

Ministry of the Flemish Community – Policy Domain Agriculture and Fisheries

Agentschap Landbouw en Zeevisserij, Oostende, Belgium

Flanders Research Institute for Agricultural, Fisheries and Food (ILVO),
Oostende, Belgium

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

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

Commission Delegated Decision (EU) 2021/1167 of 27 April 2021

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

Commission Implementing Decision (EU) 2021/1168 of 27 April 2021

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

Commission Implementing Decision (EU) 2022/39 of 12 January 2022

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

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

2025-2027

Version [4] – 2024

[Ostend, 8 November 2024]

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SECTION 1: GENERAL INFORMATION

Data collection framework at national level

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

The present document contains the Belgian National Work Plan for the period 2025-2027, in fulfilment of the Commission Delegated Decision (EU) 2021/1167 and Commission Implementing Decision (EU) 2021/1168, laying down detailed rules for the application Regulation (EU) 2017/1004.

The Belgian National Work Plan 2025-2027 is structured following the guidelines and contains the Text called Belgium_WP-Programme_2025-2027_Text_20241015 and Standard Tables, called Belgium_WP_2025-2027_Tables_2025-2027 in separate documents. Annexes, which are referred to, are added separately.

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Ministry of the Flemish Community – Policy Domain Agriculture and Fisheries (DVZ)

In Belgium, the Flemish Ministry of Agriculture and Fisheries, Department Agriculture and Fisheries (as part of the Policy Domain Agriculture and Fisheries) is the administrative authority responsible for fisheries and fisheries issues. The collection of information on fishing capacity, fishing effort, landing statistics, VMS data and economics of the fisheries sector is performed by ‘Agentschap Landbouw en Zeevisserij’ with the support of the Institute for Agricultural, Fisheries Research and Food (EV ILVO). *Contact details*

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Institute for Agricultural, Fisheries Research and Food (EV ILVO)

The Institute for Agricultural, Fisheries and Food Research (EV ILVO), i.e. the research department ILVO Marine is responsible for the collection, analysis and processing of biological data, support for the collection of socio-economic data of the fisheries sector, processing of the socio-economic data from the fisheries sector and the collection, analysis and processing of the data from the fish processing industry and aquaculture.

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Royal Belgian Institute of Natural Sciences (RBINS – OD Nature)

From January 2008 onwards, the Royal Belgian Institute of Natural Sciences, Directorate Natural Environment (RBINS – OD Nature) has joined the Belgian National Data Gathering Programme (NDGP). This federal

research institute has expertise in the fields of marine modelling, monitoring and management and is responsible for the budget, scientific equipment, and the planning of scientific campaigns of the Belgian research vessel RV Belgica. The research vessel is available for all Belgian marine scientists and used in the North Sea Beam Trawl Survey (BTS). It is in this capacity that RBINS – OD Nature is involved in the Belgian work plan.

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Division:
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Marine Environment
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8400 Oostende

<http://odnature.naturalsciences.be/home/>

Flanders Marine Institute (VLIZ)

The Flanders Marine Institute (VLIZ) has joined the Belgian NDGP since 2013. VLIZ is an autonomous institute with the legal status of a non-profit organization under Belgian law that receives an annual allowance from the Government of Flanders (Ministry of the Flemish Community – Department of Economy, Science and Innovation (EWI)), and from the province of West-Flanders (West-Vlaanderen). The VLIZ is a centre for coastal research and owns since the beginning of 2013 a multidisciplinary research vessel: RV Simon Stevin. The ship is used for coastal and oceanographic research in the Southern Bight of the North Sea and the eastern part of the English Channel. ILVO embarks RV Simon Stevin for the Demersal and Young Fish Survey (DYFS). It is in this capacity that VLIZ is involved in the Belgian work plan.

Contact details

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Website: <https://www.vliz.be/en/>

Instituut Natuur en Bosonderzoek (INBO)

INBO conducts research into the sustainable use and restoration of water-based ecosystems and their services considering climate change, flooding risk, shipping, port development, agriculture, pollution, fishing and alien species. In this way it supports various policy tools: the Water Framework Directive, the Marine Strategy Framework Directive, OSPAR, the Habitats and Birds Directives, the European Eel Regulation, the Long-Term vision for the Scheldt Estuary, the Ramsar Convention, the Nature Decree, the Sigma Plan Update, species protection programmes, etc. It is in the capacity of the eel monitoring that INBO is involved in the Belgian work plan.

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Agentschap voor Natuur en Bos (ANB)

Agentschap voor Natuur en Bos (Agency for Nature and Forests) is responsible for policy, sustainable management and strengthening of nature together with all partners. ANB strives for more nature in Flanders.

ANB maintains the current nature in Flanders, protects and further develops it. ANB implements the policy of species protection. Since ANB is responsible for the coordination of the Eel Management Plan of Belgium, ANB is involved in the Belgian Work plan.

Contact details

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Website: <https://natuurenbos.vlaanderen.be/>

National DCF website:

The Belgian national DCF website can be found on <https://smartfisheries.be/data-collection/>

This website frames the DCF and describes how Belgium meets and executes the European legislation on a national level. Furthermore, it provides an overview on how data is collected and gives valuable links to several European websites. The website is written in Dutch as the DCF is executed by the Ministry of the Flemish Community.

(max. 1000 words)

Text Box 1a: Test studies description

Region: 1 North Atlantic and North Sea

Test study: 1 Genetics

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

Name of the regional test study: 1 Genetics

RWP NANSEA2025-2027

Participation in RWP NANSEA 2025-2027 and in RWP Regional Work Plan on data collection in the fisheries and aquaculture sectors 2025-2027

(max 250 words per study)

Test study: 2 Diadromous species data collection

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

Name of the regional test study: 2 Diadromous species data collection

RWP NANSEA2025-2027

Participation in RWP NANSEA 2025-2027 and in RWP Regional Work Plan on data collection in the fisheries and aquaculture sectors 2025-2027

(max 250 words per study)

Test study: 3 North Sea bass (*Dicentrarchus labrax*) stock marine recreational fisheries sampling

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

Name of the regional test study: 3 North Sea bass (*Dicentrarchus labrax*) stock marine recreational fisheries sampling

RWP NANSEA2025-2027

Participation in RWP NANSEA 2025-2027 and in RWP Regional Work Plan on data collection in the fisheries and aquaculture sectors 2025-2027

(max 250 words per study)

Test study: 4 Socio-economic survey of recreational fisheries

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

Name of the national test study: Socio-economic survey of recreational fisheries

1. Aim of the study

The purpose of this survey is to get a better view on the recreational fishing community as a whole. The catch effort (and thus the catches) is influenced by a lot of social and economic factors. In order to get a better catch effort estimation, we will perform a survey to better understand the social and economic drivers that result in catch effort.

2. Duration of the test study

The duration of the test study is aimed to start late 2025 and end in 2027.

3. Methodology and expected outcomes of the test study

One of the risks is not having enough response from the recreational fisheries community. Therefore, the survey will be set up for a longer time period to maximise response rate and collect as much data as possible. It will also focus on the whole recreational fishing community of our country, meaning that we will include the freshwater recreational community (especially for the eel catch estimates) and make the survey available in different languages (to reach all fishers) to obtain a complete picture of the fishing effort.

The survey will collect data on the fisher itself in order to develop a profile of a typical recreational fisher. This will include intrinsic information, as well as social and economic parameters like fishing partners and budget for fishing gear.

The results of this survey will be used in the calculation of the recreational catches and serve as an indicator of the recreational fishing population.

Test study: 5 Capital value estimation of fishing vessels

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

Name of the national test study: Capital value estimation of fishing vessels

1. Aim of the study

In the current economic data collection, no data is collected on actual capital value of fishing vessels, because the value of a vessel is connected to the fishing licence. The aim of this test study is to collect detailed data on the capital value and capital cost of Belgian fishing vessels. If this data can be collected, the study will assess if an estimation such as the PIM (Perpetual Inventory Method) method, which estimates capital depreciation, can be valuable or if data 'as-is' is better to report. As vessels are on average around 30 years old, the test study also aims to assess if actual capital value or a 'vintage' capital value is better suited for reporting.

2. Duration of the test study

The test study is planned to align with the duration of the WP (01/01/2025-31/12/2027).

3. Methodology and expected outcomes of the test study

Data on capital value and costs will be collected through several methods.

First, data will be collected via stakeholder interactions and questionnaires directed at the fisheries sector itself. Second, questionnaires and stakeholder interactions will be organised and directed at vessel design companies and vessel wharfs (build enterprises). Data on whole vessels and on individual components of the vessel will be collected to obtain new and used values. For individual components, online research will help to collect the new and/or used values of components on board. If data collection is deemed feasible and manageable, it will be assessed if this exercise can be performed once per WP cycle to improve reporting of capital value and costs of fishing vessels.

Test study: 6 Aquaculture data collection survey

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

Name of the national test study: 6 Aquaculture data collection survey

1. Aim of the study

Due to the small size of aquaculture enterprises in Belgium, the annual financial accounts are incomplete and therefore full coverage of the socio-economic data collection is not possible. Furthermore, because many one-person enterprises with intermittent production years exist, the Member State misses out on socio-economic data of the aquaculture sector. This study aims to assess how feasible and valuable detailed socio-economic data collection of the aquaculture sector with full coverage is for Belgium.

2. Duration of the test study

The test study is planned to align with the duration of the WP (01/01/2025-31/12/2027).

3. Methodology and expected outcomes of the test study

The small number of aquaculture enterprises and one-person enterprises will be contacted to start stakeholder interactions. The enterprises will be asked about their willingness to provide data, either through stakeholder interactions or questionnaires, along with the specific type of data they are willing to provide. If positive responses are received, an attempt to start data collection with increased coverage via either stakeholder interactions or questionnaires will be made. However, if data collection seems to be unfeasible or of limited value for the Belgian aquaculture sector, it will be reported accordingly. An assessment of the possibility of conducting a single, detailed data collection via stakeholder interactions during each WP cycle, will be reported on.

Test study: 7 Innovative minimal-invasive age monitoring: fish scales

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

Name of the national test study: 7 Innovative minimal-invasive age monitoring: fish scales

1. Aim of the study

Currently, for stock assessment, age reading is mainly done using ear bones, or otoliths. However, obtaining otoliths requires the fish to be cut open, leading to the fish's death. Considering the future of wild fish species, threatened fish stocks, marine protected areas, and animal ethics, among others, the development of an innovative minimally invasive age-monitoring tool is compelling. As already shown in the *Manual of fish sclerochronology* and by Shearer (1992) for Atlantic salmon, fish scales can serve as an effective alternative. The study aims to assess which fish caught in the North Sea have ontogenetic scales that can effectively be used for minimally invasive age-monitoring.

2. Duration of the test study

The test study is planned to align with the duration of the WP (01/01/2025-31/12/2027)

3. Methodology and expected outcomes of the test study

Ontogenetic scales will be collected from fish caught during trials and surveys undertaken by ILVO. Scale circuli (growth rings like rings in a tree stump) will be visualised via oblique light, polarised light and alizarin red S for mineralised tissues under a microscope. The growth rings will be identified on images and compared to the growth rings in otoliths following standard age reading protocols. The study will identify whether this method can work for consistent age reading and for which species it is effective for. An assessment will be made if this method proves to be suitable for regular age data collection.

Reference

Panfili, Jacques, et al. *Manual of fish sclerochronology*. Ifremer-IRD coedition, 2002.

Shearer, William M. *Atlantic salmon scale reading guidelines*. ICES Cooperative Research Reports (CRR), 1992.

Test study: 8 Innovative data collection using environmental DNA

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

Name of the national test study: 8 Innovative data collection using environmental DNA

1. Aim of the study

Environmental DNA (eDNA) refers to DNA shed by organisms (e.g., scales, slime, gametes) in their environment. Consequently, genetic material from specimens can be collected from the environment without the need to actually capture those organisms. Environmental DNA offers a powerful and non-invasive method to detect the presence of species, including endangered, threatened, and protected species (ETPs), and invasive species, which is useful for monitoring biodiversity. Moreover, biomass estimates can be inferred from eDNA, as demonstrated by the Belgian EFMZV funded SoleDNA project, which revealed a positive relationship between biomass estimates and eDNA concentrations of flatfishes, at least in the shallower regions of the North Sea.

The overall aim is to implement the collection of eDNA on a routinely basis and in a standardized manner in both research surveys and commercial trips. The latter provides an opportunity to gather data on a larger spatial and temporal scale, especially in areas where traditional survey methods may be limited. This genetic data can be used for monitoring, fisheries and ecosystem-based assessments.

2. Duration of the test study

The test study is planned to align with the duration of the WP (01/01/2025-31/12/2027).

3. Methodology and expected outcomes of the test study

ILVO Belgium has dedicated significant efforts to optimize and innovate eDNA collection and analysis techniques, ensuring efficient and effective monitoring of the marine environment complementary to traditional monitoring methods. Since 2020, eDNA samples have been systematically collected during each Belgian North Sea Beam Trawl Survey (BTS) which allows a comprehensive comparative analysis of both genetic and trawl data. Genetic sampling and data integration opportunities will be discussed during the ICES WGAGFA meeting in 2025.

Expected outcomes:

1. A comparative analysis of long-term eDNA and trawl data collected during the Belgian BTS
2. A contribution to the regional inventory of marine eDNA collection initiatives

Test study: 9 Fisheries social data collection

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

Name of the national test study: 9 Fisheries social data collection

1. Aim of the study

As a consequence of a meeting on the social dimension of the European fisheries (STECF-24-05), and an intersessional subgroup (ISSG) meeting on exploring options for data collection for new social variables (18-19/09/2024) a list of 38 social indicators were developed. A subset of 12 indicators, for which data is mostly already available, has been selected for further development. The aim of this test study is to assess (i) if indeed all data and information is available, (ii) which data of information needs to be collected, (iii) how feasible it is to collect the data, (iv) how most pragmatically the data can be collected, and (v) if the data collection and indicator development can be included in regular data collection schemes.

2. Duration of the test study

The test study is planned to align with the duration of the WP (01/01/2025-31/12/2027).

3. Methodology and expected outcomes of the test study

For each of the 12 social indicators, an overview of which DCF-related data is available, where that data can be found and how it is recorded for the particular MS (in this case Belgium) will be made. This overview will identify data and information gaps. Once these are identified, a further search will determine if the gaps can be filled with other information or data that may be present outside the DCF scope. Next, the availability (easy access, frequency, etc), quality and validity of the 'non-DCF' will be assessed to determine if such data and information is indeed useful for the development of the 12 social indicators. If information and data gaps still exist, stakeholder interactions and questionnaires aimed at DCF-related data sources and non-DCF-related data sources will be used to collect the data and information necessary to supplement existing data and therefore completing the information and data necessary to develop the social indicators.

Test study: 10 Optimisation of Self-sampling by using AI

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

Name of the national test study: 10 Optimisation of Self-sampling by using AI

1. Aim of the test study

In addition to our the intensive at-sea sampling programme, ILVO Belgium currently also conducts a self-sampling programme focussing on sole (*Solea solea*) as one of the main target species of the Belgian commercial fishing fleet. It has the aim of collecting length and weight information of the sole catch for areas 4, 7d, 7e-h, 7a and 8ab. The sampling is twofold and involves the cooperation of fishers and scientist/observers:

- 1) Fishers register: Collection of weight information on the sole for the discard and landing fraction during the trip. Additionally, they collect 30 kg of discards that are later analysed in the lab by scientists/observers.
- 2) Scientists/observers: Measuring lengths of the landings and discards in the fish auction and selecting specimen for biological sampling in the lab (individual length & weight, sex, maturity and age).

At present, four self-sampling trips are planned throughout the year (one per quarter). However, there are some challenges and obstacles that hamper the further development of the self-sampling programme. Firstly, the at-sea sampling programme is quite intensive, leaving little time for scientists/observers to oversee self-sampling trips. Secondly, vessels are required to fish in one specific area during a trip, while it is common for Belgian fishing vessels to operate in multiple areas simultaneously during one trip. Finally, since the self-sampling programme is voluntary, we rely on the cooperation and initiative of fishers.

As part of the VISIM II project, which aims to collect data on the catches onboard fishing vessels in an automated way, a camera was installed above a conveyor belt at the fish auction to collect training data to train for an Artificial Intelligence (AI) model intended for the use onboard fishing vessels. Sole landings are processed on a conveyor belt that sorts them by weight category. This inspired the idea of using this

automated set up for length measuring as part of the self-sampling process, replacing the need for measurements by observers/scientists and increasing the number of trips from which length data is collected. By automating this step, the self- sampling process would become significantly less time-consuming addressing the challenge of limited time caused by the intensive at-sea sampling programme.

During this test study, the practicalities concerning the use of a camera coupled to an AI-model in the fish auction will be evaluated and the long-term feasibility to collect data in this way will be investigated. We aim to fully redesign the self-sampling programme by exploring the use of Artificial Intelligence cameras in the fish auction.

2. Duration of the test study

The test study is planned to align with the duration of the WP (01/01/2025-31/12/2027).

3. Methodology and expected outcomes of the test study

This test study is built up out of 3 different phases:

Exploratory phase:

In the first phase of the test study, we will explore the practical possibilities of using a camera coupled to an artificial intelligence model in the fish auctions for the self- sampling protocol. This will involve close collaboration with the auction to assess what is feasible within their operations. Different sampling set-ups will be explored to ensure that we can collect enough length measurements, without disrupting the auction process. Additionally, we must establish a process for selecting individuals for biological sampling (age, maturity, sex, length and weight) across length distributions to ensure the data collected is both accurate and representative.

Testing phase:

In the testing phase, the sampling plans developed during the exploratory phase will be tested at the fish auction over for several trips. The practicality, efficiency, and accuracy of each approach will be evaluated. Practicality will be assessed based on time efficiency and the level of disturbance of the auction operations. Efficiency will be judged by the number of samples collected before the fish are further processed and compared to the previous sampling design carried out by observers. Accuracy will be evaluated by comparing the length measurements from the AI camera, as well as the number and range of the selected biological samples, with those from the previous sampling design carried out by observers. This will ensure that the new method meets the required standards.

Implementation phase:

In the final stage of this test study, assuming the testing phase was successful, we will integrate the newly developed self- sampling programme into our existing data collection framework. Since this sampling scheme relies on the participation of fishers, this phase will involve active communication with the sector and explore possible incentives for fishers, such as financial compensation, to encourage their involvement and ensure the success of this programme.

After the self-sampling programme has been implemented for some time, we will evaluate whether the protocol can be expanded to cover additional species, métiers, and a greater number of sampling trips. Furthermore, we will investigate the potential of using the AI camera system for future market- sampling implementations.

Potential expected outcomes:

New self- sampling protocol adapted to the AI camera system

Implementation of this new sampling protocol in the Belgian national workprogram.

The activities planned for monitoring of fisheries by using AI also fully contribute to the specific national measures to minimize by-catch of sensitive species in regard to the EU Marine Action Plan: Protecting and restoring marine ecosystems for sustainable and resilient fisheries.

(max 900 words per study)

Text Box 1b: Other data collection activities

Region: 1 North Atlantic and North Sea, 2 ECON

Activity: 1 Secretariat

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

Name of the regional activity: 1 - RCGs Secretariat,

RWP NANSEA 2025-2027 and RWP ECON 2025-2027

Participation in RWP NANSEA 2025-2027 and in RWP Regional Work Plan on data collection in the fisheries and aquaculture sectors 2025-2027.

In line with Article 9.10 of EU regulation 2017/1004 and where applicable: the relevant regional work plan parts shall be considered to replace or supplement the relevant parts of this national work plan.

(max 250 words per study)

Region:1 North Atlantic and North Sea

Activity: 2 Regional data base and estimation System (RDBES)

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

Name of the regional activity: 2 Regional data base and estimation System (RDBES)

RWP NANSEA 2025-2027

Participation in RWP NANSEA 2025-2027 and in RWP Regional Work Plan on data collection in the fisheries and aquaculture sectors 2025-2027.

In line with Article 9.10 of EU regulation 2017/1004 and where applicable: the relevant regional work plan parts shall be considered to replace or supplement the relevant parts of this national work plan.

(max 250 words per study)

Activity: 3 Regional Coordination taking place in Inter Sessional SubGroups (ISSGs) and pan regional cooperation between RCGs

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

Name of the regional activity: 3 - Regional Coordination taking place in Inter Sessional SubGroups (ISSGs) and pan regional cooperation between RCGs,

RWP NANSEA 2025-2027

Participation in RWP NANSEA 2025-2027 and in RWP Regional Work Plan on data collection in the fisheries and aquaculture sectors 2025-2027.

In line with Article 9.10 of EU regulation 2017/1004 and where applicable: the relevant regional work plan parts shall be considered to replace or supplement the relevant parts of this national work plan.

(max 250 words per study)

Activity: 4 Smart Dots

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

Name of the regional activity: 4- Smart Dots,

RWP NANSEA 2025-2027

Participation in RWP NANSEA 2025-2027 and in RWP Regional Work Plan on data collection in the fisheries and aquaculture sectors 2025-2027.

In line with Article 9.10 of EU regulation 2017/1004 and where applicable: the relevant regional work plan parts shall be considered to replace or supplement the relevant parts of this national work plan.

(max 250 words per study)

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

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

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

RWP NANSEA 2025-2027

Participation in RWP NANSEA 2025-2027 and in RWP Regional Work Plan on data collection in the fisheries and aquaculture sectors 2025-2027.

In line with Article 9.10 of EU regulation 2017/1004 and where applicable: the relevant regional work plan parts shall be considered to replace or supplement the relevant parts of this national work plan.

(max 250 words per study)

Activity: 6 SoleMATES

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

Name of the national activity: 6 SoleMATES

1. Aim of the data collection activity

The Belgian SoleMATES (Sole Monitoring using Automated and meTaprobe Edna Sampling) project proposal will be submitted in the next OVIS call (November 2024). The overall goal of the project is to optimise automated environmental DNA (eDNA) sampling in a highly efficient way and to collect valuable biomass estimates of commercial species using the commercial fishing fleet (with a focus on sole and plaice). These indirect biomass estimates can complement and improve current monitoring and stock assessments of flatfishes in a non-destructive and cost-efficient manner.

