

Means of data capture: Measuring board, scales, tools to collect otoliths.

Data capture documentation: https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid

Quality checks documentation: Y, https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid

Data storage

National database: EMI-UT
International database: In aggregated form, the data is transmitted to Intercatch and the detailed data to Fishframe or RDB database.
Quality checks and data validation documentation: https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid

Sample storage

Storage description: Age registering samples are stored in EMI-UT archive permanently. Archive is accessible to the stuff of EMI-UT and to another scientist on request. The work is ongoing to digitize the data in archive and make the information about the stored materials available through the Web.

Sample analysis: https://www.ices.dk/community/Pages/PGCCDBS-doc-repository.aspx EMI-UT uses SmartDots age reading platform, which facilitates age readings based on otolith images and takes part in intercalibration workshops.

Data processing

Evaluation of data accuracy (bias and precision): Y, https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid

Editing and imputation methods: Y, https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid

Quality document associated to a dataset: N **Validation of the final dataset:** Deviations are checked by length/weight, age/weight, age/length scatter plots by visual inspection.

AtSeaCommercialNEAFC

MS: EST
Region: North Sea and Eastern Arctic, North-East Atlantic
Sampling scheme identifier: AtSeaCommercialNEAFC
Sampling scheme type: Commercial fishing trip
Observation type: SciObsAtSea
Time period of validity: 2022-2027
Short description (max 100 words): sampling scheme aiming at collecting biological samples from commercial landings of selected species at sea by observers. The scheme covers all Estonian trawlers fishing in North-East Atlantic Fisheries Commission (NEAFC) regulatory area (more precise in ICES areas I and II and XIV).
Description of the population
Population targeted: PSU is fishing trip. **Population sampled:** All vessels in the segment are in the draw list. **Stratification:** N/A
Sampling design and protocols
Sampling design description: Primary sampling unit (PSU) is fishing trip. Method of PSU selection is SRSWR. Sampling scheme follow the Hierarchy 3 in RDBES. **Is the sampling design compliant with the 4S principle?:** Y **Regional coordination:** N **Link to sampling design documentation:** https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid **Compliance with international recommendations:** Y **Link to sampling protocol documentation:** https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid **Compliance with international recommendations:** Y
Sampling implementation
Recording of refusal rate: Y **Monitoring of sampling progress within the sampling year:**

The main concern is recruiting enough observers to be able to cover the sufficient number of long-lasting fishing trips. As the number of vessels is small and companies are interested to have observer onboard there are no big concerns. Changing quotas and short fishing periods could hinder the number of samples collected, thus fishing activity and quota exhaustion is monitored and observers are instructed accordingly on an ongoing basis.
Data capture
Means of data capture: Measuring board, scales, tools to collect otoliths **Data capture documentation:** https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid **Quality checks documentation:** https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid

Data storage
National database: EMI-UT **International database:** Fishframe/RDB database. **Quality checks and data validation documentation:** https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid
Sample storage
Storage description: Age registering samples are stored in EMI-UT archive permanently. Archive is accessible to the stuff of EMI-UT and to another scientist on request. The work is ongoing to digitize the data in archive and make the information about the stored materials available through the Web. **Sample analysis:** Age registering structures are collected but have not been analysed.
Data processing
Evaluation of data accuracy (bias and precision): Y, https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid **Editing and imputation methods:** Y, https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid **Quality document associated to a dataset:** N **Validation of the final dataset:** Deviations are checked by length/weight scatter plots by visual inspection.

AtSeaCommercialNAFO

MS: EST
Region: Other regions (NAFO)
Sampling scheme identifier: AtSeaCommercialNAFO
Sampling scheme type: Commercial fishing trip

Observation type: SciObsAtSea
Time period of validity: 2022-2027
Short description (max 100 words): sampling scheme aiming at collecting biological samples from commercial landings of selected species at sea by observers. The scheme covers all trawling vessels in NAFO areas.
Description of the population
Population targeted: PSU is fishing trip. **Population sampled:** Census approach, all vessels fishing in the area are sampled. **Stratification:** There is no stratification.
Sampling design and protocols
Sampling design description: Primary sampling unit (PSU) is fishing trip. Method of PSU selection is CENSUS. Sampling scheme follow the Hierarchy 3 in RDBES. **Is the sampling design compliant with the 4S principle?:** Y **Regional coordination:** N **Link to sampling design documentation:** https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid **Compliance with international recommendations:** Y **Link to sampling protocol documentation:** https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid **Compliance with international recommendations:** Y
Sampling implementation
Recording of refusal rate: NA (observers on-board are mandatory). **Monitoring of sampling progress within the sampling year:** Changing quotas and short fishing periods could hinder the number of samples collected, thus fishing activity and quota exhaustion is monitored and observers are instructed accordingly on an ongoing basis.
Data capture
Means of data capture: Measuring board, scales, tools to collect otoliths. **Data capture documentation:** https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid **Quality checks documentation:** https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid

Data storage
National database: EMI-UT

International database: Fishframe/RDB database. **Quality checks and data validation documentation:** https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid
Sample storage
Storage description: Age registering samples are stored in EMI-UT archive permanently. Archive is accessible to the stuff of EMI-UT and to another scientist on request. The work is ongoing to digitize the data in archive and make the information about the stored materials available through the Web. **Sample analysis:** Age registering structures are collected but have not been analysed.
Data processing
Evaluation of data accuracy (bias and precision): Y, https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid **Editing and imputation methods:** Y, https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid **Quality document associated to a dataset:** N **Validation of the final dataset:** Deviations are checked by length/weight scatter plots by visual inspection.

Parrelectrofishing

MS: EST
Region: Baltic Sea
Sampling scheme identifier: parrelectrofishing
Sampling scheme type: Diadromous (scientific)
Observation type: SciObs water body
Time period of validity: 2022-2027
Short description (max 100 words): sampling scheme aiming at collecting data on *Salmo salar* and *Salmo trutta* parr densities in selected rivers using electrofishing. The scheme covers important parr rearing areas. Parr densities of salmonids are sampled annually in 11 fixed rivers inhabited by Atlantic salmon. Parr densities of salmonids are sampled also in 28 to 32 rivers every year which are inhabited mostly by sea trout. 28 rivers are sampled in odd years and 32 in even years.
Description of the population
Population targeted: Target species are Atlantic salmon *Salmo salar* and sea trout *Salmo trutta*. The survey takes place in permanent areas in rivers flowing into the Baltic Sea. **Population sampled:** Only salmonid part (*Salmo salar* and *Salmo trutta*) of the river fish assemblage is studied. **Stratification:** Parr densities are studied and presented by species (*Salmo salar*, *Salmo trutta)*, rivers and areas within the rivers.

