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Annual Report 2017

IRELAND

30th May 2018

TABLE OF CONTENTS

INTRODUCTION

The Guidance for the submission of Annual Reports (AR), under the framework Regulation (EU) 2017/1004, Commission Implementing Decision (EU) 2016/1251, Commission Implementing Decision (EU) 2016/1701 (the 'Data Collection Framework' or DCF), is intended to help Member States (MS) in producing Annual Reports that contain all the necessary information for evaluation by the Scientific, Technical and Economic Committee for Fisheries (STECF) and the European Commission (EC).

SECTION 1: BIOLOGICAL DATA

Table 1A: List of required stocks

The list of required stocks as planned and outlined in Ireland's work plan 2017 – 2019 are presented in Table 1A. Major changes in landings affecting sampling are highlighted.

Table 1B: Planning of sampling for biological variables

Table 1B illustrates the planned sampling of biological variables for 2017, and is copied directly from Irelands Work Plan 2017 – 2019.

Table 1C: Sampling intensity for biological variables

The sampling intensity planned and achieved for biological variables is available in Table 1C. Specific Issues of under and over sampling are explained in the comments section in the relevant row.

Text Box 1C: Sampling intensity for biological variables

This text box is applicable to the AR.

General comment: This box fulfils paragraph 2 point (a)(i)(ii)(iii) of Chapter III, Chapter IV of the multiannual Union programme and Article 2, Article 4 paragraph 1 and Article 8 of the Decision (EU) 2016/1701. This box is applicable to the Annual Report.

a. Evidence of data quality assurance

SOP's and documentation on sampling design are all available on Irelands National DC-MAP website : http://www.dcmap-ireland.ie/

1. Evidence of Data Quality Assurance

Sampling for population parameters (sex ratio and maturity) of demersal species

These parameters are generally collected on surveys (sampling plans described in Text Box 1G).

Sampling on shore- demersal and pelagic fish species

Guidelines: ICES WGCATCH (statistically sound sampling)

Purpose: Length, age, weight data of landings and sex/maturity of pelagic landings

Design: Class C - sites x time

Expected difficulties: Refusals related to landing obligation

Data archiving: Secure SQL database and RDB

Quality assurance: Data entry checks and database validation, visual inspection of outliers

Analysis: Estimation procedure adapted from COST project.

Sampling frame: top 21 ports x time for demersal, and top 7 ports for pelagics

Sample selection PSU: Port-day - random, weighted by weighted by landings in previous 2 years.

Sample selection SSU: Stock – ad-hoc, based on target number of samples per stock

Sample selection TSU: Size grade – ad-hoc, at least one box per grade

Coverage: sampled ports receive >95% of landings of demersal and pelagic species into Ireland (3% of demersal landings and 15% of pelagic landings are in foreign ports which are covered under bilateral agreements (see table 7c); <1% of the total landings are sampled.

Stratification: 5 regions, 4 quarters

Targets: 1) number of port visits; 2) number of samples per stock; 3) number of age structures per sample

Quality: No major bias identified, targets are based on optimising precision for 26 demersal stocks and 9 pelagic stocks

Demersal at-sea Pelagic at-sea

Guidelines: ICES WGCATCH (statistically sound sampling)

Purpose: Length, age, weight data of discards and landings of demersal species &Pelagics (excluding Nephrops)

Design: Class A - vessels x time

Expected difficulties: Refusals, mainly related to landing obligation; logistics

Data archiving: Secure SQL database and RDB

Quality assurance: Data entry checks and database validation, visual inspection of outliers

Analysis: R code and markdown

Sampling frame: vessels x time

Sample selection PSU: vessel x time – currently ad-hoc, will move to random draw list, weighted by number of trips or landings in previous years

Sample selection SSU: haul – ad-hoc, dictated by rest periods

Sample selection TSU: discard sample – random box

Coverage: around 1% of the total number of trips are sampled.

Stratification:4 regions, 4 quarters for demersals, 5 regions, 2 quarters for pelagics

Targets: 1) number of observer trips; 2) number of hauls per trip 3) representative amount of

commercial fish sampled per haul/trip 4) All discard fish measured per sample unit

Quality: Possible bias due to refusals, precision is determined by number of trips

Crustacean at-sea Sampling on shore for Nephrops

Guidelines: ICES WGCATCH (statistically sound sampling), WKNEPH (2013)

Purpose: Length, sex, maturity data of discards and landings

Design: Class A - vessels x time

Expected difficulties: Refusals, mainly related to landing obligation; logistics

Data archiving: Secure SQL database

Quality assurance: Electronic data capture. Quality assurance using NEMESYS software

Analysis: R code and markdown

Sampling frame: vessels x time

Sample selection PSU: vessel x time – currently ad-hoc, will move to sampling a reference fleet.

Sample selection SSU: haul – ad-hoc

Sample selection TSU: discard sample – random box, catch sample – random box, graded landings (FU16)

Coverage: around 1% of the total number of trips are sampled.

Stratification: 6 FUs, 4 quarters

Targets: 1) number of trips

Quality: Possible bias due to refusals,bias due to seasonal variation, precision is determined by number of trips

Crustacean at-sea Molluscs at-sea (crab lobster, bivalves)

Guidelines: ICES WGCATCH (statistically sound sampling)

Purpose: Length, weight data of discards and landings of shellfish (except Nephrops), biomass estimates for bivalves

Design: Class A - vessels x time, stratified random or grid sampling for bivalves

Expected difficulties: Refusals, logistics, weather

Data archiving: Secure SQL database

Quality assurance: Data entry checks and database validation, visual inspection of outliers

Analysis: R, Arcmap, spatial analysis

Sampling frame: crustaceans: vessels x time, bivalves: stock distributional extent for bivalves

Sample selection PSU: crustaceans: vessel x time – currently ad-hoc. Bivalves: haul

Sample selection SSU: census, all hauls sampled

Sample selection TSU: random sample or total catch

Coverage: crustaceans: <1% of the total number of trips are sampled (Inshore fleet). Bivalves: full coverage of geographic stock distribution area

Stratification: crustaceans: 5 regions, 3 quarters, Bivalves: none

Targets: 1) number of catch sampling trips; 2) number of hauls per trip

Quality: Crustaceans: Possible bias due vessel selection (mainly larger vessels are sampled)

Sampling on shore (crab lobster, bivalves, whelks)

Guidelines: ICES WGCATCH (statistically sound sampling)

Purpose: Length, age (where possible), weight data of landings of shellfish species (Pecten, Homarus, Cancer, Buccinum)

Design: Class C - sites x time

Expected difficulties: Prior grading of landings, time constraints at processing plants

Data archiving: Secure SQL database and RDB

Quality assurance: Data entry checks and database validation, visual inspection of outliers

Analysis: Estimation procedure adapted from COST project where possible

Sampling frame: ports targeted based on location of >80% of landings.

Sample selection PSU: Fishing trip or 'fishing trip x ICES rectangle' or 'bulk landing'

Sample selection SSU: Unit of landing (box, bag, tank)

Sample selection TSU: Size grade – ad-hoc

Coverage: samled ports receive >80% of landings of Pecten and Buccinum >80% and >20% of landings of Homarus and Cancer. <1% of trips sampled.

Stratification: 3 regions, 6-9 months

Targets: 1) number of port visits; 2) number of samples per stock; 3) number of age structures per sample where possible

Quality: poor identification of origin in bulk landings, bias due to poor spatial coverage

2. *Deviations from the Work plan*

Sampling intensity:

   a. Some deviations in excess of planned sampling intensity occurred, but were achieved at national or no additional expense.

   b. Some maturity targets were set too high in the AWP, and will be revised in future annual work plan updates, for example for Gadus morhua in VIIe-k, and Lepidorhombus whiffiagonis in VII, VIIIab

   c. Maturity sampling from commercial sources has mostly been replaced with sampling on

surveys, which accounts for some of the short falls in sampling. The short fall in commercial maturity sampling is counter balanced by an over sampling compared to planned numbers on the surveys.

d. Homarus gammarus achieved sampling for weight fell short of target due to time constraints in the processors, where there wasn't always an opportunity to collected weight as well as length sex and maturity data.

e. Lophius budegassa commercial targets for areas IV, VI were set too high in the annual work plan, and are not achievable as L budegassa is relatively rare in IV, VI. These targets will be revised in future annual work plans.

f. Some under sampling in terms of individual numbers compared with the AWP targets can be seen, however the target number of sampling events were generally achieved or exceed in these cases.

g. Targets for Thunnus alalunga, were not reached due to changes in fishing and landing patterns.

Methods used for collecting data.

a. No changes to the methodologies presented in the Annual Work Plan were made in 2017. All data collection is in line with international best practice and is fully documented and available.

Methods used for estimating the parameters.

Detailed comments on deviations on particular species/stocks are included in the AR Comments column in Table 1C, and some overarching general comments are also highlighted above under sampling intensity.

No new additional species were sampled above those highlighted in the Annual Work Plan, and no changes in methodologies used to estimate the parameters were made.

3. *Actions to avoid deviations.*
a. Survey targets will remain for skates and rays and all individuals encountered in the surveys will be sampled.
b. Maturity targets will be updated in future programmes to reflect the shift from commercial to survey sampling and to reflect more realistic targets in some cases.
c. It is not possible to mitigate against a fishery not opening, as was the case for Clupea harengus in VIaN in 2017.

    d. Thunnus alalunga: The nature of this fishery can shift year on year, with landings from the Irish fleet being predominantly landed into Irish ports one year and into foreign ports the next. The landing location is dictated by the location of the fishery. In 2017, with the majority of Irish landings were landed into foreign ports, mostly France (2,257t were landed abroad in 2017 compared with 615t in 2016). A total of 256t were landed into Irish ports by Irish vessels in 2017, compared with 1,801t in 2016. This shift in the fishery resulted in lower than planned sampling opportunities. This pattern cannot be controlled or mitigated against, but all efforts are made to ensure sampling targets are met where practical and feasible.

    e. Ireland will refocus efforts on species/stocks where shortfalls were experienced to ensure achievement of targets in the future.

Table 1D: Recreational fisheries

Details of Ireland's recreational fishery sampling can be found in Table 1D

Text Box 1D - Recreational fisheries

General comment: This box fulfills paragraph 2 point (a) (iv) of Chapter III of the multiannual Union programme and Article 2, Article 3 and Article 4 paragraph 1 of the Decision (EU) 2016/1701. This box is applicable to the Annual Report. This box is intended to provide information on the design, implementation and analysis of all components of sampling schemes/ surveys that are listed in Table 1D.

National Coded Wire Tagging Programme.

1. *Description of the target population*

There are approximately 140 salmon rivers in Ireland and advice is provided for all of these. In addition separate advice may be given for upstream and downstream areas of large rivers with hydroelectric dams and for two adult age cohorts separately. All recreational fisheries take place in freshwater.

The provisional rod harvest in 2017 was 20,031 salmon (54.1 t) compared to 14,587 (39.3 t) in 2016. The commercial catch in 2017 was 6, 683 (18 t) compared to 6,917 (18.7 t). Therefore the total harvest by all methods in 2017 was 26,714 (72 t). Rod harvests are considerably lower than

the reported catches prior to the introduction of the carcass tagging and logbook scheme in 2001 (102 t in 2000 and 97 t in 1999) and reflect the fact that many rod fisheries are closed or restricted to catch and release only since harvest fisheries are permitted only on rivers exceeding conservation limits. In 2017, the estimated number of salmon caught and released by anglers was 11,259 compared to 10,280 in 2016 and 9,383 in 2015. The 2017 released catch represented 36% of the total rod catch and 30% of the total catch.

The most recent stock status and catch advice suggests that for the 2018 fishery:

- 41 rivers have an advised harvestable surplus as they are exceeding their CLs.

- A further 36 rivers, may be opened on a C&R-only basis, subject to IFI management criteria based on having a high probability of achieving 50% of their CL or exceeding the minimum fry threshold of 15 or greater fry per five minute survey in catchment-wide electrofishing surveys.

- In addition 66 rivers are either not meeting 50% of CL or there is lack of recent data to determine their status relative to attainment of CL. Where there is a lack of data, or where electro-fishing surveys indicate juvenile numbers below the management threshold, the assumption is made that these rivers are failing to meet CL.

Since 2013, this represents a moderate decline in the number of river systems open as a harvest fishery, a moderate increasing trend in fisheries open solely for catch and release angling and a moderate increasing trend in closed fisheries.

There are 16 rivers for which a separate assessment is made for MSW (spring) salmon where there are significant fisheries. Of these:

- 12 have an advised harvestable surplus as they are exceeding their CLs; and

- 4 rivers may be opened on a catch and release-only basis subject to IFI management criteria as they are they have a high probability of achieving 50% of their CL or exceeding the minimum fry threshold (15 fry) in catchment-wide electro-fishing.

Amongst the stocks being assessed are 54 river stocks where no rod catch data has been available since 2006 and the most recent annual average rod catch (2002–2006) has been less than 10 salmon, making a direct assessment difficult. Although these are insignificant fisheries (accounting for less than 0.5% of the total national rod catch when combined), their stocks are important as spawning populations in their own right, which must be maintained as constituent elements of biodiversity, as required under the EU Habitats Directive. Because there is no recent means of direct salmon stock assessment on these rivers, an assessment of CL attainment on these rivers is

not provided in the advice. However it is advised that these rivers remain closed until additional information is made available to assess stock status relative to their CLs. In effect this means that stocks in 85 salmon rivers are assessed annually.

In addition, there are four assessments on major rivers used for hydro power which have been assessed as being below their CL i.e. Upper Liffey (Dublin), Upper Lee (Cork), Upper Shannon (Limerick) and the River Erne. Stocks in the areas above the impoundments are significantly below their CLs and following the scientific advice already provided for other rivers, there should be no harvest fisheries on wild salmon in these specific rivers.

2. *Type of survey*

The methodology and the sampling design of the National Coded Wire Tagging Programme is fully documented in Tables 1D, 1E and 5A .