The project has two important objectives:

1. The optimisation of a more efficient and automated collection of water samples for eDNA using an automatic eDNA sampler onboard of a commercial fishing vessel. By involving the commercial fishing fleet in the passive sampling of eDNA, samples can be collected on a much larger temporal and spatial scale than achievable through only scientific surveys.
2. The potential to indirectly monitor biomass estimates of sole and plaice using eDNA concentrations has been shown in previous ILVO research (EFMZV funded SoleDNA project), at least in shallow waters of the North Sea. In this project, the positive relationship between eDNA concentration and biomass of sole and plaice will be further investigated using samples collected in deeper waters. Indirect biomass estimates obtained from eDNA are particularly important in data-poor regions such as the southern Celtic Sea (27.7h).

2. Duration of the data collection activity

This is planned to align with the duration of the WP (1/1/2025-31/12/2027)

3. Methodology and expected outcomes of the data collection activity

The commercial fishing fleet will be contacted to take on an active role in the passive collection of eDNA samples. Samples will be collected using either an automatic eDNA sampler or metaprobes (3D-printed plastic spheres containing sterile mesh that passively adsorbs eDNA). The data inferred from eDNA includes biomass estimates for sole and plaice (and potentially other commercial species) and species occurrence data (presence/absence). The latter is valuable data to monitor biodiversity and ecosystem changes and can be used as input for ecosystem-based models.

Expected outcomes:

1. To offer a ready-to-use, non-invasive and automated eDNA sampling tool that can be used by both commercial and scientific vessels on a large temporal and spatial scale.
2. A comprehensive evaluation of the relationship between eDNA concentration and biomass of sole and plaice in deeper waters. A positive outcome creates new opportunities for data collection for stock assessments, especially in data-poor regions such as the southern Celtic Sea (27.7h).

(max 900 words per activity)

Activity: 7 Telemetry and tracking eel

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

Name of the national activity: 2 Telemetry & tracking eel

1. Aim of the data collection activity:

Modelling migration success of eel based on telemetry tracking data

2. Duration of the data collection activity:

2025-2028

3. Methodology and expected outcomes of the data collection activity:

This project is subject to budget approval. Tagging and tracking of eels to build a model should result in estimates of the timing of eel migration to the sea and the relative numbers involved. By combining tracking data with local density estimates, it is also possible to determine the absolute number of eels migrating and the standing stock and ratio of yellow vs silver eel.

The current model used to estimate the number of eels migrating needs updating. The tracking data model outcomes can be compared with the current model, allowing for updates and improvements to existing estimates of silver eel escapement.

(max 900 words per activity)

SECTION 2: BIOLOGICAL DATA

Text Box 2.3: Diadromous species data collection in freshwater

Region: 1 North Atlantic and North Sea

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

RWP 2025-2027

Participation in RWP NANSEA 2025-2027 and in RWP Regional Work Plan on data collection in the fisheries and aquaculture sectors 2025-2027.

In line with Article 9.10 of EU regulation 2017/1004 and where applicable: the relevant regional work plan parts shall be considered to replace or supplement the relevant parts of this national work plan.

(max 250 words per species and area)

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

Commercial fisheries for eel (*Anguilla Anguilla*) are prohibited for all inland waters in Belgium. In Flanders, recreational fishery for eel is allowed, at most three eels per angler per fishing event (minimum size 30 cm). In Wallonia, anglers have a release obligation for caught eel. For coastal and sea waters, all eel fisheries (recreational and commercial) have been prohibited since 2023. Therefore, no data from commercial catches is collected.

Fisheries independent data collection:

Currently, there is no specific monitoring ongoing for diadromous fish species in Flanders. However, number, lengths and weight data can be retrieved from the regular INBO fish monitoring network in Flemish waters, conducted in accordance with the WFD (Water Framework Directive) and supplemented with additional data collection gathered by volunteers or on a project basis. These data are also utilised as part of the Belgian Eel Management Plan (Commission Decision C (2009)10510).

The full description of the Belgian Eel Management Plan can be found on [link](#)

Data is collected from three recruitment series. Glass eel recruitment is monitored at river Yser (See also Annex 1.1 sampling scheme: YSER_G) and Veurne-Ambacht canal (See also Annex 1.1 sampling scheme: VeAm_GY) in Nieuwpoort. Ascending young yellow eel recruitment is monitored at Lixhe on the River Meuse (See also Annex 1.1 sampling scheme: MEUS_Y). Additionally, Yellow eel abundance surveys are conducted via electrofishing and fyke nets for the water frame work directive in EMU Scheldt and Meuse, supplemented with paired fyke and anchor net monitoring on the river Scheldt (See also Annex 1.1 sampling scheme: FLA_Y).

Belgium is required to report every three years in the framework of the EU Eel Regulation (Council Regulation (EC) No 1100/2007 of 18 September 2007 establishing measures for the recovery of the stock of European eel) on the effective migration of silver eel from the eel management units (EMUs) of Meuse and Scheldt.

In Flanders the quantification of the migration of silver eel is based on model calculations using data from yellow eel electric gear surveys (Annex 1.1 sampling scheme: FLA_Y). In Wallonia silver eel escapement has been re-evaluated in 2013.

6(max 250 words per species and area)

Text Box 2.4: Recreational Fisheries

Region: 1 North Atlantic and North Sea

General comment: This text box fulfils Article 5(2)(a), Article 6(3)(a), (b) and (c) of Regulation (EU) 2017/1004 and Chapter II point 2.2 of the EU MAP Delegated Decision annex. Use this text box to give an overview of the methodology used to collect data on marine and freshwater recreational catches. For freshwater diadromous species, use Table and Text Box 2.3.

RWP 2025-2027

Participation in RWP NANSEA 2025-2027 and in RWP Regional Work Plan on data collection in the fisheries and aquaculture sectors 2025-2027.

In line with Article 9.10 of EU regulation 2017/1004 and where applicable: the relevant regional work plan parts shall be considered to replace or supplement the relevant parts of this national work plan.

(max 250 words per sampling scheme)

General comment: This text box fulfils Article 5(2)(a), Article 6(3)(a), (b) and (c) of Regulation (EU) 2017/1004 and Chapter II point 2.2 of the EU MAP Delegated Decision annex. Use this text box to give an overview of the methodology used to collect data on marine and freshwater recreational catches. For freshwater diadromous species, use Table and Text Box 2.3.

The main target species are European sea bass (*Dicentrarchus labrax*), cod (*Gadus morhua*) and pollack (*Pollachius virens*), eel (*Anguilla Anguilla*) and occurring *Elasmobranchii*. Other species of which data are requested to collect through the logbook are: brill, mackerel, dab, flounder, sole, whiting, however these are not a priority. In addition, there are no recreational glass eel fisheries. In Belgium, both commercial and recreational glass eel fisheries are forbidden by law.

Silver-eel: no time-series available. Due to the specific behaviour of silver eel, catches of silver eel by recreational anglers are considered significant low.

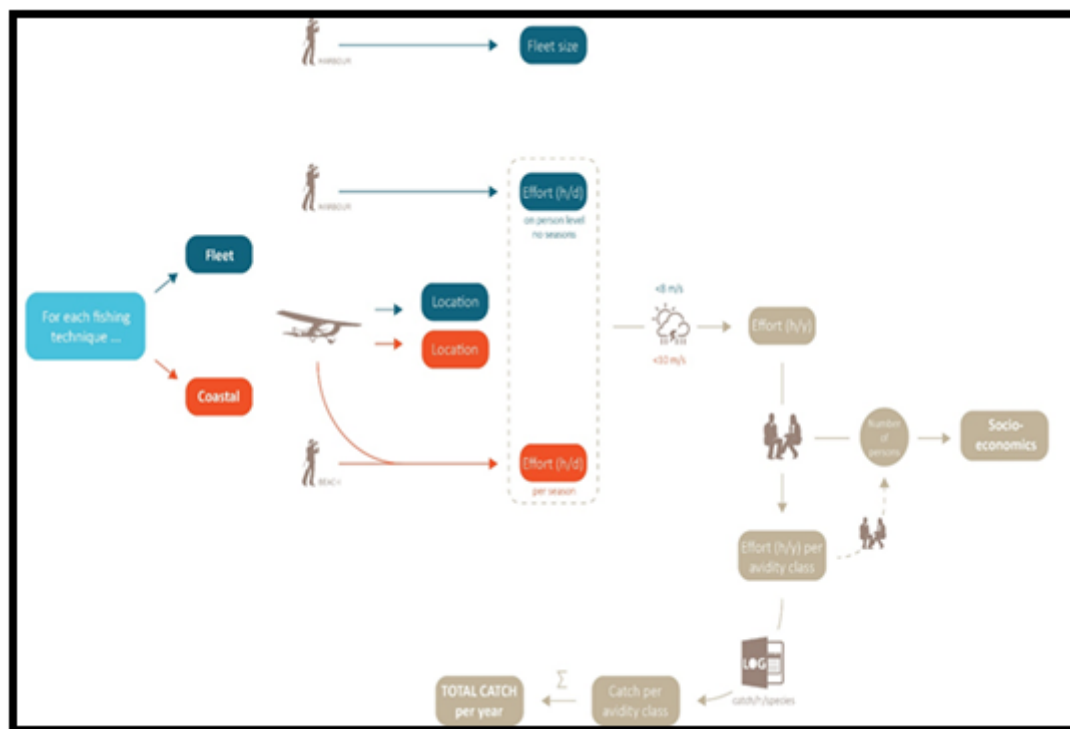
(https://purews.inbo.be/ws/portalfiles/portal/29133073/CRs_2020.pdf)

All gears are considered in the data collection.

To make an estimation of the catches, a logbook is used. This logbook, as well as digital as in hardcopy, was designed on a national level and approved by WGRFS. The logbook participants are recruited by an omnibus survey that took place in 2017 and added to a pool of purposefully selected logbook participants. A questionnaire is being developed for marine and freshwater species (including eel) covering catch and release data at first instance but also socio-economic data including consumption figures.

On-site surveys, among which an aerial survey, are carried out in order to estimate total fishing effort. Logbook surveys are used to estimate the recreational catches of a stratified sample of recreational fishermen. Interviews in the 4 major Belgian marine areas and at the coast act as a control on the reported catches. Extrapolation to total catches takes into account fishing technique and avidity. The exact protocol is developed and was published in the beginning of 2017, with an update in 2020. See [BIN-Recreatieve-Zeevisserij-2022-2017-2021-1.pdf](https://www.recreatievezevisserij.be/Monitoring/Methodologie) ([recreatievezevisserij.be/Monitoring/Methodologie](https://www.recreatievezevisserij.be/Monitoring/Methodologie))

A schematic overview of the protocol is given in the figure below.



(max 900 words per region)

Text Box 2.5: Sampling plan description for biological data

Region: 1 North Atlantic and North Sea

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

Sampling scheme name (or identifier):

RWP 2025-2027

Participation in RWP NANSEA 2025-2027 and in RWP Regional Work Plan on data collection in the fisheries and aquaculture sectors 2025-2027.

In line with Article 9.10 of EU regulation 2017/1004 and where applicable: the relevant regional work plan parts shall be considered to replace or supplement the relevant parts of this national work plan.

No regional sampling is planned

(max 250 words per sampling scheme)

Sampling scheme name: 1 SciObsAtSea*Commercial fishing trip*Selected species/stocks

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

Sampling scheme name (or identifier): 1 SciObsAtSea*Commercial fishing trip*Selected species/stocks

There is no complementary information needed regarding the sampling design done in Belgium.

A full description of the sampling plan is given in the Annex 1.1 text boxes.

Additional information on sampling schemes

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

Additional description on sampling frames

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

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

Sampling scheme identifier: 2 SelfAtSea*Commercial fishing trip*Selected species/stocks

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

Sampling scheme name (or identifier): 2 SelfAtSea*Commercial fishing trip*Selected species/stocks

There is no complementary information needed regarding the sampling design done in Belgium.

A full description of the sampling plan is given in the Annex 1.1 text boxes.

Additional information on sampling schemes

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

Additional description on sampling frames

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

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

Text Box 2.6: Research surveys at sea

Region: 1 North Atlantic and North Sea

Research survey: 1 North Sea Beam Trawl Survey (BTS)

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

Research survey: North Sea Beam Trawl Survey (BTS)

RWP 2025-2027

Participation in RWP NANSEA 2025-2027 and in RWP Regional Work Plan on data collection in the fisheries and aquaculture sectors 2025-2027.

In line with Article 9.10 of EU regulation 2017/1004 and where applicable: the relevant regional work plan parts shall be considered to replace or supplement the relevant parts of this national work plan.

National specifics

1. Objectives of the survey

The Belgian BTS started in 1993, resulting in a time series of 28 years. During the survey 62 fixed stations (ICES Area 27.4b and 27.4c) are fished in the third quarter of the year.

The objectives are:

- Create fisheries-independent **abundance indices** by age group for plaice, sole, dab, cod, lemon sole, turbot, and brill for the sampled area
- Collection of **biological data** for ecosystem analysis purposes:
 - on all fish (including elasmobranchs) species, including length and total catch weight measurements
 - on all epibenthic species, including count and weight measurements
 - on commercially important shellfish and cephalopod species (*Nephrops norvegicus*, *Cancer pagurus*, *Hommarus gammarus*, *Loligo vulgaris*, *Loligo forbesii* and *Sepia officinalis*), including weight and length measurements
- Collection of **marine litter** data by international standards
- Collection of **environmental data**, such as depth, surface and bottom temperature and salinity
- Assess the feasibility of plankton monitoring and stomach content analysis over the course of the WP2025-2027
- Collection of eDNA data for plaice, sole. The stations (15 in total) were selected based on abundance of sole and plaice. Some stations are characterised by both high abundances of sole and plaice, others are characterised by high abundances of sole and low abundances of plaice (and vice versa), Others are characterised by very low abundances of both species. This setup allows to finetune the eDNA technique and the results of this genetic analysis provide a cross-check of actual abundances of plaice and sole in the net.

All collected data is frequently used by end-users.

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

The survey design is discussed annually with the other member states at the WGBEAM to maintain and increase standardization in sampling. WGBEAM has published an offshore manual, describing the

standardized sampling protocols and practices by each country (WGBEAM, 2019; [Manual for the Offshore Beam Trawl Surveys](#)) The national manual (in Dutch) is stored on the internal server and available on request.

(max 450 words per survey)

Research survey: 2 Demersal Young Fish Survey (DYFS)

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

Research survey: 2 Demersal Young Fish Survey (DYFS)

RWP 2025-2027

Participation in RWP NANSEA 2025-2027 and in RWP Regional Work Plan on data collection in the fisheries and aquaculture sectors 2025-2027.

In line with Article 9.10 of EU regulation 2017/1004 and where applicable: the relevant regional work plan parts shall be considered to replace or supplement the relevant parts of this national work plan.

National specifics

1. Objectives of the survey

The Belgian DYFS started in 1973, resulting in a time series of 48 years. During the survey 33 fixed stations are fished in the third quarter of the year. The location of the sampling area matches the main flatfish nursery grounds along the Belgian coast (red dots Figure 2). The aims are:

- Create fisheries-independent **abundance indices** by age group for plaice and sole
- Collection of **biological data** for ecosystem analysis purposes:
 - of 16 commercial fish species and brown shrimp, including length and total catch weight measurements
 - on all elasmobranchs per sex, including length and weight measurements
 - on all epibenthic species and non-commercial fish, including count and weight measurements
- Collection of **marine litter** data by international standards
- Collection of **environmental data**: depth, surface and bottom temperature and salinity

All collected data is frequently used by end-users.

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

(max 450 words per survey)

As an inshore manual is not yet publicly available, the method of the survey is described below. Belgium guarantees to continue incorporating updated method designs as coordinated by WGBEAM.

33 stations are fished for ~30 min, with a standard 6-m shrimp beam trawl (cod-end mesh size 22 mm, no tickler chains) at 3.5 knots against tide. The catch is poured into a rotating shrimp riddle to sort it in 'small', 'medium' and 'large' fractions. All fractions are processed separately but in a similar manner. Commercial fish (sole, plaice, dab, whiting, brill, turbot, red, English and grey gurnard, flounder, cod, horse mackerel, mackerel, lemon sole, sea bass and surmullet) and elasmobranchs are handpicked from the fractions, sorted by

species, weighed and measured. Subsequently, if the fraction is large, a subsample is taken after picking out litter, stones, wood and the ‘general sweep’ (i.e. epibenthic and non-commercial fish species that are not representative of the fraction composition). From each subsample, 250 brown shrimps are picked. These shrimps are measured and weighed. What rests of the subsample and the ‘general sweep’ is sorted by species, counted and weighed.

SECTION 3: FISHING ACTIVITY DATA

Text Box 3.1: Fishing activity variables data collection strategy

Region: 1 North Atlantic and North Sea

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

RWP NANSEA 2025-2027

Participation in RWP NANSEA 2025-2027 and in RWP Regional Work Plan on data collection in the fisheries and aquaculture sectors 2025-2027.

In line with Article 9.10 of EU regulation 2017/1004 and where applicable: the relevant regional work plan parts shall be considered to replace or supplement the relevant parts of this national work plan.

(max 450 words)

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

National strategies

No complementary data collection is planned

(max. 900 words)

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

Region: 1 North Atlantic and North Sea

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.

RWP 2025-2027

Participation in RWP NANSEA 2025-2027 and in RWP Regional Work Plan on data collection in the fisheries and aquaculture sectors 2025-2027.

In line with Article 9.10 of EU regulation 2017/1004 and where applicable: the relevant regional work plan parts shall be considered to replace or supplement the relevant parts of this national work plan.

(max. 900 words)

General comment: This text box fulfils Article 5(2)(c), Article 6(3)(a), (b) and (c) of Regulation (EU) 2017/1004 and Chapter II point 3.2 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.

Commercial eel fishing has been banned in Flanders for years. Commercial fisheries for eel (*Anguilla Anguilla*) are prohibited for all inland waters in Belgium. In Flanders, recreational fishery for eel is allowed, at most three eels per angler per fishing event (minimum size 30 cm). In Wallonia, anglers have a release obligation for caught eel. For coastal and sea waters, all eel fisheries (recreational and commercial) have been prohibited since 2023.

(max. 900 words)

SECTION 4: IMPACT OF FISHERIES ON MARINE BIOLOGICAL RESOURCES

Text Box 4.2: Incidental catches of sensitive species

Region: 1 North Atlantic and North Sea

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.

RWP 2025-2027

Participation in RWP NANSEA 2025-2027 and in RWP Regional Work Plan on data collection in the fisheries and aquaculture sectors 2025-2027.

In line with Article 9.10 of EU regulation 2017/1004 and where applicable: the relevant regional work plan parts shall be considered to replace or supplement the relevant parts of this national work plan.

(max 250 words per activity)

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

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?

No, the Belgian commercial sampling scheme applies to beam trawl fisheries, which form the largest part of the Belgian commercial fishing fleet. Sea going observers have been monitoring incidental catches of sensitive species on beam trawlers since 2014 and all their registrations have been transferred to ICES WGBYC. Up until now, very few sensitive species were registered, except for certain elasmobranchs. Belgian fisheries policy strongly focuses on reducing bycatch of sensitive species, especially regarding the elasmobranchs. Currently, only blonde ray, spotted ray and thornback ray can be landed. Other ray species are released immediately. Fishermen are encouraged to use techniques and equipment to ensure rapid and safe release in accordance with European regulations.

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

The Belgian fishing fleet uses both passive and active gears as shown in the table below. Most vessels use active gears. Within the WP, Belgium only monitors beam trawl fisheries as this is the largest part of the commercial fishing fleet (~70% of the fishing vessels; see table below).

Type of fishing technique		N° of vessels
Active gears	Beam trawlers	44
Active gears	Demersal trawlers and/or demersal seiners	16
Active gears	Dredges	1
Passive gears	Drift and/or fixed netters	1
Passive gears	Pots and/or traps	1

Beam trawling is still prone to catch bycatch. However, the amount of bycatch of sensitive species is found to be low (data reported to WGBYC). Beam trawlers impact a considerably lower amount of water volume compared to demersal trawlers and seiners (bottom trawls) and gillnets (the latter is not present in Belgian fleet). The latter (bottom trawls and gillnets) have been flagged by Suuronen et al. (2012) to have the disadvantage to catch incidental bycatch of non-target species often sea birds, turtles and other charismatic species. WGBYC latest report states that the highest number of dolphins and vulnerable elasmobranchs are caught with gill/trammel nets and bottom otter trawling. Given that the Belgian commercial fishing fleet consists mostly of beam trawlers, the risk of catching sensitive species is limited compared to the other gear types/metiers.

Sources:

- Suuronen, P.; Chopin, F.; Glass, C.; Løkkeborg, S.; Matsushita, Y.; Queirolo, D.; Rihan, D. (2012). Low impact and fuel-efficient fishing - Looking beyond the horizon, Fisheries Research, Volumes 119–120, Pages 135-146, <https://doi.org/10.1016/j.fishres.2011.12.009>.
- ICES. 2020. Working Group on Bycatch of Protected Species (WGBYC). ICES Scientific Reports. 2:81. 216 pp. <http://doi.org/10.17895/ices.pub.7471>

- What methods are used to calculate the observation effort?

See annex 1.1

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

Belgium uses the DCF sampling programme to monitor marine mammals and incidental catches of sensitive species. In addition, both ICES WGBYC and WGEF (Working Group on Bycatch of Protected Species and Working Group on Elasmobranch Fishes respectively) have issued a list of sensitive species. Belgium's protocol is to only report species from these lists which are observed on the conveyor belt and to register numbers, no weights. If the species are still alive, they are put back overboard as quickly as possible to increase survival chances. The seagoing observers are trained by following a species recognition workshop, they have received the Harokit project training and internally an app to identify rays species by using AI is used as well.

- ICES. 2019. Working Group on Bycatch of Protected Species (WGBYC). ICES Scientific Reports. 1:51. 163 pp. <http://doi.org/10.17895/ices.pub.5563>

- ICES. 2019. Working Group on Elasmobranch Fishes (WGEF). ICES Scientific Reports. 1:25. 964 pp. <http://doi.org/10.17895/ices.pub.5594>
- (EU) 2016/1251 of 12 July 2016 (Table 1D)
- [1_HAROkIt_Inleiding.pdf \(vliz.be\)](#)

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

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

No, rare specimens are monitored at the conveyor belt. However, if large specimens are present in the catch and are not transferred to the conveyor belt, observers will notice and register them.