Sampling design and protocols
Sampling design description: Monitoring method of studying parr (Salmo salar and Salmo trutta) densities in rivers is electrofishing. The study sites are fished twice to calculate fishing efficiency and parr densities are presented as individuals per 100 m2. **Is the sampling design compliant with the 4S principle?:** NA **Regional coordination:** N **Link to sampling design documentation:** Method is accredited nationally by the accreditation certificate No L179 (2017) of the Tartu University, Estonian Marine Institute: Assessment of species composition and abundance of salmonids in riverine habitat, KJ l/21; based on Bohlin et al., 1989 and ICES, 2014. Laboratory of the Estonian Marine Institute is accredited against the requirements of standard EVS-EN ISO/IEC 17025:2017 (https://mereinstituut.ut.ee/sites/default/files/mereinstituut/akrediteerimisulatus_2020.pdf). **Compliance with international recommendations:** Y **Link to sampling protocol documentation:** Sampling protocol is based on Bohlin *et al* 1989 (Electrofishing – Theory and practice with special emphasis on salmonids. Hydrobiologia 173: 9 – 43) article that is modified according to the local needs and this modified methodology is accepted by ICES WGBAST (ICES C.M. 2014/ACOM:08). Sampling design is described in detail in documents of accreditation No L179 (2017) of the Tartu University, Estonian Marine Institute: Assessment of species composition and abundance of salmonids in riverine habitat, KJ l/21. **Compliance with international recommendations:** Y
Sampling implementation
Recording of refusal rate: NA **Monitoring of sampling progress within the sampling year:** High water levels in river could hinder the sampling. By reserving enough time for sampling, you can find a period when conditions for survey are favourable.
Data capture
Means of data capture: Bakcpack electrofisher, measuring board, scales. **Data capture documentation:** https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid **Quality checks documentation:** https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid

Data storage
National database: EMI-UT **International database:** NA

Quality checks and data validation documentation: https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid
Sample storage
Storage description: Scales have seldom been collected. If so, then those age registering samples are stored in EMI-UT archive permanently. Archive is accessible to the stuff of EMI-UT and to another scientist on request. The work is ongoing to digitize the data in archive and make the information about the stored materials available through the Web. **Sample analysis:** Estonia takes part in intercalibration workshops. https://www.ices.dk/community/Pages/PGCCDBS-doc-repository.aspx
Data processing
Evaluation of data accuracy (bias and precision): Y, https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid **Editing and imputation methods:** Y, https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid **Quality document associated to a dataset:** N **Validation of the final dataset:** Deviations are checked by length/weight scatter plots by visual inspection.

Smolttrapping

MS: EST
Region: Baltic Sea
Sampling scheme identifier: smolttrapping
Sampling scheme type: Diadromous (scientific)
Observation type: SciObs water body
Time period of validity: 2022-2027
Short description (max 100 words): sampling scheme aiming at collecting data on abundance of descending *Salmo salar* and *Salmo trutta* smolts in River Pirita flowing into the Gulf of Finland (SD32).
Description of the population
Population targeted: Target species are Atlantic salmon *Salmo salar* and sea trout *Salmo trutta*. The survey takes place in River Pirita, which is designated as index river by ICES. **Population sampled:** Only descending salmonid part (*Salmo salar* and *Salmo trutta*) of the river fish assemblage is studied. **Stratification:** *Salmo salar* and *Salmo trutta* smolt abundancy are estimated separately.
Sampling design and protocols
Sampling design description: Salmo salar and Salmo trutta smolt abundancy estimate in river Pirita is done by capture-mark-recapture method. Smolts are caught by trap-net at the river mouth throughout

the migration season. Captured smolts are tagged by VIE (visible implant elastomer) and released 2 km upstream from the trap. Some of the tagged smolts will be recaptured during their descent towards the sea. This enables to estimate the overall smolt run size. Only *Salmo salar* and *Salmo trutta* smolts are studied, all other fish are released directly.

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

Regional coordination: N

Link to sampling design documentation: https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid

Compliance with international recommendations: Y

Link to sampling protocol documentation: https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid

Compliance with international recommendations: Y

Sampling implementation

Recording of refusal rate: NA

Monitoring of sampling progress within the sampling year: NA

Data capture

Means of data capture: Trap-net, fish tagging equipment, measuring board, scales

Data capture documentation: https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid

Quality checks documentation: https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid

Data storage

National database: EMI-UT

International database: NA

Quality checks and data validation documentation: https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid

Sample storage

Storage description: Scales have seldom been collected. If so, then those age registering samples are stored in EMI-UT archive permanently. Archive is accessible to the stuff of EMI-UT and to another scientist on request. The work is ongoing to digitize the data in archive and make the information about the stored materials available through the Web.

Sample analysis: Estonia takes part in intercalibration workshops. https://www.ices.dk/community/Pages/PGCCDBS-doc-repository.aspx
Data processing
Evaluation of data accuracy (bias and precision): Y, https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid **Editing and imputation methods:** Y, https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid **Quality document associated to a dataset:** N **Validation of the final dataset:** Deviations are checked by length/weight scatter plots by visual inspection.

Adultcounting

MS: EST
Region: Baltic Sea
Sampling scheme identifier: adultcounting
Sampling scheme type: Diadromous (scientific)
Observation type: EMA water body
Time period of validity: 2022-2027
Short description (max 100 words): sampling scheme aiming at collecting data on abundance of ascending *Salmo salar* and *Salmo trutta* adults in River Pirita flowing into the Gulf of Finland (SD32).
Description of the population
Population targeted: Target species are Atlantic salmon *Salmo salar* and sea trout *Salmo trutta*. The survey takes place in River Pirita, which is designated as index river by ICES. **Population sampled:** Ascending Atlantic salmon and sea trout spawners are counted in river Pirita throughout the migration season. River Pirita is designated as index river by ICES. Besides salmon and trout parr density monitoring salmon and sea trout smolt abundancy and spawner abundancy is monitored in river Pirita. **Stratification:** *Salmo salar* and *Salmo trutta* spawners are counted separately.
Sampling design and protocols
Sampling design description: A fish fence (type: resistance board weir) covering the entire width of the river guides fish through an opening that has a fish counter. Only *Salmo salar* and *Salmo trutta* adults are counted. **Is the sampling design compliant with the 4S principle?:** NA **Regional coordination:** N

Link to sampling design documentation: https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid **Compliance with international recommendations:** Y **Link to sampling protocol documentation:** https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid **Compliance with international recommendations:** Y
Sampling implementation
Recording of refusal rate: NA **Monitoring of sampling progress within the sampling year:** NA
Data capture
Means of data capture: Fish counter Vaki Riverwatcher with a camera tunnel. **Data capture documentation:** https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid **Quality checks documentation:** https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid

Data storage
National database: EMI-UT **International database:** NA **Quality checks and data validation documentation:** https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid
Sample storage
Storage description: NA **Sample analysis:** NA
Data processing
Evaluation of data accuracy (bias and precision): Y, https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid **Editing and imputation methods:** Y, https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid **Quality document associated to a dataset:** N **Validation of the final dataset:** Videos are analysed by two experts.

