Marine Institute, Rinville, Oranmore, Galway. H91 R673, Ireland.

Bord Iascaigh Mhara (BIM) Crofton Rd, Dún Laoghaire, Dublin. A96 E5A0

Inland Fisheries Ireland (IFI) 3044 Lake Dr, Cheeverstown, Dublin. D24 CK66

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

Ireland Annual Report on data collection in the fisheries and aquaculture sectors

2022

Version 2

Galway, 16/06/2023

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Data collection framework at national level

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

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

Give full name, acronym and contact details of all institutes that contribute to the data collection activities, and describe briefly their role in the work plan.

Provide a link to the national data collection website, if there is one.

The framework of Irelands national work plan is in accordance with Regulation (EU) 2017/1004 of the European Parliament and of the Council of 17 May 2017, Commission Delegated Decision (EU) 2021/1167 of 16 July 2021 and Commission Implementing Decision (EU) 2021/1168 of 16 July 2021 and following the supplied guidance document for the layout of text and tables. The submission is for the full period 2022-2027.

Major changes:

Biological data on exploited biological resources caught by Union commercial fisheries: The major changes in the programme compared to previous submission are the inclusion of self-sampling on the commercial fisheries, demersal, pelagic, nephrops and shellfish into the at sea sampling plan sampling frame. This work was initially driven by the Coronavirus pandemic but has proven to be a valuable data collection portal and is included as part of the at sea sampling frames.

Ireland also plans to commence the development of Digital Data Collection on our port sampling on commercial fish species in order to improve the quality of the data collected as it will not only save time in data entry but will provide instant feedback in data quality by performing live checks. Ireland intends to build capacity from 2023 and develop expertise in boarfish ageing to support development of age–based assessment models. We hope to develop bilateral agreements for sampling of Albacore Tuna and Boarfish, finalise 4S on our pelagic sampling, based on stock ID work to date and depending on the results of the benchmark process in 2021/2022, we are looking to separate mixed stock catches of herring in 6a using genetics. This work will commence in 2023.

In order to support the objectives of Natura, MSFD, OSPAR and especially the CFP to minimise the effects of by-catch of protected, endangered and/or threatened (PET) species, data collection under the DCF will be further developed and expanded with an enhanced sampling programme. These fisheries are the gillnet vessels >10m targeting demersal species and the OTM and PTM vessels >10m targeting *Trachurus trachurus*. Other data collection activities and dedicated projects to evaluate the impact of fisheries on by-catch will be conducted as part of the EMFAF Biodiversity /Marine Knowledge schemes and are described in Text box 4.2 Incidental catches of sensitive species.

Surveys at sea: Assessment of offshore scallop stocks in the Celtic Sea and south Irish Sea is limited by lack of survey data. It is proposed to initiate Annual scallop surveys in the Celtic and Irish Sea, and will be due to commence in 2023 Ireland also plans to commence an annual Young Fish Survey

in 2023 in order to provide more information on recruitment. The Scallop survey and the annual young fish survey will be included in subsequent updates.

Recreational Fisheries: Irelands plans to move to routine data collection programme for the recreational fisheries. This was developed by Inland Fisheries Ireland as a pilot study and will feed into assessment requirements for marine species.

VME/habitat impacts: Encounters of VME indicator species in the catch will be identified as required during surveys and on the at sea sampling frames. Other data collection activities and dedicated projects to evaluate the impact of fisheries on habitats will be conducted as part of the EMFAF Biodiversity /Marine Knowledge schemes. These Schemes are still under development for the Irish Operational Programme.

Stomach sampling: For the Celtic Seas, there are currently neither clearly defined end-user needs for stomach sampling nor regionally coordinated sampling programmes or pilot studies. Ireland therefore does not intend to commence a stomach sampling programme in 2022.
To evaluate future needs for this data collection activity, Ireland is taking the following steps:

- A concept study to evaluate the data requirements for predator prey interactions as inputs to a Celtic Seas multi-species VPA assessment.
- Further development on indicators and data needs for MSFD descriptor 4 including the use of DCF survey data to support trophic guild assessments.
- An increase in capacity in fisheries ecosystem modelling and advice from 2024 onwards once concept studies are concluded.
- Close monitoring of the North Sea regionally coordinated pilot study on IBTS stomach sampling and the interaction with and advisory outputs of WGSAM over the next two years.
- A financial placeholder for future funding of stomach sampling in the DCF budget estimations under EMFAF.

BIM: The MS wants to move away a paper-based system with manual data entry towards an online data entry system where data is stored in a database as there are still some paper based surveys circulated to the industry. The first phase of development in late 2021 will be for the fisheries industry whereby survey forms will be available online and these will connect with a database back end. This will enable the digital capturing, storing and reporting of data. The EU - MAP system will facilitate the entry of data through an online web portal and through a data entry and integration layer which will allow for access to data in current and future systems. The EU - MAP system will include the development of a scalable database storage and support reporting through a BI module. The main objective of this system to support the mandatory EU - MAP reporting.

RCG Secretariat and Webpage: The project SecWeb (MARE2020-08) was setup with the aim of developing mechanisms to support the planning and execution of administrative tasks and the branding and online visibility of the Regional Coordination Groups (RCGs), with the aim to establish a long-term supportive structure (the RCGs' Secretariat).

Give full name, acronym and contact details of all institutes that contribute to the data collection activities, and describe briefly their role in the work plan.

Marine Institute (MI) Rinville, Oranmore, Galway, H91R673, Ireland. +35391 387200

Responsible for the modules in relation to test studies, other data collection activities, biological data collection (excluding recreational fisheries), diadromous fisheries, surveys at sea, impact of fisheries on marine biological resources and relevant quality reports.

Bord Iascaigh Mhara (BIM) Crofton Rd, Dún Laoghaire, Dublin, A96 E5A0 +3531 2144100

Responsible for the data collection in relation to the economic and social data in fisheries, aquaculture and fish processing and the relevant quality reports for socioeconomic data

Inland Fisheries Ireland (IFI) 3044 Lake Dr, Cheeverstown, Dublin +3531 8842600

Responsible for the collection and collation of data from the Diadromous fisheries recreational fisheries in Ireland and associated quality reports.

Provide a link to the national data collection website, if there is one.

https://www.dcmap-ireland.ie/

(max. 1000 words)

Text Box 1a: Test studies description

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

1. Aim of the test study- Digital Data collection

Digital data collection has been commonly used in a number of our sampling programmes and surveys, for example for measuring *Nephrops* lengths, or collecting data during the Irish Groundfish Survey. However, there are still a number of sampling programmes that rely on data being recorded on paper initially before being transcribed. The aim of this test study is to further roll-out digital data collection to onshore commercial sampling in ports.

Port sampling and the associated data entry and screening is very time consuming and is also prone to human error when samplers are transcribing biological parameters collected (i.e. length, weight, sex, maturity and age) from data sheets onto the Stockman database. The objective of transitioning to digital data collection in the ports, is to streamline the data collection process, facilitating quality checking of the data in situ, and in real time, as data is being collected in the sampling location e.g. length weight regressions. Digital data collection will eliminate the need to transcribe data from datasheets, thus reducing the potential for human error and also freeing up valuable time for busy samplers.

There is also a need to digitise the data collection of commercial data at sea, however the sampling on shore has been identified as the first priority with a focus on digitising the data collection on board commercial vessels to come in subsequent years.

2. Duration of the test study

The initial pilot will be performed during 2022, with a further roll-out of devices and refinement of methods during 2023 onwards.

3. Methodology and expected outcomes of the test study

Ruggedised tablets running the Windows operating system will be purchased and a version of our “Stockman” application will be written to run on them in an off-line capacity. Users

will enter the data directly on the tablet – this will then be uploaded to the primary database once the user is back in the office.

An initial pilot of 3 tablets will be used - once the method is validated the aim is to have 10 tablets in the field. The functionality will initially be limited to the users manually measuring data and then entering the data into the tablet – it is planned that later versions will allow input directly from electronic measuring boards.

It is expected that time will be saved by avoiding the need to transcribe data. Quality checks can also be applied automatically whilst the data is being entered – this can allow measurements to be double-checked if needed whilst the fish is still in front of the sampler. These benefits should mean the data collection is more efficient and higher quality.

(max 900 words per study)

Brief description of the results (including deviations from the plan and justifications as to why if this was the case).

Two ruggedized Windows tablets were purchased for the initial trial and a mobile data collection application was developed which would run on these tablets. A number of feedback cycles with the prospective users were undertaken and the application was improved based on their input.
Whilst initial development proceeded on schedule there were two main issues which prevented further piloting and validation (see details below).

Achievement of the original expected outcomes of the study and justification if this was not the case.

Initial development was completed as expected however further piloting and validation was not possible during 2022 due to two main issues:
1) IT security changes
As part of ongoing national work to ensure cyber-security the technical security requirements for mobile devices have been made more stringent during 2022. When there is a change in the security requirements this often requires technical changes to be made to both the tablet’s configuration and the application’s code. This makes the development process slower and subject to factors which are outside of our control.
2) Procurement delays
Six further ruggedized Windows tablets were ordered with delivery expected by the end of 2022 however the supplier failed to meet this date. We will now need to start a new procurement process in 2023 to order the tablets.

Incorporation of study results into regular sampling by the Member State.
It is planned to pilot the remote data collection during 2023, with further roll-out once the system is validated.

Text Box 1b: Other data collection activities

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

1. Aim of the data collection activity

Herring Genetics

At least two stocks of herring are known to mix in ICES Division 6a during times of the year when they are acoustically surveyed and persecuted by the fishery. This issue has caused problems with the assessments for the 6a South7bc and 6a North stocks, leading to a combined assessment following the 2015 ICES benchmark. This combined 6a7bc assessment falls into a lower ICES assessment category than the previous separate assessments and has no biological reference points.

Following a series of projects with EU, national and industry funding, a genetic approach to differentiate the main herring stocks mixing in this area has successfully been developed. As a results of this significant progress, the stocks are due to be benchmarked in Q1 2022. Genetic sample collection has been in place on the relevant acoustic surveys since 2014, allowing a split survey time series that will be examined at the benchmark meeting. Mixed catches of herring from the 6a fisheries have however not been genetically sampled to date. Should the benchmark mandate that the commercial catches of herring also be genetically split, then a new data collection and analysis activity will be necessary.

2. Duration of the data collection activity

If mandated by the benchmark, the collection and analysis of herring genetic samples in 6a would likely begin in 2023. The duration of the data collection activity (sampling and analysis of acoustic survey and commercial catches) would be indefinite i.e. as long as the two 6a stock assessments remain separate.

3. Methodology and expected outcomes of the data collection activity

The tissue sampling methodology has been well established on herring acoustic surveys since 2014 and a specialised tool has been developed to reduce processing time. Genetic markers to differentiate spawning locations have been developed and proven by external project partners. Applying these methods to samples taken from commercial catches should be straightforward once a statistically robust catch sampling regime is applied.

The expected outcomes of this data collection activity are: facilitating the separate assessment of the two herring stocks in 6a, improving the accuracy of said assessments, and improving the sustainable exploitation of a number of herring populations in the area.

Brief description of the results (including deviations from the plan and justifications as to why if this was the case).

The expected outcome was achieved. The ICES benchmark in February 2022 approved a separate assessment for herring in 6.a South, 7.bc and the ICES advice for fishing opportunities in 2023 was based on the Category 3 data limited (MSY) approach, removing the need for a monitoring TAC in the area. This change was mostly made possible by the genetically-split acoustic survey biomass index. Due to the need for a split biomass index each assessment year, the benchmark meeting recommended the continuation of genetic sampling on future Malin Shelf Herring Acoustic Surveys (MSHAS).

Achievement of the original expected outcomes of the study and justification if this was not the case.

All objectives were achieved. In addition to continued genetic splitting of the MSHAS, the benchmark meeting also identified the need to begin genetically sampling the commercial catches of herring in the area in order to accurately assign catches to their population of origin. Therefore, in Q4 2022 and Q1 2023, a trial genetic sampling programme was run in 6.a South, with tissue from approximately 400 individual herring being taken from commercial catch samples during a range of port sampling events. The genotyping results of this trial will be used to inform an appropriate design for future long-term genetic sampling of catches from this stock.

Incorporation of study results into regular sampling by the Member State.

From 2023 onwards regular genetic sampling of a certain proportion of herring in the MSHAS and commercial catch will be incorporated into the sampling plan and a multiyear contract for genotyping will be developed.

Regular updating of the 'baseline' or training dataset and the assignment model used to differentiate herring populations is also required in order to maintain the current levels of accuracy. In 2022/3 a number of new spawning samples were acquired, processed, and added to the training dataset. Improvements to the assignment model that will incorporate the latest genetic sequencing methods are due to be delivered in 2023.

(max. 900 words per study)

General comment: This text box applies to the work plan and the annual report. Use this text box to provide information on other data collection activities that relate to your EMFAF operational programme and need to be included in the work plan and the annual report. Describe activities that are funded by the DCF but fulfil objectives under other EMFAF priorities, like marine knowledge, or activities funded by the DCF, but without a direct link to the EU MAP specific requirements or WP template tables, like freshwater fisheries. You

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

By-catch

1. Aim of the data collection activity

The coastal tangle / trammel net fishery targeting Spiny Lobster and Turbot is known to pose a significant risk of by-catch to certain PET species. Data on by-catch from this metier has been increased since 2017 through a combination of scientific observer and self-reporting of catch and by-catch composition. The programme continues under a new framework where the majority of the vessels in this metier are now contracted to the MI to provide data on catch and by-catch and to engage in a suite of scientific projects with the objective of taking direct actions to mitigate by-catch. These projects are funded by the EMFF and EMFAF programmes and significantly enhance by-catch data for high risk metiers.

2. Duration of the data collection activity

Data will be collected over a four-year period as part of the project running from 2021 to 2025.

3. Methodology and expected outcomes of the data collection activity

The data collection methodology will follow the protocols of the MI at-sea catch sampling programme for these gears. The expected outcomes of this data collection activity are to provide more information on the rates of by-catch and actions to mitigate.

(max 900 words per activity)

Brief description of the results (including deviations from the plan and justifications as to why if this was the case).

PET species. Data on by-catch from this metier on the south west coast of Ireland was obtained annually from 2017-2021 (EMFF) and will continue to end of 2025 (EMFAF) through a combination of scientific observer and self-reporting of catch and by-catch composition. These projects significantly enhance by-catch data for high risk metiers.

Species catch composition and catch rates have been estimated from observer and Skipper sampling data between 2017-2022. Between 300 and 600 nm of net hauls are observed annually. Endangered species of elasmobranchs and grey seals are caught as by-catch

Achievement of the original expected outcomes of the study and justification if this was not the case.

The objectives of the data collection programme are being achieved.

Incorporation of study results into regular sampling by the Member State.

Data will be collected over a four-year period as part of the project running from 2021 to 2025, with a view to incorporating the study results into regular sampling after this time.

(max. 900 words per study)

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

Project SecWeb

1. Aim of the data collection activity

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

2. Duration of the data collection activity

Starting from 2023

3. Methodology and expected outcomes of the data collection activity

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

(max 900 words per activity)

Brief description of the results (including deviations from the plan and justifications as to why if this was the case).

During 2022 the activities of the RCGs Secretariat still developed in the context of the SecWeb Project, which was extended to last until the end of February 2023. The RCG experts and the Member States' NCs engaged in several discussions about the long-term stabilization of the Secretariat services, given the value added by the project to the RCGs networks, and agreed on a

short term solution for continuity in 2023 which was incorporated with a statement in "Text Box 1b: Other data collection activities" of the Annual Work Plans of the Member States.

Achievement of the original expected outcomes of the study and justification if this was not the case.

The SecWeb project was extended until the end of February 2023 and final project deliverables will be available after this time and will be reported in the 2023 Annual Report.

Incorporation of study results into regular sampling by the Member State.

The longer term perspective will build upon the outcomes from SECWEB and will be dealt with inter-sessionally and pan regionally by ISSG NCs in 2023 and beyond.

(max. 900 words per study)

SECTION 2 : BIOLOGICAL DATA

Text Box 2.1: List of required species/stocks North Sea and Eastern Arctic (Region/RFMO/RFO/IO: Please indicate per text box and update the table of contents)

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(a) of the EU MAP Delegated Decision annex. This text box applies to the annual report and complements Table 2.1.

Deviations from the work plan

List the deviations (if any) in the achieved data collection (lengths only) compared to what was planned.

The general reasons for deviations from the work plan in terms of planned vs. achieved data collection should be summarised in this section, while detailed comments on deviations on particular species/stocks should be included in the 'AR comments' column in Table 2.1.

All stocks selected for sampling were sampled in 2022 and the sample numbers and numbers of individuals achieved are reported in Table 2.1.

The only exceptions to this are as follows:

North Sea and Eastern Arctic

In some cases, samples were collected for species that were highlighted as not selected for sampling in the WP, this is the case for *Squalus acanthias* which was sampled opportunistically when encountered. There is also a duplicate row for *Squalus acanthias* which will need to be removed from the WP.

Actions to avoid deviations

Describe the actions that will be considered/have been taken to avoid deviations in the future and when these actions are expected to produce an effect. If there are no deviations, then this section is not applicable.

All stocks selected for sampling across all regions in 2022 were sampled – bar where there were no landings or where they were simply not encountered, in spite of extensive sampling as outlined above, therefore no actions are needed.

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

Text Box 2.1: List of required species/stocks North East Atlantic
(Region/RFMO/RFO/IO: Please indicate per text box and update the table of contents)

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(a) of the EU MAP Delegated Decision annex. This text box applies to the annual report and complements Table 2.1.

Deviations from the work plan

List the deviations (if any) in the achieved data collection (lengths only) compared to what was planned.

The general reasons for deviations from the work plan in terms of planned vs. achieved data collection should be summarised in this section, while detailed comments on deviations on particular species/stocks should be included in the 'AR comments' column in Table 2.1.

All stocks selected for sampling across all regions were sampled in 2022 and the sample numbers and numbers of individuals achieved are reported in Table 2.1.

North East Atlantic

Dasyatis pastinaca and Hexanchus griseus were not sampled, as they were not encountered during 46 sampling events completed on the recreational fisheries sampling programme.

It is also not possible to sample where there are no landings, which was the case for Raja undulata in area 7b, 7j.

Engraulis encrasicolus was selected to sample for length, however there were no catches of anchovy recorded by the Irish fleet in 2022.

Nephrops norvegicus in 5b &6 were highlighted to be sampled for length in Ireland's WP however

Faroes Grounds (Division 27.5.b): There are no designated *Nephrops* Functional Units in Division 27.5.b or *Nephrops* fishing grounds regularly visited by the Irish fleet. Hence no targeted Irish *Neprhops* fishing takes in Division 27.5.b from which to collect samples.

Rockall, Northwest Coast of Scotland and North Ireland (Subarea 27.6)

- Northwest Coast of Scotland and North Ireland or as the West of Scotland (Division 27.6.a)
- Rockall (Division 27.6.b)

FU11 - no Irish landings were recorded in 2022 or 2021

FU13 - no Irish landings were recorded in 2022 or 2021

FU12 - 71.4 tonnes landings in 2022. These Irish landings from FU12 were not sampled owing to their relatively small volumes and irregularity of landings and therefore sampling opportunities. Attention was focused on adequately sampling the important Functional Units in area 7 where the vast majority of Irish fishing effort is focused, and this can be seen in Table 2.1.

Tuna landings can be very unpredictable year on year. In 2022 The vast majority of Irish tuna catches (2,668t) were landed into France and Spain.

Actions to avoid deviations

Describe the actions that will be considered/have been taken to avoid deviations in the future and when these actions are expected to produce an effect. If there are no deviations, then this section is not applicable.

All stocks selected for sampling in 2022 were sampled – bar where there were no landings or where they were simply not encountered, in spite of extensive sampling as outlined above, therefore no actions are needed.

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

Text Box 2.2: Planning of sampling for biological variables North Sea and Eastern Arctic

(Region/RFMO/RFO/IO: Please indicate per text box and update the table of contents)

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(a) of the EU MAP Delegated Decision annex. This text box applies to the annual report and complements Table 2.2.

Deviations from the work plan

List the deviations (if any) in the achieved collection of biological data (other than lengths), compared to what was planned.

The general reasons for deviations from the work plan in terms of planned vs. achieved data collection should be summarised in this section, while detailed comments on deviations on particular species/stocks should be included in the 'AR comments' column in Table 2.2.

No Deviations, sampling implemented as envisaged.

Actions to avoid deviations.

Describe the actions that will be considered/have been taken to avoid deviations in the future and when these actions are expected to produce an effect. If there are no deviations, then this section is not applicable.

No Deviations and no actions needed.

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

Text Box 2.2: Planning of sampling for biological variables Other Regions (Region/RFMO/RFO/IO: Please indicate per text box and update the table of contents)

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(a) of the EU MAP Delegated Decision annex. This text box applies to the annual report and complements Table 2.2.

Deviations from the work plan

List the deviations (if any) in the achieved collection of biological data (other than lengths), compared to what was planned.

The general reasons for deviations from the work plan in terms of planned vs. achieved data collection should be summarised in this section, while detailed comments on deviations on particular species/stocks should be included in the 'AR comments' column in Table 2.2.

Thunnus alalunga landings into Ireland were sampled by the Marine Institute and Irish landings into French and Spanish ports were covered under bi lateral agreements between Ireland and France and Ireland and Spain.

Actions to avoid deviations.

Describe the actions that will be considered/have been taken to avoid deviations in the future and when these actions are expected to produce an effect. If there are no deviations, then this section is not applicable.

No Deviations and no actions needed.

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

Text Box 2.2: Planning of sampling for biological variables North East Atlantic (Region/RFMO/RFO/IO: Please indicate per text box and update the table of contents)

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(a) of the EU MAP Delegated Decision annex. This text box applies to the annual report and complements Table 2.2.

Deviations from the work plan

List the deviations (if any) in the achieved collection of biological data (other than lengths), compared to what was planned.

The general reasons for deviations from the work plan in terms of planned vs. achieved data collection should be summarised in this section, while detailed comments on deviations on particular species/stocks should be included in the 'AR comments' column in Table 2.2.

Demersal– at–sea:

Across the entire sampling – at – sea scheme, achieved sampling was lower than expected. At the beginning of 2022 the Irish fishing industry was coming to terms with major disruptive events negatively affecting the industry, such as Brexit (significant reduction in fishing opportunities) and the effect of Covid lockdowns on international fish markets when at the end of quarter one the fuel crisis added yet another layer of complexity and difficulty.

In an effort to mitigate for the effects of Brexit the Irish State had taken action as recommended by the Seafood Taskforce and instigated a temporary tie up scheme where up to 60 vessels could tie up for up to two months of the year whilst receiving a state subsidy (with a month in-between at sea fishing) thus leaving more of a monthly quota for those vessels not tied up. This resulted in fewer sampling opportunities at sea as we had less vessels fishing and fewer sampling opportunities for sampling ashore.

The State also launched a Decommissioning Scheme with the intention of removing 8000GT or 60 vessels from the fleet in an effort to make the remaining units more profitable with the resulting balance of Irish quota available to them. While this scheme was launched in 2022 and originally to come into effect in December 2022 it did not come into effect until Jan/Feb 2023 when the first of the vessels were cut up. Given this operating climate and the level of uncertainty faced by skippers and owners, it is not entirely surprising that vessels were not very inclined to participate in the Marine Institute demersal at sea sampling program during this time.

The fuel crisis precipitated by the invasion of Ukraine resulted in greatly increased fuel costs for Irish fishing vessels in 2022 which not only affected the margins to the vessels but also affected decisions to fish and fishing patterns whilst at sea. Vessels which would in the past, choose to sail for short 3-4 day trips in between weather patterns/systems, were holding off, and waiting for better weather windows. With margins so tight, the cost of getting to and from fishing grounds for a short time on the ground did not make economic sense for some. This resulted in lower number of landings and thus fewer sampling opportunities ashore and at sea. The Irish fishing industry also felt that the

Irish State had let them down by not providing a fuel subsidy, as other member states have for their respective fleets. This may also have increased non participation with the demersal Marine Institute sampling at sea scheme, as it was an area where the industry could vent some of the frustration via non participation.

While 2022 was a very difficult year for the demersal at sea sampling scheme, we would hope, that following restructuring post decommissioning and with a reduction in fuel costs, that participation with the demersal at sea sampling scheme will improve greatly throughout 2023.

Gadus morhua 6a Demersal – On – Shore: Q1 sex and maturity sampling for cod was challenging. Some covid restrictions remained in place in Q1, but these were fully lifted at the sampling location from Q2 onwards.

Lophius budegassa 7b-k, 8abd: Illicia/otoliths are not currently collected for monk in 7b-k, 8abd. Ireland did originally age using illicia, but the ageing protocol was deemed unreliable and ageing was stopped. The Stock Assessment for *L. budegassa* is now a length based assessment.

Mollusca on-shore: Buccinum undatum Irelands WP includes 2 rows for weight for whelk but there is a duplicate row, this will be corrected. At the moment Ireland only takes shell height measurements, samples are being processed as we sample them, giving us a very limited time window to sample across vessels.

Pelagic – on shore: *Sprattus sprattus* in area 7 (excluding 7d): A duplicate row appears in the WP which will be removed. Also, Ireland has length measurements for sprat but no individual weights. This will be reviewed.

Actions to avoid deviations.

Describe the actions that will be considered/have been taken to avoid deviations in the future and when these actions are expected to produce an effect. If there are no deviations, then this section is not applicable.

Demersal–at–sea:

In the post Covid environment Ireland has retrained seagoing staff and retained the At Sea Self Sampling program to help ensure maximum resource availability and participation in the demersal at sea sampling program. We have also recruited a dedicated sampling at sea contractor, under a pilot programme, to increase the sampling at sea. This is an effort to mitigate for the reducing resource availability owing to contractors having better opportunities in the ORE sector. Ireland have also undertaken an extensive outreach program to increase participation by the fleet with the Demersal – at – sea programme. After the conclusion of the decommission scheme, it is hoped that those remaining vessels will indeed be more profitable and it is expected that this will help to increase participation in the sampling programme as the industry view the at sea sampling programme as a vital component to ensuring future viability.

Gadus morhua 6a Demersal- on – shore: Sampling has returned to normal in this sampling location post covid and Q1 sex and maturity targets have been reached in 2023.

Lophius budegassa 7b-k, 8abd: The WP will be reviewed in light of the fact that this stock does not have an age based assessment, and the WP and /or sampling protocols will be updated as needed.

Mollusca on-shore: Buccinum undatum A review of the necessity to collect weight for whelk, will be conducted and the WP and/or sampling procedures will be updated as necessary.

Pelagic – on shore: *Sprattus sprattus* in area 7 (excluding 7d): The WP will be updated and sampling requirements reviewed.

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

Text Box 2.3: Diadromous species data collection in freshwater

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

MI/ESB Programmes: Text Box filled for Sampling Scheme Identifier: Diad_ESB_Eel, Diad_MI_Eel, Diad_MI_Salmon_SeaTrout, Diad_MI_Salmon_CWT and Diad_ESB_Counter

IFI Programmes: Text Box filled for Sampling Scheme Identifier: Wild Salmon and Sea Trout Tagging Scheme Recreational, Wild Salmon and Sea Trout Tagging Scheme commercial, Biological sampling NSIC, Biological sampling smolts NSIC

MI Programme (Including ESB)

Sampling Scheme Identifier: Diad_ESB_Counter

Counter Smolt Fixed permanent counter upstream monitor salmon and and kelt moving downstream, enabling full census on wild salmon and released reared salmon. These are situated at or closed to the tidal limit and are fixed to natural or hydropower barriers or weirs on the Shannon Ardnacrusha and Parteen (IE_Sha) and Erne (IE_NorW) and Clady. These counters provide a valuable time series of relative abundance of wild salmon smolts and released reared salmon smolts.

Use: Counters provide annual index recruitment abundance data for ICES WGNAS datacalls and in WGNAS assessment model.

Adult Fixed permanent counter downstream monitor adult salmon moving upstream, enabling full census on wild salmon and released reared salmon.

These are situated at or closed to the tidal limit and are fixed to natural or hydropower barriers or weirs on the Shannon Ardnacrusha and Parteen (IE_Sha) and Erne (IE_NorW) and Clady. These counters provide a valuable time series of relative abundance of wild salmon adults and released salmon adults.

Use: Counters provide annual index recruitment abundance data for ICES WGNAS datacalls and in WGNAS assessment model

Sampling Scheme Identifier: Diad_ESB_Eel

Glass Eel/Recruitment Traps Fixed permanent elver ladder traps monitor upstream recruiting juvenile eel. These are situated at or closed to the tidal limit and are fixed to natural or hydropower barriers or weirs on the Shannon Ardnacrusha and Parteen (IE_Sha) and Erne (IE_NorW). These traps provide a valuable time series of relative abundance of glass eel and young yellow eel recruits and are used in the annual ICES WGEEL stock assessment.

Use: Elver traps provide annual index recruitment abundance data for ICES WGEEL. Data are collected in biomass (kg) or where numbers are very low, counts are made and converted to biomass. For WGEEL datacalls, numbers are converted from biomass using site specific conversion factors related to size and age of recruits.

Silver Eel Escapement Methods: Data collected on silver eel conservation trap and Transport on the Erne (IE_NorW), Shannon (IE_Sha) and Liffey (IE_East). Eels are captured in the programme using location specific gear types, such as bridge mounted coghill nets, and or river anchored V-Wing Fykes. Programme to estimate silver eel production/escapement and to monitor downstream trap and transport of migrating silver eel using mark-recapture, DIDSON, hydrological profiles and assessment models. Additional sampling (length, silvering characteristics) undertaken at the points of capture.

Use: determines eel escapement. Used to set the levels of trap and transport of silver eel in the Erne, Shannon and Lee which is a management measure in the Irish EMP. Used in conjunction with T&T quantities to estimate silver eel production and escapement, Erne and Shannon are index rivers in the Irish model – IMESE)

The above described programmes contribute to the national eel monitoring programme (Eel: Council Regulation 1100/2007), which operate across different Irish agencies and parent departments.

Sampling Scheme Identifier: Diad_MI_Eel

Glass Eel/Recruitment Traps Fixed permanent elver ladder traps monitor upstream recruiting juvenile eel. These are situated at or closed to the tidal limit and are fixed to

natural or hydropower barriers or weirs on the Liffey (IE_East) and Burrishoole (IE_West). These traps provide a valuable time series of relative abundance of glass eel and young yellow eel recruits and are used in the annual ICES WGEEL stock assessment.

Use: Elver traps provide annual index recruitment abundance data for ICES WGEEL. Data are collected in biomass (kg) or where numbers are very low, counts are made and converted to biomass. For WGEEL datacalls, numbers are converted from biomass using site specific conversion factors related to size and age of recruits.

Yellow Eel Standing Stock Electrofishing and fyke net surveys Electrofishing river surveys and fyke net lake surveys on the Burrishoole Catchment (IE_West) target yellow eel in selected water bodies, all fish are identified; weight and length measurements taken.

Use: Estimating yellow eel (river, lake and transitional water) populations. Used in time series analysis in ICES WGEEL. May be used in future eel stock assessment modelling employing the French Eel Density Assessment (EDA) model. Outputs will be reported under EU Regulation metrics and also in ICES Datacalls

Silver Eel Production/Escapement Traps Permanent traps monitor downstream migrating silver eels on the Burrishoole River (IE_West) providing a full daily census.

Use: For estimating annual production and escapement of silver eel. Numbers of fish migrating downstream, daily number, size, weight and sex ratio of emigrating silver eels (used in the Irish model for estimating silver eel escapement - IMESE). Above described programmes contribute to the national eel monitoring programme (Eel: Council Regulation 1100/2007), which operates across different Irish agencies and parent departments.

Sampling Scheme Identifier: Diad_MI_ Salmon_SeaTrout

Parr Electrofishing surveys Electrofishing (salmon, trout) surveys target juvenile salmon and trout in selected water bodies of the Burrishoole catchment (IE_West), all fish identified; weight and length measurements taken.

Use: Estimating juvenile salmon and trout (river) populations. Juvenile stocks linked to stock/recruitment data collected from the main census traps. Used in time series analysis in ICES WGTRUTTA.

Smolt Traps Permanent traps in Burrishoole (IE_West) monitor salmon and sea trout smolt (and kelt) moving downstream, enabling full census on wild salmon, released reared salmon and wild sea trout.

National Coded Wire Tagging Scheme Tags seaward migrating salmon smolts, detected upon river return as adults. Data include release and recovery locations, dates and sea age.

Use: Estimating survival/exploitation rates and straying of wild/hatchery salmon.

Adults Traps Permanent traps in Burrishoole (IE_West) monitor adult salmon and trout moving upstream from the sea, enabling full census on wild salmon, released reared salmon and wild sea trout.

Use: Estimating annual returns of adult salmon and recruitment of salmon and sea trout smolt. Numbers of fish upstream/downstream, daily number, size, weight and sex ratio of salmon, sea trout.

Data are provided in datacalls to ICES WGNAS and in annual data collation in ICES WGTRUTTA. Index data from Burrishoole are used to calibrate annual models and assessments, due to the long time series available.

Data also used by the National Technical Expert group on Salmon to calibrate the national assessments for setting Conservation Limits.

Sampling Scheme Identifier: Diad_MI_Salmon_CWT

National Coded Wire Tagging Scheme, Smolt and Adult life stages Tags seaward migrating salmon smolts, detected upon river return as adults. Data include release and recovery locations, length of tagged smolt, dates and sea age.

Tagging carried out on 7 rivers, Bundorragha river; Burrishoole river; Cong river; Corrib river; Erne river, Lee river and Shannon River.

Use: Estimating survival/exploitation rates and straying of wild/hatchery salmon.

Data are provided in data calls to ICES WGNAS. Index data from Burrishoole are used to calibrate annual models and assessments, due to the long time series available.

Data also used by the National Technical Expert group on Salmon to calibrate the national assessments for setting Conservation Limits.

Sampling Scheme Identifier: Eel_elver_trap_Diadromous (scientific)

Recruits: Time series data is required on number of recruiting eels (glass or elver) to Ireland. The elver traps are located at the high water mark capturing elvers as they migrate from transitional waters to freshwater. The trap is a unit of effort with catch per night recorded. Length data will be collected on specified dates to gather relevant biometry data for WGEEL data call and to supplement existing biometry data for the traps collected since 2009.

Sampling Scheme Identifier: Eel_Silver_Diadromous (scientific)

Silver Eel: Coghill nets set per night giving number of eels per survey. Number of nets are fixed for each site. Locations are former commercial fishing sites. Biometry data collected will include length, weight, eye measurements; where needed 50-100 eels will be taken back to laboratory for further analysis re sex determination, age, growth, parasite prevalence, intensity, swimbladder damage.

Sampling Scheme Identifier: Eel_Fykenet_Diadromous (scientific)

Yellow eel: Fyke Net Survey, nets set in standardised chains of 5 nets for 1 night giving a catch per unit of effort (net nights). Biometry data collected including length, weight, eye measurements. Standard Operating Procedure available on DCMAP Ireland websites. Biometry data collected will include length, weight, eye measurements; where needed 50-100 eels will be taken back to laboratory for further analysis re sex determination, age, growth, parasite prevalence, intensity, swimbladder damage.

Sampling Scheme Identifier: - Wild Salmon and Sea Trout Tagging Scheme Recreational

Sampling scheme aiming at collecting annual catch quantities for Salmo salar in the freshwater part of their lifecycle as specified in Tables 1 and 4 of the EU MAP Delegated Decision annex and to provide data on fishing effort ;number and weight of all salmon caught separated by fisheries, location, age class with estimates also required for unreported catches; weight of ranched salmon caught; assignment to jurisdiction/region/river of origin of adult salmon; and sea age composition of returning adults; as specified by the RCG ISSG Diadromous Fishes.

The 5 Index rivers selected are Owenmore, Drowes, Mulkear, Laune, Slaney and Boyne.

Sea age will be determined based on date of capture or the relative proportion of stock that is one-sea-winter or multi-sea-winter proportion applied by the Technical Expert Group on Salmon. Unreported catch will be assumed be to 10% of reported raised recreational catch.

Sampling Scheme Identifier: Wild Salmon and Sea Trout Tagging Scheme commercial

These fisheries are primarily in single river estuaries (only three stocks i.e. Killary, Owenmore estuary and Castlemaine are mixed-stock estuary fisheries). As such this is

considered to come under sampling scheme aiming at collecting annual catch quantities for Salmo salar in the freshwater part of their lifecycle as specified in Tables 1 and 4 of the EU MAP Delegated Decision annex and to provide data on fishing effort ;number and weight of all salmon caught separated by fisheries, location, age class with estimates also required for unreported catches; weight of ranched salmon caught; assignment to jurisdiction/region/river of origin of adult salmon; and sea age composition of returning adults; as specified by the RCG ISSG Diadromous Fishes.

There are no marine commercial or freshwater commercial fisheries for salmon in Ireland.

Locations include: Bandon; Barrow and Pollmounty; Belclare; Blackwater, Glenshelane, Finisk; Caragh; Castlemaine; Dawros; Eany; Feale, Galey and Brick; Glenamoy; Gweebarra; Ilen; Inny; Killary; Laune and Cottoners; Lower Lee (Cork); Maine; Moy; Newport; Nore; Owenduff; Owenea and Owentocker; Owenglin; Owenmore estuary; Roughty; Sheen; Sneem; Suir, Clodiagh, Lingaun, Blackwater; Waterville.

Sampling Scheme Identifier: Biological sampling NSIC

Length (cm), weight (kg) and age (scale sample as one-sea-winter or multi-sea-winter) are collected from a random sample of 100 adult Atlantic salmon per annum intercepted in the upstream fish trap at the National Salmonid Index Catchment River Erriff.

Sampling Scheme Identifier: Biological sampling smolts NSIC

Trapping facilities to capture and tag out-migrating smolts for DCMAP purposes at Tawnyard in the Erriff catchment during the smolt run in April to May each year. For the Erriff, total numbers can be determined, and age composition taken from scale samples of 100 smolts per species per annum.

(max 250 words per species and area)

Sampling Scheme Identifier: Diad_ESB_Counter

Were the planned numbers achieved? Yes/ No

No sampling achieved in 2022.

If the answer is No, explain why not, and what measures were taken to avoid non-conformity.

Eel sampling in Ireland under the EUMAP involves several actors one of whom (ESB) is a national utilities company, who fund and manage this activity directly. This company changed some of its sampling arrangements in 2022, the impact of this is being discussed at the National Technical Eel Group who are working towards ensuring the Irish sampling for eel is mitigated.

(max 250 words per species and area)

Sampling Scheme Identifier: Diad_ESB_Eel

Were the planned numbers achieved? Yes/ No

60% sampling achieved for Silver eel in the Erne, but no sampling for eel across other locations in 2022.

If the answer is No, explain why not, and what measures were taken to avoid non-conformity.

Eel sampling in Ireland under the EUMAP involves several actors one of whom (ESB) is a national utilities company, who fund and manage this activity directly. This company changed some of its sampling arrangements in 2022, the impact of this is being discussed at the National Technical Eel Group who are working towards ensuring the Irish sampling for eel is mitigated.

(max 250 words per species and area)

Sampling Scheme Identifier: Diad_MI_Eel

Were the planned numbers achieved? Yes/ No

Yes

If the answer is No, explain why not, and what measures were taken to avoid non-conformity.

All sampling achieved as planned.

(max 250 words per species and area)

Diad_MI_ Salmon_SeaTrout

Were the planned numbers achieved? Yes/ No

Yes

If the answer is No, explain why not, and what measures were taken to avoid non-conformity.

All sampling achieved as planned.

(max 250 words per species and area)

Diad_MI_Salmon_CWT

Were the planned numbers achieved? Yes/ No

Yes

If the answer is No, explain why not, and what measures were taken to avoid non-conformity.

All sampling achieved as planned

(max 250 words per species and area)

Eel_elver_trap_Diadromous (scientific)

Were the planned numbers achieved? Yes/ No

Mostly: 85% achieved for Inagh Trap and 100% achieved for the Corrib Trap.

If the answer is No, explain why not, and what measures were taken to avoid non-conformity.

For the Elver traps an estimate of 32 trips to the trap was estimated for the Inagh trap only 27 records exist for assessing the trap. This was due to an early finish of the migration run which meant monitoring was no longer required following a series of zero catches.

(max 250 words per species and area)

Eel_Silver_Diadromous (scientific)

Were the planned numbers achieved? Yes/ No

Mostly for the Barrow and yes for the Fane

If the answer is No, explain why not, and what measures were taken to avoid non-conformity.

A combination of low catch on Barrow and large catch on Fane coupled with limited staff resources available to service both sites at the same time, meant limited staff resources were sent to the fane catchment as the catches there were higher.

The variability in catches from year to year, is very hard to predict and sampling is directed to ensure representative sampling across all catchments.

(max 250 words per species and area)

Eel_Fykenet_Diadromous (scientific)

Were the planned numbers achieved? Yes/ No

No

If the answer is No, explain why not, and what measures were taken to avoid non-conformity.

No fyke net study carried out in 2022 as resources were not available. Work is continuing on a National Level to plan the resumption of this activity of this survey in the future.

(max 250 words per species and area)

Wild Salmon and Sea Trout Tagging Scheme Recreational

Were the planned numbers achieved? Yes/ No

No

If the answer is No, explain why not, and what measures were taken to avoid non-conformity.

For this scheme, achievement of the planned numbers depends on: 1) how many salmon are caught by fisheries; and 2) whether the fishery is open for fishing or closed based on scientific and associated management advice for the particular stock. Therefore, in certain instances, it was not possible to achieve the minimum number of units in cases where the fishery was closed or less than the minimum number of units of fish were caught. Alternatively, when the catches were greater than the minimum number of units, the data is available and therefore, an excess of the minimum units is reported. In general, it should be noted that the units are identified as 'planned minimum number of units' and the WP comments in the excel file state "number will be dependent on returns from anglers".

Therefore, no action can be taken as the shortfalls are entirely dependent on a fishery being open in the first instance, and if open, is dependent on returns from fishers.

(max 250 words per species and area)

Wild Salmon and Sea Trout Tagging Scheme commercial

Were the planned numbers achieved? Yes/ No

No

If the answer is No, explain why not, and what measures were taken to avoid non-conformity.

For this scheme, achievement of the planned numbers depends on: 1) how many salmon are caught by fisheries; and 2) whether the fishery is open for fishing or closed based on scientific and associated management advice for the particular stock. Therefore, in certain instances, it was not possible to achieve the minimum number of units in cases where the fishery was closed or less than the minimum number of units of fish were caught. Alternatively, when the catches were greater than the minimum number of units, the data is available and therefore, an excess of the minimum units is reported. In general, it should be noted that the units are identified as 'planned minimum number of units' and the WP comments in the excel file state "number will be dependent on returns from fishers".

Therefore, no action can be taken as the shortfalls are entirely dependent on a fishery being open in the first instance, and if open, is dependent on returns from fishers.

(max 250 words per species and area)

Biological sampling NSIC

Were the planned numbers achieved? Yes/ No

No

If the answer is No, explain why not, and what measures were taken to avoid non-conformity.

50 of the target 100 samples were taken. Planned numbers were not achieved in 2022 due temporarily unavailable resources; work is ongoing to mitigate for this in 2023.

(max 250 words per species and area)

Biological sampling smolts NSIC

Were the planned numbers achieved? Yes/ No

Yes

If the answer is No, explain why not, and what measures were taken to avoid non-conformity.

No deviations, therefore no action needed.

(max 250 words per species and area)

Text Box 2.4: Recreational Fisheries

(Region: Please indicate per text box and update the table of contents)

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.

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

Fish catch rates from shore-based recreational angling (including beach, rock, pier and estuary) and inshore recreational angling (including private and rental boat, kayak and charter vessel) will be assessed as these components comprise virtually all marine recreational fishing (MRF) landings in Ireland.

Sampling methods, developed during the pilot study on MRF in Ireland (Ryan et al., 2021), have been refined and will be utilised to estimate area-specific catch rates on an annual basis. A multi-species sampling frame is being used which will account for all species listed in Table 4 of the EU MAP Delegated Decision annex, as well as all other angling species encountered in Ireland.

A combination of on-site (IMREC_CREEL, IMREC_OB_CH_SURVEY) and off-site (IMREC_ANG_DI, IMREC_SKP_DI) sampling programmes are being employed to estimate MRF catch rates in Ireland.

Deviations from the work plan

List the deviations (if any) in the achieved data collection, compared to what was planned in the work plan and explain the reasons for the deviations.

Catch data for ICES divisions 6a, 7b &7j were also collected in addition to the planned sampling in 7a and 7g in both the IMREC_ANG_DI, and IMREC_SKP_DI programmes. This was done at no additional expense to the DCF. All other programmes were implemented as planned.

Action to avoid deviations

Describe the actions that will be considered/have been taken to avoid the deviations in the future and when these actions are expected to produce results.

Additional data collected, otherwise the programmes were implemented as planned with no further deviations, therefore no actions needed.

(max 900 words per region)

Text Box 2.5: Sampling plan description for biological data North East Atlantic (Region/RFMO/RFO/IO: Please indicate per text box and update the table of contents)

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.

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

Sampling scheme: Demersal at-sea, Demersal vessels – At-sea and self-sampling

The scheme covers all vessels>10m, all gears, that landed demersal species (including *Nephrops*) in the same quarter of the previous year. The scheme has two sampling components: At-sea sampling and self-sampling. At-sea sampling and self-sampling trips are based on the same sampling frame, which is a list of vessels, stratified into three geographic

regions where the vessel mainly operates. PSUs are selected with unequal probability, based on past landings of demersal species. Currently Ireland has a limited at-sea sampling programme due to Covid 19 restrictions so where we are unable to get an on-board sampler, vessels are asked to undertake an at sea self-sampling trip. As restrictions ease and when safe to do so Ireland will endeavour to get more samplers to sea but will also continue with the at sea self-sampling scheme thus enabling two data streams to feed into the catch sampling programme. In future work programmes we will split out this scheme into two separate schemes once a full at-sea programme resumes. Provision is made for monitoring bycatch, rare and VME species as part of this sampling scheme

Sampling scheme: Demersal at-sea Enhanced, Demersal vessels - Enhanced

In order to support the objectives of Natura, MSFD, OSPAR, and the CFP, further sampling of PET species bycatch will be undertaken as part of the 'enhanced' sampling programme to supplement bycatch sampling planned through the DCF sampling-at-sea scheme. The DCF demersal-at-sea sampling scheme covers all vessels >10m and all gears that land demersal species, and provision is made for monitoring bycatch, rare and VME species as part of this sampling scheme. The recommendations of STECF and WKPETSAMP included an increase in monitoring of metiers with a high risk of protected species bycatch. As such, based on a risk assessment of Irish fisheries, high risk metiers for the demersal fleet were identified and have been targeted by this enhanced sampling scheme. The enhanced scheme, in contrast to the regular DCF sampling scheme, targets demersal metiers deemed high risk to PETS following the results of this risk assessment. Specifically, the enhanced scheme covers all gillnet vessels >10m that landed demersal species. The enhanced sampling scheme will ensure sampling is undertaken on metiers deemed at high risk for bycatch of PETS, in addition to bycatch sampling concurrently carried out across all metiers. At-sea sampling is based on the same sampling frame, which is a list of gillnet vessels only, stratified into three geographic regions where the vessel mainly operates. PSUs are selected with unequal probability, based on past landings of demersal species. Currently Ireland has a limited at-sea sampling programme due to Covid 19 restrictions so where we are unable to get an on-board sampler, vessels are asked to undertake an at sea self-sampling trip. As restrictions ease and when safe to do so Ireland will endeavour to get more samplers to sea but will also continue with the at sea self-sampling scheme thus enabling two data streams to feed into the catch sampling programme.

Sampling scheme: Demersal on-shore, Main demersal ports

The scheme covers the top ports where 95% of the demersal landings (excluding *Nephrops*) take place. The scheme has a single sampling frame: Main Demersal Ports. The sampling frame is stratified into geographical areas for practical reasons. PSU targets are based on the demersal landings of the same quarter in the previous year. Provision is made for monitoring incidental bycatch and rare species as part of this sampling scheme.

Sampling scheme: Pelagic at-sea Herring, Pelagic vessels targeting Herring

The target population is the group of vessels that are engaged in the Irish fisheries targeting the herring stocks of 6a.7bc (North West), Celtic Sea, and Irish Sea. All vessels that are authorised to fish for each herring stock in the sampling year are included in the sampling frame. The yearly lists of authorisations are compiled by the relevant section of the Department of Agriculture, Food and the Marine (DAFM) in conjunction with management advisory committees. The sampling frames are stratified by semester. The PSU is vessel*time. Vessels are sampled from the list with replacement. Sampling is carried out by a sampler on-board for the duration of the fishing trip. Provision is made for monitoring bycatch and rare species as part of this sampling scheme.

Sampling scheme: Pelagic at-sea enhanced, Pelagic vessels - Enhanced programme targeting horse mackerel, mackerel and blue whiting

In order to support the objectives of Natura, MSFD, OSPAR, and the CFP, further sampling of PET species bycatch will be undertaken as part of the 'enhanced' sampling programme to supplement bycatch sampling planned through the DCF sampling scheme. The DCF pelagic-at-sea sampling schemes cover all vessels >10m and all gears that land pelagic species such as tuna, mackerel, horse mackerel, herring, and blue whiting, and provision is made for monitoring bycatch, rare and VME species as part of this sampling scheme. The recommendations of STECF and WKPETSAMP included an increase in monitoring of metiers with a high risk of protected species bycatch. As such, based on a risk assessment of Irish fisheries, high risk metiers for the pelagic fleet were identified and have been targeted by this enhanced sampling scheme. The enhanced scheme, in contrast to the regular DCF sampling scheme, targets demersal metiers deemed high risk to PETS following results of this risk assessment. Specifically, the enhanced scheme covers all midwater otter trawl (OTM) and pelagic pair trawl (PTM) vessels >10m that landed horse mackerel, mackerel or blue whiting. The enhanced sampling scheme will ensure sampling is undertaken on metiers deemed at high risk for bycatch of PETS, in addition to generally bycatch sampling concurrently carried out across all metiers. At-sea sampling are based on the same sampling frame, which is a list of these high risk pelagic vessels only, stratified into three geographic regions where the vessel mainly operates. PSUs are selected with unequal probability, based on past landings of specific pelagic species. Currently Ireland has a limited at-sea sampling programme due to Covid 19 restrictions so where we are unable to get an on-board sampler, vessels are asked to undertake an at sea self-sampling trip. As restrictions ease and when safe to do so Ireland will endeavour to get more samplers to sea but will also continue with the at sea self-sampling scheme thus enabling two data streams to feed into the catch sampling programme.

Sampling scheme: Pelagic on-shore Boarfish, Boarfish Self sampling

A significant proportion of boarfish is landed into foreign ports and the fishery is prosecuted by a small number of vessels. A reference fleet (2 vessels) collect 2 samples per ICES division per week, freezes and stores for collection when returning to an Irish port.

Sampling scheme: Pelagic on-shore Herring, Pelagic vessels targeting Celtic Sea, NW, Irish Sea Herring

The sampling scheme covers all Irish pelagic and polyvalent vessels authorised to land herring in ICES areas 6 and 7. Both the Celtic Sea herring and 6a.7bc (North West) herring stocks are currently under monitoring TACs and sampling is therefore dictated by the needs to continue the respective scientific time-series. In the Celtic Sea, ICES has advised a target of 17 samples per year across the main fleet and sentinel fleet. To achieve this the PSU is haul * area or day where feasible. In 6a.7bc the PSU is fishing trip and all trips are to be sampled. The target of 25 samples has been set based on the number of trips in the preceding three years. Special arrangements are in place for both stocks to secure the necessary samples. The sampling scheme for Celtic Sea and 6a.7bc will need to be amended in order to be compliant with 4S if and when the stocks rebuild and support a full fishery. Pelagic on-shore sampling of Irish Sea herring is conducted on a random basis.

Sampling scheme: Pelagic on-shore Sprat, Pelagic vessels targeting Sprat

The targeted population is the commercial catch of Sprat by Irish pelagic vessels from all ICES areas. All vessels licenced for the fishery are included in the sampling frame, including a sizeable proportion of less than 10m vessels. The PSU is fishing trip*species. Irish sprat landings are highly variable year-to-year. The target number of PSUs therefore needs to be flexible. In years with significantly higher sprat fishing effort, sampling intensity will be increased accordingly. In years with particularly low sprat fishing effort, it may not be possible to reach the sampling target.

Sampling scheme: *Nephrops* at sea self-sampling, *Nephrops* vessels in FU16

Further to the designated **Demersal at-sea** (detailed above) sampling targeting dedicated *Nephrops* fishing vessels takes place for Functional Unit (FU) 16 - Porcupine Bank *Nephrops* Ground. This is in order to ensure adequate sampling occurs to gather size measurements (carapace length) for the ICES FU16 assessment to be undertaken. The scheme covers all vessels >10m that target *Nephrops* in FU 16. These vessels pack and freeze catch on-board, reducing possibility for on-shore landings sampling. The scheme operates self-sampling programme. Vessels that have historically reported *Nephrops* landings are included in the quasi-reference fleet. Each undertakes on average 3 to 5 fishing trips per year to FU16. The quasi-reference fleets are not stratified owing to their low number and are sampled as and when availability allows according to reasonable logistics and constraints. The FU16, Porcupine Bank *Nephrops* Ground fishery is closed during summer months: by EU Regulation for three months (May 1st – July 31st) from 2010 to 2012, reducing to may since

2013, however Irish national restrictions continue to close the ground between the end of May and the end of September, this requires sampling to be aligned to available opportunities. PSUs are selected with unequal probability, based on past landings. Currently Ireland has a limited at-sea sampling programme due to Covid 19 restrictions so where we are unable to get an on-board sampler, vessels are asked to undertake an at sea self-sampling trip. As restrictions ease and when safe to do so Ireland will endeavour to get more samplers to sea but will also continue with the at sea self-sampling scheme thus enabling two data streams to feed into the catch sampling programme. Provision is made for monitoring bycatch, rare and VME species as part of this sampling scheme.

Sampling scheme: *Nephrops* at-sea, *Nephrops* vessels in FU16

Further to the designated **Demersal at-sea, Demersal vessels – At-sea and self-sampling** (detailed above) sampling targeting dedicated *Nephrops* fishing vessels takes place for Functional Unit (FU) 16 - Porcupine Bank *Nephrops* Ground. This is in order to ensure adequate sampling occurs to gather size measurements (carapace length) for the ICES FU16 assessment to be undertaken. The scheme covers all vessels >10m that target *Nephrops* in FU 16. These vessels pack and freeze catch on-board, reducing possibility for on-shore landings sampling. The scheme operates At-sea sampling. Vessels that have historically reported *Nephrops* landings are included in the quasi-reference fleet. Each undertakes on average 3 to 5 fishing trips per year to FU16. The quasi-reference fleets are not stratified owing to their low number and are sampled as and when availability allows according to reasonable logistics and constraints. The FU16, Porcupine Bank *Nephrops* Ground fishery is closed during summer months: by EU Regulation for three months (May 1st – July 31st) from 2010 to 2012, reducing to may since 2013, however Irish national restrictions continue to close the ground between the end of May and the end of September, this requires sampling to be aligned to available opportunities. PSUs are selected with unequal probability, based on past landings. Provision is made for monitoring bycatch, rare and VME species as part of this sampling scheme.

Sampling scheme: *Nephrops* on shore, *Nephrops* vessels excluding FU16

All commercial catch fractions from the *Nephrops* fisheries landed into Ireland, from the primary *Nephrop*s Functional Units (FU) fished by Irish registered vessels (or for fisheries where a bi-lateral agreement is in place).

Population sampled: 98% of the *Nephrops* landings are covered by the sampling program. All vessel classes > 10 metres and only *Nephrops norvegicus* are included in the sampling program. FUs 11 to 14 are not routinely sampled owing to low levels of national participation in these fisheries.

Stratification: Sampling events are stratified by FU/vessel/year/month. *Nephrops* grounds are geo-referenced by FU (FU15, FU17, FU19, FUs20 and 21 combined, and FU22).

Samples are brought ashore by fishers or by on-board samplers.

Sampling scheme: Crustacea at-sea, Potting Vessels

European lobster (*Homarus gammarus*) and Brown crab (*Cancer pagurus*) catches are sampled on board commercial vessels around the coast of Ireland in ICES areas 6 and 7 through an at sea sampling programme with sampling trips occurring on an ad-hoc basis during the 6-9 months that the fisheries take place.

Sampling scheme: Crustacea on-shore, Shellfish Co-ops and Processors

Landings, by Irish vessels, of the European lobster (*Homarus gammarus*) and Brown Crab (*Cancer pagurus*) are sampled monthly, where possible, at various processing facilities in the northwest, west and southwest of Ireland, during the 6-9 months of the fishing season.

Sampling scheme: Mollusc on-shore, Shellfish Processors

Landings, by Irish vessels, of the King Scallop (*Pecten maximus*) and Common whelk (*Buccinum undatum*) are sampled monthly, where possible. King Scallop are sampled at a processing facility in the southeast of Ireland, while Whelk are sampled at processing facilities in the northwest and southeast.

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

Deviations from the work plan

List deviations (if any) in the achieved data collection compared to what was planned in the work plan and explain the reasons for the deviations.

Sampling scheme: Demersal at-sea, Demersal vessels – At-sea and self-sampling.

2022 proved to be a difficult year for at sea and self-sampling mainly due to a variety of external extenuating circumstances affecting the availability of participating vessels. Morale in the fishing industry is at an all-time low following Brexit and the difficult trading conditions post Covid, particularly the high cost of fuel. The government tie-up scheme resulted in a significant portion of the fleet (60 vessels) being tied up for two months of the year in 2022 and resulted in varied fishing patterns and limited sampling opportunities compared to previous years.

Actions to avoid deviations

Describe the actions that will be considered/have been taken to avoid deviations in the future and when these actions are expected to produce an effect. If there are no deviations, then this section is not applicable.