- 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?

Not applicable. Belgium only monitors beam trawl fisheries

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

Yes, the protocol instructs to check for rare specimen during sorting of a large catch at the conveyor belt. The observer writes down the number per species.

Yes, the observer indicates what percentage of the sorting process has been checked. Typically, this is 50% (starboard OR portside) or 100% (starboard AND portside) of the catch.

Additional information on sampling schemes:

Belgium is partner in the LIFE EU Bycatch project 'CiBBRiNA' ([Homepage - CiBBRiNA](#)) and the Horizon project Marine Beacon ([Home - Marine Beacon](#)). These projects aims to minimize bycatch in fisheries with a high risk of incidental bycatch by working together with fishers, scientists, fisheries and environment ministries and NGO's.

Marine mammals are also monitored under a range of international treaties such as the OSPAR treaty for the protection of the marine environment and the Habitat and Marine Strategy Framework Directives. Dedicated aerial surveys are carried out biannually to determine the density and distribution of marine mammals in Belgian waters. This is coordinated by ICES WGMME to ensure standardised methodology across countries. The national report (in Dutch with English summary) on the 2020 monitoring can be found here: http://www.marinemammals.be/static-file/report_marinemammals_2020_NLBE.pdf

Reference: Haelters, J., F. Kerckhof, K. Moreau, Team SeaLife, E. Lambert & T. Jauniaux, 2021. Strandingen en waarnemingen van zeezoogdieren en opmerkelijke andere soorten in België in 2020 [Strandings and sightings of marine mammals and remarkable other species in Belgium in 2020]. Koninklijk Belgisch Instituut voor Natuurwetenschappen (KBIN), Brussel. 34 pp.

Additional description on sampling frames

Not applicable

The activities planned for monitoring of as described above in the textbox and being partner in the consortium of CiBBRina and Marine Beacon, also fully contribute to the specific national measures to minimize by-catch

of sensitive species in regard to the EU Marine Action Plan: Protecting and restoring marine ecosystems for sustainable and resilient fisheries.

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

Text Box 4.3: Fisheries impact on marine habitats

Region: 1 North Atlantic and North Sea

Study: 1 Regionally coordinated stomach sampling programme

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

Name of the study: 1 Regionally coordinated stomach sampling program

RWP 2025-2027

Participation in RWP NANSEA 2025-2027 and in RWP Regional Work Plan on data collection in the fisheries and aquaculture sectors 2025-2027.

In line with Article 9.10 of EU regulation 2017/1004 and where applicable: the relevant regional work plan parts shall be considered to replace or supplement the relevant parts of this national work plan.

(max 250 words per study)

Study: 2 Comprehensive stomach content data collection

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

Name of the national test study: 2 Comprehensive stomach content data collection

1. Aim of the study

Stomach content data provides valuable insights into the feeding ecology and trophic interactions of species, especially in a changing environment. Additionally, dietary data is crucial input for food web models, which are in turn the base of ecosystem models. Currently, most North Sea ecosystem models are based on a food web model established with data from 1991 (ICES Year of the Stomach). In order to improve the predictive capabilities of these ecosystem models, a thorough revision of the food web model is recommended. To achieve this, diet composition matrices need to be updated with current stomach content data, ideally on species level. Furthermore, the incorporation of predator-prey interactions has been proven useful in the stock assessment of several commercial species (e.g., capelin, cod) as it provides important data on natural mortality. Accurate estimates of natural mortality help improve stock assessments by offering a better understanding of population dynamics influenced by non-fishing factors. This enables more sustainable management of fish stocks which aligns with the MAP objective “contribute to getting and keeping fish stocks to sustainable levels”. Regional differences in stomach content analyses, however, are known to hamper the inclusion of dietary data in assessments which illustrates the need for a standardised protocol.

Previous research has shown that integrating visual and molecular analysis (i.e., DNA metabarcoding) of stomach contents yields the most comprehensive insights into the prey composition (Maes & Schaafsma, 2022). DNA metabarcoding uses short genetic fragments, known as genetic barcodes (i.e., unique genetic ID for each species), and high-throughput sequencing for high-resolution taxonomic identification of prey, including gelatinous and digested prey items. By using DNA as identification tool, this method overcomes most limitations of visual prey identification such as the requirement of expert taxonomic knowledge, high labour intensity, species-specific digestion rates and unidentifiable prey items. Visual analysis, however, can provide additional biological information such as biomass and life stages of the prey items.

The aim of this test study is four-fold:

1. Develop a comprehensive sampling and methodological plan to standardize stomach data collection practices for the Belgian BTS in alignment with the existing RCG ISSG stomach sampling scheme and protocol.
2. Test the developed sampling protocol at sea and evaluate its effectiveness, costs and feasibility in practice.
3. Generate a comprehensive, high-resolution taxonomic stomach content dataset of commercial species by using visual (subsample) and molecular analysis
4. Update the ICES stomach database with new data (ICES - Stomach Content Data)

2. Duration of the test study

The test study is planned to align with the duration of the WP (01/01/2025-31/12/2027).

3. Methodology and expected outcomes of the test study

The ISSG Regionally Coordinated Stomach Sampling aims to establish a regionally coordinated stomach sampling program in European waters. Currently, this coordinated sampling is focused on the International Bottom Trawl Survey (IBTS). However, we aim to expand the monitoring of stomach samples to our BTS due to three key factors: 1) ILVO's involvement in the CINEA SC10 study on stomach content of fish to update databases and analyse possible changes in diet or food web interactions; 2) the inclusion of areas covered by the Belgian BTS, such as the Thames estuary, which are not fully covered by the IBTS survey; and 3) the importance of the survey for certain fish stocks (e.g., sol.27.4, ple.27.420 and bl.27.3a47de).

Before sampling the stomachs, we will develop a protocol that aligns with the ISSG standards to ensure consistency and accuracy in our sampling practices. During the BTS, this protocol will be tested, and stomach samples will be collected from commercial species and ETP species (opportunisticly sampled when dead) following the five-year rotation scheme developed by the RCG ISSG stomach sampling (Table 1). At ILVO, the stomach content of a selected subset of samples will be visually analysed using microscopy (following the ISSG stomach protocol). Additionally, DNA metabarcoding will be performed on all samples, including those that have been visually analysed. The metabarcoding protocol is readily available and has been described in detail by Maes & Schaafsma (2022). We propose the routinely integration of the data collection for the next WP-cycle if the conclusion of the study is positive.

Table 1. Five-year stomach sampling scheme including target species for each year and, "minor" species and "opportunistic" species (i.e., species sampled opportunisticly, dead specimens) to be sampled yearly.

Year	Species	Yearly "minor" species	Yearly "opportunistic" species
1	Whiting Anglerfish Megrim	Turbot Brill Pollack Tusk Ling Tub gurnard	Starry ray Cuckoo ray Thornback ray Spotted ray Common skate-complex Spur dog Tope Halibut
2	Cod Horse mackerel		
3	Hake Plaice		
4	Haddock Mackerel (Q3 only)		
5	Saithe Red gurnard Grey gurnard		

Expected outcomes:

1. A comprehensive sampling and methodological plan to standardize stomach data collection practices that aligns with the ISSG standards
2. A high-resolution taxonomic stomach dataset of selected commercial species sampled during BTS.

This activities planned also fully contribute to the specific national measures to minimize by-catch of sensitive species in regard to the EU Marine Action Plan: Protecting and restoring marine ecosystems for sustainable and resilient fisheries.

SECTION 5: ECONOMIC AND SOCIAL DATA IN FISHERIES

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

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

RWP ECON implementation years

National specific aspects

1. Description of clustering.

The Belgian Fishing fleet numbers as reported in the AER 2023.

Type of fishing technique		Length classes (LOA)	N° of vessels	Clusters
Active gears	Beam trawlers	12-<18 m	1	TBB VL1824
		18-<24 m	16	TBB VL1824
		24-<40 m	28	
Active gears	Demersal trawlers and/or demersal seiners	18-<24 m	8	DTS VL2440
		24-<40 m	7	DTS VL2440
Passive gears	Drift and/or fixed netters	18-<24 m	1	PMP VL1824
Total active vessels			61	
Inactive vessels			6	
Total			67	

Fleet segments are determined as described in the European legislation. Several segments consist of less than 10 fishing vessels (see table above) and raises a confidentiality issue related to sensitive socio-economic data. Therefore, and in order to both report on a full dataset as well as report a continuous time series clustering is necessary.

The beam trawlers 12-18m are clustered with beam trawlers 18-24m. The latter is an economic important segment and hence determines the name, however both segments use the same fishing gear and exhibit similar behavior in terms of target species.

For demersal trawlers and/or seiners, all length categories present in the current Belgian fleet contain 15 vessels. The vessels in the two length classes are clustered in demersal trawlers and/or demersal seiners-vessel length 24-<40 m*, to retain confidentiality of the data reported for these vessels and in order to report consistent data over time. In addition, this clustering is made in response to the changing number of vessels over the years in all specified length classes.

For dredges and passive gears, the ‘non-important segments with distinct characteristics’ principle in order to provide a full dataset and retain confidentiality is applied. Also, for this cluster a time series continuation argument can be used, because we have reported on this clustered segment in previous Annual Reports (from 2008 onwards). As there is no real dominant segment in this cluster and in an attempt to avoid misleading the end-user, these vessels were clustered as ‘vessels using active and passive gears’ (PMP). The category ‘Other’ is non-existent. The number of vessels is however fluctuating in recent years and has not been reported on in 2023 due to confidentiality reasons. Socio-economic data of this cluster will be reported if the cluster contains enough vessels again to ensure confidentiality.

As the number of inactive vessels, however fluctuating, is always low, the two length classes of inactive vessels, that is vessel length 18-<24 m and 24-<40 m, are also clustered, namely in inactive vessels-vessel length 12-<40 m*.

2. Description of activity indicator

During the previous WP-cycle, Belgium has done a test study to determine the viability of analysing and reporting the activity indicator in the current WP cycle (2025-2027). The analyses resulted in reporting the activity indicator, with only major implications on a single clustered segment, that is beam trawlers 18-< 24 m*. The analyses also showed a possible change of activity in different segments, however, these results cannot be reported due to loss of confidentiality. In addition, although the activity indicator that will be provided in the current WP-cycle is based on ‘days at sea’, it has been further modified to present correct activity levels. Further details can be found in the quality annex of fisheries (ANNEX 1.2: Fisheries).

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

To report the variables ‘capital value’ and ‘capital costs’, the Member State does not use the PIM method. This is because the MS does not collect the necessary values used for the PIM calculation. In addition, as the MS has limited fishing licences and a fishing vessel is connected to a licence, the ‘capital value’ and ‘capital costs’ have abstract values. This is because these values are influenced by both the value of the vessel and the value of the licence. However, the value of the licence is difficult to determine. The MS therefore asks the ‘capital value’ and ‘capital costs’ variables in a questionnaire and are given by the accountants of the fishing company. The MS chooses for consistency reasons to report these variables collected by a questionnaire and thus respect the time series. However, a test study (Text box 1a, Test Study 5) has been suggested to assess if improved data collection on actual ‘capital’ value and the ‘capital’ cost of vessels in the Belgium fishing fleet is possible. If data would be obtained, it will be assessed if it can be used to create improved estimates of ‘capital value’ and ‘capital cost’.

(max. 900 words)

SECTION 6: ECONOMIC AND SOCIAL DATA IN AQUACULTURE

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

General comment: This text box fulfils Article 5(2)(e), Article 6(3)(a), (b) and (c) of Regulation (EU) 2017/1004, and Chapter II point 6 of the EU MAP Delegated Decision annex. It is intended to specify data to be collected under Tables 10 and 11 of the EU MAP Delegated Decision annex.

RWP ECON 2025-2027

1. Description of the threshold application

According to EUROSTAT, the total Belgian annual production of the aquaculture sector was 243 tonnes, with a value of 1,738,908 EURO (last data year 2022). These values represent respectively far less than 1% of the total weight and less than 5% of the total value (last total value in EUROSTAT 2022) produced in the European Union. **Yet, as the national government considers this as an important topic, and is an end-user for the data, from 2022 onwards Belgium has undertaken efforts to collect both economic and social data of the aquaculture sector annually.** The previous WP-cycle (2022-2024) included specific details on the stepwise improvement of data gathering in the aquaculture sector. For a number of enterprises annual socio-economic data has been collected via annual financial accounts. However, data gathering from enterprises without annual accounts has proven to be exceptionally difficult, due to the small number of such enterprises and many enterprises that only have occasional production years, i.e. many operate only intermittently, experiencing gaps in production. Data for these enterprises are not captured via annual accounts and responses to questionnaires are non-existent. Therefore, the socio-economic data needs to be collected through direct interactions, based on relationships. However, building the trust needed to obtain such data often takes multiple years. Hence, although our data coverage has improved in the previous WP-cycle, a test study will be started to reassess the feasibility of socio-economic data gathering for the aquaculture sector in Belgium (Text box 1a, Test Study 6).

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

(max. 900 words)

SECTION 7: ECONOMIC AND SOCIAL DATA IN FISH PROCESSING

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

General comment: This text box fulfils Article 5(2)(f), Article 6(3)(a), (b) and (c) of Regulation (EU) 2017/1004, and Chapter II point 7 of the EU MAP Delegated Decision annex.

RWP ECON 2025-2027

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

The MS collects data from the fish processing industry. The complementary data collection is necessary to ensure consistent time series and is also at the request of the Flemish government. The needed data of both economic and social variables is mostly covered by the balance accounts and financial statements of large enterprises that have to submit a full balance account and financial statement. Yet specific economic and social variables cannot be extracted from the balance accounts and financial statements. The data of these variables is collected through questionnaires. In addition, questionnaires and by consequence stakeholder interaction is key for collecting data on economic and social variables of medium and small fish processing enterprises. Part of the challenge of collecting data via questionnaires is non-response. To cover the within group (size of enterprise) non-response, average values are calculated based on the data reported by respondents within that group and thus covering the data reporting required. Details of the sampling scheme can be found in Annex 1.2 (Fish processing industry). In addition, the MS will put extra effort in gathering data via live stakeholder interactions during the current WP-cycle.

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

BEL applies a census data collection of the fish processing industry and therefore no deviations from RCG ECON recommendations are present.

(max. 900 words)

ANNEX 1.1 - QUALITY REPORT FOR BIOLOGICAL DATA SAMPLING SCHEME

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries.

Related to Table 2.3 [and Text Box 2.3] (biological specific data collection/diadromous data collection/recreational fisheries data collection/commercial fisheries data collection/stomach sampling)

Sampling scheme identifier: YSER_G

MS : BEL
Region : North Sea and Eastern Arctic
Sampling scheme identifier : YSER_G
Sampling scheme type: Diadromous (scientific)
Observation type: Self water body
Time period of validity : 2025-2027
<u>Glass eel recruitment at the river Yser (Nieuwpoort):</u> In Flanders, long term glass eel recruitment monitoring is carried out in Nieuwpoort at the mouth of the river Yser (IJzer) at the Belgian coast. Yearly monitoring, in the sea sluice at the Nieuwpoort station, begins in February and continues until May or June. Fishing is dependent on weather conditions and tide. Usually there are 20 to 30 fishing nights per season. Fishing commences approximately 2-3 hours before high tide and continues until high tide is reached. The outer (seaside) doors of the ship lock are opened to allow glass eel entering the ship lock. A 5 m long steeled dipnet (width 80cm, height 60cm) is held vertical from the ship lock quay and pulled forward, just below the surface, for the length of the ship lock. These data has been collected by volunteers (anglers) since 1964 according to the same protocol.
Description of the population
Population targeted: Glass eel (<i>Anguilla anguilla</i>) migrating from sea to fresh water are targeted near the coast in Nieuwpoort Population sampled: Glass eel (<i>Anguilla anguilla</i>) migrating from sea to fresh water are targeted near the coast in Nieuwpoort. Stratification: Stratification is applied.
Sampling design and protocols
Sampling design description: From February till June glass eel abundance is determined by means of dipnet fishing at night in the ship lock (Figure 1)

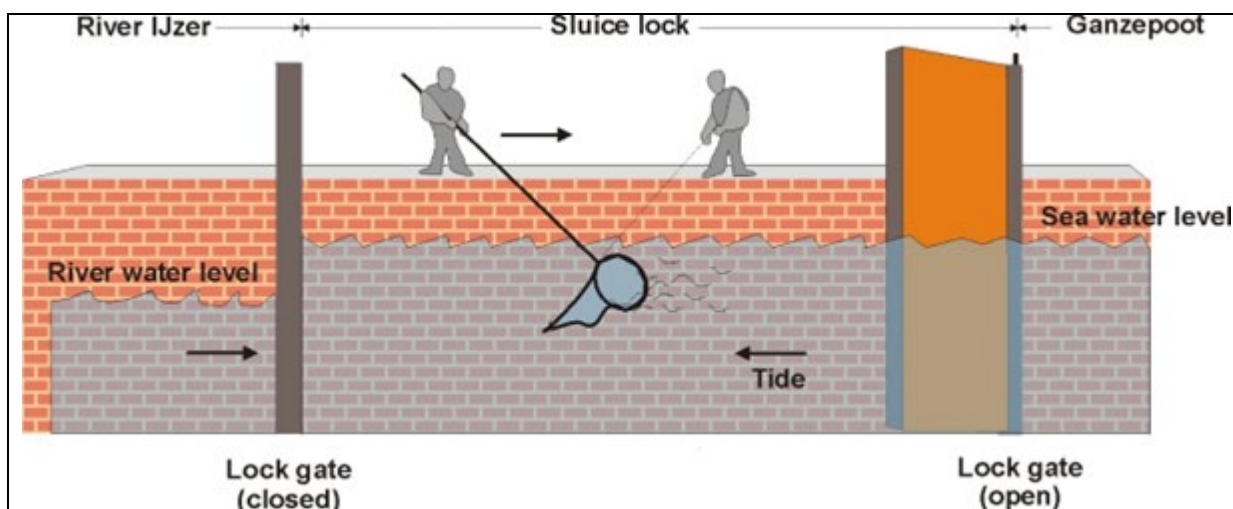


Figure 1: schematic overview of how data are collected at the ship lock sluices (Belpaire et al., 2002).

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

Regional coordination: N

Link to sampling design documentation:

Belpaire, C. (2006) Report on the eel stock and fishery in Belgium 2005. In FAO European Inland Fisheries Advisory Commission; International Council for the Exploration of the Sea. Report of the 2006 session of the Joint EIFAC/ICES Working Group on Eels. Rome, 23–27 January 2006. EIFAC Occasional Paper. No. 38, ICES CM 2006/ACFM:16. Rome, FAO/Copenhagen, ICES. 2006. 352p., 217-241. ;

https://purews.inbo.be/ws/portalfiles/portal/6394592/BE_WG_eel_2006_country_report_final.pdf (Chapter BE.G p.11)

Belpaire, C. (2002) Monitoring of glass eel recruitment in Belgium. In: Dekker W. (Ed.) Monitoring of glass eel recruitment. Netherlands Institute of Fisheries research, report C007/02-WD, Volume 2B, pp. 167-180 ([Link](#))

Compliance with international recommendations: Y

Link to sampling protocol documentation:

Standard operating procedures are available in Dutch on request. A brief description is available in the links above. In dutch. <https://www.vliz.be/imisdocs/publications/121881.pdf>

Sampling implementation

Recording of refusal rate: NA

Monitoring of sampling progress within the sampling year: Y

Numbers are regularly forwarded during the fishing season.

Data capture

Means of data capture:

Available data are daily glass eel catches (kg), date, starting and ending hours of the fishing period and tide data. Catches are presented as total annual yield or can be presented as maximum daily catch or mean daily catch. This series relies on total catch but with a variation in effort. Effort data are reported since 2003

Data capture documentation: https://purews.inbo.be/ws/portalfiles/portal/29133073/CRs_2020.pdf https://purews.inbo.be/ws/portalfiles/portal/15669538/WGEEL_CRs_2018.pdf up-to-date results are available via: https://shiny.sk8.inrae.fr/app/wgeel-wgeel-shiny-dv Quality checks documentation: Y Quality checks are conducted upon processing at the institute, and before entry into the international ICES database. Several R scripts are used for the data quality checks. A shiny app is used for correct data integration into the ICES database
Data storage National database: N Data is mainly stored in excel sheets on a server at ANB. Progress will be made towards including recruitment data into the VIS database. International database: Y : ICES-WGEEL Quality checks and data validation documentation: https://purews.inbo.be/ws/portalfiles/portal/29133073/CRs_2020.pdf
Sample storage Storage description: NA The catch is after processing released to the environment.
Data processing : Recruitment data are processed in R scripts available at the institute and on an international level via the ICES WGEEL working group.
Evaluation of data accuracy (bias and precision): Y The data are checked on outliers and compared with previous years. Editing and imputation methods: Y All editing is documented and traceable. Corrected data are also reuploaded to the international ICES database. R scripts are available to relevant teams at INBO. Quality document associated to a dataset: N Validation of the final dataset: Y Before data are submitted to an end user (e.g ICES WGEEL), the data are reviewed and checked for errors.