3. *Data Quality*

Recreational fisheries are required to obtain a state license and report their catches as soon as they are landed in a mandatory logbook. They are also required to fix a self-locking tag on the carcass of the fish and record the unique tag number into the logbook. Other data required to be recorded in the logbook are Date of capture, River/lake, Beat, County, Species (salmon or sea trout), Weight (lbs or Kgs), lure (fly, spinner, worm, prawn/shrimp, other and total days fished. The information must be returned to the fisheries authority on the 19th of October of the year for which the licence is valid. Returns of recreational logbooks are over 60% while returns for commercial logbooks is 100%. Data are centralised by the Inland Fisheries Ireland and published annually.

Specific biological sampling of the salmon fisheries (commercial and recreational) is carried out in selected rivers where artificially reared salmon are tagged and released either in scientific smolt release programmes or smolt releases to mitigate against loss of natural production by hydro-damming, or other man made problems. A National Microtagging and Tag Recovery programme was established in 1980 by the fisheries authorities. Approximately 160,000 salmon smolts were tagged and released in 2017 for return in 2018. This included approximately approximately 3,500 wild salmon sampled and tagged from the River Corrib in Galway. Over 2000 salmon tagged in 2016 for return in 2017 were recovered subsequently during sampling of commercial/recreational fisheries and brood stocks in 2017 and measured for fork length and weighed. The data from the National Coded Wire Tagging and Tag Recovery programme provides information on marine survival, exploitation rates, and survival to spawn for national and international stock assessments.

Salmon stock assessment is reported on the basis of numbers rather than biomass. There are only two principal sea-age classes which are represented in the fisheries in Ireland i.e 1Sea Winter and

multi sea Winter (MSW) which are predominantly 2 SW fish. Recent catch information from angling logbooks suggests an average MSW proportion of 17% for the period 2008 to 2017 (provisional estimate). Stock assessment is not dependent on sampling for length and age and results from these analyses are mainly for monitoring the biological characteristics of the stocks. On the reported recreational catch statistics estimated individual weights are provided by anglers in the mandatory reporting logbooks. In the sampling of salmon in the National Coded Wire Tagging and Tag Recovery Programme, approximately 2,000 adult salmon were measured and weighed.

Recreational catch data quality is assessed initially by district salmon fishing inspectors of Inland Fisheries Ireland. Subsequent data quality checking and analyses may be carried out by the TEGOS (Technical Expert Group on Salmon) established by the cross-border North South Standing Scientific Committee on Inland Fish (NSSSCIF). The catch data are modified to account for non-return of logbooks, anomalous returns in logbook data and for the provision of a total estimated catch and unreported catch is included. Long term trends are examined and an assessment of stock status relative to the attainment of Conservation Limits (defined as Maximum Sustainable Yield in numbers of salmon) is carried out by the SSC. Advice on catch levels and river TACs is provided on an individual river or stock basis.

Length composition of the catch originates from voluntary data provided by recreational fishermen in the logbook and from private fishery owners who monitor the number and size of fish captured in their rivers, as well as sampling carried out by staff of Inland Fisheries Ireland. There are no specific sampling, or precision targets associated with this process but it is known that weight estimates may be estimated and the effect of this relative imprecision on spawning parameters is being investigated by the SSC.

Up to 2010, the Wild Salmon and Sea Trout Tagging Scheme was administered by the Central and the seven Regional Fisheries Boards (Eastern, Southern, South Western, Shannon, Western, North Western and Northern Regional Fisheries Boards) on behalf of their parent Department, the Department of Communications, Energy and Natural Resources (DCENR). In 2010, a new institution was created which amalgamated the Regional and Central Fisheries Boards into one organisation i.e. Inland Fisheries Ireland (IFI). Cross boarder collaboration with the Loughs Agency (an inter-government agency between Ireland and the UK) occurs in the case of the river Foyle, while inter-governmental collaboration also exists between the UK and Ireland by the cross-border North South Standing Scientific Committee on Inland Fish (NSSSCIF). Data collection at a regional level is co-ordinated by the IFI while, data analyses, stock assessment and research are co-ordinated by the IFI and the Marine Institute. The overseeing government department recently changed name from the Department of Communications, Energy and Natural Resources (DCENR) to the Department of Climate Change Action and Environment (DCCAE).

4. *Data Analysis and processing*
Data editing and imputation methods are fully documented and identified in Table 5A.
(max. 900 words per survey)

Pilot Study 1: Relative share of catches of recreational fisheries compared to commercial fisheries

Details of the Recreational Fisheries Pilot Study are provided in the text box below.

General comment: This box fulfils paragraph 4 of Chapter V of the multiannual Union programme and Article 2 and Article 4 paragraph (3) point (a) of the Decision (EU) 2016/1701.
General comment: This box is applicable to the Annual Report. This box is intended to provide information on the results obtained from the implementation of the pilot study.
Pilot study on marine recreational fisheries in Ireland   1. Aim of pilot study   Marine recreational fisheries in Ireland consist mainly of angling on shore, charter vessels and private boats (Hyder et al, 2017; Hynes et al, 2017) with an estimated number of 127 000 people engaged in this activity every year ((Inland Fisheries Ireland, 2015). The aim of the DCF pilot study on marine recreational fisheries in Ireland is to access the spatial/seasonal distribution and effort of marine recreational fishing; the characterisation of catches from the onshore and off shore components of marine recreational fisheries and the estimation of the share of catches from the marine recreational fishery for cod, pollack, elasmobranches, seabass and highly migratory fishes.   2. Duration of pilot study   The pilot study is designed in 2017 with data collection commencing in 2018. Preliminary results will be available at the end of 2018.   3. Methodology and expected outcomes of pilot study   The Pilot study on marine recreational components aims to include three components of data collection: • Assessment of spatial/seasonal distribution and effort of recreational fishing through broad scale questionnaires.   • On site catch characterisation of onshore component through interviews/logbooks targeting onshore anglers and potentially using analysis of angling competitions.

- On site catch characterisation of offshore component by including angling charter vessels in the catch sampling at sea programme as a unit in the sampling frame. Vessels will be randomly selected from predefined vessel lists using strata based on ICES division and quarters.

As a pilot study, the work will be implemented in a phased approach and where required, adjustments will be made to methodologies and sampling effort. Onsite data collection on a voluntary basis will depend on the cooperation of the angling sector. Implementation will be carefully monitored, including recording of response rates and refusals. The methodology will take into consideration the recommendations from ICES WGRFS and the FishPi project.

4. References:

Hyder, K, Radford, Z, Prellezo, R, Weltersbach, MS, Lewin, WC, Zarauz, L, Ferter, K, Ruiz,J, Townhill, B, Mugerza, E, & Strehlow, HV, 2017, Research for PECH Committee – Marine recreational and semi-subsistence fishing - its value and its impact on fish stocks, European Parliament, Policy Department for Structural and Cohesion Policies, Brussels;

Hynes, Stephen, Gaeven, Rainey and Paul, O'Reilly,, (2017), Estimating a Total Demand Function for Sea   Angling Pursuits, Ecological Economics, 134, issue C, p. 73-81;

Inland Fisheries Ireland, 2015. The Economic Contribution of Bass and Sea Angling in Ireland. IFI publication, Dublin.

The Pilot Study is not planned to commence until 2018, so no results are available in 2017.

Table 1E: Anadromous and catadromous species data collection in fresh water

Table 1E contains details of Ireland's anadromous and catadromous species data collection in 2017.

Text Box 1E: Anadromous and catadromous species data collection in fresh water

This text box is applicable to the AR. MS should transfer the information from their accepted WP before filling in the additional section highlighted in grey.

General comment: This box fulfills paragraph 2 points (b) and (c) of Chapter III of the multiannual Union programme and Article 2 of the Decision (EU) 2016/1701.

General comment: This box is applicable to the Annual Report.

Method selected for collecting data

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.

Counters and traps

Counters record returning salmon numbers and dates. Traps monitor fish moving upstream and downstream, enabling full census on wild salmon, released reared salmon and downstream migrating silver eels. Fixed elver ladder traps monitor upstream recruiting juvenile eel.

Use: Estimating annual returns of salmon, silver eel production, annual abundance of recruiting juvenile eel and dates. Numbers of fish upstream/downstream, daily number, size, weight and sex ratio of salmon and emigrating silver eels.

Silver Eel mark recapture Escapement

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 point of capture.

Use: determines eel escapement.

Electrofishing and fyke net surveys

Electrofishing (salmon, eel) and fyke net (eel) surveys target juvenile salmon and yellow eel in selected water bodies, all fish identified; weight and length measurements taken.

Use: Estimating juvenile salmon (river) and yellow eel (river, lake and transitional water) populations.

Above described programmes contribute to the national salmon and eel monitoring programmes (Eel: Council Regulation 1100/2007), which operate across different Irish agencies and parent departments. National coordination discussions are underway, to ensure contribution of all relevant salmon and eels sampling activities to the national data collection required under EUMAP.

National Coded Wire Tagging Programme

7 sites were included in the AWP 2017 – 2019, which do not form part of the core programme. These are ad hoc release site, depending on various project involvements and will be removed from future programmes. The programme was otherwise realised as planned.

Transport capture sites Coghills and Vwing Fykes for Silver Eel.

Trap and Transport surveys were planned for three locations on the Erne, Shannon and Lee rivers in 2017. The fishery in both the Erne and the Shannon rivers was lower than in previous years, so achieved sampling reached 86% and 75% respectively. Targets for the river Lee were achieved 100%. Close liaison is maintained between partner agencies to ensure all sampling is completed as planned and reflects the activity in each of these major rivers.

Electrofishing on the Burrishoole river for Yellow Eel

There was a short fall in the achieved number of electrofishing surveys completed in the Burrishoole

in 2017. This was because of an exceptionally wet Summer, which resulted in very high water levels in the river, which in turn, prevented electrofishing. Unfortunately weather and environmental conditions cannot be mitigated against in such circumstances, but efforts will be re – focused on achieving all electrofishing targets in 2018.

Electrofishing on the Burrishoole river for Juvenile Salmon.

There was a short fall in the achieved number of electrofishing surveys completed in the Burrishoole in 2017. This was because of an exceptionally wet Summer, which resulted in very high water levels in the river, which in turn, prevented electrofishing. Unfortunately weather and environmental conditions cannot be mitigated against in such circumstances, but efforts will be re – focused on achieving all electrofishing targets in 2018.

(max 500 words per Area)

Table 1F: Incidental by-catch of birds, mammals, reptiles and fish

Incidences of by catch of birds, mammals, reptiles and fish are recorded in Table 1F.

Text box 1F: Incidental by-catch of birds, mammals, reptiles and fish

General Comment: This box fulfils paragraph 3 point (a) of Chapter III of the multiannual Union programme and Article 2 of the Decision (EU) 2016/1701. This box is applicable to the Annual Report. This box is applicable only for those sections where Member States have reported that they have been carrying out regular sampling. Results and deviations for Pilot studies should be reported under Pilot Study 2.

1. Results

Occurrences of incidental by catch for birds and mammals were very low. Only one incident of bird bycatch was recorded in 2017, When 3 individual Uria aalge (common guillemot) were caught by an otter trawl. All guillemots were dead upon re - release.

One incident of fish bycatch was recorded. The individual fish was a Alosa fallax (Twaite Shad). The shad was dead upon re - release.

Three incidents of marine mammal by – catch were recorded in 2017, all, Delphinus delphis (common dolphin). Two animals were dead upon re – release, but one was released alive.

2. Deviations from Work Plan

The data collection protocol of incidental by – catch was completed as planned on all observer trips in 2017. However there were a lower than expected number of achieved observer trips.

sampling intensity:

The lower than expected number of observer trips achieved in 2017 was as a direct result of non – cooperation from the fishing industry. Several factors were at play here, including the Landing Obligation, the introduction of the penalty points system, an impending Porcupine *Nephrops* court case, taken by the industry against the Irish Government, and concerns about insurance for observers while on board.

3. Data quality

Protocols for observation of incidental bycatch are currently in place for the off shore catch observer programme. Collection protocols follow the design recommended by WGBYC.

- Does the on board observer protocol contain a check for rare specimens in the catch at opening of the codend? Yes this is highlighted in the Irish protocols.

- If YES is the observer instructed to indicate if the codend was NOT checked in a haul? This is

currently not part of the Irish protocol, but can be included.

- 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 which never came on board (because they fall out of the net)? No, this is currently not recorded.

- In large catches: does the protocol instruct to check for rare specimens during sorting of the catch (i.e. at conveyor belt)? Yes the observer surveys the catch as it is being sorted.

- Is the observer instructed to indicate what percentage of the sorting or hauling process has been checked at "haul level"? This is not currently recorded.

-Does the on board observer protocol instruct to report on the use of mitigation (i.e. Escape Devices or Acoustic Deterrent Devices)? Yes observers record the use of mitigation devices as part of the logging of gear and the modification is logged using a specific gear code.

- Does the sampling design and protocol follow the recommendations from relevant expert groups? Yes the Irish protocol follows the advice and recommendations of WGBYC.

- Are data quality issues taken into account? Yes

- How are data (and samples) stored? Data is uploaded to the central Observer Database. Samples are generally not taken, however rare specimens are frozen on board and returned to Marine Institute HQ for further examination.

(max 900 words)

Pilot Study 2: Level of fishing and impact of fisheries on biological resources and marine ecosystem

This text box is applicable to the AR. MS should transfer the information from their accepted WP before filling in the additional section highlighted in grey.

General comment: This Box fulfills paragraph 3 point (c) of Chapter III of the multiannual Union programme and Article 2 and Article 4 paragraph (3) point (b) of the Decision (EU) 2016/1701.

General comment: This box is applicable to the Annual Report. This box is intended to provide information on the results obtained from the implementation of the pilot study.

1. Aim of pilot studies

In Ireland, pilot studies to investigate the level of fishing and impact of fisheries on biological resources and marine ecosystem are conducted under the EMFF marine biodiversity scheme. The thematic objective of the scheme is to preserve and protect the environment and to promote resource efficiency. The two specific objectives are 1.) Reduction of the impact of fisheries and aquaculture on the marine environment, including the

avoidance and reduction, as far as possible, of unwanted catch and 2.) Protection and restoration of aquatic biodiversity and ecosystems. Specific projects are submitted annually and measures implemented under the scheme are undertaken for the protection and preservation of marine biodiversity, for the benefit of the industry as a whole, and to contribute to fulfilment of Ireland's obligations under EU Natura Directives.

2. Duration of pilot study

Pilot studies last between 12 and 18 months or are multiannual programmes from 2017 onwards.