In the post Covid environment Ireland has retrained seagoing staff and retained the At Sea Self Sampling program to help ensure maximum resource availability and participation in the demersal at sea sampling program. We have also recruited a dedicated sampler at sea contractor under a pilot program to increase the sampling at sea. This is an effort to mitigate for the reducing resource availability owing to contractors having better opportunities in the Offshore Renewable Energy (ORE) sector. Ireland have also undertaken an extensive outreach program to increase the participation by the fleet. In 2023 the fleet is going through a rationalisation phase with up 8000GT or 60 vessels being removed from the fleet by the end of 2023, in an effort to make the remaining units more profitable.

It is hoped that those remaining vessels will indeed be more profitable and it is expected that they will continue to increase participation in the sampling program as they see it as a vital component to ensuring future viability.

Sampling scheme: Demersal at-sea Enhanced, Demersal vessels - Enhanced

List deviations (if any) in the achieved data collection compared to what was planned in the work plan and explain the reasons for the deviations.

Sampling opportunity of the gillnet fleet was limited mainly owing to the fact that the method of fishing does not lend itself to/effective self-sampling. Limited space aboard vessels limits the opportunity for a sampler at sea. A number of trips on the tangle net fishery were carried out in the south west which is a sub set of the gill net fishery.

Actions to avoid deviations

Describe the actions that will be considered/have been taken to avoid deviations in the future and when these actions are expected to produce an effect. If there are no deviations, then this section is not applicable

With the allocation of a spurdog quota Ireland has increased its efforts to sample the gillnet fleet. Stakeholder meetings have been held to increase participation of the fleet and provide more sampling opportunities.

Sampling scheme: Demersal on-shore, Main demersal ports

Deviations from the work plan

List deviations (if any) in the achieved data collection compared to what was planned in the work plan and explain the reasons for the deviations.

Sampling for demersal stocks on shore went very well in 2022, in spite of many challenges (Brexit, Covid aftermath, increasing fuel costs to the fishing industry and the vessel tie – up scheme). No major deviations to report.

Actions to avoid deviations

Describe the actions that will be considered/have been taken to avoid deviations in the future and when these actions are expected to produce an effect. If there are no deviations, then this section is not applicable

NA

Sampling scheme: Pelagic at-sea Herring, Pelagic vessels targeting Herring

List deviations (if any) in the achieved data collection compared to what was planned in the work plan and explain the reasons for the deviations.

The sampling of herring at sea was severely curtailed due to government management structures and tie-up scheme in 2022. A limited number of offshore vessels were granted licence to fish the stock and some firstly availed of their tie-up month before commencing herring fishing. Whilst we had

samplers out, the scarcity of available fish resulted in the vessels cutting their season even shorter and thus limiting opportunities to sample at sea.

Actions to avoid deviations

Describe the actions that will be considered/have been taken to avoid deviations in the future and when these actions are expected to produce an effect. If there are no deviations, then this section is not applicable

It is expected that 2023 will provide greater opportunity as the tie-up scheme will not be in place and thus grant more sampling opportunities.

Sampling scheme: Pelagic at-sea enhanced, Pelagic vessels - Enhanced programme targeting horse mackerel, mackerel and blue whiting

List deviations (if any) in the achieved data collection compared to what was planned in the work plan and explain the reasons for the deviations.

The opportunities of sampling pelagic at sea others in Qtr. 1 where the bulk of Pelagic Others fishing occurs was restricted due to Covid regulations and restricted to opportunistic sampling where a trained sampler was aboard given vessels.

List deviations (if any) in the achieved data collection compared to what was planned in the work plan and explain the reasons for the deviations.

It is expected that 2023 will be a better year as all Covid restrictions have been lifted and samplers can go to sea. The pilot At Sea Self Sampling is also expected to increase the number of trips sampled.

Sampling scheme: Pelagic on-shore Boarfish, Boarfish Self sampling

List deviations (if any) in the achieved data collection compared to what was planned in the work plan and explain the reasons for the deviations.

The proportion of the total Irish catch landed into Irish ports has increased significantly in recent years, and this has provided additional sampling opportunities for Irish port-based staff. Consequently, both the number of samples and the number of vessels sampled in 2022 is greater than the targets based on the reference fleet only (which also provides samples).

List deviations (if any) in the achieved data collection compared to what was planned in the work plan and explain the reasons for the deviations.

Sampling opportunities for boarfish are dependent on the catch landing port (which may be abroad) and self-sampling by the reference fleet will continue to ensure adequate sampling levels. However, landings into Ireland will continue to be sampled opportunistically.

Sampling scheme: Pelagic on-shore Herring, Pelagic vessels targeting Celtic Sea, NW, Irish Sea Herring

Deviations from the work plan

List deviations (if any) in the achieved data collection compared to what was planned in the work plan and explain the reasons for the deviations.

None

Actions to avoid deviations

Describe the actions that will be considered/have been taken to avoid deviations in the future and when these actions are expected to produce an effect. If there are no deviations, then this section is not applicable

Herring in 6.a South and 7.b-c is now assessed separately to 6.a North, with ICES issuing category 3 MSY catch advice for 2023. The stock is therefore no longer subject to a monitoring TAC and the sampling scheme will be amended to account for this. Herring in the Celtic Sea remains under a monitoring TAC.

Sampling scheme: Pelagic on-shore Sprat, Pelagic vessels targeting Sprat

Deviations from the work plan

List deviations (if any) in the achieved data collection compared to what was planned in the work plan and explain the reasons for the deviations.

The targeted population is the commercial catch of Sprat by Irish pelagic vessels from all ICES areas. All vessels licenced for the fishery are included in the sampling frame, including a sizeable proportion of less than 10m vessels. The PSU is fishing trip*species. Irish sprat landings are highly variable year-to-year. The target number of PSUs therefore needs to be flexible. In years with significantly higher sprat fishing effort, sampling intensity will be increased accordingly. In years with particularly low sprat fishing effort, it may not be possible to reach the sampling target.

Actions to avoid deviations

Describe the actions that will be considered/have been taken to avoid deviations in the future and when these actions are expected to produce an effect. If there are no deviations, then this section is not applicable

Sampling will be responsive to landings year on year.

Sampling scheme: *Nephrops* at sea self-sampling, *Nephrops* vessels in FU16

List deviations (if any) in the achieved data collection compared to what was planned in the work plan and explain the reasons for the deviations

The sampling at sea of Nephrops vessels in FU16 was limited to At Sea Self sampling resulting in a number of samples. The sampling target was not reached due to a logistical error on a participating vessel where sampling materials (datasheets etc…) were left ashore in error.

List deviations (if any) in the achieved data collection compared to what was planned in the work plan and explain the reasons for the deviations

It is expected that At Sea Self-sampling will produce the required sample numbers in 2023

Sampling scheme: Nephrops at-sea, Nephrops vessels in FU16
List deviations (if any) in the achieved data collection compared to what was planned in the work plan and explain the reasons for the deviations

Sampling opportunities at sea in Qtr. 1 were restricted due to Covid regulations. The sampling opportunity for Ireland in FU16 is restricted due to the closure of the ground to Irish vessel for 25% of the year.

Actions to avoid deviations

Describe the actions that will be considered/have been taken to avoid deviations in the future and when these actions are expected to produce an effect. If there are no deviations, then this section is not applicable.

Extra training of sea going staff has been undertaken in early 2023 and there has been renewed engagement with the industry, to increase sampling opportunities in 2023.

Sampling scheme: *Nephrops* on shore, *Nephrops* vessels excluding FU16

Deviations from the work plan

List deviations (if any) in the achieved data collection compared to what was planned in the work plan and explain the reasons for the deviations.

Activity in this sampling frame was approx. 25% lower than in the reference year. Less sampling opportunities were available due to vessels availing of the National Vessel Tie – Up Scheme in 2022, which resulted in lower than planned achieved sampling.

Actions to avoid deviations

*Describe the actions that will be considered/have been taken to avoid deviations in the future and when these actions are expected to produce an effect. If there are no deviations, then this section is not applicable***.**

There has been renewed engagement with industry to ensure targets are achieved in 2023, and sampling is on track to date.

Sampling scheme: Crustacea at-sea, Potting Vessels

Deviations from the work plan

List deviations (if any) in the achieved data collection compared to what was planned in the work plan and explain the reasons for the deviations.

There was additional activity in this sampling frame in 2022 compared with the reference years on stocks that are of significant importance nationally, and as a result, additional sampling was achieved at no additional cost to the DCF.

Actions to avoid deviations

Describe the actions that will be considered/have been taken to avoid deviations in the future and when these actions are expected to produce an effect. If there are no deviations, then this section is not applicable

Sampling is responsive to frame activity and also to national stakeholder needs and will continue as such.

Sampling scheme: Crustacea on-shore, Shellfish Co-ops and Processors

Deviations from the work plan

List deviations (if any) in the achieved data collection compared to what was planned in the work plan and explain the reasons for the deviations.

No deviations

Actions to avoid deviations

Describe the actions that will be considered/have been taken to avoid deviations in the future and when these actions are expected to produce an effect. If there are no deviations, then this section is not applicable

NA

Sampling scheme: Mollusc on-shore, Shellfish Processors

Deviations from the work plan

List deviations (if any) in the achieved data collection compared to what was planned in the work plan and explain the reasons for the deviations.

Additional sampling achieved as activity in this frame increased significantly compared with the reference years and sampling was responsive to this. Additional sampling is done at national expense.

Actions to avoid deviations

Describe the actions that will be considered/have been taken to avoid deviations in the future and when these actions are expected to produce an effect. If there are no deviations, then this section is not applicable

Additional sampling achieved.

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

Text Box 2.5: Sampling plan description for biological data North Sea and Eastern Arctic

(Region/RFMO/RFO/IO: Please indicate per text box and update the table of contents)

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.

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

Sampling scheme: Pelagic on-shore Norwegian Spring Spawning Herring, Pelagic vessels targeting NSSH self-sampling

A significant proportion of Norwegian Spring Spawning Herring is landed into foreign ports and the fishery is prosecuted by a small number of vessels (approx. 7). Arrangements are made with randomly selected vessels for the collection and storage of samples by the vessel crew. Samples are collected by scientific staff when the vessel returns to an Irish port.

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

Deviations from the work plan

List deviations (if any) in the achieved data collection compared to what was planned in the work plan and explain the reasons for the deviations.

Sampling scheme: Pelagic on-shore Norwegian Spring Spawning Herring, Pelagic vessels targeting NSSH self-sampling

Deviations from the work plan

A significant proportion of Norwegian Spring Spawning Herring is landed into foreign ports and the fishery is prosecuted by a small number of vessels (approx. 7). Arrangements are made with

randomly selected vessels for the collection and storage of samples by the vessel crew. Samples are collected by scientific staff when the vessel returns to an Irish port.

List deviations (if any) in the achieved data collection compared to what was planned in the work plan and explain the reasons for the deviations.

None

Actions to avoid deviations

No actions needed.

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

Text Box 2.5: Sampling plan description for biological data Other Regions (Region/RFMO/RFO/IO: Please indicate per text box and update the table of contents)

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.

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

Sampling scheme: Pelagic at-sea Tuna, Pelagic vessels targeting Albacore Tuna

Tuna fisheries covered by a Joint MI- Irish Tuna FIP (Fisheries Improvement Project) providing an at-sea sampler who collects data according to MI protocols. This allows a trained sampler to be embedded with the fleet when they fish south in the Bay of Biscay and land the catch into Spanish & French Ports. In recent years the majority of Irish caught Albacore has been landed directly into Spain & France and are covered by Bilateral agreements to sample. Provision is made for monitoring bycatch, and rare species as part of this sampling scheme.

Sampling scheme: Pelagic on-shore Tuna, pelagic vessels landing Tuna

The sampling scheme covers the landings by Pelagic vessels of albacore tuna into Irish ports. Over the past few years landings into foreign ports has increased significantly and this is now covered in a bi-lateral agreements with France and Spain.

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

Deviations from the work plan

Sampling scheme: Pelagic at-sea Tuna, Pelagic vessels targeting Albacore Tuna

List deviations (if any) in the achieved data collection compared to what was planned in the work plan and explain the reasons for the deviations.

Ireland and the Irish Tuna Fisheries Improvement Project (FIP) have collaborated in recent years to increase the at sea sampling of albacore tuna. The Irish Tuna fleet take and land >90% of their quota in the Bay of Biscay landing into Spanish and French ports/processors. Ireland have a bilateral agreement with Spain & France to sample Irish landed albacore in their respective countries. With the FIP Ireland has embedded a sampler with the fleet for the season with an aim of maximising the number of trips sampled at sea. The number of PSUs achieved in 2022 was limited due to logistical reasons with one trip lost as the vessel left early as the sampler was still in transit to the port.

Irish landings were also sampled in Spain and France in line with the signed bilateral agreements between both Member States and Ireland. Spain sampled 7 trips of Irish vessels fishing albacore, during 2022 and a further 1 landing was sampled in France from the 3 planned. France have indicated that the issue in sampling Irish landings of albacore tuna lay in the fact, that the catches do not go through auction halls but go straight to the canneries. So, by the time contact was made with the factory staff, only one sampling event could be carried out at the factory and then the tuna quota was finished.

Actions to avoid deviations

Describe the actions that will be considered/have been taken to avoid deviations in the future and when these actions are expected to produce an effect. If there are no deviations, then this section is not applicable

In 2023 Ireland plans to work again with the Irish Tuna FIP to sample at sea and are also in consultation with the fisheries producer organisations to develop and launch an Irish Tuna At Sea Self Sampling Program.

In relation to Irish landings into France in 2023, FRA is planning sampling effort, trying to better anticipate the sampling at the factory and secure the required number of sampling events.

Sampling scheme: Pelagic on-shore Tuna, pelagic vessels landing Tuna

Deviations from the work plan

List deviations (if any) in the achieved data collection compared to what was planned in the work plan and explain the reasons for the deviations.

Samples were secured from the tuna catches landed into Ireland.

Tuna landings fluctuate significantly year on year, making planning sampling difficult. There was less activity in this scheme in 2022, compared to the reference years, which is why sampling is lower. The vast majority of Irelands tuna catches were landed into France and Spain in 2022. These landings are covered by bilateral agreements between Ireland and France and Ireland and Spain, which were updated and signed in December 2021 and March 2022 respectively.

Actions to avoid deviations

Describe the actions that will be considered/have been taken to avoid deviations in the future and when these actions are expected to produce an effect. If there are no deviations, then this section is not applicable

Ireland will continue to maintain close contacts with colleagues in France and Spain, helping to track Irish landings into both countries. Additional personnel will be based in the main port into which tuna are landed in 2023, and this will help to ensure that tuna catches landed into Ireland are sampled adequately.

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

Text Box 2.5: Sampling plan description for biological data All Regions (Region/RFMO/RFO/IO: Please indicate per text box and update the table of contents)

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.

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

Sampling scheme: Pelagic at-sea others, Pelagic vessels targeting Mackerel, horse mackerel, blue whiting and boarfish fisheries

All vessels>10m with average landings of Mackerel, Horse Mackerel, Blue Whiting and Boarfish combined of >10t in the most recent 3 years for the semester. PSUs are selected with unequal probability, based on average historic landings of the 4 species combined. Provision is made for monitoring bycatch and rare species as part of this sampling scheme.

Sampling scheme: Pelagic on-shore others, Pelagic ports landing Mackerel, Horse Mackerel, Blue Whiting

The sampling scheme covers landings and road transport of Mackerel, Horse Mackerel and Blue Whiting into the port of Killybegs for processing which accounts for over 95% of the total landings of these species into Ireland. The fisheries for these species commence at the start of the year and continue sequentially (Horse Mackerel, Mackerel and Blue Whiting) with some overlap for approximately 15 weeks. A second fishery for Mackerel and Horse Mackerel takes place in the fourth quarter for 6-8 weeks. The sampling frame is stratified by species, ICES division and vessel licence type (full pelagic or polyvalent). PSUs from vessels operating as pairs are combined. In the event the number of landings exceeds a weekly threshold, PSUs are selected at random.

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

Sampling scheme: Pelagic at-sea others, Pelagic vessels targeting Mackerel, horse mackerel, blue whiting and boarfish fisheries

List deviations (if any) in the achieved data collection compared to what was planned in the work plan and explain the reasons for the deviations.

The opportunities of sampling pelagic at sea others in Qtr. 1 where the bulk of Pelagic Others fishing occurs was restricted due to Covid regulations and restricted to opportunistic sampling where a trained sampler was aboard given vessels.

Actions to avoid deviations

Describe the actions that will be considered/have been taken to avoid deviations in the future and when these actions are expected to produce an effect. If there are no deviations, then this section is not applicable

It is expected that 2023 will be a better year as the Covid restrictions nationally have been fully lifted and samplers can go to sea. A pilot At Sea Self Sampling programme is also expected to increase the number of trips sampled.

Sampling scheme: Pelagic on-shore others, Pelagic ports landing Mackerel, Horse Mackerel, Blue Whiting

Deviations from the work plan

List deviations (if any) in the achieved data collection compared to what was planned in the work plan and explain the reasons for the deviations.

No deviations, sampling executed as planned in 2022.

Actions to avoid deviations

Describe the actions that will be considered/have been taken to avoid deviations in the future and when these actions are expected to produce an effect. If there are no deviations, then this section is not applicable NA

Text Box 2.6: Research surveys at sea
(Research survey: Please indicate per text box and update the table of contents)

General Comment: This Text box fulfils Article 5 (1)(b), Article 6 (3)(a), (b) and (c) of Regulation (EU) 2017/1004 and Chapters I and II of the EU MAP Implementing Decision. It is intended to specify which research surveys at sea set out in Table 2 of the EU MAP Implementing Decision will be carried out. Member States shall specify whether the research survey is included in Table 2 of the EU-MAP Implementing Decision or whether it is an additional survey.
International Ecosystem Survey in the Nordic Seas (ASH) 1. Objectives of the survey See other MS WP (Denmark) for full details on this survey

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

See other MS WP (Denmark) for full details on this survey

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

See other MS WP (Denmark) for full details on this survey

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

IRL participates by sending personnel and cost sharing as per RCG 2021 agreement

(max 450 words per survey)

5. For internationally coordinated surveys, provide a link to the latest meeting report of the coordination group.
Provide a link to the meeting report from the body coordinating the survey (ICES, MEDITS coordination group, MEDIAS coordination group, etc.). For surveys that are not internationally coordinated, refer to any status report (e.g. Cruise report).

A cost sharing agreement is in place, to reimburse Denmark for their ship time at the relative share of their TAC. IRL participates by sending personnel and cost sharing as per latest multilateral agreement. Please refer to the Danish Annual Report for all details relating to this survey.

6. List the main use of the results of the survey (e.g. indices, abundance estimates, environmental indicators). Specify in which context the results are used (on a routine basis), both in international and national context.
If presenting maps of the achieved research survey stations is necessary, provide them as an annex. Refer clearly to the annex and map numbers.

7. Extended comments
Extended AR comments can be placed under this section.

(max. 450 words per survey)

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

Name of the research survey
Irish Groundfish Survey (IBTS_Q4)

1. Objectives of the survey

The main objective of the IBTS_Q4 is to collect data on the distribution, relative abundance and biological parameters of commercial commercially exploited demersal species in 6a south, 7b & 7g-j north. The indices currently utilised by assessment WG's are for haddock, whiting, plaice, cod, hake and sole. Survey data is also provided for white & black anglerfish, megrim, pollack, ling, blue whiting and a number of elasmobranchs as well as several pelagics (herring, horse mackerel and mackerel). Occurrence of vulnerable or sentinel invertebrate species such as corals, sea pen, fan mussel and ocean quahog is also noted. Marine litter is also sorted and recorded. Oceanographic data are collected from CTD instrument on trawl door and occasional surface to sea bed CTD transects. Sediment grabs are carried out opportunistically using a Day grab.

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

Stations are randomly selected within a stratified survey area based on depth and historic analysis of survey catch distribution rates. Fishing is conducted using a GOV 36/47 trawl (20mm liner) with 5.3m2 (1450 Kg) Morgere otter doors, 16" hoppers (D-gear) in area 6a and 8" disks (A-gear) areas 7b, g and j. The gear is trawled at 4kn for 30min at each station. Sweeps are 55m up to 80m depth, extended to 110m in deeper water to minimise variable trawl geometry.

All fish and invertebrate species are sorted and weighed. Biological data are collected for selected commercial demersal species such as Cod, Haddock and Whiting etc. Occurrence of vulnerable or sentinel invertebrate species such as corals, sea pen, fan mussel and ocean quahog is also noted. Litter is sorted and recorded. Oceanographic data are collected from CTD instrument on trawl door and occasional surface to sea bed CTD transects. Sediment grabs are carried out opportunistically using Day grab.

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

The Irish IBTS_Q4 Survey is carried out in formal collaboration with the other IBTS surveys in the area run by Scotland, Spain, France and Northern Ireland to a lesser degree. IBTS_Q4 Survey data from France and Ireland for cod, haddock and whiting are aggregated by Ireland to produce combined indices for stock assessment and advice at the ICES Working Group for the Celtic Seas Ecoregion (WGCSE). Several other single survey indices are also provided for WGCSE, WGBIE, WGCEPH and WGEF.

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

Not applicable.

5. For internationally coordinated surveys, provide a link to the latest meeting report of the coordination group.

Provide a link to the meeting report from the body coordinating the survey (ICES, MEDITS coordination group, MEDIAS coordination group, etc.). For surveys that are not internationally coordinated, refer to any status report (e.g. Cruise report).

The IGFS survey is co-ordinated internationally by the International Bottom Trawl Survey Working Group (IBTSWG): IBTSWG (ices.dk)

6. List the main use of the results of the survey (e.g. indices, abundance estimates, environmental indicators). Specify in which context the results are used (on a routine basis), both in international and national context.

If presenting maps of the achieved research survey stations is necessary, provide them as an annex. Refer clearly to the annex and map numbers.

The Q4 Irish Groundfish Survey (IGFS) collects data on the distribution, relative abundance and biological parameters of commercially exploited demersal species in VIa south, VIIb & VIIg,j north. The indices currently utilised by assessment WG's are for haddock, whiting, plaice, cod, hake and sole. Survey data is also provided for white & black anglerfish, megrim, pollack, ling, blue whiting and a number of elasmobranchs as well as several pelagics (herring, horse mackerel and mackerel).

A number of ancillary objectives are also undertaken:

a. To collect hydrographical information on the water column and the seafloor;

b. To collect information on the composition and quantities of litter items on the sea floor, as caught in the fish trawl;

c. To collect data on fish biology, invertebrates and or/the environment as specified by additional requests from international institutions and universities and as regarded practicable during the course of the survey.

A Survey Map illustrating achieved stations in 2022 is available in Annex 1.1

7. Extended comments
Extended AR comments can be placed under this section.

Current IBTS Term of Reference to develop a new sampling trawl is being carried out, including sea trials, with Marine Science Scotland and IFREMER, Lorient. Work is being absorbed within existing programs until roll out of the proposed trawl to IBTS participants during 2023.

Recent benchmarks have seen a shift towards modelled Spatio-temporal survey indices such as those for cod, haddock and whiting in the Celtic Sea. This has seen demonstrable improvements in precision of the indices so far. In addition, much of the routine diagnostics available as a result has proved valuable in managing issues such as loss of days at sea due to poor weather.

In 2022 there was a delay of c.36hrs in starting the survey due to the vessel having to make last minute alternate dry dock arrangements for maintenance because of a delay arising with a vessel in

the contracted dry dock. Thankfully weather was reasonable during the survey and little further time was lost.

(max. 450 words per survey)

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

International Blue Whiting Spawning Survey (IBWSS)

1. Objectives of the survey

- The primary aim of the International blue whiting spawning stock survey is to determine the age stratified abundance and distribution of blue whiting (*Micromesistius poutassou)* using acoustic survey techniques
- Collect hydrographic data by means of vertical CTD profiles
- Conduct directed trawl sampling using a pelagic trawl to determine the biological profile of target species
- Conduct directed trawl sampling using a pelagic trawl to determine the species composition of mesopelagic fish echotraces
- Conduct visual abundance surveys of marine mammals and seabirds

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

The Manual for International Pelagic Surveys (IPS) describes the methods used for survey design, analysis and reporting of survey data (SISP #9) and is described in detail in the latest IBWSS survey report (http://hdl.handle.net/10793/1689)

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

This survey acoustically measures the size of the spawning stock of blue whiting (Micromesistius poutassou) in western waters and is conducted by vessels from Ireland (RV *Celtic Explorer*), the Faroe Islands (RV *Jákup Sverri*), the Netherlands (RV *Tridens*), Norway (FV *Vendla*) and Spain (RV *Vizconde de Eza*).

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

A Danish scientist from DTUAqua participates in the IBWSS each year onboard the RV *Celtic Explorer* for the full duration of the survey (21 days).

A cost sharing agreement is in place, to reimburse Ireland and Netherlands for their ship time at the relative share of their TAC. Participating Member States for the blue whiting survey in 2022 are Denmark, Germany, Netherlands, Ireland, France and Sweden. Spain will provide ship time on its own vessel.

(max 450 words per survey)

5. For internationally coordinated surveys, provide a link to the latest meeting report of the coordination group.
Provide a link to the meeting report from the body coordinating the survey (ICES, MEDITS coordination group, MEDIAS coordination group, etc.). For surveys that are not internationally coordinated, refer to any status report (e.g. Cruise report).

The International Blue Whiting Spawning Survey (IBWSS) is internationally coordinated through WGIPS: WGIPS (ices.dk)

A cost sharing agreement is in place, to reimburse Ireland and Netherlands for their ship time at the relative share of their TAC. Participating Member States for the blue whiting survey in 2022 are Denmark, Germany, Netherlands, Ireland, France and Sweden. Spain will provide ship time on its own vessel.

The 2022 cruise report can be fund here: http://hdl.handle.net/10793/1746

6. List the main use of the results of the survey (e.g. indices, abundance estimates, environmental indicators). Specify in which context the results are used (on a routine basis), both in international and national context.
If presenting maps of the achieved research survey stations is necessary, provide them as an annex. Refer clearly to the annex and map numbers.

The primary objective of the survey is to provide an age stratified abundance and biomass index for pre-spawning /spawning aggregations of blue whiting observed over the survey area and to combine data to produce a global estimate of abundance for this widely distributed stock on the western spawning grounds.

The survey in 2022 shows a 15% increase in TSB and a corresponding 56% increase in TSN when compared to the 2021 estimate for comparable survey effort and coverage. The estimated uncertainty around the total stock biomass was higher than in 2021, CV=0.19 compared to 0.14.

In terms of abundance, 2-year-olds (2020 year-class) were most abundant (30%), followed by the 4-year-olds (17%), 3-year-olds and 5-year-olds (8%) respectively. Immature fish represented 12.6% of TSB and 23.8% of TSN and was made up of 1- and 2-year-old fish, 23% of which were found to be immature. The abundance of these two year classes (2020 and 2021) were the highest in the time series and above the numbers observed associated with the 2014 record year class.

A Survey Map is provided in Annex 1.1

7. Extended comments
Extended AR comments can be placed under this section.

Unfortunately, in 2022 an outbreak of Covid-19 on board the RV Celtic Explorer, with many crew and scientists symptomatic, required the survey to be cut short and the ship return to port and the survey was cancelled.

The International Blue Whiting Spawning stock survey was carried out over 15 days and within the recommended 21-day time window agreed by the coordination group. Weather conditions were regarded as exceptional compared to 2021, with no weather induced downtime recorded. The stock was regarded as suitably contained within the survey area. The total survey effort was comparable to survey effort in previous years

(max. 450 words per survey)

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

Name of the research survey
International mackerel and horse mackerel egg survey (MEGS)

1. Objectives of the survey

The main objective of the survey is to extract, identify and stage the development of mackerel and horse mackerel eggs collected from plankton samples. Samples are collected every ICES half statistical rectangle. A CTD is attached to the plankton sampler and information on temperature, salinity and sample depth is collected at each station. Gonad samples are also collected from female fish which are analysed for fecundity, batch fecundity, atresia and POF stage. These data are used to provide WGWIDE, the assessment group for widely distributed pelagic fish, with a spawning stock biomass, SSB, estimate for mackerel, and an egg production estimate for horse mackerel.

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

The survey protocols have been published by ICES and can be accessed at https://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%205%20-%20WGMEGS%20Manual%20for%20AEPM%20and%20DEPM.pdf and https://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%206%20-%20MEGS%20V1.3.pdf

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

IPMA Portugal – Vizconde de Eza
IEO Spain - Vizconde de Eza
AZTI Spain – Ramon Margalef
TI Germany – Walther Herwig

WMR Netherlands - Tridens
DTU Aqua Denmark - Dana
IMR Norway - Charter
FAMRI Faroes – Jakup Sverri
MSS Scotland – Scotia + Charter
CEFAS England – Cefas Endeavour
MI Ireland – Celtic Explorer

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

No thresholds apply this is a mandatory survey for the MS

5. For internationally coordinated surveys, provide a link to the latest meeting report of the coordination group.
Provide a link to the meeting report from the body coordinating the survey (ICES, MEDITS coordination group, MEDIAS coordination group, etc.). For surveys that are not internationally coordinated, refer to any status report (e.g. Cruise report).

The International Mackerel and Horse Mackerel Egg survey is coordinated through WGMEGS, and the 2022 WGMEGS working group report can be found at https://ices-library.figshare.com/articles/report/Working_Group_on_Mackerel_and_Horse_Mackerel_Egg_Surveys_WGMEGS_outputs_from_2022_meeting_/22128536

6. List the main use of the results of the survey (e.g. indices, abundance estimates, environmental indicators). Specify in which context the results are used (on a routine basis), both in international and national context.
If presenting maps of the achieved research survey stations is necessary, provide them as an annex. Refer clearly to the annex and map numbers.

The surveys are carried out over a six-month period every three years and provide one of the main fishery independent datasets for the assessment programme for mackerel and horse mackerel. MEGS participants collect, count and stage mackerel and horse mackerel eggs from plankton hauls. Fishing tows are also carried out to collect adult fish for fecundity and atresia estimations. Stage 1 egg counts, combined with fecundity data, are used to derive a spawning stock biomass estimate for mackerel. Horse mackerel egg counts are used to derive an estimate of total egg production for this species. These data are then provided to WGWIDE, the ICES Working Group on Widely Distributed Stocks, for use in their assessment process.

A Survey Map is provided in Annex 1.1

7. Extended comments
Extended AR comments can be placed under this section.

The March survey was carried out successfully on board the RV Celtic Explorer, with 95 plankton stations sampled and 8 fishing hauls completed.

For the June survey, the Northern Ireland research vessel, RV Corystes, was chartered to carry out the survey. One week before the survey was due to start it was announced that this vessel had to go into dry dock for emergency repairs, and would not be available to conduct the survey during the appropriate time period. An alternative research vessel, RV Prince Madog, was chartered from the

UK. After five days at sea, however, it became apparent that this vessel was not suitable for the work programme planned. As a result, following consultation between the MEGS Chair and survey coordinator, as well as Marine Institute management, it was decided to abandon the survey and return to port, as there was no value in remaining at sea.

(max. 450 words per survey)

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

Spawning/pre-spawning herring/boarfish acoustic survey (WESPAS_IRL)

1. Objectives of the survey

- The primary aim of the WESPAS_IRL survey is to determine the age stratified abundance and distribution of herring (*Clupea harengus)*, boarfish (*Capros aper*) and horse mackerel (*Trachurus trachurus*) using acoustic survey techniques
- Collect biological samples from directed trawling on fish echotraces to determine age structure and maturity state of standing stocks
- Conduct genetic sampling of individual herring within ICES divisions 6a and 7b, c for stock identification analysis
- Use vertical CTD casts to determine hydrographic conditions and the extent of shelf front regions
- Collect zooplankton samples using dedicated vertical trawls to determine biomass of zooplankton and the spatial extent of areas of concentration
- Conduct visual abundance surveys of marine mammals and seabirds

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

The Manual for International Pelagic Surveys (IPS) describes the methods used for survey design, analysis and reporting of survey data (SISP #9) and is described in detail in the latest WESPAS survey report (http://hdl.handle.net/10793/1659).

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

Not applicable

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

Not applicable

(max 450 words per survey)

5. For internationally coordinated surveys, provide a link to the latest meeting report of the coordination group.
Provide a link to the meeting report from the body coordinating the survey (ICES, MEDITS coordination group, MEDIAS coordination group, etc.). For surveys that are not internationally coordinated, refer to any status report (e.g. Cruise report).

The WESPAS survey is coordinated through WGIPS WGIPS (ices.dk)

The latest WESPAS Cruise Report is available here: http://hdl.handle.net/10793/1806

6. List the main use of the results of the survey (e.g. indices, abundance estimates, environmental indicators). Specify in which context the results are used (on a routine basis), both in international and national context.
If presenting maps of the achieved research survey stations is necessary, provide them as an annex. Refer clearly to the annex and map numbers.

- The primary aim of the WESPAS_IRL survey is to determine the age stratified abundance and distribution of herring (*Clupea harengus)*, boarfish (*Capros aper*) and horse mackerel (*Trachurus trachurus*) using acoustic survey techniques.
- Collect biological samples from directed trawling on fish echotraces to determine age structure and maturity state of standing stocks
- Conduct genetic sampling of individual herring within ICES divisions 6a and 7b, c for stock identification analysis
- Use vertical CTD casts to determine hydrographic conditions and the extent of shelf front regions
- Collect zooplankton samples using dedicated vertical trawls to determine biomass of zooplankton and the spatial extent of areas of concentration
- Conduct visual abundance surveys of marine mammals and seabirds

Abundance estimates are supplied for use by WGWIDE annually.

A Survey Map is provided in Annex 1.1

7. Extended comments
Extended AR comments can be placed under this section.

Boarfish distribution was similar to previous years. Total stock biomass (TSB) was 2% higher than observed in 2021, while TSN was 15% lower. The decrease in abundance was largely driven by the low numbers of immature fish observed in the Celtic Sea as compared to 2021, an above average year for immature fish. Spawning stock biomass (SSB) increased by 26% compared to last year, and can be attributed to recruitment of young fish from strong 2020 and 2021 year classes to the spawning stock. Of the six survey strata, all but one saw an increase in biomass compared to 2021. The Celtic Sea saw a decrease of 16% in observed biomass. Reports from the PEL-GAS survey indicate increased numbers of boarfish in the mid and northern Bay of Biscay, indicating the stock was not fully contained on the southern boundary. The 3-year age class dominated the 2022 estimate contributing over 32% of TSB and 40.5% of TSN. Ranked second and third were the 4-

year old and 2-year old fish (27.2% TSB & 22.9% TSN and 9.3% TSB & 17.4% TSN respectively). Combined these three age classes represented 68.6% of TSB and 80.7% of TSN. The 15+ age class, once dominant in the survey time series, represented 3% of TSB and 0.8% of TSN. Maturity analysis of boarfish indicated 94.9% of observed biomass was mature (98.1% total abundance). Immature fish were under represented during the 2022 survey.

Aggregations of Celtic Sea herring were encountered around the Labadie Bank and composed of several high density aggregations. Four winter ring fish dominated the total estimate, representing 32.2% of TSB and 35.4% of total abundance. Five winter ring fish ranked second contributing 31.8% and 31.2% respectively. Ranked third were 6 winter ring fish (16.1% TSB & 14.6% TSN). In terms of age structure, the survey has tracked the strong 2018-year class successfully into 2022. Maturity analysis of Celtic Sea herring samples indicated 100% of fish sampled were mature.

Horse mackerel were found distributed along the Irish west coast and Celtic Sea. Geographical distribution was comparable to previous years. However, the number of echotraces and acoustic density remains low. The 2022 estimate was 21% lower in terms of biomass and 22% lower in terms of abundance compared to 2021. The 2022 estimate is the lowest in the current time series and the downward trend within the survey continues. No monospecific echotraces of horse mackerel were observed during the survey and biological samples were taken as part of mixed species by-catch. Aging was applied using survey samples this year and will continue going forward. The 8-year-old fish dominated the estimate representing 36.9% of TSB and 36.3% of TSN. Fourteen -year-old fish ranked second (7.6% of TSB and 7.8% of TSN) and 5-year-old fish ranked third (5.5% to TSB & 7.6% TSN), Combined these three age classes represented 56.8% of TSB and 56% of TSN. All individuals were mature.

(max. 450 words per survey)

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

Name of the research survey
***Nephrops* UWTV Survey (UWTV 16-17, UWTV 19, UWTV 20-22)**

MS undertakes three UWTV surveys in any one year but they are described here as one as the areas surveyed can interchange during the survey periods depending on weather conditions.

1. Objectives of the survey

The main objective of the Irish *Nephrops* Underwater TV surveys is to obtain quality assured estimates of *Nephrops* burrow densities for the following Functional Units (FU): 16-17, 19, 20-22. Occurrence of vulnerable or sentinel invertebrate species such as soft corals, and sea pens is also noted. Litter is recorded.

2. Description of the survey design and methods used in the survey for each type of data collection as listed in Table 2.6 for this specific survey.
Stations are randomly selected within a stratified survey area sufficient to cover adequately the known spatial and bathymetric distributions for each stock and ensure a CV of less than 20% for the total abundance estimate as recommended by SGNEPS. This data is submitted to WGCSE on an annual basis to contribute to stock assessment and management advice and also to WGNEPS annually, for survey coordination and quality control purposes.
At each station the UWTV sledge is deployed to capture time referenced high-definition image data with field of view or 'FOV' of 1.03 metre. Vessel position (DGPS), depth and position of sledge using a USBL transponder are recorded every 3 seconds.
Occurrence of vulnerable or sentinel invertebrate species such as corals and sea pen is also noted. Litter is recorded. Oceanographic data are collected from a sledge mounted CTD instrument. Sediment grabs are carried out opportunistically using Day grab. When time allows beam trawling is carried out to opportunistically sample *Nephrops* and macro benthos, where the aim is to carry out approximately 7 beam trawls randomly on FU 17 and FU 22 only.

Documentation is listed in the quality report.

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

Not applicable.

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

Not applicable.

5. For internationally coordinated surveys, provide a link to the latest meeting report of the coordination group.
Provide a link to the meeting report from the body coordinating the survey (ICES, MEDITS coordination group, MEDIAS coordination group, etc.). For surveys that are not internationally coordinated, refer to any status report (e.g. Cruise report).

Nephrops UWTV surveys are co-ordinated internationally by the international coordination group for Nephrops underwater television and trawl surveys within ICES WGNEPS and reported annually. Latest WGNEPS report is available here.

6. List the main use of the results of the survey (e.g. indices, abundance estimates, environmental indicators). Specify in which context the results are used (on a routine basis), both in international and national context.
If presenting maps of the achieved research survey stations is necessary, provide them as an annex. Refer clearly to the annex and map numbers.

The main objective of the survey is to obtain quality assured estimates of *Nephrops norvegicus* (Norway lobster) burrow distribution and abundance estimates in area 7 which includes the *Nephrops* Functional Units (FU16, FU17, FU 19, FU 20-21 combined and FU22). This data is

supplied to the relevant ICES stock assessment working group (WGCSE) to provide catch options for these commercial stocks.

Secondary objectives include: collection of presence-absence data on sea-pen species where this data has been supplied to the relevant ICES working group on deep-water ecology (WGDEC); presence-absence data of other macro benthos species, fish species and trawl marks on the sea-bed In addition CTD data is collected and viewed as an emerging time series which will be used for looking at inter-annual and longer term variability of bottom sea temperature around the coast of Ireland.

A Survey Map is provided in Annex 1.1

7. Extended comments
Extended AR comments can be placed under this section.

100% coverage of all the *Nephrops* grounds was achieved in 2022 for stock assessment purposes for FU 19, FU 22 and FU 20-21 combined. 88% coverage of FU 16 Porcupine Bank was completed and this was deemed acceptable for stock assessment after inspection of variograms. 14% coverage of FU 17 was obtained in 2022 where the main ground Aran and smaller ground Slyne Head were not surveyed. This did not affect the provision of catch advice where it was deemed acceptable to use result the previous year's survey result (2021) for stock assessment. Weather hampered the UWTV survey programme in 2022 with 36% of operation time lost due to weather. Fishing operations were also not carried out due to weather downtime.

(max. 450 words per survey)

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

Celtic Sea herring acoustic survey (CSHAS_IRL)

1. Objectives of the survey

- The primary aim of the CSHAS_IRL is to determine the age stratified abundance and distribution of herring (*Clupea harengus)* and sprat (*Sprattus sprattus)* using acoustic survey techniques
- Collect biological samples from directed trawling on insonified fish echotraces to determine age structure and maturity state of the herring stock
- Determine estimates of biomass and abundance for sprat within the survey area
- Collect physical oceanography data from vertical profiles from a deployed sensor array
- Conduct visual abundance surveys of marine mammals and seabirds

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

The Manual for International Pelagic Surveys (IPS) describes the methods used for survey design, analysis and reporting of survey data (SISP #9) and is described in detail in the latest CSHAS survey report (http://hdl.handle.net/10793/1664).

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

Not applicable

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

Not applicable

(max 450 words per survey)

5. For internationally coordinated surveys, provide a link to the latest meeting report of the coordination group.
Provide a link to the meeting report from the body coordinating the survey (ICES, MEDITS coordination group, MEDIAS coordination group, etc.). For surveys that are not internationally coordinated, refer to any status report (e.g. Cruise report).

The 2022 Celtic Sea Herring cruise report is available here: http://hdl.handle.net/10793/1815

6. List the main use of the results of the survey (e.g. indices, abundance estimates, environmental indicators). Specify in which context the results are used (on a routine basis), both in international and national context.
If presenting maps of the achieved research survey stations is necessary, provide them as an annex. Refer clearly to the annex and map numbers.

- The primary aim of the CSHAS_IRL is to determine the age stratified abundance and distribution of herring (*Clupea harengus)* and sprat (*Sprattus sprattus)* using acoustic survey techniques
- Collect biological samples from directed trawling on insonified fish echotraces to determine age structure and maturity state of the herring stock
- Determine estimates of biomass and abundance for sprat within the survey area
- Collect physical oceanography data from vertical profiles from a deployed sensor array
- Conduct visual abundance surveys of marine mammals and seabirds

Abundance estimates are supplied for use by Herring Assessment Working Group annually: HAWG (ices.dk)

A Survey Map is provided in Annex 1.1

7. Extended comments
Extended AR comments can be placed under this section.

The primary objectives of the survey were carried out but with notable area coverage and sampling compromises. Poor weather conditions stopped survey operations for approximately 12 hrs and a further 72 hrs was lost due to requirements of our new RV to be ashore for a state visit. Overall, geographical coverage was reduced when compared to 2021 (-21%) and acoustic sampling effort or survey miles also decreased (-28%). Core replicate surveys (Pass 1 & 2) were completed, but with reduced area coverage. Adaptive survey effort was reduced to allow for prioritisation of core effort strata. One adaptive inshore survey was undertaken along the south coast and another in Dingle Bay. Mature fish were observed offshore in a discreet location and were sampled within the core effort stratum. Immature herring (0-wr) were well represented in the wider survey area, albeit in low numbers, as part of mixed species aggregations dominated by sprat. The age profile of mature herring sampled during the survey were representative of those in landings data and from observations during the summer WESPAS survey (2022).

The 2022 TSB estimate (Pass 2: core stratum) is 12,533 t and 113 million individuals (CV 1.24) and an increase on the 2021 estimate. The very high CV is accounted for by the single high density aggregation that made up the Pass 2estimate. Age composition was dominated by 3-wr, followed by 4-wr, 5-wr and immature 0-wr fish by weight. The dominant 3-wr fish contributed 52.2% to the TSB and 50.6%, fol-lowed by 4-wr fish (40.5% TSB & 34.5% TSN), then 5-wr fish (3.8% TSB & 3.0% TSN) and 0-wr fish (1.1% TSB & 10% TSN). Mature fish (2-7-wr fish) represented 98.9% of TSB and 90% of TSN.

The biomass of sprat was higher than observed in 2021 with a more widespread distribution than observed n either 2020 or 2021 (centred inshore). The 2022 TSB estimate (Pass 1) represented a total biomass of 34,508.4 t and a total abundance of 5,235,755 (‘000s) individuals (CV 0.67).6.1

The shortfall in acoustic sampling miles was a consequence of a Presidential visit to the new Research Vessel (RV *Tom Crean*) requiring the ship to be in Port and also due to poor weather conditions encountered during the survey at sea.

Number of trawl samples exceeded the planned target by 25%. However, the number of trawls carried out annually is determined by need during the survey to ground truth insonified targets for species composition and to provide biological samples and not to meet a specific target number.

Poor weather conditions led to a reduced number of planned CTD stations due to safe operating of the equipment. Zooplankton sampling is part of a pilot program being developed at a national level and is not currently a reporting requirement. Unfortunately, stations were not carried out for the above mentioned reasons.

(max. 450 words per survey)

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

Name of the research survey

Irish Anglerfish and Megrim Survey (IAMS_IRL)

1. Objectives of the survey

The main objective of the survey is to obtain biomass and abundance indices for anglerfish (*Lophius piscatorius* and *L. budegassa*) and megrim (*Lepidorhombus whiffiagonis* and *L. boscii*) in areas 6a (south of 58°N) and 7 (west of 8°W). Secondary objectives are to collect data on the distribution, relative abundance and biology of other commercial demersal species (cod, haddock, ling, plaice, sole, pollack, saithe, whiting, brill, hake, john dory, lemon sole, turbot, brill, blonde ray, cuckoo ray, common skate/flapper skate, spotted ray, thornback ray, spurdog, *Nephrops*). Occurrence of vulnerable or sentinel invertebrate species such as corals, sea pen, fan mussel and ocean quahog is also noted. Litter is also sorted and recorded.

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

Stations are randomly selected within a stratified survey area based on depth and commercial catch rates of the target species. Fishing is conducted using a Jackson trawl with 5.45m^2 Thyboron Type 16 otter doors, 16" hoppers, 19mm tickler chain and 100mm cod end mesh. The gear is trawled at 3kn for one hour at each station. The warp to depth ratio is 3:1 for depths up to 200m, and 2:1 plus 200m in deeper water. All fish and invertebrate species are sorted and weighed. Biological data are collected for selected commercial demersal species such as Cod, Haddock and Whiting etc. Occurrence of vulnerable or sentinel invertebrate species such as corals, sea pen, fan mussel and ocean quahog is also noted. Litter is also sorted and recorded. Oceanographic data are collected from CTD instrument on trawl door and occasional surface to sea bed CTD transects. Sediment grabs are carried out opportunistically using Day grab.

Documentation is listed in the quality report

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

Irish Anglerfish and Megrim Survey is carried out in informal collaboration with Marine Scotland's Scottish Anglerfish and Megrim Survey (SIAMISS) and uses the same gear and fishing practices. IAMS is limited to south of 58° North while SIAMISS extends north of this line. Survey data are shared between Ireland and Scotland for the purpose of stock assessment and advice at ICES Working Group for the Celtic Seas Ecoregion (WGCSE) and Working Group for the Bay of Biscay and the Iberian Waters Ecoregion (WGBIE).

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

Not applicable.

5. For internationally coordinated surveys, provide a link to the latest meeting report of the coordination group.

Provide a link to the meeting report from the body coordinating the survey (ICES, MEDITS coordination group, MEDIAS coordination group, etc.). For surveys that are not internationally coordinated, refer to any status report (e.g. Cruise report).

Irish Anglerfish and Megrim Survey 2022 Cruise Report is available from Marine Institute Open Access Repository: Cruise report: Irish Anglerfish & Megrim Survey 2022 (marine.ie)

6. List the main use of the results of the survey (e.g. indices, abundance estimates, environmental indicators). Specify in which context the results are used (on a routine basis), both in international and national context.
If presenting maps of the achieved research survey stations is necessary, provide them as an annex. Refer clearly to the annex and map numbers.

The main objective of the survey is to obtain biomass and abundance indices for anglerfish (Lophius piscatorius and L. budegassa) and megrim (Lepidorhombus whiffiagonis and L. boscii) in areas 6a (south of 58°N) and 7 (west of 8°W). Secondary objectives are to collect data on the distribution, relative abundance and biology of other commercially exploited species. Indices of abundance are produced and supplied to relevant ICES stock assessment working groups. For the fourth year, additional sampling took place in deep water (up to 1,500m) in order to monitor the recovery of exploited deep-water species following the decline of the deep-water fisheries in Irish waters.

A Survey Map is provided in Annex 1.1

7. Extended comments
Extended AR comments can be placed under this section.

Storm ‘Dudley’ arrived on Wednesday 16th February 2022 with a status yellow wind warning in place which made the last day of Leg I unworkable. Storms ‘Eunice’ and ‘Franklin’ followed in quick succession with a status orange wind warning in place making the first 7 days of Leg II also unworkable. This was an unprecedented period of bad weather which resulted in Leg II scientific staff standing down from the vessel on 21st February 2022 and re-joining on 24th February. A full day of survey work was completed on 25th of February 2022 with three stations completed but 26th February 2022 was again unworkable due to gale force winds. Another three stations were completed on 27th February and two more stations on 28th February 2022. It was not possible to return to Galway City as planned due to a malfunctioning dock gate so the vessel returned to Cork City.

Due to the loss of working days during Leg I and Leg II it was decided to allocate some days from Leg III to cover the survey area to the West of Ireland. From 13th to 17th April 2022, 23 stations were completed on the Porcupine Bank including two deep water stations. Another 24 stations were completed in the area to the North of Ireland (ICES Division 6a) from 17th to 21st April 2022. Sea conditions were much improved during Leg III (12-24th April) with no downtime due to weather. During IAMS 2022 a total of 91 valid tows were completed (out of a target of 97), including 3 additional deep water tows. There were two invalid hauls, one at the beginning of Leg I and another at the end of Leg III; a wing sensor was lost but there was no substantial damage to gear.

(max. 450 words per survey)

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

Name of the research survey: **Cockle North Irish Sea (CNIS)**

1. Objectives of the survey

Estimation of biomass to provide catch advice. Habitat assessment and impact of fishery on designated bird populations.

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

Stratified random. Scientific quadrat and rake sampling. Enumeration of target species and other characterising species of benthic habitat.

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

N/A

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

N/A

(max 450 words per survey)

5. For internationally coordinated surveys, provide a link to the latest meeting report of the coordination group.
Provide a link to the meeting report from the body coordinating the survey (ICES, MEDITS coordination group, MEDIAS coordination group, etc.). For surveys that are not internationally coordinated, refer to any status report (e.g. Cruise report).

The Cockle North Irish Sea (CNIS) survey is not coordinated internationally. The CNIS survey report is available in the Shellfish Stocks and Fisheries Review 2022 publication Shellfish Stocks and Fisheries Review 2022: an assessment of selected stocks (marine.ie)

6. List the main use of the results of the survey (e.g. indices, abundance estimates, environmental indicators). Specify in which context the results are used (on a routine basis), both in international and national context.
If presenting maps of the achieved research survey stations is necessary, provide them as an annex. Refer clearly to the annex and map numbers.

The Cockle Irish Sea survey is undertaken to provide size distribution and to estimate a biomass of cockles (*Cerastoderma edule*) in Dundalk Bay to advise on the status of the cockle stock. The Dundalk Bay cockle survey consists of a 500 m^2 survey grid mapped over the intertidal sand flat. Each grid cell was divided into 400 sub-cells 25m^2 in area. A quadrat and rake-over sample is collected from 3 randomly selected sub-cells (each of which was 25 x 25m) in each grid cell. The same grid cells are sampled each year where possible.

Survey data is submitted routinely to the government department responsible for the management of inshore fisheries in Ireland, i.e. The Department of Agriculture, Food and the Marine (DAFM). Data is also made available to the National and Regional Inshore Fisheries Forums (NIF and RIFF's), at which marine agencies, DAFM, the minister, representatives of the inshore industry and other stakeholders participate.

Size and weight distribution is calculated: reflecting exploitation rate, growth, mortality and recruitment history of the stock.

Survey Maps are provided in Annex 1.1

7. Extended comments
Extended AR comments can be placed under this section.

A pre-fishery survey was completed between 23-26th May 2022 on the sandflats of Dundalk Bay. A total of 373 stations, were sampled, using two different gears: scientific quadrats covering an area of 0.25 m^2 and rakes covering an area of 2 m^2, resulting in approximately 839 m^2 of Dundalk Bay being sampled. The total area surveyed was 27.8 km^2.

Only 89.8% of the sampling stations were sampled during the 2022 survey due to some not being accessible as they were located below the low tide mark during the survey and the varying movements of streams running through the sandflats from year to year. However, the survey area was covered adequately even though samples weren't collected from all the planned sampling points.

(max. 450 words per survey)

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

Name of the research survey: Oyster West Ireland (OWI)

1. Objectives of the survey

Estimation of biomass to provide catch advice on *Ostrea edulis* and *Magallana gigas* and habitat assessment.

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

Regular grid or random, oyster dredge hauls. Enumeration of target and by-catch species. Size distribution data.

No map available as locations are very local and dispersed.

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

N/A

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

N/A

(max 450 words per survey)

5. For internationally coordinated surveys, provide a link to the latest meeting report of the coordination group.
Provide a link to the meeting report from the body coordinating the survey (ICES, MEDITS coordination group, MEDIAS coordination group, etc.). For surveys that are not internationally coordinated, refer to any status report (e.g. Cruise report).

Oyster survey reports are available in the Shellfish Stocks and Fisheries Review 2022 publication Shellfish Stocks and Fisheries Review 2022: an assessment of selected stocks (marine.ie)

6. List the main use of the results of the survey (e.g. indices, abundance estimates, environmental indicators). Specify in which context the results are used (on a routine basis), both in international and national context.
If presenting maps of the achieved research survey stations is necessary, provide them as an annex. Refer clearly to the annex and map numbers.

Oyster West Ireland (OWI) surveys provide data on catch and size distribution of the native oyster (*Ostrea edulis*) and by-catch of non-target species of bivalves.

Oyster survey designs vary locally and locally preferred dredges are used for each survey. A survey was undertaken in Lough Swilly in November and December 2022 where a total of 153 tows were sampled with a single toothless dredge of width 1.5 meters. Two other surveys were undertaken in 2022, with a single toothless dredge of 1.2 meters' width. A total of 79 tows, were undertaken in Fenit, Inner Tralee Bay, Co. Kerry, in September 2022. A survey consisting of 131 tows, was undertaken in September and December in Clew Bay.

Biomass estimates for native oysters (*Ostrea edulis*) are obtained from these surveys. In Lough Swilly the distribution and biomass of naturalised pacific oysters (*Magellana gigas*) are also estimated. Survey data is submitted routinely to the government department responsible for the management of inshore fisheries in Ireland, i.e. The Department of Agriculture, Food and the

Marine (DAFM). Data is also made available to the National and Regional Inshore Fisheries Forums (NIF and RIFF's), at which marine agencies, DAFM, the minister, representatives of the inshore industry and other stakeholders participate.

The size and weight distribution are also calculated, reflecting exploitation rate, growth, mortality and recruitment history of the stock. Data submitted and used routinely by DAFM and also at the RIFF's and NIF.

Survey Maps are provided in Annex 1.1

7. Extended comments
Extended AR comments can be placed under this section.

Only 56% of the planned sampling activities were undertaken as only 3 oyster surveys were carried out in late 2022. Three surveys were rescheduled for early 2023 to minimise the issue of seagrass growth negatively impacting on the efficiency of the dredge.

(max. 450 words per survey)

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

Name of the research survey: **Razor Clam Irish Sea (RCIS)**
1. Objectives of the survey
Estimation of biomass to provide catch advice on *Ensis siliqua* in the north and south Irish Sea by dredge haul. Monitoring of benthic habitats in the fished area.

2. Description of the survey design and methods used in the survey for each type of data collection as listed in Table 2.6 for this specific survey.
Stratified random based on high frequency iVMS data (Figure X and XX). Hydraulic dredge used for fish hauls. Enumeration of target species and other bivalves caught as by-catch. Size distribution target species. Marine community assessment.

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

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

N/A

(max 450 words per survey)

5. For internationally coordinated surveys, provide a link to the latest meeting report of the coordination group.

Provide a link to the meeting report from the body coordinating the survey (ICES, MEDITS coordination group, MEDIAS coordination group, etc.). For surveys that are not internationally coordinated, refer to any status report (e.g. Cruise report).

The Razor Clam Irish Sea (RCIS) report is available in the Shellfish Stocks and Fisheries Review 2022 Shellfish Stocks and Fisheries Review 2022: an assessment of selected stocks (marine.ie)

6. List the main use of the results of the survey (e.g. indices, abundance estimates, environmental indicators). Specify in which context the results are used (on a routine basis), both in international and national context.
If presenting maps of the achieved research survey stations is necessary, provide them as an annex. Refer clearly to the annex and map numbers.

The Razor Clam Irish Sea survey is to provide data on catch and size distribution of the Razor Clam (*Ensis siliqua*) and by-catch of non-target species of bivalves. Biomass estimates of the Razor Clam (*Ensis siliqua*) in the Irish Sea are then calculated using a geostatistical routine.

The survey in the north Irish Sea is based on a stratified random design using iVMS data. Commercial vessels using standard commercial dredges undertake sampling of 800 pre-determined stations towing for between 3-5 minute duration. The commercial dredges are 1-1.2 meters in width and the dredge cages are comprised of 10 mm bar spacing or a 10 mm grid. The sampled area or swept area at each station was estimated from the tow length and the dredge width. Tow length was calculated from the point at which the vessel started towing to the point at which it stopped. GPS positions along the tow path were generated every 5 seconds and recorded in a Trimble GPS field survey unit. Full selectivity is assumed for razor clams above the minimum size. In 2022 a total of 781 tows were undertaken using five different vessels, with hydraulic dredges ranging from 0.86-1.2 m width. Based on the final track length and the gear width, swept area for each tow was estimated, resulting in a total sampling effort of 22,568 m^2.

In the south Irish Sea, a random survey design using a survey grid was utilised. This was undertaken in September 2022. Off Curracloe, Co. Wexford, 42 dredge tows were completed with a further 39 stations sampled off Rosslare, Co. Wexford.