CFSeel

MS: EST
Region: Baltic Sea
Sampling scheme identifier: CFSeel
Sampling scheme type: Diadromous (scientific)
Observation type: SciObs water body
Time period of validity: 2022-2027
Short description (max 100 words): sampling scheme aiming at collecting abundance data and biological samples on eel (*Anguilla anguilla*) in coastal waters of the Baltic Sea. The scheme covers areas SD 28-32.
Description of the population
Population targeted: Target species is *Anguilla anguilla* and survey takes place in areas SD 28-32. **Population sampled:** Survey targets yellow eels, silver eels are mostly unreachable for the sampling. **Stratification:** Survey takes place in 6 permanent coastal areas. Abundance indexes are calculated per area.
Sampling design and protocols
Sampling design description: The fyke nets used are 55 cm high with a semi-circular opening and a leader or wing that is 5 m long. They are made of 17 mm mesh in the arm and 10 mm mesh in the crib of yarn quality no. 210/12 in twisted nylon. Minimum of 80 fyke net days are fished in each of the 6 study areas along the Baltic Sea Estonian coast in July and August. Caught eels are measured for length and weight and otoliths for age reading are collected. Only *Anguilla anguilla*, (mostly yellow eels) are studied, all other fish species are released. **Is the sampling design compliant with the 4S principle?:** NA **Regional coordination:** N **Link to sampling design documentation:** Method is accredited nationally by the accreditation certificate No L179 (2017) of the Tartu University, Estonian Marine Institute: Assessment of biodiversity, abundance and biomass of fish assemblages; KJ l/20; based on EVSEN 14757; Helcom, 2015 (Coastal Fish Guidelines). Laboratory of the Estonian Marine Institute is accredited against the requirements of standard EVS-EN ISO/IEC 17025:2017 (https://mereinstituut.ut.ee/sites/default/files/mereinstituut/akrediteerimisulatus_2020.pdf). **Compliance with international recommendations:** Y **Link to sampling protocol documentation:** https://helcom.fi/wp-content/uploads/2020/01/HELCOM-Guidelines-for-coastal-fish-monitoring-2019.pdf **Compliance with international recommendations:** Y
Sampling implementation
Recording of refusal rate: NA

Monitoring of sampling progress within the sampling year: NA
Data capture
Means of data capture: Fyke nets, measuring board, scales. **Data capture documentation:** https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid **Quality checks documentation:** https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid

Data storage
National database: EMI-UT **International database:** NA **Quality checks and data validation documentation:** https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid
Sample storage
Storage description: Age registering samples are stored in EMI-UT archive permanently. Archive is accessible to the stuff of EMI-UT and to another scientist on request. The work is ongoing to digitize the data in archive and make the information about the stored materials available through the Web. **Sample analysis:** Estonia takes part in intercalibration workshops. https://www.ices.dk/community/Pages/PGCCDBS-doc-repository.aspx
Data processing
Evaluation of data accuracy (bias and precision): Y, https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid **Editing and imputation methods:** Y, https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid **Quality document associated to a dataset:** N **Validation of the final dataset:** Deviations are checked by length/weight scatter plots by visual inspection.

Freshwater_eelfykes_scientific

MS: EST
Region: Other
Sampling scheme identifier: freshwater_eelfykes_scientific
Sampling scheme type: Diadromous (scientific)
Observation type: SciObs water body
Time period of validity: 2022-2027

Short description (max 100 words): Sampling scheme to collect samples from fishery independent (scientific data collection) sources to estimate silver eel escapement from Narva River Basin District.
Description of the population
Population targeted: Target species is *Anguilla anguilla* and survey takes place in Narva River Basin District, most notably Lake Võrtsjärv. **Population sampled:** Survey targets yellow eels and silver eels. Males are mostly unreachable due to selectivity of gear. **Stratification:** As the eel population is concentrated in Lake Võrtsjärv (85% of restocking takes place in this water body) the samples are collected from only this water body.
Sampling design and protocols
Sampling design description: Fyke nets (mouth opening <3m, mesh size >38mm in the cod end) are used for eel fresh water scientific survey. Survey lasts usually from May until October, depending on water temperature. Fyke nets are controlled in every 3 days. Length (TL=mm), weight (g), age (from otolith), silvering stage (length of the pectoral fins and eye diameter) and infestation with parasites are recorded. Annual data of eel restocking is collected with average weight (g) and total number of restocked individuals recorded. **Is the sampling design compliant with the 4S principle?:** NA **Regional coordination:** N **Link to sampling design documentation:** Sampling design described in Page 87 (Estonian Country Report, Section 4.1): https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/Fisheries%20Resources%20Steering%20Group/2020/WGEEL_Publications%20with%20multiple%20files/CRs_2020.pdf **Compliance with international recommendations:** Y **Link to sampling protocol documentation:** https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid **Compliance with international recommendations:** Y
Sampling implementation
Recording of refusal rate: NA **Monitoring of sampling progress within the sampling year:** NA
Data capture
Means of data capture: Fyke nets, measuring board, scales, equipment for age reading from otoliths (grinder, microscope)

Data capture documentation: https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid **Quality checks documentation:** https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid

Data storage
National database: PlutoF https://plutof.ut.ee **International database:** ICES WGEEL database on http://185.135.126.250:8080/shiny_di/ **Quality checks and data validation documentation:** https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid
Sample storage
Storage description: Otoliths are stored in Estonian University of Life Sciences. Samples are stored permanently. Access to samples is provided on request. Work is ongoing to insert all information on samples to the database on https://plutof.ut.ee **Sample analysis:** https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2009/WKAREA/WKAREA%202009.pdf
Data processing
Evaluation of data accuracy (bias and precision): Y, https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid **Editing and imputation methods:** Y, https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid **Quality document associated to a dataset:** N **Validation of the final dataset:** All datasets are controlled by 3 independent individuals.

Freshwater_eelfykes_commercial

MS: EST
Region: Other
Sampling scheme identifier: freshwater_eelfykes_commercial
Sampling scheme type: Diadromous (commercial)
Observation type: SciObs water body
Time period of validity: 2022-2027
Short description (max 100 words): Sampling scheme to collect samples from fishery dependent (sampling commercial landings) to estimate silver eel escapement from Narva River Basin District.
Description of the population

Population targeted: PSU is month and SSU is vessel trip, meaning one fishing trip to check all fishing gear. SSU will be selected from a list of trusted fishermen. During a fishing season (April-October), each month one fishing trip is selected for biological data collection, with the main survey area being Lake Võrtsjärv.

Population sampled: Population is reachable during the active fyke net fishing period which usually extends from April to October. Both yellow- and silver eels are targeted for sampling in an unsorted catch (meaning the fish selected reflect all specimens the fishermen has caught during that trip).

Stratification: As the eel population is concentrated in Lake Võrtsjärv (85% of restocking takes place in this water body) the samples are collected from the same water body.

Sampling design and protocols

Sampling design description: Total length, weight and silvering stage are recorded for the individuals sampled from commercial catches.

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

Regional coordination: N

Link to sampling design documentation: https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid

Compliance with international recommendations: N

Link to sampling protocol documentation: https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid

Compliance with international recommendations: Y

Sampling implementation

Recording of refusal rate: Y

Monitoring of sampling progress within the sampling year: Fishermen are contacted one week prior to following month to make sure of ability to obtain samples. If needed more fishermen will be involved in the program.

Data capture

Means of data capture: Fyke nets, measuring board, scales, equipment for age reading from otoliths (grinder, microscope)

Data capture documentation: https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid

Quality checks documentation: Y, https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid

Data storage

National database: PlutoF https://plutof.ut.ee **International database:** ICES WGEEL database on http://185.135.126.250:8080/shiny_di/ **Quality checks and data validation documentation:** https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid
Sample storage
Storage description: Otoliths are stored in Estonian University of Life Sciences. Samples are stored permanently. Access to samples is provided on request. Work is ongoing to insert all information on samples to the database on https://plutof.ut.ee **Sample analysis:** https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2009/WKAREA/WKAREA%202009.pdf
Data processing
Evaluation of data accuracy (bias and precision): Y, https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid **Editing and imputation methods:** Y, https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid **Quality document associated to a dataset:** N **Validation of the final dataset:** All datasets are controlled by 3 independent individuals.