3. Methodology and expected outcomes of pilot study

Twelve projects have been submitted for 2017 (subject to approval by the Department of Agriculture, Food and Marine-DAFM) and below are descriptions of the projects that are directly relevant to the DCF requierements to inform on the level of fishing and impact of fisheries on biological resources and marine ecosystem and to inform on future data collection programmes.

3.1. Mapping fishing pressures on habitats (2 projects)

3.1.1. Methodology to map fishing pressure of <12m vessels

Data aqusition will be automated for vessels under 12 m in length, building on the iVMS project operating mainly in the Irish Sea by expanding iVMS to other fleets and adding functionality to enable capture of fishing effort and catch data. Expected outcome will be the acquisition of data to allow mapping of fishing pressures in relation to Natura 2000 sites and for MSFD descriptors; improved fisheries advice, improved data on landings, effort and economic value of the sector as required for ICES; STECF data calls and DCF requirements.

3.1.2. Assessment of fisheries/habitat interactions on Irish offshore reef habitats:

 Assessment of fisheries/habitat interactions will be carried out on offshore reefs. Ireland will undertake mapping surveys of offshore reefs with a view to mapping of status and pressures from fishing. Expected outcome is improved spatial data of offshore reefs and their status in relation to spatial distribution of bottom impacting fishing pressure.

3.2. Ecosystem fisheries interaction (2 projects)

3.2.1. Species catch composition in fisheries posing a risk to biodiversity

In Ireland, the data collection scheme under EMFF UP 3 monitors the bycatch of endangered and protected species as part of the at sea observer scheme. The sampling effort of this observer scheme is, however, stratified according to commercial fisheries and might not provide adequate resolution for statistically meaningful bycatch data. As part of this project, additional sampling effort will be allocated to fisheries that pose a potential risk to biodiversity through bycatch of PET species. Monitoring of retained and non-retained by-catch including endangered and protected species will be carried out via an at sea observer programme targeting fisheries that have been identified by endusers as a potential risk to the conservation objectives under NATURA, and GES GES for MSFD. These include tangle netting, gill netting, trammel netting and pelagic trawling. Expected outcomes are actual recorded bycatch figures by species per unit of fishing effort; total bycatch estimates by métier for selected métiers, season/month, area fished, vessel size; risk profiling of the observed fisheries; identification of problem areas and/or fishing practices where possible; identification of sources of variability &

data gaps; recommendations for ongoing monitoring.

3.2.2. Establishing Maximum Sustainable Yield (MSY) proxies for data-limited stocks for key stone species and species sensitive to the impacts of fishing:

Many of the stocks which are caught by the Irish commercial fishing fleets are considered to be data-limited or are not assessed at all. The reasons for this vary from lack of commercial value to practical difficulties in data collection or problems with ageing. This includes key stone prey species (like sprat, gurnards); key stone predators (saithe, pollack, ling) and species sensitive to the impacts of fishing (like rays and skates, john dory, brill and turbot). For these stocks, the fishing mortality is unknown and MSY reference points are not established. The overall aim of the project is to develop and test a range of assessment models and methods to establish MSY reference points (or proxy MSY reference points) across the spectrum of data-limited stocks for key stone species and/or species sensitive to the impacts of fishing. Expected outcomes are:

- A range of assessment methods and models to establish MSY reference points for data-limited and/or non-commercial stocks which are either key stone species or are sensitive to fishing.
- Estimates of the level of fishing impact of fishing activities, relative to MSY on data-limited or non-commercial stocks which are either key stone species or are sensitive to fishing.
- Cost-benefit analysis of various scenarios of future data collection for these stocks.

For more detail in relation to the Irish EMFF marine biodiversity scheme please see

https://www.agriculture.gov.ie/media/migration/seafood/marineagenciesandprogrammes/emff/EMFFOPSummary251116.pdf

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Brief description of the results obtained (including deviations from planned and justifications as to why if this was not the case).

Mapping Fishing Pressures on Habitats (2 Projects)

Methodology to Map Fishing Pressure of <12m Vessels (iVMS)

Data acquisition will be automated for vessels under 12 m in length, building on the iVMS project operating mainly in the Irish Sea by expanding iVMS to other fleets and adding functionality to enable capture of fishing effort and catch data. Expected outcome will be the acquisition of data to allow mapping of fishing pressures in relation to Natura 2000 sites and for MSFD descriptors; improved fisheries advice, improved data on landings, effort and economic value of the sector as required for ICES; STECF data calls and DCF requirements.

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

The pilot study has involved approximately 100 vessels mainly in the under 12m DRB and FPO metiers. Over 3 years of data have been acquired. The data provide high resolution positional data, in time and space, on vessel activity. For a subset of vessels gear in gear out (GIGO) sensors have been

used to identify the precise locations of gear deployments and recoveries even if the spatial patterns of the positional data also shows the likelihood of a fishing event separate to a non-fishing event. Data sets have been mapped which shows the entire distribution of fishing activity of certain fleets on certain stocks.

5. *Incorporation of results from pilot study into regular sampling by the MS*

The mapped VMS data shows the entire distribution of commercial fishing activity on some stocks. Assuming this is a proxy for the distribution of the stock the VMS data has been used to design research surveys in regular surveys of these stocks. The data are also used to support pressure and impact monitoring for the Habitats Directive and MSFD. Reporting of position is also now a regulatory requirement for some fisheries as a result of the pilot demonstration.

Assessment of Fisheries/Habitat Interactions on Irish Offshore Reef Habitats

The project started in May 2017 and the first phase will run until December 2018. As such only preliminary results are available. Consistent with sub-article 6.2 of the Habitats Directive (EC 92/43/EEC), which requires member states to take measures to avoid deterioration of protected habitats, Ireland undertook mapping surveys of offshore reefs to evaluate status and introduce conservation and management measures in proportion to status and pressures from fishing. Survey preparation and site selection for a three week offshore mapping survey in 2017 included the following:

• Review of status data: Review of existing information and datasets on deep Ireland's deep reef habitat were collated to assess the status of reef in water greater than 200m and evaluate sensitivities of deep reef habitats. This was part of a commissioned desk study prior to the commencement of the pilot study.

• Mapping of fishing pressures: Spatial information on reef habitats was overlaid with VMS data from fishing vessels disaggregated by fishing gear to link potential impact with habitat sensitivity and identify data deficiencies.

• Site Selection: Areas of focus for the 3 week survey were reefs with high conservation value and low interaction of fishing effort. In selecting new sites to be surveyed, the following aspects were taken into account: Data availability for pre-screening; Level of fishing pressure, focussing on low impact sites; geographical distribution in relation to existing designations. The survey also covered one existing SAC designation and monitored signs of impact and recovery along transects that have been originally surveyed in 2009. This data was intended to help evaluating the detection of change

and effects of mitigation in designated sites.

• 3 week offshore survey: A three week offshore mapping survey was carried out in July 2017 using a remotely operated vehicle (ROV). A total of 50 transects were surveyed with 127 hours spent sampling and recording HD video on the seabed, collecting 147 biological specimens and 49 sediment samples across the continental shelf margin northwest of Ireland.

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

The project is ongoing and completion of tasks is in progress. The original expected outcomes are listed below with current status in brackets:

1. Assessment of Irish National Seabed Survey and compiled reef habitat data in Irish Offshore Waters to identify high likelihood of reef distribution (completed for first phase of project and survey preparation, ongoing data review continues).

2. VMS overlay of vessels using bottom impacting gears (completed for first phase of project and survey preparation, ongoing data review continues).

3. Proposed survey design based on fisheries (VMS) habitat interaction of Irish reef habitats >200m (completed for 2017 survey).

4. Survey reports of two 3 week ROV habitat mapping surveys (completed for 2017 survey).

5. Data output of each reef survey (Survey data analysis 2017 to be completed in Q3, 2018).

6. Data dissemination via web interphase (Q3, 2018).

7. Outreach material relating to the above (ongoing, first survey results presented at several outreach events).

5. *Incorporation of results from pilot study into regular sampling by the MS*

Incorporation of results from pilot study into regular sampling by the MS will be reviewed as the project nears completion.

Ecosystem Fisheries Interaction (2 Projects)

Species Catch Composition in fisheries posing a risk to biodiversity

The project started in Quarter 2 2017 and the first phase will run until December 2018. As such, only preliminary results are available. Ireland is currently sampling the bycatch of protected, endangered and threatened (PET) species as part of its observer programme on commercial inshore and offshore

fleet metiers for the Data Collection Framework (DCF). The at sea catch sampling programme is optimised for assessment of fish catches. Protected, rare or endangered species are not typical in fish catches but occur sporadically (i.e. potentially high but infrequent by-catch). Estimates for zero inflated data are difficult to obtain requires in the first instance an enhanced observer programme for fleet metiers that pose the highest risk of by-catch of such species. This project has started in Q2 in 2017 and continues until the end of 2018. Static net fisheries are considered to pose a potential risk of capture to a number of designated species including grey seal, harbour seal and small cetaceans (i.e. porpoises and dolphins). Furthermore some metiers within the static net fleet also have a by-catch of rare and endangered fish species, of commercial species subject to TAC, and potentially there are also incidences of seabird by-catch. For 2017, the enhanced bycatch programme focussed on static nets.

For this purpose, the population of vessels to be sampled under an enhanced observer programme was reviewed included an assessment of the level of activity by static net vessels under 10m (no logbook) and the location of activity of vessels under 12m (no VMS) using expert and local knowledge. Approximately 60 trips completed on the set net fishery with an additional 15 on pelagic trawls. Data entry and analysis for 2017 trips in progress. Preliminary bycatch data of DCF and enhanced programme is being reviewed under FISHPI II and ICES WKPETSAMP. Biopsy kits were provided to observers, to collect samples from bycaught animals.

In addition to the estimates of by-caught animals from different metiers; information was obtained on the cause of mortality of stranded animals including the determination of cause of death through fishing impact. Under Ireland's ongoing Cetacean Strandings Scheme a subsample of the stranded animals were collected for post mortem examination to determine the cause of death. In 2017, a total of 24 individual cetaceans were recovered for necropsy from two geographical lots, meeting the target goals set by the project for 2017. Biological samples from the specimen were collected for further scientific studies and dissemination.

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

The project is ongoing and the completion of tasks is in progress. The original expected outcomes are listed below with current status in brackets:

a. Data on bycatch of seals, small cetaceans, seabirds and rare and endangered species by fishing metier in enhanced observer programme based on selected fishing metiers that pose a higher risk to biodiversity, these to include the static net fisheries (2017+) and pelagic fisheries (2018+), (Data collected from enhanced bycatch programme from 60 trips on setnet metier and 15 trips on pelagic fishery, data entry and analysis in progress).

b. Collection of scientific specimen of bycaught animals in the enhanced observer

programme to be disseminated late 2018 for further scientific studies (ongoing).

c. Results of post mortem examinations of subset of stranded cetaceans from the national stranding's scheme, stratified by geographic region and species (24 individual cetaceans recovered and post mortem examination carried out to determine cause of death, project report completed).

d. Collection of scientific specimen of stranded animals used for post mortem examination to be disseminated late 2018 for further scientific studies (biological data collection ongoing).

5. *Incorporation of results from pilot study into regular sampling by the MS*

Integration of results with data collection scheme and dissemination of data to endusers is ongoing through collaboration with other government departments, FISHPI II and ICES WKPETSAMP, finalised in phase 2 of the project.

Establishing Maximum Sustainable Yield (MSY) Proxies For Data Limited Stocks, For Key Stone Species, and Species Sensitive to the Impacts of Fishing.

The MYDAS project started in July 2017 and will run for 24 months. Any results so far are preliminary. The project has a wiki (https://github.com/laurieKell/mydas/wiki) which is continuously being updated with the most current results:

•   Stock periodisation is complete

•   Data collation is largely complete

•   Method and simulation framework is in development; largely complete

•   Linkages ICES work and with other projects have been made

•   Outlines of peer-reviewed papers are complete

•   No deviations from plans

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

The original expected outcomes are as follows:

•   A range of assessment methods and models to establish MSY reference points for data-limited

and/or non-commercial stocks which are either key stone species or are sensitive to fishing.

• Estimates of the level of fishing impact of fishing activities, relative to MSY on data-limited or non-commercial stocks which are either key stone species or are sensitive to fishing.

• Cost-benefit analysis of various scenarios of future data collection for these stocks.

All of the tasks are on schedule but the outcomes are not available yet as the project is not due to finish until July 2019.

5. *Incorporation of results from pilot study into regular sampling by the MS*

Not relevant – project maintains close linkages with ICES work on MSY reference points.

 (max 900 words)

Table 1G: List of research surveys at sea

For a full list of DCF Eligible surveys please refer to Table 1G of the Irish Annual Work Plan 2017 – 2019. Table 1G of this Annual Report, outline the surveys, in which Ireland participate.

Text Box 1G: List of research surveys at sea

This text box is applicable to the AR. MS should transfer the information from their accepted WP before filling in the additional section highlighted in grey.

General comment: This box fulfills Chapter IV of the multiannual Union programme and Article 2 and Article 7 paragraph (3) of the Decision (EU) 2016/1701. It is intended to specify which reseach surveys at sea set out in Table 10 of the multiannual Union programme will be carried out. Member States shall specify whether the research survey is included in Table 10 of the multiannual Union programme or whether it is an additional survey.

General comment: This box is applicable to the Annual Report. This box should provide complementary information on the performance of the surveys, the results and their main use.

Western IBTS 4th quarter(including Porcupine survey) (IBTS Q4)

1. Objectives of the survey:

The main objectives of the Irish Groundfish Survey (IGFS) are to provide a relative index of abundance for commercially exploited demersal fish stocks around Ireland. In particular recruitment indices for tuning ICES stock assessment models. The survey also collects data on non-commercial fish, elasmobranch, cephalopod and invertebrate species; oceanographic data; litter data; and additional international research sample requests where possible.