Survey Maps are provided in Annex 1.1

7. Extended comments
Extended AR comments can be placed under this section.

89% of targets were achieved in 2022, this was because less sampling was undertaken in the South Irish Sea due to gear failures.

(max. 450 words per survey)

Text Box 3.1: Fishing activity variables data collection strategy

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

Explain the reasons for implementing complementary data collection.

The Member State will continue to collect transversal data, on a daily basis, from vessels < 12 meters in length (LOA) in a national, Sentinel Vessel Programme (SVP). These data report all transversal variables. However, it is not yet possible to define quantitative targets for a sampling programme for transversal parameters within metiers containing an inshore component; specifically, for vessels <10 metres LOA and where official declarations of their landings are not required. More specifically the total number of active/inactive vessels in the inshore component is not accurately known and the SVP data are not raised to metier level. Also the SVP does not sample all possible metiers in the <10m fleet.

Further details are in Annex 1.2 Fisheries – Sentinel Vessel Programme

(max. 900 words)

Deviations from the work plan
List the changes from the work plan (if any) and explain the reasons.

Table 3.1 indicates that additional data collection was planned for segments within the SSCF through the SVP coastal logbooks. As stated in the WP, SVP data are not raised to metier level, nor does it sample all possible metiers in the SSCF. While data was collected from a small number of these segments ranging from 100% to 500% in achieved response rate, not all of these data were submitted as part of the 2023 socio-economic data call. For completeness, the actual return rates have been reported in Table 3.1 but data on effort was not submitted for DTSVL1012, HOKVL1012* and DFNVL1012 as there was insufficient data to estimate a raised total effort figure for the entire fleet segment.

Table 3.1 indicates that Purse Seiners 0-< 10m* are a segment in the IRL fleet (but this not appear in Table 5.1 Fleet Population). Whilst this may have been the case when the WP was originally drafted, this segment is no longer a feature of the fleet.

Another point to note is that some of the data indicated in Table 3.1 is from the Control Regulation (Art. 62 (EC)No 1224/2009, namely Sales Notes data and this is not a complementary data source. Sales Notes should not have been included in the table but given that amendments cannot be made to the WP table; the AR portion of the table was completed.

Actions to avoid deviations
Briefly describe the actions that will be considered / have been taken to avoid deviations in the future and when these actions are expected to produce an effect. If there are no deviations, then this section is not applicable.

Planned sample rates will be reviewed across the SSCF. Modifications will be made to the WP in Oct 2023 to reflect the developments highlighted above (i.e., removal of Purse Seiners 0-< 10m*; removal of Sales Notes as a data source in Table 3.1)

(max. 900 words)

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

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

As part of the management measures in the Ireland Eel Management Plan, commercial and recreational eel fisheries were ceased in 2009 (& 2010 in the UK part of IE_NorW) and this will be continued for the period 2022-2027. All bycaught eel must be released.

A full description of the historical fishery is given in the Irish EMP.

Deviations from the work plan
List the changes from the work plan (if any) and explain the reasons.

There were no changes to the work plan. The fisheries remained closed in 2023.

Actions to avoid deviations
Briefly describe the actions that will be considered / have been taken to avoid deviations in the future and when these actions are expected to produce an effect. If there are no deviations, then this section is not applicable.

This is kept under review by the National Technical Group on Eel (TEGE).

(max. 900 words)

SECTION 4 : IMPACT OF FISHERIES ON MARINE BIOLOGICAL RESOURCES

Text Box 4.2: Incidental catches of sensitive species
(Region/RFMO/RFO/IO: Please indicate per text box and update the table of contents)

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

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

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):

- Annex 1.1 Demersal at-sea enhanced
- Annex 1.1 Pelagic at-sea enhanced

- 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?

An assessment of high risk fishing metiers for cetacean, seabird and other PET species was carried out by the Marine Institute. Two metiers, (1) gillnet fisheries targeting fish and crustaceans and (2) pelagic trawl fisheries (OTM and PTM) targeting horse mackerel, mackerel and blue whiting, were identified as being high risk for bycatch for the Irish fleet. These fisheries were therefore specifically targeted for the enhanced bycatch sampling, with an additional 8 PSU for the gillnet fishery, and an additional 2 PSU for the pelagic fisheries targeting horse mackerel, mackerel or blue whiting. These sampling PSU are for 2022, with the intention of increasing these PSU incrementally over the coming years as capacity allows.

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

For the Irish fleet, two metiers, (1) gillnet fisheries and (2) pelagic trawl fisheries (OTM and PTM) targeting horse mackerel, mackerel and blue whiting, were identified as high risk for cetacean and other PET species based on the available scientific literature and on a risk assessment carried out by the Marine Institute.

- What are the methods to calculate the observation effort?

The sampling design and protocol are described in detail in Annex1.1 for demersal at-sea enhanced, and Annex1.1 Pelagic at-sea enhanced sampling.

- 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.

The sampling design and protocol are described in detail in Annex1.1 for demersal at-sea enhanced, and Annex1.1 Pelagic at-sea enhanced sampling.

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

- Annex 1.1 Demersal at-sea enhanced
- Annex 1.1 Pelagic at-sea enhanced

- 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?

Not relevant for gill net fishery

- 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?

All interactions with the sampled hauled nets are observed and recorded. Some hauls are not observed due to H&S rest allowances/guidance and are recorded as not observed.

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

For the gillnet fishery it is possible to observe the total catch, for the pelagic fisheries due to the nature of the pumping operations it is only possible to observe the catch in the bag alongside the vessel and in the sample obtained. Samplers are instructed to note any incidental by-catch caught during the whole hauling process.

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.

None

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).

None

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

Results

Provide additional information, if available, in this text box. For example, summary information on the number of individuals recorded as bycaught per species, gear group and monitoring method with information about the state of the animals (i.e. were they released alive, dead, or collected for sampling).

A total of 11 PSUs across the gillnet fleet and 48 PSUs within the targeted tangle net fleet recorded data for sensitive and PET species. A further 31 demersal PSUs and 14 Pelagic PSUs also recorded data on PET species. Preliminary data shows that the majority of PSUs did not encounter PET Species. However, a total of seven PET species were recorded including grey seal, harbour seal, Risso's dolphin, angel shark, flapper skate, common skate, and sting ray. The majority of the PET species were encountered in static gear were dead owing to the longer soak times. It is worth noting that the record of pinnipeds in tangle nets only occurred where soak times were greater than 3 days. While depredation by seals on gillnets were encountered, the number of fatal interactions with the gear was minimal.

Deviations from the work plan

The Member State shall list the deviations (if any) in the achieved data collection compared to what was planned in the work plan and explain the reasons for the deviations.

The work plan was hindered in 2022 as we came out of Covid regulations. Never the less a significant number of PSU's were achieved. A dedicated targeting of the high risk tangle net fleet achieved an extra 48 PSU sampled.

Actions to avoid deviations

The Member State shall describe the actions that will be considered/have been taken to avoid deviations in the future and when these actions are expected to produce an effect. If there are no deviations, then this section is not applicable.

As stated in the plan, an incremental increase in dedicated targeting of high risk metiers is planned for the coming years. Planning is underway for a Biodiversity Bycatch Sampling programme which aims to increase sampling at sea across all high risk metiers and is designed to collect high resolution data on sensitive and PET bycatch species. A dual stream of data with Sampler At Sea data and At Sea Self Sampling data is planned to increase the effective observation rate.

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

Text Box 4.3: Fisheries impact on marine habitats

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

The Marine Institute will develop specific projects targeting areas and metiers of potential high risk (VME indicator spp.) and this will be done outside the DCF through EMFAF and these are currently in development.

As part of the Marine Institutes survey programme, data on VME species is routinely collected during multiple surveys such as the Ground Fish Survey, the UWTV surveys and DCF surveys. Where possible data are also collected on board the at-sea sampling programme

(max 900 words per study)

Brief description of the results (including deviations from the plan and justifications as to why if this was the case).

The Marine Institute has successfully managed to collect data on Vulnerable Marine Ecosystems (VME) during multiple surveys, including the Groundfish Survey, Underwater TV (UWTV) Surveys, and the Irish Anglerfish and Megrim Survey (IAMS). These surveys have delivered valuable information on VME indicator species, their distribution and habitats. In 2022, a comprehensive collection of 273 VME records was obtained, encompassing diverse taxa. Specifically, there were 63 records obtained from the UWTV surveys, 207 from the Groundfish Survey, and 3 from the IAMS survey.

A subset of 127 observations was submitted to the ICES Working Group on Deepwater Ecology (WGDEC) and incorporated into the ICES VME database, contributing to a broader understanding of these ecologically sensitive areas. These submissions included 62 records from the UWTV survey, 63 records from the Groundfish Survey, and 2 records from the IAMS survey.

Achievement of the original expected outcomes and justification if this was not the case.
The original expected outcome was to develop specific projects targeting areas and metiers with potential high risk associated with VME indicator species. However, as of now, no specific projects aimed at targeting these high risk areas and metiers have been developed outside the data collection framework (DCF) through the European Maritime and Fisheries Fund (EMFAF). The absence of these projects can be attributed delays in getting observers on-board fishing vessels post-COVID, to the lack of dedicated staff to manage the work and lack of trained observers.

Justification for the deviation from the original plan regarding specific projects targeting high-risk areas and metiers associated with VME indicator species is the current development phase of these projects.

The complexities involved in identifying and addressing high- risk areas and metiers require additional time and resources. The Marine Institute is in the process of recruiting a Scientific and Technical Officer (STO) for VME assessments to enhance their VME research and management. The STO will collaborate with the FEAS ecosystems team to strengthen the institutes VME research and conservation efforts.

Follow-up to the activities (what are the next steps, how the results will be used).

Moving forward, the Marine Institute is prioritizing the completion and implementation of specific projects targeting high- risk areas and metiers associated with VME indicator species. The continuous routine data collection carried out during surveys such as the Groundfish Survey, UWTV surveys, and IAMS play a vital role in advancing our understanding of VME indicator species and their habitats.

The Marine Institute has ambitious plans to enhance the scope of data collection efforts. Specifically, there are plans to increase the number of reporting species in the UWTV surveys, allowing for a more comprehensive understanding of VME indicator species and their distribution. Additionally, in 2023, the Institute has expanded the program to routinely include the Irish Anglerfish and Megrim Survey (IAMS), further enriching the dataset.

The inclusion of the IAMS survey, along with the increased taxonomic coverage in the UWTV surveys, will significantly contribute to our knowledge of VMEs and their associated species.

In conclusion, while the Marine Institute has successfully implemented routine data collection on VME Indicator species through surveys such as the Groundfish Survey, UWTV surveys, and IAMS. The specific projects targeting high risk areas and metiers associated with VMEs are currently in the development phase.

(max. 900 words per study)

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

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

1. Description of clustering

Clustering is used for a small number of segments for Irish vessels. Of the 35 unique segmentations in the Irish fleet, 14 are cluster into larger segments to maintaining confidentiality. Clustering of these 14 segments is done by combining vessels segment by vessel lengths with similar segments using the same gear. Clustering takes place when a segment has fewer than 10 vessels. The majority of these segments which are clustered are non-important and in total make up 3% of the total registered fleet. Refer to Table 5.1 for fleet clustering details.

2. Description of activity indicator

The activity of the Irish Fleet is described as "NA" as Ireland is not using activity indicators.

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

The only deviation taken by Ireland is to not use the PIM. This was omitted due to the collection of tangible assets from financial accounts which are used to report capital values in line with the EU MAP Guidance which states that MS may use 'Alternative methods based on company surveys. These alternative methods may be used if the derived estimates reflect the actual definition of net capital stock (depreciated replacement value of the vessel including on-board equipment with a useful lifetime of more than one year)'.

(max. 900 words)

Deviations from the work plan
List the changes from the work plan (if any) and explain the reasons.

The method of clustering of pelagic trawler vessels was modified to maintain confidentiality of vessels within this cluster. Previously, segments TMVL0010 and TMVL1012 were clustered into a cluster named TMVL0010. Furthermore, TMVL1218 and TMVL1824 were clustered into a cluster named TMVL1218. A low number of active vessels were reported for 2021 in the TMVL1012 segment, and no vessels were reported active in the TMVL0010 segment which threatened to breach the confidentiality of certain vessel owners. A re-clustering of the vessels in this gear class was thus needed. There were no active vessels in TMVL0010 in 2021, vessels in TMVL1012 were clustered with the TMVL1218 cluster consisting of vessels from TMVL1218 and TMVL1824.

As detailed in Table 6.1, IRL achieved higher response rates than planned for most segments representing larger vessels (i.e., vessels greater than 12 metres LOA) as detailed in Table 5.2, this has improved data quality. Completion of the annual economic survey was a condition of payment to vessel owners under an EMFF grant aid scheme, (i.e., the Brexit temporary tie-up scheme) which resulted in higher achieved response numbers in 2022. In addition, the MS hosted a series of industry information sessions to promote the annual survey and the importance of providing data in October 2022. These factors have had a positive impact on the response rates for certain segments.

As detailed in Table 6.1, IRL achieved lower response rated than planned for the DFNVL1824 segment and certain segments under 10m LOA of the inshore fleet that are traditionally challenging in terms of data collection. Unlike many vessels in the Irish fleet, these segments were not covered under the criteria of the EMFF Brexit tie-up scheme and although they received several reminders, they did not return completed economic surveys.

Actions to avoid deviations
Briefly describe the actions that will be considered / have been taken to avoid deviations in the future and when these actions are expected to produce an effect. If there are no deviations, then this section is not applicable.

For segments that achieved lower response rates than expected (DFNVL1824 and certain segments under 10m LOA), the MS will explore options to improve the response rates through pro-active engagement (e.g. targeting meetings through the inshore forums) with the sector and raising awareness about the importance of providing data on an annual basis to close the current data gaps.

(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.

1. Description of the threshold application
Please provide % of the MS production from the latest EU aquaculture production reported to the EUROSTAT.
All census data is used to generate total and segmented estimations for both EUMAP and EUROSTAT. In both cases, data is generated from all commercially active and licenced production units.
To protect business-level anonymity, there is a threshold of a minimum three business units applied to the reporting of any data by segment. Segment population below this number requires that segment data is amalgamated with that of the most appropriate related segment or both are amalgamated into a new segment and the historical data of the two old segments is incorporated accordingly into subsequent time series uploads. This can happen segment numbers have temporal fluctuations

2. Deviation from the RCG ECON (ex. PGECON) definitions
Describe and justify any deviations from variable definitions as listed in 'EU MAP Guidance Document' in the DCF website.

Land-based shellfish and marine macroalgal production have a collective output of less than 5% of total national production. Previously, these were amalgamated as an all-catching segment 'Other Shellfish other' so as to provide an accurate estimation of overall national output. The growing interest in Seaweed culture prompted Ireland to try separating Macro-algal production into a dedicated segment but the production output and the number of business involved to date are too few to allow this. A number of new companies have entered the population, since 2018, and output is expected to grow. As these numbers are too low to report on for confidentiality and would be under threshold they have not being included in table 6.1. If a minimum number of businesses are detected in the future threshold B should apply to Macro-Algal and land-based shellfish segment data provision. The latter segment may be incorporated into the most appropriate larger shellfish segment, probably 'Oyster Other methods' (Oyster on trestles) as the units involved are mainly hatcheries that supply this segment
(max. 900 words)

Deviations from the work plan
List the changes from the work plan (if any) and explain the reasons.

IRL achieved higher response rates than planned for most segments (as detailed in Table 6.1), this has improved data quality. The format of the annual survey has been revised in recent years and indications from industry suggest that this improvement has helped to increase response rates for some segments.

IRL achieved lower response rated than planned for certain variables in the 'Other bottom bivalves' segments. This segment is organised as cooperatives of small dredger crews that are jointly owned and as a result, individual accounts are not available.

Actions to avoid deviations
Briefly describe the actions that will be considered / have been taken to avoid deviations in the future and when these actions are expected to produce an effect. If there are no deviations, then this section is not applicable.

For segments that achieved higher response rates than expected, if this becomes a trend over the next few years, planned samples rates will be reviewed for future data collection in line with expected response rates.

For segments that achieved lower response rates than expected, the MS will explore options to improve the response rates through pro-active engagement with the sector and raising awareness about the importance of providing data on an annual basis to close the current data gaps.

(max. 900 words)

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

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

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

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

Describe and justify any deviations from variable definitions as listed in 'EU MAP Guidance Document' in the DCF website.

(max. 900 words)

Deviations from the work plan

List the changes from work plan (if any) and explain the reasons.

NA

Actions to avoid deviations

Briefly describe the actions that will be considered / have been taken to avoid deviations in the future and when these actions are expected to produce an effect. If there are no deviations, then this section is not applicable.

NA

(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.

Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Provide short descriptions where indicated, even if the documentation can be found in English. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. For quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS : IRL
Region: North-East Atlantic
Sampling scheme identifier: Demersal at-sea
Sampling scheme type: Commercial fishing trip
Observation type: SciObsAtSea
Time period of validity: 2018-2027
Description of the population
Population targeted: The target population is the group of vessels that are engaged in demersal fisheries (i.e. catching of demersal fish and *Nephrops* using bottom contacting gears) **Population sampled:** All vessels that reported demersal landings in the same quarter of the previous year are included in the sampling frame. **Stratification:** The sampling frames are stratified by year/quarter and geographic region (i.e., vessels that mainly operate in area 6, 7a or 7b-k).
Sampling design and protocols
Sampling design description: The PSU is vessel*time. The sampling frame is a quarterly list of vessels that were active in the same quarter of the previous year using the gear types OTB, SSC, GNS and TBB and the target assemblages DEF and CRU (demersal fish and crustaceans). Each vessel has a sampling probability based on the demersal landings in the relevant quarter of the previous year. Vessels are sampled with replacement. Any new vessels will not be included in the current year. Vessels catching demersal fish with other gears are also not included. The vessels are sampled using two methods 1) At-Sea Sampling with a sampler aboard the vessel 2) At-Sea Self Sampling where the vessel skipper & crew collect samples and associated data which is brought ashore for further analysis.

Rare/incidental bycatch of fish species are checked during each sampling event.
Any Bird/Mammal/Reptile/PET/Decomposed organism that comes in contact with the gear during fishing operation is also recorded.
VME indicator species are noted if present in the random box of discards

Vessels targeting *Nephrops* also bring in a sample of catch and discards to augment the *Nephrops* on shore sampling

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

Regional coordination: N

Link to sampling design documentation:

https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/Trip%20selection%20for%20the%20demersal%20observer%20programme%20v2.docx

Compliance with international recommendations: Y. The sampling program has been designed in accordance with guidance from the ICES WKPICS workshops and WGCATCH working group. It has also been necessary to take into account national logistics and constraints.

Link to sampling protocol documentation:
https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/docs/At-Sea%20Sampling%20Manual_2020.pdf

Compliance with international recommendations: Y.
The sampling protocols have been designed in accordance with guidance from the ICES WKPICS workshops and WGCATCH working group. It has also been necessary to take into account national logistics and constraints.

Sampling implementation

Recording of refusal rate: Y – Refusals and analysis of refusal rates are in accordance with guidance from SGPIDS, 2013.

Monitoring of sampling progress within the sampling year: Sampling progress against targets is tracked within the database and reports of sampling targets and achievements are available to samples.

Data capture

Means of data capture:
Data is initially recorded on paper and then transferred to a database application as soon as possible after sampling. Fish lengths are measured using 1 metre ruler; fish weights are only recorded for samples that are brought back to the lab.

Data capture documentation:
SOPs for sampling (weighing / measuring / completing data sheets / otolith storage etc.) are held in Paradigm3 (a document management system) and reviewed and updated regularly. A

recent copy of the SOP for completing data sheets is available at https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/docs/SOP_Sampling%20Demersal%20and%20Pelagic%20Form%20filling.docx

Quality checks documentation: Y
Data Validation occurs within the entry screens of the database. Data Checking occurs with a Voice Reports software package that reads what has been entered in the database and allows the data enterer to check the records that are being read out against the records written on the datasheets. For information the Operations Guide for the voice reports software is available at https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/docs/TextToSpeech%20Operations%20Guide.doc

Data storage

National database: FEAS_DemDiscards

International database: Detailed data is submitted to RDB / RDBES. Raised data is also currently submitted to the ICES InterCatch database.

Quality checks and data validation documentation: Y
Data Validation occurs within the entry screens of the database. Data Checking occurs with a Voice Reports software package that reads what has been entered in the database and allows the data enterer to check the records that are being read out against the records written on the datasheets.

Quality control occurs after each trip has been entered. These reports look at data anomalies, raising factors, tow and length data etc. This identifies any anomalies which can be checked against the paper data sheets or with the observer. The reports are run in R using imbedded SQL queries and the results are generated by LaTex as PDF documents.

Length weight validation occurs in an excel spreadsheet. and serves as method for age and length checking also.

Data is also checked during extractions for end-users such as ICES / European Commission. The checks used will depend on the use of the data.

The data management of this data collection activity is incorporated into the Marine Institute's IODE accredited Data Management – Quality Management Framework (DM-QMF).

Sample storage

Fish samples are processed in Marine Institute laboratories for length, weight and maturity analysis. Samples for aging such as otoliths are stored clean and dry at room temperature before transport to Marine Institute laboratories for processing and analysis. These age structures are stored at Marine Institute premises for a period of months before preparation and age reading is carried out.
The datasheets are scanned and stored electronically, the original raw datsheets are kept in the regional laboratories and then transferred to headquarters where they are filed. Raw data sheets, duplicate otoliths and read otoliths are archived offsite in secure storage areas after three years. Sectioned otoliths and illicia are stored on site in specialised file storage units.

Data processing
Evaluation of data accuracy (bias and precision): Y There is not a stand-alone evaluation of bias and precision of the data collected by this scheme, but it has been evaluated in a recent ICES benchmark: http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/BSG/2017/WKIrish/wkirish3_2017.pdf **Editing and imputation methods: Y** Where errors are identified, the preferred action is to correct the errors in the database – this might involve reference to the original data sheets if the data has occurred during transcription. Imputation of unsampled domains of interest often done at the international level (e.g. ICES), rather than at the national level. However, in some cases, it is appropriate to merge minor domains with larger ones to reduce the burden on the end-user to deal with data gaps. This can include merging ICES divisions or metiers with similar fishing patterns. At a lower level, imputation may also take place in applying age-length keys where length classes for which no age data exists are imputed following the approach described by Gerritsen et al (2006) Gerritsen, Hans D., David McGrath, and Colm Lordan. "A simple method for comparing age–length keys reveals significant regional differences within a single stock of haddock (Melanogrammus aeglefinus)." ICES Journal of Marine Science 63.6 (2006): 1096-1100. **Quality document associated to a dataset:** No DOI is currently created for the dataset since it is not publicly available. R markdown documents recording the estimation and imputation steps performed for ICES data calls are available on request. The estimation is based on the COST R package. An example of the scripts are available at https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/docs/Discard%20Data%20Extraction_example.rmd **Validation of the final dataset:** Data is checked during extractions for end-users such as ICES / European Commission - the checks used will depend on the use of the data. If errors or anomalies are observed, then data is either corrected by reference to the original data sheets (e.g., in the case of input error) or excluded from that particular use.
AR comment: Indicate any deviations or developments. Do not change the text already adopted in the work plan. Sampling scheme implemented as designed, please see Tables 2.2 and 2.5 and Text Box 2.2 and 2.5 for details of achievements in 2022.

MS : IRL
Region: North-East Atlantic
Sampling scheme identifier: Demersal at-sea enhanced
Sampling scheme type: Commercial fishing trip
Observation type: SciObsAtSea
Time period of validity: 2022-2027
Description of the population

Population targeted: The enhanced sampling specifically targets fisheries determined to be higher risk to bycatch. The target population is the group of vessels that are engaged in demersal gillnet fisheries specifically (i.e. catching of demersal fish using gillnet gears).
Population sampled: All vessels that reported demersal gillnet landings in the same quarter of the previous year are included in the sampling frame.

Stratification: The sampling frames are stratified by year/quarter and geographic region (i.e., vessels that mainly operate in area 6, 7a or 7b-k).

Sampling design and protocols

Sampling design description: The PSU is vessel*time.
The sampling frame is a quarterly list of gillnet vessels only that were active in the same quarter of the previous year using the gear type GNS and the target assemblages DEF and CRU (demersal fish and crustaceans). Each vessel has a sampling probability based on the demersal landings in the relevant quarter of the previous year. Vessels are sampled with replacement.
Any new vessels will not be included in the current year. Vessels catching demersal fish or crustaceans with other gears are also not included. The vessels are sampled using two methods 1) At-Sea Sampling with a sampler aboard the vessel, and if necessary 2) At-Sea Self Sampling where the vessel skipper & crew collect samples and associated data which is brought ashore for further analysis.

Rare/incidental bycatch of fish species are checked during each sampling event.
Any Bird/Mammal/Reptile/PET/Decomposed organism that comes in contact with the gear during fishing operation is also recorded. In addition, associated information on each bycatch event are recorded, including haul number, gear used, whether the animal(s) is released alive or deceased, number of animals, condition of the animal(s), sex, and length.

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

Regional coordination: N

Link to sampling design documentation:
https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/Trip%20selection%20for%20the%20demersal%20observer%20programme%20v2.docx

Compliance with international recommendations: Y. The enhanced bycatch sampling programme is designed to supplement the regular bycatch sampling occurring under DCF. This sampling program has been designed in accordance with guidance from the ICES WKPICS workshops and WGCATCH working group. It has also been necessary to take into account national logistics and constraints. The recommendations of STECF included an increase in monitoring of metiers with a high risk of protected species bycatch. As such, based on a risk assessment of Irish fisheries, high risk fisheries for the fleet were identified and have been targeted by this enhanced sampling scheme.

Link to sampling protocol documentation:
https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/docs/At-Sea%20Sampling%20Manual_2020.pdf

Compliance with international recommendations: Y. The sampling protocols have been designed in accordance with guidance from the ICES WKPICS workshops and WGCATCH working group. It has also been necessary to take into account national logistics and constraints.

Sampling implementation

Recording of refusal rate: Y – Refusals and analysis of refusal rates are in accordance with guidance from SGPIDS, 2013.

Monitoring of sampling progress within the sampling year: Sampling progress against targets is tracked within the database and reports of sampling targets and achievements are available to samples.

Data capture

Means of data capture:
Data on bycatch is initially recorded on paper and then transferred to a database application as soon as possible after sampling. All bird, mammal, reptile (fresh or decomposed) that comes into contact with the gear during fishing operations (either collected on deck or falling out during hauling) is recorded. Information on the bycaught species is recorded in the data sheets, if no bycatch is recorded this information is also noted to ensure all true zero samples are recorded and clear. Information recorded includes, haul number, gear used, whether the animal(s) is released alive or deceased, number of animals, condition of the animal(s), sex, and length.

Data capture documentation:
A recent copy of the SOP for completing data sheets is available at https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/docs/SOP_Sampling%20Demersal%20and%20Pelagic%20Form%20filling.docx

Quality checks documentation: Y

Data Validation occurs within the entry screens of the database. Data Checking occurs with a Voice Reports software package that reads what has been entered in the database and allows the data enterer to check the records that are being read out against the records written on the datasheets. For information the Operations Guide for the voice reports software is available at https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/docs/TextToSpeech%20Operations%20Guide.doc

The data management of this data collection activity is incorporated into the Marine Institute's IODE accredited Data Management – Quality Management Framework (DM-QMF).

Data storage

National database: FEAS_DemDiscards, bycatch data are also summarised and stored in a bycatch specific database.–

International database: Detailed data is submitted to RDB / RDBES. Raised data is also currently submitted to the ICES InterCatch database.

Bycatch data on seabirds, cetaceans, pinnipeds and PET species fish are submitted to ICES WGBYC data call annually, and to any additional ICES or OSPAR special request data calls relating to bycatch, such as WKMOMA.

Quality checks and data validation documentation: Y

Data Validation occurs within the entry screens of the database. Data Checking occurs with a Voice Reports software package that reads what has been entered in the database and allows the data enterer to check the records that are being read out against the records written on the datasheets.

Quality control occurs after each trip has been entered. These reports look at data anomalies, raising factors, tow and length data etc. This identifies any anomalies which can be checked against the paper data sheets or with the observer. The reports are run in R using imbedded SQL queries and the results are generated by LaTex as PDF documents.

Length weight validation occurs in an excel spreadsheet and serves as method for age and length checking also.

Data is also checked during extractions for end-users such as ICES / European Commission. The checks used will depend on the use of the data.

Sample storage

The data sheets are scanned and stored electronically, the original raw datsheets are kept in the regional laboratories and then transferred to headquarters where they are filed. Raw data sheets, duplicate otoliths and read otoliths are archived offsite in secure storage areas after three years. Sectioned otoliths and illicia are stored on site in specialised file storage units.

Any retained fish samples are processed in Marine Institute laboratories
for length, weight and maturity analysis. Samples for aging such as otoliths are stored clean and dry at room temperature before transport to Marine Institute laboratories for processing and analysis. These age structures are stored at Marine Institute premises for a period of months before preparation and age reading is carried out.

Data processing

Evaluation of data accuracy (bias and precision): Y

There is not a stand-alone evaluation of bias and precision of the data collected by this scheme, but it has been evaluated in a recent ICES benchmark:
http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/BSG/2017/WKIrish/wkirish3_2017.pdf

Editing and imputation methods: Y

Where errors are identified, the preferred action is to correct the errors in the database – this might involve reference to the original data sheets if the data has occurred during transcription.

Imputation of unsampled domains of interest often done at the international level (e.g. ICES), rather than at the national level. However, in some cases, it is appropriate to merge minor domains with larger ones to reduce the burden on the end-user to deal with data gaps. This can include merging ICES divisions or metiers with similar fishing patterns. At a lower level, imputation may also take place in applying age-length keys where length classes for which no age data exists are imputed following the approach described by Gerritsen et al (2006)

Gerritsen, Hans D., David McGrath, and Colm Lordan. "A simple method for comparing age–length keys reveals significant regional differences within a single stock of haddock (Melanogrammus aeglefinus)." ICES Journal of Marine Science 63.6 (2006): 1096-1100.

Quality document associated to a dataset:
No DOI is currently created for the dataset since it is not publicly available.
R markdown documents recording the estimation and imputation steps performed for ICES data calls are available on request. The estimation is based on the COST R package. An example of the scripts are available at https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/docs/Discard%20Data%20Extraction_example.rmd

Validation of the final dataset: Data is checked during extractions for end-users such as ICES / European Commission - the checks used will depend on the use of the data. If errors or anomalies are observed, then data is either corrected by reference to the original data sheets (e.g., in the case of input error) or excluded from that particular use.

AR comment: Indicate any deviations or developments. Do not change the text already adopted in the work plan.

Sampling scheme implemented as designed, please see Tables 2.2 and 2.5 and Text Box 2.2 and 2.5 for details of achievements in 2022.

MS : IRL
Region: North-East Atlantic
Sampling scheme identifier: Demersal On-Shore
Sampling scheme type: Commercial fishing trip
Observation type: SciObsOnShore
Time period of validity: 2014-2027

Description of the population

Population targeted: All commercial catch fractions from the demersal fisheries landed into Ireland from all ICES areas by Irish registered vessels (or for fisheries where a bi-lateral agreement is in place)

Population sampled: 95% of the demersal landings are covered by the sampling program. The top 21 ports are sampled – other ports are excluded. All vessel classes and all commercial species are included in the sampling program.

Stratification: Sampling events are stratified by year/quarter and ports are grouped by geographic region (north-west / west / south-west / south-east / east).

Sampling design and protocols

Sampling design description: The PSU is port*day. Targets for number of port-days to be sampled are set for each quarter / port – these are proportional to the landings from the relevant reference period. Expert judgement is used to decide which specific port-days are sampled. Vessels present during a sampling event are selected randomly for sampling - the sampler decides how to perform this selection. If there is not time to sample all species landed from a vessel then species selection is made on a priority basis (i.e. rarer species/stocks are

prioritised over more commonly sampled species/stock). There is a length-stratified target number of otolith samples per sampling event.
Rare/incidental bycatch of fish species are checked during each sampling event.

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

Regional coordination: N

Link to sampling design documentation:
https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/docs/PortSamplingSummaryReport.pdf

Compliance with international recommendations: Y. The sampling program has been designed in accordance with guidance from the ICES WKPICS workshops and WGCATCH working group. It has also been necessary to take into account national logistics and constraints.

Link to sampling protocol documentation:
https://www.dcmap-ireland.ie/documents/methodologies

Compliance with international recommendations: Y.
The sampling protocols have been designed in accordance with guidance from the ICES WGBIOP working group. It has also been necessary to take into account national logistics and constraints.

Sampling implementation

Recording of refusal rate: N – since samplers decide which port-days to sample using expert judgement the refusal rate is not relevant for this sampling program. Refusals would only occur extremely rarely in this sampling programme in any case.

Monitoring of sampling progress within the sampling year: Sampling progress against targets is tracked within the database and reports of sampling targets and achievements are available to samples (and are automatically updated). If the targets are not being met, then targeted sampling may occur.

Data capture

Means of data capture:
Data is initially recorded on paper and then transferred to a database application as soon as possible after sampling. Data is measured using ruler and scales.

Data capture documentation:
SOPs for sampling (weighing / measuring / completing data sheets / otolith storage etc.) are held in Paradigm3 (a document management system) and reviewed and updated regularly. A recent copy of the SOP for completing data sheets is available at https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/docs/SOP_Sampling%20Demersal%20and%20Pelagic%20Form%20filling.docx

Quality checks documentation: Y

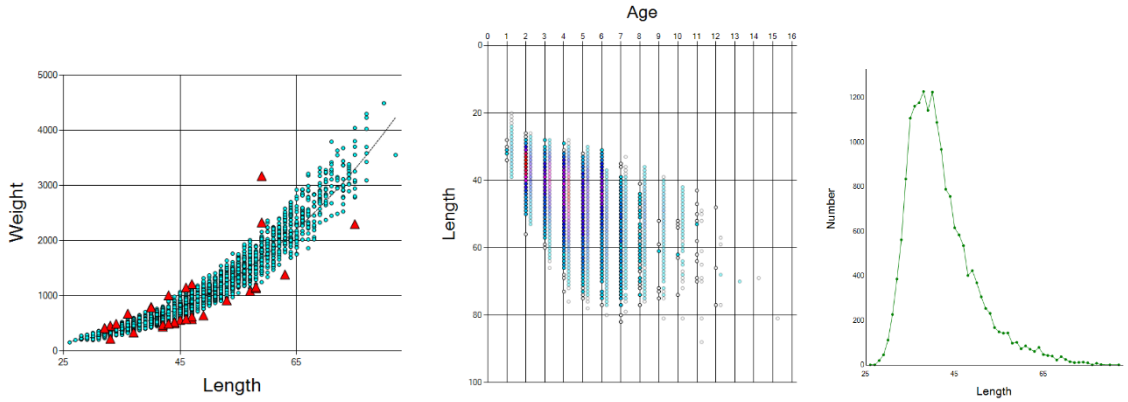
See “Data_checks_Demersal_Onshore.xlsx” at https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/docs/Data_checks_Demersal_Onshore.xlsx for a summary of these checks.

Data storage

National database: Stockman

International database: Detailed data is submitted to RDB / RDBES. Raised data is also currently submitted to the ICES InterCatch database.

Quality checks and data validation documentation: Y
Data Quality QC functions are available within Stockman – these cover length-weight, age-length, length-frequency distributions e.g.



Data is checked during extractions for end-users such as ICES / European Commission. The checks used will depend on the use of the data. See “Data_checks_Demersal_Onshore.xlsx” at https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/docs/Data_checks_Demersal_Onshore.xlsx for a summary of these checks.

The data management of this data collection activity is incorporated into the Marine Institute’s IODE accredited Data Management – Quality Management Framework (DM-QMF).

Sample storage

Samples for aging such as otoliths are stored clean and dry at room temperature before transport to Marine Institute laboratories for analysis. These age structures are stored at Marine Institute premises for a period of months before preparation and age reading is carried out.
Raw data sheets are kept in the regional laboratories and then transferred to headquarters where they are filed. Raw data sheets, duplicate otoliths and read otoliths are archived offsite in secure storage areas after three years. Sectioned otoliths and illicia are stored on site in specialised file storage units.

Data processing

Evaluation of data accuracy (bias and precision): Y

There is not a stand-alone evaluation of bias and precision of the data collected by this scheme but it has been evaluated in recent ICES benchmarks including:
WKIRISH3
2017 http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/BSG/2017/WKIrish/wkirish3_2017.pdf ,
WKAnglerfish 2018 http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2018/WKANGLER/WKAngler_2018.pdf
WKCeltic 2020
https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/Fisheries%20Resources%20Steering%20Group/2020/wkceltic_2020.pdf
WKFlatNSCS 2020
https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/Fisheries%20Resources%20Steering%20Group/2020/WKFlatNSCS_2020.pdf
WKDEM 2020 https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/Fisheries%20Resources%20Steering%20Group/2020/wkdem_2020.pdf

Editing and imputation methods: Y
Where errors are identified, the preferred action is to correct the errors in the database – this might involve reference to the original data sheets if the data has occurred during transcription.
Imputation of unsampled domains of interest often done at the international level (e.g. ICES), rather than at the national level. However, in some cases, it is appropriate to merge minor domains with larger ones to reduce the burden on the end-user to deal with data gaps. This can include merging ICES divisions or metiers with similar fishing patterns. At a lower level, imputation may also take place in applying age-length keys where length classes for which no age data exists are imputed following the approach described by Gerritsen et al (2006)
Gerritsen, Hans D., David McGrath, and Colm Lordan. "A simple method for comparing age–length keys reveals significant regional differences within a single stock of haddock (Melanogrammus aeglefinus)." ICES Journal of Marine Science 63.6 (2006): 1096-1100.

Quality document associated to a dataset:
No DOI is currently created for the dataset since it is not publicly available.
R markdown documents recording the estimation and imputation steps performed for ICES data calls are available on request. The estimation is based on the COST R package. An example of the scripts are available at https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/docs/Cost%20Data%20Extraction_example.Rmd

Validation of the final dataset: Data is checked during extractions for end-users such as ICES / European Commission - the checks used will depend on the use of the data. If errors or anomalies are observed, then data is either corrected by reference to the original data sheets (e.g. in the case of input error) or excluded from that particular use.

AR comment: Indicate any deviations or developments. Do not change the text already adopted in the work plan.

Sampling scheme implemented as designed, please see Tables 2.2 and 2.5 and Text Box 2.2 and 2.5 for details of achievements in 2022.

MS : IRL

Region: North-East Atlantic

Sampling scheme identifier: Pelagic on-shore

(incorporating Pelagic on-shore Herring, Pelagic on-shore boarfish, Pelagic on-shore Sprat, Pelagic on-shore Tuna, and Pelagic on-shore Other)

Sampling scheme type: Commercial fishing trip

Observation type: SciObsOnShore

Time period of validity: 2014-2027

Description of the population

The sampling scheme "Pelagic on-shore" is grouped by populations as follows: Pelagic on-shore Herring, Pelagic on-shore boarfish, Pelagic on-shore Sprat, Pelagic on-shore Tuna, and Pelagic on-shore Other. As these schemes differ only in their population description and sampling design, a single annex 1.1 is presented.

Pelagic on-shore Others

Population targeted: Commercial catch of Mackerel, Horse Mackerel and Blue Whiting landed into Ireland from all ICES area by Irish registered fishing vessels

Population sampled: All vessels landing catch for processing at facilities in Killybegs are included where over 95% of the catch of mackerel, horse mackerel and blue whiting landed in Ireland is processed (samples are secured upon arrival at the processing facility).

Stratification: Sampling events are stratified by year/quarter/week, species, ICES division and fleet segment (RSW or Polyvalent).

Pelagic on-shore Herring

Population targeted: Commercial catch of Celtic Sea herring, Irish Sea herring and 6a (north West) herring by Irish pelagic vessels from ICES areas 6 and 7.

Population sampled: All vessels licenced for the fishery are included in the sampling frame, including the main and sentinel fleet in the Celtic Sea and all authorised vessels for the monitoring TAC in 6a.7bc.

Stratification: Vessels are selected at random from the sampling frame without stratification.

Pelagic on-shore Boarfish

Population targeted: Commercial catch of Boarfish by Irish pelagic vessels from all ICES areas.

Population sampled: Catches of boarfish by reference fleet

Stratification: Sampling events are stratified by week and ICES division

Pelagic on-shore Norwegian Spring Spawning Herring

Population targeted: Commercial catch of Norwegian Spring Spawning Herring by Irish pelagic vessels from all ICES areas.

Population sampled: All vessels licenced for the fishery are included in the sampling frame.

Stratification: Vessels are selected at random from the sampling frame without stratification.

Pelagic on-shore Sprat

Population targeted: Commercial catch of Sprat by Irish pelagic vessels from all ICES areas.

Population sampled: All vessels licenced for the fishery are included in the sampling frame.

Stratification: Sampling events are stratified by week and ICES division.

Pelagic on-shore Tuna

Population targeted: Commercial catch of Tuna by Irish pelagic vessels from all ICES areas.

Population sampled: All vessels licenced for the fishery are included in the sampling frame.

Stratification: Sampling events are stratified by week and ICES division.

Sampling design and protocols

Pelagic On-Shore Others

Sampling design description: The PSU is fishing trip*species. Targets are set to maintain species level sampling levels achieved during the reference period. If the number of landings taking place during any week exceeds a threshold, a random selection if trip*species is made, after stratification by species, ICES division and fleet segment.

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

Regional Coordination: N

Pelagic on-shore Herring

Sampling design description:

Celtic Sea - The PSU is fishing haul * area or day. ICES has advised a total target PSU number of 17 across the main and sentinel fleets. All vessels from the authorised list of licenced vessels participating in the fishery are included. Special fishery arrangements and close liaison between Marine Institute scientists, fish producer organisations and vessel skippers is in place to secure the necessary samples.

6a.7bc (North West) - The PSU is fishing trip. All vessels from the authorised list of licenced vessels participating in the fishery are included. Special fishery arrangements and close liaison between Marine Institute scientists, fish producer organisations and vessel skippers is in place to secure the necessary samples.

Irish Sea Herring - The PSU is fishing trip. Targets are set to maintain sampling levels achieved during the reference period.

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

*Celtic Sea and 6a sampling designs are dictated by the monitoring TAC needs. Once these stocks have been rebuilt, further planning will be required to be compliant with 4S sampling design.

Regional Coordination: N

All landings of herring to be sampled in the Celtic Sea and 6a (North West) as per the monitoring TAC arrangements. PSU for Celtic Sea is haul*area or day. PSU for 6a (North West) is trip.

Pelagic on-shore Boarfish

Sampling design description: The PSU is fishing trip*ICES division*week for vessels in the reference fleet. Targets (2 samples per week per ICES division) are set to maintain sampling levels achieved during the reference period. A sample is taken halfway through the pumping operation, bagged, labelled and frozen and delivered to a Marine Institute laboratory as the next available opportunity.

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

Regional Coordination: N

Pelagic on-shore Norwegian Spring Spawning Herring

Sampling design description: The PSU is fishing trip. Vessels are selected at random from the list of licenced vessels participating in the fishery. Selected vessels secure a sample from a random haul which is frozen onboard and delivered to a Marine Institute laboratory at the next available opportunity.

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

Regional Coordination: N

Pelagic on-shore Sprat

Sampling design description: The PSU is fishing trip*species. Irish sprat landings are highly variable year-to-year. The target number of PSUs therefore needs to be flexible. Targets are set to maintain species level sampling levels achieved during the reference period.

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

Regional Coordination: N

Pelagic on-shore Tuna

Sampling design description: The PSU is fishing trip*species. Irish tuna landings are highly variable year-to-year. The target number of PSUs therefore needs to be flexible. Targets are set to maintain species level sampling levels achieved during the reference period.

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

Regional Coordination: N

Link to sampling design documentation:

https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/docs/PortSamplingSummaryReport.pdf

Sampling implementation

Recording of refusal rate: N – samplers have access to all potential sampling locations (processing facilities, reference fleet vessels or licenced vessels).

Monitoring of sampling progress within the sampling year: Sampling progress against targets is tracked within the database and reports of sampling targets and achievements are available to samples (and are automatically updated). If the targets are not being met, then targeted sampling may occur.

Data capture

Means of data capture:

After the sample is secured from the processing factory (or removed from freezer storage and defrosted) it is transported to the local Marine Institute laboratory.

Length, weight, sex and maturity are recorded on paper for each specimen. Based on the (species specific) sampling protocol, otolith removal is also carried out. When the data has been recorded for all specimens in the sample, the data is manually input to the Stockman database.

Otoliths are prepared for age reading immediately or are transported to another Marine Institute laboratory for preparation before forwarding to the appropriate laboratory for age reading. Ages are initially captured on paper before being entered into Stockman.

Data capture documentation:

SOPs for sampling (weighing / measuring / completing data sheets / otolith storage etc.) are held in Paradigm3 (a document management system) and reviewed and updated regularly. A recent copy of the SOP for completing data sheets is available at https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/docs/SOP_Sampling%20Demersal%20and%20Pelagic%20Form%20filling.docx

Quality checks documentation: Y

See https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/docs/PortSamplingSummaryReport.pdf

and https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/docs/FEAS_Pelagic_3_PortSampling.pdf for a summary of these checks.

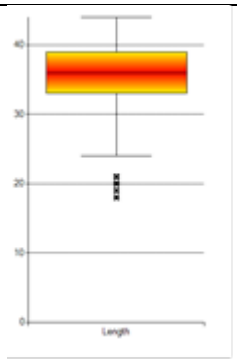
Data storage

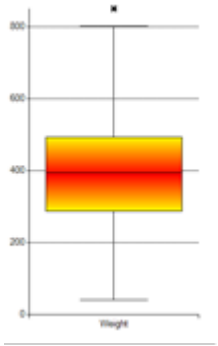
National database: Stockman

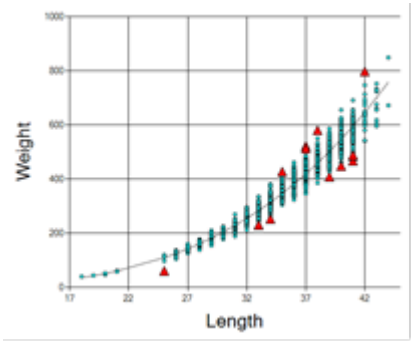
International database: Raised data is submitted to the ICES InterCatch database and to ICES accessions email in a proprietary data exchange format specified by end users.

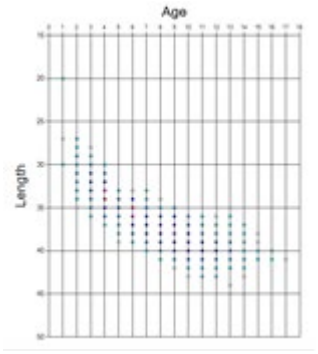
Quality checks and data validation documentation: Y

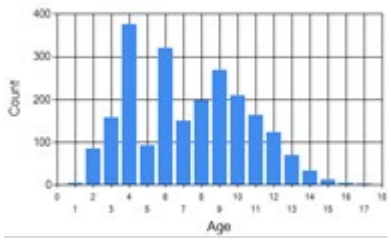
Length, weight, maturity and age data are checked by comparing data both within an individual sample and between all samples with predefined spatial and temporal domains
Data Quality QC functions are available within Stockman – these cover distributions of lengths, weights, the length-weight regression, age-length, length-frequency distributions e.g.

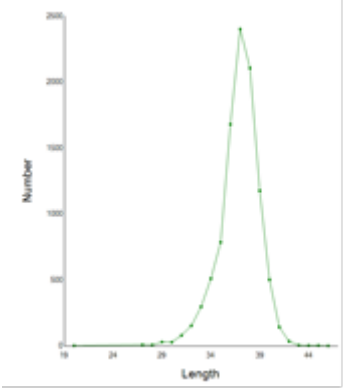












Data is further checked during final extractions and raising of estimates in response to the needs of end-users such as ICES / European Commission. The specific checks used will depend on the purpose for which the data is requested *e.g.* stock assessment.

The data management of this data collection activity is incorporated into the Marine Institute's IODE accredited Data Management – Quality Management Framework (DM-QMF).

Sample storage

Samples for aging such as otoliths are stored clean and dry at room temperature before transport to Marine Institute laboratories for analysis. These age structures are stored at a Marine Institute premises for a period before further sample preparation and age reading is carried out.

Raw data sheets are kept in the regional laboratories and then transferred to headquarters where they are filed. Raw data sheets, duplicate otoliths and otoliths that have been read are archived offsite in secure storage areas after three years. Sectioned otoliths and illicia are stored on site in specialised file storage units.

Data processing

Evaluation of data accuracy (bias and precision): Y

Stand-alone evaluation of bias and precision of the data collected by this scheme is not conducted. Evaluation takes place at a stock level in assessment benchmark meetings and age reading workshops including:

WKARMAC2 – Report of the Workshop on Age Estimation of Atlantic Mackerel (https://doi.org/10.17895/ices.pub.8171)

WKARHOM3 – Workshop on Age Reading of Horse Mackerel, Mediterranean Horse Mackerel and Blue Jack Mackerel (https://doi.org/10.17895/ices.pub.8170)

WKARBLUE3 - Report of the Workshop on Age Estimation of Blue Whiting (in prep)

IBPNEAMAC – Interbenchmark Workshop on the Assessment of Northeast Atlantic Mackerel (https://doi.org/10.17895/ices.pub.4985)

WKWIDE - Report of the Benchmark Workshop on Widely Distributed Stocks (https://doi.org/10.17895/ices.pub.5585)

IBPher6a7bc 2019-Interbenchmark Protocol for Herring in 6.a, 7.b-c

(http://doi.org/10.17895/ices.pub.5261)

WKWEST 2015 Report of the Benchmark Workshop on West of Scotland Herring and Celtic Sea Herring

https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2015/WKWEST/01%20WKWEST%20Report%20%20Final.pdf

Editing and imputation methods: Y

Where errors are identified, the preferred action is to correct the errors in the database – this might involve reference to the original data sheets if the data has occurred during transcription.

Imputation of unsampled domains of interest is carried out by the stock coordinator upon receipt of the annual data submission.

Quality document associated to a dataset:

No DOI is currently created for the dataset since it is not publicly available.

Documentation detailing the estimation and imputation steps performed for ICES data calls are available on request.

Validation of the final dataset: Data is checked during extractions for end-users such as ICES / European Commission - the checks used will depend on the use of the data. If errors or anomalies are observed, then data is either corrected by reference to the original data sheets (e.g. in the case of input error) or excluded from that particular use.

AR comment: Indicate any deviations or developments. Do not change the text already adopted in the work plan.

Sampling scheme implemented as designed, please see Tables 2.2 and 2.5 and Text Box 2.2 and 2.5 for details of achievements in 2022.

MS : IRL

Region: North-East Atlantic

Sampling scheme identifier: Pelagic at-sea

Sampling scheme type: Commercial fishing trip

Observation type: SciObsAtSea

Time period of validity: 2021-2027

Description of the population

Pelagic at-sea others

Population targeted: The target population is the group of vessels that are engaged in the target mackerel, horse mackerel, blue whiting, boarfish and Norwegian spring spawning herring fisheries.

Population sampled: All vessels that reported landings in the same semester of the previous year are included in the sampling frame.

Stratification: The sampling frames are stratified by semester.

Pelagic at-sea Tuna

Population targeted: The target population is the group of vessels that are engaged in the target Tuna fisheries.

Population sampled: All vessels that are authorised to fish for each tuna stock in the sampling year are included in the sampling frame. The yearly lists of authorisations are compiled by the relevant section of the Department of Agriculture, Food and the Marine (DAFM) in conjunction with management advisory committees.

Stratification: The sampling frames are stratified by semester

Pelagic at-sea Herring

Population targeted: The target population is the group of vessels that are engaged in the Irish fisheries targeting the herring stocks of 6a.7bc (NW), Celtic Sea, and Irish Sea.

Population sampled: All vessels that are authorised to fish for each herring stock in the sampling year are included in the sampling frame. The yearly lists of authorisations are compiled by the relevant section of the Department of Agriculture, Food and the Marine (DAFM) in conjunction with management advisory committees.

Stratification: The sampling frames are stratified by semester.

Sampling design and protocols

Sampling design description:

Pelagic at-sea others

The PSU is vessel*time. The sampling frame is a list of vessels active in the target fisheries for mackerel, horse mackerel, blue whiting, boarfish and Norwegian spring spawning herring during the reference period. Each vessel has a sampling probability based on average landings during the relevant semester over the reference period. Vessels are sampled from the list with replacement. Sampling is carried out by a sampler on-board for the duration of the fishing trip.

Rare/incidental bycatch of fish species are checked during each sampling event.

Any Bird/Mammal/Reptile/PET/Decomposed organism that comes in contact with the gear during fishing operation is also recorded.

VME indicator species are noted if present in the random sample box

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

Regional coordination: N

Link to sampling design documentation:

https://www.dcmap-ireland.ie/documents/methodologies

Pelagic at-sea Tuna

The PSU is vessel*time. The sampling frame is a list of vessels active in the target fisheries for Tuna during the reference period. Sampling is carried out by a sampler on board the vessels is assigned by the industry for the duration of the fishing trip.

Rare/incidental bycatch of fish species are checked during each sampling event.

Any Bird/Mammal/Reptile/PET/Decomposed organism that comes in contact with the gear during fishing operation is also recorded.

VME indicator species are noted if present in the random sample box

Pelagic at-sea Herring

The PSU is vessel*time. The three sampling frames are the authorised list of Irish vessels licenced to target herring in the three stocks (6a.7bc, Celtic Sea, Irish Sea). Vessels are sampled from the list with replacement. Sampling is carried out by a sampler on-board for the duration of the fishing trip.

Rare/incidental bycatch of fish species are checked during each sampling event.

Any Bird/Mammal/Reptile/PET/Decomposed organism that comes in contact with the gear during fishing operation is also recorded.

VME indicator species are noted if present in the random sample box

Compliance with international recommendations: Y. The sampling program has been designed in accordance with guidance from the ICES WKPICS workshops and WGCATCH working group. It has also been necessary to take into account national logistics and constraints.

Link to sampling protocol documentation:

https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/docs/At-Sea%20Sampling%20Manual_2020.pdf

Compliance with international recommendations: Y. The sampling protocols have been designed in accordance with guidance from the ICES WKPICS workshops and WGCATCH

working group. It has also been necessary to take into account national logistics and constraints.

Sampling implementation

Recording of refusal rate: Y – Refusals and analysis of refusal rates are in accordance with guidance from SGPIDS, 2013.

Monitoring of sampling progress within the sampling year: Sampling progress against targets is tracked within the database and reports of sampling targets and achievements are available to samples.

Data capture

Means of data capture:

Data is initially recorded on paper and then transferred to a database application as soon as possible after sampling. Fish lengths are measured using 1 metre ruler; fish weights are only recorded for samples that are brought back to the lab.

Data capture documentation:

SOPs for sampling (weighing / measuring / completing data sheets / otolith storage etc.) are held in Paradigm3 (a document management system) and reviewed and updated regularly. A recent copy of the SOP for completing data sheets is available at https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/docs/SOP_Sampling%20Demersal%20and%20Pelagic%20Form%20filling_0.docx

Quality checks documentation: Y

Data Validation occurs within the entry screens of the database. Data Checking occurs with a Voice Reports software package that reads what has been entered in the database and allows the data enterer to check the records that are being read out against the records written on the datasheets.

Data storage

National database: Pelagic Discards Database (Access)

International database: Data (unraised) submitted to ICES in request to annual data call.

Quality checks and data validation documentation: Y

Data Validation occurs within the entry screens of the database. Input is constrained by the use of drop-down lists with further checks performed by the DB application code.

Data is further checked during extractions for end-users such as ICES / European Commission. The checks used will depend on the use of the data.

Migration to SQL Server will be undertaken following completion of the design and specification phases.

The data management of this data collection activity is incorporated into the Marine Institute's IODE accredited Data Management – Quality Management Framework (DM-QMF).

Sample storage

Fish samples are processed in Marine Institute laboratories for length, weight and maturity analysis. Samples for aging such as otoliths are stored clean and dry at room temperature before transport to Marine Institute laboratories for processing and analysis. These age structures are stored at Marine Institute premises for a period of months before preparation and age reading is carried out.

Raw data sheets are kept in the regional laboratories and then transferred to headquarters where they are filed. Raw data sheets, duplicate otoliths and read otoliths are archived offsite in secure storage areas after three years. Sectioned otoliths and illicia are stored on site in specialised file storage units.

Data processing

Evaluation of data accuracy (bias and precision): Y

No a stand-alone evaluation of bias and precision of the data collected by this scheme. Any data collected is submitted to end users at which point accuracy will be assessed.

Editing and imputation methods: Y

Where errors are identified, the preferred action is to correct the errors in the database – this might involve reference to the original data sheets if the data has occurred during transcription.

Imputation of unsampled domains of interest often done at the international level (e.g. ICES), rather than at the national level.

Quality document associated to a dataset: No DOI is currently created for the dataset since it is not publicly available. **Validation of the final dataset:** Data is checked during extractions for end-users such as ICES / European Commission - the checks used will depend on the use of the data. If errors or anomalies are observed, then data is either corrected by reference to the original data sheets (e.g., in the case of input error) or excluded from that particular use.
AR comment: Indicate any deviations or developments. Do not change the text already adopted in the work plan. Sampling scheme implemented as designed, please see Tables 2.2 and 2.5 and Text Box 2.2 and 2.5 for details of achievements in 2022.

TO BE UPDATED

MS : IRL
Region: North-East Atlantic
Sampling scheme identifier: Pelagic at-sea Others
Sampling scheme type: Commercial fishing trip
Observation type: SciObsAtSea
Time period of validity: 2021-2027
Short description (max 100 words): *e.g. sampling scheme aiming at collecting length samples from commercial landings on-shore for all species listed in Table 1 of the EU MAP Delegated Decision annex. The scheme covers mainland and all outermost regions ('RUP' in French, Portuguese, and Spanish).*
Description of the population
Population targeted: Specify which are the primary sampling units (PSU), e.g. all national port*days (information present in former Table 4B). For research surveys: specify the main target species from a survey perspective (as opposed to Table 1 in the Annex to the Implementing Decision) and the main survey area. **Population sampled:** Specify which part of the target population will be sampled and specify which part of the target population is unreachable for sampling or excluded for some reason to explain, *e.g. major ports being listed as auctions excluding all minor ports and no sampling during the week-ends*. For research surveys at sea describe target species in single-species surveys or ecosystem component *(e.g. demersal, pelagic)* in multispecies surveys.