Sampling scheme identifier: VeAm_GY

MS : BEL
Region : North Sea and Eastern Arctic
Sampling scheme identifier : VeAm_GY
Sampling scheme type: Diadromous (scientific)
Observation type: Self water body
Time period of validity : 2025-2027

<u>Glass eel recruitment in the Veurne-Ambacht canal (Nieuwpoort):</u> Adjusted barrier management (ABM: limited barrier opening during tidal rise) is applied at a sluice complex located downstream in the Veurne-Ambacht canal. Glass eel recruitment (with ABM) is weekly monitored (March–June) since 2017 by means of 2 eel ladders installed on both sides of a pumping station (the next migration barrier located at 835 m upstream from the sluice complex). Once or twice a week, volunteers (anglers) quantify the amount of glass eels caught with both eel ladders and concordantly release the animals in the polder area. Mostly glass eels are caught, but also small elvers are present.
Description of the population Population targeted: Glass eel and elvers (<i>Anguilla anguilla</i>) migrating from sea to fresh water are targeted near the coast in Nieuwpoort Population sampled: Glass eel and elvers (<i>Anguilla anguilla</i>) migrating from sea to fresh water are targeted near the coast in Nieuwpoort Stratification: Stratification is applied.
Sampling design and protocols Sampling design description: Glass eel recruitment is weekly monitored (March–June) since 2017 by means of 2 eel ladders installed on both sides of a pumping station Is the sampling design compliant with the 4S principle? NA Regional coordination: N Link to sampling design documentation: Mouton, A., Stevens, M., Van den Neucker, T., Buysse, D., & Coeck, J. (2011). Adjusted barrier management to improve glass eel migration at an estuarine barrier. <i>Marine Ecology Progress Series</i>, 439, 213-222. https://doi.org/10.3354/meps09325 Vandamme L., Verhelst P., Pauwels I., Buysse D., Broos S., Auwerx J., Brys R., Neyrinck S., Plaetinck S., Pieters S., Rosseel D., De Maerteleire N., Coeck J. (2023). Wetenschappelijke onderbouwing en ondersteuning van het visserijbeleid en het visstandbeheer, Onderzoeksprogramma visserij 2021 – 2022. Rapporten van het Instituut voor Natuur- en Bosonderzoek 2024 (3). Instituut voor Natuur- en Bosonderzoek, Brussel. DOI: doi.org/10.21436/inbor.101502149 Compliance with international recommendations: Y Link to sampling protocol documentation: Elaborated standard operating procedures are available in Dutch on request
Sampling implementation Recording of refusal rate: NA Monitoring of sampling progress within the sampling year: Y numbers are regularly forwarded during the monitoring season.

Data capture
Means of data capture: Total weight and number of glass eels and elvers are reported for each side of the pumping station, together with environmental variables such as time of day, air and water temperature. Data capture documentation: https://purews.inbo.be/ws/portalfiles/portal/29133073/CRs_2020.pdf and https://purews.inbo.be/ws/portalfiles/portal/15669538/WGEEL_CRs_2018.pdf up-to-date results are available via: https://shiny.sk8.inrae.fr/app/wgeel-wgeel-shiny-dv Quality checks documentation: Y Quality checks are conducted upon processing at the institute, and before entry into the international database. Several R scripts are used for the data quality checks. A shiny app is used for correct data integration into the ICES database.
Data storage
National database: N Data is mainly stored in excel sheets on a server at ANB. Progress will be made towards including recruitment data into the VIS database. International database: Y ICES-WGEEL Quality checks and data validation documentation: https://purews.inbo.be/ws/portalfiles/portal/29133073/CRs_2020.pdf
Sample storage
Storage description: NA The catch is after processing released to the environment
Data processing : Recruitment data are processed in R scripts available at the institute and on an international level via the ICES WGEEL working group. Evaluation of data accuracy (bias and precision): Y The data are checked on outliers and compared with previous years. Editing and imputation methods: Y All editing is documented and traceable. Corrected data are also reuploaded to the international ICES database. R scripts are available to relevant teams at INBO. Quality document associated to a dataset: N Validation of the final dataset: Before data are submitted to an end user (e.g ICES WGEEL), the data are reviewed and checked for errors.
Sampling scheme identifier: Meus_Y
MS : BEL
Region : North Sea and Eastern Arctic
Sampling scheme identifier :

Meus_Y
Sampling scheme type: Diadromous (scientific)
Observation type: SciObs water body
Time period of validity : 2025-2027
<u>Yellow eel recruitment in the river Meuse in Lixhe</u> On the river Meuse in Lixhe, the University of Liège is monitoring the amount of ascending young yellow eels in a fish-pass (yellow eel recruitment). Since 1992, upstream migrating eels are collected in a trap (0.5 cm mesh size) installed at the top of a small pool-type fish-pass at the Visé-Lixhe dam (built in 1980 for navigation purposes and hydropower generation; height: 8.2 m; not equipped with a ship-lock) on the international River Meuse near the Dutch–Belgium border (323 km from the North Sea; width: 200 m; mean annual discharge: 238 m³ s⁻¹ ; summer water temperature 21–26°C). The trap in the fish-pass is checked continuously (three times a week) over the migration period from March to September each year, except in 1994.
Description of the population
Population targeted: Ascending Young Yellow Eel (<i>Anguilla anguilla</i>) on the river Meuse Population sampled: Ascending Young Yellow Eel (<i>Anguilla anguilla</i>) on the river Meuse Stratification: Stratification is applied.
Sampling design and protocols
Sampling design description: Y Upstream migrating eels are collected in a trap (0.5 cm mesh size) installed at the top of a small pool-type fish-pass at the Visé-Lixhe dam. The trap in the fishpass is checked continuously (three times a week) over the migration period from March to September each year, except in 1994. Is the sampling design compliant with the 4S principle? NA Regional coordination: N Link to sampling design documentation: Belpaire, C. (2006) Report on the eel stock and fishery in Belgium 2005. In FAO European Inland Fisheries Advisory Commission; International Council for the Exploration of the Sea. Report of the 2006 session of the Joint EIFAC/ICES Working Group on Eels. Rome, 23–27 January 2006. EIFAC Occasional Paper. No. 38, ICES CM 2006/ACFM:16. Rome, FAO/Copenhagen, ICES. 2006. 352p., 217-241. ; https://purews.inbo.be/ws/portalfiles/portal/6394592/BE_WG_eel_2006_country_report_final.pdf (Chapter BE.G p.11) Compliance with international recommendationsY Link to sampling protocol documentation:

Standard operating procedures are available upon request. A brief description is available in the link above.
Sampling implementation
Recording of refusal rate: NA
Monitoring of sampling progress within the sampling year: Y Numbers are regularly forwarded during the fishing season.
Data capture
Means of data capture: Based on a constant year-to-year sampling effort, a non-selective cone-trap pool retaining eels in a fish pass build in the Belgian Meuse river at Lixhe is scientifically and homogeneously monitored since 1992 to assessing the abundance of the ascending young yellow eels from the Dutch Meuse. Scientific data processing make it possible to establish the trend of incoming stocks of wild eels in the Belgian Meuse. Wallonia also include electrofishing and mobile telemetry in seven rivers (Mosbeux, Hoegne, Wayai, Winamplanche, Berwinne, Gueule and Oxhe) belonging to the Meuse river basin for recruited yellow eels after stocking. Data capture documentation: https://purews.inbo.be/ws/portalfiles/portal/29133073/CRs_2020.pdf https://purews.inbo.be/ws/portalfiles/portal/15669538/WGEEL_CRs_2018.pdf up-to-date results are available via: https://shiny.sk8.inrae.fr/app/wgeel-wgeel-shiny-dv Quality checks documentation: Y Quality checks are conducted upon processing at the institute, and before entry into the international ICES database. Several R scripts are used for the data quality checks. A shiny app is used for correct data integration into the ICES database.
Data storage
National database: N Data is mainly stored in excel sheets on a server at ANB. Progress will be made towards including recruitment data into the VIS database. International database: Y ICES-WGEEL Quality checks and data validation documentation: https://purews.inbo.be/ws/portalfiles/portal/29133073/CRs_2020.pdf
Sample storage
Storage description: NA The catch is after processing released to the environment.
Data processing : Recruitment data are processed in R scripts available at the institute and on an international level via the WGEEL working group.
Evaluation of data accuracy (bias and precision): Y The data are checked on outliers and compared with previous years.
Editing and imputation methods: Y

All editing is documented and traceable. Corrected data are also reuploaded to the international ICES database. R scripts are available to relevant teams at INBO.

Quality document associated to a dataset: N

Validation of the final dataset:

Before data are submitted to an end user (e.g ICES WGEEL), the data are reviewed and checked on errors.

Sampling scheme identifier: Fla_Y

MS : BEL

Region : North Sea and Eastern Arctic

Sampling scheme identifier :
Fla-Y

Sampling scheme type: Diadromous (scientific)

Observation type: SciObs water body

Time period of validity : 2025-2027

Yellow eel abundance and silver eel escapement

Monitoring by INBO for Flanders monitoring network (for the WFD) that encompasses a total of 450 sampling points, including 385 locations in the Scheldt and 65 in the Meuse river basins. These points go through a monitoring cycle of 6 years resulting in on average 65 and 11 locations sampled respectively in Scheldt and Meuse EMU, on a yearly basis. The actual number of sampled areas varies yearly, with fluctuations in numbers depending on for example personnel availability, site reachability, and eel catchment variability. This data is supplemented with voluntary or project based additional data collection. A combination of electrical and fyke net fishing is used to estimate yellow eel abundance. Silver eel escapement is calculated and modelled (Dekker et al., 2008) based on electrical caught yellow eel.

Additionally, a fish monitoring network by INBO has been put in place since 2009 to monitor fish stock in the Scheldt estuary using paired fyke nets. Since 2012 onwards, the fish community from the Scheldt estuary is also monitored through fishing with a mid-water beam trawl from an anchored boat, minimum 2 times a year (Spring, Fall) at four sites. Possibly, a 3th monitoring campaign over summer will be maintained.

Description of the population

Population targeted:

Yellow Eel (*Anguilla anguilla*) in Scheldt and Meuse EMU

Population sampled:

Yellow Eel (*Anguilla anguilla*) in Scheldt and Meuse EMU

Stratification: Y, sample locations for the WFD go through a 6 year cycle with 450 sampling points sampled in total.

Sampling design and protocols

Sampling design description:

Sampling for Flanders monitoring programme for the Water Framework Directive is executed with electric gear and fyke nets (Van Thuyne et al., 2022).

Additionally, campaigns monitoring the Scheldt river using paired-fykenets take place in spring, summer and autumn since 2009 at six locations (Breine et al., 2021a). Besides, each year since 2012, fish in the Scheldt estuary is also monitored with a mid-water beam trawl from an anchored boat, two (possibly three) times a year in Spring, (Summer) and Fall at four sites: Doel, Antwerpen, Steendorp and Branst (Breine et al., 2021b). The data is supplied by Flanders' monitoring programs carried out by INBO's MHAF team ("Monitoring en Herstel Aquatische Fauna").

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

Regional coordination: N

Link to sampling design documentation:

Van Thuyne, G., Galle, L., Maes, Y., De Bruyn, A., Lambeens I., Terrie, T. (2022).

Visbestandopnames in Vlaanderen in het kader van het Referentiemeetnet-Bemonsteringsresultaten 2020. Rapporten van het Instituut voor Natuur- en Bosonderzoek jaar (33). Instituut voor Natuur- en Bosonderzoek, Brussel. DOI: doi.org/10.21436/inbor.87456461

Breine J., De Bruyn A., Galle L., Lambeens I., Maes Y., Terrie T., Van Thuyne G. & W. Mertens (2021a). Opvolgen van het visbestand in het Zeeschelde-estuarium. Viscampagnes met schietfuisen 2020. Rapporten van het Instituut voor Natuur- en Bosonderzoek 2021 (3). Instituut voor Natuur- en Bosonderzoek, Brussel. doi.org/10.21436/inbor.29281830

Breine J., De Bruyn A., Galle L., Lambeens I., Maes Y., Terrie T. and Van Thuyne G (2021b). Monitoring van de visgemeenschap in het Zeeschelde-estuarium. Ankerkuilcampagnes 2020. Rapporten van het Instituut voor Natuur- en Bosonderzoek 2021 (1). Instituut voor Natuur- en Bosonderzoek, Brussel. doi.org/10.21436/inbor.29272200

Compliance with international recommendations

Y

Link to sampling protocol documentation:

Standard operating procedures are available in Dutch on request. A brief description is available in the links above.

Sampling implementation

Recording of refusal rate: NA

Monitoring of sampling progress within the sampling year: Y

A sampling plan is followed and if necessary adjusted throughout the year

Data capture

Means of data capture:

Length and weight is collected for all species caught including, diadromous species, monitored by INBO. Data collected with electrical gear is expressed in numbers/biomass per 100m. Data

from each survey per site is standardized as number of fish per fyke per day. The data collected with an anchored boat are expressed as number of fish per hour.

Belgium is required to report every three years in the framework of the EU Eel Regulation (Council Regulation (EC) No 1100/2007 of 18 September 2007 establishing measures for the recovery of the stock of European eel) on the effective migration of silver eel from the eel management units (EMUs) of Meuse and Scheldt (Belpaire et al 2021; Desender et al., 2024). In Flanders the quantification of silver eel migration relies on model calculations (Dekker et al., 2008) based on yellow eel abundance caught with electric gear.

For this purpose, the total number of yellow eels per stratum River Type * River Basin is calculated based on the estimated density of yellow eel (using electrofishing data) and the surface area of watercourses in the eel management plan, including corrections for various factors of natural and anthropogenic mortality.

In Wallonia silver eel escapement has been re-evaluated in 2013.

Data capture documentation:

Dekker W., Deerenberg C.M., Jansen H.M. (2008). Duurzaam beheer van de aal in Nederland: onderbouwing van een beheersplan. IMARES (Rapport / Imares C041/08). <https://edepot.wur.nl/135215>

Belpaire C., Verschelde P., Maes Y., Van Thuyne G., Van Wichelen J., Buysse D., Breine J., Desender M., Verreycken H. (2021). Berekening van het ontsnappingspercentage van zilverpaling ten behoeve van de 2021 rapportage voor de Palingverordening. Rapporten van het Instituut voor Natuur- en Bosonderzoek 2021 (49). Instituut voor Natuur- en Bosonderzoek, Brussel. DOI: doi.org/10.21436/inbor.54212349

Desender Marieke , Pieter Verschelde, Gerlinde Van Thuyne, Yves Maes, Jeroen Van Wichelen, David Buysse, Pieterjan Verhelst, Hugo Verreycken, Claude Belpaire (2024) Berekening van het ontsnappingspercentage van zilverpaling ten behoeve van de 2024 rapportage voor de palingverordening. Rapporten van het Instituut voor Natuur- en Bosonderzoek 2024.

Quality checks documentation: Y

Quality checks are conducted upon processing at the institute, and before entry into the national VIS database. Several R scripts are used for the data quality checks.

Data storage

National database: Y

Data on yellow/silver eel are available in the INBO VIS database: [Vis - Home](#)

The data are not publicly available, users of the data need to send a request to INBO.

International database: Y

ICES-WGEEL
Quality checks and data validation documentation: https://purews.inbo.be/ws/portalfiles/portal/29133073/CRs_2020.pdf doi.org/10.21436/inbor.54212349
Sample storage Samples of collected yellow eel are stored, long term, in the INBO fish tissue Collection. Information about this collection will be made available to the public. Data regarding sample collection and freezer storage are kept in an INBO contaminant database, where also results of pollutant analysis are available. This access database is not publicly available at the moment and will be upgraded to SQL and connected to the INBO VIS database.
Data processing : Data are processed in R scripts available at the institute.
Evaluation of data accuracy (bias and precision): Y The data are checked on outliers and compared with previous years.
Editing and imputation methods: Y All editing is documented and traceable. Github repository and R scripts are available to relevant teams at INBO
Quality document associated to a dataset: N Validation of the final dataset: Before data are submitted to an end user (e.g ICES WGEEL), the data are reviewed and checked on errors.

Related to Table 2.4 [and Text Box 2.4] (biological specific data collection/diadromous data collection/recreational fisheries data collection/commercial fisheries data collection/stomach sampling)

Sampling Scheme identifier: SciObsOnShore*recreational

MS : BEL
Region : North Sea and Eastern Arctic
Sampling scheme identifier : SciObsOnShore*recreational (on site surveys)
Sampling scheme type: recreational (on site surveys)
Observation type: SciObsOnShore,
Time period of validity : 2025-2027

Short description (max 100 words): The sampling scheme aims at to check the relative contribution of the Belgian recreational catches of European sea bass (<i>Dicentrarchus labrax</i>), cod (<i>Gadus morhua</i>), eel (<i>Anguilla anguilla</i>) and pollack (<i>Pollachius virens</i>) in the total national catches (recreational and commercial) of these species with regards to possible thresholds. The sampling scheme applies to marine recreational fisheries, with the focus on the Belgian continental shelf RWP 2025-2027 Participation in RWP NANSEA 2025-2027 and in RWP Regional Work Plan on data collection in the fisheries and aquaculture sectors 2025-2027.
Description of the population
Population targeted: The target population is the catches of all resident fishers fishing in the Belgian water bodies. PSU = catches per fishermen per year Population sampled: Average 2000 recreational fishermen were identified during a questionnaire dd 2018. In 2020, 259 of these recreational fishermen are sampled through a voluntary corporation to fill in logbooks. Stratification: NA
Sampling design and protocols
Sampling design description: Y Sampling design is described in BIN-Recreatieve-Zeevisserij-2022-2017-2021-1.pdf For the completion of the logbook, a separate protocol is available (in Dutch): Logboek_Inleiding.pdf https://www.recreatievezevisserij.be/Portals/0/Bestanden/Logboek_Inleiding.pdf The logbook can be filled in online (through the website), through a hardcopy (see example below) or from 1st of January 2022 onwards by using an recreational fisheries app.

LOGBOEK

RECREatieve ZEEVISSERIJ

identificatienummer

datum dd-mm-jj

VISTECHNIËK (aanvinken)

HENGELLEN

☐ met kunstas
☐ met levend aas

☐ boothengelen

☐ focus op zeebaars/kabeljauw
☐ focus andere soorten

☐ hengelen vanaf strand of golfbreker
☐ hengelen vanaf pier, staketwal of stekdam

ANDERE

☐ boot met sleepnet
☐ kruilen
☐ paardvisser

☐ passieve strandvisserij - type

aantal

VISLOCATIE (aanvinken meerdere opties mogelijk)

☐ kust
☐ 0 tot 3 nautische mijl
☐ 3 tot 6 nautische mijl
☐ 6 tot 12 nautische mijl
☐ voorbij 12 nm
☐ scheepswaak
☐ scheide-estuarium

indien buitenland, welk land?

DUUR VISACTIVITEIT (werkelijke duur visactiviteit, zonder pauze)

VANGSTEN (enkel invullen wat voor u van toepassing is)

lengtes (cm)	n° 1	n° 2	n° 3	n° 4	n° 5	n° 6	n° 7	n° 8	n° 9	n° 10
KABELJAUW	houden									
MOEKE	teruggooi									
ZEEBAARS	houden									
BAR	teruggooi									

	BOET FLET	GOET BASSALE	MAISEL HACKEREAU	SCHAB LIBANEE	PLADIS PLE	STEENMOEK TACAUD
aantal stuks						
houden						
teruggooi - ondermaat						
teruggooi - bovenmaat						
totaal gewicht (kg)						
houden		kg	kg	kg	kg	kg

	TARBOT TURBOT	TONG SOLE	WITTING MERLAN	GARNAAL CREVETTE	andere	andere
aantal stuks						
houden				na		
teruggooi - ondermaat				na		
teruggooi - bovenmaat				na		
totaal gewicht (kg)						
houden		kg	kg	kg	kg	kg

Eventuele opmerkingen kunnen op de ommezijde worden vermeld.

www.recreatievezeeverij.be

Is the sampling design compliant with the 4S principle?

NA

Regional coordination:

N

Link to sampling design documentation:

[BIN-Recreatieve-Zeevisserij-2022-2017-2021-1.pdf](#) Compliance with international recommendations

Y

Link to sampling protocol documentation: [BIN-Recreatieve-Zeevisserij-2022-2017-2021-1.pdf](#)

Protocol follows international recommendations:

Y

Sampling implementation

Recording of refusal rate: NA Monitoring of sampling progress within the sampling year: NA
Data capture
Means of data capture: Data are collected through a survey which consists of two parts: ▪ the estimation of the total population of recreational sea fishermen or recreational fishing effort and ▪ the estimation of catches for a sample of recreational fishermen. An online omnibus survey was sent in 2017 to a representative sample of 200.000 Belgian inhabitants, inquiring about their recreational fishing activity in the Belgian part of the North Sea in the past 12 months. Follow-up questions, when a positive response was received, allows to estimate the total population of Belgian fishermen in function of the used fishing technique and avidity classes. An update of the survey is planned for 2025. A logbook, as well digital as in hardcopy, was designed, and logbook participants are recruited in the omnibus survey and were added to a pool of purposefully selected logbook participants. On-site surveys, among which an aerial survey, were done in 2017 to estimate total fishing effort. Logbook surveys are used to estimate the recreational catches of a stratified sample of recreational fishermen. Interviews in the 4 major Belgian marine areas and at the coast act as a control on the reported catches. Extrapolation to total catches take into account fishing technique and avidity. The exact protocol is developed and was published in the beginning of 2017, with an update in 2021. However, this is currently only available in Dutch. (see BIN-Recreatieve-Zeevisserij-2022-2017-2021-1.pdf) A schematic overview of the current protocol is given in figure 1.

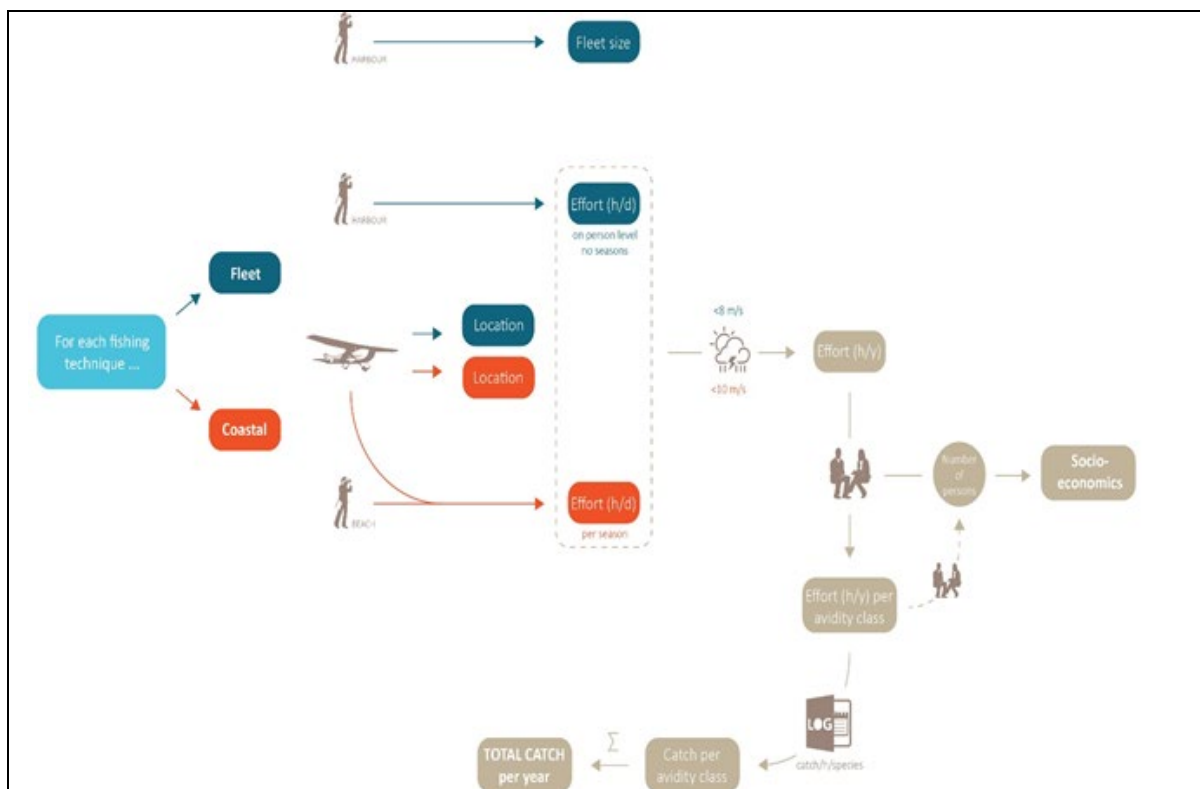


Figure 1: schematic overview of the protocol for collecting data on recreational fisheries and estimate the relative shares of catches of recreational fisheries.