2. Description of the methods used in the survey.

Methodology is per general IBTS protocols (IBTS Manual) using the GOV 36/47 otter trawl. More specific details for the Western Area surveys can be found in the Western Area IBTS Manual. The survey is essentially a depth stratified semi-random trawl survey of 30min duration per haul.
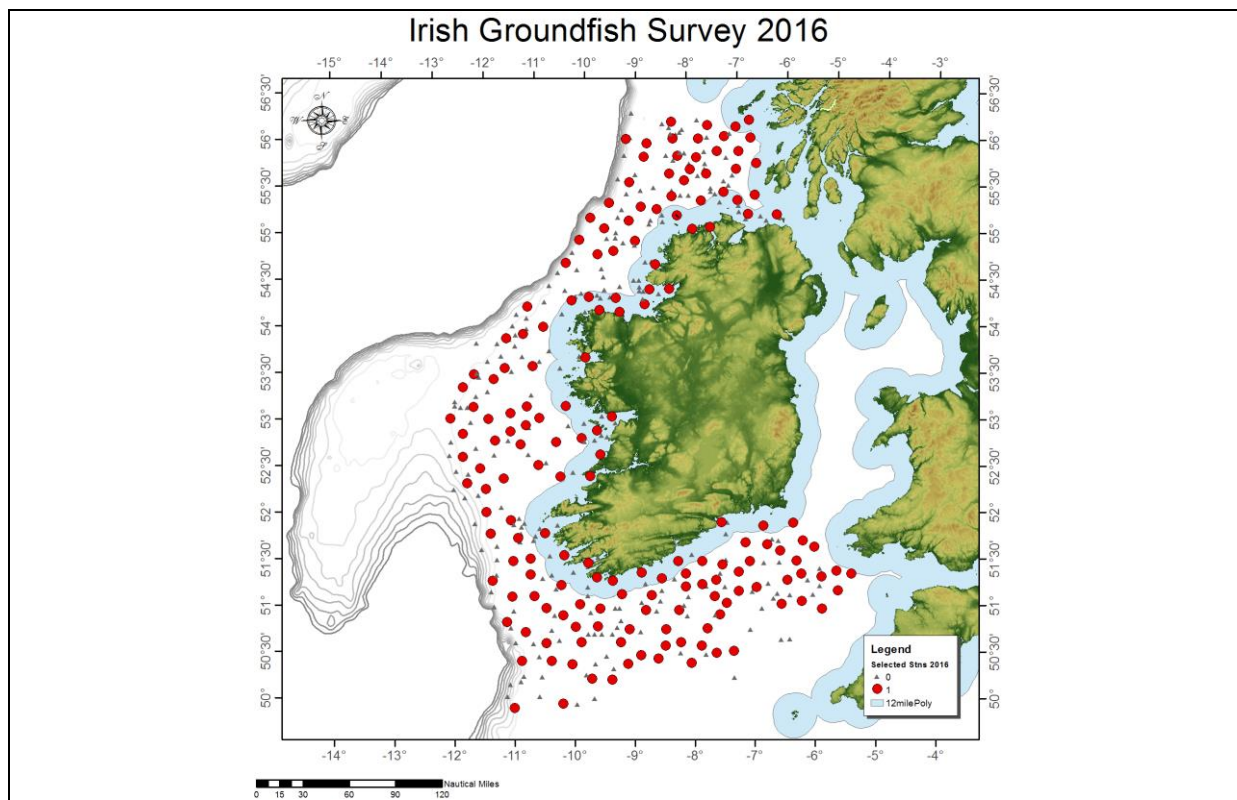
Fig 1. IGFS stations

3. For internationally coordinated surveys, describe the participating Member States/vessels and the relevant international group in charge of planning the survey

The IGFS is co-ordinated under the ICES International Bottom Trawl Survey Working Group (http://www.ices.dk/community/groups/Pages/IBTSWG.aspx). Co-ordination occurs from Norway, Sweden, Denmark, Holland and Germany in N. Sea; to Scotland, Ireland, N. Ireland, England, France, Spain and Portugal in the NE Atlantic.

4. Where applicable, describe the international task sharing (physical and/or financial) and the cost sharing agreement used
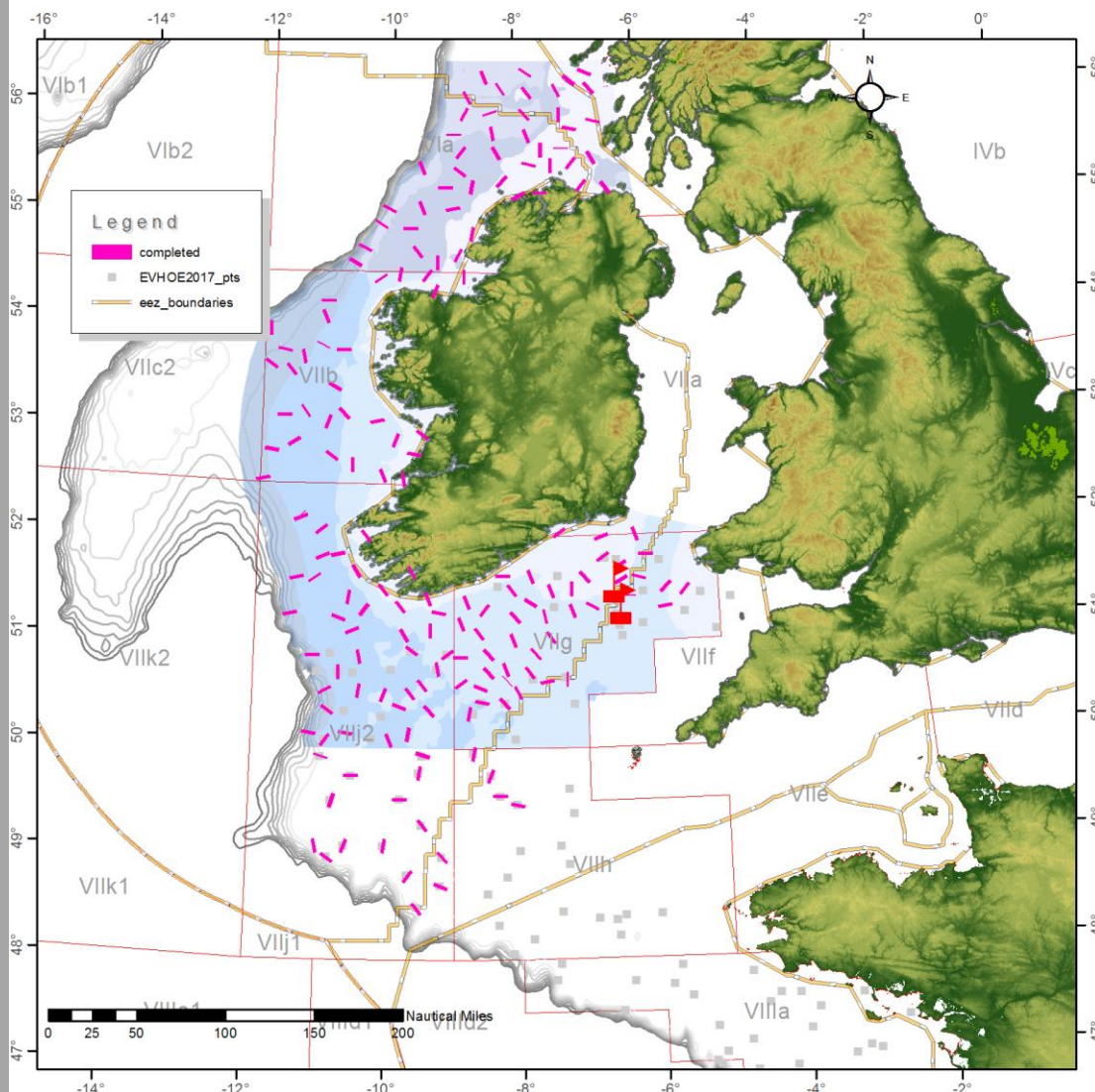
Main shared tasks are the construction of combined indices for cod, haddock and whiting between Ireland and France for WGCSE.

5. Explain where thresholds apply

Share of Union TAC for target species is above 3%

6. IGFS 2017 completed stations (in pink).

Irish Groundfish Survey 2017

Legend
- ■ completed
- ■ EVHOE2017_pts
- — eez_boundaries

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

The IGFS is internationally coordinated through the International Bottom Trawl Survey Working Group, and their latest report is below:

http://ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/SSGIEOM/2017/IBTSWG/IBTSWG%202017.pdf

8. List the main use of the results of the survey (e.g. indices, abundance estimates, environmental indicators).

- Abundance estimates are provided for a broad range of species to the international working groups, i.e. WGCSE and WGBIE annually to contribute to the provision of assessment and management advice.

- CTD stations are also completed and all hydrographic data is uploaded by transect to DATRAS

- A litter log is also maintained at each station, categorising , and weighing all litter brought on board, and is sent to EUROGOOS

- Sea pens are collected annually on the IGFS and sent to the London museum for Population genetics

- Sepeolids are collected annually on the IGFS and sent to Belgian Museum for ID and to contribute to their catalog of distribution.

9. Extended comments (Tables 1G and 1H)

If the Member State has extended AR Comments, these can be placed under this section. If this is the case, a reference to this text box should be provided in the corresponding tables.

NA

(max 450 words per survey)

General Comment: This Box fulfills Chapter IV of the multi-annual Union programme and Article 2 and Article 7 paragraph (3) of this Decision. It is intended to specify which reseach surveys at sea set out in Table 10 of the multi-annual Union programme will be carried out. Member States shall specify whether the research survey is included in Table 10 of the multi-annual Union programme or whether it is an additional survey.

Blue whiting survey

1. Objectives of the survey:

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.

2. Description of the methods used in the survey. For mandatory surveys, link to the manuals. Include a graphical representation (map)

Survey methods applied during the survey are provided in the survey cruise report (http://hdl.handle.net/10793/1148) and detailed in the Manual for International Pelagic Surveys (http://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%209%20Manual%20for%20International%20Pelagic%20Surveys%20(IPS).pdf).
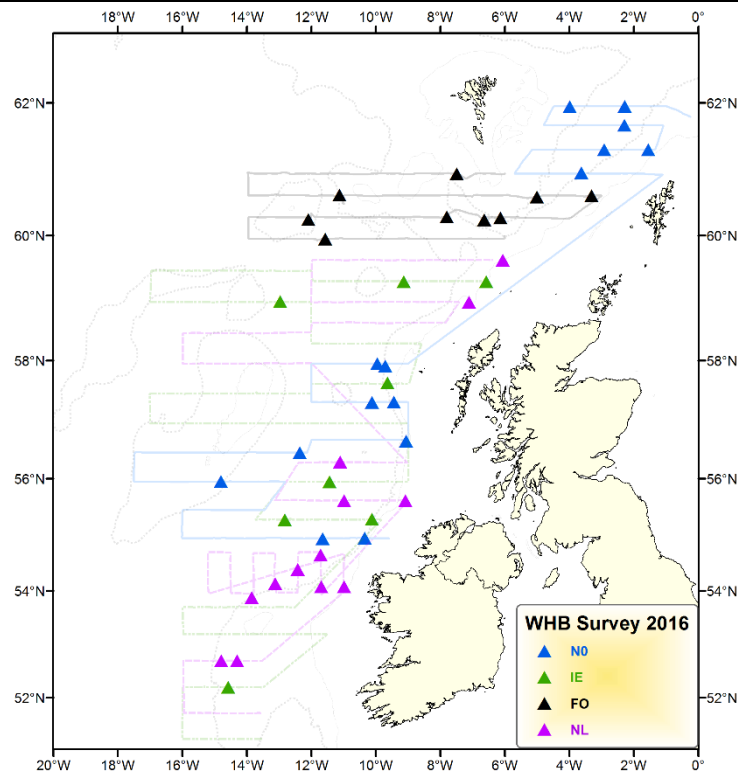
Figure 2. 2016 Blue whiting survey cruise track by nation and trawl stations (triangle).

3. For internationally coordinated surveys, describe the participating Member States/vessels and the relevant international group in charge of planning the survey.

The survey is coordinated by WGIPS through by the IBWSS survey coordinator. Details of the IBWSS area, participant countries are latest stock estimate of provided in the WGIPS report. (http://www.ices.dk/community/groups/Pages/WGIPS.aspx).

4. Where applicable, describe the international task sharing (physical and/or financial) and the cost sharing agreement used

Data is shared internationally between participant countries. International data is compiled to produce acoustic abundance and biomass for blue whiting. Denmark provides a scientist annually to participate in this survey as art of a cost sharing agreement.