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

Sampling design and protocols

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

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

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

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

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

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

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

Sampling implementation

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

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

Data capture

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

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

- e.g. internal report). If no documentation on data capture (e.g. measuring protocols, maturity staging, manual for the data capture means etc.) exists, provide some details in the textbox.

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

Data storage

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

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

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

Sample storage

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

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

Data processing

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

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

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

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

AR comment: Indicate any deviations or developments. Do not change the text already adopted in the work plan.

Annex 1.1 updated in amended 2023 – 2027 work plan resubmitted in October 2022. Sampling scheme implemented as designed, please see Tables 2.2 and 2.5 and Text Box 2.2 and 2.5 for details of achievements in 2022.

TO BE UPDATED

MS : IRL
Region: North-East Atlantic
Sampling scheme identifier: Pelagic at-sea Tuna
Sampling scheme type: Commercial fishing trip
Observation type: SciObsAtSea
Time period of validity: 2021-2027
Short description (max 100 words): *e.g. sampling scheme aiming at collecting length samples from commercial landings on-shore for all species listed in Table 1 of the EU MAP Delegated Decision annex. The scheme covers mainland and all outermost regions ('RUP' in French, Portuguese, and Spanish).*
Description of the population
Population targeted: Specify which are the primary sampling units (PSU), e.g. all national port*days (information present in former Table 4B). For research surveys: specify the main target species from a survey perspective (as opposed to Table 1 in the Annex to the Implementing Decision) and the main survey area. **Population sampled:** Specify which part of the target population will be sampled and specify which part of the target population is unreachable for sampling or excluded for some reason to explain, *e.g. major ports being listed as auctions excluding all minor ports and no sampling during the week-ends*. For research surveys at sea describe target species in single-species surveys or ecosystem component *(e.g. demersal, pelagic)* in multispecies surveys. **Stratification:** Explain the logic taken to stratify the population and the number of strata generated, *e.g. population stratified in 3 geographical lots (from A to B, from B to C and from C to D). Each lot is then stratified by auction.*
Sampling design and protocols
Sampling design description: Describe how the sampling allocation is defined; how PSU and SSU are selected for sampling; indicate for which catch fraction the sampling scheme applies. **Is the sampling design compliant with the 4S principle?:** Y/N/NA (NA for e.g. surveys and diadromous and recreational sampling schemes) **Regional coordination:** Indicate if the sampling design and protocols were developed as part of a regional or multi-lateral agreement, and if yes, refer to the agreement (table 1.3) and list all MS participating.

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

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

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

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

Sampling implementation

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

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

Data capture

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

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

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

Data storage

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

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

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

Sample storage

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

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

Data processing

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

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

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

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

AR comment: Indicate any deviations or developments. Do not change the text already adopted in the work plan.

Annex 1.1 updated in amended 2023 – 2027 work plan resubmitted in October 2022. Sampling scheme implemented as designed, please see Tables 2.2 and 2.5 and Text Box 2.2 and 2.5 for details of achievements in 2022.

TO BE UPDATED

MS : IRL

Region: North-East Atlantic

Sampling scheme identifier: Pelagic at-sea Herring

Sampling scheme type: Commercial fishing trip

Observation type: SciObsAtSea

Time period of validity: 2021-2027

Short description (max 100 words): *e.g. sampling scheme aiming at collecting length samples from commercial landings on-shore for all species listed in Table 1 of the EU MAP Delegated Decision annex. The scheme covers mainland and all outermost regions ('RUP' in French, Portuguese, and Spanish).*

Description of the population

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

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

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

Sampling design and protocols

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

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

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

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

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

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

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

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

Sampling implementation

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

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

Data capture

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

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

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

Data storage

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

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

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

Sample storage

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

Sample analysis: Provide a brief description or the references to documents, including link to webpages (e.g. age reading manuals, EGs reports and protocols) if adequate, where information on the processing of the samples is provided.
Data processing
Evaluation of data accuracy (bias and precision): Indicate with 'Y' (yes) or 'N' (no). If 'N' (no), indicate when (year) documentation will be available. Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the evaluation of data accuracy exists, provide some details in the textbox. **Editing and imputation methods:** Indicate with 'Y' (yes) or 'N' (no). If 'N' (no), indicate when (year) documentation will be available. Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the editing and imputation methods exists, provide some details in the textbox. **Quality document associated to a dataset:** Is there a publication digital object identifier (DOI) created? Is there a document summarising the estimation process followed? **Validation of the final dataset:** How are datasets validated (quality checked) before providing to end-user?
AR comment: Indicate any deviations or developments. Do not change the text already adopted in the work plan. Annex 1.1 updated in amended 2023 – 2027 work plan resubmitted in October 2022. Sampling scheme implemented as designed, please see Tables 2.2 and 2.5 and Text Box 2.2 and 2.5 for details of achievements in 2022.

TO BE UPDATED

MS : IRL
Region: North-East Atlantic
Sampling scheme identifier: Pelagic on-shore Others
Sampling scheme type: Commercial fishing trip
Observation type: SciObsOnShore
Time period of validity: 2021-2027
Short description (max 100 words): *e.g. sampling scheme aiming at collecting length samples from commercial landings on-shore for all species listed in Table 1 of the EU MAP Delegated Decision annex. The scheme covers mainland and all outermost regions ('RUP' in French, Portuguese, and Spanish).*
Description of the population
Population targeted: Specify which are the primary sampling units (PSU), e.g. all national port*days (information present in former Table 4B). For research surveys: specify the main target species from a survey perspective (as opposed to Table 1 in the Annex to the Implementing Decision) and the main survey area.

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

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

Sampling design and protocols

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

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

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

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

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

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

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

Sampling implementation

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

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

Data capture

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

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

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

Data storage

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

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

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

Sample storage

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

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

Data processing

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

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

Quality document associated to a dataset: Is there a publication digital object identifier (DOI) created? Is there a document summarising the estimation process followed? **Validation of the final dataset:** How are datasets validated (quality checked) before providing to end-user?
AR comment: Indicate any deviations or developments. Do not change the text already adopted in the work plan. Annex 1.1 updated in amended 2023 – 2027 work plan resubmitted in October 2022. Sampling scheme implemented as designed, please see Tables 2.2 and 2.5 and Text Box 2.2 and 2.5 for details of achievements in 2022.

TO BE UPDATED

MS : IRL
Region: North-East Atlantic
Sampling scheme identifier: Pelagic on-shore Tuna
Sampling scheme type: Commercial fishing trip
Observation type: SciObsOnShore
Time period of validity: 2021-2027
Short description (max 100 words): *e.g. sampling scheme aiming at collecting length samples from commercial landings on-shore for all species listed in Table 1 of the EU MAP Delegated Decision annex. The scheme covers mainland and all outermost regions ('RUP' in French, Portuguese, and Spanish).*
Description of the population
Population targeted: Specify which are the primary sampling units (PSU), e.g. all national port*days (information present in former Table 4B). For research surveys: specify the main target species from a survey perspective (as opposed to Table 1 in the Annex to the Implementing Decision) and the main survey area. **Population sampled:** Specify which part of the target population will be sampled and specify which part of the target population is unreachable for sampling or excluded for some reason to explain, *e.g. major ports being listed as auctions excluding all minor ports and no sampling during the week-ends*. For research surveys at sea describe target species in single-species surveys or ecosystem component *(e.g. demersal, pelagic)* in multispecies surveys. **Stratification:** Explain the logic taken to stratify the population and the number of strata generated, *e.g. population stratified in 3 geographical lots (from A to B, from B to C and from C to D). Each lot is then stratified by auction.*
Sampling design and protocols
Sampling design description: Describe how the sampling allocation is defined; how PSU and SSU are selected for sampling; indicate for which catch fraction the sampling scheme applies.

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

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

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

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

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

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

Sampling implementation

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

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

Data capture

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

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

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

Data storage

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

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

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

Sample storage

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

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

Data processing

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

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

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

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

AR comment: Indicate any deviations or developments. Do not change the text already adopted in the work plan.

Annex 1.1 updated in amended 2023 – 2027 work plan resubmitted in October 2022. Sampling scheme implemented as designed, please see Tables 2.2 and 2.5 and Text Box 2.2 and 2.5 for details of achievements in 2022.

TO BE UPDATED

MS : IRL
Region: North-East Atlantic
Sampling scheme identifier: Pelagic on-shore Herring
Sampling scheme type: Commercial fishing trip
Observation type: SciObsOnShore
Time period of validity: 2021-2027
Short description (max 100 words): *e.g. sampling scheme aiming at collecting length samples from commercial landings on-shore for all species listed in Table 1 of the EU MAP Delegated Decision annex. The scheme covers mainland and all outermost regions ('RUP' in French, Portuguese, and Spanish).*
Description of the population
Population targeted: Specify which are the primary sampling units (PSU), e.g. all national port*days (information present in former Table 4B). For research surveys: specify the main target species from a survey perspective (as opposed to Table 1 in the Annex to the Implementing Decision) and the main survey area. **Population sampled:** Specify which part of the target population will be sampled and specify which part of the target population is unreachable for sampling or excluded for some reason to explain, *e.g. major ports being listed as auctions excluding all minor ports and no sampling during the week-ends*. For research surveys at sea describe target species in single-species surveys or ecosystem component *(e.g. demersal, pelagic)* in multispecies surveys. **Stratification:** Explain the logic taken to stratify the population and the number of strata generated, *e.g. population stratified in 3 geographical lots (from A to B, from B to C and from C to D). Each lot is then stratified by auction.*
Sampling design and protocols
Sampling design description: Describe how the sampling allocation is defined; how PSU and SSU are selected for sampling; indicate for which catch fraction the sampling scheme applies. **Is the sampling design compliant with the 4S principle?:** Y/N/NA (NA for e.g. surveys and diadromous and recreational sampling schemes) **Regional coordination:** Indicate if the sampling design and protocols were developed as part of a regional or multi-lateral agreement, and if yes, refer to the agreement (table 1.3) and list all MS participating. **Link to sampling design documentation:** Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, Member State shall provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the sampling design exists, Member State shall provide some details in the textbox. **Compliance with international recommendations:** Indicate 'Y' (yes) if the sampling design is in line with international recommendations, and 'N' if not. If no relevant expert or coordination groups exist, the sampling design should be shortly explained in the text, and should be available upon request for the evaluators.

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

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

Sampling implementation

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

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

Data capture

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

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

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

Data storage

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

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

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

Sample storage

Storage description: Indicate the type of soft tissues and hard parts stored (e.g. age structures, stomach, plankton, genetics) and the location used for samples storage; how long the samples are stored; how conservation and maintenance as well as access to samples are organised; whether the samples are stored under the

auspices/responsibility of an international organization; if yes, which one. Provide a link to information on quantities of sampled stored by species/stock, geographic sub-area and by year.

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

Data processing

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

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

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

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

AR comment: Indicate any deviations or developments. Do not change the text already adopted in the work plan.

Annex 1.1 updated in amended 2023 – 2027 work plan resubmitted in October 2022. Sampling scheme implemented as designed, please see Tables 2.2 and 2.5 and Text Box 2.2 and 2.5 for details of achievements in 2022.

TO BE UPDATED

MS : IRL

Region: North-East Atlantic

Sampling scheme identifier: Pelagic on-shore Boarfish

Sampling scheme type: Commercial fishing trip

Observation type: SciObsOnShore

Time period of validity: 2021-2027

Short description (max 100 words): *e.g. sampling scheme aiming at collecting length samples from commercial landings on-shore for all species listed in Table 1 of the EU MAP Delegated Decision annex. The scheme covers mainland and all outermost regions ('RUP' in French, Portuguese, and Spanish).*

Description of the population

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

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

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

Sampling design and protocols

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

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

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

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

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

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

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

Sampling implementation

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

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

Data capture

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

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

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

Data storage

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

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

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

Sample storage

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

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

Data processing

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

Editing and imputation methods: Indicate with 'Y' (yes) or 'N' (no). If 'N' (no), indicate when (year) documentation will be available. Provide a link to a webpage where the documentation can be found. If no link is

available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the editing and imputation methods exists, provide some details in the textbox.

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AR comment: Indicate any deviations or developments. Do not change the text already adopted in the work plan.

Annex 1.1 updated in amended 2023 – 2027 work plan resubmitted in October 2022. Sampling scheme implemented as designed, please see Tables 2.2 and 2.5 and Text Box 2.2 and 2.5 for details of achievements in 2022.

TO BE UPDATED

MS : IRL

Region: North-East Atlantic

Sampling scheme identifier: Pelagic on-shore Norwegian Spring Spawning Herring

Sampling scheme type: Commercial fishing trip

Observation type: SciObsOnShore

Time period of validity: 2021-2027

Short description (max 100 words): *e.g. sampling scheme aiming at collecting length samples from commercial landings on-shore for all species listed in Table 1 of the EU MAP Delegated Decision annex. The scheme covers mainland and all outermost regions ('RUP' in French, Portuguese, and Spanish).*

Description of the population

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

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

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

Sampling design and protocols

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

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

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

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

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

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

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

Sampling implementation

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

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

Data capture

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

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

Quality checks documentation: Indicate with 'Y' (yes) or 'N' (no). If 'N' (no), indicate when (year) documentation will be available. Provide a link to a webpage where the documentation can be found. If no link is

available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the quality checks exists, provide some details in the text box.

Data storage

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

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

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

Sample storage

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

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

Data processing

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

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

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

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

AR comment: Indicate any deviations or developments. Do not change the text already adopted in the work plan.

Annex 1.1 updated in amended 2023 – 2027 work plan resubmitted in October 2022. Sampling scheme implemented as designed, please see Tables 2.2 and 2.5 and Text Box 2.2 and 2.5 for details of achievements in 2022.

TO BE UPDATED

MS : IRL

Region: North-East Atlantic

Sampling scheme identifier: Pelagic on-shore Sprat

Sampling scheme type: Commercial fishing trip

Observation type: SciObsOnShore

Time period of validity: 2021-2027

Short description (max 100 words): *e.g. sampling scheme aiming at collecting length samples from commercial landings on-shore for all species listed in Table 1 of the EU MAP Delegated Decision annex. The scheme covers mainland and all outermost regions ('RUP' in French, Portuguese, and Spanish).*

Description of the population

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

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

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

Sampling design and protocols

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

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

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

Link to sampling design documentation: Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, Member State shall provide a literature reference

(author(s), year and type of publication - e.g. internal report). If no documentation on the sampling design exists, Member State shall provide some details in the textbox.

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

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

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

Sampling implementation

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

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

Data capture

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

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

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

Data storage

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

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

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

Sample storage

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

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

Data processing

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

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

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

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

AR comment: Indicate any deviations or developments. Do not change the text already adopted in the work plan.

Annex 1.1 updated in amended 2023 – 2027 work plan resubmitted in October 2022. Sampling scheme implemented as designed, please see Tables 2.2 and 2.5 and Text Box 2.2 and 2.5 for details of achievements in 2022.

MS : IRL

Region: North-East Atlantic

Sampling scheme identifier: Pelagic at-sea Enhanced

Sampling scheme type: Commercial fishing trip

Observation type: SciObsAtSea

Time period of validity: 2021-2027

Description of the population

Population targeted: The enhanced sampling specifically targets fisheries determined to be higher risk to bycatch. The target population is the group of vessels that are engaged in the target mackerel, horse mackerel, and blue whiting fisheries.

Population sampled: All vessels that reported landings in the same semester of the previous year are included in the sampling frame.

Stratification: The sampling frames are stratified by semester.

Sampling design and protocols

Sampling design description:

The PSU is vessel*time. The sampling frame is a list of vessels active in the target fisheries for mackerel, horse mackerel, and blue whiting, during the reference period. Each pelagic vessel has a sampling probability based on average landings during the relevant semester over the reference period. Vessels are sampled from the list with replacement. Sampling is carried out by a sampler on-board for the duration of the fishing trip.

Rare/incidental bycatch of fish species are checked during each sampling event.

Any Bird/Mammal/Reptile/PET/Decomposed organism that comes in contact with the gear during fishing operation is also recorded. In addition, associated information on each bycatch event are recorded, including haul number, gear used, whether the animal(s) is released alive or deceased, number of animals, condition of the anima(s), sex, and length.

VME indicator species are noted if present in the random sample box

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

Regional coordination: N

Link to sampling design documentation:

https://www.dcmap-ireland.ie/documents/methodologies

Compliance with international recommendations: Y. The enhanced bycatch sampling programme is designed to supplement the regular bycatch sampling occurring under DCF. This sampling program has been designed in accordance with guidance from the ICES WKPICS workshops and WGCATCH working group. It has also been necessary to take into account national logistics and constraints. The recommendations of STECF included an increase in monitoring of metiers with a high risk of protected species bycatch. As such, based on a risk assessment of Irish fisheries, high risk fisheries for the fleet were identified and have been targeted by this enhanced sampling scheme.

Link to sampling protocol documentation:

https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/docs/At-Sea%20Sampling%20Manual_2020.pdf

Compliance with international recommendations: Y.

The sampling protocols have been designed in accordance with guidance from the ICES WKPICS workshops and WGCATCH working group. It has also been necessary to take into account national logistics and constraints.

Sampling implementation

Recording of refusal rate: Y – Refusals and analysis of refusal rates are in accordance with guidance from SGPIDS, 2013.

Monitoring of sampling progress within the sampling year: Sampling progress against targets is tracked within the database and reports of sampling targets and achievements are available to samples.

Data capture

Means of data capture:

Data on bycatch is initially recorded on paper and then transferred to a database application as soon as possible after sampling. All bird, mammal, reptile (fresh or decomposed) that comes into contact with the gear during fishing operations (either collected on deck or falling out during hauling) is recorded. Information on the bycaught species is recorded in the data sheets, if no bycatch is recorded this information is also noted to ensure all true zero samples are recorded and clear. Information recorded includes, haul number, gear used, whether the animal(s) is released alive or deceased, number of animals, condition of the anima(s), sex, and length.

Data capture documentation:

A recent copy of the SOP for completing data sheets is available at https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/docs/SOP_Sampling%20Demersal%20and%20Pelagic%20Form%20filling_0.docx

Quality checks documentation: Y

Data Validation occurs within the entry screens of the database. Data Checking occurs with a Voice Reports software package that reads what has been entered in the database and allows the data enterer to check the records that are being read out against the records written on the datasheets.

Data storage

National database: Pelagic Discards Database (Access), bycatch data are also summarised and stored in a bycatch specific database.

International database: Detailed data is submitted to RDB / RDBES. Raised data is also currently submitted to the ICES InterCatch database. Bycatch data on seabirds, cetaceans, pinnipeds and PET species fish are submitted to ICES WGBYC data call annually, and to any additional ICES or OSPAR special request data calls relating to bycatch, such as WKMOMA.

Quality checks and data validation documentation: Y

Data Validation occurs within the entry screens of the database. Input is constrained by the use of drop-down lists with further checks performed by the DB application code.

Data is further checked during extractions for end-users such as ICES / European Commission. The checks used will depend on the use of the data.

Migration to SQL Server will be undertaken following completion of the design and specification phases.

The data management of this data collection activity is incorporated into the Marine Institute's IODE accredited Data Management – Quality Management Framework (DM-QMF).

Sample storage

Raw data sheets are kept in the regional laboratories and then transferred to headquarters where they are filed. Raw data sheets, duplicate otoliths and read otoliths are archived offsite

in secure storage areas after three years. Sectioned otoliths and illicia are stored on site in specialised file storage units.

Any retained fish samples are processed in Marine Institute laboratories for length, weight and maturity analysis. Samples for aging such as otoliths are stored clean and dry at room temperature before transport to Marine Institute laboratories for processing and analysis. These age structures are stored at Marine Institute premises for a period of months before preparation and age reading is carried out.

Data processing

Evaluation of data accuracy (bias and precision): Y

No a stand-alone evaluation of bias and precision of the data collected by this scheme. Any data collected is submitted to end users at which point accuracy will be assessed.

Editing and imputation methods: Y

Where errors are identified, the preferred action is to correct the errors in the database – this might involve reference to the original data sheets if the data has occurred during transcription.

Imputation of unsampled domains of interest often done at the international level (e.g. ICES), rather than at the national level.

Quality document associated to a dataset:

No DOI is currently created for the dataset since it is not publicly available.

Validation of the final dataset: Data is checked during extractions for end-users such as ICES / European Commission - the checks used will depend on the use of the data. If errors or anomalies are observed, then data is either corrected by reference to the original data sheets (e.g., in the case of input error) or excluded from that particular use.

AR comment: Indicate any deviations or developments. Do not change the text already adopted in the work plan.

Sampling scheme implemented as designed, please see Tables 2.2 and 2.5 and Text Box 2.2 and 2.5 for details of achievements in 2022.

MS : IRL

Region: North-East Atlantic

Sampling scheme identifier: *Nephrops* at-sea self-sampling, *Nephrops* vessels in FU16

Sampling scheme type: Commercial fishing trip

Observation type: SciObsOnShore

Time period of validity: 2020-ongoing

Description of the population

Population targeted: All commercial catch fractions from the *Nephrops* fisheries landed into Ireland, from the primary *Nephrops* Functional Units (FU16) fished by Irish registered vessels.

Population sampled: 100% of the *Nephrops* landings are covered by the sampling program. All vessel classes > 10 metres and only *Nephrops norvegicus* are included in the sampling program.

Stratification: Sampling events are stratified by FU/vessel/year/month. *Nephrops* grounds are geo-referenced by FU16.

Sampling design and protocols

Sampling design description: The Primary Sampling Unit (PSU) is vessel*month. Targets for number of vessels to be sampled are set for each FU/month – these are proportional to the landings from the relevant reference period. Samples consist of one box of unsorted catch and one box of discards taken from three random valid fishing tows and brought ashore for subsequent work up from one PSU. A valid fishing tow is when no fishing gear problems encountered during fishing tow.

Fishing vessels are contacted and asked to bring the samples ashore.

Three samples brought ashore from each fishing trip sampled.

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

Regional coordination: N

Link to sampling design documentation:

https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/docs/FEAS_*Nephrops*_SOP_2016.pdf

Compliance with international recommendations: Y. The sampling programme is designed to gather samples covering *Nephrops* FU16 from the fleets fishing each. These quasi-reference fleets are sampled to the extent of one sample per 50 tonnes total landings, directed according to the recent three-year average. It has also been necessary to take into account national logistics and constraints.

Link to sampling protocol documentation:

https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/docs/At-Sea%20Sampling%20Manual_2020.pdf

Documentation is stored on national server and will be transferred to the Marine Institutes "Paradigm3", SOP document management repository in 2022.

Sampling implementation

Recording of refusal rate: N – since samplers decide which vessels to sample using expert judgement the refusal rate is not relevant for this sampling program. Refusals would only occur extremely rarely in this sampling programme in any case.

Monitoring of sampling progress within the sampling year: Sampling planning and progress against targets is tracked and sampling achievements are available to samplers and are automatically updated. If the targets are not being met, then targeted sampling may occur.

Data capture

Means of data capture:

Nephrops catch weights, length frequency distributions and biological data are captured using digital electronic callipers and marine scales connected to a tablet and stored locally on the tablet and then uploaded to a SQL server database "Nemesys" as soon as possible after sampling.

Data capture documentation:

SOPs for sampling (weighing / measuring etc.) are held locally on the network and will be transferred to the Marine Institutes "Paradigm3" document management repository, to be reviewed and updated as necessary, in early 2022.

Quality checks documentation: Y

Data are QC'd during the "Nemesys" database collection process.

Data storage

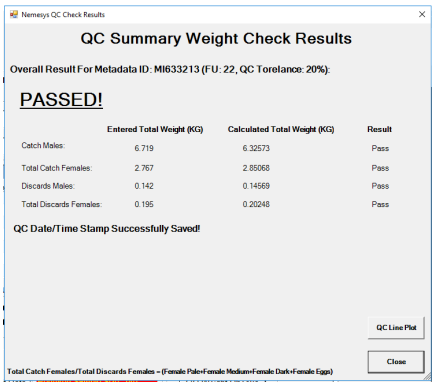
National database: FEAS Nemesys

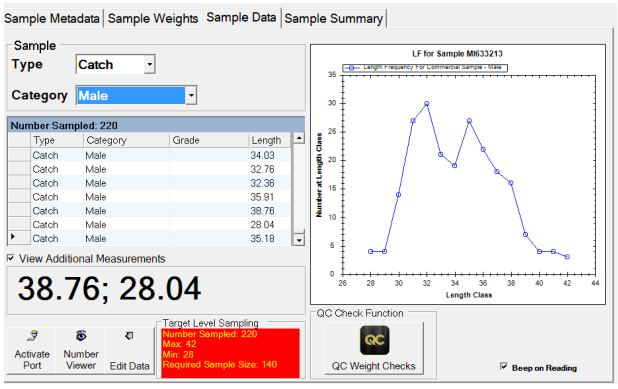
Stored in secure database on Marine Institute IT servers with regular backups following the Institutes IT protocols.

International database: Detailed data will be submitted to ICES RDB / RDBES. Raised data is currently submitted to the ICES InterCatch database.

Quality checks and data validation documentation: Y

Data Quality QC functions are available within "Nemesys" – these cover for example, length-weight, length-frequency distributions.





Data are also checked during extractions for end-users such as ICES / European Commission. The checks used depend on the intended use of the data.

The data management of this data collection activity is incorporated into the Marine Institute's IODE accredited Data Management – Quality Management Framework (DM-QMF).

Sample storage

Samples are routinely labelled and frozen in freezers in port laboratories before work-up.

Data are initially saved to Local "Nemesys" databases on tablets, which are subsequently uploaded to the master Nemesys SQL server soon after processing of a sample.

Additionally, Local Nemesys database on tablets are backed up to the Marine Institute network.

Data processing

Evaluation of data accuracy (bias and precision): Y

There is not a stand-alone evaluation of bias and precision of the data collected by this scheme but it has been evaluated in recent ICES benchmarks including:

> Report of the Benchmark Workshop on *Nephrops* Stocks (WKNEPH)2013 https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2013/WKNEPH%202013/wkneph_2013.pdf
>
> Report of the Benchmark Workshop on Celtic Sea stocks (WKCELT) 2014 https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2014/WKCELT/WKCELT%20Final%20Report.pdf
>
> Hans Gerritsen, Jennifer Doyle and Colm Lordan, 2006. An Evaluation of the Precision of length-frequency samples of *Nephrops* from the Western Irish Sea (FU 15), Working Document to the Workshop on *Nephrops* Stocks (WKNEPH), 24–27 January 2006, ICES Headquarters. ICES CM 2006/ACFM:12. 85 pp. https://www.ices.dk/sites/pub/CM%20Doccuments/2006/ACFM/ACFM1206.pdf

Editing and imputation methods: Y

Where errors are identified, the preferred action is to correct the errors in the database.

Imputation of unsampled domains of interest are often done at the international level (e.g. ICES), rather than at the national level.

Quality document associated to a dataset:

No DOI is currently created for the dataset since it is not publicly available.

R markdown documents recording the estimation and imputation steps performed for ICES data calls are available on request.

Validation of the final dataset: Data are checked during extractions for end-users such as ICES / European Commission - the checks used depend on the type and intended use of the data. If errors or anomalies are observed, then data are either corrected by reference to the database (e.g. in the case of input error) or excluded from that particular use.

AR comment: Indicate any deviations or developments. Do not change the text already adopted in the work plan.

Sampling scheme implemented as designed, please see Tables 2.2 and 2.5 and Text Box 2.2 and 2.5 for details of achievements in 2022.

MS : IRL

Region: North-East Atlantic

Sampling scheme identifier: *Nephrops* at-sea, *Nephrops* vessels in FU16

Sampling scheme type: Commercial fishing trip

Observation type: SciObsAtSea

Time period of validity: 2011 – 2027

Description of the population

Population targeted: The target population is the group of vessels that are engaged in demersal fisheries (i.e. catching of demersal fish and *Nephrops* using bottom contacting gears) of the FU16, Porcupine Bank *Nephrops* Grounds only.
Population sampled: Primary vessels that have historically reported *Nephrops* landings are included in the quasi-reference fleet. Each undertakes on average 3 to 5 fishing trips per year to FU16.

Stratification: The quasi-reference fleets are not stratified owing to their low number, and are sampled as and when availability allows according to reasonable logistics and constraints.

Sampling design and protocols

Sampling design description: The Primary Sample Unit (PSU) is vessel*time.
The sampling frame is a quarterly list of vessels that were active in the same quarter of the previous year. A sampling target of 3 trips is defined per quarter that the FU is open (historically FU16 has been closed to fishing from the end of June to the start of October).
Rare/incidental bycatch of fish species are checked during each sampling event. Any Bird/Mammal/Reptile/PET/Decomposed organism that comes in contact with the gear during fishing operation is also recorded. VME indicator species are noted if present in the random box of discards

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

Regional coordination: N

Link to sampling design documentation:
https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/docs/FEAS_Nephrops_SOP_2016.pdf

Compliance with international recommendations: Y. The sampling programme is designed to gather samples from the fleet fishing *Nephrops* FU16. It has been necessary to take into account national logistics and constraints.

Link to sampling protocol documentation:
Documentation is stored on national server and will be transferred to the Marine Institutes "Paradigm3", SOP document management repository in 2022.

Compliance with international recommendations: Y

Sampling implementation

Recording of refusal rate: N – Since samplers decide which vessels to sample using expert judgement the refusal rate is not relevant for this sampling program. Refusals would only occur extremely rarely in this sampling programme in any case.-

Monitoring of sampling progress within the sampling year: Sampling planning and progress against targets is tracked and sampling achievements are available to samplers. If the targets are not being met, then targeted sampling may occur.

Data capture

Means of data capture:
Nephrops catch weights, length frequency distributions and biological data are captured using digital electronic callipers and marine scales connected to a tablet and stored locally in wet laboratory and then uploaded to a SQL server database "Nemesys" as soon as possible after sampling.

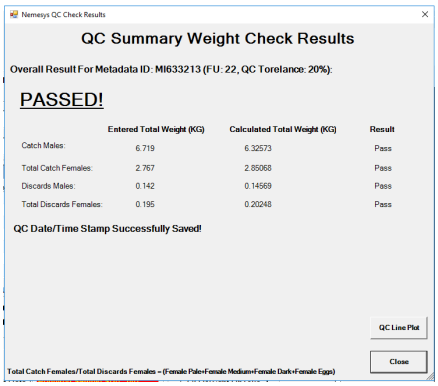
Data capture documentation:
SOPs for sampling (weighing / measuring etc.) are held locally on the network and will be transferred to the Marine Institutes "Paradigm3" document management repository, to be reviewed and updated as necessary, in early 2022.

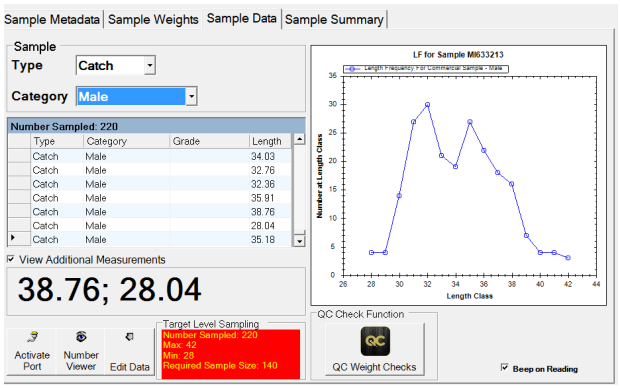
Quality checks documentation: Y
Data are QC'd during the "Nemesys" database collection process.

Data storage

National database: FEAS Nemesys
Stored in secure database on Marine Institute IT servers with regular backups following the Institutes IT protocols.
International database: Detailed data will be submitted to ICES RDB / RDBES. Raised data is currently submitted to the ICES InterCatch database.

Quality checks and data validation documentation: Y
Data Quality QC functions are available within "Nemesys" – these cover length-weight, length-frequency distributions e.g.





Data are also checked during extractions for end-users such as ICES / European Commission. The checks used will depend on the intended use of the data.

The data management of this data collection activity is incorporated into the Marine Institute's IODE accredited Data Management – Quality Management Framework (DM-QMF).

Sample storage

Samples are routinely labelled and frozen in freezers in port laboratories before work-up.

Data are initially saved to Local "Nemesys" databases on tablets, which are subsequently uploaded to the master Nemesys SQL server soon after processing of a sample.

Additionally, Local Nemesys database on tablets are backed up to the MI network.

Data processing

Evaluation of data accuracy (bias and precision): Y
There is not a stand-alone evaluation of bias and precision of the data collected by this scheme but it has been evaluated in recent ICES benchmarks including:

> Report of the Benchmark Workshop on *Nephrops* Stocks (WKNEPH)2013 https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2013/WKNEPH%202013/wkneph_2013.pdf
>
> Hans Gerritsen, Jennifer Doyle and Colm Lordan, 2006. An Evaluation of the Precision of length-frequency samples of *Nephrops* from the Western Irish Sea (FU 15), Working Document to the Workshop on *Nephrops* Stocks (WKNEPH), 24–27 January 2006, ICES Headquarters. ICES CM 2006/ACFM:12. 85 pp. https://www.ices.dk/sites/pub/CM%20Doccuments/2006/ACFM/ACFM1206.pdf

Editing and imputation methods: Y
Where errors are identified, the preferred action is to correct the errors in the database.
Imputation of unsampled domains of interest are often done at the international level (e.g. ICES), rather than at the national level.

Quality document associated to a dataset:
No DOI is currently created for the dataset since it is not publicly available.
R markdown documents recording the estimation and imputation steps performed for ICES data calls are available on request.

Validation of the final dataset: Data are checked during extractions for end-users such as ICES / European Commission - the checks used will depend on the intended use of the data. If errors or anomalies are observed, then data are either corrected by reference to the original data sheets (e.g. in the case of input error) or excluded from that particular use.

AR comment: Indicate any deviations or developments. Do not change the text already adopted in the work plan.

Sampling scheme implemented as designed, please see Tables 2.2 and 2.5 and Text Box 2.2 and 2.5 for details of achievements in 2022.

MS : IRL
Region: North-East Atlantic
Sampling scheme identifier: *Nephrops* On-Shore, *Nephrops* vessels excluding FU16
Sampling scheme type: Commercial fishing trip
Observation type: SciObsOnShore
Time period of validity: 2001-ongoing
Description of the population
Population targeted: All commercial catch fractions from the *Nephrops* fisheries landed into Ireland, from the primary *Nephrops* Functional Units (FU) fished by Irish registered vessels (or for fisheries where a bi-lateral agreement is in place). **Population sampled:** 98% of the *Nephrops* landings are covered by the sampling program. All vessel classes > 10 metres and only *Nephrops norvegicus* are included in the sampling program. FUs 11 to 14 are not routinely sampled owing to low levels of national participation in these fisheries. **Stratification:** Sampling events are stratified by FU/vessel/year/month. *Nephrops* grounds are geo-referenced by FU (FU15, FU17, FU19, FUs20 and 21 combined, and FU22).
Sampling design and protocols
Sampling design description: The Primary Sampling Unit (PSU) is vessel*month. Targets for number of vessels to be sampled are set for each FU/month – these are proportional to the landings from the relevant reference period. Samples consist of one box of catch and one box of discards taken from any one haul and brought ashore for subsequent work up. **Is the sampling design compliant with the 4S principle?:** Y **Regional coordination:** N **Link to sampling design documentation:** https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/docs/FEAS_*Nephrops*_SOP_2016.pdf **Compliance with international recommendations:** Y. The sampling programme is designed to gather samples covering all *Nephrops* FUs from the fleets fishing each. These quasi-reference fleets are sampled to the extent of one sample per 50 tonnes total landings, directed according to the recent three-year average. It has also been necessary to take into account national logistics and constraints. **Link to sampling protocol documentation:** https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/docs/At-Sea%20Sampling%20Manual_2020.pdf

Documentation is stored on national server and will be transferred to the Marine Institutes "Paradigm3", SOP document management repository in 2022.

Sampling implementation

Recording of refusal rate: N – since samplers decide which vessels to sample using expert judgement the refusal rate is not relevant for this sampling program. Refusals would only occur extremely rarely in this sampling programme in any case.

Monitoring of sampling progress within the sampling year: Sampling planning and progress against targets is tracked and sampling achievements are available to samplers and are automatically updated. If the targets are not being met, then targeted sampling may occur.

Data capture

Means of data capture:
Nephrops catch weights, length frequency distributions and biological data are captured using digital electronic callipers and marine scales connected to a tablet and stored locally on the tablet and then uploaded to a SQL server database "Nemesys" as soon as possible after sampling.

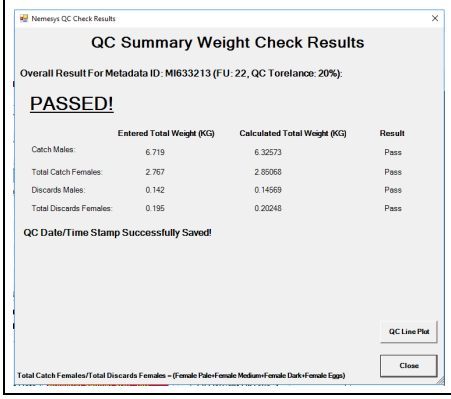
Data capture documentation:
SOPs for sampling (weighing / measuring etc.) are held locally on the network and will be transferred to the Marine Institutes "Paradigm3" document management repository, to be reviewed and updated as necessary, in early 2022.

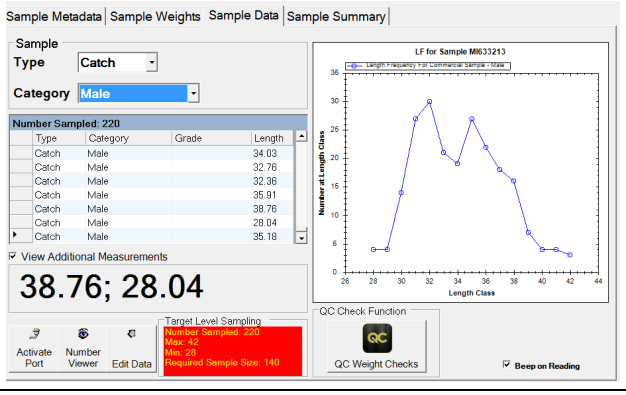
Quality checks documentation: Y
Data are QC'd during the "Nemesys" database collection process.

Data storage

National database: FEAS Nemesys
Stored in secure database on Marine Institute IT servers with regular backups following the Institutes IT protocols.
International database: Detailed data will be submitted to ICES RDB / RDBES. Raised data is currently submitted to the ICES InterCatch database.

Quality checks and data validation documentation: Y
Data Quality QC functions are available within "Nemesys" – these cover for example, length-weight, length-frequency distributions.





Data are also checked during extractions for end-users such as ICES / European Commission. The checks used depend on the intended use of the data.

The data management of this data collection activity is incorporated into the Marine Institute's IODE accredited Data Management – Quality Management Framework (DM-QMF).

Sample storage

Samples are routinely labelled and frozen in freezers in port laboratories before work-up.

Data are initially saved to Local "Nemesys" databases on tablets, which are subsequently uploaded to the master Nemesys SQL server soon after processing of a sample.

Additionally, Local Nemesys database on tablets are backed up to the Marine Institute network.

Data processing

Evaluation of data accuracy (bias and precision): Y
There is not a stand-alone evaluation of bias and precision of the data collected by this scheme but it has been evaluated in recent ICES benchmarks including:

WKNEPH 2013
https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2013/WKNEPH%202013/wkneph_2013.pdf

WKCELT 2014
https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2014/WKCELT/WKCELT%20Final%20Report.pdf

IBPNeph 2015 https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2015/IBP%20Neph/IBPNeph_2015.pdf

Hans Gerritsen, Jennifer Doyle and Colm Lordan, 2006. An Evaluation of the Precision of length-frequency samples of *Nephrops* from the Western Irish Sea (FU 15), Working Document to the Workshop on *Nephrops* Stocks (WKNEPH), 24–27 January 2006, ICES Headquarters. ICES CM 2006/ACFM:12. 85 pp.

Editing and imputation methods: Y
Where errors are identified, the preferred action is to correct the errors in the database.
Imputation of unsampled domains of interest are often done at the international level (e.g. ICES), rather than at the national level.

Quality document associated to a dataset:
No DOI is currently created for the dataset since it is not publicly available.
R markdown documents recording the estimation and imputation steps performed for ICES data calls are available on request.

Validation of the final dataset: Data are checked during extractions for end-users such as ICES / European Commission - the checks used depend on the type and intended use of the data. If errors or anomalies are observed, then data are either corrected by reference to the database (e.g. in the case of input error) or excluded from that particular use.
AR comment: Indicate any deviations or developments. Do not change the text already adopted in the work plan. Sampling scheme implemented as designed, please see Tables 2.2 and 2.5 and Text Box 2.2 and 2.5 for details of achievements in 2022.

MS : IRL
Region: North-East Atlantic
Sampling scheme identifier: Crustacea at-sea
Sampling scheme type: Commercial fishing trip
Observation type: SciObsAtSea
Time period of validity: 2013-ongoing
European lobster (*Homarus gammarus*) and Brown crab (*Cancer pagurus*) catches are sampled on board commercial vessels around the coast of Ireland through an at sea observer programme with sampling trips occurring on an ad-hoc basis during the 6-9 months that the fisheries take place. A Sentinel Vessel Programme and a skipper self-sampling programme, where skippers keep records of daily catches of lobster and brown crab runs parallel to the observer programme.
Description of the population
Population targeted: All commercial catch fractions from the European lobster (*Homarus gammarus*) and Brown crab (*Cancer pagurus*) fisheries around in the Irish coast in ICES Areas 6 and 7. **Population sampled:** <1% of the total number of fishing trips of vessels >12 meters are sampled. **Stratification:** Sampling events are stratified by geographic region (north-west / west / south-west / south east / east).
Sampling design and protocols
Sampling design description: The PSU is vessel-trip. Targets for number of trips undertaken are set for each region. **Is the sampling design compliant with the 4S principle?:** N **Regional coordination:** N **Link to sampling design documentation:** N Sampling of lobster and brown crab catches from ICES Areas 6 and 7 is carried out opportunistically for the 6-9 months of the season. **Compliance with international recommendations:** N **Link to sampling protocol documentation:** An SOP for the at sea sampling (measuring, sexing and recording data) are held in Paradigm 3 (a document management system) and are reviewed and updated regularly.

Compliance with international recommendations: N

Sampling implementation

Recording of refusal rate: N

Monitoring of sampling progress within the sampling year: Sampling progress against targets is tracked throughout the fishing season.

Data capture

Means of data capture:

Data is initially recorded on paper and is then input into an excel template prior to being transferred to a database application as soon as possible after sampling. Data is measured using callipers and measuring boards.

Data capture documentation:

SOPs for sampling (measuring /sexing/recording data) are held in Paradigm3 (a document management system) and reviewed and updated regularly.

Quality checks documentation: Y

Data validation checks and database validation are carried out along with visual inspection of outliers.

Data storage

National database: FEAS_InshoreFisheries

International database: NA

Quality checks and data validation documentation: Y

Data Quality QC functions are available within an excel spreadsheet that is used to input the data. Data is also checked during extractions for end-users. The checks used will depend on the use of the data.

The data management of this data collection activity is incorporated into the Marine Institute's IODE accredited Data Management – Quality Management Framework (DM-QMF).

Sample storage

Storage description: NA

Data processing

Evaluation of data accuracy (bias and precision): Y

The precision of the data is reported in the catch index of our assessments.

Editing and imputation methods: Y

Where errors are identified then the preferred action is to correct the errors in the database – this might involve reference to the original data sheets if the data has occurred during transcription.

Quality document associated to a dataset:

No DOI is currently created for the dataset since it is not publicly available.

Validation of the final dataset:

Data is checked during extractions for end-users - the checks used will depend on the use of the data. If errors or anomalies are observed then data is either corrected by reference to the original data sheets (e.g. in the case of input error) or excluded from that particular use.

AR comment: Indicate any deviations or developments. Do not change the text already adopted in the work plan.

Sampling scheme implemented as designed, please see Tables 2.2 and 2.5 and Text Box 2.2 and 2.5 for details of achievements in 2022.

MS : IRL

Region: North-East Atlantic

Sampling scheme identifier: Crustacea On-Shore

Sampling scheme type: Commercial fishing trip

Observation type: SciObsOnShore

Time period of validity: 2013-ongoing

Landings, by Irish vessels, of the European lobster (*Homarus gammarus*) and Brown Crab (*Cancer pagurus*) are sampled on a monthly basis, where possible, at various processing facilities in the northwest, west and southwest of Ireland, during the 6-9 months of the fishing season. Overall <1% of vessel trips are sampled.

Description of the population

Population targeted: The PSU is port*day. All commercial landings (HUC) from the European lobster (*Homarus gammarus*) and Brown crab (*Cancer pagurus*) fisheries landed in to Ireland from ICES Areas 6 and 7.
Population sampled: <1% of the lobster and brown crab landings from ICES Areas 6 and 7 are covered by the sampling program.
Stratification: Sampling events will occur on a monthly basis in 3 regions undertaken in the north-west, west and south-west.

Sampling design and protocols

Sampling design description: The PSU is port-day. The PSU is port-day. Ports/processing facilities are targeted based on location of where the majority of landings occur.
Approximately 20% of *Homarus gammarus* and *Cancer pagurus* landings will be sampled.
Is the sampling design compliant with the 4S principle?: N
Regional coordination: N
Link to sampling design documentation: N
Sampling of lobster and brown crab landings from ICES Areas 6 and 7 is carried out on a monthly basis, where possible. The sampling is stratified into 3 regions and sampling occurs at processing facilities in the northwest, west and southwest of Ireland.

Compliance with international recommendations: N
Link to sampling protocol documentation:
An SOP for sampling (collecting, measuring, weighing and recording data) are held in Paradigm 3 (a document management system) and are reviewed and updated regularly. https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/docs/1.0%20FEAS%20Inshore%20Sampling%20Overview.docx

Compliance with international recommendations: N

Sampling implementation

Recording of refusal rate: N
Samplers decide which port-days to sample by liaising with the processing facility and using expert judgement the refusal rate is not relevant for this sampling program.

Monitoring of sampling progress within the sampling year: Sampling progress against targets is tracked throughout the year.

Data capture

Means of data capture:
Data is initially recorded on paper and is then input into an excel template to be transferred to a database application as soon as possible after sampling. Data is measured using callipers or measuring boards and scales.

Data capture documentation:
SOPs for sampling (weighing / measuring /) are held in Paradigm3 (a document management system) and reviewed and updated regularly. https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/docs/FEAS_Inshore_3_PortSampling.pdf

Quality checks documentation: Y
Data validation checks and database validation are carried out along with visual inspection of outliers.

Data storage

National database: FEAS_Inshore
International database: NA
Quality checks and data validation documentation: Y
Data Quality QC functions are available within an excel spreadsheet that is used to input the data. Data is also checked during extractions for end-users. The checks used will depend on the use of the data.

The data management of this data collection activity is incorporated into the Marine Institute's IODE accredited Data Management – Quality Management Framework (DM-QMF).

Sample storage

Storage description: N/A

Data processing

Evaluation of data accuracy (bias and precision): N
There is no stand-alone evaluation of bias and precision of the data collected by this scheme.

Editing and imputation methods: Y
Where errors are identified then the preferred action is to correct the errors in the database – this might involve reference to the original data sheets if the data has occurred during transcription.

Quality document associated to a dataset:
No DOI is currently created for the dataset since it is not publicly available.

Validation of the final dataset:
Data is checked during extractions for end-users - the checks used will depend on the use of the data. If errors or anomalies are observed then data is either corrected by reference to the original data sheets (e.g. in the case of input error) or excluded from that particular use.

AR comment: Indicate any deviations or developments. Do not change the text already adopted in the work plan.

Sampling scheme implemented as designed, please see Tables 2.2 and 2.5 and Text Box 2.2 and 2.5 for details of achievements in 2022.

MS: IRL

Region: North-East Atlantic

Sampling scheme identifier: Mollusca On-Shore

Sampling scheme type: Commercial fishing trip

Observation type: SciObsOnShore

Time period of validity: 2002-ongoing

Landings, by Irish vessels, of the King Scallop (*Pecten maximus*) and Common whelk (*Buccinum undatum*) are sampled on a monthly basis, where possible. King Scallop are sampled at a processing facility in the southeast of Ireland, while Whelk are sampled at processing facilities in the northwest and southeast. Overall <1% of vessel trips are sampled.

Description of the population

Population targeted: The PSU is port*day. All commercial landings (HUC) from the King Scallop (*Pecten maximus*) and Common whelk (*Buccinum undatum*) fisheries landed into Ireland from ICES Areas 6 and 7.

Population sampled: <1% of the lobster and brown crab landings from ICES Areas 6 and 7 are covered by the sampling program.

Stratification: Sampling events will occur on a monthly basis in 3 regions undertaken in the north-west, west and south-west.

Sampling design and protocols

Sampling design description: The PSU is port-day. Ports/processing facilities are targeted based on location of where the majority of landings occur and >80% of *Pecten maximus* and *Buccinum undatum* landings will be sampled.

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

Regional coordination: N

Link to sampling design documentation: N

Sampling of scallop and whelk landings from ICES Areas 6 and 7 is carried out on a monthly basis, where possible. The sampling is stratified into 2 regions and sampling occurs at processing facilities in the northwest and southwest of Ireland.

Compliance with international recommendations: N

Link to sampling protocol documentation: An SOP for sampling (collecting, measuring, weighing and recording data) are held in Paradigm 3 (a document management system) and are reviewed and updated regularly. https://www.dcmap-ireland.ie

Compliance with international recommendations: N

Sampling implementation

Recording of refusal rate: N

Samplers decide which port-days to sample by liaising with the processing facility and using expert judgement the refusal rate is not relevant for this sampling program.

Monitoring of sampling progress within the sampling year: Sampling progress against targets is tracked throughout the year.

Data capture

Means of data capture:

Data is initially recorded on paper and is then input into an excel template to be transferred to a database application as soon as possible after sampling. Data is measured using callipers or measuring boards and scales.

Data capture documentation:

SOPs for sampling (weighing / measuring /) are held in Paradigm3 (a document management system) and reviewed and updated regularly. https://www.dcmap-ireland.ie

Quality checks documentation: Y

Data validation checks and database validation are carried out along with visual inspection of outliers.

AR comment: Indicate any deviations or developments. Do not change the text already adopted in the work plan.

Sampling scheme implemented as designed, please see Tables 2.2 and 2.5 and Text Box 2.2 and 2.5 for details of achievements in 2022.

MS : Ireland

Region: North East Atlantic

Sampling scheme identifier: Diad_ESB_Counter *(Salmo salar)*

Sampling scheme type: Diadromous (Scientific)

Observation type: EMA water body

Time period of validity: from when until when 2022-2027

Short description (max 100 words):

Species: *Salmo salar*

Sampling Scheme Type: Diadromous (Scientific)

Sampling Scheme Identifier: Diad_ESB_Counter

Fixed permanent counter upstream and downstream (n=2) monitor salmon and and kelt moving downstream, as well as adult salmon moving upstream enabling full census on wild salmon and released reared salmon.

These are situated at or closed to the tidal limit and are fixed to natural or hydropower barriers or weirs on the Shannon Ardnacrusha and Parteen (IE_Sha) and Erne (IE_NorW) and Clady. These counters provide a valuable time series of relative abundance of wild salmon smolts/adults and released reared salmon smolts/adults.

Counters provide annual index recruitment abundance data for ICES WGNAS datacalls and in WGNAS assessment model.

Description of the population

Population targeted:

Target Species: *Salmo salar*

Stocks targeted are the total stock (downstream migrating recruits and upstream migrating returning adults) for both species in the Erne, Clady, Shannon and Lee river.

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

Smolts and Adults.

Stratification:

These rivers (Erne IE_NorW, Shannon IE_Sha, Lee IE_SouW) were identified as having major hydropower stations at the tidal limit.

Rivers were ESB operate hydropower stations.

Sampling design and protocols

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

Recruitment data are continual census data

Recruitment data (smolt) are continual census data at fixed counter locations at the tidal limit in the Erne, Clady, Shannon and Lee Rivers.

Adult upstream count data are continual census data at fixed counter locations at the tidal limit in the Erne, Clady, Shannon and Lee Rivers.

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

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

No regional co-ordination.

Link to sampling design documentation:

It is managed by the Irish Electricity Supply Board (ESB).

https://www.esb.ie/docs/default-source/investor-relations-documents/esb-annual-report-2013

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

N, currently in discussion in WGNAS. Has been ongoing discussion for 4 years now.

Sampling implementation

Recording of refusal rate:

NA

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

Oversight by the Technical Expert Group on Salmon (TEGOS).

The total catches are what is caught – there is no sub-sampling – its census data or total catch data.

Sampling is monitored at end of season and adjusted for next season

Biological sampling rates can be adjusted as well

Data capture

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

Field data are initially recorded by hand on field sheets or fisher's logs, and subsequently transcribed to excel spreadsheets.

Data capture documentation:

https://www.esb.ie/docs/default-source/investor-relations-documents/esb-annual-report-2013

https://www.fisheriesireland.ie/sites/default/files/migrated/docman/The%20Status%20of%20Irish%20Salmon%20Stocks%20in%202020%20with%20Catch%20Advice%20for%2021.pdf

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

Visual checks are applied to the data at each stage. Once data is on spreadsheet, graphical checks are used to identify outliers. These are either changed with cross checks with the paper records and data providers, or deleted where verification is not possible.

Fishers logs and reported catch data are followed up if data is not consistent with expectations by area managers.

Data storage
National database: Recruitment data are uploaded annually with TEGOS. **International database:** Provide the name of international database(s) and the organisation hosting the database, if applicable. Otherwise, insert 'NA' (not applicable). Provide a link if the database is accessible through a website. ICES WGNAS database. **Quality checks and data validation documentation:** Not currently available. WGNAS on going work on this: https://www.ices.dk/sites/pub/Publication%20Reports/Forms/DispForm.aspx?ID=37558
Sample storage
Storage description: N/A – no biological samples taken from Adults or Smolts.
Data processing
Evaluation of data accuracy (bias and precision): No formal evaluation, data used by WGNAS for years (since early 1980s). No issues have been identified. **Editing and imputation methods:**

N

Quality document associated to a dataset:

No. There isn't a DoI publication of all the data.

Data are summarised and published in the Annual Technical Expert Group on Salmon Reports

https://www.fisheriesireland.ie/sites/default/files/migrated/docman/The%20Status%20of%20Irish%20Salmon%20Stocks%20in%202020%20with%20Catch%20Advice%20for%202021.pdf

Validation of the final dataset:

Data are quality checked during capture and transcription, the annual dataset is then manually / graphically checked for correctness and consistency, the data undergoes further checks upon upload to the WGNAS database, during WGNAS meeting. Spurious unverified data is discarded and not used in any stock assessments.

AR comment: Indicate any deviations or developments. Do not change the text already adopted in the work plan.

Sampling scheme implemented as designed, please see Table 2.3 and Text Box 2.3 for details of achievements in 2022.

MS : Ireland

Region: North East Atlantic

Sampling scheme identifier: Diad_ESB_Eel *(Anguilla anguilla)*

Sampling scheme type: Diadromous (Scientific)

Observation type: SciObs water body

Time period of validity: from when until when 2022-2027

Short description (max 100 words):

Sampling Scheme Identifier: Diad_ESB_Eel

Commercial and recreational fisheries are closed in Ireland, so all data collection is Fishery Independent and Scientific

Programme of data collection for eel, glass (recruitment), and silver eel stages.

a/ Data collected on silver eel conservation trap and Transport on the Erne (IE_NorW), Shannon (IE_Sha) and Liffey (IE_East). Eels are captured in the programme using location specific gear types, such as bridge mounted coghill nets, and or river anchored V-Wing Fykes. Data collected as part of the ESB Silver Eel Trap and Transport programme, biomass in kg and biometry, length (cm) and weight (gm). Sex is imputed from the length frequency distributions.

Programme to estimate silver eel production/escapement and to monitor downstream trap and transport of migrating silver eel using mark-recapture, DIDSON, hydrological profiles and assessment models (described in the Irish TEGE annual assessment reports https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/TEGE_Report_2019_final.pdf , and the Reports to the EU – eg https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/ROI%20Eel%20Management%20Actions%202015-2017_6%20July%202018.pdf)

Data collection is used for reporting under obligation of the EU Eel Stock Recovery Regulation, and the ICES Data calls for eel stock assessment in ICES WGEEL.

b/ Data collected on recruiting glass eel and young yellow eels.

Fixed permanent elver ladder traps monitor upstream recruiting juvenile eel. These are situated at or closed to the tidal limit and are fixed to natural or hydropower barriers or weirs on the Shannon Ardnacrusha and Parteen (IE_Sha) and Erne (IE_NorW). These traps provide a valuable time series of relative abundance of glass eel and young yellow eel recruits and are used in the annual ICES WGEEL stock assessment.

Data type is census data and measured in kgs.

Description of the population

Population targeted:

Target Species: *Anguilla anguilla*

National, using index rivers and reporting by Eel Management Unit (EMU)

The silver eel data are collected from the total emigrating stock for three individual rivers, Erne, Shannon and Lee, which cover approx. 50% of the irish wetted area.

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

Recruits (glass eel and young yellow eel): census data at whole river impassable barriers

Silver Eel production (Bbest) and escapement (Bcurrent) and mortality ΣA determined on a whole river basis

Stratification:

EU Regulation (1100/2007) requires reporting by EMU.

These rivers (Erne IE_NorW, Shannon IE_Sha, Lee IE_SouW) were identified in the National Eel Management Plan as having major hydropower stations at the tidal limit. They are also key index rivers in the Irish modelling for estimating silver eel output.

https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/Ireland%20NationalManagementPlan191208v%5B1%5D.pdf

Sampling design and protocols

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

Recruitment data are continual census data

Silver Eel data are collected from the Trap and Transport Fisheries. Total Catches.