Recreational_catchreports

MS: EST
Region: Baltic Sea
Sampling scheme identifier: recreational_catchreports
Sampling scheme type: Diadromous (recreational)
Observation type: Self water body
Time period of validity: 2022-2027
Short description (max 100 words): Recreational fishermen using commercial gear (gill nets, trap nets, longlines) or fishing for salmon or sea trout in salmonid rivers are all obliged to buy a licence and report back catches. Reports have information about all catches and releases for salmon, sea trout and eel. The scheme covers Estonia's coastal areas (SD 28-32) and salmonid rivers.
Description of the population
Population targeted: All recreational fishermen that fish with gear or areas where having fishing licence is obligatory. **Population sampled:** All recreational fishermen that fish with gear or areas where having fishing licence is obligatory.

Stratification: Recreational catches are collected by SD and by rivers.
Sampling design and protocols
Sampling design description: This is a census approach as all recreational fishermen using commercial gear (gill nets, trap nets, longlines) or fishing for salmon or sea trout in salmonid rivers are all obliged to buy a licence and write a report afterwards. **Is the sampling design compliant with the 4S principle?:** NA **Regional coordination:** N **Link to sampling design documentation:** NA **Compliance with international recommendations:** Y **Link to sampling protocol documentation:** NA **Compliance with international recommendations:** Y
Sampling implementation
Recording of refusal rate: Y **Monitoring of sampling progress within the sampling year:** NA
Data capture
Means of data capture: NA **Data capture documentation:** NA **Quality checks documentation:** NA

Data storage
National database: TEHA (Science and Recreational Fisheries database), overview of yearly catches is available here: https://envir.ee/elusloodus-looduskaitse/kalandus/harrastuspuuk#statistika. **International database:** NA **Quality checks and data validation documentation:** Quality checks are made on database to sort out errors made when entering the data. Fishermen are contacted personally to validate inserted data when inserted information is an outlier (species in uncommon areas, catch volumes etc).
Sample storage
Storage description: NA **Sample analysis:** NA
Data processing
Evaluation of data accuracy (bias and precision): NA **Editing and imputation methods:** N, imputation is not done.

Quality document associated to a dataset: N

Validation of the final dataset: Quality checks are made on database to sort out errors made when entering the data. Fishermen are contacted personally to validate inserted data when inserted information is an outlier (species in uncommon areas, catch volumes etc).

Recreational_interview

MS: EST
Region: Baltic Sea
Sampling scheme identifier: Recreational_interview
Sampling scheme type: recreational (off site surveys)
Observation type: EMOnShore
Time period of validity: 2022-2027
Short description (max 100 words): sampling scheme aiming at collecting data about recreational catches and releases for salmon, sea trout, eel and cod by anglers and rod fishermen fishing in the sea. The scheme covers areas 28-32.
Description of the population
Population targeted: The target group of the study is Estonian residents aged 15 and older, who are engaged in recreational angling and rod fishing. **Population sampled:** Estonian residents aged 15 and older, younger generation is excluded. **Stratification:** Recreational catches are estimated by different coastal areas.
Sampling design and protocols
Sampling design description: Survey was conducted by polling company and used method was CATI (Computer Assisted Telephone Interviewing). The process and the sample size were controlled by the special software (NIPO Fieldwork System for CATI). Filters and rotations of the software are programmed to reduce polling errors. To get better estimates on catch volumes and releases for salmon, sea trout, eel and cod additional interviews were conducted using CAWI (Computer-assisted web interview) method. Outcomes of CAWI interviews were used to have better estimates on catch volumes at sea areas. **Is the sampling design compliant with the 4S principle?:** NA **Regional coordination:** N **Link to sampling design documentation:** https://old.envir.ee/sites/default/files/harkal20_aruanne_parandatud29062021.pdf **Compliance with international recommendations:** Y

Link to sampling protocol documentation: https://old.envir.ee/sites/default/files/harkal20_aruanne_parandatud29062021.pdf **Compliance with international recommendations:** Y
Sampling implementation
Recording of refusal rate: Y **Monitoring of sampling progress within the sampling year:** NA
Data capture
Means of data capture: CATI (Computer Assisted Telephone Interviewing), CAWI (Computer-assisted web interview) sample size was controlled by the special software (NIPO Fieldwork System for CATI). **Data capture documentation:** https://old.envir.ee/sites/default/files/harkal20_aruanne_parandatud29062021.pdf **Quality checks documentation:** https://old.envir.ee/sites/default/files/harkal20_aruanne_parandatud29062021.pdf

Data storage
National database: NA **International database:** NA **Quality checks and data validation documentation:** https://old.envir.ee/sites/default/files/harkal20_aruanne_parandatud29062021.pdf
Sample storage
Storage description: NA **Sample analysis:** NA
Data processing
Evaluation of data accuracy (bias and precision): https://old.envir.ee/sites/default/files/harkal20_aruanne_parandatud29062021.pdf **Editing and imputation methods:** Y, https://old.envir.ee/sites/default/files/harkal20_aruanne_parandatud29062021.pdf **Quality document associated to a dataset:** N **Validation of the final dataset:** The follow-up of the survey was carried out within two days after the end of the survey. The follow-up of the survey was carried out by the project manager of the survey. 10% of the representatives of the target group, with whom the interview was conducted were called again and asked the respondent to comment on various aspects of the interviewer's work. The respondent was asked questions concerning the content of the survey as well as the observance of the survey methodology, adherence to the professional skills.

Interviewers whose work was audited were selected on a systematic random basis. Follow-up activities and results were documented.

BITS_Q4

MS: EST
Region: Baltic Sea
Sampling scheme identifier: BITS_Q4
Sampling scheme type: NA
Observation type: SciObsAtSea
Time period of validity: 2022-2027
Short description (max 100 words): it is the mandatory survey according to Table 1 of the EU MAP Implementing Decision annex. The aim of the survey is monitoring the spatial distribution and abundance of cod and flounder year-classes, and other fish species spatial distribution, taking into consideration the principal hydrological parameters vertical and horizontal variations. The survey is focused on evaluation of the fishing efficiency and abundance of different species and collects materials for the main species biological parameters. The results are used by the ICES WGBFAS for assessment of the cod and flounder stocks.
Description of the population
Population targeted: The main target species are cod and flounder. In Table 1 of the EU MAP Implementing Decision annex target species list of the survey contains the following species: BLL COD DAB FLE HER PLE TUR. But species as BLL, DAB and PLE do not habit or are extremely rare in our survey area and have been caught only on individual occasions or never. EST part of the survey covers SD28. **Population sampled:** The main target of the survey is demersal fish assemblage, but pelagic component (Baltic herring) is also analysed. **Stratification:** The ICES Subdivisions and depth layers within an ICES Subdivision are used as strata.
Sampling design and protocols
Sampling design description: Total mass and the catch by species are estimated, length composition of main target species, age, sex, individual mass (weight) and maturity samples are collected. Sampling design is described in detail in survey manual: https://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%207%20-%20Manual%20for%20the%20Baltic%20International%20Trawl%20Surveys%20(BITS).pdf **Is the sampling design compliant with the 4S principle?:** NA **Regional coordination:** NA **Link to sampling design documentation:** https://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%207%20-%20Manual%20for%20the%20Baltic%20International%20Trawl%20Surveys%20(BITS).pdf

Compliance with international recommendations: Y

Link to sampling protocol documentation: https://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%207%20-%20Manual%20for%20the%20Baltic%20International%20Trawl%20Surveys%20(BITS).pdf

Compliance with international recommendations: Y

Sampling implementation

Recording of refusal rate: NA

Monitoring of sampling progress within the sampling year: NA

Data capture

Means of data capture: Standard trawl type TV-3#520, scales, measuring board, CTD.