5. Explain where thresholds apply

Share of Union TAC for target species is above 3%

 (max 450 words per survey)

6. Irish blue whiting acoustic survey (BWAS) 2017. Transect effort (green line) and numbered trawl station position.
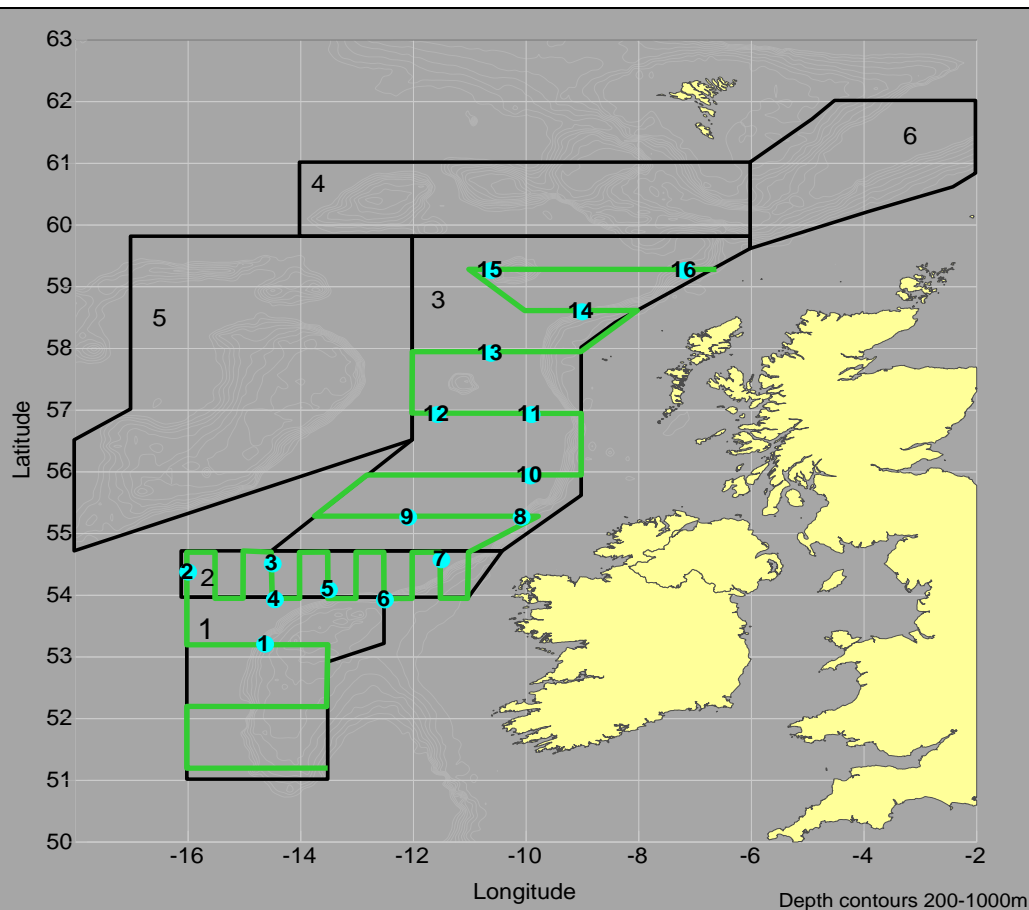
Depth contours 200-1000m

7. Here is the link to Latest WGIPS report. WGIPS coordinates all acoustic pelagic surveys across the EU. http://ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/EOSG/2018/WGIPS/WGIPS%20report%202018.pdf

Also, here is a link to the Irish Blue whiting cruise report: http://hdl.handle.net/10793/1319

8. List the main use of the results of the survey (e.g. indices, abundance estimates, environmental indicators).
   - Age stratified estimate of relative abundance of blue whiting submitted to WGWIDE annually. Combined data inputs (Ireland, Netherlands, Norway, and Faroe) contribute towards management and catch advice for this international cross boundary stock.
   - Biological samples are collected from directed trawling on fish echotraces to determine age structure and maturity state of survey stock.
   - Collect physical oceanography data as horizontal and vertical profiles from a deployed sensor array. All hydrographic, biological and oceanographic data is uploaded to the internationally coordinated database.
   - Visual abundance surveys of marine mammals and seabirds in conjunction with passive acoustic monitoring of marine mammals. It is envisaged that this data will be analysed in the future and the seabird abundance (birds per km travelled), and seabird density (birds per km²) will be mapped per ¼ ICES square (15° latitude x 30° longitude), allowing comparison to the results of previous seabird surveys in the waters around Ireland. .

All data collected on this survey is used annually for internationally coordinated assessments and is used routinely at a national level.

9. Extended comments (Tables 1G and 1H)
If the Member State has extended AR Comments, these can be placed under this section. If this is the case, a reference to this text box should be provided in the corresponding tables.

NA

(max 450 words per survey)

International Mackerel and Horse Mackerel Egg Survey (Triennial) MEGS

1. Objectives of the survey: The surveys are carried out over a six month period every three years and provide the main fishery independent data for the assessment programme. Members 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.

2. Description of the methods used in the survey.

The surveys are carried out over a number of time periods and areas between January and the end of July. Participants are given time periods and areas within which to work. The survey is adaptive and participants are requested to cover their areas on alternate transects on a first pass, filling in any gaps where time allows. During each survey double oblique plankton tows are carried out every ICES half statistical rectangle, either to within 5m of the bottom or to a maximum depth of 200m. These plankton tows are sorted and mackerel and horse mackerel eggs are extracted, counted and development stage recorded. Adult fish are collected at various latitudes for histology sample collection. The protocols used on the survey can be found in http://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%206%20-%20MEGS%20V1.3.pdf#search=sisp%206 . Procedures for fecundity sampling can be found in

Fig 3 MEGS 2016 stations

3. For internationally coordinated surveys, describe the participating Member States/vessels and the relevant international group in charge of planning the survey: The participating states are Ireland, Scotland, Netherlands, Germany, Spain (IEO), Spain (AZTI), Portugal, Iceland, and Faroes, working either on national research or commercially chartered vessels. The survey programme is coordinated by WGMEGS.

4. Where applicable, describe the international task sharing (physical and/or financial) and the cost sharing agreement used: Participants carry out between one and three surveys. Each member analyses their own egg

samples. Fecundity samples are pooled and analysed by five participants.

5. Explain where thresholds apply:

Share of Union TAC for target species is above 3%

(max 450 words per survey)

The International Mackerel and Horse Mackerel Egg Survey, is scheduled to take place in 2019, in accordance with its internationally coordinated and agreed Triennial survey cycle.

General Comment: This Box fulfills Chapter IV of the multi-annual Union programme and Article 2 and Article 7 paragraph (3) of this Decision. It is intended to specify which reseach surveys at sea set out in Table 10 of the multi-annual Union programme will be carried out. Member States shall specify whether the research survey is included in Table 10 of the multi-annual Union programme or whether it is an additional survey.

Spawning/Pre spawning Herring/Boarfish acoustic survey (WESPAS component)

1. Objectives of the survey:

The primary objective of the survey is to provide an age stratified abundance and biomass index for target species observed over the survey area. For the WESPAS survey this represents; spawning/pre-spawning aggregations of boarfish and feeding aggregations of Malin Shelf herring. In addition data is collected on the hydrographic conditions encountered over the survey area alongside seabird and marine mammal abundance surveys.

2. Description of the methods used in the survey. For mandatory surveys, link to the manuals. Include a graphical representation (map).

Survey methods applied during the survey are provided in the survey cruise report and detailed in the Manual for International Pelagic Surveys (http://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%209%20Manual%20for%20International%20Pelagic%20Surveys%20(IPS).pdf)

Figure 4 Spawning/Pre spawning Herring/Boarfish acoustic survey (WESPAS component) survey track 2016.
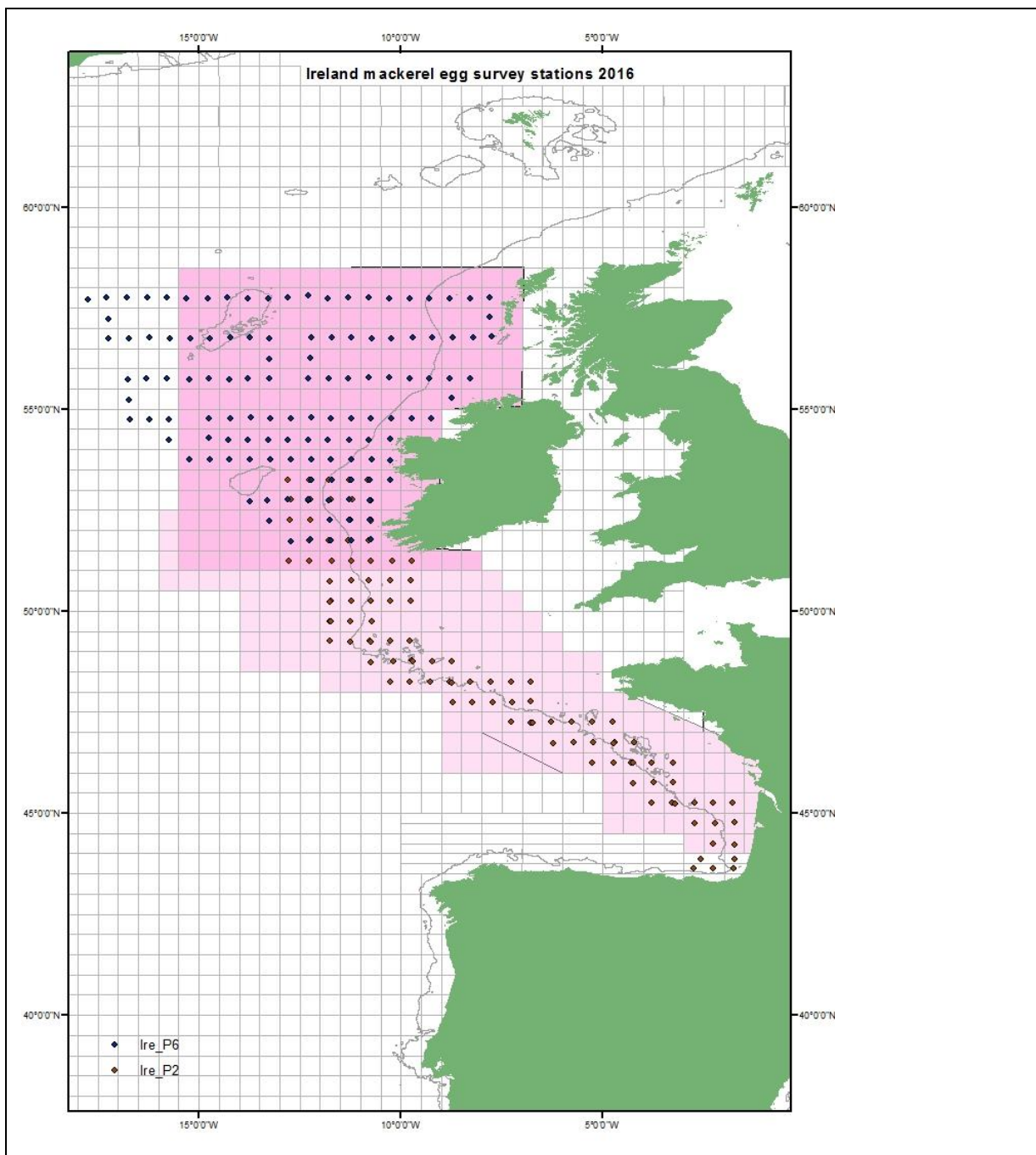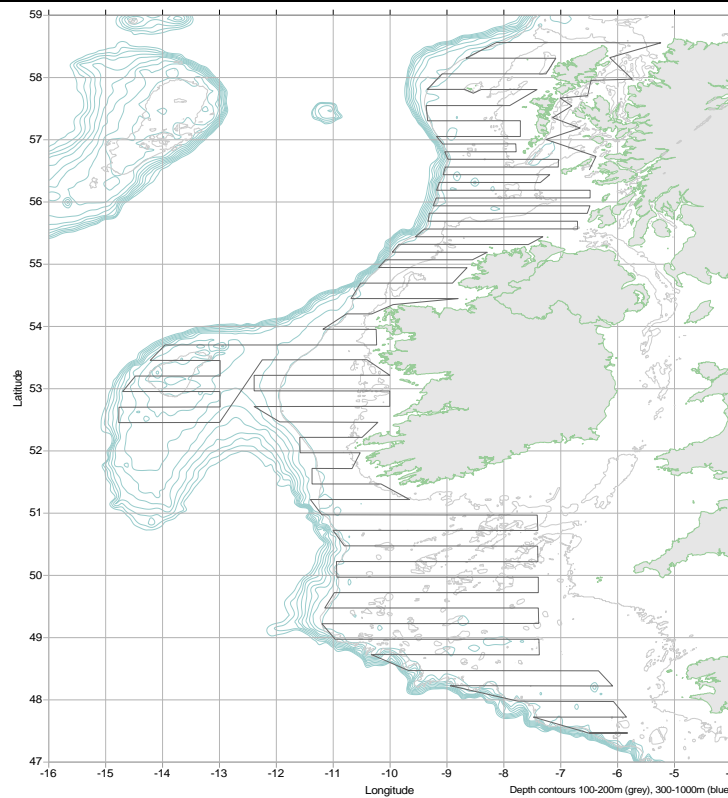
3. For internationally coordinated surveys, describe the participating Member States/vessels and the relevant international group in charge of planning the survey.

The herring component of the survey is coordinated by WGIPS through by the HERAS survey coordinator. This position is rotated every four years within HERAS member countries. Details of the current HERAS coordinator and latest work schedule is provided in the latest WGIPS report (http://www.ices.dk/community/groups/Pages/WGIPS.aspx)

4. Where applicable, describe the international task sharing (physical and/or financial) and the cost sharing agreement used.

The herring component of the survey is coordinated by WGIPS through by the HERAS survey coordinator. Data is shared internationally between participant countries. International data is compiled to produce acoustic abundance and biomass for herring. Details of the HERAS area, participant countries are latest stock estimate of provided in the WGIPS report.(http://www.ices.dk/community/groups/Pages/WGIPS.aspx)

5. Explain where thresholds apply

Share of Union TAC for target species is above 3%

6. Irish WESPAS acoustic survey (WESPAS) 2017. Transect effort and trawl station position.
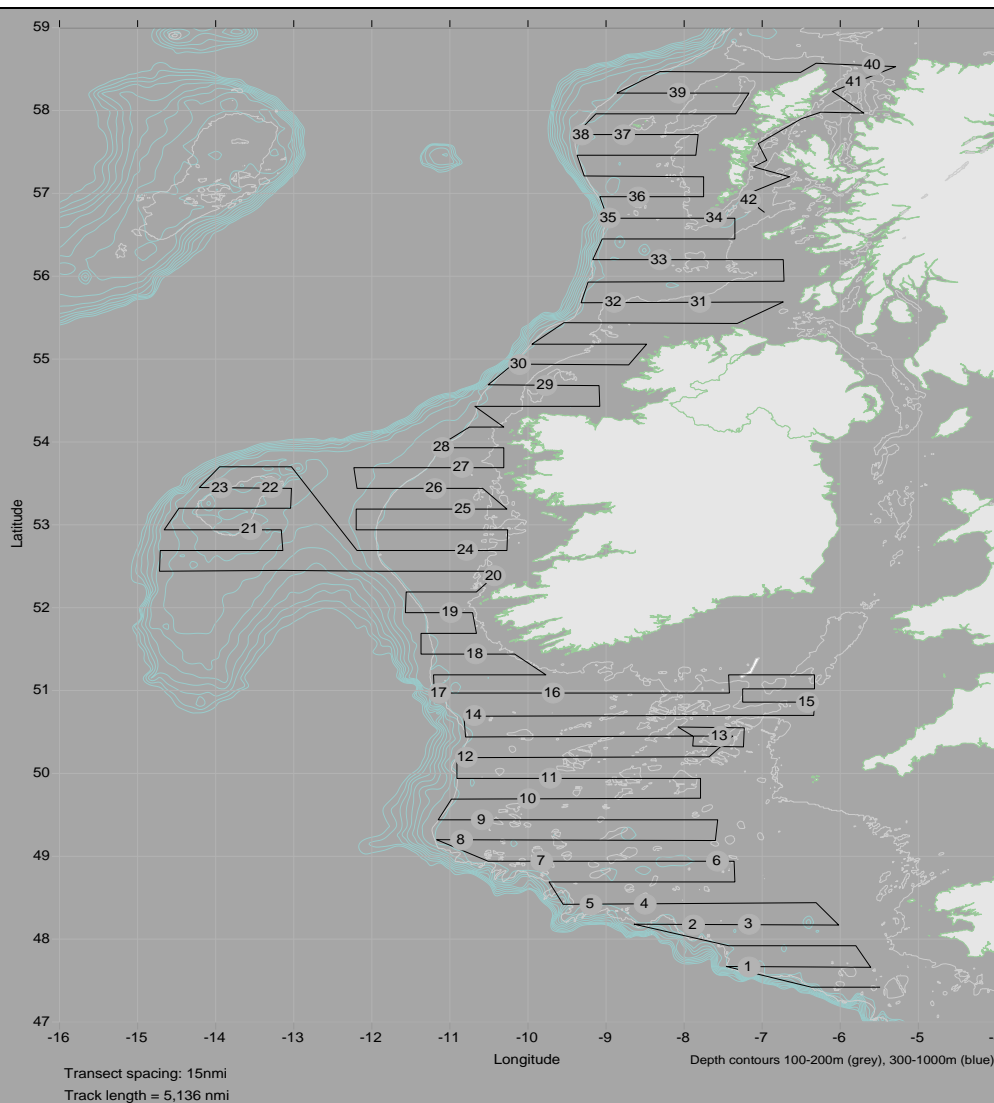
Transect spacing: 15nmi
Track length = 5,136 nmi