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

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

No regional co-ordination. Sampling has been reported since 2009 for silver eel, and since the 1980s for the recruitment data. No issues have been raised in ICES WGEel or in WKEPEMP 2013 or WKEMP 2018

https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2013/WKEPEMP/wkepemp_2013.pdf

https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2018/WKEMP/wkemp_2018.pdf

Link to sampling design documentation:

The overall framework for the silver eel trap and transport programme was laid out in the Irish Eel Management Plan (EMP) (https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/Ireland%20NationalManagementPlan191208v%5B1%5D.pdf). It is managed by the Irish Electricity Supply Board (ESB) and its use as index sites in the silver eel stock assessments is also described in the Irish EMP.

The Recruitment monitoring elver traps are located at historically chosen sites laid down in legislation governing the construction of the hydropower stations.

Compliance with international recommendations:

There are no specific international recommendations.

This programme follows any recommendations as laid out in the EU Regulation for the Recovery of the Eel Stock (EU 1100/2007).

Also follows recommendations from ICES WGEEL (https://www.ices.dk/community/groups/Pages/WGEEL.aspx) and ICES Eel Datacalls (https://www.ices.dk/sites/pub/Publication%20Reports/Data%20calls/data.call.WGEEL.2021.zip)

Link to sampling protocol documentation:

Refer to the Irish Eel Management Plan and subsequent compliance reports in 2012, 2015, 2018 and 2021 (not published yet) for details (https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/Ireland%20NationalManagementPlan191208v%5B1%5D.pdf https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/ROI%20Eel%20Management%20Actions%202015-2017_6%20July%202018.pdf)

Compliance with international recommendations: Member State shall state 'Y' (yes) if the sampling protocol is in line with international recommendations, and 'N' if not. If no

relevant expert or coordination groups exist, the sampling protocol should be shortly explained in the text, and should be available upon request for the evaluators.

Y

Refer to the Irish Eel Management Plan and subsequent compliance reports in 2012, 2015, 2018 and 2021 for details (https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/Ireland%20NationalManagementPlan191208v%5B1%5D.pdf and https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/ROI%20Eel%20Management%20Actions%202015-2017_6%20July%202018.pdf).

Also compliance with ICES datacalls. (https://www.ices.dk/sites/pub/Publication%20Reports/Data%20calls/data.call.WGEEL.2021.zip)

Sampling implementation

Recording of refusal rate:

NA

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

Oversight by the National Technical Expert Group on Eel.

The total catches are what is caught – there is no sub-sampling – its census data or total catch data.

Sampling is monitored at end of season and adjusted for next season

Biological sampling rates can be adjusted as well

Data capture

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

Field data are initially recorded by hand on field sheets or fisher's logs, and subsequently transcribed to excel spreadsheets. Data are uploaded annually to the ICES WGEEL Database.

Recruitment

Data collected from permanent ramp type elver traps, lengths using measuring board.

Silver Eel

ESB rivers (Shannon, Erne, Lee), capture by coghill and v-wing fyke nets, biometry by measuring board and balance

Otoliths are prepared by burning and cracking, following ICES WKAREA protocols, and images are captured using ImageProPLus software. Growth data is calculated by the software and transferred to excel as described in WKAREA1. https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/docs/Eel%20otolith%20ageing%20SOP.doc

Data capture documentation:

See The Stock Annexes attached to the Irish Reports to the EU in 2012, 2015, and 2018 for descriptions of the Trap and Transport programmes, estimation of silver eel escapement etc. https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/ROI%20Eel%20Management%20Actions%202015-2017_6%20July%202018.pdf

Methods are also described in:

MacNamara, R. & McCarthy, T.K. (2013). Silver eel (*Anguilla anguilla*) population dynamics and production in the River Shannon, Ireland, *Ecology of Freshwater Fish* **23** (2), 181-192.

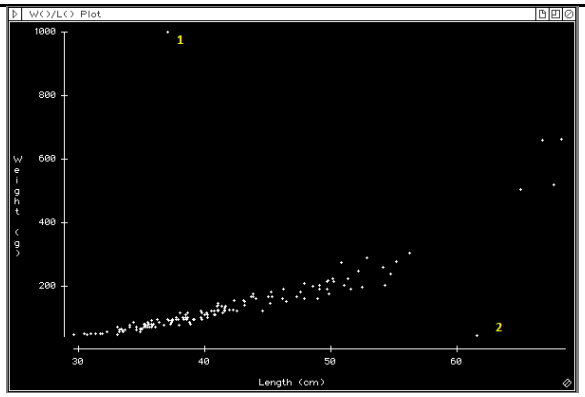
McCarthy, T.K., Nowak, D., Grennan, J., Bateman, A., Conneely, B. & MacNamara, R. (2014). Spawner escapement of European eel (*Anguilla anguilla*) from the River Erne, Ireland. Ecology of Freshwater Fish **23** (1), 21-32.

ICES Manual for Eel age determination WKAREA 1 and associated Manual, WKARE 2 and associated Manual (https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/docs/Eel%20otolith%20ageing%20SOP.doc)

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

Visual checks are applied to the data at each stage. Once data is on spreadsheet, graphical checks are used to identify outliers. These are either changed with cross checks with the paper records and data providers, or deleted where verification is not possible.

Below is an example of erroneous data in a graphical plot. Point 1 was weighed as 100gm but typed in as 1000gm and Point 2 was weighed as 430gm but typed in as 43.0gm.



Model outputs and stock assessment estimates are also cross-checked for spurious data.

Fishers logs and reported catch data are followed up if data is not consistent with expectations.

Data storage

National database:

Recruitment data are uploaded annually to the ICES Eel Database.

Index silver eel data and biomass estimates are uploaded into the WGEEL database every 3 years, in compliance with ICES data calls.

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

ICES WGEEL Eel Database

Quality checks and data validation documentation:

Eel Stock Annex provides some information

https://www.ices.dk/sites/pub/Publication%20Reports/Stock%20Annexes/2020/Anguilla_anguilla_SA.pdf

A git repository hosts the code for WGEEL for recruitment analysis and data processing and to facilitate scientific collaboration:

https://github.com/ices-eg/wg_WGEEL

"Git" is a version control system that manages and stores revisions of projects. GitHub is a Git repository hosting service. It provides a Web-based graphical interface, access control

and several collaboration features, such as a wikis and basic task management tools for every project.

The relevant data (landings, restocking, mortality rates, biomass indicators) provided through the Data Call are integrated into the existing WGEEL database using a shiny application. The idea is (1) to let WGEEL experts carry out checks on the new files, (2) help national correspondents to qualify their data for quality (3) compare the new data with the existing data in the database and check for duplicates. There are two applications, one to edit data straight into the database, and display graphs to check for duplicates once data are submitted. Detailed information can be found on the website:

https://github.com/ices-eg/wg_WGEEL/tree/master/R/shiny_data_integration

The second shiny application is used to visualize and analyse the data provided. It can be found at:

http://185.135.126.249:8080/shiny_dv/

Sample storage

Storage description:

Otoliths are stored dry in envelopes in the MI or AFBINI Archives. Prepared otoliths (burn and crack) are stored mounted in cured silicone in the MI Archive These archive databases are currently being updated (2021)

Data processing

Evaluation of data accuracy (bias and precision):

No formal evaluation, data used by WGEEL for years (since early 1980s. No issues have been identified.

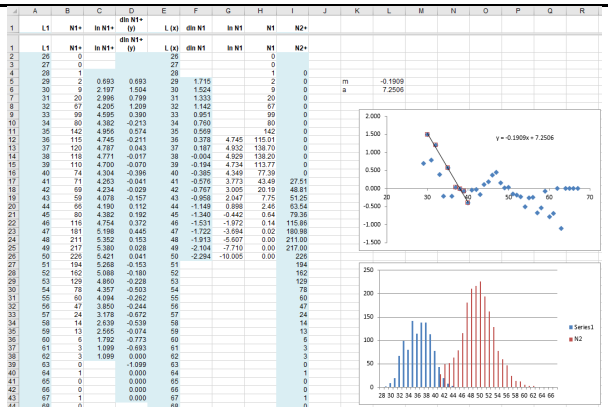
See previous information on the WGEEL GITHUB.

Editing and imputation methods:

Missing weights in length weight data are calculated using log length/weight regressions, for the purposes of calculating biomass.

Sex ratios of silver eel are determined from length frequencies using the Bhattacharya Method (1967), validated using sub-samples of dissected eel

Bhattacharya, C. G. 1967. A simple method of resolution of a distribution into Gaussian components. Biometrics, 23: 115–135.



Quality document associated to a dataset:

No. There isn't a DoI publication of the data.

Data are summarised and published in the Annual Technical Expert Group on Eel Reports (https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/TEGE_Report_2019_final.pdf) and in the triennial Stock Annexes reported to the EU (https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/ROI%20Eel%20Management%20Actions%202015-2017_6%20July%202018.pdf)

Validation of the final dataset:

Data are quality checked during capture and transcription, the annual dataset is then manually / graphically checked for correctness and consistency, the data undergoes further checks upon upload to the WGEel database. Spurious unverified data is discarded and not used in any stock assessments.

AR comment: Indicate any deviations or developments. Do not change the text already adopted in the work plan.

60% of sampling targets were achieved in 2022. Eel sampling in Ireland under the EUMAP involves several actors one of whom (ESB) is a national utilities company, who fund and manage this activity directly. This company changed some of its sampling arrangements in 2022, the impact of this is being discussed at the National Technical Eel Group who are working towards ensuring the Irish sampling for eel is mitigated. See Text Box 2.3 and Table 2.3 for details.

MS : Ireland

Region: *North East Atlantic*

Sampling scheme identifier: Diad_MI_Eel *(Anguilla anguilla)*

Sampling scheme type: Diadromous (Scientific)
Observation type: SciObs water body
Time period of validity: from when until when 2022-2027
Short description (max 100 words): Species: *Anguilla Anguilla* Sampling Scheme Type: Diadromous (Scientific) Sampling Scheme Identifier: Diad_ESB_Eel Commercial and recreational fisheries are closed in Ireland, so all data collection is Fishery Independent and Scientific Programme of data collection for eel, glass (recruitment), yellow (standing stock) and silver eel stages. a/ Data collected on silver eel: Permanent traps monitor downstream migrating silver eels on the Burrishoole River (IE_West) providing a full daily census for estimating annual production and escapement of silver eel. Numbers of fish migrating downstream, daily number, size, weight and sex ratio of emigrating silver eels (used in the Irish model for estimating silver eel escapement - IMESE), described in the Irish TEGE annual assessment reports, and the Reports to the EU – eg https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/TEGE_Report_2019_final.pdf https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/ROI%20Eel%20Management%20Actions%202015-2017_6%20July%202018.pdf) Data collection is used for reporting under obligation of the EU Eel Stock Recovery Regulation, and the ICES Data calls for eel stock assessment in ICES WGEEL. b/ Data collected on recruiting glass eel and young yellow eels. Fixed permanent elver ladder traps monitor upstream recruiting juvenile eel. These are situated at or closed to the tidal limit and are fixed to natural or hydropower barriers or weirs on the Liffey (IE_East) and Burrishoole (IE_West). Elver traps provide annual index recruitment abundance data for ICES WGEEL. Data are collected in biomass (kg) or where numbers are very low, counts are made and converted to biomass. For WGEEL datacalls, numbers are converted from biomass using site specific conversion factors related to size and age of recruits. c/ Data collected on Yellow Eel Standing Stock; Electrofishing and fyke net surveys Electrofishing river surveys and fyke net lake surveys on the Burrishoole Catchment (IE_West) target yellow eel in selected water bodies, all fish are identified; weight and

length measurements taken. Used for estimating yellow eel (river, lake and transitional water) populations. Used in time series analysis in ICES WGEEL. Data may be used in future eel stock assessment modelling employing the French Eel Density Assessment (EDA) model. Outputs will be reported under EU Regulation metrics and also in ICES Datacalls

Above described programmes contribute to the national eel monitoring programme (Eel: Council Regulation 1100/2007), which operates across different Irish agencies and parent departments

Burrishoole river is an index river for national assessment but also for the joint EIFAAC/ICES/GFCM Working Group on Eel (WGEel).

Description of the population

Population targeted:

Target Species: *Anguilla anguilla*

National, using index rivers and reporting by Eel Management Unit (EMU)

The silver eel data are collected from the total emigrating stock for the Burrishoole Index River (IE_West)

Recruit data are collected at Burrishoole (IE_West) and the Liffey (IE_East).

Yellow eel data collected in the Burrishoole in three habitats, rivers, freshwater lakes, and transitional waters (tidal lagoon lake)

Population sampled:

Recruits (glass eel and young yellow eel) : census data at whole river tidal limit

Silver Eel production (Bbest) and escapement (Bcurrent) and mortality ΣA determined on a whole river basis

Yellow eel relative abundance using time series of CPUE, length and weight

Stratification:

EU Regulation (1100/2007) requires reporting by EMU.

Burrishoole is a long-term index river and a key river in the Irish modelling for estimating silver eel output under the EU Eel Regulation EMP. https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/Ireland%20NationalManagementPlan191208v%5B1%5D.pdf

Relevant References:

Bornarel, V, et al. inc R Poole (2018). Modelling the recruitment of European eel (*Anguilla anguilla*) throughout its European range. ICES Journal of Marine Science 75(2), 541-552. https://doi.org/10.1093/icesjms/fsx180

Poole, W.R., Reynolds, J.D.R. & Moriarty, C. (1990). Observations on the silver eel migrations of the Burrishoole river system, Ireland. 1959 to 1988. *Int. Revue Ges Hydrobiol*. **75** (6); 807-815.

Poole W. R., Diserud, O.H., Thorstad, E.B., Durif, C., Dolan, C., Sandlund, O.T., Bergesen, K., Rogan, G., Kelly, S. & Vollestad, L.A. (2018). Long-term variation in numbers and biomass of silver eels being produced in two European river systems. *ICES Journal of Marine Science*, 75 (5); 1627-1637; doi:10.1093/icesjms/fsy053

Sampling design and protocols

Sampling design description:

Recruitment data are continual census data at fixed trap locations

Silver Eel data are collected from the permanent traps in Burrishoole, a daily census

Yellow eel surveys are targeted at the warmer months of the year, with standard locations, standard gear and fixed effort.

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

Regional coordination:

No regional co-ordination. Sampling has been reported since 2009 for silver eel, and since the 1980s for the recruitment data. No issues have been raised in ICES WGEel or in WKEPEMP 2013 or WKEMP 2018

https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2013/WKEPEMP/wkepemp_2013.pdf

https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2018/WKEMP/wkemp_2018.pdf

Link to sampling design documentation:

The overall framework for the silver eel census programme was laid out in the Irish Eel Management Plan (EMP) (https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/Ireland%20NationalManagementPlan191208v%5B1%5D.pdf), making use of historical locations with time series of data.

Burrishoole Silver eel trapping is described in Poole et al. (1990, 1998) and in the Burrishoole Traps Manual (https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/docs/Freshwater%20Traps%20Operation%20Document%2005-10-2015.pdf)

Compliance with international recommendations:

There are no specific international recommendations.

This programme follows any recommendations as laid out in the EU Regulation for the Recovery of the Eel Stock (EU 1100/2007).

Also follows recommendations from ICES WGEEL and ICES Eel Datacalls (https://www.ices.dk/community/groups/Pages/WGEEL.aspx https://www.ices.dk/sites/pub/Publication%20Reports/Data%20calls/data.call.WGEEL.2021.zip)

Link to sampling protocol documentation:

Refer to the Irish Eel Management Plan and subsequent compliance reports in 2012, 2015, 2018 and 2021 (not published yet) for details (https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/Ireland%20NationalManagementPlan191208v%5B1%5D.pdf https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/ROI%20Eel%20Management%20Actions%202015-2017_6%20July%202018.pdf)

Also refer to the Burrishoole Traps Manual, which is currently being updated (2021) (https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/docs/Freshwater%20Traps%20Operation%20Document%2005-10-2015.pdf)

Compliance with international recommendations:

Y

Refer to the Irish Eel Management Plan and subsequent compliance reports in 2012, 2015, 2018 and 2021 for details: https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/Ireland%20NationalManagementPlan191208v%5B1%5D.pdf https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/ROI%20Eel%20Management%20Actions%202015-2017_6%20July%202018.pdf

Also compliance with ICES datacalls.
https://www.ices.dk/sites/pub/Publication%20Reports/Data%20calls/data.call.WGEEL.2021.zip

Sampling implementation

Recording of refusal rate:

NA

Monitoring of sampling progress within the sampling year:

Oversight by the National Technical Expert Group on Eel. The total catches are what is caught – there is no sub-sampling – its census data or total catch data. Sampling is monitored at end of season and adjusted for next season. Biological sampling rates can be adjusted as well

Data capture

Means of data capture:

Field data are initially recorded by hand on field sheets (waterproof paper), and subsequently transcribed to excel spreadsheets. Data are uploaded monthly to the Burrishoole SQL traps database, and annually to the ICES WGEEL Database.

Recruitment

Data collected from permanent ramp type elver traps, lengths using measuring board.

Yellow Eel

Data are collected as follows: Rivers using Backpack electrofishers, lakes using standard fyke nets fished in chains of 10.

Silver Eel

Silver eels captured in permanent downstream fish traps (see https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/docs/Freshwater%20Traps%20Operation%20Document%2005-10-2015.pdf)

Otoliths are prepared by burning and cracking, following ICES WKAREA protocols, and images are captured using ImageProPLus software. Growth data is calculated by the software and transferred to excel as described in WKAREA1.

https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/docs/Eel%20otolith%20ageing%20SOP.doc

Data capture documentation:

Silver eels

(See https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/docs/Freshwater%20Traps%20Operation%20Document%2005-10-2015.pdf)

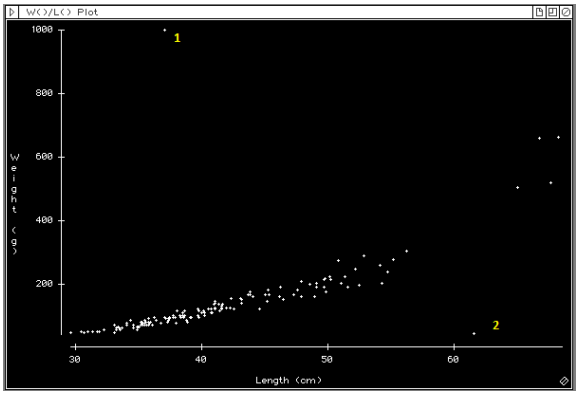
Yellow Eels (See SOP for field data); Providing a new SOP for Eel fyke netting in 2022.

Recruitment – Needs a new SOP document (2022)

Quality checks documentation:

Visual checks are applied to the data at each stage. Once data is on spreadsheet, graphical checks are used to identify outliers. These are either changed with cross checks with the paper records and data providers, or deleted where verification is not possible.

Below is an example of erroneous data in a graphical plot. Point 1 was weighed as 100gm but typed in as 1000gm and Point 2 was weighed as 430gm but typed in as 43.0gm.



Model outputs and stock assessment estimates are also cross-checked for spurious data.

Data storage

National database:

Recruitment data are uploaded annually to the ICES Eel Database. Stored locally on spreadsheets and on daily backups.

Yellow eel data are uploaded annually to the ICES Eel Database. Stored locally on spreadsheets and on daily backups.

Index silver eel data and biomass estimates are uploaded into the WGEEL database every 3 years, in compliance with ICES data calls. Silver eel data stored locally on spreadsheet and uploaded monthly to the Burrishoole Traps Database which also stores the upload sheets and QC sheets.

http://data.marine.ie/geonetwork/srv/eng/catalog.search#/metadata/ie.marine.data:dataset.4343

International database:

ICES WGEEL Eel Database

Quality checks and data validation documentation:

Eel Stock Annex provides some information

https://www.ices.dk/sites/pub/Publication%20Reports/Stock%20Annexes/2020/Anguilla_anguilla_SA.pdf

A git repository hosts the code for WGEEL for recruitment analysis and data processing and to facilitate scientific collaboration:

https://github.com/ices-eg/wg_WGEEL

"Git" is a version control system that manages and stores revisions of projects. GitHub is a Git repository hosting service. It provides a Web-based graphical interface, access control and several collaboration features, such as a wikis and basic task management tools for every project.

The relevant data (landings, restocking, mortality rates, biomass indicators) provided through the Data Call are integrated into the existing WGEEL database using a shiny application. The idea is (1) to let WGEEL experts carry out checks on the new files, (2) help national correspondents to qualify their data for quality (3) compare the new data with the existing data in the database and check for duplicates. There are two applications, one to edit data straight into the database, and display graphs to check for duplicates once data are submitted. Detailed information can be found on the website:

https://github.com/ices-eg/wg_WGEEL/tree/master/R/shiny_data_integration

The second shiny application is used to visualize and analyse the data provided. It can be found at:

http://185.135.126.249:8080/shiny_dv/

Sample storage

Storage description:

Otoliths are stored dry in envelopes in the MI or AFBINI Archives. Prepared otoliths (burn and crack) are stored mounted in cured silicone in the MI Archive. These archive databases are currently being updated (2021).

Data processing

Evaluation of data accuracy (bias and precision):

No formal evaluation, data used by WGEEL for years (since early 1980s. No issues have been identified.

See previous information on the WGEEL GITHUB.

Silver Eel data has been peer-reviewed:

Poole, W.R., Reynolds, J.D.R. & Moriarty, C. (1990). Observations on the silver eel migrations of the Burrishoole river system, Ireland. 1959 to 1988. *Int. Revue Ges Hydrobiol*. **75** (6); 807-815.

Poole W. R., Diserud, O.H., Thorstad, E.B., Durif, C., Dolan, C., Sandlund, O.T., Bergesen, K., Rogan, G., Kelly, S. & Vollestad, L.A. (2018). Long-term variation in numbers and biomass of silver eels being produced in two European river systems. *ICES Journal of Marine Science*, 75 (5); 1627-1637; doi:10.1093/icesjms/fsy053

Sandlund, O.T., Diserud, O. H., Poole, R., Bergesen, K., Dillane, M., Rogan, G., Durif, C., Thorstad, E. B., and Vøllestad, L. A. 2017. Timing and pattern of annual silver eel migration in two European watersheds are determined by similar cues. Ecology and Evolution, DOI:10.1002/ece3.3099; 11pp.

Yellow Eel data is being prepared for publication in early 2022.

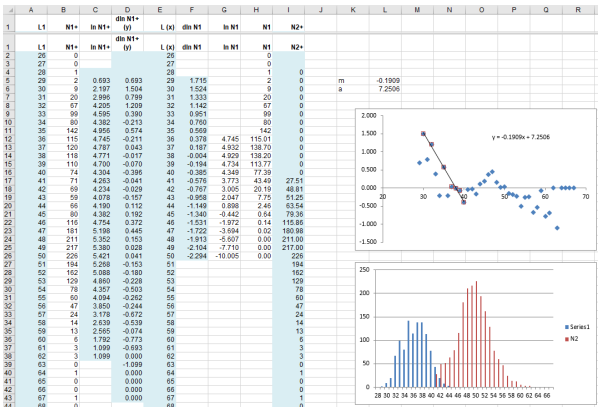
Editing and imputation methods:

Y

Missing silver eel and yellow eel weights in length weight data are calculated using log length/weight regressions, for the purposes of calculating total biomass.

Sex ratios of silver eel are determined from length frequencies using the Bhattacharya Method (1967), validated using sub-samples of dissected eel

Bhattacharya, C. G. 1967. A simple method of resolution of a distribution into Gaussian components. Biometrics, 23: 115–135.



Quality document associated to a dataset:

No. There isn't a DoI publication of all the data.

Silver eel count data are:

http://data.marine.ie/geonetwork/srv/eng/catalog.search#/metadata/ie.marine.data:dataset.4343

Data are summarised and published in the Annual Technical Expert Group on Eel Reports (https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/TEGE_Report_2019_final.pdf) and in the triennial Stock Annexes reported to the EU (https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/ROI%20Eel%20Management%20Actions%202015-2017_6%20July%202018.pdf) and in the previous peer-review publications

Validation of the final dataset:

Data are quality checked during capture and transcription, the annual dataset is then manually / graphically checked for correctness and consistency, the data undergoes further checks upon upload to the WGEel database. Spurious unverified data is discarded and not used in any stock assessments.

AR comment: Indicate any deviations or developments. Do not change the text already adopted in the work plan.

Sampling scheme implemented as designed, please see Table 2.3 and Text Box 2.3 for details of achievements in 2022.

MS : Ireland

Region: North East Atlantic

Sampling scheme identifier: Diad_MI_Salmon_CWT*(Salmo salar)*

Sampling scheme type: Diadromous (recreational)

Observation type: SciObs water body

Time period of validity: from when until when 2022-2027

Short description (max 100 words):

Species: *Salmo salar / Salmo trutta*

Sampling Scheme Type: Diadromous (Recreational)

Sampling Scheme Identifier: Diad_MI_ Salmon_CWT

National Coded Wire Tagging programme data collection for salmon. Tag seaward migrating salmon smolts, detected upon river return as adults. Data include release and recovery locations, length of tagged smolt, dates and sea age.

Tagging carried out on 7 rivers, BUNDORRAGHA RIVER; BURRISHOOLE RIVER; CONG RIVER; CORRIB RIVER; ERNE RIVER; LEE RIVER and SHANNON RIVER

Data used in estimation of survival/exploitation rates and straying of wild/hatchery salmon.

Data are provided in data calls to ICES WGNAS. Index data from Burrishoole are used to calibrate annual models and assessments, due to the long time series available.

Data also used by the National Technical Expert group on Salmon to calibrate the national assessments for setting Conservation Limits.

Description of the population

Population targeted: Target Species: *Salmo salar*

Stocks targeted are the ranched Salmon smolts (downstream migrating recruits) in the BUNDORRAGHA RIVER; BURRISHOOLE RIVER; CONG RIVER; CORRIB RIVER; ERNE RIVER; LEE RIVER and SHANNON RIVER

Population sampled:

Returning coded wire tagged adults at traps on the Bundorragha river, Burrishoole river, Cong River, Corrib river, Erne river, Lee river and Shannon river.

Stratification:

t's a total stock census for salmon on the Bundorragha river, Burrishoole river, Cong River, Corrib river, Erne river, Lee river and Shannon river.

Sampling design and protocols

Sampling design description:

Returning adults sampled at traps on rivers.

Sample (core) taken if adult presents CWT (metal detection).

Sample is subsequently sent to Marine Institute Newport where sample is analysed and entered into National Coded Wire Tagging database.

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

Regional coordination:

No regional co-ordination.

Data are provided in annual datacall to ICES WGNAS. Marine survival data are used to calibrate annual models and assessments, for WGNAS.

Data also used by the National Technical Expert group on Salmon to calibrate the national assessments for setting Conservation Limits.

Link to sampling design documentation:

https://www.dcmap-ireland.ie/documents/methodologies

https://data.gov.ie/dataset/national-coded-wire-tagging-and-tag-recovery-programme

Compliance with international recommendations:

There are no specific international recommendations.

Link to sampling protocol documentation:

https://www.dcmap-ireland.ie/documents/methodologies

https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/docs/National%20Microtag%20Recovery%20Programme%20Student%20Protocol.docx

Compliance with international recommendations:

N, there is currently none from WGNAS.

Sampling implementation

Recording of refusal rate:

NA

Monitoring of sampling progress within the sampling year:

Oversight by the National Technical Expert Group on Salmon

The total catches are what is caught – there is no sub-sampling – its census data or total catch data.

Sampling is monitored at end of season and adjusted for next season

Data capture

Means of data capture:

Returning adults sampled at traps on rivers.

Field data are initially recorded by hand on field sheets (waterproof paper), and subsequently transcribed to excel spreadsheets.

Sample (core) taken if adult presents CWT (metal detection).

Sample is subsequently sent to Marine Institute Newport where sample is analysed and serial number on microtag entered into National Coded Wire Tagging database.

Data capture documentation:

https://www.dcmap-ireland.ie/documents/methodologies

Quality checks documentation:

Visual checks are applied to the data at each stage. Once data is on spreadsheet, graphical checks are used to identify outliers. These are either changed with cross checks with the paper records and data providers, or deleted where verification is not possible.

Data storage

National database:

Microtag data are stored on the National Coded Wire tagging database.

International database:

ICES WGNAS salmon database

Quality checks and data validation documentation:

Not currently available.

Sample storage

Storage description:

Cores are stored in tubes filled in ethanol in the MI, until they are prepared for analysis.

Data processing

Evaluation of data accuracy (bias and precision):

No formal evaluation, data used by WGNAS for years (since early 1980s. No issues have been identified.

Editing and imputation methods:

N

Quality document associated to a dataset:

No. There isn't a DoI publication of all the data.

Data are summarised and published in the Annual National Coded Tag recovery report

https://data.gov.ie/dataset/national-coded-wire-tagging-and-tag-recovery-programme

Validation of the final dataset:

Data are quality checked during capture and transcription, the annual dataset is then manually / graphically checked for correctness and consistency, the data undergoes further checks upon upload to the international databases. Spurious unverified data is discarded and not used in any stock assessments.

AR comment: Indicate any deviations or developments. Do not change the text already adopted in the work plan.

Sampling scheme implemented as designed, please see Table 2.3 and Text Box 2.3 for details of achievements in 2022.

MS : Ireland

Region: North East Atlantic

Sampling scheme identifier: Diad_MI_Salmon_SeaTrout *(Salmo salar & Salmo trutta)*

Sampling scheme type: Diadromous (Scientific)

Observation type: SciObs water body

Time period of validity: from when until when 2022-2027

Short description (max 100 words):

Species: *Salmo salar / Salmo trutta*

Sampling Scheme Type: Diadromous (Scientific)

Sampling Scheme Identifier: Diad_MI_ Salmon_SeaTrout

Programme of data collection for salmon and sea trout in the Burrishoole Index Catchment, West of Ireland. This annex covers wild salmon and wild sea trout parr, downstream

migrating smolt and upstream adult returns. Also collected are data on the returns of tagged ranched salmon, numbers, survival and growth/sex.

Data for the total fish census, including counts, survivals (freshwater/marine), size and fecundity, sex, have been collected in Burrishoole since 1970. Primary data are from total river permanent fish traps, with supplementary data on parr from river electrofishing surveys.

Description of the population

Population targeted:

Target Species: *Salmo salar & Salmo trutta*

Stocks targeted are the total stock (downstream migrating recruits and upstream migrating returning adults) for both species in the Burrishoole river.

Population sampled:

Recruits (parr and smolt): census data at whole river tidal limit, parr are site specific surveys, smolts are total production

Adult salmon is the total return of both wild and ranched stock - a total census. Biological sampling covers approx. 25% of the returns of wild salmon (to minimise handling) and all the ranched fish.

Wild sea trout, a total census of all returning trout (fully anadromous fish and all other non-silvered "slob" trout)

Stratification:

Burrishoole is a long-term index river and a key river in the Irish modelling setting conservation limits for salmon.

It's a total stock census for both salmon and sea trout

Relevant References:

E. de Eyto, J. White, P. Boylan, B. Clarke, D. Cotter, D. Doherty, P. Gargan, R. Kennedy, P. McGinnity, N. O'Maoiléidigh, K. O'Higgins, (2015). The fecundity of wild Irish Atlantic salmon Salmo salar L. and its application for stock assessment purposes,

Fisheries Research, 164; 159-169, ISSN 0165-7836

https://doi.org/10.1016/j.fishres.2014.11.017.

Poole, W.R., Dillane, M., deEyto, E., Rogan, G., McGinnity, P. & Whelan, K. (2006). Characteristics of the Burrishoole sea trout population: census, marine survival, enhancement and stock recruitment, 1971-2003. In: *Sea Trout: Biology, Conservation and*

Management (Harris, G.S. & Milner, N.J., Eds). Proceedings of the First International Sea Trout Symposium, July 2004, Cardiff, Wales, UK. Blackwell Publishing, Oxford, pp. 279-306.

Sampling design and protocols

Sampling design description:

Recruitment data parr are from annual electrofishing surveys carried out at standard locations.

Recruitment data (smolt) are continual census data at fixed trap locations at the tidal limit in the Burrishoole.

Adult upstream count data are collected from the permanent traps in Burrishoole, a daily census

Link to Trap manual https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/docs/Freshwater%20Traps%20Operation%20Document%2005-10-2015.pdf

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

Regional coordination:

No regional co-ordination. Sampling follows the schedule outlined in the ICES WKESDCF workshop report (2012) for index rivers.

Data are provided in datacalls to ICES WGNAS and in annual data collation in ICES WGTRUTTA. Index data from Burrishoole are used to calibrate annual models and assessments, due to the long time series available.

Data also used by the National Technical Expert group on Salmon to calibrate the national assessments for setting Conservation Limits.

Link to sampling design documentation:

Link to TEGOS 2021

https://www.fisheriesireland.ie/sites/default/files/migrated/docman/The%20Status%20of%20Irish%20Salmon%20Stocks%20in%202020%20with%20Catch%20Advice%20for%202021.pdf

Burrishoole census trapping is described in Poole et al. (2006) and in the Burrishoole Traps Manual (https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/docs/Freshwater%20Traps%20Operation%20Document%2005-10-2015.pdf)

Poole, W.R., Dillane, M., deEyto, E., Rogan, G., McGinnity, P. & Whelan, K. (2006). Characteristics of the Burrishoole sea trout population: census, marine survival, enhancement and stock recruitment, 1971-2003. In: *Sea Trout: Biology, Conservation and Management* (Harris, G.S. & Milner, N.J., Eds). Proceedings of the First International Sea Trout Symposium, July 2004, Cardiff, Wales, UK. Blackwell Publishing, Oxford, pp. 279-306.

Compliance with international recommendations:

There are no specific international recommendations.

the data is however used by WGNAS as Burrishoole is an index river for the Lifecycle model as well as the older Bayesian Model which preceded it.

Also follows recommendations from ICES WGNAS, WGTRUTTA and ICES Datacalls

WGNAS:

https://www.ices.dk/sites/pub/Publication%20Reports/Forms/DispForm.aspx?ID=37558

WGTRUTTA:

https://www.ices.dk/sites/pub/Publication%20Reports/Forms/DispForm.aspx?ID=36884

Link to sampling protocol documentation:

Also refer to the Burrishoole Traps Manual, which is currently being updated (2021) https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/docs/Freshwater%20Traps%20Operation%20Document%2005-10-2015.pdf

Compliance with international recommendations:

Y

Also compliance with ICES datacalls.

https://www.ices.dk/sites/pub/Publication%20Reports/Forms/DispForm.aspx?ID=37558

Sampling implementation

Recording of refusal rate:

NA

Monitoring of sampling progress within the sampling year:

Oversight by the National Technical Expert Group on Salmon

The total catches are what is caught – there is no sub-sampling – its census data or total catch data.

Sampling is monitored at end of season and adjusted for next season

Biological sampling rates can be adjusted as well

Data capture

Means of data capture:

Field data are initially recorded by hand on field sheets (waterproof paper), and subsequently transcribed to excel spreadsheets. Data are uploaded monthly to the Burrishoole SQL traps database, and annually to the ICES Salmon Database.

Recruitment

Data on parr collected from electrofishing surveys (3 catch fishing depletions, Numbers, densities), lengths using measuring board.

Data on smolt collected from downstream traps(sub-daily counts), lengths using measuring board, sex by dissection.

Adults

Returning wild and ranched salmon adults and wild trout are counted in the upstream traps, full census (see Traps Manual https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/docs/Freshwater%20Traps%20Operation%20Document%2005-10-2015.pdf)

Scales are prepared by cleaning in freshwater, and reading under a microfiche, or microscope, and images are captured using ImageProPLus software. Growth data is calculated by the software and transferred to excel as described in the Celtic Sea Trout Manual. https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/docs/CSTP%20Sea%20Trout%20Scale%20Manual%20Vers%201%2027-01-2011.pdf

SALSEA-Merge (2008) Workshop on Digital Scale Reading Methodology, Trondheim, Norway, 8th to 10th

September 2008. 23pp.

Data capture documentation:

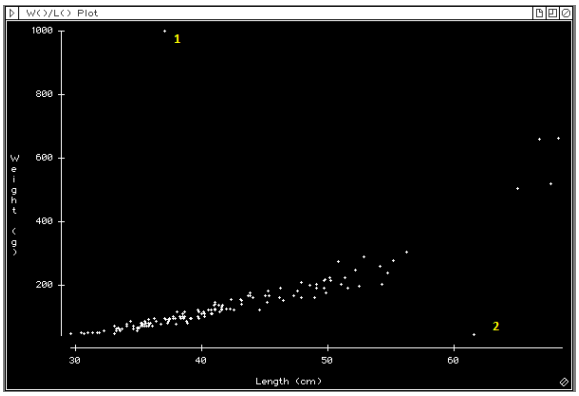
Parr (See SOP for field data https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/docs/Field%20Survey%20SOPS%20for%20Juvenile%20Salmonids%20and%20eel.doc)

Smolts and adults in permanent traps – see Traps Manual https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/docs/Freshwater%20Traps%20Operation%20Document%2005-10-2015.pdf

Quality checks documentation:

Visual checks are applied to the data at each stage. Once data is on spreadsheet, graphical checks are used to identify outliers. These are either changed with cross checks with the paper records and data providers, or deleted where verification is not possible.

Below is an example of erroneous data in a graphical plot. Point 1 was weighed as 100gm but typed in as 1000gm and Point 2 was weighed as 430gm but typed in as 43.0gm.



Model outputs and stock assessment estimates are also cross-checked for spurious data.

The data management of this data collection activity is incorporated into the Marine Institute's IODE accredited Data Management – Quality Management Framework (DM-QMF).

Data storage

National database:

Electrofishing data are stored on backed up excel sheets – a database is in development.

Index smolt and adult trap data are stored locally on spreadsheets and uploaded monthly to the Burrishoole Traps Database which also stores the upload sheets and QC sheets.

International database:

ICES WGNAS salmon database

ICES WGTRUTTA database which is in development

Quality checks and data validation documentation:

None available.

Sample storage

Storage description:

Scales are stored dry in envelopes in the MI. Prepared slides are stored mounted in the MI Archive. These archive databases are currently being updated (2021).

Data processing

Evaluation of data accuracy (bias and precision):

No formal evaluation, data used by WGNAS for years (since early 1980s. No issues have been identified.

Data have been peer-reviewed:

E. de Eyto, J. White, P. Boylan, B. Clarke, D. Cotter, D. Doherty, P. Gargan, R. Kennedy, P. McGinnity, N. O'Maoiléidigh, K. O'Higgins, (2015). The fecundity of wild Irish Atlantic salmon Salmo salar L. and its application for stock assessment purposes,

Fisheries Research, 164; 159-169, ISSN 0165-7836

https://doi.org/10.1016/j.fishres.2014.11.017.

de Eyto, E., Dalton, C., Dillane, M., Jennings, E., McGinnity, P., O'Dwyer, B., Poole, R., Rogan, G., and Taylor, D. (2016). The response of North Atlantic diadromous fish to multiple stressors, including land use change: a multidecadal study. Can. J. Fish. Aquat. Sci. 73(12): 1759–1769. doi:10.1139/cjfas-2015-0450.

Poole, W.R., Dillane, M., deEyto, E., Rogan, G., McGinnity, P. & Whelan, K. (2006). Characteristics of the Burrishoole sea trout population: census, marine survival, enhancement and stock recruitment, 1971-2003. In: *Sea Trout: Biology, Conservation and Management* (Harris, G.S. & Milner, N.J., Eds). Proceedings of the First International Sea Trout Symposium, July 2004, Cardiff, Wales, UK. Blackwell Publishing, Oxford, pp. 279-306.

Editing and imputation methods:

N

Quality document associated to a dataset:

No. There isn't a DoI publication of all the data.

Salmon and sea trout smolt count data are:

http://data.marine.ie/geonetwork/srv/eng/catalog.search#/metadata/ie.marine.data:dataset.4343

Data are summarised and published in the Annual Statistic Reports for the Burrishoole (http://hdl.handle.net/10793/1672) and in the previous peer-review publications

Validation of the final dataset:

Data are quality checked during capture and transcription, the annual dataset is then manually / graphically checked for correctness and consistency, the data undergoes further checks upon upload to the international databases. Spurious unverified data is discarded and not used in any stock assessments.

AR comment: Indicate any deviations or developments. Do not change the text already adopted in the work plan.

Sampling scheme implemented as designed, please see Table 2.3 and Text Box 2.3 for details of achievements in 2022.

MS : IRL

Region : North-East Atlantic

Sampling scheme identifier : Wild Salmon and Sea Trout Tagging Scheme Recreational

Sampling scheme type: Diadromous (recreational)

Observation type: Self water body

Time period of validity : 2022 - 2027

Short description (max 100 words): Sampling scheme aiming at collecting annual catch quantities for *Salmo salar* in the freshwater part of their lifecycle as specified in Tables 1 and 4 of the EU MAP Delegated Decision annex and to provide data on fishing effort ;number and weight of all salmon caught separated by fisheries, location, age class with estimates also required for unreported catches; weight of ranched salmon caught; assignment to jurisdiction/region/river of origin of adult salmon; and sea age composition of returning adults; as specified by the RCG ISSG Diadromous Fishes.

Description of the population

Population targeted: *Salmo salar*

Population sampled: All nationwide recreational angling catches of *Salmo salar*.

The 5 Index rivers selected for 2022 are Owenmore, Drowes, Mulkear, Laune, Slaney and Boyne.

This may change in subsequent updated

Stratification: NA

Sampling design and protocols

Sampling design description: Data can be collated from all salmon designated rivers open to fishing. Those river open for fishing are determined annually. This includes a maximum of 144 rivers in Ireland. Catches (with date and weight information) must be reported by anglers in logbooks under the Wild Salmon and Sea Trout Tagging Scheme and submitted to Inland Fisheries Ireland (IFI) annually. IFI collate, validate and publish this information and provide it to the Technical Expert Group on Salmon (TEGOS) (and the ICES Working Group on North Atlantic Salmon) for scientific stock assessment purposes. Scientific advice is then provided to support the regulation and management of fisheries which are designated under annual fishing Regulations.

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

Regional coordination: NA

Link to sampling design documentation:

TEGOS reports provide the sampling design documentation https://www.fisheriesireland.ie/what-we-do/research/technical-expert-group-on-salmon-tegos , information on the *Wild Salmon and Sea Trout Tagging Scheme* can be found at https://store.fishinginireland.info/salmon-fishing-regulations/ and information on collection and collation of catch data can be found in the *Wild salmon and Sea Trout Statistics Reports* on the IFI website e.g. for 2019

https://www.fisheriesireland.ie/sites/default/files/transfereed/docman/Wild%20Salmon%20and%20Sea%20Trout%20Statistics%20Report%202019.pdf

Compliance with international recommendations: Y

Link to sampling protocol documentation:

Sampling protocol documentation can be found in TEGOS reports https://www.fisheriesireland.ie/what-we-do/research/technical-expert-group-on-salmon-tegos , are detailed in the *Wild Salmon and Sea Trout Tagging Scheme* https://store.fishinginireland.info/salmon-fishing-regulations/ and detailed in the *Wild salmon and Sea Trout Statistics Reports* on the IFI website e.g. for 2019

https://www.fisheriesireland.ie/sites/default/files/transfereed/docman/Wild%20Salmon%20and%20Sea%20Trout%20Statistics%20Report%202019.pdf

Sampling implementation

Recording of refusal rate: NA

Monitoring of sampling progress within the sampling year: Sampling allocations depend on the level of catches reported and the amount of information gathered is known after the end of the fishing season (30th September) when the information is collated. Reported catches are revised depending on logbook return rates per Fisheries District as per Small (1991) (Exploring data provided by angling for salmonids in the British Isles. In: Catch effort sampling strategies (ed. I.G. Cowx), pp 81-91. Fishing News Books, Oxford). All anglers who do not return logbooks are written to as a means of improving logbook returns and a proportion are taken to court annually and fined for non-return of logbooks.

Data capture

Means of data capture: Data are captured by anglers via logbooks under the *Wild Salmon and Sea Trout Tagging Scheme* and reported to IFI. The data is entered, stored and validated using the Bradán database maintained by IFI. The data is ultimately transferred to the National Salmon Assessment Database (NSADB) for scientific stock assessment purposes and stored on the IFI SQL server.

Data capture documentation:

The data is captured in angling logbooks.

The overall scheme is managed by Inland Fisheries Ireland (as designated under *Section 69* of the *Inland Fisheries Act 2010*). General details on this process can be found in the follow sources:

Wild Salmon and Sea Trout Tagging Scheme https://store.fishinginireland.info/salmon-fishing-regulations/ and *Wild salmon and Sea Trout Statistics Reports* on the IFI website e.g. for 2019

https://www.fisheriesireland.ie/sites/default/files/transfereed/docman/Wild%20Salmon%20and%20Sea%20Trout%20Statistics%20Report%202019.pdf

Quality checks documentation: N (year for documentation to be available to be confirmed). Data from logbooks is entered by IFI staff in each River Basin District and collated, reviewed and quality checked by the database manger. The data is ultimately transferred to the National Salmon Assessment Database (NSADB) for scientific stock assessment purposes where final QC checks are made before assessments are undertaken.

Data storage

National database: Bradán database and National Salmon Assessment Database (NSADB) stored on the IFI SQL server.

International database: NA.

Quality checks and data validation documentation: There is no formal quality checks and data validation documentation available at present.

Sample storage

NA

Data processing

Evaluation of data accuracy (bias and precision): N (year for documentation to be available to be confirmed).

Editing and imputation methods: N (year for documentation to be available to be confirmed). The database manager is responsible for coordinating these.

Quality document associated to a dataset: No and No.

Validation of the final dataset: Datasets are validated by the database manager and subsequently validated by IFI scientists before being used by the end-user. In addition, the reporting output is circulated to relevant IFI staff for review, forwarded to IFI board for approval and further sent to DECC for final review before publication on the IFI website. The data is ultimately transferred to the National Salmon Assessment Database (NSADB) for scientific stock assessment purposes where validation checks are made before assessments are undertaken.

AR comment: Indicate any deviations or developments. Do not change the text already adopted in the work plan.

Sampling scheme implemented as designed, please see Table 2.3 and Text Box 2.3 for details of achievements in 2022. Additional sampling was completed in 2022 to reflect catch levels by fishers.

MS : IRL

Region : North-East Atlantic

Sampling scheme identifier : Wild Salmon and Sea Trout Tagging Scheme commercial

Sampling scheme type: Diadromous (commercial)

Observation type: Self water body

Time period of validity : 2022 - 2027

Short description (max 100 words): These fisheries are primarily in single river estuaries (only three stocks i.e. Killary, Owenmore estuary and Castlemaine are mixed-stock estuary fisheries). As such this is considered to come under sampling scheme aiming at collecting annual catch quantities for *Salmo salar* in the freshwater part of their lifecycle as specified in Tables 1 and 4 of the EU MAP Delegated Decision annex and to provide data on fishing effort ;number and weight of all salmon caught separated by fisheries, location, age class with estimates also required for unreported catches; weight of ranched salmon caught; assignment to jurisdiction/region/river of origin of adult salmon; and sea age composition of returning adults; as specified by the RCG ISSG Diadromous Fishes.

There are no marine commercial or freshwater commercial fisheries for salmon in Ireland.

Description of the population

Population targeted: *Salmo salar*

Population sampled: All nationwide commercial catches of *Salmo salar* in river estuaries.

Bandon; Barrow and Pollmounty; Belclare; Blackwater, Glenshelane, Finisk; Caragh; Castlemaine; Dawros; Eany; Feale, Galey and Brick; Glenamoy; Gweebarra; Ilen; Inny; Killary; Laune and Cottoners; Lower Lee (Cork); Maine; Moy; Newport; Nore; Owenduff; Owenea and Owentocker; Owenglin; Owenmore estuary; Roughty; Sheen; Sneem; Suir, Clodiagh, Lingaun, Blackwater; Waterville.

Stratification: NA

Sampling design and protocols

Sampling design description: Data can be collated from all salmon designated commercial fisheries open to fishing. Those fisheries open for fishing are determined annually. Catches (with date and weight information) must be reported by commercial fishers in logbooks under the Wild Salmon and Sea Trout Tagging Scheme and submitted to Inland Fisheries Ireland (IFI) annually. IFI collate, validate and publish this information and provide it to the Technical Expert Group on Salmon (TEGOS) (and the ICES Working Group on North Atlantic Salmon) for scientific stock assessment purposes. Scientific advice is then provided to support the regulation and management of fisheries which are designated under annual fishing Regulations.

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

Regional coordination: NA

Link to sampling design documentation:

TEGOS reports provide the sampling design documentation https://www.fisheriesireland.ie/what-we-do/research/technical-expert-group-on-salmon-tegos , information on the *Wild Salmon and Sea Trout Tagging Scheme* can be found at https://store.fishinginireland.info/salmon-fishing-regulations/ and information on collection and collation of catch data can be found in the *Wild salmon and Sea Trout Statistics Reports* on the IFI website e.g. for 2019

https://www.fisheriesireland.ie/sites/default/files/transfereed/docman/Wild%20Salmon%20and%20Sea%20Trout%20Statistics%20Report%202019.pdf

Compliance with international recommendations: Y

Link to sampling protocol documentation:

Sampling protocol documentation can be found in TEGOS reports https://www.fisheriesireland.ie/what-we-do/research/technical-expert-group-on-salmon-tegos , are detailed in the *Wild Salmon and Sea Trout Tagging Scheme*

https://store.fishinginireland.info/salmon-fishing-regulations/ and detailed in the *Wild salmon and Sea Trout Statistics Reports* on the IFI website e.g. for 2019

https://www.fisheriesireland.ie/sites/default/files/transfereed/docman/Wild%20Salmon%20and%20Sea%20Trout%20Statistics%20Report%202019.pdf

Sampling implementation

Recording of refusal rate: NA

Monitoring of sampling progress within the sampling year: Sampling allocations depend on the level of catches reported and the amount of information gathered is known after the end of the fishing season (30th September) when the information is collated. Return rate of logbooks is 100% as it is strictly regulated by IFI.

Data capture

Means of data capture: Data are captured by fisheres via logbooks under the *Wild Salmon and Sea Trout Tagging Scheme* and reported to IFI. The data is entered, stored and validated using the Bradán database maintained by IFI. The data is ultimately to transferred to the National Salmon Assessment Database (NSADB) for scientific stock assessment purposes and stored on the IFI SQL server.

Data capture documentation:

The data is captured in logbooks.

The overall scheme is managed by Inland Fisheries Ireland (as designated under *Section 69* of the *Inland Fisheries Act 2010*). General details on this process can be found in the follow sources:
Wild Salmon and Sea Trout Tagging Scheme https://store.fishinginireland.info/salmon-fishing-regulations/ and *Wild salmon and Sea Trout Statistics Reports* on the IFI website e.g. for 2019

https://www.fisheriesireland.ie/sites/default/files/transfereed/docman/Wild%20Salmon%20and%20Sea%20Trout%20Statistics%20Report%202019.pdf

Quality checks documentation: N (year for documentation to be available to be confirmed). Data from logbooks is entered by IFI staff in each River Basin District and collated, reviewed and quality checked by the database manger. The data is ultimately transferred to the National Salmon Assessment Database (NSADB) for scientific stock assessment purposes where final QC checks are made before assessments are undertaken.

Data storage

National database: Bradán database and National Salmon Assessment Database (NSADB) stored on the IFI SQL server.

International database: NA.

Quality checks and data validation documentation: There is no formal quality checks and data validation documentation available at present. Data is stored in the Bradán database and subsequently the National Salmon Assessment Database (NSADB) hosted by IFI..

Sample storage

NA

Data processing

Evaluation of data accuracy (bias and precision): N (year for documentation to be available to be confirmed).

Editing and imputation methods: N (year for documentation to be available to be confirmed). The database manager is responsible for coordinating these.

Quality document associated to a dataset: No and No.

Validation of the final dataset: Datasets are validated by the database manager and subsequently validated by IFI scientists before being used by the end-user. In addition, the reporting output is circulated to relevant non-scientific IFI staff for review, forwarded to IFI board for approval and further sent to DECC for final review before publication on the IFI website. The data is ultimately transferred to the National Salmon Assessment Database (NSADB) for scientific stock assessment purposes where validation checks are made before assessments are undertaken.

AR comment: Indicate any deviations or developments. Do not change the text already adopted in the work plan.

Sampling scheme implemented as designed for fisheries that were open, please see Table 2.3 and Text Box 2.3 for details of achievements in 2022.

However no samples were possible from areas where there was no fishery in operation and where scientific advice was that no sustainable surplus was available for exploitation.

MS : IRL

Region : North-East Atlantic

Sampling scheme identifier : Biological sampling NSIC

Sampling scheme type: Diadromous (scientific)

Observation type: SciObs water body

Time period of validity : 2022 - 2027

Short description (max 100 words): Length (cm), weight (kg) and age (scale sample as one-sea-winter or multi-sea-winter) are collected from a random sample of 100 adult Atlantic salmon per annum intercepted in the upstream fish trap at the National Salmonid Index Catchment River Erriff.

Description of the population

Population targeted: *Salmo salar and Salmo trutta*

Population sampled: *Salmo salar* (River Erriff stock)

Stratification: NA

Sampling design and protocols

Sampling design description: Data is collected from a random sample of 100 adult Atlantic salmon which represents approximately 5% of the total run annually. Samples are collected from May to September which encompasses the main range of the run.

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

Regional coordination: NA

Link to sampling design documentation:

Millane, M. and Gargan, P. (2021). National Salmonid Index Catchment Erriff Research Plan. Research & Development, Inland Fisheries Ireland pp. 23 (internal document).

Compliance with international recommendations: NA

Link to sampling protocol documentation:

Millane, M. and Gargan, P. (2021). National Salmonid Index Catchment Erriff Research Plan. Research & Development, Inland Fisheries Ireland pp. 23 (internal document).

Sampling implementation

Recording of refusal rate: NA

Monitoring of sampling progress within the sampling year: Resident research staff at the National Salmonid Index Catchment monitor sampling progress during the sampling period.

Data capture

Means of data capture: Length (cm) is recorded on a measuring board. Weight is recorded on a manual weighing scales (larger fish) or an electronic balance (smaller fish). Data are initially captured on standard field books and subsequently entered into a standard database.10-20 scale samples are taken from a fish and stored in scales envelopes for later age determination using a digital scale reader and entered into a standard database.

Data capture documentation:

Millane, M. and Gargan, P. (2021). National Salmonid Index Catchment Erriff Research Plan. Research & Development, Inland Fisheries Ireland pp. 23 (internal document).

Quality checks documentation: Y Millane, M. and Gargan, P. (2021). National Salmonid Index Catchment Erriff Research Plan. Research & Development, Inland Fisheries Ireland pp. 23 (internal document).

Data storage

National database: NA

International database: NA.

Quality checks and data validation documentation:

Millane, M. and Gargan, P. (2021). National Salmonid Index Catchment Erriff Research Plan. Research & Development, Inland Fisheries Ireland pp. 23 (internal document).

Sample storage

Scale samples are stored in the NSIC Erriff laboratory and subsequently transferred to the National Salmon Scale Archive (NSSA) in IFI HQ in Dublin for permanent storage. Access to the material is via request to IFI. The archive is hosted by IFI and holds greater than 20,000 scale samples from a total of 38 river systems in Ireland.

Data processing

Evaluation of data accuracy (bias and precision): Y

Millane, M. and Gargan, P. (2021). National Salmonid Index Catchment Erriff Research Plan. Research & Development, Inland Fisheries Ireland pp. 23 (internal document).

Editing and imputation methods: Y

Millane, M. and Gargan, P. (2021). National Salmonid Index Catchment Erriff Research Plan. Research & Development, Inland Fisheries Ireland pp. 23 (internal document).

Quality document associated to a dataset: No and No.

Validation of the final dataset: 100% of the data entered from field book are reviewed for data entry errors before use by end users.

AR comment: Indicate any deviations or developments. Do not change the text already adopted in the work plan.

Sampling scheme implemented as designed, please see Table 2.3 and Text Box 2.3 for details of achievements in 2022.

MS : IRL

Region : North-East Atlantic

Sampling scheme identifier : Biological sampling smolts NSIC

Sampling scheme type: Diadromous (scientific)

Observation type: SciObs water body

Time period of validity : 2022 - 2027

Short description (max 100 words): Number and age composition (scale sample to determine freshwater age) are collected from a random sample of 100 adult Atlantic salmon and 100 Sea trout per annum intercepted in the Tawnyard trap in the National Salmonid Index Catchment River Erriff.

Description of the population

Population targeted: *Salmo salar and Salmo trutta*

Population sampled: *Salmo salar* & *Salmo trutta* (River Erriff stock)

Stratification: NA

Sampling design and protocols

Sampling design description: Data is collected per annum from a random sample of 100 Atlantic salmon and 100 sea trout in the Erriff. Samples are collected from April to May which encompasses the main range of the run. Samples will be placed in scale envelopes and later read using a light microscope. The number of salmonid smolts in the Erriff intercepted in the Tawnyard trap will be counted per annum.

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

Regional coordination: NA

Link to sampling design documentation:

Millane, M. and Gargan, P. (2021). National Salmonid Index Catchment Erriff Research Plan. Research & Development, Inland Fisheries Ireland pp. 23 (internal document).

Compliance with international recommendations: NA

Link to sampling protocol documentation:

Millane, M. and Gargan, P. (2021). National Salmonid Index Catchment Erriff Research Plan. Research & Development, Inland Fisheries Ireland pp. 23 (internal document).

Sampling implementation

Recording of refusal rate: NA

Monitoring of sampling progress within the sampling year: Research staff at the National Salmonid Index Catchment monitor sampling progress during the sampling period.

Data capture

Means of data capture: Data are initially captured in standard field books and scale envelopes subsequently entered into a standard database.10-20 scale samples are taken from a fish and stored in scales envelopes for later age determination using a light microscope and entered into a standard database.