Data capture documentation: https://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%207%20-%20Manual%20for%20the%20Baltic%20International%20Trawl%20Surveys%20(BITS).pdf

Quality checks documentation: https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid

Data storage

National database: EMI-UT

International database: DATRAS

Quality checks and data validation documentation: https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid

Sample storage

Storage description: Age registering samples are stored in EMI-UT archive permanently. Archive is accessible to the stuff of EMI-UT and to another scientist on request. The work is ongoing to digitize the data in archive and make the information about the stored materials available through the Web.

Sample analysis: https://www.ices.dk/community/Pages/PGCCDBS-doc-repository.aspx EMI-UT uses SmartDots age reading platform, which facilitates age readings based on otolith images and takes part in intercalibration workshops.

Data processing

Evaluation of data accuracy (bias and precision): Y, https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid

Editing and imputation methods: Y, https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid

Quality document associated to a dataset: Y, https://doi.org/10.17895/ices.pub.7580 **Validation of the final dataset:** Deviations are checked by length/weight, age/weight, age/length and other scatter plots by visual inspection.

BIAS

MS: EST
Region: Baltic Sea
Sampling scheme identifier: BIAS
Sampling scheme type: NA
Observation type: SciObsAtSea
Time period of validity: 2022-2027
Short description (max 100 words): it is the mandatory survey according to Table 1 of the EU MAP Implementing Decision annex. The aim of the survey program is to obtain the fisheries-independent information for tuning analytical stock assessment models for Baltic herring and sprat, data are used as indices for assessment purposes.
Description of the population
Population targeted: Target species are Baltic herring and sprat. EST part of the survey covers SD28-32. **Population sampled:** Pelagic component of the fish assemblage (Baltic herring and sprat) is studied. **Stratification:** The stratification is based on ICES statistical rectangles.
Sampling design and protocols
Sampling design description: The acoustic surveys cover the total area of ICES Division III and site allocation is done by the Baltic International Fish Survey Working Group (WGBIFS), thus each country has a mandatory responsible area. The area is limited inshore by the 10 m depth line. The standard equipment used for the survey is the Simrad EK/EY-60 echosounder and the standard frequency is 38 kHz. Baltic International Acoustic Survey (BIAS) is carried out in September/October. Sampling design is described in detail in survey manual: https://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%208%20-%20Manual%20of%20International%20Baltic%20Acoustic%20Surveys%20(IBAS).pdf **Is the sampling design compliant with the 4S principle?:** NA **Regional coordination:** NA **Link to sampling design documentation:** https://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%208%20-%20Manual%20of%20International%20Baltic%20Acoustic%20Surveys%20(IBAS).pdf **Compliance with international recommendations:** Y

Link to sampling protocol documentation: https://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%208%20-%20Manual%20of%20International%20Baltic%20Acoustic%20Surveys%20(IBAS).pdf **Compliance with international recommendations:** Y
Sampling implementation
Recording of refusal rate: NA **Monitoring of sampling progress within the sampling year:** NA
Data capture
Means of data capture: Standard trawl, Simrad EK/EY-60 echosounder, scales, measuring board, CTD. **Data capture documentation:** https://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%208%20-%20Manual%20of%20International%20Baltic%20Acoustic%20Surveys%20(IBAS).pdf **Quality checks documentation:** https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid

Data storage
National database: EMI-UT **International database:** ICES Acoustic trawl Surveys Database **Quality checks and data validation documentation:** https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid
Sample storage
Storage description: Age registering samples are stored in EMI-UT archive permanently. Archive is accessible to the stuff of EMI-UT and to another scientist on request. The work is ongoing to digitize the data in archive and make the information about the stored materials available through the Web. **Sample analysis:** https://www.ices.dk/community/Pages/PGCCDBS-doc-repository.aspx EMI-UT uses SmartDots age reading platform, which facilitates age readings based on otolith images and takes part in intercalibration workshops.
Data processing
Evaluation of data accuracy (bias and precision): Y, https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid **Editing and imputation methods:** Y, https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid **Quality document associated to a dataset:** Y, https://doi.org/10.17895/ices.pub.7581

Validation of the final dataset: Deviations are checked by length/weight, age/weight, age/length and other scatter plots by visual inspection.

GRAHS

MS: EST
Region: Baltic Sea
Sampling scheme identifier: GRAHS
Sampling scheme type: NA
Observation type: SciObsAtSea
Time period of validity: 2022-2027
Short description (max 100 words): it is the mandatory survey according to Table 1 of the EU MAP Implementing Decision annex. The aim of the survey program is to obtain the fisheries-independent information for tuning analytical stock assessment model for Baltic herring in the Gulf of Riga, data is used as indices for assessment purposes. Survey takes place in the Gulf of Riga.
Description of the population
Population targeted: Target species is Baltic herring. Survey covers the whole Gulf of Riga **Population sampled:** Pelagic fish species Baltic herring is studied. **Stratification:** NA
Sampling design and protocols
Sampling design description: The acoustic surveys cover the total area of the Gulf of Riga. The survey is carried out jointly by the Latvian and Estonian scientists on the chartered Latvian fishing vessel. The standard equipment used for the survey is the Simrad EK/EY-60 echosounder and the standard frequency is 38 kHz. GRAHS is carried out in July-August annually in order to cover the period after main spawning season when most of the stock has left the near-coast spawning grounds. Sampling design is described in detail in survey manual: https://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%208%20-%20Manual%20of%20International%20Baltic%20Acoustic%20Surveys%20(IBAS).pdf **Is the sampling design compliant with the 4S principle?:** NA **Regional coordination:** NA **Link to sampling design documentation:** https://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%208%20-%20Manual%20of%20International%20Baltic%20Acoustic%20Surveys%20(IBAS).pdf **Compliance with international recommendations:** Y **Link to sampling protocol documentation:** https://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%208%20-%20Manual%20of%20International%20Baltic%20Acoustic%20Surveys%20(IBAS).pdf

Compliance with international recommendations: Y
Sampling implementation
Recording of refusal rate: NA **Monitoring of sampling progress within the sampling year:** NA
Data capture
Means of data capture: Standard trawl, Simrad EK/EY-60 echosounder, scales, measuring board, CTD **Data capture documentation:** https://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%208%20-%20Manual%20of%20International%20Baltic%20Acoustic%20Surveys%20(IBAS).pdf **Quality checks documentation:** https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid

Data storage
National database: EMI-UT **International database:** ICES Acoustic trawl Surveys Database **Quality checks and data validation documentation:** https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid
Sample storage
Storage description: Age registering samples are stored in EMI-UT archive permanently. Archive is accessible to the stuff of EMI-UT and to another scientist on request. The work is ongoing to digitize the data in archive and make the information about the stored materials available through the Web. **Sample analysis:** https://www.ices.dk/community/Pages/PGCCDBS-doc-repository.aspx EMI-UT uses SmartDots age reading platform, which facilitates age readings based on otolith images and takes part in intercalibration workshops.
Data processing
Evaluation of data accuracy (bias and precision): Y, https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid **Editing and imputation methods:** Y, https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid **Quality document associated to a dataset:** Y, https://doi.org/10.17895/ices.pub.7581 **Validation of the final dataset:** Deviations are checked by length/weight, age/weight, age/length and other scatter plots by visual inspection.