Although no prior studies regarding the total Belgian recreational catch (including all species) have been performed before 2017, it was expected that only for sea bass a significant share of the total Belgian catch can be attributed to recreational fishermen. Although cod is a target species for recreational fisheries, the volume of recreational catch is rather low compared to the commercial landings. The recreational catch of pollack and elasmobranchen is insignificant. Salmon is not present in the Belgian recreational fisheries.

Data capture documentation:

[Hoe data bijhouden - Recreatieve Zeevisserij](#) Quality checks documentation:

N

Data storage

National database: Y

Link: [Mijn vangsten - Recreatieve Zeevisserij](#)

The website has a protected part which is only accessible for ILVO and where login and password is needed. The data uploaded by an individual recreational fisher, is not visible for another individual. The individual has only access to a protected part where only his data can be consulted, access is by individual login and password.

International database: NA
Quality checks and data validation documentation: Through the processing of the data, various quality checks can and will be implemented. These quality checks will be performed at the level of raw data, to check for data input errors and outliers. The checks will also happen at later stages, where calculations can validate the data and the out coming results will also be checked.
Sample storage
Sample storage is not applicable in this context. Fish caught by the recreational fisheries is either taken home, either thrown back as soon as possible.
Data processing
Evaluation of data accuracy (bias and precision): N.
Editing and imputation methods: N Documentation in Dutch.
Quality document associated to a dataset: N
Validation of the final dataset: R-scripts are developed to validate the quality of the data

Sampling Scheme identifier: SelfAtSea*recreational

MS : BEL
Region : North Sea and Eastern Arctic
Sampling scheme identifier : SelfAtSea*recreational (on site surveys)
Sampling scheme type: recreational (on site surveys)
Observation type: SelfAtSea
Time period of validity : 2025-2027
Short description (max 100 words):

The sampling scheme aims at to check the relative contribution of the Belgian recreational catches of European sea bass (*Dicentrarchus labrax*), cod (*Gadus morhua*), eel (*Anguilla anguilla*) and pollack (*Pollachius virens*) in the total national catches (recreational and commercial) of these species with regards to possible thresholds.

The sampling scheme applies to marine recreational fisheries, with the focus on the Belgian continental shelf

RWP 2025-2027

Participation in RWP NANSEA 2025-2027 and in RWP Regional Work Plan on data collection in the fisheries and aquaculture sectors 2025-2027.

Description of the population

Population targeted:

The target population is the catches of all resident fishers fishing in the Belgian water bodies. PSU = catches per fishermen per year

Population sampled:

Average 2000 recreational fishermen were identified during a questionnaire dd 2018. In 2020, 259 of these recreational fishermen are sampled through a voluntary corporation to fill in logbooks.

Stratification: NA

Sampling design and protocols

Sampling design description: Y

Sampling design is described in [BIN-Recreatieve-Zeevisserij-2022-2017-2021-1.pdf](#)

For the completion of the logbook, a separate protocol is available (in Dutch):

https://www.recreatievezevisserij.be/Portals/0/Bestanden/Logboek_Inleiding.pdf.

The logbook can be filled in online (through the website), through a hardcopy (see example below) or from 1st of January 2022 onwards by using an recreational fisheries app.

LOGBOEK

RECREatieve ZEEVISSERIJ



identificatienummer

datum dd-mm-jj

VISTECHNIËK (aanvinken)

- HINGELEN** ☐ met kunstas ☐ met levend aas
- ☐ boothengelen
- ☐ focus op zeebaars/kabeljauw
- ☐ focus andere soorten
- ☐ hengel vanaf strand of golfbreker
- ☐ hengel vanaf pier, staketsel of strekdam

ANDERE

- ☐ boot met sleepnet ☐ kruien ☐ paardvisser
- ☐ passieve strandvisserij - type
- aantal

VISLOCATIE (aanvinken meerdere opties mogelijk)

- ☐ kust
- ☐ 0 tot 3 nautische mijl
- ☐ 3 tot 6 nautische mijl
- ☐ 6 tot 12 nautische mijl
- ☐ voorbij 12 nm
- ☐ scheepswrak
- ☐ scheide-estuarium

indien buitenland, welk land?

DUUR VISACTIVITEIT (werkelijke duur visactiviteit, zonder pauze)

VANGSTEN (enkel invullen wat voor u van toepassing is)

lengtes (cm)	n° 1	n° 2	n° 3	n° 4	n° 5	n° 6	n° 7	n° 8	n° 9	n° 10
KABELJAUW	houden									
ROOIJLE	teruggooi									
ZEEBAARS	houden									
BAR	teruggooi									

	BOIT FLET	GOBT BAARSJE	MAISEL HACKEREAL	SCHAB LIBANDE	PLADIS PLIE	STEENBOLK TACAUD
aantal stuks						
houden						
teruggooi - ondermaat						
teruggooi - bovenmaat						
totaal gewicht (kg)						
houden						

	TARBOT TURBOT	TONG SOLE	WITTING HESLAN	GARNAAL CREVETTE	andere	andere
aantal stuks						
houden						
teruggooi - ondermaat						
teruggooi - bovenmaat						
totaal gewicht (kg)						
houden						

Bevattende opmerkingen kunnen op de ommezijde worden vermeld.

www.recreatievezevisserij.be

Is the sampling design compliant with the 4S principle?

NA

Regional coordination:

N

Link to sampling design documentation:

[BIN-Recreatieve-Zeevisserij-2022-2017-2021-1.pdf](#)

Compliance with international recommendations

Y

Link to sampling protocol documentation:

BIN-Recreatieve-Zeevisserij-2022-2017-2021-1.pdf
Protocol follows international recommendations: Y
Sampling implementation
Recording of refusal rate: NA Monitoring of sampling progress within the sampling year: NA
Data capture
Means of data capture: Data are collected through a survey which consists of two parts: ▪ the estimation of the total population of recreational sea fishermen or recreational fishing effort and ▪ the estimation of catches for a sample of recreational fishermen. An online omnibus survey was sent in 2017 to a representative sample of 200.000 Belgian inhabitants, inquiring about their recreational fishing activity in the Belgian part of the North Sea in the past 12 months. Follow-up questions, when a positive response was received, allows to estimate the total population of Belgian fishermen in function of the used fishing technique and avidity classes. An update of the survey is planned for 2025. A logbook, as well digital as in hardcopy, was designed, and logbook participants are recruited in the omnibus survey and were added to a pool of purposefully selected logbook participants. On-site surveys, among which an aerial survey, were done in 2017 to estimate total fishing effort. Logbook surveys are used to estimate the recreational catches of a stratified sample of recreational fishermen. Interviews in the 4 major Belgian marine areas and at the coast act as a control on the reported catches. Extrapolation to total catches take into account fishing technique and avidity. The exact protocol is developed and was published in the beginning of 2017 and updated in 2021. However, this is currently only available in Dutch. (see BIN-Recreatieve-Zeevisserij-2022-2017-2021-1.pdf) A schematic overview of the current protocol is given in figure 1.

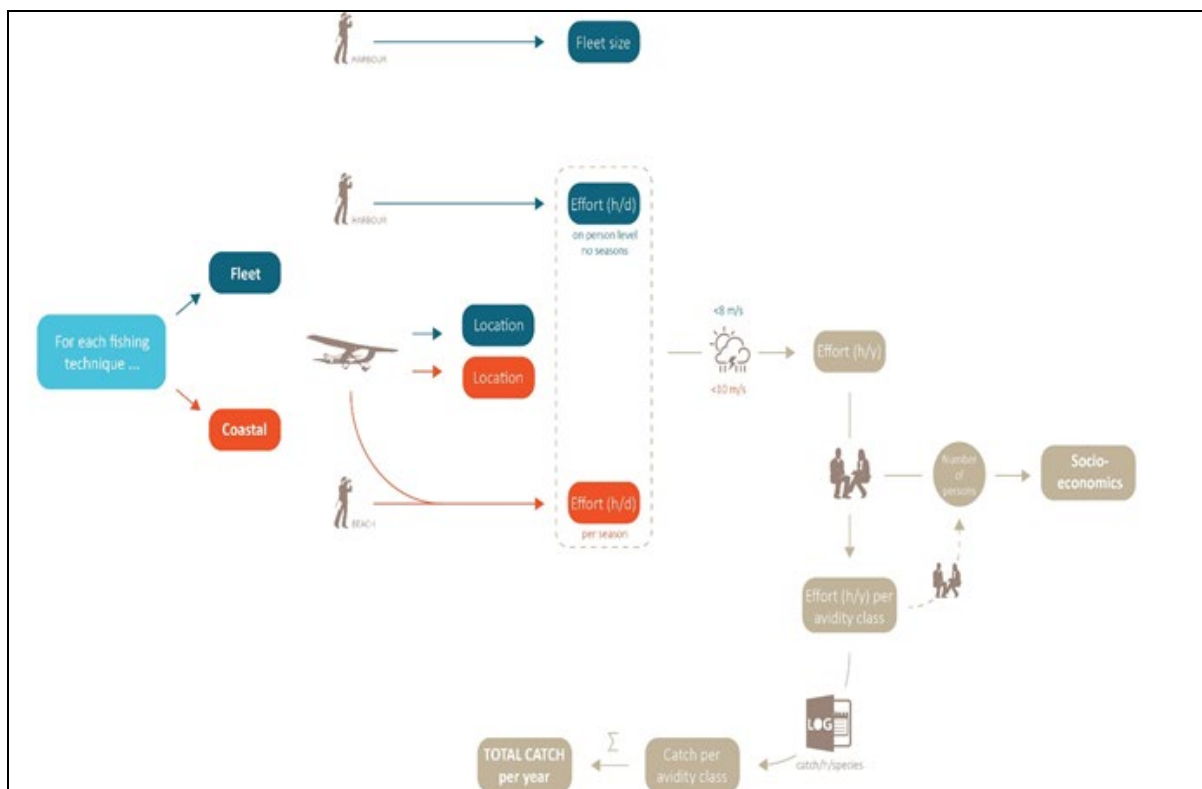


Figure 1: schematic overview of the protocol for collecting data on recreational fisheries and estimate the relative shares of catches of recreational fisheries.

Although no prior studies regarding the total Belgian recreational catch (including all species) have been performed before 2017, it was expected that only for sea bass a significant share of the total Belgian catch can be attributed to recreational fishermen. Although cod is a target species for recreational fisheries, the volume of recreational catch is rather low compared to the commercial landings. The recreational catch of pollack and elasmobranchen is insignificant. Salmon is not present in the Belgian recreational fisheries.

Data capture documentation:

Hoe data bijhouden - Recreatieve Zeevisserij

Quality checks documentation:

N

Data storage

National database: Y

Link: Mijn [vangsten - Recreatieve Zeevisserij](#)

The website has a protected part which is only accessible for ILVO and where login and password is needed. The data uploaded by an individual recreational fisher, is not visible for another individual.

The individual has only access to a protected part where only his data can be consulted, access is by individual login and password.

International database:

NA

Quality checks and data validation documentation:

Through the processing of the data, various quality checks can and will be implemented. These quality checks will be performed at the level of raw data, to check for data input errors and outliers. The checks will also happen at later stages, where calculations can validate the data and the out coming results will also be checked.

Sample storage

Sample storage is not applicable in this context. Fish caught by the recreational fisheries is either taken home, either thrown back as soon as possible.

Data processing

Evaluation of data accuracy (bias and precision):

N.

Editing and imputation methods:

N

Documentation in Dutch.

Quality document associated to a dataset:

N

Validation of the final dataset:

R-scripts are developed to validate the quality of the data

Sampling Scheme identifier: SelfOnshore*recreational

MS : BEL
Region : North Sea and Eastern Arctic
Sampling scheme identifier : SelfOnshore*recreational (on site surveys)
Sampling scheme type: recreational (on site surveys)
Observation type: SelfOnshore

Time period of validity : 2025-2027
Short description (max 100 words): The sampling scheme aims at to check the relative contribution of the Belgian recreational catches of European sea bass (<i>Dicentrarchus labrax</i>), cod (<i>Gadus morhua</i>), eel (<i>Anguilla anguilla</i>) and pollack (<i>Pollachius virens</i>) in the total national catches (recreational and commercial) of these species with regards to possible thresholds. The sampling scheme applies to marine recreational fisheries, with the focus on the Belgian continental shelf RWP 2025-2027 Participation in RWP NANSEA 2025-2027 and in RWP Regional Work Plan on data collection in the fisheries and aquaculture sectors 2025-2027.
Description of the population
Population targeted: The target population is the catches of all resident fishers fishing in the Belgian water bodies. PSU = catches per fishermen per year Population sampled: Average 2000 recreational fishermen were identified during a questionnaire dd 2018. In 2020, 259 of these recreational fishermen are sampled through a voluntary corporation to fill in logbooks. Stratification: NA
Sampling design and protocols
Sampling design description: Y Sampling design is described in BIN-Recreatieve-Zeevisserij-2022-2017-2021-1.pdf For the completion of the logbook, a separate protocol is available (in Dutch): Logboek_Inleiding.pdf The logbook can be filled in online (through the website), through a hardcopy (see example below) or from 1st of January 2022 onwards by using an recreational fisheries app.

LOGBOEK

RECREATIEVE ZEEVISSERIJ



identificatienummer

datum dd-mm-jj

VISTECHNIËK (aanvinken)

HENGELEN ☐ met kunstas ☐ met levend aas
☐ boothengelen
☐ focus op zeebaars/kabeljauw
☐ focus andere soorten
☐ hengel vanaf strand of golfbreker
☐ hengel vanaf pier, staket of stekdam

ANDERE
☐ boot met sleepnet ☐ kruisen ☐ paardvisser
☐ passieve strandvisserij - type
 aantal

VISLOCATIE (aanvinken meerdere opties mogelijk)

☐ kust
☐ 0 tot 3 nautische mijl
☐ 3 tot 6 nautische mijl
☐ 6 tot 12 nautische mijl
☐ voorbij 12 nm
☐ scheepswrak
☐ scheide-estuarium

indien buitenland, welk land?

DUUR VISACTIVITEIT (werkelijke duur visactiviteit, zonder pauze)

VANGSTEN (enkel invullen wat voor u van toepassing is)

lengtes (cm)	n° 1	n° 2	n° 3	n° 4	n° 5	n° 6	n° 7	n° 8	n° 9	n° 10
KABELJAUW	houden									
MOEKE	teruggooi									
ZEEBAARS	houden									
BAR	teruggooi									

	BOET FLET	GOET BARKLE	MAISEL HACKEREAL	SCHAB LIBANSE	PLADIS PLIE	STEENBLOK TACAUD
aantal stuks						
houden						
teruggooi - ondermaat						
teruggooi - bovenmaat						
totaal gewicht (kg)						
houden	14	14	14	14	14	14

	TARBOT TURBOT	TONG SOLE	WITTING HESLAN	GARNAAL CREVETTE	andere	andere
aantal stuks						
houden				na		
teruggooi - ondermaat				na		
teruggooi - bovenmaat				na		
totaal gewicht (kg)						
houden	14	14	14	14	14	14

Bevattende opmerkingen kunnen op de ommezijde worden vermeld.

www.recreatievezevisserij.be

Is the sampling design compliant with the 4S principle?

NA

Regional coordination:

N

Link to sampling design documentation:

[BIN-Recreatieve-Zeevisserij-2022-2017-2021-1.pdf](#)

Compliance with international recommendations

Y

Link to sampling protocol documentation: [BIN-Recreatieve-Zeevisserij-2022-2017-2021-1.pdf](#)

Protocol follows international recommendations:

Y

Sampling implementation
Recording of refusal rate: NA Monitoring of sampling progress within the sampling year: NA
Data capture
Means of data capture: Data are collected through a survey which consists of two parts: ▪ the estimation of the total population of recreational sea fishermen or recreational fishing effort and ▪ the estimation of catches for a sample of recreational fishermen. An online omnibus survey was sent in 2017 to a representative sample of 200.000 Belgian inhabitants, inquiring about their recreational fishing activity in the Belgian part of the North Sea in the past 12 months. Follow-up questions, when a positive response was received, allows to estimate the total population of Belgian fishermen in function of the used fishing technique and avidity classes. An update of the survey is planned for 2025. A logbook, as well digital as in hardcopy, was designed, and logbook participants are recruited in the omnibus survey and were added to a pool of purposefully selected logbook participants. On-site surveys, among which an aerial survey, were done in 2017 to estimate total fishing effort. Logbook surveys are used to estimate the recreational catches of a stratified sample of recreational fishermen. Interviews in the 4 major Belgian marine areas and at the coast act as a control on the reported catches. Extrapolation to total catches take into account fishing technique and avidity. The exact protocol is developed and was published in the beginning of 2017, and updated in 2021. However, this is currently only available in Dutch. (see BIN-Recreatieve-Zeevisserij-2022-2017-2021-1.pdf) A schematic overview of the current protocol is given in figure 1.

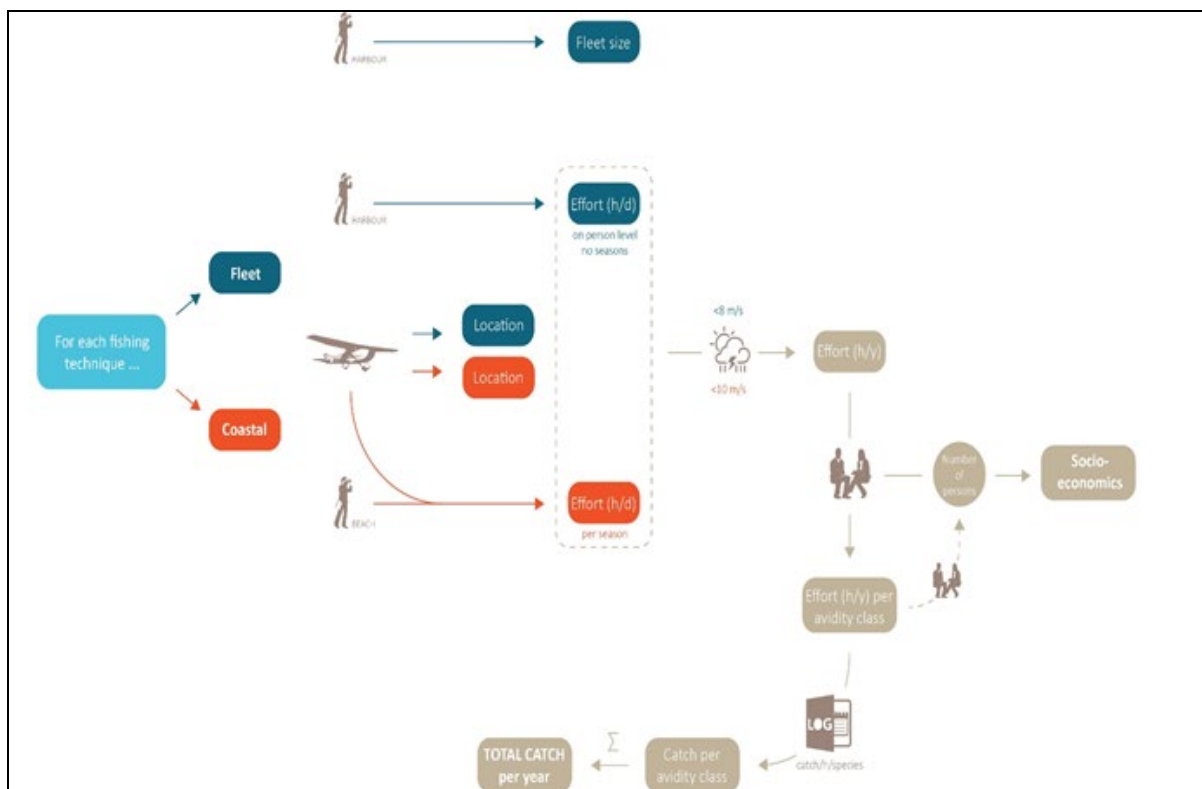


Figure 1: schematic overview of the protocol for collecting data on recreational fisheries and estimate the relative shares of catches of recreational fisheries.

Although no prior studies regarding the total Belgian recreational catch (including all species) have been performed before 2017, it was expected that only for sea bass a significant share of the total Belgian catch can be attributed to recreational fishermen. Although cod is a target species for recreational fisheries, the volume of recreational catch is rather low compared to the commercial landings. The recreational catch of pollack and elasmobranchen is insignificant. Salmon is not present in the Belgian recreational fisheries.

Data capture documentation:

Hoe data bijhouden - Recreatieve Zeevisserij

Quality checks documentation:

N

Data storage

National database: Y

Link: Mijn [vangsten - Recreatieve Zeevisserij](#)

The website has a protected part which is only accessible for ILVO and where login and password is needed. The data uploaded by an individual recreational fisher, is not visible for another individual.

The individual has only access to a protected part where only his data can be consulted, access is by individual login and password.