Data capture documentation:

Millane, M. and Gargan, P. (2021). National Salmonid Index Catchment Erriff Research Plan. Research & Development, Inland Fisheries Ireland pp. 23 (internal document).

Quality checks documentation: Y Millane, M. and Gargan, P. (2021). National Salmonid Index Catchment Erriff Research Plan. Research & Development, Inland Fisheries Ireland pp. 23 (internal document).

Data storage

National database: NA

International database: NA.

Quality checks and data validation documentation:

Millane, M. and Gargan, P. (2021). National Salmonid Index Catchment Erriff Research Plan. Research & Development, Inland Fisheries Ireland pp. 23 (internal document).

Sample storage

Scale samples are stored in the NSIC Erriff laboratory and subsequently transferred to the National Salmon Scale Archive (NSSA) in IFI HQ in Dublin for permanent storage. Access to the material is via request to IFI. The archive is hosted by IFI and holds greater than 20,000 scale samples from a total of 38 river systems in Ireland.

Data processing

Evaluation of data accuracy (bias and precision): Y

Millane, M. and Gargan, P. (2021). National Salmonid Index Catchment Erriff Research Plan. Research & Development, Inland Fisheries Ireland pp. 23 (internal document).

Editing and imputation methods: Y

Millane, M. and Gargan, P. (2021). National Salmonid Index Catchment Erriff Research Plan. Research & Development, Inland Fisheries Ireland pp. 23 (internal document).

Quality document associated to a dataset: No and No.

Validation of the final dataset: 100% of the data entered from field book and scale envelopes are reviewed for data entry errors before use by end users.

AR comment: Indicate any deviations or developments. Do not change the text already adopted in the work plan.

Sampling scheme implemented as designed, please see Table 2.3 and Text Box 2.3 for details of achievements in 2022.

MS : Ireland

Region: North-East Atlantic

Sampling scheme identifier:
Eel_elver_trap_Diadromous (scientific)

Sampling scheme type:
Diadromous (scientific)

Observation type:
SciObs water body

Time period of validity: 2022-2027

Short description (max 100 words): *e.g. sampling scheme aiming at collecting length samples from commercial landings on-shore for all species listed in Table 1 of the EU MAP Delegated Decision annex. The scheme covers mainland and all outermost regions ('RUP' in French, Portuguese, and Spanish).*

The elver traps are located at the high water mark to capture the elvers and yellow eels migrating from the estuary into freshwater. They operate from April to August but can continue to operate into September if catches continue.

The traps are fixed and sample in a standardised manner.

Additional information include eel length, weight, eye and fin measurements. When necessary samples will be brought back to the laboratory to confirm 0+ status and to get an age profile of the yellow eels migrating upstream.

Description of the population

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

The elver traps target the elver population migrating from estuary into freshwater along one bank of a river. The traps also capture older yellow eels however these are recorded separately from the recruits data.

Population sampled: Specify which part of the target population will be sampled and specify which part of the target population is unreachable for sampling or excluded for some reason to explain, *e.g. major ports being listed as auctions excluding all minor ports and no sampling*

during the week-ends. For research surveys at sea describe target species in single-species surveys or ecosystem component *(e.g. demersal, pelagic)* in multispecies surveys.

The elvers that encounter the trap and climb the ramp into the holding box. The traps are fixed in place so sample the same location every year.

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

For reporting to the EU under the Eel Regulation Ireland created Eel Management Units (in line with River Basin Districts). The recommendation from WKESDCF and highlighted within the dcmap directive is for each MS to monitor all eel lifestages within at least one catchment per RBD.
In Ireland the RBD or eel management units are East EMU, SouthEast EMU, SouthWest EMU, Shannon International EMU, West EMU and the NorthWest EMU. In addition there are index catchments with historical information available that is targeted in this programme to continue the longterm temporal trend.

Sampling design and protocols

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

Sites is located at the on one river bank at the high water mark.

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

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

No regional coordination is undertaken for sampling eel. However for the transboundary North West EMU consultation occurs between agencies in Northern Ireland and Republic of Ireland in relation to combined eel surveys on occasion.

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

An elver trap SOP is available.

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

Y

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

[Sampling protocols – need to put up on Ireland dcmap webpage]
Compliance with international recommendations: Member State shall state 'Y' (yes) if the sampling protocol is in line with international recommendations, and 'N' if not. If no relevant expert or coordination groups exist, the sampling protocol should be shortly explained in the text, and should be available upon request for the evaluators.

Y

The EIFAAC/ICES/GFCM working group on eel have a number of reports outlining the data requirements for international assessments and recommendations. These include but are not limited to ICES 2008, 2007, the WKESDCF report from 2012.

https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2008/WGEEL/wgeel_2008_final.pdf

https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2007/WGEEL/2007%20EIFAC-ICES%20Report-Final-01-09-08.pdf

https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2012/WKESDCF/WKESDCF%20report%202012.pdf

Sampling implementation

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

NA

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

GANTT Charts are created annually to keep track of planned surveys with room for flexibility if a survey needs to be rescheduled due to poor weather or unforeseen events.

Data capture

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

Data for recruits, fyke nets, electrofishing and silver eel fishing are captured using Survey123 and uploaded to the cloud for storage. A quality control procedure is then carried out on the data. If the digital capture fails on the day a paper version is captured.

Equipment required include measuring board for length, scales for weight, calipers for eye and fin measurements, scanners for tag detection

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

Data capture protocols are available

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

Y

Data storage

National database: SQL database for Eels and ARCGIS geodatabase

International database: WGEEL database

Quality checks and data validation documentation: Y

An SOP document outlines the policy and procedure for the Inputting and Quality Check of Eel Survey Data

Data is checked during extractions for end-users such as ICES / European Commission.

Sample storage

Otoliths for aging are stored clean and dry at room temperature. These age structures are stored at Castlehouse before preparation and age reading is carried out.

Eel specimens are frozen and stored in Castlehouse facility until processed in the wet laboratory. All necessary information is recorded and extracted and the remains disposed of in the biological waste facility.

Data processing

Evaluation of data accuracy (bias and precision): Y

A number of documents relate to the inputting and quality check of data from fieldwork and laboratory work.

A number of aging workshops are held with colleagues within Ireland to ensure a standardisation in method and agreement within the country.

The overall aim of our qc endeavour for aging otoliths is for:

- Mean Percentage Agreement to be preferably above >90%,
- All individual % Agreement Scores on the Graph to be >80%,
- OUI Class Scores of 1 are preferable however, OUI Class 2 would be acceptable but only on older eels. We do not want any OUI Class 3 scores if possible. Class 3 specimens should be re-read with both readers to reach conensus,
- Agree difficult otolith with both readers (original and QC readers),
- If there are a lot of differences in a sample; to agree to widen QC sample; and failing that to re-age the entire site of eels.

Editing and imputation methods: Y

Any errors detected during the QC procedure or during the analysis and report writing is immediately corrected in the raw data files.

Quality document associated to a dataset:

Validation of the final dataset: Data is checked during extractions for end-users such as ICES / European Commission - the checks used will depend on the use of the data. If errors or anomalies are observed, then data is either corrected by reference to the original data sheets (e.g. in the case of input error) or excluded from that particular use.

AR comment: Indicate any deviations or developments. Do not change the text already adopted in the work plan.

Sampling scheme implemented as designed, please see Table 2.3 and Text Box 2.3 for details of achievements in 2022.

MS : Ireland

Region: North-East Atlantic

Sampling scheme identifier:
Eel_Silver_Diadromous (scientific)

Sampling scheme type:
Diadromous (scientific)

Observation type:
SciObs water body

Time period of validity: 2022-2027

Short description (max 100 words): *e.g. sampling scheme aiming at collecting length samples from commercial landings on-shore for all species listed in Table 1 of the EU MAP Delegated Decision annex. The scheme covers mainland and all outermost regions ('RUP' in French, Portuguese, and Spanish).*

The silver eel index sites will be monitored to record the silver eel migration providing a time series data both within a year and between years.
The data provides count of silver eels, mark recapture studies along with length frequency, weight
biological information including length, weight, eye and fin measurements. Samples will be brought back to the laboratory for age, growth, sex, parasite prevalence and swimbladder damage indices.

The escapement data is used in the IMESE model to estimate silver eel production and escapement as required under the Eel Regulation.

Description of the population

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

The silver eel index surveys target the migrating silver eel cohort of the eel population upstream of the fishing site. The site is fished by former eel fishers and it is fished 20-30 nights from September to December to capture the variability in eels biological parameters across the season.

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

For silver eel index sites the length profile is 30-96cm and corresponds to the migrating adult silver eel population. The sample does include eels that would be classified as yellow eel however the uncertainty around the silvering process means its difficult to say that these eels will not migrate.

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

For reporting to the EU under the Eel Regulation Ireland created Eel Management Units (in line with River Basin Districts). The recommendation from WKESDCF and highlighted within the dcmap directive is for each MS to monitor all eel lifestages within at least one catchment per RBD.
In Ireland the RBD or eel management units are East EMU, SouthEast EMU, SouthWest EMU, Shannon International EMU, West EMU and the NorthWest EMU. In addition there are index catchments with historical information available that is targeted in this programme to continue the longterm temporal trend.

Sampling design and protocols

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

The silver eel migration typically occurs around the new moon phase when rivers are in flood these nights are targeted for fishing. Outside these nights, nets are also set if a significant rise in water levels is observed as this can entice eels to migrate outside of the new moon phase. The number of nights fished varies year to year due to the environmental conditions. At a minimum 300-500 eels are required to be measured for length to capture a representative length frequency.

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

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

No regional coordination is undertaken for sampling eel. However for the transboundary North West EMU consultation occurs between agencies in Northern Ireland and Republic of Ireland in relation to combined eel surveys on occasion.

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

Silver eel sampling design. Locations are the site of former commercial eel fisheries and are now run on a research basis. The silver eel migration is dependent on environmental conditions (new moon phase and flood conditions) over an extended period of time; August to January. Twenty – 30 nights are fished during relevant conditions during this time frame.

The sites are fished in a standardised way year to year to allow a comparison across time.

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

Y

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

[Sampling protocols – need to put up on Ireland dcmap webpage]

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

Y

The EIFAAC/ICES/GFCM working group on eel have a number of reports outlining the data requirements for international assessments and recommendations. These include but are not limited to ICES 2008, 2007, the WKESDCF report from 2012.

https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2008/WGEEL/wgeel_2008_final.pdf

https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2007/WGEEL/2007%20EIFAC-ICES%20Report-Final-01-09-08.pdf

https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2012/WKESDCF/WKESDCF%20report%202012.pdf

Sampling implementation

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

NA

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

GANTT Charts are created annually to keep track of planned surveys with room for flexibility if a survey needs to be rescheduled due to poor weather or unforeseen events.

Data capture

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

Data for recruits, fyke nets, electrofishing and silver eel fishing are captured using Survey123 and uploaded to the cloud for storage. A quality control procedure is then carried out on the data. If the digital capture fails on the day a paper version is captured.

Equipment required include measuring board for length, scales for weight, calipers for eye and fin measurements, scanners for tag detection

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

measuring protocols, maturity staging, manual for the data capture means etc.) exists, provide some details in the textbox.

Data capture protocols are available

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

Y

Data storage

National database: SQL database for Eels and ARCGIS geodatabase

International database: WGEEL database

Quality checks and data validation documentation: Y
An SOP document outlines the policy and procedure for the Inputting and Quality Check of Eel Survey Data

Data is checked during extractions for end-users such as ICES / European Commission.

Sample storage

Otoliths for aging are stored clean and dry at room temperature. These age structures are stored at Castlehouse before preparation and age reading is carried out.

Eel specimens are frozen and stored in Castlehouse facility until processed in the wet laboratory. All necessary information is recorded and extracted and the remains disposed of in the biological waste facility.

Data processing

Evaluation of data accuracy (bias and precision): Y

A number of documents relate to the inputting and quality check of data from fieldwork and laboratory work.
A number of aging workshops are held with colleagues within Ireland to ensure a standardisation in method and agreement within the country.

The overall aim of our qc endeavour for aging otoliths is for:
- Mean Percentage Agreement to be preferably above >90%,
- All individual % Agreement Scores on the Graph to be >80%,

o OUI Class Scores of 1 are preferable however, OUI Class 2 would be acceptable but only on older eels. We do not want any OUI Class 3 scores if possible. Class 3 specimens should be re-read with both readers to reach consensus,
o Agree difficult otolith with both readers (original and QC readers),
o If there are a lot of differences in a sample; to agree to widen QC sample; and failing that to re-age the entire site of eels.

Editing and imputation methods: Y

Any errors detected during the QC procedure or during the analysis and report writing is immediately corrected in the raw data files.

Quality document associated to a dataset:

Validation of the final dataset: Data is checked during extractions for end-users such as ICES / European Commission - the checks used will depend on the use of the data. If errors or anomalies are observed, then data is either corrected by reference to the original data sheets (e.g. in the case of input error) or excluded from that particular use.

AR comment: Indicate any deviations or developments. Do not change the text already adopted in the work plan.

Sampling scheme implemented as designed, please see Table 2.3 and Text Box 2.3 for details of achievements in 2022.

MS : Ireland

Region: North-East Atlantic

Sampling scheme identifier:
Eel_Fykenet_Diadromous (scientific)

Sampling scheme type:
Eel_Silver_Diadromous (scientific)

Observation type:
SciObs water body

Time period of validity: 2022-2027

Short description (max 100 words): *e.g. sampling scheme aiming at collecting length samples from commercial landings on-shore for all species listed in Table 1 of the EU MAP Delegated Decision annex. The scheme covers mainland and all outermost regions ('RUP' in French, Portuguese, and Spanish).*

The yellow eel fyke net surveys will provide samples from the local eel population. Fyke nets can be set in lakes, large rivers and transitional waters. This method will provide samples for count of eels, mark recapture studies, biological information including length, weight, eye and fin measurements. Samples will be brought back to the laboratory for age, growth, sex, parasite prevalence and swimbladder damage indices.

Description of the population

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

The fyke net surveys target the local eel population in the vicinity of the netting location in the waterbody surveyed, e.g. lake, large river and the transitional waterbody

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

For fyke nets the population sampled is the eel population >30cm which is the typical size of eels captured in fyke nets, smaller eels can escape through the mesh of the nets and while they can be caught it is not representative of the local population.

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

For reporting to the EU under the Eel Regulation Ireland created Eel Management Units (in line with River Basin Districts). The recommendation from WKESDCF and highlighted within the dcmap directive is for each MS to monitor all eel lifestages within at least one catchment per RBD.
In Ireland the RBD or eel management units are East EMU, SouthEast EMU, SouthWest EMU, Shannon International EMU, West EMU and the NorthWest EMU. In addition there are index catchments with historical information available that is targeted in this programme to continue the longterm temporal trend.

Sampling design and protocols

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

Within a lake a random sampling design is employed. In lakes with historical survey information repeat sampling is employed to maintain longterm datasets.

In large Rivers a representative stretch of river is surveyed with number of nets distributed along the river length or target area. Access for boats is a consideration for ease of setting and retrieving nets. For Rivers with historical survey information repeat samples are undertaken to maintain longterm data sets.

Within Estuaries a random design along with targeted locations to compare with historical survey locations is employed.

In Lakes each chain consists of 5 fyke nets. Eight chains will be set nightly to capture the variation in the spatial distribution of eels around the lakes. This information will be consistent with data gathered under the eel monitoring programme from 2009 to present.

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

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

No regional coordination is undertaken for sampling eel. However for the transboundary North West EMU consultation occurs between agencies in Northern Ireland and Republic of Ireland in relation to combined eel surveys on occasion.

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

In order to standardise the influence of environmental conditions and ensure the catch reflects the actual eel population as suggested by Harley et al., 2001, lakes were surveyed between June and September each year, with the surveys carried out over 2-3 visits. The nets were randomly assigned to the lake using a trap builder in the software Density 4 to remove operator bias and ensure good coverage of the area (Efford et al. 2004). The nets were set in chains of five fyke

nets tied end to end and set at least 50 m apart to avoid interference between chains. The chains of nets were lifted daily to avoid gear saturation and all eels counted per net end. To standardise the difference in lake size and effort; large lakes (for example Lough Derg) were divided into upper and lower and sampled as 2 lakes and therefore had twice the effort of the smaller lakes.

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

Y

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

[Sampling protocols – need to put up on Ireland dcmap webpage]

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

The EIFAAC/ICES/GFCM working group on eel have a number of reports outlining the data requirements for international assessments and recommendations. These include but are not limited to ICES 2008, 2007, the WKESDCF report from 2012.

https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2008/WGEEL/wgeel_2008_final.pdf

https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2007/WGEEL/2007%20EIFAC-ICES%20Report-Final-01-09-08.pdf

https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2012/WKESDCF/WKESDCF%20report%202012.pdf

Y –

Sampling implementation

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

NA

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

GANTT Charts are created annually to keep track of planned surveys with room for flexibility if a survey needs to be rescheduled due to poor weather or unforeseen events.

Data capture

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

Data for recruits, fyke nets, electrofishing and silver eel fishing are captured using Survey123 and uploaded to the cloud for storage. A quality control procedure is then carried out on the data. If the digital capture fails on the day a paper version is captured.

Equipment required include measuring board for length, scales for weight, calipers for eye and fin measurements, scanners for tag detection

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

Data capture protocols are available

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

Y
Control quality procedures exist for all data generated in the field and laboratory including length, weight regression analyses and identification, removal/replacement of outlier data.
Laboratory QC of eel dissection data, parasite data and swimbladder indices results are carried out with each new sample. An intensive QC methodology of all ageing and growth data is in place and constantly improved in order to gain accurate data over time.

Data storage

National database: SQL database for Eels and ARCGIS geodatabase

International database: WGEEL database

Quality checks and data validation documentation: Y
An SOP document outlines the policy and procedure for the Inputting and Quality Check of Eel Survey Data

Data is checked during extractions for end-users such as ICES / European Commission.

Sample storage

Otoliths for aging are stored clean and dry at room temperature. These age structures are stored at Castlehouse before preparation and age reading is carried out.

Eel specimens are frozen and stored in Castlehouse facility until processed in the wet laboratory. All necessary information is recorded and extracted and the remains disposed of in the biological waste facility.

Data processing

Evaluation of data accuracy (bias and precision): Y
A number of documents relate to the inputting and quality check of data from fieldwork and laboratory work.
A number of aging workshops are held with colleagues within Ireland to ensure a standardisation in method and agreement within the country.

The overall aim of our qc endeavour for aging otoliths is for:
- Mean Percentage Agreement to be preferably above >90%,
- All individual % Agreement Scores on the Graph to be >80%,
- OUI Class Scores of 1 are preferable however, OUI Class 2 would be acceptable but only on older eels. We do not want any OUI Class 3 scores if possible. Class 3 specimens should be re-read with both readers to reach consensus,
- Agree difficult otolith with both readers (original and QC readers),
- If there are a lot of differences in a sample; to agree to widen QC sample; and failing that to re-age the entire site of eels.

Editing and imputation methods: Y
Any errors detected during the QC procedure or during the analysis and report writing is immediately corrected in the raw data files.

Quality document associated to a dataset:

Validation of the final dataset: Data is checked during extractions for end-users such as ICES / European Commission - the checks used will depend on the use of the data. If errors or anomalies are observed, then data is either corrected by reference to the original data sheets (e.g. in the case of input error) or excluded from that particular use.

AR comment: Indicate any deviations or developments. Do not change the text already adopted in the work plan.

No fyke net study was carried out on Lough Derg in 2022 as resources were not available. Work is continuing on a National Level to plan the resumption of this activity of this survey in the future.

MS : IRL

Region: North-East Atlantic

Sampling scheme identifier: IMREC_CREEL

Sampling scheme type: Recreational fisheries

Observation type: SciObsOnShore

Time period of validity: 2022-Ongoing

Short description (max 100 words):
The IMREC_CREEL survey of shore and small boat anglers utilises a spatio-temporal sampling method to collect catch per unit effort (CPUE) data of sea anglers around the Irish coast, whereby the unit of effort is a daily angler session.

Description of the population

Population targeted:
All species caught by recreational shore and small boat anglers in Irish waters.

Population sampled:
All shore and small boat anglers catch is included in the sampling programme.

Stratification:
Sampling is stratified bi-annually and recreational fisheries are grouped by geographic region (Irish Sea/Celtic Sea/ West coast of Ireland).

Sampling design and protocols

Sampling design description:

IMREC_CREEL embraces the on-site shore and small boat angling catch surveys. For shore angling IMREC_CREEL uses a roving creel survey, with follow up call-back to estimate shore angling catch rates, which utilises a spatio-temporal sampling frame to collect catch per unit effort (CPUE) data of sea anglers around the Irish coast. This approach was applied for the pilot study (Ryan et al., 2021) due to the disparate nature of shore angling around Ireland and the multiple potential access points to the sea. PSUs consist of connected polygons which encompass all fishable sections of Irelands shoreline. The number of spatial strata and temporal strata in the sampling frame will be reduced from five to three and from four to two respectively, based on learnings from the pilot study (Ryan et al., 2021). This amendment will decrease the requirement for imputation procedures to account for missing data points without adversely affecting precision. Sampling effort will focus more on regions and times where angling effort is known to be higher.

The small boat aspect of IMREC_CREEL uses a similar spatio-temporal sampling frame where catch data are collected through a refined random-access point survey. Pilot study sampling difficulties for the small boat sector (due to multiple access points resulting in limited sampling encounters) resulted in small sample sizes and substantial catch estimate biases. As this sector is an important component of MRF catches in Ireland continued sampling refinement and development of revised techniques to monitor catch rates will be prominent in this survey.

The spatio-temporal sampling frame consists of the whole coastline split into separate sampling polygons X 365 separate sampling days (PSUs). This sampling frame embraces every angling trip on the Irish coast over a calendar year. All catch records will be noted as 'retained' or 'released'. This will allow an estimation of the rate of fish retained and returned alive per species.

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

Regional coordination: N

Link to sampling design documentation:
Ryan. D., Leonard, E., Casserly. C. M., Roche. W. (2021). Marine Recreational Angling Catches in Ireland. Pilot Study Report (2019-2021). Inland Fisheries Ireland. Dublin.

Compliance with international recommendations: Y.
The sampling programme was designed with guidance from members of the ICES WGRFS.

Ireland's report on the DCF Annual Work Plan 2020 included a report on the pilot study which was submitted to the EC STCEF for review in March 2021. The sampling programme was deemed to be satisfactory. The pilot study and the ongoing refinements will guide the current sampling programme.
https://stecf.jrc.ec.europa.eu/documents/43805/3064868/STECF+21-09+-+Evaluation+of+AR+and+DTi.pdf/058b6ae3-ac98-4530-8a2f-be26fc42cf46?version=1.0

Link to sampling protocol documentation:
Ryan. D., Leonard, E., Casserly. C. M., Roche. W. (2021). Marine Recreational Angling Catches in Ireland. Pilot Study Report (2019-2021). Inland Fisheries Ireland. Dublin.

Compliance with international recommendations: Y.
The sampling programme was designed with guidance from members of the ICES WGRFS.
A report on the pilot study which guided the current sampling programme was submitted to the EC STCEF for review in March 2021. The sampling programme was deemed to be satisfactory.

Sampling implementation

Recording of refusal rate: Y
Refusals are recorded

Monitoring of sampling progress within the sampling year:
The sampling programme is planned to sample strata in accordance with the spatio-temporal sampling frame design. Sampling progress is continuously monitored to ensure that all strata in the sampling frame have sufficient data points to avoid imputation. If sampling coverage is lower than expected due to unforeseen issues, targeted sampling may be undertaken to gap-fill.

Data capture

Means of data capture:
Data are collected electronically on tablets via the ArcGIS Survey123© data collection tool. This resource allows instant data capture and safe storage to a centralised geodatabase.
Surveyors carry measuring boards to measure lengths of captured fish when applicable.

Data capture documentation:
Reference SOPs for surveyors using the Survey123 tool are available and reviewed regularly.

Further information on processes in:
Ryan. D., Leonard, E., Casserly. C. M., Roche. W. (2021). Marine Recreational Angling Catches in Ireland. Pilot Study Report (2019-2021). Inland Fisheries Ireland. Dublin.

Quality checks documentation:
N (year for documentation to be available to be confirmed).
Data recorded during on-site interviews are uploaded to a centralised database. Data are regularly collated, downloaded and visualised using customised R scripts to quality check for erroneous data points before assessments are undertaken.

Data storage

National database:
ArcGIS geodatabase and IFI SQL server.

International database: NA

Quality checks and data validation documentation:
Not available at present.

Quality checks/reviews of MS methods are reviewed periodically by ICES WGRFS (QAT https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/EOSG/2019/WGRFS2019.pdf).

When MS catch reports are submitted to end users (European Commission) standard quality checks will be in place with accompanying documentation.

Sample storage

Physical samples are not collected for this programme. All digital data collected are stored in a centralised geodatabase which is backed up hourly.

Data processing

Evaluation of data accuracy (bias and precision): N.
No specific documentation is currently available. Further consultation with ICES WGRFS will determine what further processes can be put in place during 2022.

CPUE estimates computed through the design-based analysis of on-site survey data are assessed for precision at analysis.

See Ryan. D., Leonard, E., Casserly. C. M., Roche. W. (2021). Marine Recreational Angling Catches in Ireland. Pilot Study Report (2019-2021). Inland Fisheries Ireland, Dublin.

Editing and imputation methods: N.
No specific documentation is currently available. Further consultation with the ICES WGRFS will determine what further processes can be put in place during 2022.

If errors are identified in the database they are removed from the dataset. The sampling programme was designed to avoid the use of imputation procedures if possible. However, if necessary, it may be appropriate to merge unsampled strata with adjacent strata with similar angling patterns.

Quality document associated to a dataset: N

No DOI currently exists for the dataset. No estimation process document is currently available.

Validation of the final dataset:
Data will be rechecked by the database manager prior to submission to end users. If potential errors are detected they will be crosschecked with original datasets and corrected if possible. If this is not possible, erroneous data will be removed prior to submission.

AR comment: Indicate any deviations or developments. Do not change the text already adopted in the work plan.

Sampling scheme implemented as designed, please see Table 2.4 and Text Box 2.4 for details of achievements in 2022.

MS : IRL

Region: North-East Atlantic

Sampling scheme identifier: IMREC_SKP_DI

Sampling scheme type: Recreational fisheries

Observation type: SelfAtSea

Time period of validity: 2022-Ongoing

Short description (max 100 words):
An angling charter skipper catch diary (IMREC_SKP_DI) is in use which allows a sample of charter skippers to self-report fish catch, and catch and release rates at species level for each angling trip. This process will also be used to provide data to support estimations of angling effort across the Irish charter fleet.

Description of the population

Population targeted:
All species caught by charter anglers in Irish waters.

Population sampled:

All catch taken by recreational charter anglers is included in the sampling programme.

Stratification:
Sampling includes all coastlines annually and recreational angling fisheries are grouped by geographic region (Irish Sea/Celtic Sea/ West coast of Ireland).

Sampling design and protocols

Sampling design description:
A charter skipper lead catch diary was developed during the pilot study (Ryan at al, 2021) which allowed contributors to enter catch data on species, lengths (and catch and release rates) for each sampling trip. Charter angling is primarily a weather- dependent leisure activity and most effort tends to be around and during the summer months. Regional stratification was also deemed appropriate as targeted species are often dependent on region. Examination of historical voluntary charter skipper catch diaries collated by IFI (up to 2008) confirmed that catch is disparate between regions.

The total number of registered active charter skippers is currently low in Ireland (< 70) and a diary has been provided to all willing participants. Contributors are requested to record all angling trips and associated catch data. Catch is reported by vessel per trip and divided by the number of anglers on board to provide a mean catch per angler per day.

The data streams from this sampling programme will be combined with IMREC_OB_CH_SURVEY at analysis, to provide an estimate of charter angling activity and catch rates.

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

Regional coordination: N

Link to sampling protocol documentation:
Ryan. D., Leonard, E., Casserly. C. M., Roche. W. (2021). Marine Recreational Angling Catches in Ireland. Pilot Study Report (2019-2021). Inland Fisheries Ireland. Dublin.

Compliance with international recommendations: Y
The sampling programme was designed through guidance from members of the ICES WGRFS. A report on the pilot study which guided the current sampling programme was submitted to the EC STCEF for review in March 2021. The sampling programme was deemed to be satisfactory.

Sampling implementation

Recording of refusal rate: NA

Monitoring of sampling progress within the sampling year:

All contributors are contacted regularly during the sampling window for progress updates and identify any sampling issues. They are also requested to share data sheets if available.

Data capture

Means of data capture:
Species capture and length data are initially recorded in a hardcopy, waterproof diary. Contributors are requested to take a digital image of all angling trip data and share it with the designated IFI data manager whenever possible. These data, when received, are transcribed to the IMREC centralized database application. Length data is recorded using measuring boards provided by IFI.

Data capture documentation:
All skippers contributing to the programme are supplied with an SOP with is regularly reviewed and updated.
Further details provided in: Ryan. D., Leonard, E., Casserly. C. M., Roche. W. (2021). Marine Recreational Angling Catches in Ireland. Pilot Study Report (2019-2021). Inland Fisheries Ireland. Dublin.

Quality checks documentation:
N (year for documentation to be available to be confirmed).

Data are regularly collated, downloaded and visualised using customised R scripts to quality check for erroneous data points before assessments are undertaken.

Data storage

National database:
ArcGIS geodatabase and IFI SQL server.

International database: NA

Quality checks and data validation documentation:
Not available at present.

Quality checks/reviews of MS methods are reviewed periodically by ICES WGRFS (QAT https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/EOSG/2019/WGRFS2019.pdf).

When MS catch reports are submitted to end users (European Commission) standard quality checks will be in place with accompanying documentation.

Sample storage

Physical samples are not collected for this programme.

Data processing

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

No specific documentation is currently available. Further consultation with ICES WGRFS will determine what further processes can be put in place during 2022.

CPUE estimates computed through the design-based analysis of on-site survey data are assessed for precision at analysis.
See Ryan. D., Leonard, E., Casserly. C. M., Roche. W. (2021). Marine Recreational Angling Catches in Ireland. Pilot Study Report (2019-2021). Inland Fisheries Ireland, Dublin.

Editing and imputation methods: N.
No specific documentation is currently available. Further consultation with the ICES WGRFS will determine what further processes can be put in place during 2022.

If errors are identified in the database they are removed from the dataset. The sampling programme was designed to avoid the use of imputation procedures if possible. However, if necessary, it may be appropriate to merge unsampled strata with adjacent strata with similar angling patterns.

Quality document associated to a dataset: N

No DOI currently exists for the dataset. No estimation process document is currently available.

Validation of the final dataset:
Data will be rechecked by the database manager prior to submission to end users. If potential errors are detected they will be crosschecked with original datasets and corrected if possible. If this is not possible, erroneous data will be removed prior to submission.

AR comment: Indicate any deviations or developments. Do not change the text already adopted in the work plan.

Sampling scheme implemented as designed, please see Table 2.4 and Text Box 2.4 for details of achievements in 2022.

MS : IRL
Region: North-East Atlantic
Sampling scheme identifier: IMREC_OB_CH_SURVEY
Sampling scheme type: Recreational fisheries
Observation type: SciObsAtSea
Time period of validity: 2022-Ongoing
Short description (max 100 words): An onsite sampling programme (IMREC_OB_CH_SURVEY) will be undertaken to randomly sample designated chartered angling trips to collect detailed species, length and weight data. This will add to data collected through the ongoing charter skipper diary (IMREC_SKP_DI). Onboard surveyors record species numbers caught, and accurately measure lengths and weights of all captured and released fish.

Description of the population

Population targeted:
All species caught by charter anglers in Irish waters.

Population sampled:
All catch taken by recreational charter anglers is included in the sampling programme.

Stratification:
Sampling is stratified bi-annually and recreational fisheries are grouped by geographic region (Irish Sea/Celtic Sea/ West coast of Ireland).

Sampling design and protocols

Sampling design description:
The sampling frame consists of a panel of participating charter skippers stratified according to their operating region. Samplers are assigned to participating charter skippers based on a stratified random sampling protocol. Samplers record angling trip data including :

- Species caught
- Whether released or retained
- Total length for the first 60 fish of each species (30 retained and 30 released fish)
- Individual weights (g) for the first 60 fish of each species (30 retained and 30 released fish)
- Total counts of all other captured fish (both released and retained) that were not measured or weighed

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

Regional coordination: N

Link to sampling protocol documentation:
Ryan. D., Leonard, E., Casserly. C. M., Roche. W. (2021). Marine Recreational Angling Catches in Ireland. Pilot Study Report (2019-2021). Inland Fisheries Ireland. Dublin.

Compliance with international recommendations: Y.
The sampling programme was designed with guidance from members of the ICES WGRFS. Ireland's report on the DCF Annual Work Plan 2020 included a report on the pilot study which was submitted to the EC STCEF for review in March 2021. The sampling programme was deemed to be satisfactory. The pilot study and the ongoing refinements will guide the current sampling programme.
https://stecf.jrc.ec.europa.eu/documents/43805/3064868/STECF+21-09+-+Evaluation+of+AR+and+DTi.pdf/058b6ae3-ac98-4530-8a2f-be26fc42cf46?version=1.0

Sampling implementation

Recording of refusal rate: NA

Monitoring of sampling progress within the sampling year:

Regular communication with charter skippers and the sampling team is undertaken to monitor progress. For each temporal sampling run trips are monitored to ensure that data collection is occurring across all regional strata. If this is not the case, some targeted sampling may be required to gap-fill.

Data capture

Means of data capture:
Data are initially recorded on waterproof data recording sheets. At the end of each sampling day, surveyors take a digital image of all angling trip data and share this with the designated IFI data manager immediately. The data, when received, is immediately transcribed to the dedicated IFI IMREC database application. Length data are recorded using measuring boards provided by IFI.

Data capture documentation:
All skippers contributing to the programme are supplied with an SOP with is regularly reviewed and updated.
Further details provided in: Ryan. D., Leonard, E., Casserly. C. M., Roche. W. (2021). Marine Recreational Angling Catches in Ireland. Pilot Study Report (2019-2021). Inland Fisheries Ireland.

Quality checks documentation: N (year for documentation to be available to be confirmed).
Data are regularly collated, downloaded and visualised using customised R scripts to quality check for erroneous data points before assessments are undertaken.

Data storage

National database:
ArcGIS geodatabase and IFI SQL server.

International database: NA

Quality checks and data validation documentation:
Not available at present.

Quality checks/reviews of MS methods are reviewed periodically by ICES WGRFS (QAT https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/EOSG/2019/WGRFS2019.pdf).

When MS catch reports are submitted to end users (European Commission) standard quality checks will be in place with accompanying documentation.

Sample storage

Physical samples are not collected for this programme.

Data processing

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

No specific documentation is currently available. Further consultation with ICES WGRFS will determine what further processes can be put in place during 2022.

CPUE estimates computed through the design-based analysis of on-site survey data are assessed for precision at analysis.
See: Ryan. D., Leonard, E., Casserly. C. M., Roche. W. (2021). Marine Recreational Angling Catches in Ireland. Pilot Study Report (2019-2021). Inland Fisheries Ireland, Dublin.

Editing and imputation methods: N.
No specific documentation is currently available. Further consultation with the ICES WGRFS will determine what further processes can be put in place during 2022.

If errors are identified in the database they are removed from the dataset. The sampling programme was designed to avoid the use of imputation procedures if possible. However, if necessary, it may be appropriate to merge unsampled strata with adjacent strata with similar angling patterns.

Quality document associated to a dataset: N

No DOI currently exists for the dataset. No estimation process document is currently available.

Validation of the final dataset:
Data will be rechecked by the database manager prior to submission to end users. If potential errors are detected they will be crosschecked with original datasets and corrected if possible. If this is not possible, erroneous data will be removed prior to submission.

AR comment: Indicate any deviations or developments. Do not change the text already adopted in the work plan.

Sampling scheme implemented as designed, please see Table 2.4 and Text Box 2.4 for details of achievements in 2022.

MS : IRL

Region: North-East Atlantic

Sampling scheme identifier: IMREC_ANG_DI

Sampling scheme type: Recreational fisheries

Observation type: SelfOnShore

Time period of validity: 2022-Ongoing

Short description (max 100 words):
A major output of the pilot study (Ryan et al., 2021) was the creation of an online angling diary (IMREC_ANG_DI). Sea anglers in Ireland have access to this online resource to input and

self-report catch data. The diary will operate in parallel with the probability based IMREC_CREEL programmes.

Description of the population

Population targeted:
All species caught by anglers in Irish waters

Population sampled:
All recreational sea anglers and their angling catches.

Stratification:
Online diary is available to all sea anglers. As anglers must provide general fishing location and the date of their fishing trip, catch data can be stratified temporally and spatially.

Sampling design and protocols

Sampling design description:

To collect marine recreational angling catch data on a continuous basis, an online angler catch diary was developed. The online IMREC Angler Diary (Fig.1) provides a fast and efficient recording platform for self-selecting anglers to submit catch information on fishing trips (shore, small boat or charter boat). This platform provides qualitative data on species caught, total catches, catch/release rates and length measurements from a vetted group of participating anglers across Ireland.

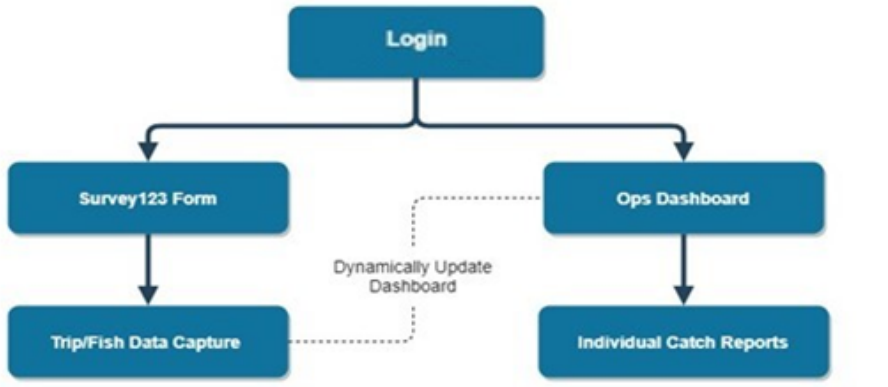


Fig. 1: Structure of the IMREC Online Diary

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

Regional coordination: N

Link to sampling protocol documentation:
Ryan. D., Leonard, E., Casserly. C. M., Roche. W. (2021). Marine Recreational Angling Catches in Ireland. Pilot Study Report (2019-2021). Inland Fisheries Ireland. Dublin

Compliance with international recommendations: Y.
The sampling programme was designed with guidance from members of the ICES WGRFS.

Ireland's report on the DCF Annual Work Plan 2020 included a report on the pilot study which was submitted to the EC STCEF for review in March 2021. The sampling programme was deemed to be satisfactory. The pilot study and the ongoing refinements will guide the current sampling programme.
https://stecf.jrc.ec.europa.eu/documents/43805/3064868/STECF+21-09+-+Evaluation+of+AR+and+DTi.pdf/058b6ae3-ac98-4530-8a2f-be26fc42cf46?version=1.0

Sampling implementation

Recording of refusal rate: NA

Monitoring of sampling progress within the sampling year:
Contributors to the sampling programme are monitored and email reminders to submit data are sent periodically.

Data capture

Means of data capture:
Contributors are self-selecting and must sign up to the programme to enable them to log their angling catch data. Data are collected electronically through an online 'diary' form via the ArcHub Survey123© data collection tool. This resource allows instant data capture and safe storage to the IMREC centralised geodatabase. Contributors are requested to provide information on their catch. Information includes: species, catch retained or released, catch length (measured or estimated) and catch weight (measured or estimated).

Data capture documentation:
All anglers contributing to the programme are supplied with an SOP with is regularly reviewed and updated. This is also available on the ArcHub© diary website after contributors sign up to the programme.
Further details provided in:
Ryan. D., Leonard, E., Casserly. C. M., Roche. W. (2021). Marine Recreational Angling Catches in Ireland. Pilot Study Report (2019-2021). Inland Fisheries Ireland. Dublin.

https://imrec-ifigis.hub.arcgis.com/pages/get-involved

Quality checks documentation:
N (year for documentation to be available to be confirmed).
Data submitted by contributors are immediately uploaded to a centralised database. Data are regularly collated, downloaded and visualised using customised R scripts to quality check for erroneous data points before assessments are undertaken.

Data storage

National database:
ArcGIS geodatabase and IFI SQL server.

International database: NA

Quality checks and data validation documentation:

Not available at present.
Quality checks/reviews of MS methods are reviewed periodically by ICES WGRFS (QAT https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/EOSG/2019/WGRFS2019.pdf).

When country catch reports assessments are submitted to end users (European Commission) standard quality checks will be in place with accompanying documentation.

Sample storage

Physical samples are not collected for this programme. All digital data collected are stored in a centralised geodatabase which is backed up daily.

Data processing

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

No specific documentation is currently available. Further consultation with the ICES WGRFS will determine what further processes can be put in place during 2022.

As IMREC_ANG_DI is a self-selecting reporting interface some level of bias is expected. Data will be assessed against data collected through the on-site shore and small boat sampling programmes (IMREC_CREEL) and any bias will be quantified.

Editing and imputation methods: N.
No specific documentation is currently available. Further consultation with the ICES WGRFS will determine what further processes can be put in place during 2022.

If errors are identified, the contributor can be contacted. If the error is recalled, the correct value is inputted. Otherwise, it is removed from the dataset.

Quality document associated to a dataset:
No DOI currently exists for the dataset. No estimation process document is currently available.
Validation of the final dataset:
Data will be rechecked by the database manager prior to submission to end users. If errors are detected, they will be crosschecked with the relevant contributor and corrected if possible. If this is not possible, erroneous data will be removed prior to submission.

AR comment: Indicate any deviations or developments. Do not change the text already adopted in the work plan.

Sampling scheme implemented as designed, please see Table 2.4 and Text Box 2.4 for details of achievements in 2022.

MS : IRL

Region: North-East Atlantic

Sampling scheme identifier: TUNA_CHART

Sampling scheme type: Recreational fisheries

Observation type: SelfAtSea

Time period of validity: 2022-Ongoing

Short description (max 100 words):

Tuna CHART is Ireland's multi-agency conventional tagging programme designed to implement, co-ordinate and oversee 'tag and release' of Atlantic Bluefin Tuna (ABFT) by anglers on board authorised Tuna CHART angling charter skipper vessels. The programme commenced in 2019 and is being undertaken to collect spatial and temporal distribution data together with some biological data. In 2018 ICCAT permitted countries in the North-East Atlantic without a Bluefin quota to authorise a limited number of charter vessels to target ABFT to collect these data.

Description of the population

Population targeted:

Atlantic Bluefin Tuna taken in Irish waters.

Population sampled:

All ABFT taken by recreational charter anglers on authorised charter angling vessels are included in the sampling programme.

Stratification:

Sampling includes all coastlines annually. Angling/sampling is confined to summer and early winter period.

Sampling design and protocols

Sampling design description:

Authorised skippers submit a digital report of their bluefin angling trips to Inland Fisheries Ireland (IFI) and Tuna CHART using the Tuna CHART form on Survey123, an ArcGIS application developed by IFI, on ruggedised Samsung tablets. Fields in the digital and associated paper forms (for Marine Institute) were designed to correspond to fields in the

ICCAT conventional tagging document. Skippers are obliged to submit their surveys digitally within a specific timeframe.

ABFT are targeted by anglers on board authorised charter vessels and brought alongside for tagging and measuring in the water. All tagging and relevant biometric data are recorded and all fish are released following a short recovery period.

Skippers must record all ABFT angling trips (effort) and associated catch data. ABFT catch is reported by vessel per trip per day and divided by the number of angling days per vessel per season to provide a seasonal CPUE value.

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

Regional coordination: N

Link to sampling protocol documentation:

A best practise angling method manual was developed by the Tuna CHART team in 2019 to optimise fish welfare. Manuals for angling, handling/ tagging and data recording are updated annually. Skippers receive training.

ABFT Tagging Manual for the Atlantic-Wide Research Programme for Bluefin Tuna (GBYP - 2010). https://www.iccat.int/GBYP/Docs/Tagging_Manual.pdf

Compliance with international recommendations: Y

The tagging programme was based on guidance in ABFT Tagging Manual for the Atlantic-Wide Research Programme for Bluefin Tuna (GBYP - 2010). https://www.iccat.int/GBYP/Docs/Tagging_Manual.pdf

Sampling implementation

Recording of refusal rate: NA

Monitoring of sampling progress within the sampling year:

All skippers are obliged to submit electronic reports within a specific timeframe. Skippers are contacted regularly during the sampling window for progress updates and to identify any sampling issues.

Data capture

Means of data capture:

ABFT capture, tagging and length data are recorded in two formats – electronically on a customized tablet supplied by the Tuna CHART programme, and on waterproof survey sheets. Environmental data are also captured. Electronic data uploads to an IFI geodatabase. Length data are recorded using a measuring tape system provided by IFI.

Data capture documentation:

All skippers are trained and are supplied with SOPs for fish handling and data capture which are reviewed annually.

Quality checks documentation:

N

Data entries are regularly checked and visualized on an ArcGIS operations dashboard. Erroneous data is identified and referred back to the originator for clarification before being approved.

Data storage

National database:

ArcGIS geodatabase and IFI SQL server.

International database: NA

Quality checks and data validation documentation:

Not available at present.

When MS catch reports are submitted to end users (European Commission, ICCAT) standard quality checks will have been undertaken.

Sample storage

Physical samples are not collected for this programme.

Data processing

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

Full catch census undertaken and skippers obliged to report under terms of their authorisation.

Editing and imputation methods: N.

No specific documentation is currently available.

If errors are identified in the database they are removed from the dataset.

Quality document associated to a dataset: N

https://www.iccat.int/en/accesingdb.html - access to dataset via 'tagging' link

Validation of the final dataset:

Data will be rechecked by the database manager prior to submission to end users (ICCAT). If potential errors are detected they will be crosschecked with original datasets and corrected if possible. If this is not possible, erroneous data will be removed prior to submission.

AR comment: Indicate any deviations or developments. Do not change the text already adopted in the work plan.

Sampling scheme implemented as designed, please see Table 2.4 and Text Box 2.4 for details of achievements in 2022.

MS : IRL

Region: North-East Atlantic

Sampling scheme identifier: IBTS_Q4

Sampling scheme type: Research survey at sea

Observation type: SciObsAtSea (Scientific observer at sea on commercial or scientific vessels)

Time period of validity: 2003 onwards

The main objective of the IBTS_Q4 is to collect data on the distribution, relative abundance and biological parameters of commercial commercially exploited demersal species in 6a south, 7b & 7g-j north. The indices currently utilised by assessment WG's are for haddock, whiting, plaice, cod, hake and sole. Survey data is also provided for white & black anglerfish, megrim, pollack, ling, blue whiting and a number of elasmobranchs as well as several pelagics (herring, horse mackerel and mackerel). Occurrence of vulnerable or sentinel invertebrate species such as corals, sea pen, fan mussel and ocean quahog is also noted. Marine litter is also sorted and recorded. Oceanographic data are collected from CTD instrument on trawl door and occasional surface to sea bed CTD transects. Sediment grabs are carried out opportunistically using a Day grab.

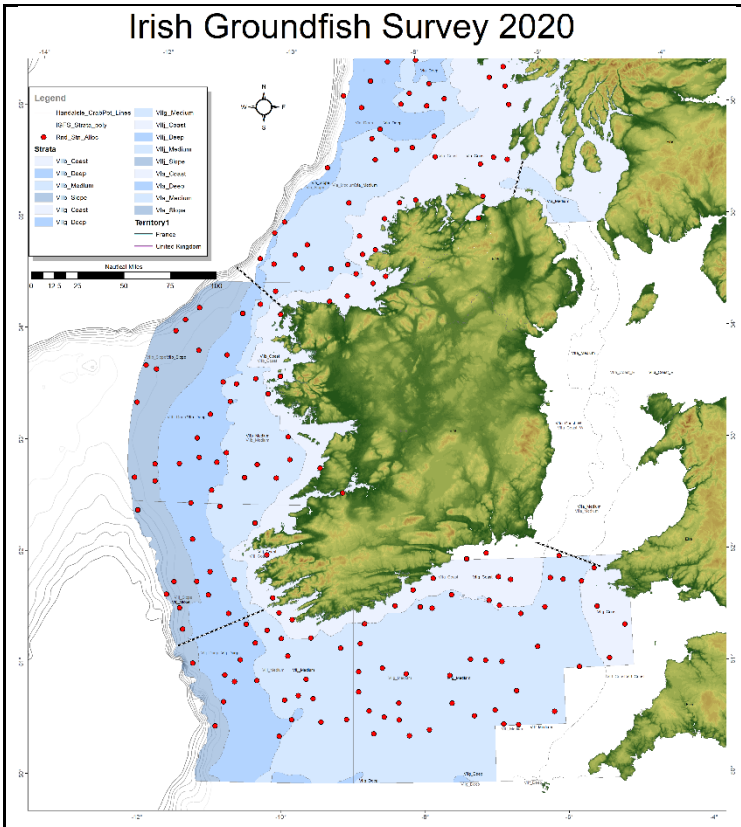
Description of the population

Population targeted: Main target species are haddock (*Melanogrammus aeglefinus*), whiting (*Merlangius merlangus*), cod (*Gadus morhua*), hake (*Merliccius merluccius*), anglerfish (*Lophius piscatorius* and *L. budegassa*) and megrim (*Lepidorhombus whiffiagonis* and *L. boscii*), sole (*Solea solea*), plaice (*Pleuronectes platessa*).

Population sampled: As a multi-species survey the target ecosystem component is demersal species. No sampling takes place outside the survey area or on grounds that are unsuitable for trawling.

Stratification: The stratification is based on the following considerations:

- Depth: 0-80m; 81-125m; and 126-200m, 201-600m.
- A hierarchical regression tree analysis was done in 2002 around historic data for target species and clustered abundance broadly into these depth strata as well as North-South quite closely to where ICES divisions fell anyway. As a starting point a combination of four ICES divisions by 4 depth strata were used to allocate sampling effort, semi-randomly, proportional to the area of each.
- Regions 6a and 7b,g,j are treated separately because they comprise different assessment and TAC areas. This also allows a heavier 'Hopper' groundgear to be used for sampling in the north (6a) where the ground is often very hard and rock, while a smaller rig is used in 7b,g,j with higher selectivity.



Sampling design and protocols

Sampling design description: Individual hauls are the PSU, these are selected from random locations inside each stratum. The catch is then processed according to the IBTS SISP 15 manual. The random locations are allocated to the nearest historic clear tow on record or to supplementary information from multibeam or commercial fisheries data.

Is the sampling design compliant with the 4S principle?: NA (but note that the sampling scheme is statistically sound)

Regional coordination: The survey is also formally coordinated under WGBITS.

Link to sampling design documentation: IBTS SISP 15 manual: https://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%2015%20NeAtl%20IBTS%20Survey.pdf

Compliance with international recommendations: Y

Link to sampling protocol documentation: IBTS SISP 15 manual: https://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%2015%20NeAtl%20IBTS%20Survey.pdf

Compliance with international recommendations: Y

Sampling implementation

Recording of refusal rate: NA

Monitoring of sampling progress within the sampling year: NA (the survey only takes place once per year).

Data capture

Means of data capture:
The CEFAS software FSS (Fishing Survey System) is used to enter station data and import catch data. These data are stored in a SQL database (FSS_SURVEY) on a local server.

The gear sensor data as well as bottom depth and GPS position are also automatically recorded in a SQL database (FSS_NMEA) at intervals of approximately one per second.

Catch weights, length frequency distributions and biological data are captured using the EFDAQ (Electronic Fisheries Data Acquisition) system and stored in a local database in the wet laboratory before being imported into the central SQL database (FSS_SURVEY).

Data capture documentation:
A new data capture system EFDAQ (Electronic Fisheries Data Acquisition) has been in use in the wet laboratory since 2021. This system was designed by SeaScope Fisheries Research for the Marine Institute and includes hardware such as electronic measuring boards and wands and software application to allow access, collection, visualization, quality assurance and editing of fisheries sample data. Identification and maturity staging are carried out using protocols as recommended by DATRAS and ICES working groups.

Quality checks documentation: Y
EFDAQ Catch Management (20 CatMan V1-7.pdf - not publicly available)
Quality control on sample data (e.g., individual lengths and weights, sample weights etc.) is carried out after every haul using EFDAQ application. Biological age samples such as otoliths are checked against individual fish size before boxes are stored for transport back to laboratory for analysis.

Data storage

National database: FSS (Fishing Survey System)

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

Quality checks and data validation documentation:
Once a survey is complete a number of data checks are carried out on haul positions, gear geometry, catch data and internal consistency of the data. During the upload process to DATRAS a similar range of checks are carried out (https://www.ices.dk/data/data-portals/Pages/DATRAS.aspx).

The data management of this data collection activity is incorporated into the Marine Institute's IODE accredited Data Management – Quality Management Framework (DM-QMF).

Sample storage

Samples for aging such as otoliths are stored clean and dry at room temperature before transport to Marine Institute laboratories for analysis. These age structures are generally stored at Marine Institute premises for a period of months before age reading is carried out. Soft tissues are generally collected by request from third parties such as universities and are stored according to protocols provided. Such samples are transported to third parties within weeks of survey completion.

Age reading is of IBTS_Q4 otolith samples is carried out according to internationally recognised protocols:
https://www.ices.dk/sites/pub/Publication%20Reports/Cooperative%20Research%20Report%20(CRR)/CRR%20346.pdf

Data processing

Evaluation of data accuracy (bias and precision): N/Y
There is no procedure in place to estimate bias. Precision for cod, haddock and whiting is estimated as part of the survey index estimation method using the spatio-temporal model VAST. Estimates are also provided for hake to WGBIE as part of the survey index estimation process. Accuracy is monitored during the assessment process relative to the catch data, which of course has its own nuances.

Editing and imputation methods: NA – no imputation takes place (with the exception of gear parameters that could not be observed – these are imputed using a model based on observed historic values).

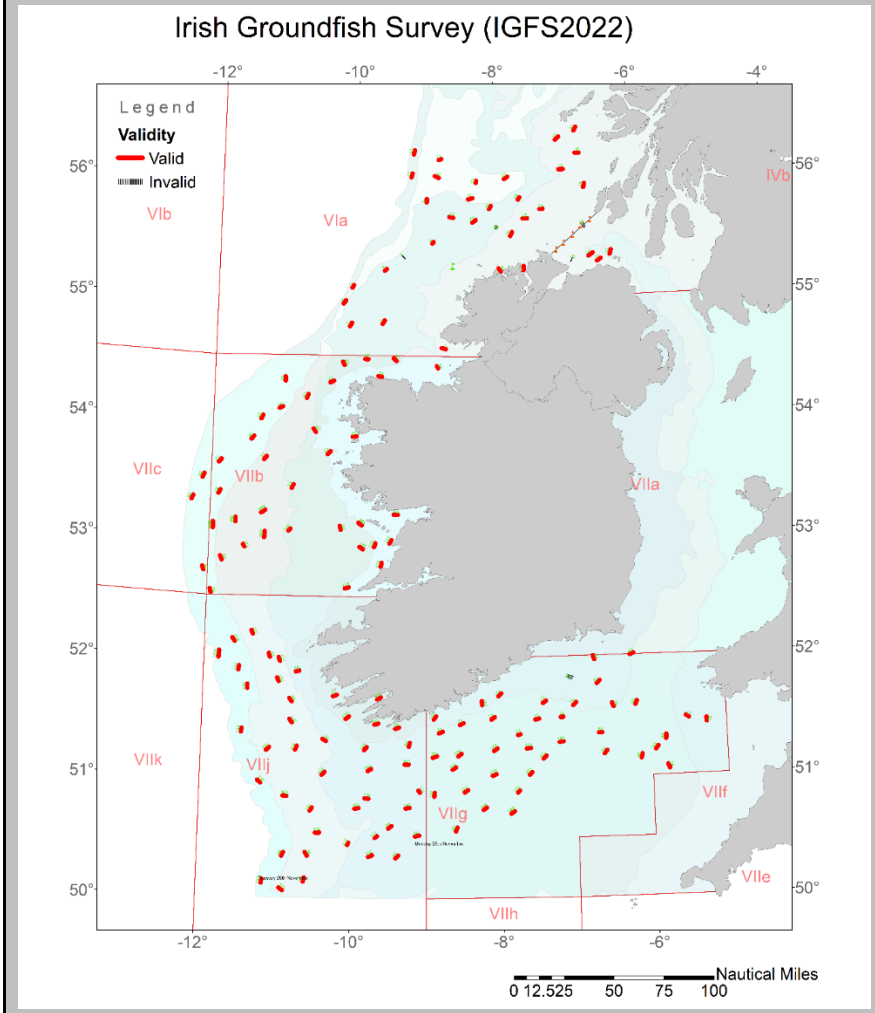
Quality document associated to a dataset:
Procedure for producing the estimations of abundance and biomass for main species has just been revised as part of the ICES benchmark process and documentation is in progress (see http://doi.org/10.17895/ices.pub.7574 and http://doi.org/10.17895/ices.pub.5983 for background.

Validation of the final dataset: Datasets are validated prior to DATRAS upload. For more information see: https://datras.ices.dk/Data%20submission/Default.aspx

AR comment: Indicate any deviations or developments. Do not change the text already adopted in the work plan.

Under sampling in relation to days at sea and fishing tows are outlined in Table 2.6 and future developments are outlined in Text Box 2.6. Below is the 2022 Survey Map with achieved survey stations highlighted.

Figure 1. IBTS_Q4 Survey Map with Valid and Invalid stations completed in 2022



MS: IRL
Region: North-East Atlantic
Sampling scheme identifier: IBWSS_IRL

Sampling scheme type: Research survey at sea

Observation type: SciObsAtSea (Scientific observer at sea on commercial or scientific vessels)

Time period of validity: 2004 to present

The main objective of the International blue whiting spawning stock survey is to determine the age stratified abundance and distribution of blue whiting (Micromesistius poutassou) using acoustic survey techniques. Biological data are collected by means of directed trawling on echotraces to determine species composition and biological characteristics of target species. Directed trawling is carried out on echotraces thought to contain mesopelagic fish species as the survey builds capacity towards reporting abundance and distribution of key fish species. Oceanographic data are collected using vertical profiles at pre-determined locations along the survey cruise track. Visual abundance surveys for marine mammals and seabirds are conducted during daylight hours.