SPRAS

MS: EST
Region: Baltic Sea
Sampling scheme identifier: SPRAS
Sampling scheme type: NA
Observation type: SciObsAtSea
Time period of validity: 2022-2027
Short description (max 100 words): it is the mandatory survey according to Table 1 of the EU MAP Implementing Decision annex. The aim of the survey program is to obtain the fisheries-independent information for tuning analytical stock assessment models for sprat, data are used as indices for assessment purposes.
Description of the population
Population targeted: Target species is sprat (*Sprattus spattus*). EST part of the survey covers SD28-32. **Population sampled:** Pelagic fish species sprat (*Sprattus spattus*) is studied. **Stratification:** The stratification is based on ICES statistical rectangles.
Sampling design and protocols
Sampling design description: The acoustic surveys cover the total area of ICES Division III and area allocations is done by the Baltic International Fish Survey Working Group (WGBIFS), thus each country has a mandatory responsible area. The area is limited inshore by the 10 m depth line. The standard equipment used for the survey is the Simrad EK/EY-60 echosounder and the standard frequency is 38 kHz. Baltic International Acoustic Survey (SPRAS) is carried out in May. Sampling design is described in detail in survey manual: https://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%208%20-%20Manual%20of%20International%20Baltic%20Acoustic%20Surveys%20(IBAS).pdf **Is the sampling design compliant with the 4S principle?:** NA **Regional coordination:** NA **Link to sampling design documentation:** https://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%208%20-%20Manual%20of%20International%20Baltic%20Acoustic%20Surveys%20(IBAS).pdf **Compliance with international recommendations:** Y **Link to sampling protocol documentation:** https://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%208%20-%20Manual%20of%20International%20Baltic%20Acoustic%20Surveys%20(IBAS).pdf **Compliance with international recommendations:** N
Sampling implementation
Recording of refusal rate: NA

Monitoring of sampling progress within the sampling year: NA
Data capture
Means of data capture: Standard trawl, Simrad EK/EY-60 echosounder, scales, measuring board, CTD. **Data capture documentation:** https://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%208%20-%20Manual%20of%20International%20Baltic%20Acoustic%20Surveys%20(IBAS).pdf **Quality checks documentation:** https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid

Data storage
National database: EMI-UT **International database:** ICES Acoustic trawl Surveys Database **Quality checks and data validation documentation:** https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid
Sample storage
Storage description: Age registering samples are stored in EMI-UT archive permanently. Archive is accessible to the stuff of EMI-UT and to another scientist on request. The work is ongoing to digitize the data in archive and make the information about the stored materials available through the Web. **Sample analysis:** https://www.ices.dk/community/Pages/PGCCDBS-doc-repository.aspx EMI-UT uses SmartDots age reading platform, which facilitates age readings based on otolith images and takes part in intercalibration workshops.
Data processing
Evaluation of data accuracy (bias and precision): Y, https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid **Editing and imputation methods:** Y, https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid **Quality document associated to a dataset:** Y, https://doi.org/10.17895/ices.pub.7580 **Validation of the final dataset:** Deviations are checked by length/weight, age/weight, age/length and other scatter plots by visual inspection

EFLS

MS: EST
Region: Baltic Sea
Sampling scheme identifier: EFLS
Sampling scheme type: NA
Observation type: SciObsAtSea
Time period of validity: 2022-2027
Short description (max 100 words): national survey has been conducted annually since 1947 to study the distribution and abundance of fish larvae and juveniles with the aim to provide primary information on herring yearclass abundance and to understand the affecting environmental background.
Description of the population
Population targeted: The main target species is spring spawning Baltic herring. The survey covers NE part of the Gulf of Riga. **Population sampled:** Ichthyoplankton and mezozooplankton communities. Larvae and juveniles of all fish species are identified, measured and counted in NE part of Gulf of Riga. **Stratification:** Fixed stations in NE part of Gulf of Riga.
Sampling design and protocols
Sampling design description: Nine fixed stations are visited weekly (May-July). Hensen larval fish net is used for 10 min. hauls in commercially important fish spawning and nursery grounds. Larvae are identified, measured and counted. Plankton samples and environmental data are collected and analysed. **Is the sampling design compliant with the 4S principle?:** NA **Regional coordination:** N **Link to sampling design documentation:** Details of the survey design is described in following paper: https://www.sciencedirect.com/science/article/abs/pii/S016578361000281X Mesozooplankton samples are collected according to HELCOM manual: https://helcom.fi/media/publications/Guidelines-for-monitoring-of-mesozooplankton.pdf **Compliance with international recommendations:** Y. Details of the survey design is described in following paper: https://www.sciencedirect.com/science/article/abs/pii/S016578361000281X Mesozooplankton samples are collected according to HELCOM manual: https://helcom.fi/media/publications/Guidelines-for-monitoring-of-mesozooplankton.pdf **Link to sampling protocol documentation:** Sampling is described in detail in paper: https://www.sciencedirect.com/science/article/abs/pii/S016578361000281X Mesozooplankton samples are collected according to HELCOM manual: https://helcom.fi/media/publications/Guidelines-for-monitoring-of-mesozooplankton.pdf **Compliance with international recommendations:** Y, Sampling is described in detail in paper: https://www.sciencedirect.com/science/article/abs/pii/S016578361000281X Mesozooplankton samples are collected according to HELCOM manual: https://helcom.fi/media/publications/Guidelines-for-monitoring-of-mesozooplankton.pdf

Sampling implementation
Recording of refusal rate: NA **Monitoring of sampling progress within the sampling year:** NA
Data capture
Means of data capture: Binocular Stemi 2000-CS, CTD, Hensen net, mesozooplankton WP-2 net equipped with flowmeters **Data capture documentation:** https://old.envir.ee/sites/default/files/2021.02.10_kalavastsed_2020.pdf **Quality checks documentation:** https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid

Data storage
National database: EMI-UT **International database:** ICES WGALES https://eggsandlarvae.ices.dk/Download.aspx **Quality checks and data validation documentation:** https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid
Sample storage
Storage description: Fish larvae and mezozooplankton samples are stored in 4% formaldehyde solution. Samples are deposited in Estonian Marine Institute storage room for 5 yr. Responsible person takes care of a maintenance, conservation and accessibility to samples. **Sample analysis:** https://old.envir.ee/sites/default/files/2021.02.10_kalavastsed_2020.pdf https://www.sciencedirect.com/science/article/abs/pii/S016578361000281X https://helcom.fi/media/publications/Guidelines-for-monitoring-of-mesozooplankton.pdf Kazanova, I. 1953. Apredelitel ikrõ i litsinok rõb Baltiskovo morja i jevo salivov. Trudõ Vsjesojusnovo nautsno-isledovatelskova instituta marskova rõbnava hasjastva I okenografi (VNIRO)
Data processing
Evaluation of data accuracy (bias and precision): https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid **Editing and imputation methods:** Y, https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid **Quality document associated to a dataset:** N **Validation of the final dataset:** The end-user of datasets is Fisheries department of Estonian Ministry of Environment that applies collected dataset implementing spatio-temporal fishing regulations and marine management. Validation and quality checks are performed in regular manner during annual reporting phase by checking all submitted datasets step-by-step interactively with researchers.