International database:

NA

Quality checks and data validation documentation:

Through the processing of the data, various quality checks can and will be implemented. These quality checks will be performed at the level of raw data, to check for data input errors and outliers. The checks will also happen at later stages, where calculations can validate the data and the out coming results will also be checked.

Sample storage

Sample storage is not applicable in this context. Fish caught by the recreational fisheries is either taken home, either thrown back as soon as possible.

Data processing

Evaluation of data accuracy (bias and precision):

N.

Editing and imputation methods:

N

Documentation in Dutch.

Quality document associated to a dataset:

N

Validation of the final dataset:

R-scripts are developed to validate the quality of the data

Related to Table 2.5 [and Text Box 2.5] (biological specific data collection/diadromous data collection/recreational fisheries data collection/commercial fisheries data collection/stomach sampling)

Sampling scheme identifier: 1 SciObsAtSea*Commercial fishing trip*Selected species/stocks

MS : BEL
Region: North Sea and Eastern Arctic
Sampling scheme identifier: SciObsAtSea*Commercial fishing trip

Sampling scheme type: Commercial fishing trip
Observation type: SciObsAtSea
Time period of validity: 2025-2027
Short description (max 100 words): The SciObsAtSea*Commercial fishing trip sampling scheme is aiming at collecting information related to catch quantities, length frequency distributions and biological parameters of selected commercial species. The data collection is performed by ILVO observers onboard of commercial beam trawl vessels active in areas 4, 7d, 7e-h, 7a and 8ab. There are 2 sampling frames within the sampling scheme SciObsAtSea*Commercial fishing trip: beam trawlers with a maximum power of 221 kW targeting demersal species (TBB_DEF_<=221kW) and beam trawlers with a capacity of more than 221 kW targeting demersal species (TBB_DEF_>221kW). The obtained information is mainly used for stock assessment purposes. RWP 2025-2027 Participation in RWP NANSEA 2025-2027 and in RWP Regional Work Plan on data collection in the fisheries and aquaculture sectors 2025-2027.
Description of the population
Population targeted: The PSU for the TBB_DEF_<=221kW sampling frame is vessel*trip. The population targeted = all vessel*trips in the TBB_DEF_<=221kW sampling frame. The PSU for the TBB_DEF_>221kW sampling frame is vessel*trip. The population targeted = all vessel*trips in the TBB_DEF_>221kW sampling frame. Population sampled: Vessels that can accommodate observers onboard, or are logistically suited to have an observer onboard, are included in the vessel list used for sampling. The remaining vessels are excluded from this list. This applies to both the TBB_DEF_<=221kW sampling frame and the TBB_DEF_>221kW sampling frame. Stratification: The population is divided into strata based on geographic areas. The distribution of the population into strata is determined by the fishing effort exerted by the fleet in the previous year within each area.
Sampling design and protocols
Sampling design description: Catch information (covering all catch fractions) is obtained through on-board observation or 'at sea sampling'. The sampling effort targets for one year are set at 4 euro cutter trips for the TBB_DEF_<=221kW sampling frame and 31 trips for the TBB_DEF_>221kW sampling frame. These sampling efforts are proportional to the fleet effort from the last available year. In both sampling frames, the primary sampling unit (PSU) is vessel*trip (as a proxy for trip) and the haul within each trip is considered as the secondary sampling unit (SSU). The PSU selection process can be defined as a Non-Probabilistic Convenience Sampling (including Quota sampling). For the SSU selection, Systematic Sampling Without Replacement, is used, where every other haul is sampled by the observer.

During the sampling process, the crew sorts out the marketable fish from the conveyor belt and stores them by species for the observer to sample. Meanwhile, the observer is sampling the other catch fraction by species. For each sampled haul, the observer determines the total weight per species (for all commercial species) per catch category and measures the length of species or stocks referred to in table 2.1 (column 'Covered by a commercial sampling scheme for length'). In cases where a species is extremely abundant, a smaller representative subsample (tertiary sampling unit (TSU)) is measured.

During each trip, a minimum of 3 fish per cm-size class (except for *Scophthalmus rhombus* 1 fish per cm-size class and for *Raja brachyura* and *Raja clavata* 1 fish per 5 cm-size class) per species, per catch category, and per area are collected for the estimations of biological parameters in the ILVO lab (see table 2.2 for more details).

In addition to collecting data on commercial species, sea- going observers also monitor incidental catches of sensitive species aboard of beam trawlers (TBB_DEF_<=221kW and TBB_DEF_>221kW) as part of the SciObsAtSea programme. Like the sampling of commercial species, observers sample every other haul for ETP species (Endangered, Threatened and Protected species). During this process, the observer records the percentage of the sorting process that has been monitored, which is typically either 100% (both starboard and portside) or 50% (either starboard or portside) of the catch. This percentage is then used to calculate the overall observation effort. While overseeing the conveyor belt sorting process, the observer focuses on detecting sensitive species and notes the number of individuals found (without recording weight data). If any ETP species are still alive, they are promptly returned to the sea to improve their chances of survival. Additional information related to the list of sensitive species for which data is collected by ILVO is available in Text Box 4.2.

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

Y

Regional coordination:

N

Link to sampling design documentation:

Documentation can be found on the Belgian national DCF website <https://smartfisheries.be/data-collection/>

Design follows international recommendations:

Y

Link to sampling protocol documentation:

Documentation can be found on the Belgian national DCF website <https://smartfisheries.be/data-collection/>

Protocol follows international recommendations:

Y

Sampling implementation

Recording of refusal rate:

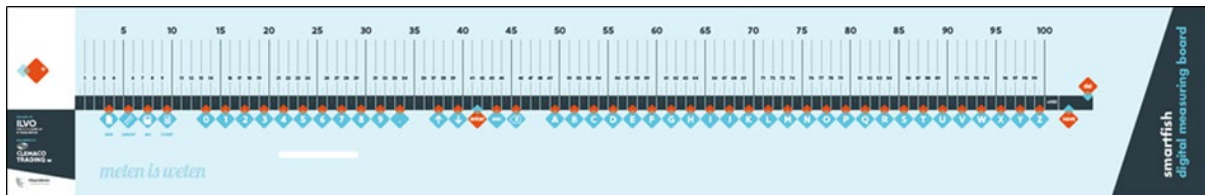
N, the SciObsAtSea sampling programme at ILVO is defined as Non-Probabilistic Convenience Sampling (including Quota sampling). Therefore, ILVO considers collecting non-responses and refusals on PSU (trip) level not relevant. However, the sea-going observers keep track of the vessels they contact within the sampling frame.

Monitoring of sampling progress within the sampling year:

Adjustments to the initial planning/sampling allocations are avoided. Follow-up of the sampling progress is covered during the weekly observer/scientist meetings. If, due to unforeseen circumstances the initial planning cannot be maintained, the scientist in charge decides whether a change to the original planning will be implemented.

Data capture**Means of data capture:**

- Length data is registered on electronic measuring boards (picture below; power supply via power bank, registers lengths using a linear magnetic sensor) coupled to rugged tablets with inhouse developed SmartFish software for easy connection to the SmartFish database.



- Weight data registered on calibrated scales (type Marelec D4/W10)
- Sex and maturity staging following international standards (SMSF scale (except for rays where the WKSEL3 scale is used)).
- Age readings using SmartDots software and the SmartLab platform
- SmartLab application: this in-house developed tool is used to follow up the analysis of samples, processed in the lab to determine biological parameters.
- SmartDots application: this in-house developed tool for age reading and quality control of age reading is endorsed by WGBIOP and used by the ICES community for exchanges and workshops on age reading. <https://www.ices.dk/data/tools/Pages/smartdots.aspx>

All tools and supporting software are developed by ILVO.

Data capture documentation:

- SmartFish: manual available upon request (W. Allegaert (2015, 2024 in prep), “ SmartFish manual”)
- Weight data: manual online available (<https://manualzz.com/doc/27548711/marelec-d4>)
- Maturity staging: [Report of the Workshop for Advancing Sexual Maturity Staging in Fish \(WKASMSF\) \(ices.dk\)](#)
- SmartLab and Smartdots: applications to record lab data and determine and manage age records [SmartDots \(ices.dk\)](#)

Quality checks documentation:

Y, the process of quality control is described in the national protocol which is available upon request: <https://smartfisheries.be/data-collection/>

Quality checks are performed at different levels:

While recording data:

- Pop-up messages are integrated into the SmartFish software to warn the user when the recorded individual weight data deviates from the expected based on general length-weight keys (LWK). This allows the user to correct the weight and helps to reduce outliers.
- When using SmartFish, the status of the trip must be changed from ‘raw’ to ‘validated’ in the SmartFish software, as it is linked with SmartLab, which requires a validated dataset. When changing the status of a trip in SmartFish, various checks are automatically performed on the

dataset. These checks include verifying whether the trip's end date is later than the start date and whether the subsample's weight is less than the sample's weight, among others. Detailed descriptions of these checks can be found in the SmartFish manual (W. Allegaert, 2015 and 2024 in prep.).

- Age reading: SmartLab software is used for sample and laboratory management. SmartDots software is used for age reading: images are taken from all otoliths and images are annotated using the SmartDots software, making quality assurance easier and faster. Age reading results are directly included into the SmartLab database, avoiding copying mistakes. After several quality checks, age data is synchronized with the SmartFish database. Following quality checks are performed: readers register the certainty of their reading (age quality (AQ) 1, 2 or 3). Only AQ1 data are synchronized with the final SmartFish database. All readings are performed by two readers (double reads of the otoliths). If ages match, the reading is registered as "approved" in SmartDots. Reference collections are used on a monthly basis as a tool to monitor possible deviation in age readings over time. Furthermore, a scientist makes stock-based age-length keys using R-scripts as final check before synchronization with the SmartFish database.
- Using Power BI: using graphs and tables to check species composition, sampling locations, duration and distance of trawls, outliers in length-weight-keys and age-length-keys, positions in otolith blocks, etc. A description of what is checked by Power Bi is available on demand (in Dutch).
- Using R-scripts: extra quality checks are performed. Scripts are available on demand.

Data storage

National database:

Data is stored in the national SmartFish database (SQL Server). User specific access rights are defined in the database, and it is not publicly accessible through a website. Laboratory otolith data is stored in the SmartLab database.

International database:

National data are uploaded in The Regional Database & Estimation System (RDBES), which is hosted by ICES. The database is accessible through this website: <https://rdbes.ices.dk/>

Quality checks and data validation documentation:

Belgium follows a well-documented protocol to ensure high quality data from sampled trips (documentation is stored at the ILVO-ICT intranet web portal). When seagoing observers return from a commercial fishing trip, the collected data are immediately transferred from their ruggedized tablet to the SmartFish database (Sync Trip). Metadata from the trip are added to the database, and all data are reviewed together with a second observer. Before the trip can be validated, an internal quality control is run within the database. Subsequently, scientists run an intensive quality control protocol, where the raw data undergo several consecutive checks (including outlier detection) using PowerBi. If no quality issues are found, the trip status is updated to 'consolidated'. If quality issues are detected, the observer is requested to review the raw data and to correct where needed before the status is changed to 'consolidated'. Only then can the data be used for analysis and raising. In the next step, a scientist runs an R-markdown script to produce a vessel report. This report is reviewed by the seagoing observer responsible for the specific trip, and once approved, it is sent to the vessel owner.

To track the data flow for each trip, the in-house developed tool 'Plan-it' is used. This tool, designed for project and time management, has been in continuous use since its implementation in 2016.

The figure below is a screen shot of the 'Plan-it' application that presents the interim status of each trip in a well-organized and clear overview for both observers and scientists. This procedure has been in place since 2017 and has proved to be very efficient.

Projects

Time-Entry

Timesheets

Follow-Up

Notifications

Karen

NDGP - COMMERCIAL SAMPLING - AT SEA

ODIS: NDGP 2023 (7159)

Workflow

Quick Filters: Only My Issues Recently Updated Only Open Tasks

Complete Sprint

To Do

121 NDGP24_S_BYDR08 AT SEA

117 NDGP24_S_NKSZ07 AT SEA

OBS: Sync Trip

OBS: Register data

120 NDGP24_S_CNVE09 AT SEA

OBS: Validate Trip

SCI: Quality control

111 NDGP24_S_CDDR07 AT SEA

SCI: Create vessel re...

113 NDGP24_S_BYDR07 AT SEA

OBS: Check vessel re...

119 NDGP24_S_CNVE08 AT SEA

115 NDGP24_S_CNVE06 AT SEA

116 NDGP24_S_CNVE07 AT SEA

Done

86 NDGP23_S_BYDR10 AT SEA

75 NDGP23_S_CNVE05 AT SEA

114 NDGP24_S_CNVE05 AT SEA

106 NDGP24_S_CNVE04 AT SEA

99 NDGP24_S_CNVE03 AT SEA

105 NDGP24_S_CDDR04 AT SEA

92 NDGP24_S_CNVE01 AT SEA

Sample storage

Storage description:

- Fish for which biological variables are to be determined are sometimes stored overnight in the refrigerator/freezers of ILVO ahead of analysis.
- After biological sampling, otoliths are stored in otolith containers and vertebrae are stored in the freezer before they enter the flow of age reading.
- After age reading, otoliths and vertebrae are stored in paper bags at ILVO's archive for an indefinite period.

Sample analysis:

Determination of biological parameters of target species:

- National protocol, internally available: "Beproevingprocedure VSL001 for biological parameters (version 4, 2023)"
- And "Werkvoorschrift WV001 VSL001" for maturity determination of flatfish based on [Report of the Workshop for Advancing Sexual Maturity Staging in Fish \(WKASMSF\) \(ices.dk\)](#)
- Age readings: are performed in ILVO's accredited ANIMALAB (ISO17025). National protocols are used "Beproevingprocedure OTL001 (version 10, 2024)" for otoliths and "Beproevingprocedure OTL003 (version 4, 2024)" for vertebrae.

Data processing

Evaluation of data accuracy (bias and precision):

Y

During and ahead of the data collection, care is taken to collect the data as accurately as possible:

- Sea going observers are trained and they follow an annual refresher on species determination in ILVO's yearly "Species Determination Workshop" (which is open for the public as well).
- WGBIOP assures consistency regarding the collection of biological parameters across member states and regularly organizes exchanges and workshops in which Belgium participates.
- Bias and precision of age reading will be re-evaluated by the end of 2024 for all species analyzed in Belgium.

Editing and imputation methods:

N

When outliers or mistakes are encountered during the quality check procedure, editing and imputation takes place. Corrections are then made directly in the SmartFish database.

Quality document associated to a dataset:

N

Validation of the final dataset:

National checks are performed prior to submission of data to ICES data calls in InterCatch and RDBES. Scripts used for raising observer data to fleet level consist of a thorough data check including outlier detections, verifying length-weight and age-length relationships, comparing the registered subsample weight from the haul with the calculated weight based on the length frequency distribution from the haul and the length-weight information from the trip, etc. Scripts are available on demand.

Sampling scheme identifier: 2 SelfAtSea*Commercial fishing trip*Selected species/stocks

MS : BEL
Region: North East Atlantic
Sampling scheme identifier: SelfAtSea*Commercial fishing trip
Sampling scheme type: Commercial fishing trip
Observation type: SelfAtSea
Time period of validity: 2025-2027
Short description (max 100 words): The SelfAtSea*Commercial fishing trip sampling scheme aims to collect data on the quantities of sole (<i>Solea solea</i>) in the catch (including both landings and discards) for areas 4, 7d, 7e-h, 7a and 8ab. Data is collected onboard of commercial beam trawl vessels with a capacity of more than 221kW targeting demersal species (TBB_DEF_>221kW), and the sampling is carried out by trained fishermen. Additionally, length-frequency data from the sampled trip is collected by scientists at the fish auction and biological data is collected at our lab facility. The information gathered through this self-sampling programme is primarily used for stock assessment purposes. RWP 2025-2027 Participation in RWP NANSEA 2025-2027 and in RWP Regional Work Plan on data collection in the fisheries and aquaculture sectors 2025-2027.
Description of the population
Population targeted: The PSU for SelfAtSea*Commercial fishing trip is vessel*trip. The population targeted = all vessel (TBB_DEF_>221kW) *trips in areas 4, 7d, 7e-h, 7a and 8ab. Population sampled: Only the crew members of the vessels that are willing to carry out the self-sampling protocol will deliver sampling information (voluntary). Stratification: The population is not stratified.
Sampling design and protocols
Sampling design description: The sampling targets for one year are set at 4 trips for the TBB_DEF_>221kW sampling frame (vessels active in areas 4, 7d, 7e-h, 7a and 8ab.). Since this is a voluntary programme, the timing of the data collection is dependent on the industry. Information on <i>Solea solea</i> is obtained through on-board observation by the fishing industry. All catch fractions are covered in the data collection process, as the crew is asked to record total catch weights of this species by haul and by catch fraction. When it comes to <u>sampling</u>, only the <u>discarded part of the catch</u> is sampled by the fishermen, who are asked to collect a representative discard sample (more details below). The <i>Solea solea</i> <u>landings</u> (all landing fractions) on the other hand are <u>sampled</u> by ILVO scientists through onshore observation in the fish auction/harbor.

The primary sampling unit (PSU) is vessel*trip (as a proxy for trip). The PSU selection can be defined as a Non-Probabilistic Convenience Sampling (including Quota sampling) since the self-sampling programme is a voluntary programme and therefore the sampling takes place when the opportunity arises.

The secondary sampling unit (SSU) for discards is a basket of 30 kg *Solea solea* discards (within a trip). The 30 kg discard sample is collected randomly during the trip and contains fish from at least 3 hauls spread out over the entire trip (beginning, middle and end part of the trip are covered). The discard sample is stored on ice, brought ashore by the crew and further analysed in the ILVO fish lab: the entire discard sample is measured and 5 fish per cm-size are randomly selected for estimations of biological parameters (see table 2.2 for more details).

The secondary sampling unit (SSU) for landings is a representative number of fish boxes (randomly selected from all *Solea solea* landings from the trip. All the fish in this sample are measured and 4 fish per cm-size are randomly selected for estimations of biological parameters (see table 2.2 for more details) in the ILVO lab (reimbursement is provided for the shipowner). It should be noted that the *Solea solea* landings are sampled *before* the sorting process takes place in the auction.

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

Y

Regional coordination:

N

Link to sampling design documentation:

Documentation can be found on the Belgian national DCF website <https://smartfisheries.be/data-collection/>

Design follows international recommendations:

Y

Link to sampling protocol documentation:

Documentation can be found on the Belgian national DCF website <https://smartfisheries.be/data-collection/>

Protocol follows international recommendations:

Y

Sampling implementation

Recording of refusal rate:

N

The SelfAtSea sampling programme at ILVO is a voluntary programme, so the sampling takes place when the opportunity arises. Therefore, ILVO considers collecting non-responses and refusals on PSU (trip) level not relevant.

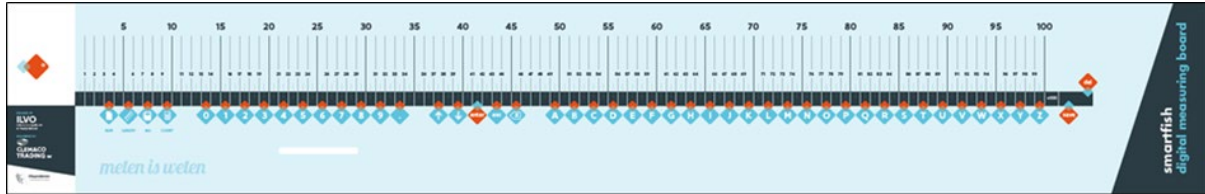
Monitoring of sampling progress within the sampling year:

The SelfAtSea sampling programme at ILVO is a voluntary programme so the sampling takes place when the opportunity arises. Follow-up of the sampling progress is covered during the weekly observer/scientist meetings and the industry is encouraged on several occasions (meetings, workshops, etc.) to cooperate in order to achieve the annual planned number of PSUs.

Data capture

Means of data capture:

- Length data is registered on electronic measuring boards (picture below; power supply via power bank, registers lengths using a linear magnetic sensor) coupled to rugged tablets with inhouse developed SmartFish software for easy connection to the SmartFish database.



- Weight data registered on calibrated scales (type Marelec D4/W10)
- Sex and maturity staging following international standards (SMSF scale)
- Age readings using SmartDots software and the SmartLab platform
- SmartLab application: this in-house developed tool is used to follow up the analysis of samples, processed in the lab to determine biological parameters.
- SmartDots application: this in-house developed tool for age reading and quality control of age reading is endorsed by WGBIOP and used by the ICES community for exchanges and workshops on age reading. <https://www.ices.dk/data/tools/Pages/smartdots.aspx>

All tools and supporting software are developed by ILVO.

Data capture documentation:

- SmartFish: manual available upon request (W. Allegaert (2015, 2024 in prep), “ SmartFish manual”)
- Weight data: manual online available (<https://manualzz.com/doc/27548711/marelec-d4>)
- Maturity staging: [Report of the Workshop for Advancing Sexual Maturity Staging in Fish \(WKASMSF\) \(ices.dk\)](https://www.ices.dk/data/tools/Pages/smartdots.aspx)
- SmartLab and SmartDots: applications to record lab data and determine and manage age records [SmartDots \(ices.dk\)](https://www.ices.dk/data/tools/Pages/smartdots.aspx)

Quality checks documentation:

Y, The process of quality control is described in the national protocol which is available upon request: <https://smartfisheries.be/data-collection/>

Quality checks are performed at different levels:

While recording data:

- Pop-up messages are integrated into the SmartFish software to warn the user when the recorded individual weight data deviates from the expected based on general length-weight keys (LWK). This allows the user to correct the weight and helps to reduce outliers.
- When using SmartFish, the status of the trip must be changed from ‘raw’ to ‘validated’ in the SmartFish software, as it is linked with SmartLab, which requires a validated dataset. When changing the status of a trip in SmartFish, various checks are automatically performed on the dataset. These checks include verifying whether the trip’s end date is later than the start date and whether the subsample’s weight is less than the sample’s weight, among others. Detailed descriptions of these checks can be found in the SmartFish manual (W. Allegaert, 2015 and 2024 in prep.).
- Age reading: SmartLab software is used for sample and laboratory management. SmartDots software is used for age reading: images are taken from all otoliths and images are annotated

using the SmartDots software, making quality assurance easier and faster. Age reading results are directly included into the SmartLab database, avoiding copying mistakes. After several quality checks, age data is synchronized with the SmartFish database. Following quality checks are performed: Readers register the certainty of their reading (age quality (AQ) 1, 2 or 3). Only AQ1 data are synchronized with the final SmartFish database. All readings are performed by two readers (double reads of the otoliths). If ages match, the reading is registered as “approved” in SmartDots. Reference collections are used on a monthly basis as a tool to monitor possible deviation in age readings over time. Furthermore, a scientist makes stock-based age-length keys using R-scripts as final check before synchronization with the SmartFish database.