Description of the population

Population targeted: The main target species of the survey is blue whiting (Micromesistius poutassou)

Population sampled: Blue whiting are targeted within a pre-defined survey boundary region, containing the core spawning grounds.

Stratification: The geographical survey area is stratified based on two key criteria; acoustic sampling effort within the stratum and scaled historic abundance (core or peripheral stratum).

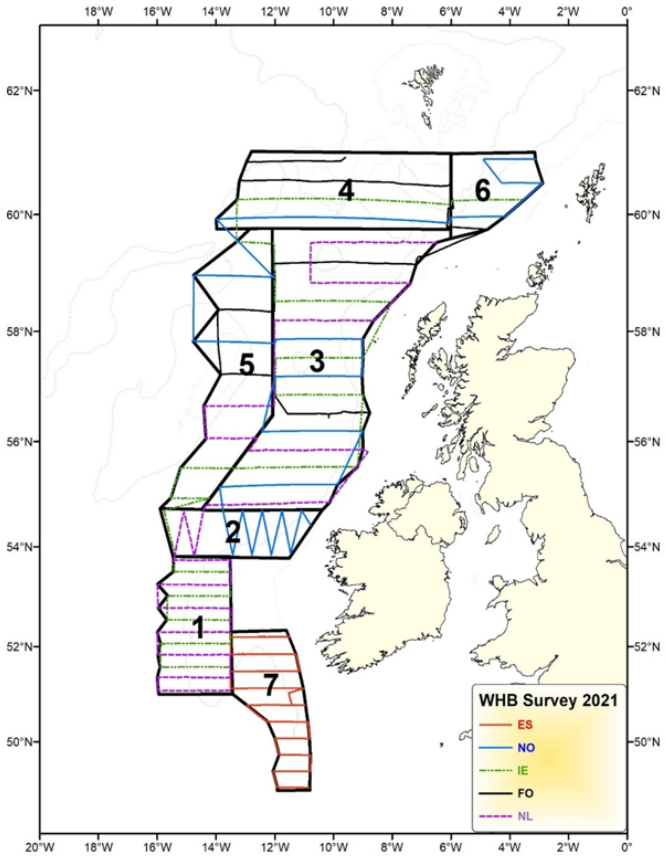


Figure 1. IBWSS Survey area stratification (numbered boxes). Strata 1-3 core abundance and 4-7 peripheral, low abundance

Sampling design and protocols

Sampling design description: PSU is measured in 1 nmi (nautical mile) EDSU (Elementary distance sampling units.

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

Regional coordination: IBWSS is coordinated through ICES WGIPS.

Link to sampling design documentation: The Manual for International Pelagic Surveys (IPS) describes the methods used for survey design, analysis and reporting of survey data (SISP #9) and is described in detail in the latest IBWSS survey report (http://hdl.handle.net/10793/1689)

Compliance with international recommendations: Y

Link to sampling protocol documentation: The Manual for International Pelagic Surveys (IPS) describes the methods used for survey design, analysis and reporting of survey data (SISP #9) and is described in detail in the latest IBWSS survey report (http://hdl.handle.net/10793/1689)

Compliance with international recommendations: Y

Sampling implementation

Recording of refusal rate: NA

Monitoring of sampling progress within the sampling year: NA (Annual survey)

Data capture

Means of data capture: Acoustic data are recorded via a Simrad EK60 scientific echosounder and processed using a proprietary software (Echoview V12). Biological data are collected and stored within an SQLite database and held nationally. Aggregated acoustic and biological data are uploaded to the open access ICES Trawl Acoustic repository post survey (https://www.ices.dk/data/data-portals/Pages/acoustic.aspx).

Data capture documentation: The Manual for International Pelagic Surveys (IPS) describes the methods used for survey design, analysis and reporting of survey data (SISP #9)

Quality checks documentation: Y (The Manual for International Pelagic Surveys (IPS) describes the methods used for survey design, analysis and reporting of survey data (SISP #9))

Data storage

National database: Acoustic data repository with data stored separately for each survey/year

International database: ICES acoustic trawl survey database https://www.ices.dk/data/data-portals/Pages/acoustic.aspx

Quality checks and data validation documentation: Data undergo checks and validation during submission to ICES. The ICES controlled vocabularies can be found at http://vocab.ices.dk/?theme=4

The data management of this data collection activity is incorporated into the Marine Institute's IODE accredited Data Management – Quality Management Framework (DM-QMF).

Sample storage

Biological samples (otoliths) are aged onboard the ship (herring & blue whiting) for species requiring additional processing prior to age reading (horse mackerel, boarfish & mackerel) samples are dry stored for transportation to the Marine Institute.

Age reading is of IBWSS samples is carried out according to internationally recognised protocols: https://www.ices.dk/sites/pub/Publication%20Reports/Cooperative%20Research%20Report%20(CRR)/CRR%20346.pdf

Data processing

Evaluation of data accuracy (bias and precision): Acoustic biomass and abundance from survey data is calculated using the open source software StoX (https://doi.org/10.1111/2041-210X.13250). Within StoX, the RStoX package has been developed to calculate the coefficient of variation (CV) of survey estimates. CV across the survey time series is described in the latest IBWSS survey report (http://hdl.handle.net/10793/1689)

Editing and imputation methods: Y within the StoX analysis framework. Survey estimates are reviewed annually at the survey coordination group ICES WGIPS.

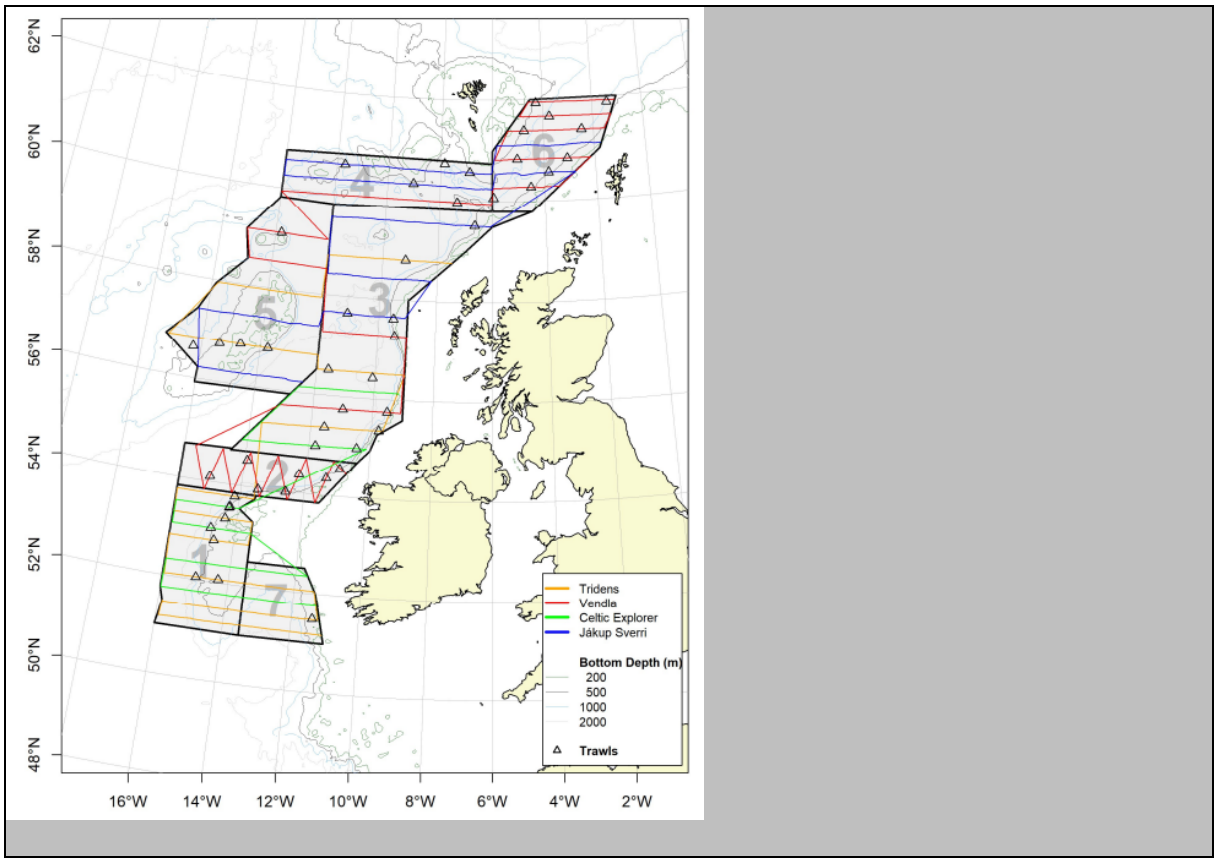
Quality document associated to a dataset: The publishing of DOIs relating to survey data uploaded to the ICES data portal is under development and will be implemented as part of the Transparent Assessment Framework within ICES (http://ices.dk/marine-data/assessment-tools/Pages/transparent-assessment-framework.aspx)

Validation of the final dataset: Data upload to the ICES portal (https://www.ices.dk/data/data-portals/Pages/acoustic.aspx) is dependent on meeting defined metadata standards described in the vocabulary (http://vocab.ices.dk/?theme=4)

AR comment: Indicate any deviations or developments. Do not change the text already adopted in the work plan.

Under achievement in terms of days and acoustic track are highlighted in Table 2.6 and further details on the survey can be found in Text Box 2.6. Below is a survey map for 2022.

Figure 2. IBWSS Survey area stratification (numbered boxes). Strata 1-3 core abundance and 4-7 peripheral, low abundance



MS : IRL
Region: North-East Atlantic
Sampling scheme identifier: MEGS_IRL
Sampling scheme type: Research survey at sea
Observation type: SciObsAtSea (Scientific observer at sea on commercial or scientific vessels)
Time period of validity: 1992 onwards
The main objective of the MEGS_IRL sampling is to provide egg counts and histology data for mackerel (*Scomber scombrus*) and horse mackerel (*Trachurus trachurus*), as well as CTD data, to let WGMEGS calculate an SSB for North-east Atlantic mackerel, and an egg production estimate for horse mackerel. Eggs are collected, identified and staged from plankton tows carried out using a GULF VII plankton sampler every ICES half statistical rectangle in ICES areas 5, 6, 7 and 12. Histology samples are collected from opportunistic fishing hauls. Oceanographic data are collected from every plankton station using a CTD

mounted on the GULF frame. Secondary objectives are to collect egg count data of other species, such as hake (*Merluccius merluccius*).

Description of the population

Population targeted: The main target species are mackerel (*Scomber scombrus*) and horse mackerel (*Trachurus trachurus*).

Population sampled: The main species targeted form the plankton sampling are mackerel (*Scomber scombrus*) and horse mackerel (*Trachurus trachurus*). Secondary species identified include hake (*Merluccius merluccius*) and ling (*Molva Molva*).

Stratification: The stratification is based on the following considerations:

- Plankton samples are collected from every ICES half statistical rectangle, along a series of transects, in the survey area allocated to Ireland by WGMEGS. (Fig 1) This location can vary from survey to survey. The survey is adaptive so the decision on when to finish a transect is at the discretion of the scientist-in-charge.
- Histology samples, as well as length, weight and maturity data, and otoliths, are collected from female mackerel and horse mackerel caught in opportunistic trawl hauls.

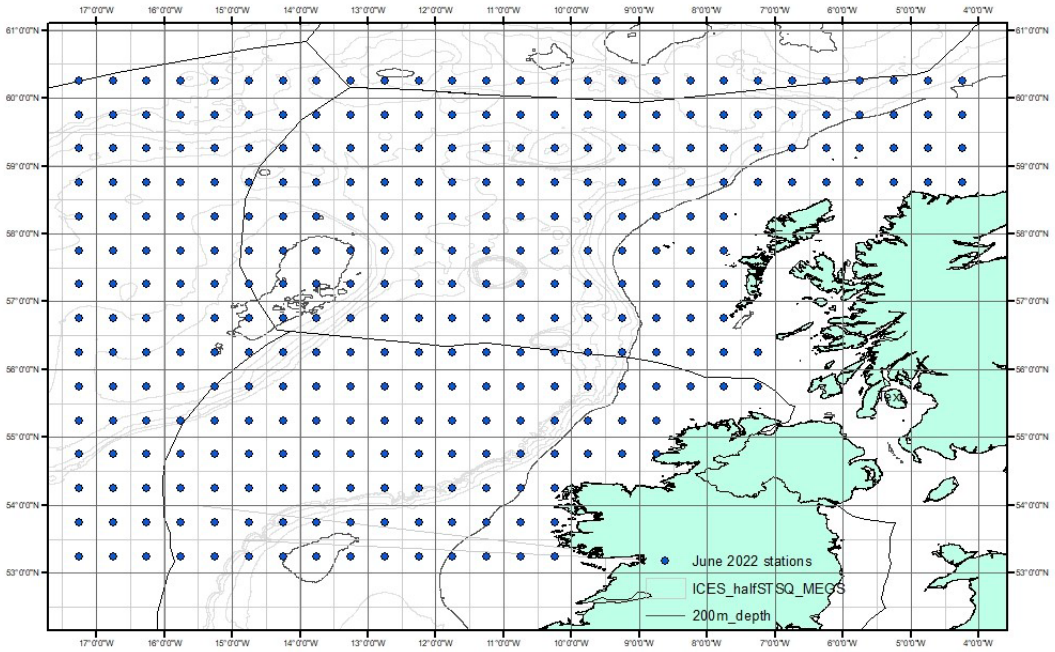


Fig 1: Plankton station locations for MEGS_IRL for both March and June surveys 2022

Sampling design and protocols

Sampling design description: Individual hauls are the PSU. Plankton samples are collected from each ICES half statistical rectangle, along a series of transects. Histology samples, as well as associated biological data are collected from female mackerel and horse mackerel caught in opportunistic trawl hauls. Plankton and histology samples are processed according to the MEGS SISP 5 and 6 manuals.

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

Regional coordination: MEGS_IE is formally coordinated under WGMEGS.

Link to sampling design documentation: ICES SISP 5 and 6 manuals:

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

https://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%206%20Manual%20for%20the%20mackerel%20and%20horse%20mackerel%20egg%20surveys,%20smapling%20at%20sea_Jan%202019.pdf

Compliance with international recommendations: Y

Link to sampling protocol documentation: ICES SISP 5 and 6 manuals:

https://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%206%20Manual%20for%20the%20mackerel%20and%20horse%20mackerel%20egg%20surveys,%20smapling%20at%20sea_Jan%202019.pdf

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

Compliance with international recommendations: Y

Sampling implementation

Recording of refusal rate: NA

Monitoring of sampling progress within the sampling year: NA

Data capture

Means of data capture:

Egg counts and fishing biological data are initially recorded on paper and then transferred to spreadsheet as soon as possible after sampling. A database to hold this data is currently under development. CTD data is collected and stored electronically.

Data capture documentation:

Plankton and histology data collected on survey are compiled into spreadsheets designed by WGMEGS. Egg identification and maturity staging are carried out using protocols as recommended by WGMEGS.

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

https://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%206%20Manual%20for%20the%20mackerel%20and%20horse%20mackerel%20egg%20surveys,%20smapling%20at%20sea_Jan%202019.pdf

Quality checks documentation: Y

Survey data is compiled by a WGMEGS coordinator. Total survey data is compiled from all Institutes and is run through an R script https://github.com/GersomCostas/Teggprod to check

for errors prior to being used to provide the SSB assessment. Biological age samples such as otoliths are checked against individual fish size before boxes are stored for transport back to laboratory for analysis.

Data storage

National database: FEAS_MEGS (in development)

International database: ICES Egg and larval database; https://www.ices.dk/data/data-portals/Pages/Eggs-and-larvae.aspx

Quality checks and data validation documentation:

Once a survey is complete several data checks are carried out on haul positions and CTD data. During the upload process to the ICES egg and larval database a similar range of checks are carried out.

The data management of this data collection activity is incorporated into the Marine Institute's IODE accredited Data Management – Quality Management Framework (DM-QMF).

Sample storage

Plankton samples and extracted eggs are stored onsite in the Marine Institute in 4% buffered formalin. Histology samples are kept for 18 months until the data has been accepted and validated by WGMEGS. These histology samples are then disposed of.

Age reading is of MEGS samples is carried out according to internationally recognised protocols:

https://www.ices.dk/sites/pub/Publication%20Reports/Cooperative%20Research%20Report%20(CRR)/CRR%20346.pdf

Data processing

Evaluation of data accuracy (bias and precision): N/Y

There is no procedure in place to estimate bias.

Interim results are provided to the relevant stock assessment working group (WGWIDE) in the year of the survey. Final results, including precision of abundance and biomass estimates for main target species, are provided in the WGMEGS report published the year after the survey has taken place, and are subsequently presented to WGWIDE.

https://www.ices.dk/sites/pub/Publication%20Reports/Forms/DispForm.aspx?ID=37365

Editing and imputation methods: NA

Quality document associated to a dataset:

No DOI is currently created for the dataset. The data is uploaded to the ICES database the year following the survey and is publicly available from there.

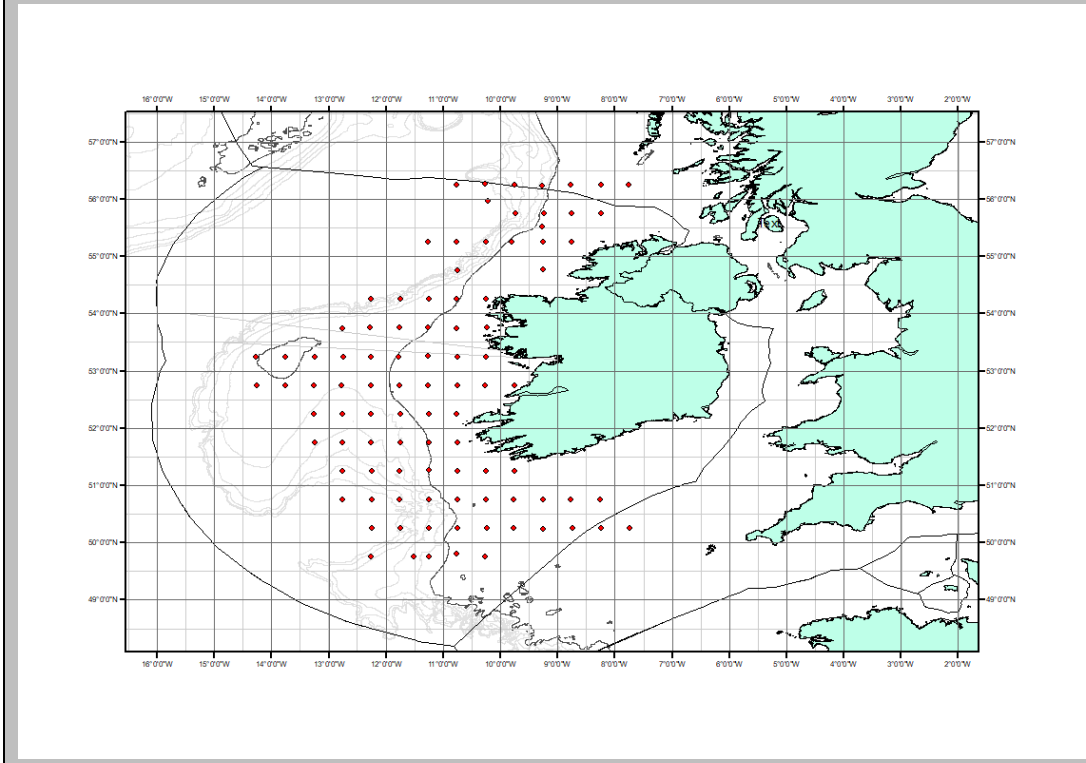
Validation of the final dataset:

Datasets are validated prior to upload to the egg and larval database. This ICES database also has additional validation checks which are applied during data upload.

AR comment: Indicate any deviations or developments. Do not change the text already adopted in the work plan.

Under sampling on this survey in 2022 is detailed in Table 2.6 and also in Text Box 2.6, below is a survey map of the March Survey, which was successfully completed.

Figure 3. MEGS_IRL Survey map with stations March 2022.



MS: IRL

Region: North-East Atlantic

Sampling scheme identifier: WESPAS_IRL

Sampling scheme type: Research survey at sea

Observation type: SciObsAtSea (Scientific observer at sea on commercial or scientific vessels)

Time period of validity: 2011 to present

The primary aim of the WESPAS survey is to determine the age stratified abundance and distribution of herring (*Clupea harengus)*, boarfish (*Capros aper*) and horse mackerel (*Trachurus trachurus*) using acoustic survey techniques. Biological data are collected by means of directed trawling on echotraces to determine species composition and biological characteristics of target species. Oceanographic data are collected using vertical profiles at pre-determined locations along the survey cruise track. Zooplankton sampling is conducted at hydrographic station and used to determine the dry weight biomass across the survey area. Visual abundance surveys for marine mammals and seabirds are conducted during daylight hours.

Description of the population

Population targeted: The main target species of the survey are herring (*Clupea harengus)*, boarfish (*Capros aper*) and horse mackerel (*Trachurus trachurus*).

Population sampled: Target species are sampled on the summer feeding grounds (herring) and spawning grounds (boarfish and horse mackerel).

Stratification: The geographical survey area is stratified based on two key criteria; acoustic sampling effort within the stratum and scaled historic abundance (core or peripheral stratum).

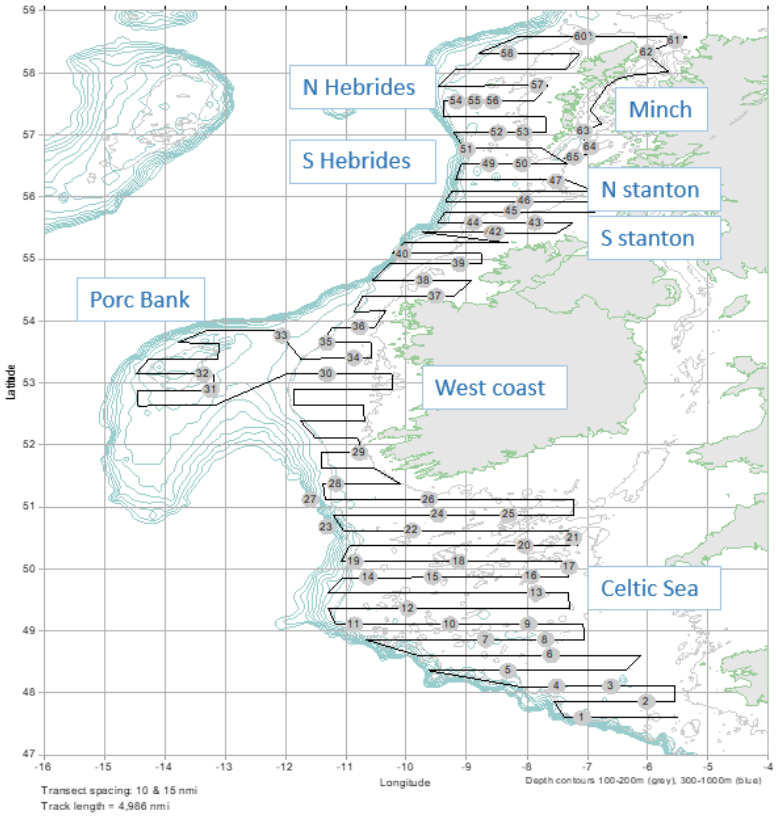


Figure 1. WESPAS Survey area stratification and trawl stations (grey circles) 2021.

Sampling design and protocols

Sampling design description: PSU is measured in 1 nmi (nautical mile) EDSU (Elementary distance sampling units.

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

Regional coordination: WESPAS is coordinated through ICES WGIPS.

Link to sampling design documentation: The Manual for International Pelagic Surveys (IPS) describes the methods used for survey design, analysis and reporting of survey data (SISP #9) and is described in detail in the latest WESPAS survey report (http://hdl.handle.net/10793/1659)

Compliance with international recommendations: Y

Link to sampling protocol documentation: The Manual for International Pelagic Surveys (IPS) describes the methods used for survey design, analysis and reporting of survey data (SISP #9) and is described in detail in the latest WESPAS survey report (http://hdl.handle.net/10793/1659)

Compliance with international recommendations: Y

Sampling implementation

Recording of refusal rate: NA

Monitoring of sampling progress within the sampling year: NA (Annual survey)

Data capture

Means of data capture: Acoustic data are recorded via a Simrad EK60 scientific echosounder and processed using a proprietary software (Echoview V12). Biological data are collected and stored within a SQLite database and held nationally. Aggregated acoustic and biological data are uploaded to the open access ICES Trawl Acoustic repository post survey (https://www.ices.dk/data/data-portals/Pages/acoustic.aspx).

Data capture documentation: The Manual for International Pelagic Surveys (IPS) describes the methods used for survey design, analysis and reporting of survey data (SISP #9)

Quality checks documentation: Y (The Manual for International Pelagic Surveys (IPS) describes the methods used for survey design, analysis and reporting of survey data (SISP #9))

Data storage

National database: Acoustic data repository with data stored separately for each survey/year

International database: ICES acoustic trawl survey database https://www.ices.dk/data/data-portals/Pages/acoustic.aspx

Quality checks and data validation documentation: Data undergo checks and validation during submission to ICES. The ICES controlled vocabularies can be found at http://vocab.ices.dk/?theme=4

The data management of this data collection activity is incorporated into the Marine Institute's IODE accredited Data Management – Quality Management Framework (DM-QMF).

Sample storage

Biological samples (otoliths) are aged onboard the ship (herring & blue whiting) for species requiring additional processing prior to age reading (horse mackerel, boarfish & mackerel) samples are dry stored for transportation to the Marine Institute.

Age reading is of WESPAS samples is carried out according to internationally recognised protocols:
https://www.ices.dk/sites/pub/Publication%20Reports/Cooperative%20Research%20Report%20(CRR)/CRR%20346.pdf

Data processing

Evaluation of data accuracy (bias and precision): Acoustic biomass and abundance from survey data is calculated using the open-source software StoX (https://doi.org/10.1111/2041-210X.13250). Within StoX, the RStoX package has been developed to calculate the coefficient of variation (CV) of survey estimates. CV across the survey time series is described in the latest IBWSS survey report (http://hdl.handle.net/10793/1659)

Editing and imputation methods: Y within the StoX analysis framework. Survey estimates are reviewed annually at the survey coordination group ICES WGIPS.

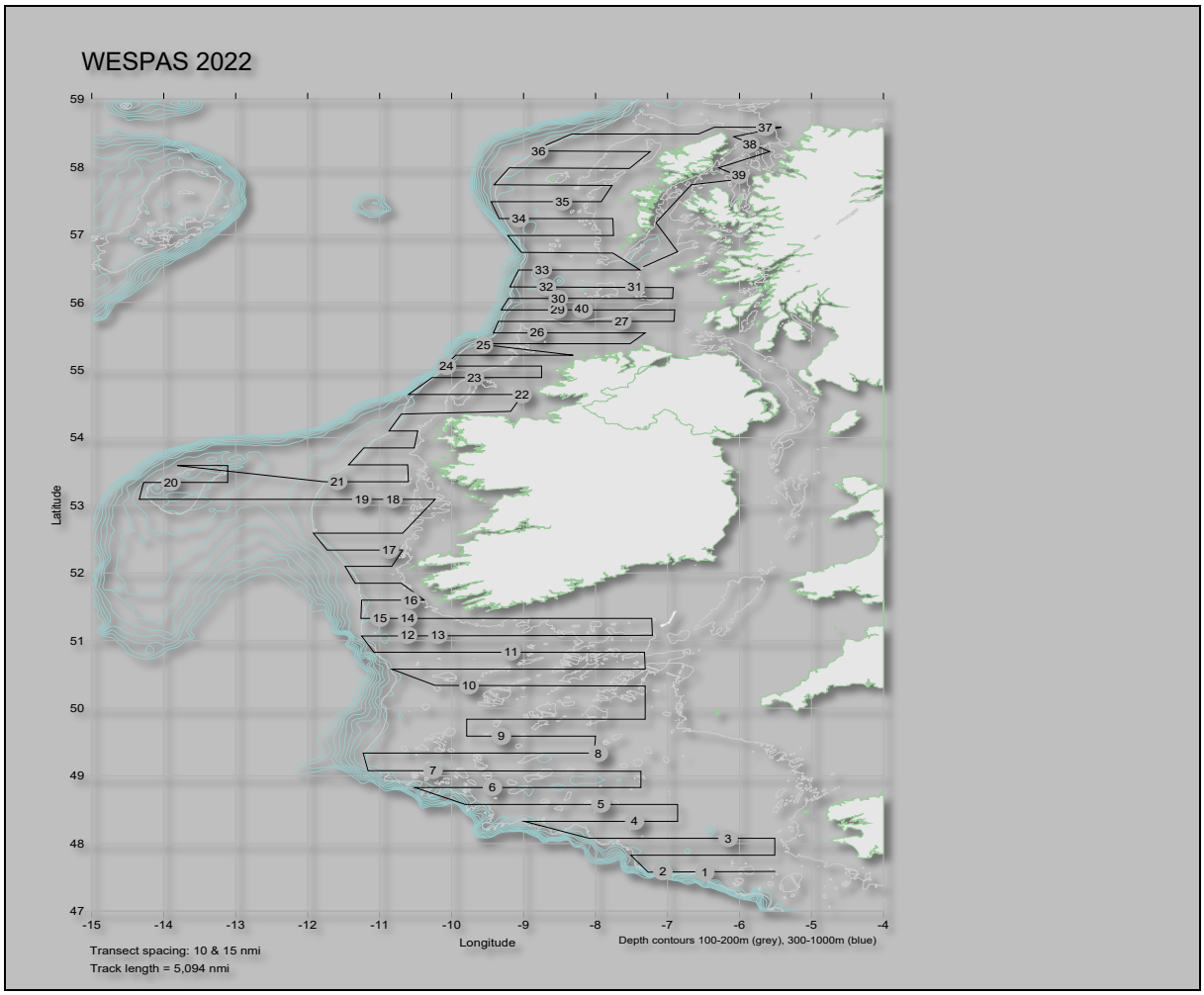
Quality document associated to a dataset: The publishing of DOIs relating to survey data uploaded to the ICES data portal is under development and will be implemented as part of the Transparent Assessment Framework within ICES (http://ices.dk/marine-data/assessment-tools/Pages/transparent-assessment-framework.aspx)

Validation of the final dataset: Data upload to the ICES portal (https://www.ices.dk/data/data-portals/Pages/acoustic.aspx) is dependent on meeting defined metadata standards described in the vocabulary (http://vocab.ices.dk/?theme=4)

AR comment: Indicate any deviations or developments. Do not change the text already adopted in the work plan.

Achieved sampling on the WESPAS_IRL survey is detailed in Table 2.6 and also in Text Box 2.6, below is a survey map illustrating achieved acoustic track and stations in 2022.

Figure 4. WESPAS_IRL 2022 Survey Map



MS : IRL
Region: North-East Atlantic
Sampling scheme identifier: *Nephrops* UWTV Survey (UWTV16-17, UWTV19, UWTV20-22)
Sampling scheme type: Research survey at sea
Observation type: SciObsAtSea (Scientific observer at sea on commercial or scientific vessels)
Time period of validity: 2002 – 2027
The main objective of the *Nephrops* UWTV Survey sampling scheme is to obtain quality assured burrow abundance estimates for Norway lobster (*Nephrops norvegicus*) in Functional Units (FU): 16, 17, 19, 20-21 combined, and 22 in area 7. Secondary objectives are to record observations of trawl marks, fish and *Nephrops* activity. Occurrence of vulnerable or sentinel invertebrate species such as soft corals and sea pens is also noted. Marine litter is recorded. Oceanographic data are collected from a sledge mounted CTD instrument. Beam trawl tows are carried out on FU 17 "Aran" and FU 22 "Smalls" grounds only when UWTV operations have been fully achieved. Sediment grabs are carried out opportunistically using a Day grab

and contribute to the Irish national "INFOMAR" seabed mapping programme and are used during ICES FU assessment Benchmark processes by contributing to the definition of the spatial area of FU *Nephrops* grounds.

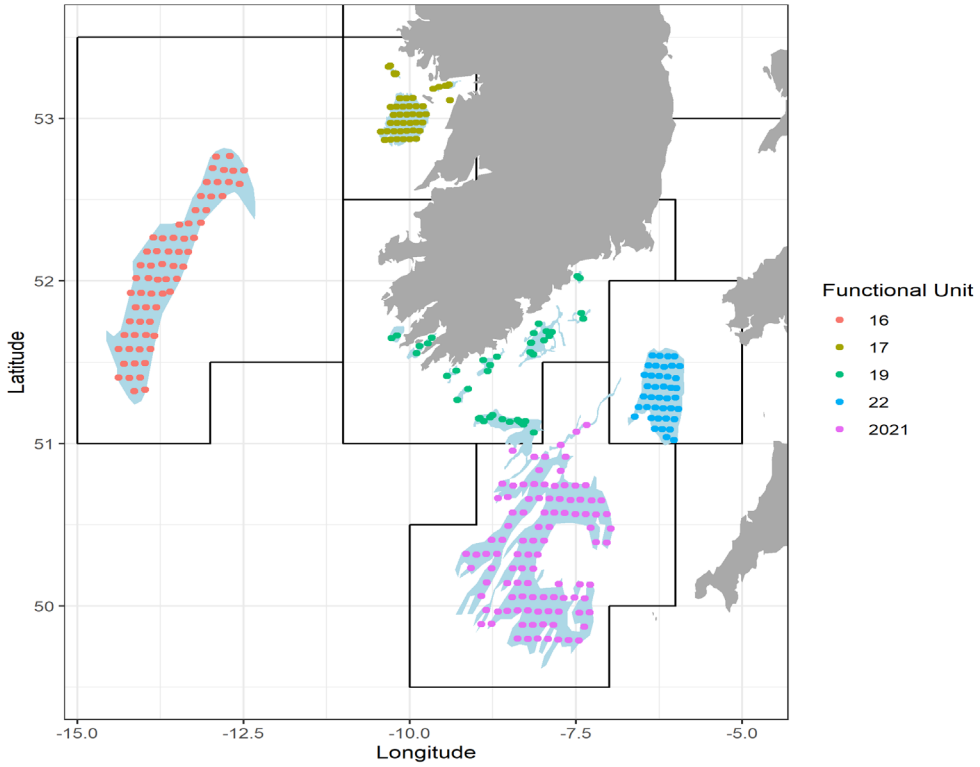
Description of the population

Population targeted: Main target species is Norway lobster (*Nephrops norvegicus*).

Population sampled: Main target species is Norway lobster (*Nephrops norvegicus*). No sampling takes place outside survey areas.

Stratification: The stratification is based on the following considerations:

- Clearly defined *Nephrops* grounds (see map below) were identified as separate strata; an area defined by sediment data and high fishing intensity surrounded by low fishing intensity signify that the bottom type and ecology on the fishing ground is different from that of the surrounding area.
- *Nephrops* FUs are treated separately because they comprise different assessment areas.



Sampling design and protocols

Sampling design description: Individual video transects are the Primary sample Unit (PSU), these are selected from random locations inside each stratum. Each transect is then processed according to the ICES Manual for *Nephrops* Underwater TV Surveys TIMES 65 manual https://doi.org/10.17895/ices.pub.8014.

Is the sampling design compliant with the 4S principle?: NA (but note that the sampling scheme is statistically sound)

Regional coordination: NA. The survey is formally coordinated under ICES WGNEPS. International staff exchange is facilitated when possible on UWTV surveys to allow for protocol and technical expertise development and international standardisation.

Link to sampling protocol documentation: ICES Manual for *Nephrops* Underwater TV Surveys TIMES 65: https://www.ices.dk/sites/pub/Publication%20Reports/Techniques%20in%20Marine%20Environmental%20Sciences%20(TIMES)/TIMES%2065.pdf

Compliance with international recommendations: Y

Sampling implementation

Recording of refusal rate: NA

Monitoring of sampling progress within the sampling year: NA (the survey only takes place once per year).

Data capture

Means of data capture:
Video transect metadata data are stored in a local database in the research vessel dry laboratory before being imported into the central SQL database (UWTV_Surveys) on return to shore.

The GPS and USBL position and depth are automatically recorded at intervals of approximately one every three seconds and stored in a local database in the research vessel dry laboratory before being imported into the central SQL database (UWTV_Surveys) on return to shore.

Burrow counts and presence/absence data are captured using an HD Image annotation "R-Shiny" app system and stored in a local database in the research vessel dry laboratory before being imported into the central SQL database (UWTV_Surveys) on return to shore. (Note that owing to the Covid-19 pandemic and restrictions on the numbers of scientists aboard research vessels, in 2020 and 2021 it was necessary to undertake this operation on-shore. It is the intention of the programme to return these operations to being undertaken at sea during surveys).

Following beam trawl tows (carried out on FU 17 "Aran" and FU 22 "Smalls" grounds – see above), *Nephrops* catch weights, length frequency distributions and biological data are captured using digital electronic callipers and marine scales connected to a tablet and stored in a local database in the research vessel wet laboratory, before being imported into the central SQL database (FSS_SURVEY) on return to shore.
Fish (weights only) and benthic catch data (weights and counts) are stored on paper copy and transferred to electronic spreadsheets before uploaded to the survey network.

Data capture documentation:
A new data capture system HD Image annotation "R-Shiny" app has been in use since 2019. This system was designed in-house by the Marine Institute (Aristegui, M., 2020) and allows access, collection, visualization, quality assurance and editing of image and position data. Burrow identification and technical processes are carried out using protocols as recommended by ICES WGNEPS.

Quality checks documentation: Y
Quality control on position data is carried out after every video transect using in-house developed scripts. Burrow count data are verified according to international standards.

Data storage

National database: FEAS_UWTV_Surveys
All data are maintained on secure servers.

International database: International database is under development.

Quality checks and data validation documentation:
Once a survey is complete a number of data checks are carried out on transect positions, count data and internal consistency of the data.
The data management of this data collection activity is incorporated into the Marine Institute's IODE accredited Data Management – Quality Management Framework (DM-QMF).

Sample storage

No biological samples are stored.

Nephrops burrow identification and counting is carried out according to internationally recognised protocols:
https://www.ices.dk/sites/pub/Publication%20Reports/Cooperative%20Research%20Report%20(CRR)/CRR340.pdf

https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/EOSG/2018/WKNEPS/WKNEPS%20report%202018.pdf

Data processing

Evaluation of data accuracy (bias and precision): N/Y
There is no procedure in place to estimate bias.
Precision of abundance estimates for the main target species are provided in Table 1 of the annual survey reports and are provided to the relevant stock assessment working group (ICES WGCSE and WGNEPS). The target level of precision (an overall coefficient of variance or standard error of less than 20%) is the international standard.

Editing and imputation methods: NA

Quality document associated to a dataset:
Procedure for producing the estimations of abundance for the target species is included in annual survey reports. No DOI is created.
Annual survey reports are available for each *Nephrops* FU:

FU 16: http://hdl.handle.net/10793/1655

FU 17: http://hdl.handle.net/10793/1656

FU19: http://hdl.handle.net/10793/1654

FU 20-21 combined: http://hdl.handle.net/10793/1657

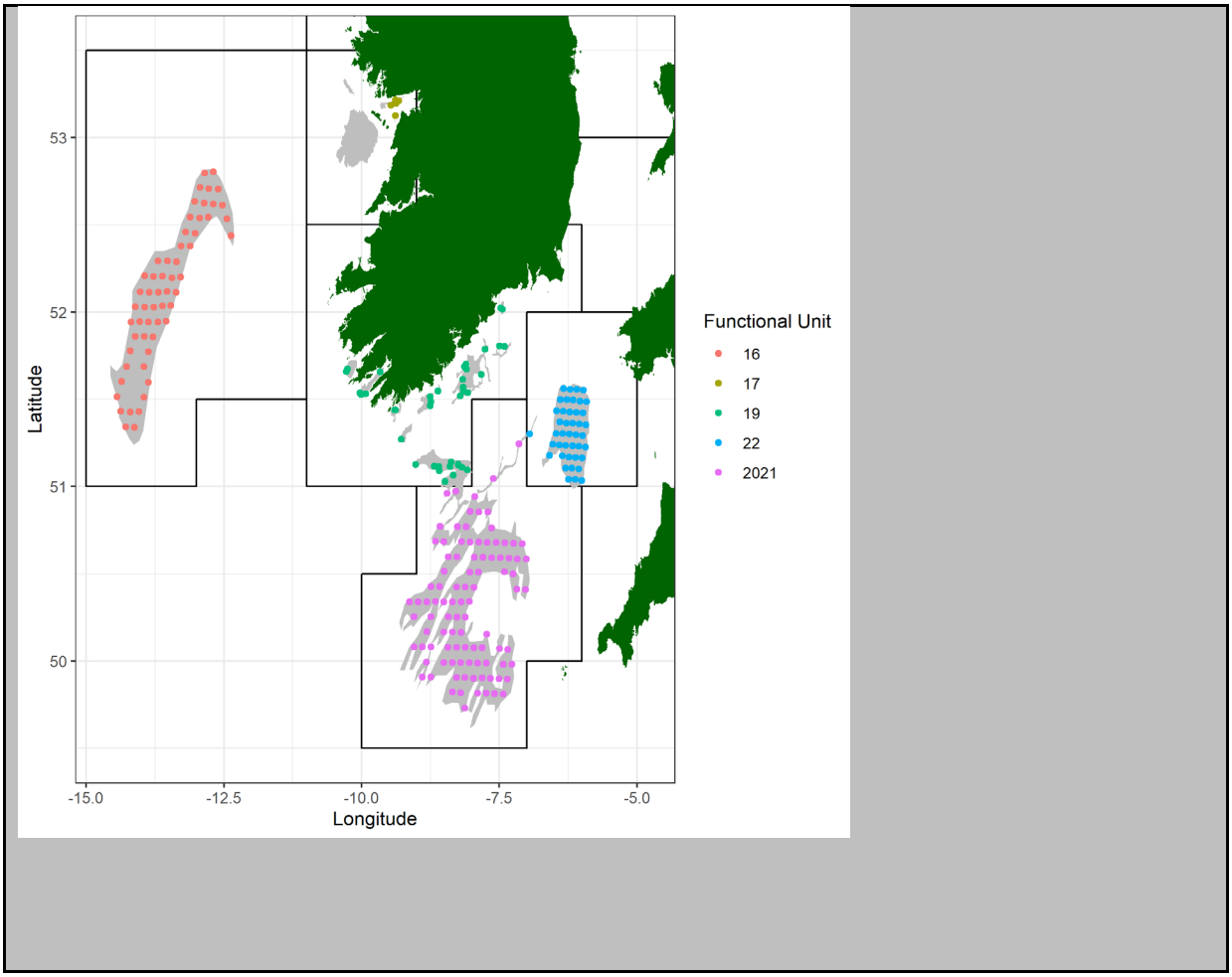
FU 22: http://hdl.handle.net/10793/1658

Validation of the final dataset:
Marine Institute *Nephrops* UWTV survey data and products are included in the Data Management Quality Management Framework (DM-QMF) by the (UNESCO) International Oceanographic Commissions (IODE) - International Oceanographic Data and Information Exchange programme framework since 2019.

AR comment: Indicate any deviations or developments. Do not change the text already adopted in the work plan.

Achieved sampling on Irelands *Nephrops* UWTV Surveys (UWTV16-17, UWTV19, UWTV20-22) are detailed in Table 2.6 and also in Text Box 2.6, below are survey maps illustrating achieved stations in 2022.

Figure 5. UWTV stations completed in 2022 by Functional Unit



MS: IRL
Region: North-East Atlantic
Sampling scheme identifier: CSHAS_IRL
Sampling scheme type: Research survey at sea
Observation type: SciObsAtSea (Scientific observer at sea on commercial or scientific vessels)
Time period of validity: 2004 to present
The primary aim of the CSHAS survey is to determine the age stratified abundance and distribution of herring (*Clupea harengus)* and sprat (*Sprattus sprattus*) using acoustic survey techniques. Biological data are collected by means of directed trawling on echotraces to determine species composition and biological characteristics of target species. Oceanographic data are collected using vertical profiles at pre-determined locations along the survey cruise track. Zooplankton sampling is conducted at hydrographic station and used to determine the dry weight biomass across the survey area. Visual abundance surveys for marine mammals and seabirds are conducted during daylight hours.
Description of the population
Population targeted: The main target species of the survey are herring (*Clupea harengus)* and sprat (*Sprattus sprattus*).

Population sampled: Target species are sampled on the spawning/pre-spawning grounds (herring) and feeding grounds (sprat).

Stratification: The geographical survey area is stratified based on two key criteria; acoustic sampling effort within the stratum and scaled historic abundance (core or peripheral stratum).

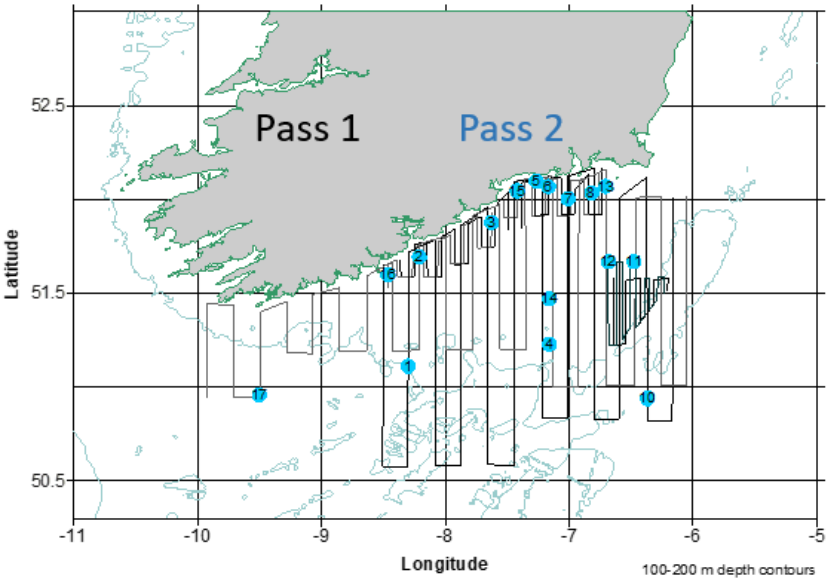


Figure 1. CSHAS_IRL Survey area stratification (Pass 1& Pass 2) and trawl stations (blue circles) 2021.

Sampling design and protocols

Sampling design description: PSU is measured in 1 nmi (nautical mile) EDSU (Elementary distance sampling units.

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

Regional coordination: CSHAS_IRL is coordinated through ICES WGIPS.

Link to sampling design documentation: The Manual for International Pelagic Surveys (IPS) describes the methods used for survey design, analysis and reporting of survey data (SISP #9) and is described in detail in the latest CSHAS survey report (http://hdl.handle.net/10793/1664).

Compliance with international recommendations: Y

Link to sampling protocol documentation: The Manual for International Pelagic Surveys (IPS) describes the methods used for survey design, analysis and reporting of survey data (SISP #9) and is described in detail in the latest CSHAS survey report (http://hdl.handle.net/10793/1664).

Compliance with international recommendations: Y

Sampling implementation

Recording of refusal rate: NA

Monitoring of sampling progress within the sampling year: NA (Annual survey)

Data capture
Means of data capture: Acoustic data are recorded via a Simrad EK60 scientific echosounder and processed using a proprietary software (Echoview V12). Biological data are collected and stored within a SQLite database and held nationally. Aggregated acoustic and biological data are uploaded to the open access ICES Trawl Acoustic repository post survey (https://www.ices.dk/data/data-portals/Pages/acoustic.aspx). **Data capture documentation:** The Manual for International Pelagic Surveys (IPS) describes the methods used for survey design, analysis and reporting of survey data (SISP #9) **Quality checks documentation:** Y (The Manual for International Pelagic Surveys (IPS) describes the methods used for survey design, analysis and reporting of survey data (SISP #9))

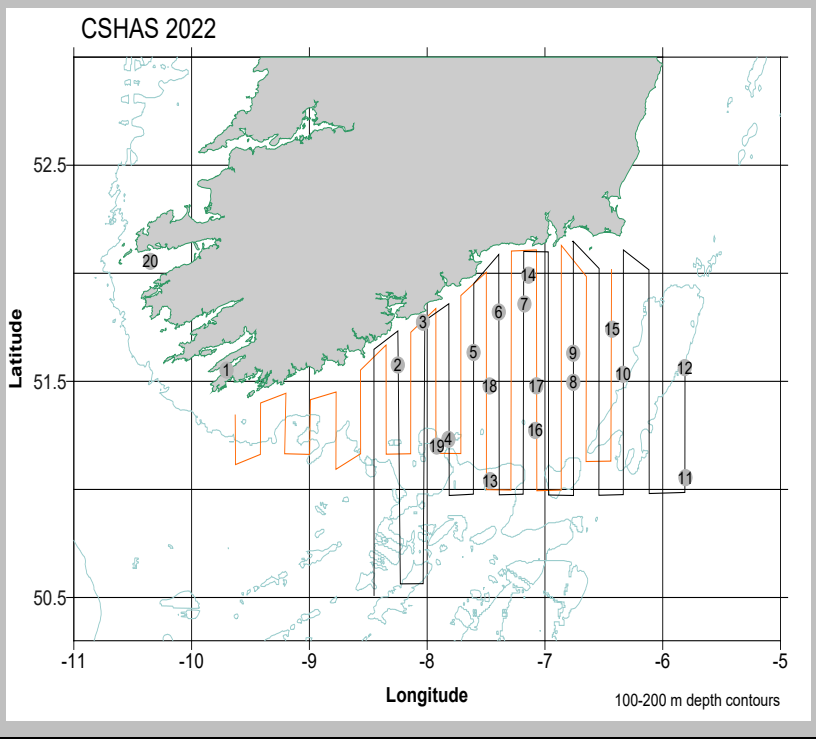
Data storage
National database: Acoustic data repository with data stored separately for each survey/year **International database:** ICES acoustic trawl survey database https://www.ices.dk/data/data-portals/Pages/acoustic.aspx **Quality checks and data validation documentation:** Data undergo checks and validation during submission to ICES. The ICES controlled vocabularies can be found at http://vocab.ices.dk/?theme=4 The data management of this data collection activity is incorporated into the Marine Institute's IODE accredited Data Management – Quality Management Framework (DM-QMF).
Sample storage
Biological samples (otoliths) are aged onboard the ship (herring & blue whiting) for species requiring additional processing prior to age reading (horse mackerel, boarfish & mackerel) samples are dry stored for transportation to the Marine Institute. Age reading is of CSHAS samples is carried out according to internationally recognised protocols: https://www.ices.dk/sites/pub/Publication%20Reports/Cooperative%20Research%20Report%20(CRR)/CRR%20346.pdf
Data processing
Evaluation of data accuracy (bias and precision): Acoustic biomass and abundance from survey data is calculated using the open-source software StoX (https://doi.org/10.1111/2041-210X.13250). Within StoX, the RStoX package has been developed to calculate the coefficient of variation (CV) of survey estimates. CV across the survey time series is described in the latest IBWSS survey report (http://hdl.handle.net/10793/1664). **Editing and imputation methods:** Y within the StoX analysis framework. Survey estimates are reviewed annually at the survey coordination group ICES WGIPS. **Quality document associated to a dataset:** The publishing of DOIs relating to survey data uploaded to the ICES data portal is under development and will be implemented as part of the Transparent Assessment Framework within ICES (http://ices.dk/marine-data/assessment-tools/Pages/transparent-assessment-framework.aspx)

Validation of the final dataset: Data upload to the ICES portal (https://www.ices.dk/data/data-portals/Pages/acoustic.aspx) is dependent on meeting defined metadata standards described in the vocabulary (http://vocab.ices.dk/?theme=4)

AR comment: Indicate any deviations or developments. Do not change the text already adopted in the work plan.

Achieved sampling on Irelands CSHAS is detailed in Table 2.6 and also in Text Box 2.6, below is a survey maps illustrating achieved acoustic track and fishing stations for 2022.

Figure 6. CSHAS Achieved Acoustic Track and Fishing Stations 2022



MS : IRL
Region: North-East Atlantic
Sampling scheme identifier: IAMS_IRL
Sampling scheme type: Research survey at sea
Observation type: SciObsAtSea (Scientific observer at sea on commercial or scientific vessels)
Time period of validity: 2016 onwards
The main objective of the IAMS_IRL sampling scheme is to obtain biomass and abundance indices for anglerfish (*Lophius piscatorius* and *L. budegassa*) and megrim (*Lepidorhombus whiffiagonis* and *L. boscii*) in areas 6a (south of 58°N) and 7 (west of 8°W). Secondary objectives are to collect data on the distribution, relative abundance and biology of other commercially exploited species. Occurrence of vulnerable or sentinel invertebrate species such as corals, sea pen, fan mussel and ocean quahog is also noted. Marine litter is also sorted and recorded. Oceanographic data are collected

from CTD instrument on trawl door and occasional surface to seabed CTD transects. Sediment grabs are carried out opportunistically using a Day grab.

Description of the population

Population targeted: Main target species are anglerfish (*Lophius piscatorius* and *L. budegassa*) and megrim (*Lepidorhombus whiffiagonis* and *L. boscii*).

Population sampled: Main target species are anglerfish (*Lophius piscatorius* and *L. budegassa*) and megrim (*Lepidorhombus whiffiagonis* and *L. boscii*). No sampling takes place outside the survey area or on grounds that are unsuitable for trawling.

Stratification: The stratification is based on the following considerations:

- Depth: 0-200m; 200-500m; and 500-1,000m
- Clearly defined fishing grounds were identified as separate strata; an area with high fishing intensity surrounded by low fishing intensity signify that the bottom type and ecology on the fishing ground is different from that of the surrounding area.
- Catch rates of the target species were also taken into account in determining the boundaries of the strata.
- Rocky bottom types are excluded from the survey area.
- Regions 6a and 7bcjk are treated separately because they comprise different assessment and TAC areas.

Sampling design and protocols

Sampling design description: Individual hauls are the PSU, these are selected from random locations inside each stratum. The catch is then processed according to the IBTS SISP 15 manual.

Is the sampling design compliant with the 4S principle?: NA (but note that the sampling scheme is statistically sound)

Regional coordination: IAMS_IE is informally coordinated with the Scottish Anglerfish and Megrim Survey (SIAMISS). The survey is also formally coordinated under WGBITS.

Link to sampling design documentation: IBTS SISP 15 manual: https://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%2015%20NeAtl%20IBTS%20Survey.pdf

Compliance with international recommendations: Y

Link to sampling protocol documentation: IBTS SISP 15 manual: https://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%2015%20NeAtl%20IBTS%20Survey.pdf

Compliance with international recommendations: Y

Sampling implementation

Recording of refusal rate: NA

Monitoring of sampling progress within the sampling year: NA (the survey only takes place once per year).

Data capture

Means of data capture:
The CEFAS software FSS (Fishing Survey System) is used to enter station data and import catch data. These data are stored in a SQL database (FSS_SURVEY) on a local server.

The gear sensor data as well as bottom depth and GPS position are also automatically recorded in a SQL database (FSS_NMEA) at intervals of approximately one per second.

Catch weights, length frequency distributions and biological data are captured using the EFDAQ (Electronic Fisheries Data Acquisition) system and stored in a local database in wet laboratory before being imported into the central SQL database (FSS_SURVEY).

Data capture documentation:
A new data capture system EFDAQ (Electronic Fisheries Data Acquisition) has been in use in the wet laboratory since 2021. This system was designed by SeaScope Fisheries Research for the Marine Institute and includes hardware such as electronic measuring boards and wands and software application to allow access, collection, visualization, quality assurance and editing of fisheries sample data. Identification and maturity staging are carried out using protocols as recommended by DATRAS and ICES working groups.

Quality checks documentation: Y
EFDAQ Catch Management (20 CatMan V1-7.pdf - not publicly available)
Quality control on sample data (e.g. individual lengths and weights, sample weights etc.) is carried out after every haul using EFDAQ application. Biological age samples such as otoliths are checked against individual fish size before boxes are stored for transport back to laboratory for analysis.

Data storage

National database: FSS (Fishing Survey System)

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

Quality checks and data validation documentation:
Once a survey is complete a number of data checks are carried out on haul positions, gear geometry, catch data and internal consistency of the data. During the upload process to DATRAS a similar range of checks are carried out (https://www.ices.dk/data/data-portals/Pages/DATRAS.aspx).

The data management of this data collection activity is incorporated into the Marine Institute's IODE accredited Data Management – Quality Management Framework (DM-QMF).

Sample storage

Samples for aging such as otoliths are stored clean and dry at room temperature before transport to Marine Institute laboratories for analysis. These age structures are generally stored at Marine Institute premises for a period of months before age reading is carried out. Soft tissues are generally collected by request from third parties such as universities and are stored according to protocols provided. Such samples are transported to third parties within weeks of survey completion.
Age reading is of IAMS samples is carried out according to internationally recognised protocols:
https://www.ices.dk/sites/pub/Publication%20Reports/Cooperative%20Research%20Report%20(CRR)/CRR%20346.pdf

Data processing

Evaluation of data accuracy (bias and precision): N/Y
There is no procedure in place to estimate bias.
Precision of abundance and biomass estimates for main target species are provided in Table 6 of the annual survey report: e.g. https://oar.marine.ie/handle/10793/1691 and are provided to the relevant stock assessment working group (WGBIE).

Editing and imputation methods: NA – no imputation takes place (with the exception of gear parameters that could not be observed – these are imputed using a model based on observed values).

Quality document associated to a dataset:
Procedure for producing the estimations of abundance and biomass for main species is included in annual survey report (https://oar.marine.ie/handle/10793/1691). No DOI is created.