GORFS

MS: EST
Region: Baltic Sea
Sampling scheme identifier: GORFS
Sampling scheme type: NA
Observation type: SciObsAtSea
Time period of validity: 2022-2027
Short description (max 100 words): Trawl survey in the Pärnu Bay was conducted already in earlier decades (since 1950s) and resumed in 2009. It is a national survey aiming at collecting of fisheries independent data for tuning the pikeperch and perch VPA assessment and collecting information about abundance and biological parameters of other fish species, including commercially important species like smelt and cyprinids.
Description of the population
Population targeted: The main target species are perch (*Perca fluviatilis*) and pikeperch (*Sander lucioperca*). Six fixed trawl transects are situated three to eight km from shore (water depth five to nine m) to cover the entire length of the Pärnu Bay. **Population sampled:** In shallow waters of the Pärnu bay demersal and pelagic part of the fish community are involved. Data on the abundance and biological parameters of fish species in the temporal fish assemblages are collected. **Stratification:** Fixed stations in Pärnu bay.
Sampling design and protocols
Sampling design description: Research vessel of the Estonian Marine Institute AURELIE is used for trawling. The trawl (working depth 0.3 m from the bottom) is pulled with the speed of 3 knots for 30 minutes. The trawl mouth is 2 m high and 6 m wide, distance between doors is 20 m and maximum distance between the 8.2 m long trawl wings is 12 m. Mesh size is 60 mm (knot to knot), at the tip of the trawl wings, 45 mm at the trawl mouth and decreases gradually to 10 mm at the codend. All 6 fixed stations are fished in May, September, October, November and December. **Is the sampling design compliant with the 4S principle?:** NA **Regional coordination:** N **Link to sampling design documentation:** https://helcom.fi/wp-content/uploads/2020/01/HELCOM-Guidelines-for-coastal-fish-monitoring-2019.pdf **Compliance with international recommendations:** Y **Link to sampling protocol documentation:** https://helcom.fi/wp-content/uploads/2020/01/HELCOM-Guidelines-for-coastal-fish-monitoring-2019.pdf **Compliance with international recommendations:** Y
Sampling implementation
Recording of refusal rate: NA

Monitoring of sampling progress within the sampling year: NA
Data capture
Means of data capture: Standard trawl, Simrad PI50 trawl monitoring system, scales, measuring board. **Data capture documentation:** https://helcom.fi/wp-content/uploads/2020/01/HELCOM-Guidelines-for-coastal-fish-monitoring-2019.pdf **Quality checks documentation:** https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid

Data storage
National database: EMI-UT **International database:** NA **Quality checks and data validation documentation:** https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid
Sample storage
Storage description: Age registering samples are stored in EMI-UT archive permanently. Archive is accessible to the stuff of EMI-UT and to another scientist on request. The work is ongoing to digitize the data in archive and make the information about the stored materials available through the Web. **Sample analysis:** Thoresson, G. 1996. Guidelines for coastal monitoring. Kustrapport 1: 1-35. https://www.ices.dk/community/Pages/PGCCDBS-doc-repository.aspx Estonia uses SmartDots age reading platform, which facilitates age readings based on otolith images and takes part in intercalibration workshops
Data processing
Evaluation of data accuracy (bias and precision): Y, https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid **Editing and imputation methods:** Y, https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid **Quality document associated to a dataset:** N **Validation of the final dataset:** Deviations are checked by length/weight, age/weight, age/length scatter plots by visual inspection.

CFS

MS: EST
Region: Baltic Sea

Sampling scheme identifier: CFS
Sampling scheme type: NA
Observation type: SciObsAtSea
Time period of validity: 2022-2027
Short description (max 100 words): National annual survey using standardised gill net series started in 1992, now in 10 fixed areas. Collected information (CPUE, age and length distribution, etc) form the basis for advice for commercially important stocks (perch, pikeperch, flounder, cod, whitefish, cyprinids) including fisheries independent data for tuning the flounder, pikeperch and perch analytical assessment.
Description of the population
Population targeted: The main target species are perch, flounder, pikeperch and cod. The survey takes place in 10 fixed areas in SD28, 29 and 32. **Population sampled:** Demersal part of the fish community is targeted but pelagic fish community is also partly involved. All caught fish species are identified, measured and weighted, also those not namely listed in the National WP or in Table 1 of the EU MAP Delegated Decision annex. **Stratification:** S28, SD29 and SD32 overall 10 fixed areas.
Sampling design and protocols
Sampling design description: Annual gill-net survey in defined areas along the Estonian coast, in fixed (Hiiumaa, Kõiguste and Küdema) or random stations. Each station consists of a series of gill nets of fixed mesh sizes and construction. 6-72 stations are fished in each area. **Is the sampling design compliant with the 4S principle?:** NA **Regional coordination:** N **Link to sampling design documentation:** Method is accredited nationally by the accreditation certificate No L179 (2017) of the Tartu University, Estonian Marine Institute: Assessment of biodiversity, abundance and biomass of fish assemblages; KJ l/20; based on EVSEN 14757; Helcom, 2015 (Coastal Fish Guidelines). Laboratory of the Estonian Marine Institute is accredited against the requirements of standard EVS-EN ISO/IEC 17025:2017 (https://mereinstituut.ut.ee/sites/default/files/mereinstituut/akrediteerimisulatus_2020.pdf). **Compliance with international recommendations:** Y **Link to sampling protocol documentation:** https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid **Compliance with international recommendations:** Y
Sampling implementation
Recording of refusal rate: NA **Monitoring of sampling progress within the sampling year:** NA
Data capture
Means of data capture: Standardized gill nets, measuring board, scales.

Data capture documentation: https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid

Quality checks documentation: https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid

Data storage
National database: EMI-UT **International database:** Data is partly in HELCOM Coastal fish core indicator database (COOL), http://bio.helcom.fi/apex/f?p=108:5:::::: **Quality checks and data validation documentation:** https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid
Sample storage
Storage description: Age registering samples are stored in EMI-UT archive permanently. Archive is accessible to the stuff of EMI-UT and to another scientist on request. The work is ongoing to digitize the data in archive and make the information about the stored materials available through the Web. **Sample analysis:** Thoresson, G. 1996. Guidelines for coastal monitoring. Kustrapport 1: 1-35. https://www.ices.dk/community/Pages/PGCCDBS-doc-repository.aspx Estonia uses SmartDots age reading platform, which facilitates age readings based on otolith images and takes part in intercalibration workshops.
Data processing
Evaluation of data accuracy (bias and precision): Y, https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid **Editing and imputation methods:** Y, https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid **Quality document associated to a dataset:** N **Validation of the final dataset:** Deviations are checked by length/weight, age/weight, age/length scatter plots by visual inspection.

ANNEX 1.2 - QUALITY REPORT FOR SOCIOECONOMIC 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, 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 annex 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.