- Using Power BI: using graphs and tables to check species composition, sampling locations, duration and distance of trawls, outliers in length-weight-keys and age-length-keys, positions in otolith blocks, etc. A description of what is checked by Power Bi is available on demand (in Dutch).
- Using R-scripts: extra quality checks are performed. Scripts are available on demand.

Data storage

National database:

Data is stored in the national SmartFish database (SQL Server). User specific access rights are defined in the database, and it is not publicly accessible through a website. Laboratory otolith data is stored in the SmartLab database.

International database:

National data are uploaded in The Regional Database & Estimation System (RDBES), which is hosted by ICES. The database is accessible through this website: <https://rdbes.ices.dk/>

Quality checks and data validation documentation:

Belgium follows a well-documented internal protocol (several steps) to ensure high quality data from sampled trips:

- When a crew member that performed the self-sampling returns from a trip, the handwritten data (trip and haul information + total catch weights of *Solea solea* by haul and by catch fraction) is imported in the SmartFish database by an ILVO observer/scientist. If issues arise or data is missing, the observer/scientist will contact the responsible crew member to correct the data. PowerBi and Excel are used to check for outliers in the data (e.g. plot of haul positions). A discard rate for the trip is calculated and compared to the discard rate of trips with vessels that use similar gear and were active in similar regions and in the same season.
- When seagoing observers return from sampling a commercial trip in the auction, collected data are immediately transferred from their ruggedized tablet to the SmartFish database (Sync Trip). And is merged with the data collected at sea.
- Length frequency distributions (LFDs) and biological parameters of the *Solea solea* discards and landings imported in SmartFish, are checked for outliers using powerBI and excel. The overall discard LFD of the self-sampled trip is plotted and compared to the LFD of trips with vessels that use similar gear and were active in similar regions and in the same season. If issues arise in step 2, the scientist will check the raw data and/or contact the responsible crew member to explain the deviation in the data and to adjust accordingly (if possible).
- Before the trip can be validated, an internal quality control is run within the database. If the quality of the data was checked and approved the trip is given a status 'consolidated' and data can be used for analysis and raising.

Sample storage
Storage description: - Fish for which biological variables are to be determined are sometimes stored overnight in the refrigerator/freezers of ILVO ahead of analysis. - After biological sampling, otoliths are stored in otolith containers and vertebrae are stored in the freezer before they enter the flow of age reading - After age reading, otoliths and vertebrae are stored in paper bags at ILVO's archive for an indefinite period. Sample analysis: Determination of biological parameters of target species: - National protocol, internally available: "Beproevingprocedure VSL001 for biological parameters (version 4, 2023)" - And "Werkvoorschrift WV001 VSL001" for maturity determination of flatfish based on Report of the Workshop for Advancing Sexual Maturity Staging in Fish (WKASMSF) (ices.dk) - Age readings: are performed in ILVO's accredited ANIMALAB (ISO17025). National protocol is used "Beproevingprocedure OTL001 (version 10, 2024)" for sole otoliths.
Data processing
Evaluation of data accuracy (bias and precision): Y During and ahead of the data collection, care is taken to collect the data as accurately as possible: - Crew members that are willing to perform the self-sampling are properly trained by ILVO before they start collecting the requested information and receive a detailed protocol. They get instructions on how to collect the data and the discard sample and how they are supposed to deal with the paperwork. They also get contact information in case something goes wrong during data collection. - WGBIOP assures consistency regarding the collection of biological parameters across member states and regularly organizes exchanges and workshops in which Belgium participates. Editing and imputation methods: N When outliers or mistakes are encountered during the quality check procedure, editing and imputation takes place. Corrections are then made directly in the SmartFish database. Quality document associated to a dataset: N Validation of the final dataset: National checks are performed prior to submission of data to ICES data calls in InterCatch and RDBES. Scripts used for raising observer data to fleet level consist of a thorough data check including outlier detections, verifying length-weight and age-length relationships, compare the registered subsample weight from the haul with the calculated weight based on the LFD from the haul and the length-weight information from the trip. Scripts are available on demand.

Related to Table 2.6 & Table 4.1 [and Text Box 2.6 & 4.3] (biological specific data collection/diadromous data collection/recreational fisheries data collection/commercial fisheries data collection/stomach sampling)

Sampling scheme identifier: BTS, DYFS

MS : BEL
Region: North Sea and Eastern Arctic
Sampling scheme identifier: BTS, DYFS
Sampling scheme type: Research surveys at sea
Observation type: SciObsAtSea
Time period of validity: 2025-2027
The main objective of the Belgian Beam Trawl Survey (BTS) is to create fisheries-independent abundance indices by age group of commercially important fish species, primarily plaice and sole, in the sampled area (ICES Area 27.4b,c). The target data are abundances, weight and length distributions of all fish and elasmobranchs, and length-weight-age-sex-maturity data of target species. In addition, epibenthic species (count and weight), hydrographic data and marine litter are recorded and stomach sampling and analysis will occur. During the Demersal Young Fish Survey (DYFS) the same target data is collected as the BTS in the Belgian coastal zone, in addition to length measurements of <i>Crangon crangon</i>. Participation in RWP NANSEA 2025-2027 and in RWP Regional Work Plan on data collection in the fisheries and aquaculture sectors 2025-2027.
Description of the population
Population targeted: BTS – ICES Area 27.4b,c The target species and collected parameters are: • Length-weight-age-sex data: cod (<i>Gadus morhua</i>), plaice (<i>Pleuronectes platessa</i>), dab (<i>Limanda limanda</i>), turbot (<i>Scophthalmus maximus</i>), brill (<i>Scophthalmus rhombus</i>) and sole (<i>Solea solea</i>) • Length-weight-age-sex-maturity data: lemon sole (<i>Microstomus kitt</i>) • Length-weight per sex data: elasmobranchs and commercially important crustaceans (<i>Cancer pagurus</i>, <i>Nephrops norvegicus</i> and <i>Homarus gammarus</i>) • Length-weight data: cephalopods (<i>Loligo vulgaris</i>, <i>Loligo forbesii</i> and <i>Sepia officinalis</i>) and remaining fish species • Count-weight data: epibenthic species • Stomach content: whiting (<i>Merlangius merlangus</i>), anglerfish (<i>Lophius budegassa</i>), megrim (<i>Lepidorhombus</i> spp.), cod (<i>Gadus morhua</i>), horse mackerel (<i>Trachurus trachurus</i>), hake (<i>Merluccius merluccius</i>), plaice (<i>Pleuronectes platessa</i>), turbot (<i>Scophthalmus maximus</i>), brill (<i>Scophthalmus rhombus</i>), pollack (<i>Pollachius pollachius</i>), tusk (<i>Brosme brosme</i>), ling (<i>Molva molva</i>), tub gurnard (<i>Chelidonichthys lucerna</i>), starry ray (<i>Amblyraja radiata</i>), cuckoo ray (<i>Leucoraja naevus</i>), thornback ray (<i>Raja clavata</i>), spotted ray (<i>Raja montagui</i>), common skate-complex (<i>Dipturus batis</i>), spurdog (<i>Squalus acanthias</i>), tope (<i>Galeorhinus galeus</i>), halibut (<i>Hippoglossus hippoglossus</i>) Collection of environmental data:

- Depth
- Bottom and surface salinity and temperature
- Marine litter

DYFS – Belgian coastal zone (ICES Area 27.4c)

The target species and collected parameters are:

- Length-weight-age-sex data: plaice (*Pleuronectes platessa*) and sole (*Solea solea*)
- Length-weight per sex data: elasmobranchs
- Length-weight data: 16 commercially important fish species (sole, plaice, cod, turbot, dab, brill, lemon sole, whiting, English gurnard, grey gurnard, red gurnard, flounder, mackerel, horse mackerel, seabass, surmullet) and brown shrimp (*Crangon crangon*)
- Count-weight data: epibenthic and non-commercial fish species

Collection of environmental data:

- Depth
- Bottom and surface salinity and temperature
- Marine litter

Population sampled:

Sampling of demersal marine species

Stratification:

For both the BTS and the DYFS, the stations are fixed as discussed at WGBEAM and as included in the survey design:

[Manual for the Offshore Beam Trawl Surveys version 3.4](#)

On the BTS biological parameters (age, sex, length, weight) of 7 species (cod, sole, plaice, turbot, brill, lemon sole and dab) are collected, stratified by ICES rectangles, namely five specimens/cm class/ICES rectangle.

On the DYFS biological parameters (age, sex, length, weight) of plaice and sole are collected, stratified by haul, namely one specimen/cm class/haul.

Sampling design and protocols

Sampling design description:

The sampling design of the BTS is described in the international manual for the offshore beam trawl surveys. The sampling design of the DYFS is described in the inshore manual, which will be published in 2022. National protocols in Dutch available upon request.

Is the sampling design compliant with the 4S principle?

NA

Regional coordination:

The BTS and DYFS sampling design is an international agreement developed by ICES Working Group on Beam Trawl Surveys (WGBEAM).

Link to sampling design documentation:

BTS: [Manual for the Offshore Beam Trawl Surveys version 3.4](#). A Belgian protocol for the BTS (in Dutch) is available on demand (L. Vandecasteele and H. Raat, 2021, National protocol BTS).

DYFS: An international inshore manual will be published in 2022. A Belgian protocol for the DYFS (in Dutch) is available on demand (H. Raat, 2021, National protocol DYFS).

Compliance with international recommendations:

Y

Link to sampling protocol documentation:

BTS: [Manual for the Offshore Beam Trawl Surveys version 3.4](#) For stomach content analysis we refer to RCG NANSEA 2023 Part III report

DYFS: An international inshore manual will be published in 2022. A Belgian protocol for the DYFS (in Dutch) is available on demand (H. Raat, 2021, Nationaal protocol DYFS). A concise version of the DYFS protocol can be consulted in Text box 2.6

Compliance with international recommendations:

Y

Sampling implementation

Recording of refusal rate:

NA

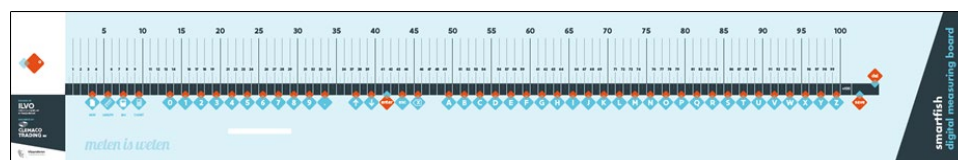
Monitoring of sampling progress within the sampling year:

The planned number of days for each survey (BTS: 10 days, DYFS: 8 days) should accommodate the number of trawls planned. If, due to weather conditions or other unforeseen circumstances the planned schedule cannot be maintained, the chief scientist decides upon a change of schedule. If needed, the international survey coordination group (WGBEAM) is contacted.

Data capture

Means of data capture:

- Environmental data:
 - o CTD sensor connected to mobile concentrator which allows automatic data transfer and storage
 - o Vessel's system for trawl information (TRANSAS)
- Length data registered on electronic measuring boards (picture below; power supply via power bank, registers lengths using a linear magnetic sensor) coupled to rugged tablets with inhouse developed Smartfish software for easy connection to the Smartfish database



- Weight data registered on calibrated scales (type Marelec D4/W10)
- Litter recording according to international standards
- Sex and maturity staging following international standards

- Shrimp length measurements registered using inhouse developed Smartshrimp hard- and software
- Age readings using SmartLab software
- The stomach content analysis involves visually analyzing a selected subset of samples using microscopy according to the ISSG stomach protocol and performing DNA metabarcoding on all samples to identify diet components.

Data capture documentation:

- CTD sensor: manual available upon request (NKE Instrumentation (2019), “Wisens CTDS – Conductivity, pressure, temperature and salinity measurements”)
- Mobile concentrator: manual available upon request (Rovin (2021), “User Manual Mobile Concentrator”)
- Smartfish: manual available upon request (W. Allegaert (2015, 2021 in prep), “Smartfish manual”)
- Weight data: manual online available (<https://manualzz.com/doc/27548711/marelec-d4>)
- Maturity staging: [Report of the Workshop for Advancing Sexual Maturity Staging in Fish \(WKASMSF\) \(ices.dk\)](#)
- Smartshrimp: manual available upon request (W. Allegaert (2017) “Smartshrimp – protocol for measuring length of shrimps”)
- SmartLab and Smartdots: applications to record lab data and determine and manage age records [SmartDots \(ices.dk\)](#)

Quality checks documentation:

Y

The process of QC is described in the national manuals which are available upon request:

- Belgian BTS protocol: L. Vandecasteele and H. Raat (2021), Nationaal protocol BTS in Dutch
- Belgian DYFS protocol: H. Raat (2021), Nationaal protocol DYFS in Dutch

Quality checks are performed at different levels and before entry in the international database DATRAS.

- While recording data:
 - o Pop-up messages built into the Smartfish software warn the user when the registered individual weight data deviates from the weight as deducted from general length-weight keys (LWK). This gives the opportunity to correct the weight and reduces outliers.
 - o In SmartLab: Ages are checked separately by two lab technicians (age readers). If ages match, it is registered as “approved” in Smartlab.
- Using Smartfish: the status of the trip must be set from ‘raw’ to ‘validated’ in the Smartfish software as it is coupled with Smartlab and the latter program needs a validated dataset. When changing the status of a trip in Smartfish, certain checks are performed on the dataset such as is end date of the survey being later than the start date, weight of subsample cannot be larger than weight of sample, etc.
- Using Power BI: visual check of species composition, sampling locations, duration and distance of trawls, outliers in length-weight-keys and age-length-keys, positions in otolith blocks, etc.
- Using R-scripts: extra quality checks are performed. Scripts are available on demand.

Data storage National database: Data is stored in the national Smartfish database (SQL Server). The database has different user access rights and is not publicly accessible through a website. International database: DATRAS https://www.ices.dk/data/data-portals/Pages/DATRAS.aspx ICES - Stomach Content Data: https://stomachdata.ices.dk Quality checks and data validation documentation: https://datsu.ices.dk/web/selRep.aspx
Sample storage Storage description: – Fish for which biological variables are to be determined are sometimes stored overnight in the refrigerator/freezers of ILVO ahead of analysis. – After biological sampling, otoliths are stored in otolith containers and vertebrae are stored in the freezer before they enter the flow of age reading – After age reading, otoliths are stored at ILVO's archive for an indefinite period. – Litter which is too light to weigh at sea are stored in the freezer of ILVO until analysis. Sample analysis: – Maturity staging: Report of the Workshop for Advancing Sexual Maturity Staging in Fish (WKASMSF) (ices.dk) – Length measurement of shrimp: manual available upon request (W. Allegaert (2017) "Smartshrimp – protocol for measuring length of shrimps") – Determination of biological parameters of target species: - o Manual for the Offshore Beam Trawl Surveys version 3.4 - o National protocol, internally available: K. Bekaert (2021), "Beproevingprocedure VSL" – Age readings: are performed in ILVO's accredited ANIMALAB laboratory – DNA Metabarcoding of stomach content will be performed at ILVO
Data processing Evaluation of data accuracy (bias and precision): N/Y During and ahead of the data collection care is taken to collect the data as accurately as possible: • Trained experts carry out the survey and they follow an annual refresher on species determination in ILVO's yearly "Species Determination Workshop" which is open for public as well. • Determination of rare species or unsure identifications can be cross-checked with members of WGBEAM. • WGBIOP assures consistency regarding the collection of biological parameters across member states and regularly organizes exchange workshops in which Belgium participates After the data collection, there is no direct evaluation of data accuracy of the trawl hauls. The coordinating survey group WGBEAM conducts some analyses for the international data set, not only

on e.g., the year classes, but also on species identification consistency. Assessment groups such as WGNSSK annually check sole and plaice cohort tracking to evaluate the survey series.

Editing and imputation methods:

N

When outliers or mistakes are encountered during the quality check procedure, editing and imputation takes place. Corrections are then made directly in the Smartfish database. An adapted dataset is submitted to the international database DATRAS if necessary, mentioning the corrections done.

Quality document associated to a dataset:

N

Validation of the final dataset:

National checks are performed prior to submission of data to the international ICES database DATRAS. In addition, consistency checks are performed in the data portal DATRAS itself during the process of uploading. After submission, the coordinating survey groups analyse last year's survey data, especially data used in stock assessments. In case certain oddities are identified, the data can still be edited prior to the stock assessment meetings (e.g. ICES WGNSSK) take place.

ANNEX 1.2 - QUALITY REPORT FOR SOCIOECONOMIC DATA SAMPLING SCHEME

The quality report fulfils Article 6 (3) (d) of the Regulation (EU) 2017/1004. This document is intended to specify data to be collected under chapter II, points 3, 5, 6, and 7 of the Delegated Decision annex: Socioeconomic data on fisheries, aquaculture and any complementary data collection of fishing activity and fish processing.

Use this document to describe quality aspects of the data collection process (design, sampling implementation, data capture, data storage and data processing etc.). The annex should be filled for each sampling scheme. Where applicable, use the handbook on sampling design (Deliverable 2.1 from MARE/2016/22 SECFISH study), available on the DCF website.

Provide information under each point in all sections.

Please indicate sampling scheme identifier (e.g combination of 'sector' and 'sampling scheme' or 'variables' from the annex table). Each identifier is unique and can be used only once; records with identical scheme identifiers are overwritten in the platform. Do not add any tables others than from the template.

Create a first survey specification record as a reference to the regional WP, add 'RWP ECON' in the 'sector name' field and leave the other fields empty.

Survey Specifications
'Sector name' refers to socio economic data on fisheries, aquaculture and any complementary data collection of fishing activity and processing as given in the EU MAP Delegated Decision annex. 'Sampling scheme' refers to survey technique: by census, by sampling, random or non-random, other (with explanation). If sampling, then outline sampling design. 'Variables' refer to Tables 7, 9 and 10 of the EU MAP Delegated Decision annex. 'Supra region' refers to Table 2 of the EU MAP Implementing Decision annex. If the sampling scheme is the same in all supra regions put 'All supra regions'.
Sector name(s): RWP ECON 2025-2027
Sampling scheme:
Variables:
Supra region(s):
Survey planning
Survey design and strategy
1. Data sources: 2. Sample sizes: 3. Survey methods:

4. Additional information used in the survey strategy:
Estimation design
1. Calculation method for population estimate: 2. Calculation method for derived data: 3. Nonresponse handling:
Error checks
Data storage and documentation
1. Data storage: 2. Documentation:
Revision
Confidentiality
1. Are procedures for confidential data handling in place and documented? 2. Are protocols to enforce confidentiality between DCF partners in place and documented? 3. Are protocols to enforce confidentiality with external users in place and documented? 4. Are there any issues with publication of data due to confidentiality reasons? Provide an explanation.

Sampling scheme identifier: 1 Fisheries Fleet

Survey Specifications
<i>'Sector name' refers to socio economic data on fisheries, aquaculture and any complementary data collection of fishing activity and processing as given in the EU MAP Delegated Decision annex.</i> <i>'Sampling scheme' refers to survey technique: by census, by sampling, random or non-random, other (with explanation). If sampling, then outline sampling design.</i> <i>'Variables' refer to Tables 7, 9 and 10 of the EU MAP Delegated Decision annex.</i> <i>'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'.</i>
Sector name(s): Fisheries
Sampling scheme: Census
Variables: Fleet economic and social (2021/1167; Table 7, Table 9)
Supra region(s): All supra regions
Survey planning
Economic and social variables

Full population including all Belgian fishing vessels. Data is collected by census.
Survey design and strategy
1. Data sources: Data comes from a national survey organised by the Flemish Government and a data transfer from the social secretariat BESOX on request of the Flemish Government. 2. Sample sizes: Socio-economic data collection is carried out in census, meaning no sample of the fleet is taken. 3. Survey methods: All vessels are surveyed (questionnaire). The office responsible for the social security of the Belgian fishermen is BESOX and collects all social data. This organisation has a census coverage of all social data except the ‘nationality’ and ‘education level’ variables. 4. Additional information used in the survey strategy: A decision regarding the obligation to supply socio-economic data was agreed upon by the Flemish Government since the 1st of September 2010. Thus, national legislation was introduced to impose the obligation to provide data requested under Appendix VI of the DCF. As a consequence, response rates increased. Methodologies are in accordance with <i>ad hoc</i> contract Commitment No. SI2 725 694 - Methodologies for the socio-economic data described in EU MAP. An annual survey is conducted by Agentschap voor Zeevisserij, Department of Agriculture and Fisheries (Flemish Government) to collect fleet socio-economic data. Information is collected on individual vessel level. Employment data are obtained mostly through the employers social-accounting secretariat, which gathers data regarding the social costs. The Belgian fishery sector has a unique system of social security. These data are delivered directly to Agentschap voor Zeevisserij via the accredited accountancy office Morbee & Ballegeer. Although fleet social data is gathered from every vessel, per crew member and per trip, the MS is still struggling to achieve a full data coverage on ‘nationality’ and ‘education level’ variables. The Belgian fishery sector has a unique system of social security. Fishermen receive relatively high incomes. Since 2003, a law on employment ended the ‘no catch, no pay’ principle, assuring income security for each sea trip (Royal Decree, Belgian State Journal, 07/03/2005). The crew members receive a fixed percentage of the value of landings. If the value of landings is lower than a certain minimum wage, the employer must pay a minimum wage. This is a system that favours employees over employer, bearing in mind that being fisherman remains a dangerous profession. During the current WP cycle, the MS will improve the collaboration between Agentschap voor Zeevisserij (Department of Agriculture and Fisheries, Flemish Government) and BESOX in order to include a census sample of the ‘nationality’ and ‘education level’ variables. These variables are currently included in the table (5.2). The MS will indicate in the ‘comments’ section when the MS was not able to collect the data but will add the data as soon as that data could be collected. .
Estimation design
1. Calculation method for population estimate:

As the Belgian Fishing fleet is covered by a census data collection scheme no estimation of values is necessary, except for estimation of missing values based on existing values. The MS cannot see any valid methods how to estimate the ‘nationality’ or ‘education level’ of fishermen as this is highly individual and sensitive data which should be reported based on actual figures and not on estimates. The only estimation that happens is not for the population but rather for the activity indicator.