7. Here is the link to Latest WGIPS report. WGIPS coordinates all acoustic pelagic surveys across the EU. http://ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/EOSG/2018/WGIPS/WGIPS%20report%202018.pdf

Also, here is a link to the Irish WESPAS cruise report: http://hdl.handle.net/10793/1326

8. List the main use of the results of the survey (e.g. indices, abundance estimates, environmental indicators).

- Split-beam acoustic data on boarfish, herring and horse mackerel feeding and spawning aggregations within a pre-determined survey area. Used Annually by WGWIDE to provide assessment and management advice. Also used routinely at a national level.
- Age stratified estimate of biomass and abundance for the above target species from survey data, Submitted to WGWIDE and used annually in the assessment, Also used routinely at a national level.
- Collect biological samples from directed trawling on fish echotraces to determine age structure and maturity state of target stocks, submitted to WGWIDE and used annually in the assessment, Also used routinely at a national level.
- Morphometric and genetic samples of individual herring in 6a/7b, c for stock identification analysis. These fish are processed according to SGHERWAY procedures (ICES 2010).
- CTD casts to determine hydrographic conditions and the extent of shelf frontal regions, used routinely on a national level   All hydrographic, biological and oceanographic data is uploaded to the internationally coordinated database.

- Collect plankton samples using dedicated vertical trawls to determine biomass of zooplankton and the spatial extent of areas of concentration, as part of an on – going project, at national level.

9. Extended comments (Tables 1G and 1H)
If the Member State has extended AR Comments, these can be placed under this section. If this is the case, a reference to this text box should be provided in the corresponding tables.

NA

(max 450 words per survey)

General Comment: This Box fulfills Chapter IV of the multi-annual Union programme and Article 2 and Article 7 paragraph (3) of this Decision. It is intended to specify which reseach surveys at sea set out in Table 10 of the multi-annual Union programme will be carried out. Member States shall specify whether the research survey is included in Table 10 of the multi-annual Union programme or whether it is an additional survey.

Spawning/Pre spawning Herring/Boarfish acoustic survey: (Celtic Sea Herring Acoustic Survey Component CHAS)

1. Objectives of the survey:

The objective of the survey is to provide an age stratified abundance and biomass index for pre-spawning /spawning aggregations of herring observed over the survey area.

2. Description of the methods used in the survey. For mandatory surveys, link to the manuals. Include a graphical representation (map).

Details of survey methods outlined in the CSHAS cruise report (http://hdl.handle.net/10793/1143) and detailed in the Manual for International Pelagic Surveys (http://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%209%20Manual%20for%20International%20Pelagic%20Surveys%20(IPS).pdf
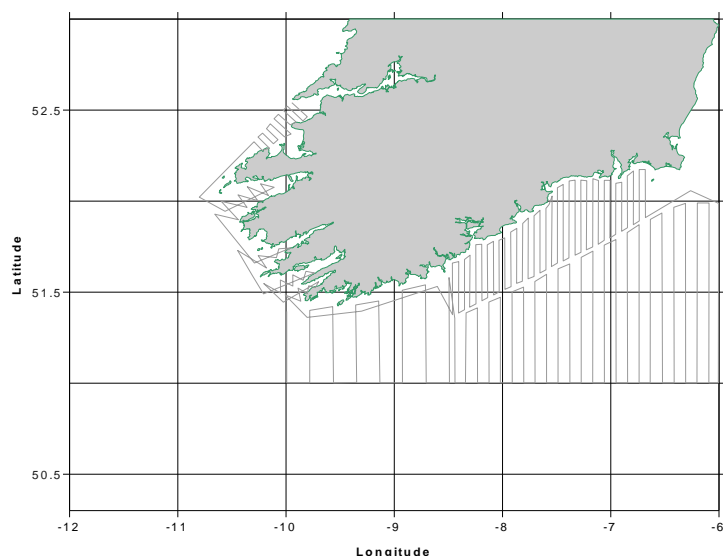

Figure 5 CSHAS survey cruise track 2015.

3. For internationally coordinated surveys, describe the participating Member States/vessels and the relevant international group in charge of planning the survey

NA

4. Where applicable, describe the international task sharing (physical and/or financial) and the cost sharing agreement used

N/A

5. Explain where thresholds apply

Share of Union TAC for target species is above 3%

(max 450 words per survey)

6. Irish Celtic Sea herring acoustic survey (CSHAS) 2017. Transect effort (coloured lines) and trawl station positions.
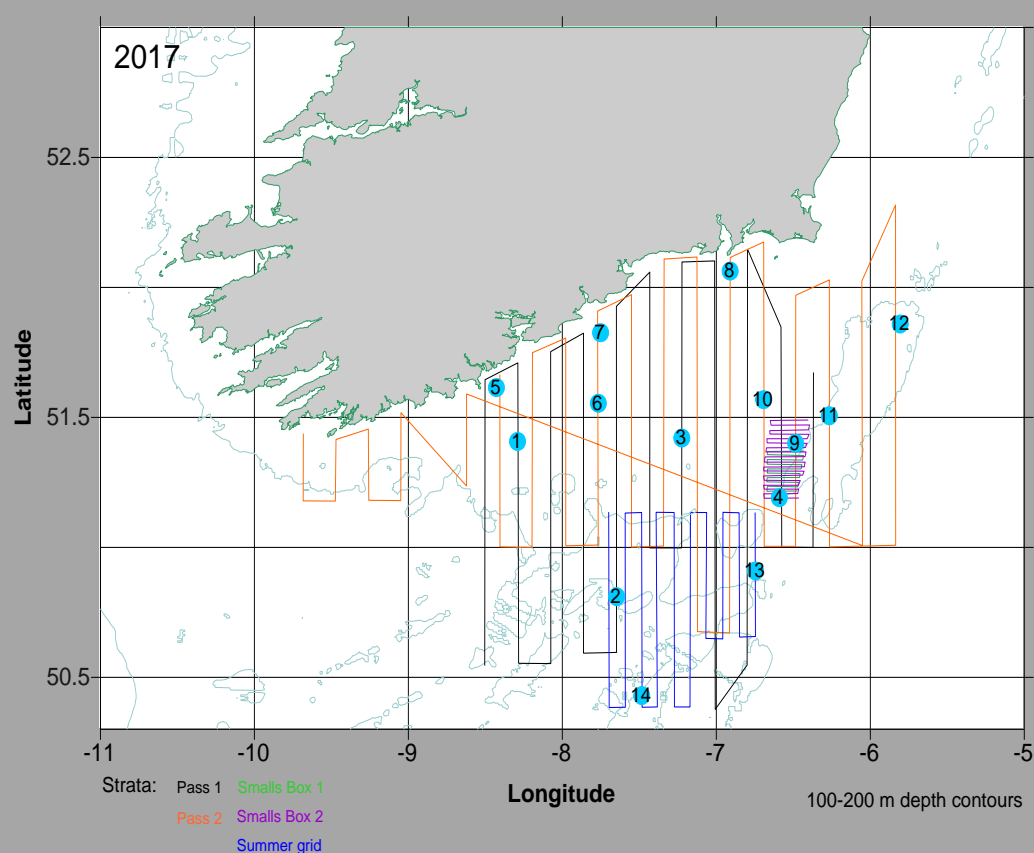
7. Here is the link to Latest WGIPS report. WGIPS coordinates all acoustic pelagic surveys across the EU. http://ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/EOSG/2018/WGIPS/WGIPS%20report%202018.pdf
Also, here is a link to the Irish WESPAS cruise report: http://hdl.handle.net/10793/1338

8. List the main use of the results of the survey (e.g. indices, abundance estimates, environmental indicators). Member State shall specify in which context the results are used (on routine basis), both on an international as

well as on a national context.

- Carry out a two phase survey cruise track covering the core survey area and Investigate high abundance herring aggregations using adaptive survey techniques. Acoustic data is submitted to WGWIDE annually and contributes towards assessment and management advice.
- Use the EM 2040 Bathymetric multibeam to map the extent of herring aggregations during adaptive surveys, This data was of particular interest and relevance Nationally and is frequently used,
- Collect biological samples from directed trawling on insonified fish echotraces to determine age structure and maturity state of the herring stock. Biological data submitted to WGWIDE on an annual basis and contributes towards the development of assessment and management advice.
- Determine an age stratified estimate of relative abundance of herring within the survey area (ICES Divisions VIIj, VIIg and VIIaS). . Biological data submitted to WGWIDE on an annual basis and contributes towards the development of assessment and management advice.
- Determine estimates of biomass and abundance for sprat within the survey area. Of interest nationally and used frequently
- Collect physical oceanography data from vertical profiles from a deployed sensor array. All hydrographic, biological and oceanographic data is uploaded to the internationally coordinated database.
- Survey by visual observations: marine mammal, surface litter and seabird abundance and distribution. It is envisaged that this data will be analysed in the future and the seabird abundance (birds per km travelled), and seabird density (birds per km²) will be mapped per ¼ ICES square (15° latitude x 30° longitude), allowing comparison to the results of previous seabird surveys in the waters around Ireland. .

9. Extended comments (Tables 1G and 1H)
If the Member State has extended AR Comments, these can be placed under this section. If this is the case, a reference to this text box should be provided in the corresponding tables.

NA

 (max 450 words per survey)

General Comment: This Box fulfills Chapter IV of the multi-annual Union programme and Article 2 and Article 7 paragraph (3) of this Decision. It is intended to specify which reseach surveys at sea set out in Table 10 of the multi-annual Union programme will be carried out. Member States shall specify whether the research survey is included in Table 10 of the multi-annual Union programme or whether it is an additional survey.

Nephrops UWTV surveys-

These are not as described in Annex 1 but are re arranged following the recommendations in http://oar.marine.ie/bitstream/10793/863/1/SGNEPS12%5B1%5D.pdf where the Irish survey effort was moved from ICES division VIIa and extended in to VIIbcjk and VIIfgh

1. Objectives of the survey:

a) To obtain quality assured estimates of *Nephrops* burrow densities for the following Functional Units FU16, 17, 19, 20-21 and 22. The number of random stations should be sufficient to cover adequately the known spatial a bathymetric of the stock and should ensure a CV of less than 20% for the total abundance estimate as recommended by WGNEPS.

b) To collect ancillary information from the UWTV footage collected at each station such as the occurrence of sea-pens, other macro benthos and fish species and trawl marks on the sea bed.

c) To collect oceanographic data using a sledge mounted CTD.

d) To opportunistically sample *Nephrops* and macro benthos using a 4 m beam trawls.

2. Description of the methods used in the survey.

Methods used on the surveys is described here: http://oar.marine.ie/handle/10793/59

The survey is typically carried out between June and August over 3 legs of 10-12 days each.
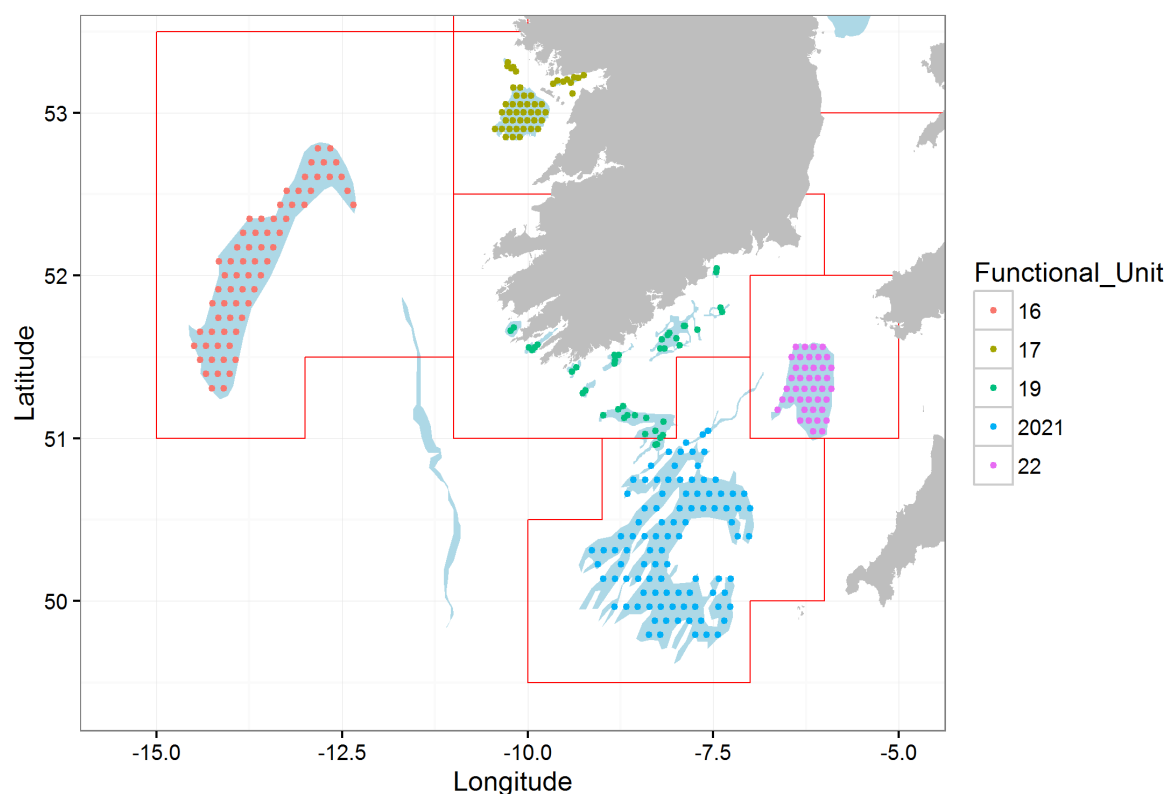
Fig 6 Planned station positions for 2016 Irish UWTV surveys.