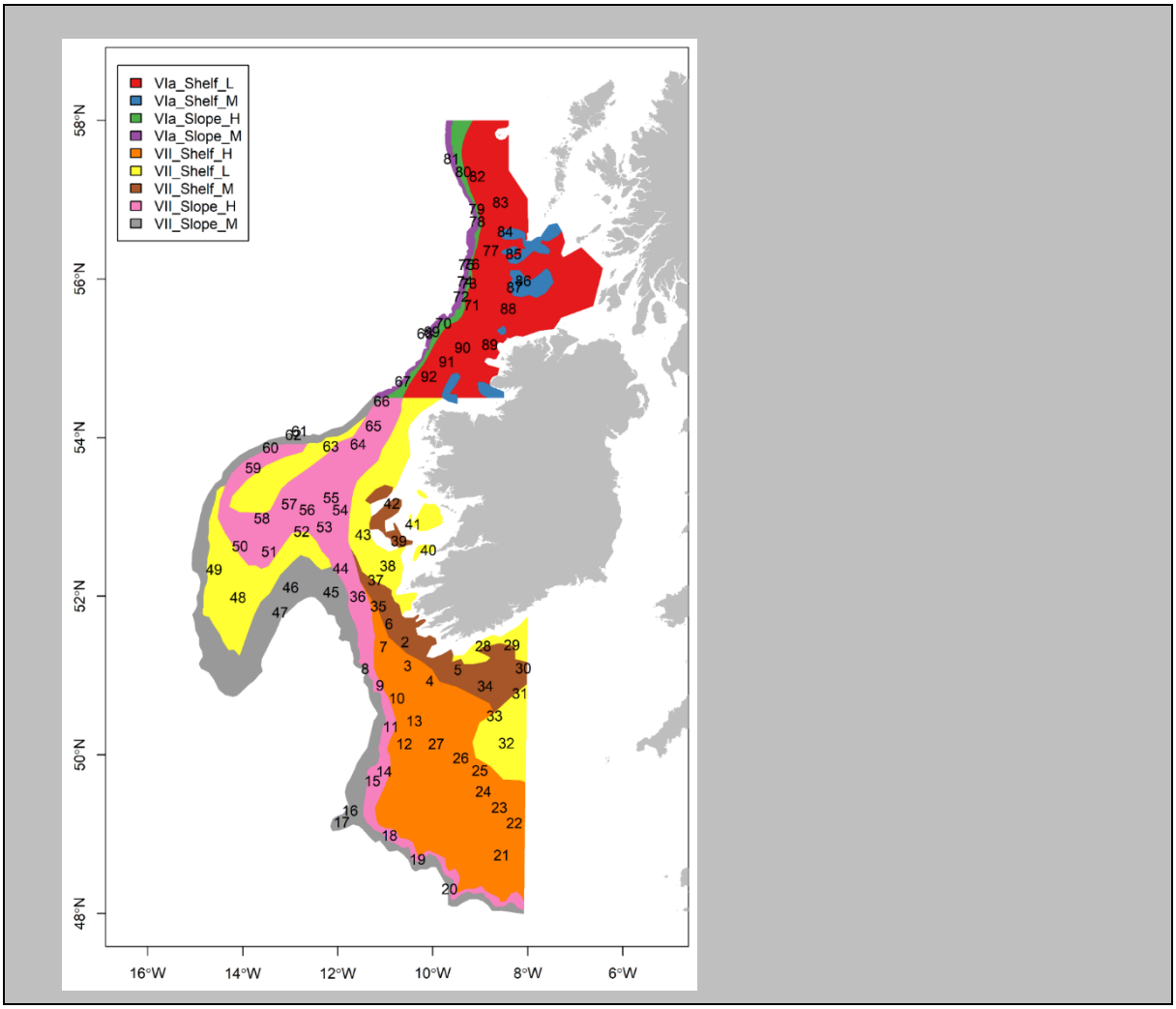
Validation of the final dataset: Datasets are validated prior to DATRAS upload. For more information see: https://datras.ices.dk/Data%20submission/Default.aspx

AR comment: Indicate any deviations or developments. Do not change the text already adopted in the work plan.

Details of achieved and under sampling on the IAMS Survey in 2022 are provided in both Table 2.6 and Text Box 2.6.

Below is a map of the achieved surveys stations from the IAMS in 2022.

Figure 7. IAMS Survey Map 2022 with achieved survey stations.



MS : IRL
Region : North-East Atlantic
Sampling scheme identifier : RCIS_IRL
Sampling scheme type: Research Survey at sea
Observation type: SciObsAtSea
Time period of validity : 2017 onwards
The main objective of the Razor Clam Irish Sea (RCIS_IRL) surveys is to estimate the biomass of razor clams and to provide advice for *Ensis siliqua* in Area 7a. Secondary objectives are to collect data on the distribution and abundance of other bivalve species caught as by-catch during the surveys.
Description of the population
Sampling design and protocols
Sampling design description: The PSU is dredge haul. The location of each dredge haul is selected randomly within four iVMS effort strata. Biomass of each dredge haul is estimated as the product of density and mean individual weight calculated from the size distribution at the station and a weight-length relationship. The following protocols are followed:

If total catch is of manageable size sort the catch completely. All bivalves are kept and sorted by species. Record weight and/or count of all Razor clams. Record the count of all other bivalves. If quantities of by-catch bivalves are too high subsample the catch by discarding a portion of the catch once all razors are removed (i.e. 1/2 or 1/3). Record the portion discarded and count all bivalves by species. If more subsampling is required because of high numbers of certain species record total weight of the sample and then the subsample weight and count of the bivalves in question. Measure all or a subsample of Razor clams (If only measuring a sub-sample of razor clams record a weight of the sub-sample).
If total catch/bulk is not of manageable size there are two options.
1) In order to adequately sample large grade razors which may be present in low numbers but which contribute a lot to overall weight of razors in the catch sort through the catch/bulk retaining all **large** commercial sized razor clams. Record the weight and /or number of these commercial razor clam and measure all or a subsample of them. If only measuring a subsample record the count of the full sample and the weight of the subsample. Level the remaining catch/bulk on the table and discard a portion of it (i.e. 1/2 or 1/3). Record proportion discarded. Sort through the remaining removing all bivalves. Record weight (or count if there are no scales on board) of all razor clams. Measure all/subsample of these razor clams. Record count of all other bivalves. If quantities of other bivalves are too high, subsample the catch again (i.e. 1/2 or 1/3). Record the proportion discarded and then sort the bivalves and count the number of each retained. If quantities of some by-caught bivalve species are still very high (i.e. *Pharus legumen* and *Acanthocardia sp*.), then sub-sample them by recording the weight of the sample and then record the weight and count of the subsample. Measure a sample/subsample of the other razor clam.
2) Where there is no evidence that large razors are present in low numbersLevel the catch/bulk on the table and discard a portion of it (i.e. 1/2). Record proportion discarded. Sort through the remaining keeping all bivalves. Record weight (or count if there are no scales on board) of all razor clams. Measure all large commercial size razor clams. Be sure to record grade on datasheet. Measure a sample/subsample of the other smaller razor clams. Be sure to record grade on datasheet. Record count of all other bivalves. If quantities of other bivalves are too high, subsample the catch again (i.e. 1/2 or 1/3). Record the proportion discarded and then sort the bivalves and count the number of each retained. If quantities of some by-caught bivalve species are still very high (i.e. *Pharus legumen* and *Acanthocardia sp*.), then sub-sample them by recording the weight of the full sample and then record the weight and count of the subsample.

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

Regional coordination: Sampling design and protocols were not developed as part of a regional or multi-lateral agreement.

Link to sampling design documentation: http://hdl.handle.net/10793/1688

Compliance with international recommendations: N
The survey is a stratified random sampling design. Fishing pressure, estimated from high frequency VMS data, is used to stratify the survey. Spatial autocorrelation is accounted for in the estimation using a geostatistical method developed in house. These methods are based on recent ICES and other training courses.

Link to sampling protocol documentation: http://hdl.handle.net/10793/1688

Sampling implementation
Recording of refusal rate: NA **Monitoring of sampling progress within the sampling year**: NA (surveys only take place once per year).
Data capture
Means of data capture: Razor clam lengths and weights are measured using measuring boards and scales and recorded on to hardcopy datasheets. The data is then entered in to excel spreadsheets and uploaded to an internal SQL shellfish database (FEAS_InshoreFisheries). **Data capture documentation**: Razor clams are measured to the nearest millimetre below. A total weight of all or a subsample of razor clams per dredge haul is recorded. An SOP for sampling razor clams is held in Paradigm 3 (a document management system) and are reviewed and updated regularly. **Quality checks documentation**: N Quality checks are carried out on the biological data recorded during the survey using an R script prior to assessment being undertaken.
Data storage
National database: FEAS_InshoreFisheries **International database**: NA **Quality checks and data validation documentation**: Once the data has been recorded and collated for assessment data checks are carried out on the haul positions and biological data using an R script prior to assessment being undertaken. The data management of this data collection activity is incorporated into the Marine Institute's IODE accredited Data Management – Quality Management Framework (DM-QMF).
Sample storage:
Storage description: Some samples of the target species are collected to enable individual length and weight measurements to be recorded. These samples are kept in water on board where possible and once measured ashore these samples are returned to water on board the vessel prior to being replaced on the razor beds being surveyed.
Data processing
Evaluation of data accuracy (bias and precision): N Surveys are stratified random design or on a systematic grid. Sampling efficiency (catchability of the hydraulic dredge sampling gear) is assumed to be 100%. There may be some underestimation bias if catchability is <1. Sampling procedures on board the survey vessel are either probabilistic random or census at a given station. Precision of biomass estimates is provided in the output of a geostatistical model. **Editing and imputation methods:** Y Where errors are identified then the preferred action is to correct the errors in the database – this might involve reference to the original datasheets if the error has occurred during transcription. **Quality document associated to a dataset**: N No DOI is currently created for the dataset, however the dataset can be requested.

Validation of the final dataset: Data checks are undertaken using an R-script prior to an assessment being run. If errors or anomalies are observed the data is either corrected by reference to the original datasheets (e.g. in the case of input error) or excluded from that particular use.

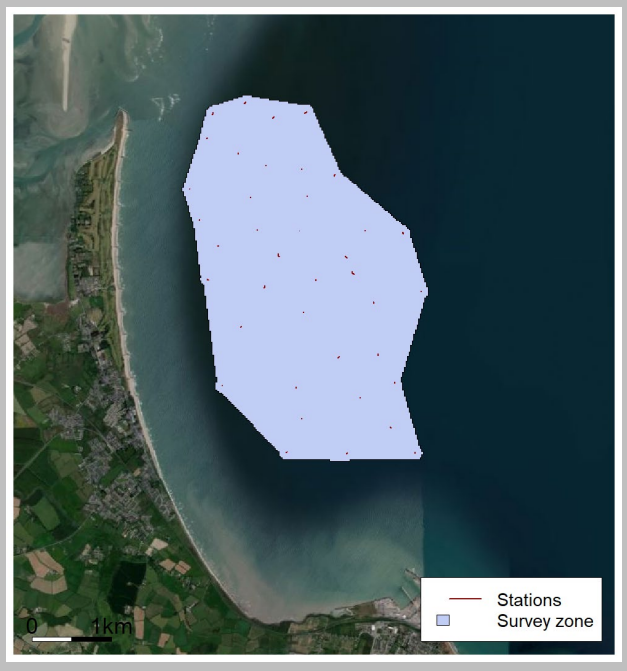
AR comment: Indicate any deviations or developments. Do not change the text already adopted in the work plan.

Details of achieved sampling on the Razor Clam Irish Sea Survey in 2022 are provided in both Table 2.6 and Text Box 2.6.

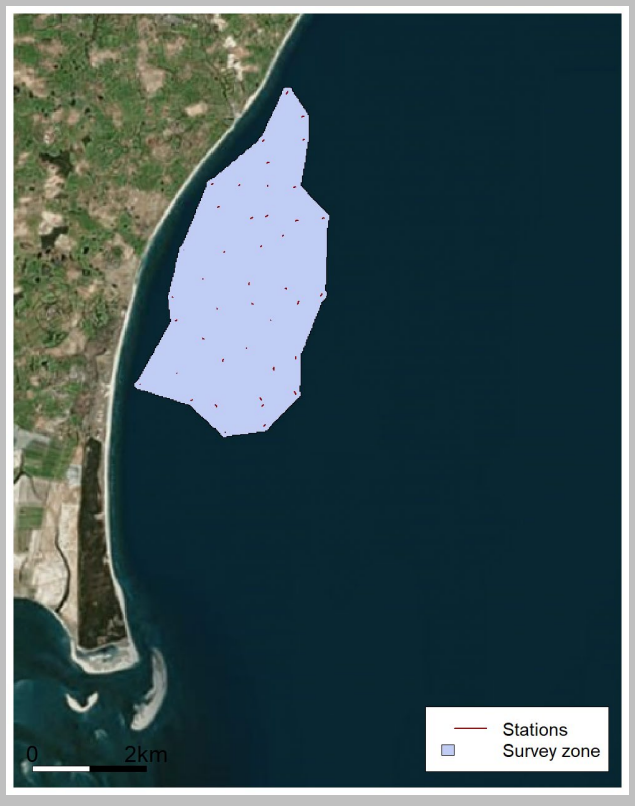
Below is a map of the achieved surveys stations from in 2022.

Figure 8. RCIS_IRL Survey Maps 2022 with achieved survey stations.

Dredge tracks undertaken in the North Irish Sea survey area.

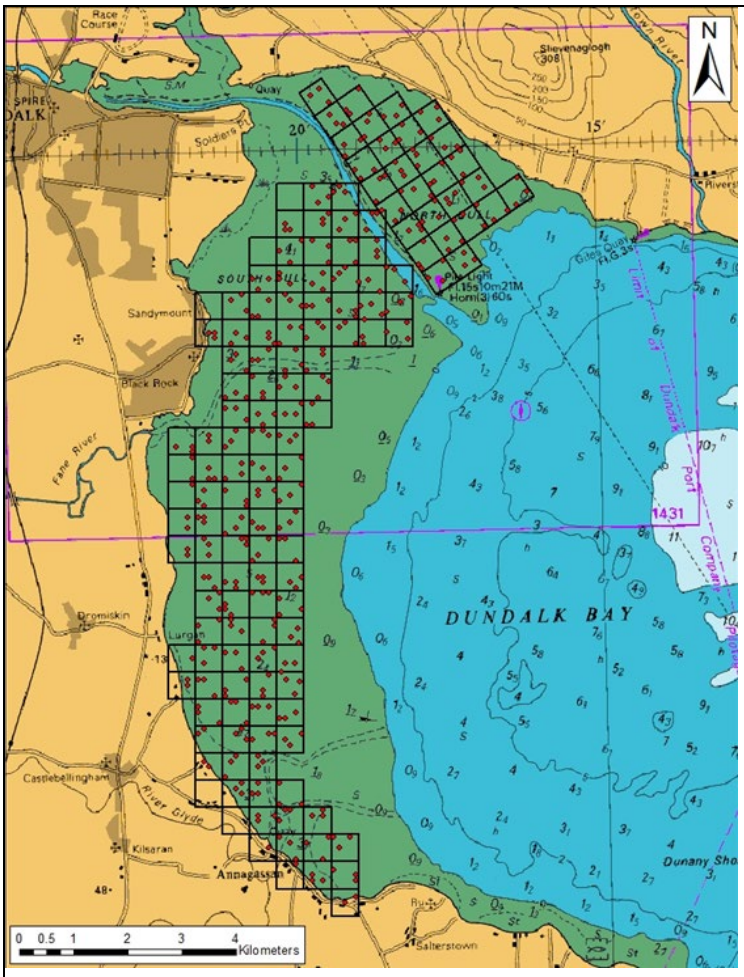


Dredge tracks undertaken in the Rosslare razor clam bed, South Irish Sea.



Dredge tracks undertaken in the Curracloe razor clam bed, South Irish Sea.

MS : IRL
Region : North-East Atlantic
Sampling scheme identifier : CNIS_IRL
Sampling scheme type: Research Survey at sea
Observation type: SciObsAtSea
Time period of validity : 2007 onwards
The main objective of the Cockle North Irish Sea (CNIS_IRL) surveys is to estimate the biomass of cockles and to provide advice for *Cerastoderma edule* in Area 7a. Secondary objectives are to collect data on the distribution and abundance of other bivalve species such as *Angulus tenuis and Macoma balthica* caught during the surveys, along with recording the depth of the redox potential discontinuity layer and abundance of *Arenicola marina* sand castings at each sampling station. These data also support Habitats Directive Article 6 assessments.
Description of the population
Population targeted: The main cockle (*Cerastoderma edule)* bed in Dundalk Bay. **Population sampled**: The target species is *Cerastoderma edule* in the intertidal zone of Dundalk Bay, Northwest Irish Sea. **Stratification**: A 500x500 m survey grid is mapped over the intertidal sand flat. Each grid cell is divided into 400 sub-cells of 25 m^2 in area and a quadrat (0.25 m^2) and raked sample (2 m^2) are collected from three randomly selected sub-cells. Since the survey began some more easterly grid cells were added to the northern survey area to ensure the eastern extent of the cockle bed was being surveyed.



Stratified random survey grid (500 x 500 m) for cockles in Dundalk Bay SAC/SPA, North Irish Sea.

Sampling design and protocols

Sampling design description: The PSU is the averaged area of a 0.25 m^2 quadrat and a 2 m^2 raked area. The location of each of the three sampling stations within each survey grid cell is selected randomly based on the 25 m^2 grid. Biomass of cockles at each sampling station is estimated as the product of density and mean individual weight calculated from the size distribution at the station and a weight-length relationship.

The sediment within each quadrat sample is dug out to a depth of approximately 30 cm and sieved through a 4 mm mesh. Rake samples were collected by raking over the 2 m^2 area to a depth of approximately 5 cm. Raking was included to increase the change of encountering larger cockles over 22 mm shell width (commercial size), which occur in lower abundance. All cockles are retained for size measurements. A sub-sample of the cockles retained are weighed and aged.

Numbers of cockles per sample are standarised to density per square meter. Densities at each station are averaged cross quadrat and rake samples prior to interpolation.

Counts of all *Angulus tenuis* and *Macoma balthica* are recorded from each sample along with a count of the *Arenicola marina* sand castings. The RPD layer depth is also measured where possible.

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

Regional coordination: Sampling design and protocols were not developed as part of a regional or multi-lateral agreement.

Link to sampling design documentation: http://hdl.handle.net/10793/1688

Compliance with international recommendations: N
The sampling design for this survey is based on 3 randomly selected stations per 500 x 500 m^2 which spans the extent of Dundalk Bay. A quadrat (0.25 m^2) and rake (2 m^2) sample are collected from each sampling location. The sediment within each quadrat sample is dug out to a depth of approximately 30 cm and sieved through a 4 mm mesh. Rake samples were collected by raking over the 2 m^2 area to a depth of approximately 5 cm. Raking was included to increase the change of encountering larger cockles over 22 mm shell width (commercial size), which occur in lower abundance. All cockles are retained for size measurements. A sub-sample of the cockles retained are weighed and aged. Numbers of cockles per sample are standarised to density per square meter. Densities at each station are averaged cross quadrat and rake samples prior to interpolation.

Link to sampling protocol documentation: http://hdl.handle.net/10793/1688

Sampling implementation

Recording of refusal rate: NA

Monitoring of sampling progress within the sampling year: NA (surveys only take place once per year).

Data capture

Means of data capture:
Cockle shell widths are measured using electronic callipers and individual weights are recorded using a precision scales (0.01g). All measurements and weights are recorded electronically in to an excel spreadsheet prior to being uploaded to an internal SQL shellfish database (FEAS_InshoreFisheries).

Data capture documentation:
Cockles are measured to the nearest millimetre below. Individual weights of cockles are recorded to 0.01 of a gram. An SOP for sampling (collecting, measuring, weighing and recording data) are held in Paradigm 3 (a document management system) and are reviewed and updated regularly.

Quality checks documentation: N
Quality checks are carried out on the biological data recorded during the survey using an R script prior to assessment being undertaken.

Data storage

National database: FEAS_InshoreFisheries

International database: NA

Quality checks and data validation documentation: Once the data has been recorded and collated for assessment data checks are carried out on the sample positions and biological data using an R script prior to assessment being undertaken.
The data management of this data collection activity is incorporated into the Marine Institute's IODE accredited Data Management – Quality Management Framework (DM-QMF).

Sample storage

Cockle samples are collected to enable individual shell width and weight measurements and age data to be recorded. These samples are kept in labelled zip lock bags and stored chilled in freezer boxes. Once measured these samples are returned to the sand flats.

Data processing

Evaluation of data accuracy (bias and precision): N
The survey is a stratified random design. Sampling efficiency at point survey stations is 100%; all cockles at the sampling point are detected counted and measured. Probability of false zero or undercounting bias is absent. Precision of biomass estimates is provided in the output of a geostatistical model.

Editing and imputation methods: Y
Where errors are identified then the preferred action is to correct the errors in the database – this might involve reference to the original datasheets if the error has occurred during transcription.

Quality document associated to a dataset: N
No DOI is currently created for the dataset, however the dataset can be requested.

Validation of the final dataset: Data checks are undertaken using an R-script prior to an assessment being run. If errors or anomalies are observed the data is either corrected by reference to the original datasheets (e.g. in the case of input error) or excluded from that particular use.

AR comment: Indicate any deviations or developments. Do not change the text already adopted in the work plan.

Details of achieved sampling on the Cockle North Irish Sea Survey in 2022 are provided in both Table 2.6 and Text Box 2.6.

Below is a map of the achieved survey stations from in 2022.

Figure 9. CNIS_IRL Survey Map 2022 with achieved survey stations.

MS: IRL
Region: North-East Atlantic
Sampling scheme identifier: OWI_IRL
Sampling scheme type: Research Survey at sea
Observation type: SciObsAtSea
Time period of validity: 2010 onwards
The main objective of the Oyster West Ireland (OWI_IRL) surveys is to estimate the biomass of the native oyster and to provide advice for *Ostrea edulis* in Area 7. And to estimate the density and biomass of both the native (*Ostrea* edulis) and pacific (*Magallana gigas*) species in Area 6.
Description of the population
Population targeted: The swept area of all dredge hauls for the main target species, *Ostrea edulis* in Area 7 and both *Ostrea edulis* and *Magallana gigas* in Area 6. **Population sampled**: The target species a is the native oyster, *Ostrea edulis* in Area 7 and *Ostrea edulis* and *Magallana gigas* in Area 6. **Stratification**: Sampling locations are chosen randomly within a survey grid for most of the oyster surveys. Grid cells can vary in size from 100 x 100 m to 250 x 250 m depending on the

extent of the oyster bed. A number of oyster beds occur as separate stocks in Bays around along the west and northwest coasts.

Sampling design and protocols

Sampling design description: The PSU is a dredge haul. Dredge designs vary locally, and these locally preferred designs are used in the surveys. The location of each dredge haul is selected randomly within a survey grid. Biomass is estimated using a geostatistical model accounting for the spatial autocorrelation in the survey data.

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

Regional coordination: Sampling design and protocols were not developed as part of a regional or multi-lateral agreement.

Link to sampling design documentation: http://hdl.handle.net/10793/1688

Compliance with international recommendations: N
Surveys are stratified random design or on a systematic grid. Sampling efficiency (catchability of the oyster dredge sampling gear) is assumed to be 32%. New estimates have recently been obtained by comparison with methods where catchability is known to be 1. Estimates are raised according to dredge efficiency. Sampling procedures on board the survey vessel are either probabilistic random or census at a given station.

Link to sampling protocol documentation: http://hdl.handle.net/10793/1688

Sampling implementation

Recording of refusal rate: NA

Monitoring of sampling progress within the sampling year: NA (surveys only take place once per year).

Data capture

Means of data capture: Oyster lengths are measured using callipers and total sample weights are achieved using marine compensated scales. Both are recorded on to hardcopy datasheets. The data is then entered in to excel spreadsheets and uploaded to an internal SQL shellfish database (FEAS_InshoreFisheries).

Data capture documentation: Oysters are measured to the nearest millimetre below. A total weight of all or a subsample of oysters per dredge haul is recorded.

Quality checks documentation: N
Quality checks are carried out on the biological data recorded during the survey using an R script prior to assessment being undertaken.

Data storage

National database: FEAS_InshoreFisheries

International database: NA

Quality checks and data validation documentation: Once the data has been recorded and collated for assessment data checks are carried out on the haul positions and biological data using an R script prior to assessment being undertaken.

The data management of this data collection activity is incorporated into the Marine Institute's IODE accredited Data Management – Quality Management Framework (DM-QMF).

Sample storage

Storage description: Some samples of the target species are collected to enable individual length and weight measurements to be recorded. These samples are kept in water on board where possible and once measured ashore these samples are returned to water on board the vessel prior to being replaced on the oyster beds.

Data processing

Evaluation of data accuracy (bias and precision): N
Sampling efficiency (catchability of the oyster dredge sampling gear) is assumed to be 32%. New estimates have recently been obtained by comparison with methods where catchability is known to be 1. Estimates are raised according to dredge efficiency. Sampling procedures on board the survey vessel are either probabilistic random or census at a given station. Precision of biomass estimates is provided in the output of a geostatistical model.

Editing and imputation methods: Y
Where errors are identified then the preferred action is to correct the errors in the database – this might involve reference to the original datasheets if the error has occurred during transcription.

Quality document associated to a dataset: N
No DOI is currently created for the dataset, however the dataset can be requested.

Validation of the final dataset: Data checks are undertaken using an R-script prior to an assessment being run. If errors or anomalies are observed the data is either corrected by reference to the original datasheets (e.g. in the case of input error) or excluded from that particular use.

AR comment: Indicate any deviations or developments. Do not change the text already adopted in the work plan.

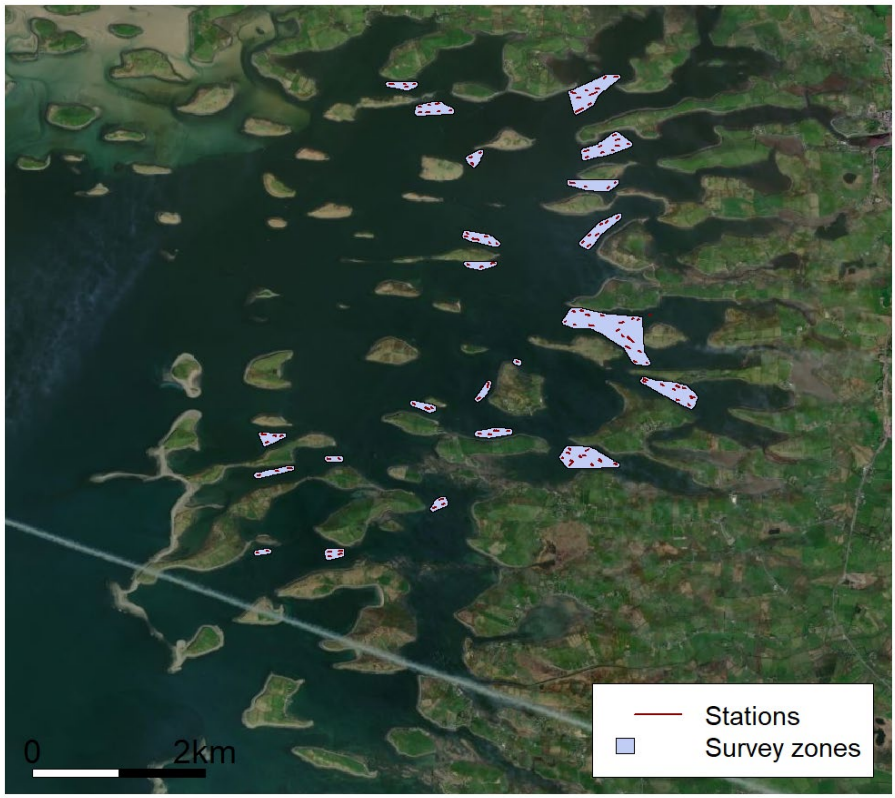
Details of achieved sampling on the Oyster Surveys West of Ireland in 2022 are provided in both Table 2.6 and Text Box 2.6.

Below is a map of the achieved surveys stations from in 2022.

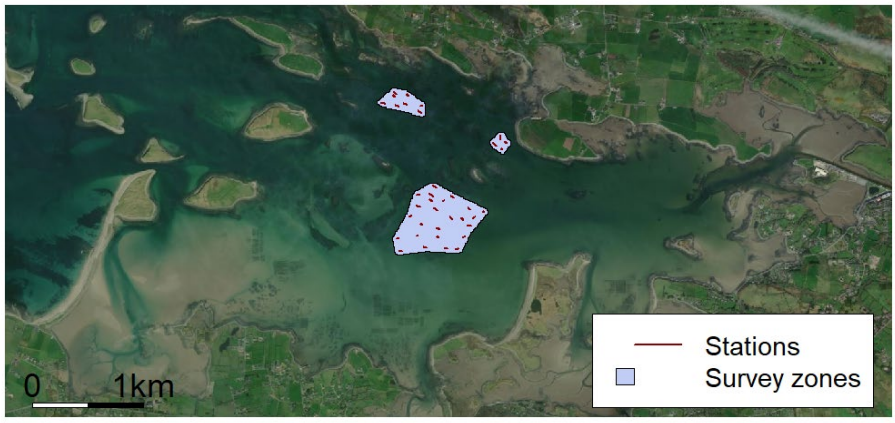
Figure 8. OWIS_IRL Survey Maps 2022 with achieved survey stations.

Dredge tracks undertaken in Lough Swilly.

Dredge tracks undertaken in Inner Tralee Bay (Fenit).



Dredge tracks undertaken in the North of Clew Bay.



Dredge tracks undertaken in the South of Clew Bay.

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. Do not delete any text from the template.

(Sampling scheme identifier: Please indicate and update the table of content)

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): Fisheries
Sampling scheme: Non-Probability Sample Survey
Variables: Consumption of fixed capital, Days at sea, Employment by age, Employment by employment status, Employment by gender, Employment by level of education, Employment by nationality, Energy consumption, Energy costs, FTEs by gender, Full-time equivalent (FTE), Gross debt, Gross value of landings, Income from leasing out quota or other fishing rights, Investments in tangible assets (net purchase of assets), Lease/rental payments for quota or other fishing rights, Mean age of vessels, Mean LOA of vessels, Number of fishing enterprises/units, Number of vessels, Operating subsidies, Other income, Other non-variable costs, Other variable costs, Paid labour, Personnel costs, Repair and maintenance costs, Subsidies on investments, Total hours worked per year (optional), Total value of assets, Total vessel power, Total vessel tonnage, Unpaid labour, Unpaid labour by gender, Value of physical capital, Value of quota and other fishing rights, Value of unpaid labour
Supra region(s): Baltic Sea; North Sea; Eastern Arctic; NAFO; extended North Western waters (ICES areas 5, 6 and 7) and extended South Western waters (ICES areas 10, 12 and 14)
Survey planning
1. The target population is the "commercial fishing fleet" as recorded in the EU Fleet Register on the last day of the reference year.

Fleet Segmentation: The segmentation of the fleet, will follow the guidelines in Table 8 of Commission Delegated Decision (EU) 2021/1167 and is used to stratify the collection of all, non-transversal, economic parameters.

The following data sources will be used to segment the fleet:

- EU Fleet Register on the 31st December for the reference year.
- EU log-book activity records for vessels active in the reference year (>10 meters);
- Sentinel Vessel Programme Effort Data
- Recorded fishing activity from previous economic surveys.

Individual vessels are assigned to fleet segments by overall length (LOA) class and the main fishing method engaged in by the vessel, in the previous calendar year. In cases where there is a risk of natural persons and/or legal entities being identified clustering may be applied to report economic variables in order to ensure statistical confidentiality. Such a clustering scheme shall be consistent over time.

The source of information used to distinguish the sampling frame from the target population, will be based on EU logbook data as follows:

- Active Vessels: For vessels greater than 10 meters in overall length, only those with at least one entry in the EU log-book, in the reference year, will be deemed active. This analysis will take place once the log-book data are available for a particular reference year, which is approximately 3 months after the end of the calendar year (March n-1);
- For vessels less than 10 meters in overall length, an estimate of inactivity will be conducted each year using all available sources, including: previous survey responses, the National Inshore Sentinel programme, sales notes data and the fleet register.

Required sampling intensities have been estimated using statistical analysis of the previous year's survey data. The analysis determines required sample size *n*, based on the mean of a finite population, to achieve a given level of precision (e.g., a CV of 25% on the sample mean).

Applying the function, we can see that for very low CV, all vessels need to be sampled and that the required sample number increases with the standard deviation of the segment. However, due to the finite population fuction you can never sample more than the full population (census). Some segment have a planned sample rate of 0% as the number of active vessel in the segment are very low (n=<5).

Survey design and strategy

The data sources used to collect economic and social data from fleet segments are:

- Sales notes data for landing income for vessels under 10m.
- Logbook data for effort and landing income for vessels over 10m.
- Voluntary questionnaire information returned by vessel owners targeted in the annual economic survey for all economic and social variables.

- Face-to-face/phone interviews with vessel owners to clarify any issues arising with economic and social variables from questionnaire.
- Mandatory economic and social questionnaire information returned by vessel owners applying for EU/National grant aid,
- Data from vessel owners from a national Sentinel Vessel Programme (to collect both transversal and non-transversal economic and social data from vessels in the small scale fisheries where log-book declarations are not mandatory). See next Annex for details.

The population shall be all active and inactive vessels registered in the Union Fishing Fleet Register as defined in Commission Regulation (EC) No 26/2004 (2) on 31 December of the reporting year and vessels that do not appear on the Register at that date but have fished at least one day during the reporting year.

The data sources for the national implementation for the fleet target population are:

- EU Fleet register;
- EU Log-book data.

Estimation design

Recognising the implications and influences imposed by the voluntary nature of the annual survey on the probability sample survey design standard appropriate raising techniques will be used, to derive final estimates for each variable collected. This methodology was reviewed in 2018, which resulted in a report to assess and improve the raising estimations. Various methods of raising are possible and this report set to establish a theoretical and empirical basis for the decision as to how best to raise sampled economic data to the fleet level.

The mean squared error (MSE) encapsulates the bias and variance of an estimator. The MSE was used as the basis for comparing raising performance. We first derive theoretical expectations on which raising method would work best when there is or is not a relationship with fishing effort. Raising methods were then tested on the real data via re-sampling and appraisal of the ability of various raising methods to recover the true sum. A suite of specifically developed visualisation code assists in appraising the distribution of the data, in particular with identifying outlying values that can overly influence the raised sum.

From the theoretical analyses there were two major conclusions for raising sample data:

1. Where a variable is independent of effort it is best to raise the average to the segment level as the inclusion of unrelated effort adds additional variance to the estimator.

2. Where a variable is proportional to effort, raising based on effort will provide a better estimator as long as the residual variance of the relationship between the economic variable and effort is comparatively small and the strength of the proportionality constant comparatively

large. In other words, if there is a strong relationship with effort, raise by effort, if not raise by the average A 'strong' relationship is defined as having less bias associated with raised estimating using this theory.

A harmonised FTE will be estimated for each of the fleet segments. For vessels >10 meters in length (LOA), operational data from log-book submissions will be used in the estimation of fishing time on a trip-by-trip basis. In addition, there are several questions on the annual economic survey forms that deal specifically with hours worked and the nature of the engagement (full-time, part-time, casual). Questions regarding gender breakdown and age profiles, education and nationality have been added to the annual survey.

Error checks

The issue of consistency of data coming from different data sources is recognized as being of significant importance. The introduction of bias in this area, is under continual assessment and is currently being addressed by restricting acceptance of data to a small number of official data streams (i.e. data items consistent with fields in annual company returns (provided via accountants), EU logbook data and Sales notes data).

Although error associated with bias and variability will effectively be introduced if observed returns do not match those expected, these descriptors will be reported where possible and with appropriate caveats.

Data storage and documentation

The data from the electronic forms are stored as .xml files and imported into a database. Data received through postal surveys, or phone surveys are entered into the electronic forms and submitted as .xml files to the same database. The data is stored on a secure server which is only accessible by EU MAP staff.

Published documentation of methodology of all EUMAP data-collection is found at:

https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/DCF_Methodology_Economic_IRL_2020.pdf

The MS wants to move away a paper-based system with manual data entry towards an online data entry system where data is stored in a database as there are still some paper based surveys circulated to the industry. The first phase of development in late 2021 will be for the fisheries industry whereby survey forms will be available online and these will connect with a database back end. This will enable the digital capturing, storing and reporting of data. The EU - MAP system will facilitate the entry of data through an online web portal and through a data entry and integration layer which will allow for access to data in current and future systems. The EU - MAP system will include the development of a scalable database storage and support

reporting through a BI module. The main objective of this system to support the mandatory EU - MAP reporting.

Revision

Segmentations are review annually to ensure that they are maintain confidentiality. The current national work programme is moving to an on-line platform for collecting all EU MAP data. This will be operational in 2022.

Confidentiality

The frame population are made aware of BIM's privacy policy and data protection policies and procedures.

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

There is a Data Sharing Agreement between the two main agencies carrying out the DCF work, the Marine Institute and Bord Iascaigh Mhara (BIM).

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

Data protocols to enforce confidentiality are followed strictly. In cases where there is a risk of natural persons and/or legal entities being identified clustering is applied to report economic variables to ensure statistical confidentiality. For internal business units and some closely related agencies, formal data-sharing agreements between the data controller and data processor must be in place before an appropriate level of data-sharing can be permitted.

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

NA

AR comment: Indicate any deviations or developments. Do not change the text already adopted in the work plan.

Developments to improve the data quality:

As of 2022, the Member State has provided an option for online submission of economic surveys through an online EU MAP survey portal. Paper-based surveys are offered as an alternative to those with low IT literacy skills to ensure the highest response rates.

The methodology of FTE estimation was revised and improved. While previously a self-reported indicator of full-time, part-time, or casual status was used to calculate FTE; average daily hours-worked and total annual sea days, are now used to estimate an FTE. The method for FTE calculation was changed due to greater availability of quality data on hours worked. This method allows for a

more accurate calculation of FTE. The deviation taken was considered to be a methodological improvement.

The MS has updated their EU MAP data collection methodology document for fisheries and aquaculture to reflect recent changes in legislation and the introduction of the new web portal developed to accommodate submission of surveys online for the fishing fleet:

EU MAP: Data Collection Framework Methodology for Fisheries & Aquaculture Socio-Economic Data

Survey Specifications
Sector name refers to socio economic data on fisheries, aquaculture and any complementary data collection of fishing activity and processing as given in the EU MAP Delegated Decision annex. *Sampling scheme refers to survey technique: by census, by sampling, random or non-random, other (with explanation). If sampling then outline sampling design.* *Variables refer to Tables 7, 9 and 10 of the EU MAP Delegated Decision annex. Supra region refers to Table 2 of the EU MAP Implementing Decision annex. If the sampling scheme is the same in all supra regions put 'All Supra regions'.*
Sector name(s): Fisheries – Sentinel Vessel Programme
Sampling scheme: Non-Probability Sample Survey
Variables: • Days at sea • Fishing days • Live Weight of landings total and per species (to augment data from Sales Notes) • Average prices per species (to augment data from Sales Notes)
Supra region(s): Baltic Sea; North Sea; Eastern Arctic; NAFO; extended North Western waters (ICES areas 5, 6 and 7) and extended South Western waters (ICES areas 10, 12 and 14)
Survey planning
The Member State will continue to collect transversal data, on a daily basis, from vessels < 12 meters in length (LOA) in a national, Sentinel Vessel Programme (SVP). This is justified on the basis that it is not currently possible to define quantitative targets for a sampling programme for transversal parameters within metiers containing an inshore component; specifically for vessels <10 metres LOA and where official declarations of their landings are not required. In accordance with Article 11(4) of Council Regulation (EC) No 199/2008 – defining the eligibility of self-sampling aboard Community fishing vessels – vessel owners participating in the sentinel

programme will record their daily landings, effort and price data in a 'sentinel record book', specifically designed to capture these data, for a full calendar year.

Additionally, and to enhance the cost-effectiveness of this programme;

- Non-transversal economic parameter will also be collected, again on a daily basis, by vessels < 12 meters (LOA) participating in the sentinel programme, these are included in Table 5.2;
- Non-operational economic parameters will also be collected at the end of the reference year. These data will be collected using a survey and an exit interview from the sentinel programme;
- Biological (length composition) and discard information will be collected on a weekly basis by vessels participating in the sentinel programme to complement the data on biological variables in these metiers.
- Daily landings and price figures are collected

Survey design and strategy

The sample population for the sentinel programme is designed to represent the diverse inshore fisheries sector in Ireland. Specific fisheries are targeted that represent gear usage, target species, and geographical location. The list of participants is reviewed annually to ensure that it remains representative of the small scale fisheries.

Logbooks are provided to participants every January. The logbooks record, vessel details and economic data annually. Daily logbook entries record target species, effort, landings, and economic data (fish prices, fuel prices). Weekly logbook entries record biological data of the catches. Logbooks are collected at the end of the year and data is entered and checked.

Those vessels accepted into the sentinel programme are remunerated to the amount of €1000 per vessel per annum. Remuneration is based on an average of 180 days at sea per year, and an estimated 30 - 40 minutes to record the data in the supplied sentinel record book. When the additional time commitment required from each participating vessel owner for direct contact with survey personnel, to complete the exit interview required at the end of the data collection period and to provide non-operation data are included, the total commitment amounts to 115 hours per year. Using the national minimum wage in Ireland (currently €8.65 per hour for adults over the age of 18) the total annual cost of 115 hours at €8.65 per hour is €1,000. This remuneration is deemed the minimum necessary to attract eligible fishermen into the programme and to ensure accurate and reliable data are recorded.

Estimation design

Operational data from log-book submissions will be used in the estimation of fishing time on a trip-by-trip basis to estimate Days at sea and Fishing days.

Error checks

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

The data collected under the SVP are entered by MI analysts. Data entry checks and validation occurs at data entry and the data are visually checked for outliers. Each book is validated by a second person

Data storage and documentation

Describe how the data is stored.

Provide link to webpage where additional methodological documentation can be found, if any.

SVP books are distributed to personnel in the regional laboratories and headquarters where they are held in locked cupboards. After three years they are archived offsite in secure storage areas.

The SVP books are transcribed into Excel Spreadsheets before being uploaded into a central SQL Server Inshore Fisheries database. The data is subject to a series of integrity checks during upload – any errors are flagged to the user. If errors do occur the user must resolve them before re-uploading the spreadsheet.

The Excel spreadsheets are stored within a structured network folder system, which reside on a secure a Microsoft Windows Network maintained by the IT Operations Department within the Marine Institute. The SQL Server Inshore Fisheries database containing the uploaded SVP data resides on a Marine Institute secure production centralised server. Access to the network folders system and/or database is controlled by membership to a specific Windows Work Group that is maintained by IT Operations. If a new member of staff requires access to the network folder system containing the SVP Excel Spreadsheets or the database, an approval progress is place, which determines whether the member of staff should be granted access. If/when a member a staff member leaves the Marine Institute access to the specific windows group is revoked by IT Operations

A new graphical user interface is currently in development which will allow SVP data to be entered directly into the SQL Server Inshore Fisheries Database. Access to the new interface is controlled by the same Windows Group Membership required for the database.

Revision

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

Segmentations are review annually to ensure that they are maintain confidentiality.

Confidentiality

Are procedures for confidential data handling in place and documented?

Yes, access to the physical SVP logbooks, the transcribed spreadsheets, and the database is controlled via a defined procedure.

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

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

Are there any issues with publication of data due to confidentiality reasons? Provide an explanation.
AR comment: Indicate any deviations or developments. Do not change the text already adopted in the work plan. No deviations to the work plan

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: • Fish feed used • Full-time equivalent (FTE) • Gross sales per species • Livestock used • Number of enterprises by size category • Operating subsidies • Paid labour • Raw material: feed costs • Raw material: livestock costs • Subsidies on investments • Weight of sales per species • Employment by employment status • Employment by gender • FTEs by gender
Supra region(s): Baltic Sea; North Sea; Eastern Arctic; NAFO; extended North Western waters (ICES areas 5, 6 and 7) and extended South Western waters (ICES areas 10, 12 and 14)
Survey planning
Provide a short description of the population the sampling scheme applies to; e.g. '*less active vessels using passive gears*'.

The population covered by this census survey are all licenced businesses and their production units, known to be producing or endeavouring to produce products by aquaculture and who employ themselves and/or staff to do so. In 2021 these totalled 266 businesses, operating 309 production units and are made up predominantly of farmed salmon, oyster and mussel segments, located along the coast, mostly the west coast, with a small number of land-based finfish units inland. The marine units are mostly inshore, using on-bottom, off-bottom or suspended cultures while penned salmon culture occurs in more exposed locations. All production meets certification standards, with little, or no, medicine or other chemical input. Finfish is dominated by salmon production while shellfish output is almost entirely consisting of bivalve molluscs. The majority of enterprises are micro-businesses.

No thresholds are applied.

Survey design and strategy

Companies are contacted using an annual survey which is circulated to all aquaculture units early in the year (Census). Subsidy data is obtained from national grants annual reports which record all units in receipt of EU/State investment. The survey is released on the Irish Seafood Developments Agency's (BIM) website and all producers are invited to complete the survey through a Customer Relationship Management (CRM) system to participate in the survey. The same survey can also be distributed by email, post or conducted by phone if preferred. Non-respondents are pursued by a combination of all these methods in particular by phone. Data from other sister agencies such as the SFPA and MI and from online abridged accounts are used to validate, cross-reference or to cover certain data shortfalls. Bottom mussel wild seed input, Oyster seed purchases, total employment, production capacity and certain operational costs data can be sourced from these alternative datasets

Seed mussel fishing is monitored in real-time by the naval service VMS system, allowing the accurate recording of mussel seed volume captured. The Seafood Protection Agency (SFPA) have direct access to this data and provide it to BIM in aggregate form. The Marine Institute (MI) are responsible for permitting translocation and import of mussel seed and accordingly collect data on the intended inputs by industry. The Department of Agriculture, Forestry and The Marine (DAFM) are the ultimate source of licenced capacity data as the regulating body, though this is also collected directly by EUMAP survey in order to ascertain intensity of capacity use.

Online abridged accounts provide a regular alternative source of data for 'total employment', 'labour costs' and 'turnover' and intermittently for 'energy costs', 'repairs and maintenance' and other operational costs'

Estimation design

Describe method of calculating population estimate from sample.

Describe method of calculating derived data: e.g. imputed values.

Describe treatment of nonresponse.

The response rate from the census survey, on average, is 78-82%.

Non-respondent performance can be estimated by a combination of methods. The Irish Seafood Development Agency's (BIM) regional aquaculture staff can estimate production from frequent site visits to the businesses in question. The Government Department responsible for aquaculture

licensing can provide area data which in turn indicates production capacity while the unit sales value of adjacent compliant producers of the same product can be used for estimation purposes. Historical averages, if available, together with capacity data can also be used for this kind of imputation. Sister agencies supply aggregated data that may be used in place of in-house estimates if deemed to be of better quality. Finally, the most recent historical data received can be used in the case of enterprises known by local officers to have steady outputs, with their endorsement. Imputed data is obtained for some social variables. This is done using the empirical value of employment status given for some companies with more than one production unit and culture. The turnover per production unit is known. The turnover contribution per single FTE for the business as a whole is calculated and the empirical breakdown used to estimate employment status per production unit.

Non-Respondents are given repeated reminders to participate in the annual survey and will receive up to three phone calls until a date at the end of March when preparations to report on the annual survey must begin.

Error checks

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

Double counting can occur within multi-production units of the salmon and oyster segments, especially if a given unit engages in just part of the production cycle. An on-growing unit may send its product to an in-house finishing unit, in the case of oyster production or to a harvesting station in the case of salmon production. Specific turnovers may be generated at each stage, but the volume could be counted twice. Close engagement with the producer reduces, if not eliminates this issue.

Phone surveys are a great source of quality data, but incorrect figures may be given or accurate data mis-recorded. Errors of decimal placing, or poor hand-writing can result in false data spikes after uploading. These become apparent in graphics set up specifically to find these outliers in the database and the cause of the spike can be investigated back to the data supplier if necessary. The survey questionnaire form is an electronic form, and this reduced errors and as such is advocated as the most accurate way to receive data over postal surveys. The formatting of these electronic forms are set to avoid ambiguous entries.

Data storage and documentation

Describe how the data is stored.

Provide link to webpage where additional methodological documentation can be found, if any.

The data from the electronic forms are stored as .xml files and imported into a database. Data received through postal surveys, or phone surveys are entered into the electronic forms and submitted as .xml files to the same database. The data is stored on a secure server which is only accessible by EU MAP staff.

Published documentation of methodology of all EUMAP data-collection is found at:

https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/DCF_Methodology_Economic_IRL_2020.pdf

Aquaculture methodology is described from page 11.

Revision

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

This is done annually or as the need arises. The smaller segments require close attention as these may have to be amalgamated with others if numbers within a segment are in decline. There may also be new growth segments that need to be accounted for in the sampling design and or segment aggregations. For example, seaweed segmentation is under continuing review due to segment growth predictions.

Confidentiality

Are procedures for confidential data handling in place and documented?

The frame population are made aware of BIM's privacy policy and data protection policies and procedures.

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

There is a Data Sharing Agreement between the two main agencies carrying out the DCF work, the Marine Institute and Bord Iascaigh Mhara (BIM).

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

Data protocols to enforce confidentiality are followed strictly. In cases where there is a risk of natural persons and/or legal entities being identified clustering is applied to report economic variables to ensure statistical confidentiality. For internal business units and some closely related agencies, formal data-sharing agreements between the data controller and data processor must be in place before an appropriate level of data-sharing can be permitted.

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

Production of data from the salmon on-growing segment causes some unease due to the small number of operators involved and the fact that one very much dominates the segment. There is close engagement between BIM, as the data controller, and the concerned parties to alleviate this.

AR comment: Indicate any deviations or developments. Do not change the text already adopted in the work plan.

The MS has updated their EU MAP data collection methodology document for fisheries and aquaculture to reflect recent changes in legislation:

EU MAP: Data Collection Framework Methodology for Fisheries & Aquaculture Socio-Economic Data

Survey Specifications

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

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

Variables refer to Tables 7, 9 and 10 of the EU MAP Delegated Decision annex. Supra region refers to Table 2 of the EU MAP Implementing Decision annex. If the sampling scheme is the same in all supra regions put 'All Supra regions'.

Sector name(s): Aquaculture

Sampling scheme: NPS

Variables:

Consumption of fixed capital

Energy costs

Financial expenditures

Financial income

Number of hours worked by employees and unpaid workers (optional)

Other income

Other operating costs

Personnel costs

Repair and maintenance costs

Unpaid labour

Value of unpaid labour

Employment by age

Employment by level of education

Employment by nationality

Unpaid labour by gender

Gross debt

Investments in tangible assets (net purchase of assets)

Total value of assets

Supra region(s): All

Survey planning

Provide a short description of the population the sampling scheme applies to; e.g. '*less active vessels using passive gears*'.

The population covered by this NPS Sample survey are of all licenced businesses and their production units, known to be producing or endeavouring to produce products by aquaculture and who employ themselves and / or staff to do so. A total of 266 businesses, operating 309 production units in 2020 are made up predominantly of Farmed Salmon, oyster and mussel segments. The majority of these are located along the west coast with a small number of land-based finfish units inland. The marine units are mostly inshore, using on-bottom, off bottom or suspended cultures while penned salmon culture occurs in more exposed locations. All production is to certified standards, with little or no medicine or other chemical input. Finfish is dominated by salmon production while shellfish output is almost entirely of bivalve molluscs. The majority of enterprises are micro-businesses. The population is covered every 4-5 years by the sample questionnaire which pursues a rotating 25% profile of the population. The online survey, covering up to 33% of the population annually, includes annually sampled, indicator companies, maintained for their pivotal role within their segments.

Survey design and strategy

List data sources; e.g. interviews, registers, log books, sales notes, VMS, financial accounts etc.

Describe how the sample sizes were determined.

Describe survey methods and distribution; e.g. questionnaire forms by post, by email, on website, by phone etc. access to other datasets etc.

Describe the role of auxiliary information, if any, in the strategy: e.g. for validation, cross referencing, fall back data source etc.

There are two main data sources for the variables listed above; the producers themselves, via annual sample questionnaire and abridged financial accounts of the year n-1 that become accessible through specialist websites.

Sampling for these variables was decided over inclusion of them in the established census survey, to reduce the additional burden imposed on clients and to protect the developing quality of census returns.

A rotating sample was chosen over a random survey due to the level of variation in terms of both population and statistical unit size within and between segments to maintain balanced sampling in this way. A sample size of 25% of the overall sector population was chosen as big enough to provide a 20% response, a viable annual sample size of the aquaculture population generally, notwithstanding the variation in segment population sizes. By this sample size, clients would be approached only once every 4 years for the more sensitive data.

The 25% sample groups were created from the time of the first upload of 2008 data. The population was ordered by decreasing turnover size at that time and assigned a number 1-4 in repeating sequence

down this decreasing turnover column. Thus 4 profile sampling groups were created and have been maintained since.

The questionnaire is activated on the BIM website and all producers within the appropriate 25% are invited through the Customer Relationship Management (CRM) system to participate. The same questionnaire can be distributed by email or post and surveys can be conducted by phone if preferred. Non-respondents are pursued by a combination of all these, particularly by phone. Data from online abridged accounts and from in-house datasets are used to validate, cross-reference or to cover certain data shortfalls from the sample questionnaire.

Estimation design

Describe method of calculating population estimate from sample.

Describe method of calculating derived data: e.g., imputed values.

Describe treatment of nonresponse.

National turnover is used to assign a percentage value to the turnover reported or estimated for each Production Unit (PU). This proportion is then used to assign the same proportional value to costs and financial data obtained for each PU. For each such variable therefore, each sample return value also has a value proportional to the national value for that variable. The sum of the sample value for each variable is divided by the sum of assigned proportional values of each PU responding, then multiplied by 100 to raise the sample value to a population estimate for that variable.

(Variable Sample sum / sum of % s of national turnover of each responding PU turnover) * 100)

A disadvantage of this methodology is that, for very small samples obtained for a given variable, the figure calculated is likely to be an over or under-estimate, due to varying segment statistical unit size. Estimation procedures are periodically reviewed.

Variables derived are: ‘Imputed value of unpaid labour’,’ certain social variables and for finfish ‘Mortality’.

Method for calculating ‘FTE’:

Full Time: >30 Hrs/week or > 40 weeks

Part Time: 10-30 Hrs /week or 13-39 weeks * 40 Hrs

Casual: > 10 Hrs /week or < 13 weeks * 40 Hrs

‘Imputed value of unpaid labour’:

This is estimated for each sampled business, then for each segment sample, then estimated for the national segment.

Minimum expected value for ‘wages and salaries’ for the segment is calculated by:

Segment FTE * national minimum wage

Actual ‘wages and salaries’ value for the segment is obtained by survey.

The two values are compared

If 'Actual value' >= minimum expected, then no unpaid labour value

If 'Actual value' < minimum expected, then the difference = 'imputed value of unpaid labour'.

Imputed data is obtained for some other social variables. This is done using the empirical value of employment status given for some companies with more than one production unit and culture. The turnover per production unit is known. The turnover contribution per single FTE for the business as a whole is calculated and the empirical breakdown used to estimate employment status per production unit.

Non-Respondents are given repeated reminders to participate in the annual survey and will receive several phone calls until a date at the end of March when preparations to report on the annual survey must begin. Late returns are accommodated as much as possible and data updates are always applied as one supplies on the basis of the best available data in hand at a given moment in time.

Error checks

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

Insufficient sample size can lead to over or under-estimation, depending on the size of the reporting unit, relative to other segment units. Production units making up the segment population vary in size and contribution to the segment's turnover. Errors are detected by viewing time series data for each variable and detecting data spikes that require analysis of cause. Phone surveys are a great source of quality data, but incorrect figures may be given or accurate data mis-recorded. Errors of decimal placing, or poor handwriting can result in false data spikes after uploading which become apparent in graphics set up specifically to find such in the database and the cause of the spike can be investigated back to the data supplier if necessary. The use of electronic questionnaire forms is advocated as the most effective way to receive accurate data. Greater engagement with the client or with their contacts within this agency, develops a better understanding of their operation scale and trend, reducing the incidence of uploading data incompatible with operational capability.

Data storage and documentation

Describe how the data is stored.

Initially data is uploaded to Excel storage files and is in the initial stages of integration to a Data warehouse environment. Reporting to date has been at:

www.bim.ie/publications/aquaculture

Provide link to webpage where additional methodological documentation can be found, if any.

Published documentation of methodology of all EUMAP data-collection is found at:

https://www.dcmap-ireland.ie/sites/default/files/DCF_Files/DCF_Methodology_Economic_IRL_2020.pdf

Aquaculture methodology is described from page 11.

Revision

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

This is done annually or as the need arises. The smaller segments require close attention as these may have to be amalgamated with others if in decline or may be new growth segments. Seaweed segmentation at the moment is under continuing review due to segment growth predictions but it too small to report at present.

Confidentiality

Are procedures for confidential data handling in place and documented?

The frame population are made aware of BIM's privacy policy and data protection policies and procedures.

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

There is a Data Sharing Agreement between the two main agencies carrying out the DCF work, the Marine Institute and Bord Iascaigh Mhara (BIM).

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

Data protocols to enforce confidentiality are followed strictly. In cases where there is a risk of natural persons and/or legal entities being identified clustering is applied to report economic variables to ensure statistical confidentiality. For internal business units and some closely related agencies, formal data-sharing agreements between the data controller and data processor must be in place before an appropriate level of data-sharing can be permitted.

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

Production of data from the salmon on-growing segment causes some unease due to the small number of operators involved and the fact that one very much dominates the segment. There is close engagement between BIM, as the data controller, and the concerned parties to alleviate this.

AR comment: Indicate any deviations or developments. Do not change the text already adopted in the work plan.

The MS has updated their EU MAP data collection methodology document for fisheries and aquaculture to reflect recent changes in legislation:

EU MAP: Data Collection Framework Methodology for Fisheries & Aquaculture Socio-Economic Data