SocioEconomic Fisheries data: Census

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 data
Sampling scheme: census
Variables: Table 7 and 9 of the EU MAP Delegated Decision annex
Supra region(s): Baltic Sea; North Sea; Eastern Arctic; NAFO; extended North Western waters (ICES areas 5, 6 and 7) and extended South Western waters (ICES areas 10, 12 and 14)
Survey planning
Sampling scheme applies to all trawlers and those coastal boats that catch at least 100t per year (based on previous year's catches)
Survey design and strategy
Describe how the sample sizes were determined: Complete enumeration is applied. Describe survey methods and distribution, e.g. questionnaire forms by post, by email, on website, by phone, access to other datasets, etc. Data are collected and the submission of questionnaires is monitored through eSTAT (the web channel for electronic data submission). The questionnaires have been designed for independent completion in eSTAT and include instructions and controls. The questionnaires and information about data submission are available on the website of Statistics Estonia in the section Questionnaires. Describe the role of auxiliary information, if any, in the strategy, e.g. for validation, cross referencing, as a fall-back data source, etc. We use fishing data, annual statistics and tax office data for additional information.
Estimation design

Describe method of calculating population estimate from sample. Describe method of calculating derived data, e.g. imputed values. Describe treatment of non-responses. The response rate has been 100%, so we do not have problem with non-response. System is that we send the remainders 5 days before the deadline, and 3, 7 and 21 days after the deadline. In case of non-submission penalty system may be used.
Error checks
Describe potential errors and how and where in the process these are detected, avoided or eliminated, e.g. data duplication, double counting, respondent error, upload error, processing error, etc. The input data are checked and, if necessary, corrected according to specified rules, and the compliance of calculated statistics with the quality requirements is checked as well: arithmetic and qualitative controls, comparisons are made with previous periods, internal coherence, the coverage of the population and the response rate are checked.
Data storage and documentation
Describe how the data are stored. Provide a link to the webpage where additional methodological documentation can be found, if any. The data are in the official database of Statistical Estonia, but are not publicly available. Methodological documentation is available: https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid
Revision
Describe the frequency of the methodology review e.g. revision of segmentation, survey method per segment, per variable, etc. There are no planned revisions. The data may be revised if the methodology is modified, errors are discovered, new or better data become available. The data revision policy and notification of corrections are described in the section Principles of dissemination of official statistics of the website of Statistics Estonia.
Confidentiality
Are procedures for confidential data handling in place and documented? Are protocols to enforce confidentiality between DCF partners in place and documented? Are protocols to enforce confidentiality with external users in place and documented? Are there any issues with publication of data due to confidentiality reasons? Provide an explanation. The dissemination of data collected for the purpose of producing official statistics is guided by the requirements provided for in § 32, § 34, § 35, § 38 of the Official Statistics Act. The treatment of confidential data is regulated by the Procedure for Protection of Data Collected and Processed by Statistics Estonia (in Estonian). See more details on the website of Statistics Estonia in the section Õigusaktid.

SocioEconomic Fisheries data: PSS

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 data
Sampling scheme: Stratified simple random sample
Variables: Table 7 and 9 of the EU MAP Delegated Decision annex
Supra region(s): Baltic Sea; North Sea; Eastern Arctic; NAFO; extended North Western waters (ICES areas 5, 6 and 7) and extended South Western waters (ICES areas 10, 12 and 14)
Survey planning
Sampling scheme applies to those coastal boats that catch less than 100t per year (based on previous year's catches). The population is divided into two strata: 1) owners of coastal boats who caught less than 10 tons (stratum 1) and 2) owners of coastal boats who caught from 10 up to 100 tons (stratum 2) in previous year. A simple random sample is drawn from the both stratum and different regions are taken into account in the final sample.
Survey design and strategy
List data sources, e.g. interviews, registers, log books, sales notes, VMS, financial accounts, etc. For determining the sample fleet register, log books and sales note information is used. Information from entities that end up in a sample is collected via online tool described below. Describe how the sample sizes were determined. In these two strata described above sample sizes were chosen as follows: • Stratum 1 (boat owners with catch less than 10t in previous year): 8% of units are selected • Stratum 2 (boat owners with catch between 10t to 100t in previous year): 50% of units are selected. Describe survey methods and distribution, e.g. questionnaire forms by post, by email, on website, by phone, access to other datasets, etc. Data are collected and the submission of questionnaires is monitored through eSTAT (the web channel for electronic data submission). The questionnaires have been designed for independent completion in eSTAT and include instructions and controls. The questionnaires and information about data submission are available on the website of Statistics Estonia in the section Questionnaires. Describe the role of auxiliary information, if any, in the strategy, e.g. for validation, cross referencing, as a fall-back data source, etc. We use fishing data, annual statistics and tax office data for additional information.
Estimation design
Describe method of calculating population estimate from sample. For calculating an estimate $\hat{t}_y$ of a population total t_y of a variable *y* the Horvitz-Thompson estimator

is used, i.e. $\hat{t}_y = \sum_{h=1}^{H} \frac{N_H}{n_h} \sum_{i_h=1}^{n_h} y_{i_h}$, where H is the number of strata, N_h is the population size of the stratum h, n_h is the sample size of the stratum h and $\sum_{i_h=1}^{n_h} y_{i_h}$ is the sample total of the variable y. Information about variables (all, except variable group Fleet, Effort and Number of fishing enterprises/units) are collected from fishing enterprises.

Describe treatment of non-responses. The response rate has been almost 100%, so we do not have problem with non-response. System is that Statistics Estonia sends the remainders 5 days before the deadline, and 3, 7 and 21 days after the deadline. In case of non-submission penalty system may be used. In total imputation is not applied, effective sample size is just smaller if any entity fails to respond.

Error checks

Describe potential errors and how and where in the process these are detected, avoided or eliminated, e.g. data duplication, double counting, respondent error, upload error, processing error, etc.

The input data are checked and, if necessary, corrected according to specified rules, and the compliance of calculated statistics with the quality requirements is checked as well: arithmetic and qualitative controls, comparisons are made with previous periods, internal coherence, the coverage of the population and the response rate are checked.

Data storage and documentation

Describe how the data are stored.
Provide a link to the webpage where additional methodological documentation can be found, if any.

The data are in the official database of Statistical Estonia, but are not publicly available.
Methodological documentation is available: https://envir.ee/elusloodus-looduskaitse/kalandus/kalanduse-riiklik-andmekogumise-programm-akp#proovivtu-juhendid

Revision

Describe the frequency of the methodology review e.g. revision of segmentation, survey method per segment, per variable, etc.

There are no planned revisions. The data may be revised if the methodology is modified, errors are discovered, new or better data become available. The data revision policy and notification of corrections are described in the section Principles of dissemination of official statistics of the website of Statistics Estonia.

Confidentiality

Are procedures for confidential data handling in place and documented?
Are protocols to enforce confidentiality between DCF partners in place and documented?
Are protocols to enforce confidentiality with external users in place and documented?
Are there any issues with publication of data due to confidentiality reasons? Provide an explanation.

The dissemination of data collected for the purpose of producing official statistics is guided by the requirements provided for in § 32, § 34, § 35, § 38 of the Official Statistics Act. The treatment of confidential data is regulated by the Procedure for Protection of Data Collected and Processed by

Statistics Estonia (in Estonian). See more details on the website of Statistics Estonia in the section Õigusaktid.