5. For internationally coordinated surveys, describe the participating Member States/vessels and the relevant international group in charge of planning the survey

These surveys are co-ordinated internationally by WGNEPS http://www.ices.dk/community/groups/Pages/WGNEPS.aspx

4. Where applicable, describe the international task sharing (physical and/or financial) and the cost sharing agreement used

The Marine Institute task shares with the UK and France by exchanging staff between Irish UWTV surveys and those in FU14, 15 and 23.

5. Explain where thresholds apply

Share of Union TAC for target species is above 3%

(max 450 words per survey)

6. Irish Nephrops UWTV surveys. 2017 UWTV station positions
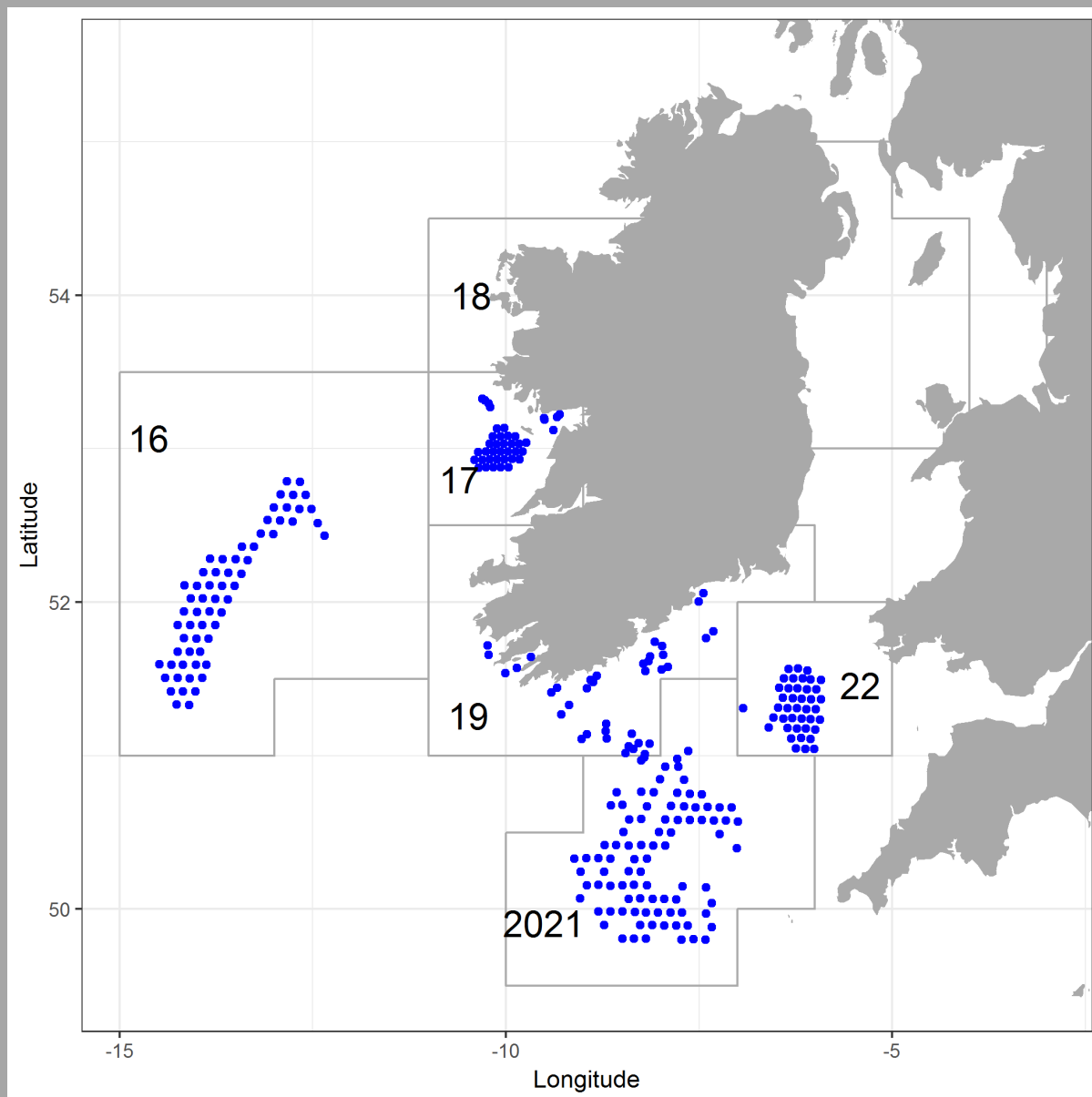
7. Here is the link to the WGNEPHS most recent report: http://ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/SSGIEOM/2017/WGNEPS/WGNEPS%20Report%202017.pdf

And here also are the individual Irish *Nephrops* survey cruise reports:
FU16 *Nephrops* UWTV Survey 2017: https://oar.marine.ie/handle/10793/1334
FU17 *Nephrops* UWTV Survey 2017: https://oar.marine.ie/handle/10793/1335
FU19 *Nephrops* UWTV Survey 2017: https://oar.marine.ie/handle/10793/1332
FU2021 *Nephrops* UWTV Survey 2017: https://oar.marine.ie/handle/10793/1330
FU22 *Nephrops* UWTV Survey 2017: https://oar.marine.ie/handle/10793/1331

8. List the main use of the results of the survey (e.g. indices, abundance estimates, environmental indicators).

Member State shall specify in which context the results are used (on routine basis), both on an international as

well as on a national context.

Obtain quality assured estimates of *Nephrops* burrow densities from a randomised isometric grid of UWTV stations at 6 nautical mile spacing over the known spatial and bathymetric distribution of the stock. This data is submitted to WGCSE on an annual basis to contribute to stock assessment and management advice and also to WGNEPS annually, for coordination and quality control purposes. The data is of great interest nationally and is used routinely.

2. To collect ancillary information from the UWTV footage collected at each station such as the occurrence of sea-pens, other macro benthos and fish species and trawl marks on the sea bed. Sea-pens and burrowing megafauna communities have been listed by OSPAR as threatened and/or declining species and habitats All sea pen data is available and used routinely by national researchers.

3. To collect oceanographic data using a sledge mounted CTD. All hydrographic data is made available and is used routinely by national researchers.

9. Extended comments (Tables 1G and 1H)
If the Member State has extended AR Comments, these can be placed under this section. If this is the case, a reference to this text box should be provided in the corresponding tables.

NA

(max 450 words per survey)

Irish Anglerfish and Megrim Survey (IAMS)

Not included in table 10.

1. Objectives of the survey:

The main objective of the survey is to obtain biomass estimates for anglerfish and establish an abundance index for megrim in VIa and VII. Secondary objectives are to collect data on the distribution and relative abundance of anglerfish, megrim and other commercially exploited species. The survey also collects maturity and biological information for commercial fish species.

2. Description of the methods used in the survey. The trawl survey takes place in areas VIa and VII at depths from around 150m to 1000m and uses a bottom trawl which is based on commercial monkfish trawls. The survey operates 24 hours per day with 1-hour tows. The sampling protocol is focused on monkfish and megrim

but maturity data of other 'commercial' species are also collected. The beam trawl survey extends the existing Cefas Endeavour Q2 Beam Trawl Survey westwards. This survey also operates 24 hours per day using two 4m beam trawls with 30-minute tows.

Station positions, heading and bottom depth were recorded at the moment the gear settled on the bottom and when the gear was hauled back. Tide and wind direction and speed, barometric pressure, heave, pitch and roll were recorded at the mid-point in the tow. Bottom depth and GPS position are also recorded in a SQL database at intervals of approximately 1 per second.

Catch weights, length frequency distributions and biological data (sex, live weight, maturity, age) were captured using the CEFAS Electronic Data Capture (EDC) system and stored into local Access '97 databases before being imported into a central SQL database. The CEFAS software FSS (Fishing Survey System) was used to enter station data and import catch data.
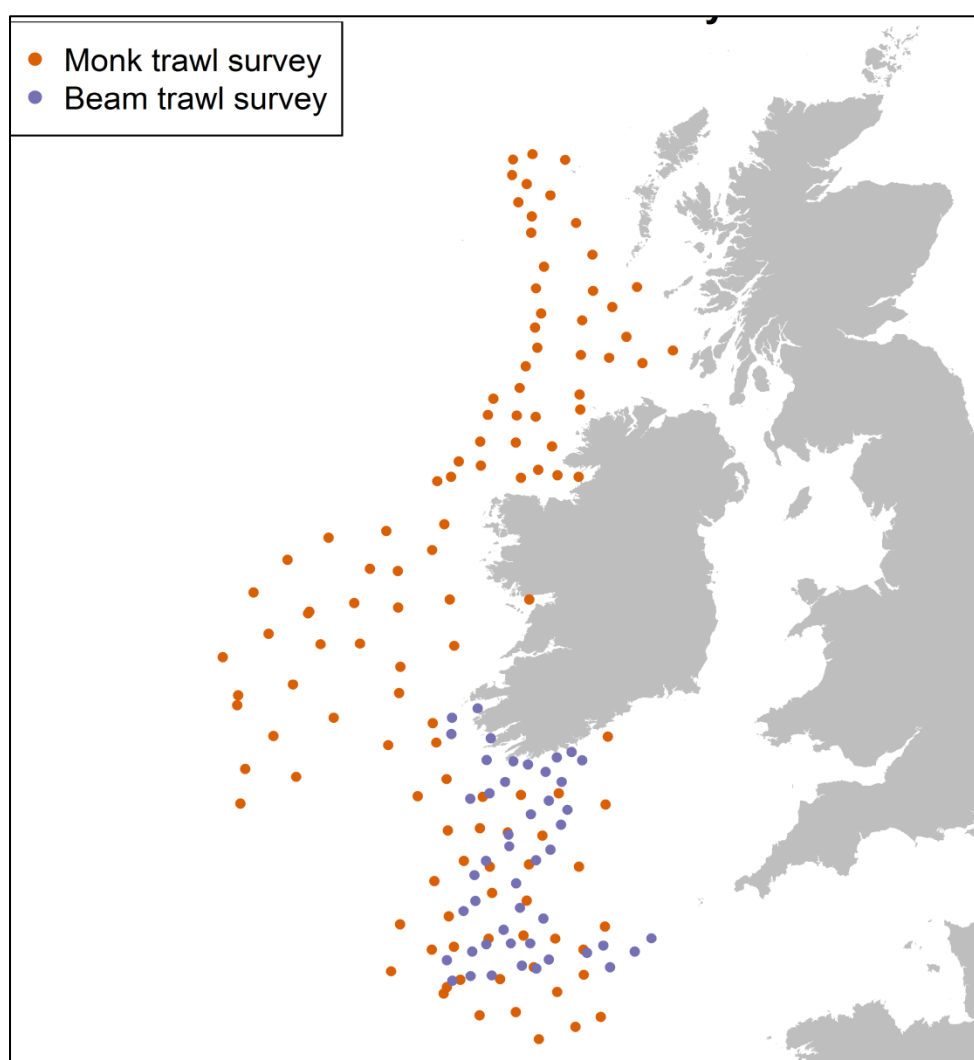
Fig 7. Completed stations from 2016 Irish Anglerfish and Megrim Survey

3. For internationally coordinated surveys, describe the participating Member States/vessels and the relevant international group in charge of planning the survey:

The survey is not formally coordinated at present. However the monkfish trawl part of the survey will be

coordinated by IBTSWG and the beam trawl part of the survey will be coordinated by WGBEAM in 2017.

4. Where applicable, describe the international task sharing (physical and/or financial) and the cost sharing agreement used:

The trawl survey will complement the Scottish monkfish survey in IV, VI, completing the spatial coverage in the south of VI. The beam trawl survey will extend the existing Cefas Endeavour Q2 Beam Trawl Survey westwards across the Celtic Sea.