2. Calculation method for derived data:

Estimation of the activity indicator:

During the previous WP-cycle (2022-2024) the MS suggested a test study on implementing an activity indicator for the Belgian fisheries fleet segments. In addition, it was mentioned that the MS would report on the test study in the current WP-cycle.

As per recommendation of the RCG-ECON of 2018, ‘minimum income’ could be used as an estimator for activity level of a fleet segment. However, as indicated in the section on ‘Survey design and strategy’ of Annex 1.2: Fisheries, a minimum wage system is applicable in the MS making the ‘minimum income’ variable not well suited to estimate activity levels of fleet segments. The MS explored if the ‘days at sea’ variable would be a better variable to estimate the activity level. This was explored for data years 2021-2023 but here only data of 2023 is shown. In figure 1A, the number of ‘days at sea’ (turquoise) and number of ‘fishing days’ (red) per vessel (x-axis) are represented by bars for 2023. A ‘low active’ threshold was set at 50 ‘days at sea’ or ‘fishing days’, which corresponds to about two months of fishing on a year. For 2023, only a single vessel falls under that threshold, thus preventing confidential reporting of the ‘low active’ vessels. Therefore, ‘days at sea’ and ‘fishing days’ were not deemed as useful variables to estimate activity level.

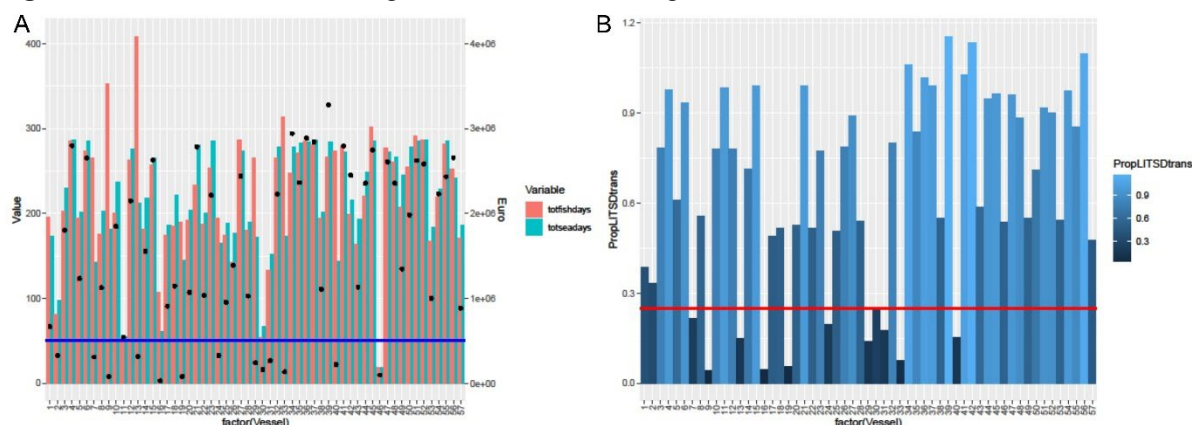
On figure 1A, there are however also dots per vessel shown. These dots represent the transformed ‘total landings income’ per vessel (value/10,000). Multiple vessels show the transformed ‘total landings income’ value under the 50 days threshold. The MS investigated if the proportion between the ‘transformed total landings income’ and the ‘days at sea’ per vessel could be a better measure for low active vessels (figure 1B for 2023). This proportion was calculated to distinguish between vessels that have high number of ‘days at sea’ with a low ‘landings income’ and vessels with a low number of ‘days at sea’ with a high ‘landings income’ relative to the days at sea. In principle, a vessel that spends few days at sea but fishes efficiently and successfully has a high landings income and can be called high active. Figure 1B shows these proportions per vessel on the Y-axis and also in colour gradient in the legend (legend = Y-axis). A threshold of 0.25 was set under which for 2023, 11 vessels now fell. As shown in table 1 (below) these vessels belong to the beam trawler-vessel length 18-24 m and a single vessel in the demersal trawlers and/or demersal seiners-vessel length 24-40 m segments. The latter vessel cannot be reported due to confidentiality, however the 10 vessels can be reported retaining confidentiality. The MS decided that the calculated proportion is more relevant and will be used as an estimator for activity, while keeping confidentiality of reporting always as a priority data quality check.

Table 1: Vessels estimated as ‘low active’ for 2023

Length	Clustered Gear	Clustered Length	Cluster Name	Vessels
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VL1218	TBB	VL1824	AREA27 TBB VL1824	1
VL1824	DTS	VL2440	AREA27 DTS VL2440	1
VL1824	TBB	VL1824	AREA27 TBB VL1824	9

Figure 1: Results of estimation design for ‘low active’ and ‘high active’ vessels in 2023.



3. Nonresponse handling:

Costs and earnings from the active vessels are surveyed through a questionnaire. As the response within the important fleet segments is high, missing data will be estimated by calculating the mean per fleet segment in the sample. This is then raised to the population level of each segment. The sum of the totals of the different categories estimates the total value for the entire fleet.

Error checks

Economic variables

As part of the yearly AER the MS has developed reproducible quality reports with R-markdown. The R-markdown scripts function to analyse the raw fleet activity data and observe the time series and data trends. The application of these scripts on the raw data allows the MS to scan for outliers or unexpected data points. Observation of outliers and unexpected data points allows the MS to couple back to the initial data sources (logbooks, sales notes). The MS aims to update and improve these R-markdown scripts yearly to improve error detection and elimination.

Social variables

The MS has developed reproducible quality reports as part of the yearly AER reporting R-markdown scripts. The R-scripts function to analyse the raw social data and observe time series data and trends. Although these R-scripts are part of the AER output (especially the trends analyses), the application of these scripts on the raw data allows the MS to scan for outliers or unexpected data points. Observation of outliers and unexpected data points allows the MS to couple back to the raw data database as well as the initial data sources. The initial data source for the social data is either the central database of Agentschap voor Zeevisserij (Department of Agriculture and Fisheries, Flemish Government) or the raw data provided by BESOX. Although no R-markdown scripts are developed yet for the social data, with improved collaboration of Agentschap voor Zeevisserij (Department of Agriculture and Fisheries, Flemish Government) and BESOX the MS aims to create similar R-markdown scripts for the social data. These scripts will be developed once satisfactory collaboration between the three partners is reached.

Data storage and documentation

1. Data storage:

The raw economic data (from the electronic logbook, sales notes and surveys) of the fisheries fleet is stored in a central data platform administered by the Agentschap voor Zeevisserij (Department of Agriculture and Fisheries, Flemish Government) called Polaris. The raw social data of the fisheries fleet is provided by BESOX to Agentschap voor Zeevisserij (Department of Agriculture and Fisheries, Flemish Government). ILVO receives the

relevant data for the AER from Agentschap voor Zeevisserij. At ILVO the data will be stored as three separate MS SQL databases, that is logbook and sales data, employment data and survey (balance sheet) data. These databases will be stored on a local database server.

The R-scripts used to fill the AR template tables, to generate the AER output, as well as the error checking R-Markdown scripts are stored in a centrally accessible GitLab repository allocated to ILVO.

2. Documentation:

Access to protocols and data files can be provided upon request as all files are stored on ILVO-intranet sites and an ILVO-owned GitLab repository. To request access to files please contact:

adelbert.declercq@ilvo.vlaanderen.be (responsible socio-economic data collection)

els.torrele@ilvo.vlaanderen.be (NC)

Revision

Economic and social variables

Methodologies under the current WP will be evaluated and updated each WP cycle.

Confidentiality

1. Are procedures for confidential data handling in place and documented?

Yes

2. Are protocols to enforce confidentiality between DCF partners in place and documented?

Yes

3. Are protocols to enforce confidentiality with external users in place and documented?

Yes

4. Are there any issues with publication of data due to confidentiality reasons? Provide an explanation.

NO

Economic and social variables

The DCF partners ILVO and the Agentschap voor Zeevisserij (Department of Agriculture and Fisheries, Flemish Government) have an agreement on the transfer and use of data on Belgian sea fisheries. In addition, data managers and scientists working with the data sign a data sharing declaration of confidentiality and transfer of rights. Both the raw data as the processed data with regard the National Data Gathering Programme are only shared with the Commission and ICES following the correct procedures in place. Specifically, for ILVO, the data is stored on a private domain server (intranet) and can only be accessed by the relevant data managers and scientists. ILVO uses Windows Authentication services to provide authenticated access to the relevant data managers and scientists.

Sampling scheme identifier: 2 Aquaculture sector

Survey Specifications

'Sector name' refers to socio economic data on fisheries, aquaculture and any complementary data collection of fishing activity and processing as given in the EU MAP Delegated Decision annex.

'Sampling scheme' refers to survey technique: by census, by sampling, random or non-random, other (with explanation). If sampling, then outline sampling design.

'Variables' refer to Tables 7, 9 and 10 of the EU MAP Delegated Decision annex.

'Supra region' refers to Table 2 of the EU MAP Implementing Decision annex. If the sampling scheme is the same in all supra regions put 'All supra regions'.

Sector name(s): Aquaculture

Sampling scheme: Census
Variables: Aquaculture economic and social
Supra region(s): All supra regions
Survey planning
The population of Belgian Aquaculture enterprises that have an annual financial account will be collected by census. The base list of enterprises will be checked every year.
Survey design and strategy
1. Data sources: Data sources used in the current WP cycle for the aquaculture sector will be the National Bank where annual financial accounts can be found. 2. Sample sizes: Socio-economic data for the Belgian aquaculture sector has been first collected under the previous WP cycle (2022-2024). As a full coverage of all aquaculture enterprises from the start of this WP cycle was impossible, the MS suggested a multi-year and multi-step plan to reach a 100% coverage of data collection of all aquaculture enterprises in Belgium, thus reaching data collection by census. A list of aquaculture companies administered by FASFC (Federal Agency for the Safety of the Food Chain) was the starting point. This list was updated and refined over the years by cross referencing the list provided by FASFC (Federal Agency for the Safety of the Food Chain) with the KruispuntBank van Ondernemingen (KBO), Aquacultuur Vlaanderen, College Des Producteurs (Wallonia), internet searches as well as stakeholder contacts via conferences such as LARVI. Although larger and medium aquaculture enterprises (size of enterprise withing Belgian context) were identified via the latter approach, the smaller aquaculture enterprises were much more challenging to identified using this approach. However, for the latter the local Flanders and Wallonia platforms and stakeholder interactions helped. The initial approach was to only identify and report on enterprises with an annual financial account that can be found in the National Bank reporting system (NBB). Furthermore, the data of these enterprises was uploaded in the newly developed ILVO internal database. Indeed, in the previous WP cycle, seven enterprises were identified with annual financial accounts by the first Belgian reporting of socio-economic data in 2022, and 17 enterprises were identified by the second reporting round in 2023. 3. Survey methods: During the previous WP cycle, the MS faced two major challenges related to socio-economic data collection for the Belgian aquaculture sector. The first related to correct segmentation. Segmentation in the first reporting year (2022) was not possible due to the low number (seven) of enterprises and thus no confidential reporting could be done if segmentation was applied. In the second reporting year (2023), the MS increased the data collection coverage to 17 enterprises, but segmentation was still not possible as for most segments only a single enterprise is active in that segment of aquaculture production. This resulted again in non-confidential data and thus clustering in a single segment (other techniques, other freshwater fishes). The second challenge the MS faced related to many one-person enterprises with only intermittent aquaculture activity, where a single or a few years are

interspersed with years of no aquaculture activities. The owners of the one-person enterprises often have a different job (e.g. builder, carpenter, etc.) to provide a stable income. Many of those one-person enterprises have annual financial accounts (of the micro type), however the data related to the aquaculture activities cannot be separated from the stable job data. In addition, different experts to collect data on aquaculture activities (Aquacultuur Vlaanderen and College Des Producteurs) noted that questionnaire responses are non-existent.

The findings that were made during the previous WP cycle (2022-2024) made the MS decide that data collection of enterprises with strictly aquaculture activities in the current WP cycle (2025-2027) will continue based on the annual financial accounts of those enterprises. These will be reported on under 'other techniques' and 'other freshwater fish. Furthermore, the MS decided to start a test study (see Test Study 4) in order to assess how valuable intensive data collection efforts are and if this can be done via questionnaires with parallel stakeholder interactions. A more extensive one-to-one approach will be used and assessed in the test study.

4. Additional information used in the survey strategy: No additional information.

Estimation design

1. Calculation method for population estimate: Not relevant.
2. Calculation method for derived data: Not relevant.
3. Nonresponse handling:

The MS aims to reach data collection based on annual financial accounts by census, and thus no variables will be estimated. A test study will be started in the current WP cycle (see Test Study 4) in order to assess how valuable intensive data collections are. If however, data collection appears feasible and with a socio-economic variables cover rate of at least 50% of the one-person enterprises (see section Survey Design and Strategy, Aquaculture), estimation calculations will be considered.

Error checks

The error checks, in the current WP cycle remain focused on the base list of aquaculture enterprises. These checks will continue throughout the next WP cycle.

Data storage and documentation

1. Data storage:

As the data collection for aquaculture is still new, ILVO has regular meetings with their IT-members, in order to maintain and refine the new database for socio-economic information related to aquaculture and fish processing industry. The correct documentation and protocols will be stored centrally at an ILVO server. Developed R-scripts related to the data collection, preparation and reporting are stored on an ILVO owned GitLab repository. As these scripts are well motivated and well explained, they can function also as protocols in place.

2. Documentation:

Access to protocols and data files can be provided upon request as all files are stored on ILVO-intranet sites and an ILVO-own GitLab repository. To request access to files please contact:
adelbert.declercq@ilvo.vlaanderen.be (responsible socio-economic data collection)
els.torrele@ilvo.vlaanderen.be (NC)

Revision

As the socio-economic data collection for aquaculture enterprises in Belgium is still new, the processes involved in the data collection will be revised every year of the current WP cycle. This is especially relevant as a new test study on data collection from the aquaculture sector is started in the current WP cycle (see Test Study 4).
Confidentiality
- Are procedures for confidential data handling in place and documented? Yes - Are protocols to enforce confidentiality between DCF partners in place and documented? Yes - Are protocols to enforce confidentiality with external users in place and documented? Yes - Are there any issues with publication of data due to confidentiality reasons? Provide an explanation. No All measures will be taken by ILVO (responsible for data collection and reporting) to respect confidentiality procedures as outlined in the Commission Decision No. 2021/1167. The protocols involved to retain confidentiality will be documented accordingly.

Sampling scheme identifier: 3 Fish Processing Industry

Survey Specifications
<i>'Sector name' refers to socio economic data on fisheries, aquaculture and any complementary data collection of fishing activity and processing as given in the EU MAP Delegated Decision annex.</i> <i>'Sampling scheme' refers to survey technique: by census, by sampling, random or non-random, other (with explanation). If sampling, then outline sampling design.</i> <i>'Variables' refer to Tables 7, 9 and 10 of the EU MAP Delegated Decision annex.</i> <i>'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'.</i>
Sector name(s): Fish Processing Industry
Sampling scheme: Census
Variables: Fish processing industry economic and social
Supra region(s): All supra regions
Survey planning
Due to the variability of activities within the processing industry and still unknown elements, Belgium will pursue a census approach.
Survey design and strategy
I. Data sources: The base list will be updated on an annual basis through consultation of the following sources:

- Federal Agency for the Safety of the Food Chain (FASFC)
- FPS Economy, S.M.E.s, Self-employed and Energy (Federal Government)
- The European IMSOC website
- Annual financial accounts, National Bank of Belgium
- Questionnaire

Data can be acquired from different sources:

- Annual financial accounts: The annual financial accounts for most enterprises can be publicly consulted, except for most self-employed one-person enterprises. Especially for larger enterprises a lot of information is available in these sheets. A limitation is that not all variables requested under the Delegated Decision, Table 11, are available in the company accounts. For example, energy costs are not separately available, but aggregated within other operational costs.
- Questionnaires: Information which is not available through annual financial accounts, or in general not publicly available will be obtained via online questionnaires.

2. Sample sizes:

In the previous Belgian National Programme, ILVO strived to list all ‘fish processing companies’. This list was based on information from the Federal Agency for the Safety of the Food Chain (FASFC), combined with the top-255 (ranking based on company turnover and number of employees) Belgian companies that were identified as being involved in ‘fish processing’ in a national survey of private company performance indicators and other sources. Every year, this list of fish processing companies was rigorously updated. However, the identification of genuine fish processing companies, with fish processing as their main activity, remains a challenge and complicates the setup of a meaningful collection scheme.

The list of fish processing companies has been intensively updated by cross-checking different sources with information on companies involved in fish-based activities. The constant refinement of the base list has led to an improved identification of the target group and thus of the quality of the gathered data.

ILVO compared the initial list with the list provided by the Federal Agency for the Safety of the Food Chain (FASFC) which strictly monitor processing activities of these companies from a health safety perspective. The list was further cross-checked with other lists, such as the ‘top-255’ list, the database of FPS Economy, S.M.E.s, Self-employed and Energy (Federal Government) and a list of the Belgian representative of AIPCE-CEP (European Fish Processors Association - European Federation of National Organisations of Importers and Exporters of Fish).

This resulted in a population of approximately 208 companies in 2019. Not all companies process fish as their main activity. Answers obtained through a questionnaire, consulting public annual financial accounts, direct contact with some companies as well as web-research, led to the estimation of 60 enterprises in 2019, which remained more or less stable up to 2022 with 68 enterprises with fish processing as their main activity.

3. Survey methods:

The main activity of the fish processing companies will be further and yearly defined through web researches and

an annual questionnaire and stakeholder interactions. Moreover, a better response to the questionnaire can be obtained by strengthening the ties with the fish processing industry. Eventually this will lead to higher quality data on for example the amount of seafood and fish used as raw material for the most commonly processed species. During the current WP cycle the MS will improve the data collection on the amount by origin but will not report on these values in the Annual report of the current WP. The MS will assess yearly if the data coverage and data quality is sufficient to report on the amount by origin in the current WP term.

4. Additional information used in the survey strategy:

The data requested under the Delegated Decision is considered to be sensitive data. Some enterprises have previously responded that they were constrained by time or that they simply would not provide the requested economic data. Especially small and medium enterprises do not see the purpose of providing their economic data and therefore their response rate is limited. Regular and direct contact with enterprises improves trust, and hence the understanding and willingness of companies to cooperate. As a result, response rate and data coverage will increase. This may also improve the quality of the provided data. On the other hand, direct contact with enterprises, given the size of the population, is labour intensive. The MS will make a special effort in the current WP cycle to increase the stakeholder contact to advance the data collection via questionnaires.

Estimation design

1. Calculation method for population estimate:

Due to the variability of activities within the processing industry and still unknown elements, Belgium will pursue a census approach.

Enterprises for which fish processing is a main and/or an important activity are targeted first. As it is not possible to directly determine the importance of the fish processing activity relative to other activities from the enterprise base list, a particular effort will be made in the current WP cycle to determine the proportional importance of the fish processing activity via stakeholder interactions. When fish processing is not an important activity, the enterprises only have to complete a shortened version of the questionnaire.

The enterprises are classified in categories according to the number of employees (≤ 10 ; 11-49; 50-249; ≥ 250 employees). When the number of enterprises per category is low, several categories will be grouped to retain confidential reporting. Variables for missing data are estimated by calculating the mean per category in the sample if absolutely necessary but will be avoided.

2. Calculation method for derived data:

If estimation is necessary, the values will be raised to the population level of each category. The totals of the different categories will be added together to estimate the total value for the entire population. More information will be included on larger companies (less abundant) than on smaller ones (more abundant). This leads to a stratified sample in which larger companies are oversampled. However, the total estimation is likely to be more precise, given that larger companies contribute more.

Should the variability between observations in a given category be large, an alternative method will be applied. This concerns mostly the 11-49 employee group. Companies in this group could be further subdivided based on their annual financial account type. Above certain thresholds, companies must lay down a 'full' annual financial

account. Estimations, based on average calculations, could then be applied to the ‘full’ and the ‘micro or shortened’ annual accounts separately.

3. Nonresponse handling:

As in 2023 a new database specific for the collection of socio-economic data for fish processing data (and aquaculture data, see Annex 1.2: aquaculture) was launched, the non-responses will be indicated in the database. This will allow the MS to identify and track the non-responses in order to develop a targeted approach aiming at engaging those enterprises to contribute to the socio-economic data collection, and therefore reducing the number of non-responses. Also for the fish processing industry, stakeholder interaction will be a key method to increase response rates, especially in the current WP cycle.

Error checks

The identification of genuine fish processing companies remains a continuous challenge. Every year withing a WP cycle the list of existing and potential new companies will be reviewed in detail so that enterprises which do not fit the definition of fish processing enterprise can be deleted and double entries are eliminated. Error checks will focus on the comparison of collected data via financial statements and annual financial accounts, and the data collected by questionnaires and stakeholder interactions. This in order to fine-tune the questionnaires, to avoid double data collection and to improve data density and quality.

Data storage and documentation

1. Data storage:

As the data collection for aquaculture is still new, ILVO has regular meetings with their IT-members, in order to maintain and refine the new database for socio-economic information related to aquaculture and fish processing industry. The correct documentation and protocols will be stored centrally at an ILVO server. Developed R-scripts related to the data collection, preparation and reporting are stored on an ILVO owned GitLab repository. As these scripts are well motivated and steps well explained, they can function also as protocols in place.

2. Documentation: See text below.

Access to protocols and data files can be provided upon request as all files are stored on ILVO-intranet sites and an ILVO-own GitLab repository. To request access to files please contact:
adelbert.declercq@ilvo.vlaanderen.be (responsible socio-economic data collection)
els.torrele@ilvo.vlaanderen.be (NC)

Revision

The processes involved in the data collection will be revised every year of the current WP cycle.

Confidentiality

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

No

All measures will be taken by ILVO (responsible for data collection and reporting) to respect confidentiality procedures as outlined in the Commission Decision No. 2021/1167. The protocols involved to retain confidentiality will be documented accordingly