5. Explain where thresholds apply

Share of Union TAC for target species is above 3%

(max 450 words per survey)

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6.   IAMS Survey track 2017, with valid tow positions, the numbers refer to the haul number
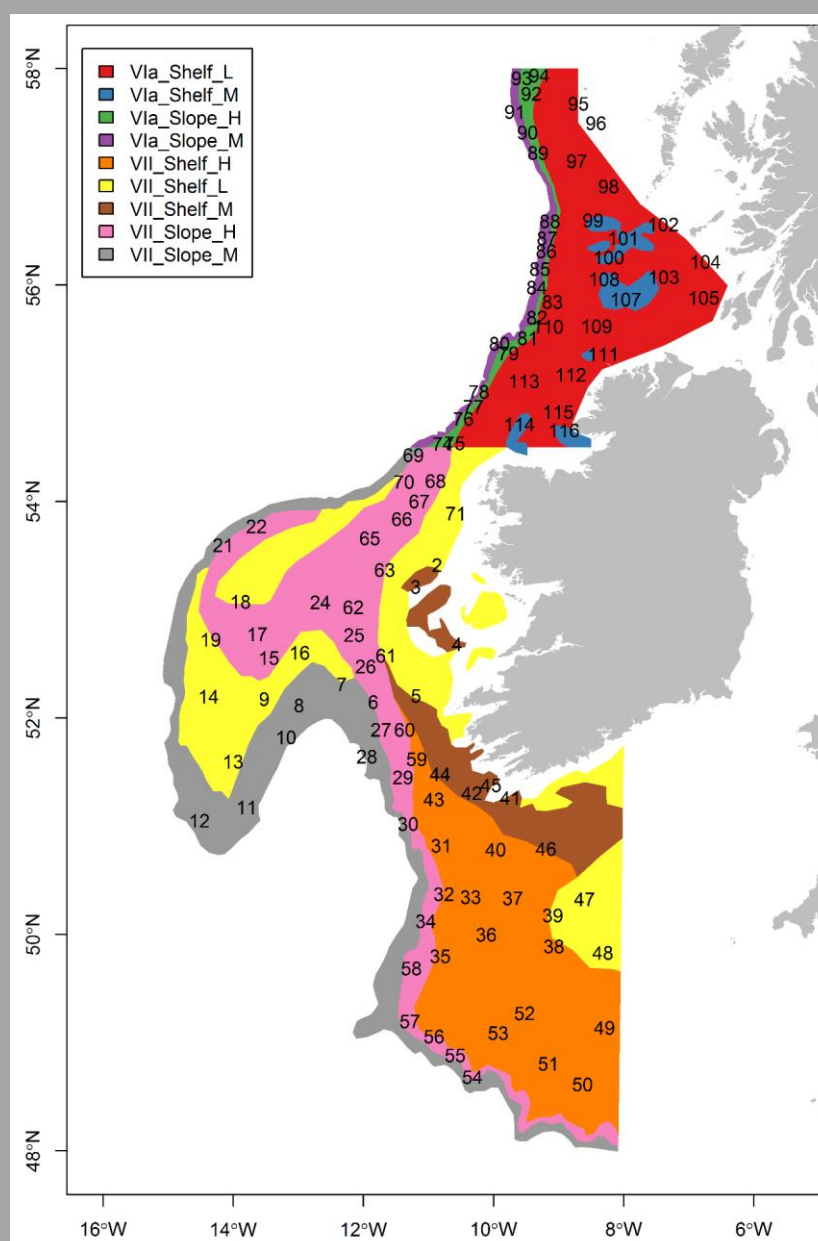
7. For internationally coordinated surveys, provide a link to the latest meeting report of the coordination group.

The IAMS survey is internationally coordinated with the Scottish Anglerfish and Megrim Survey (SIAMISS) and uses the same gear and fishing practices. The Beam trawl component of the survey is internationally coordinated through WGBEAM. Their latest report is available at: http://ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/SSGIEOM/2017/WGBEAM/WGBEAM%20report%202017.pdf

The IAMS cruise report is available at:

https://oar.marine.ie/bitstream/handle/10793/1348/Cruise%20Report%20IAMS%202017.pdf?sequence=1&isAllowed=y

8.   List the main use of the results of the survey (e.g. indices, abundance estimates, environmental indicators).

- Obtain biomass estimates for anglerfish (Lophius piscatorius and L. budegassa) and establish an abundance index for megrim (Lepidorhombus whiffiagonis and L. boscii) in areas 6a (south of 58°N) and 7 (west of 8°W).. Survey data is submitted to the International assessment working group dealing with monkfish and megrim, WGBIE annually and contributes to the production of assessment and management advice. The data is also used routinely at a national level. Ireland is working with ICES to enable upload of the IAMS data into the DATRAS database

- Secondary objectives are to collect data on the distribution and relative abundance of anglerfish, megrim and other commercially exploited species. The survey also collects maturity and other biological information for commercial fish species. This data is submitted to the relevant international assessment working groups, and is also of national importance and is used routinely. Ireland is working with ICES to enable upload of the IAMS data into the DATRAS database

- CTD stations, and litter data are also collected on board, and are available and used by national researchers. Ireland is working with ICES to enable upload of the IAMS data into the DATRAS database

9. Extended comments (Tables 1G and 1H)
If the Member State has extended AR Comments, these can be placed under this section. If this is the case, a reference to this text box should be provided in the corresponding tables.

NA

(max 450 words per survey)

Name of survey: Razor clam Irish Sea (RCIS)

1. Objectives of the survey

Estimation of biomass to provide catch advice. Monitoring of benthic habitats in the fished area. Correspondence between survey estimates and fishery dependent indicators

2. Description of the methods used in the survey. For mandatory surveys, link to the manuals. Include a graphical representation (map)

Stratified random based on high frequency iVMS data (Fig 7). Hydraulic dredge used for fish hauls. Day Grab for benthic grab samples. Enumeration of target species and other bivalves in by-catch. Size distributions target species. Marine Community assessment.

3. For internationally coordinated surveys, describe the participating Member States/vessels and the relevant international group in charge of planning the survey
NA

4. Where applicable, describe the international task sharing (physical and/or financial) and the cost sharing agreement used
NA

5. Explain where thresholds apply
NA
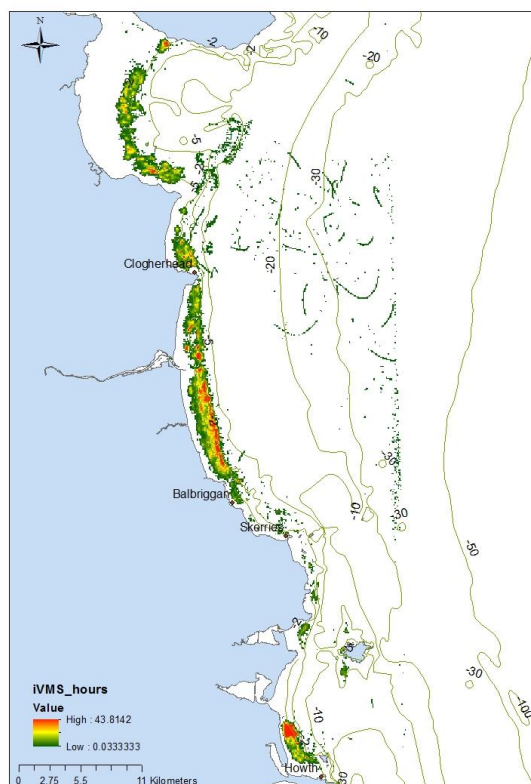
Fig 8. iVMS data showing distribution of Razor clam fishery in the north Irish Sea inside 10m depth contour.
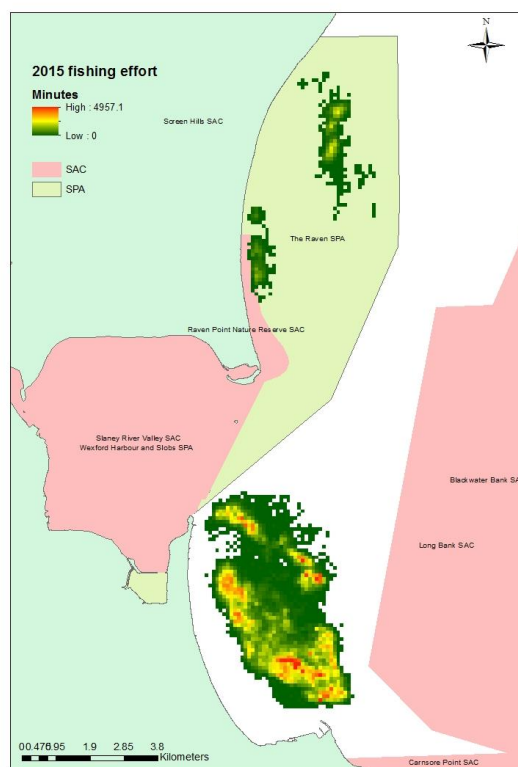
Fig 9. iVMS data showing distribution of Razor clam fishery in the south Irish Sea.

6.   Irish Sea Razor Clam survey sites 2017
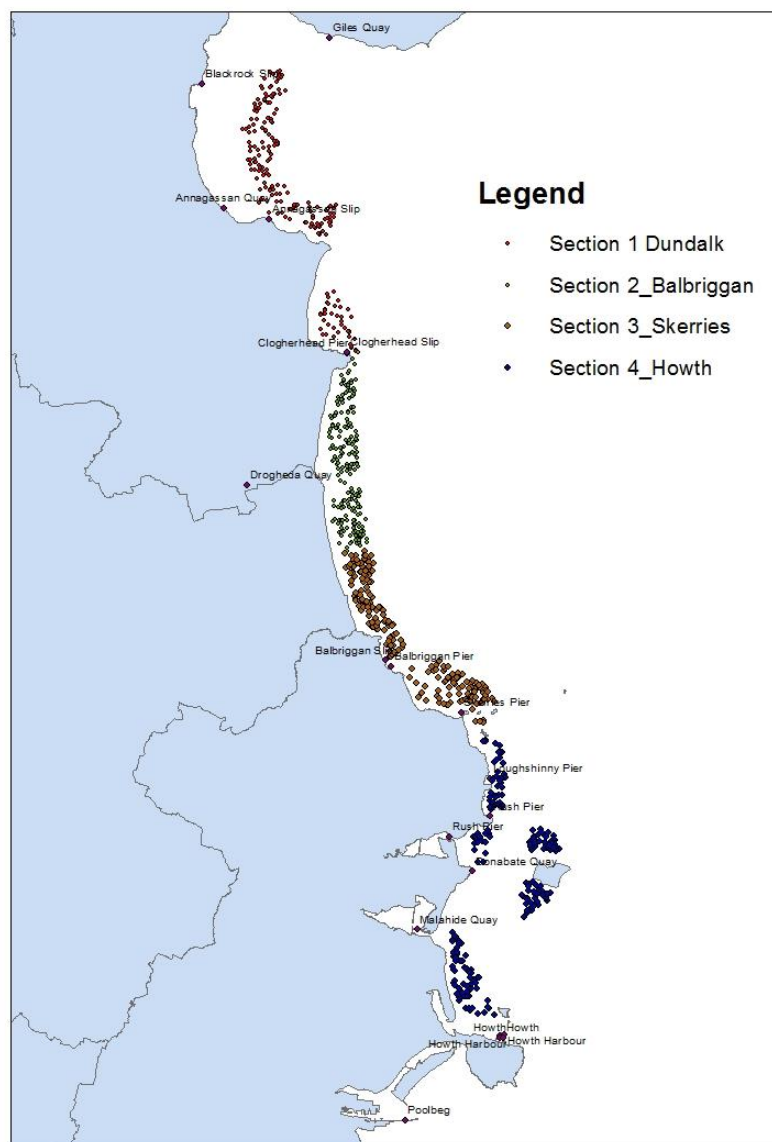
Legend
- Section 1 Dundalk
- Section 2_Balbriggan
- Section 3_Skerries
- Section 4_Howth

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

The Razor clam Irish Sea (RCIS) survey is not coordinated internationally. The RCIS survey report is available at: https://oar.marine.ie/handle/10793/1343 page 14 of the Shellfish Stocks and Fisheries Review publication..

8. List the main use of the results of the survey (e.g. indices, abundance estimates, environmental indicators).
- Obtain biomass estimates for razor clams (Ensis silique and Ensis arcuatus). 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.

47

- Calculate size and weight distribution: 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.

9. Extended comments (Tables 1G and 1H)
If the Member State has extended AR Comments, these can be placed under this section. If this is the case, a reference to this text box should be provided in the corresponding tables.

NA

(max 450 words per survey)

Name of survey: Razor Clam West Ireland (RCWI)

1. Objectives of the survey

Estimation of biomass to provide catch advice. Monitoring of benthic habitats in the fished area. Correspondence between survey estimates and fishery dependent indicators

2. Description of the methods used in the survey. For mandatory surveys, link to the manuals. Include a graphical representation (map)

Regular grid surveys or where available stratified surveys based on high frequency VMS data. Survey areas small <1 square kilometre for a number of locally distributed stocks. Hydraulic dredge used for fish hauls. Day Grab for benthic grab samples. Enumeration of target species and other bivalves in by-catch. Marine Community assessment.

No map available as locations are very local & dispersed

3. For internationally coordinated surveys, describe the participating Member States/vessels and the relevant international group in charge of planning the survey
NA

4. Where applicable, describe the international task sharing (physical and/or financial) and the cost sharing agreement used
NA

5. Explain where thresholds apply
NA

6. Razor Clam West of Ireland Survey (RCWI) stations 1:Inishkea
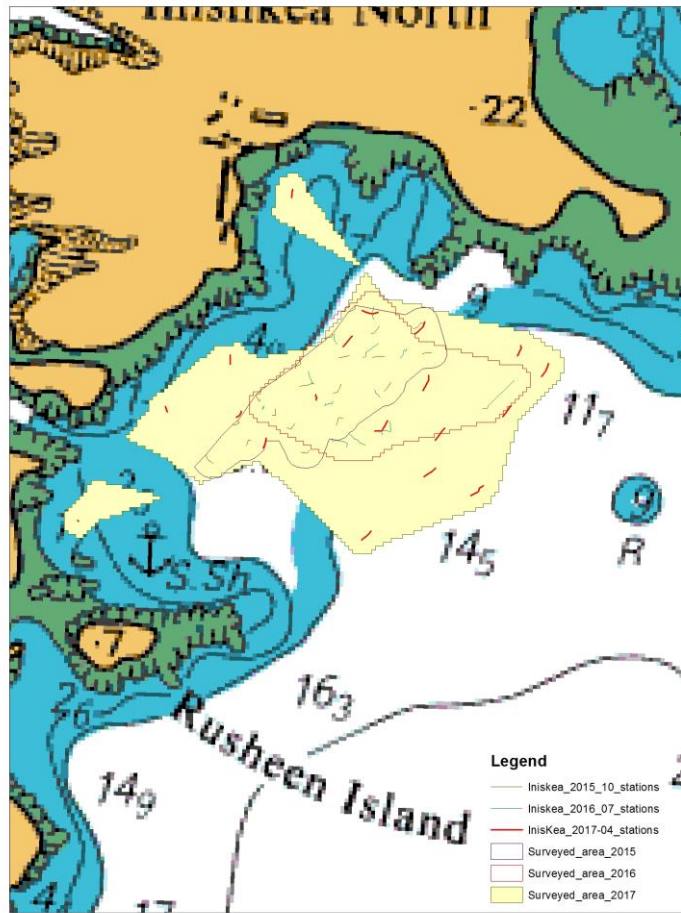
6.   Razor Clam West of Ireland Survey (RCWI) stations 2:Blacksod
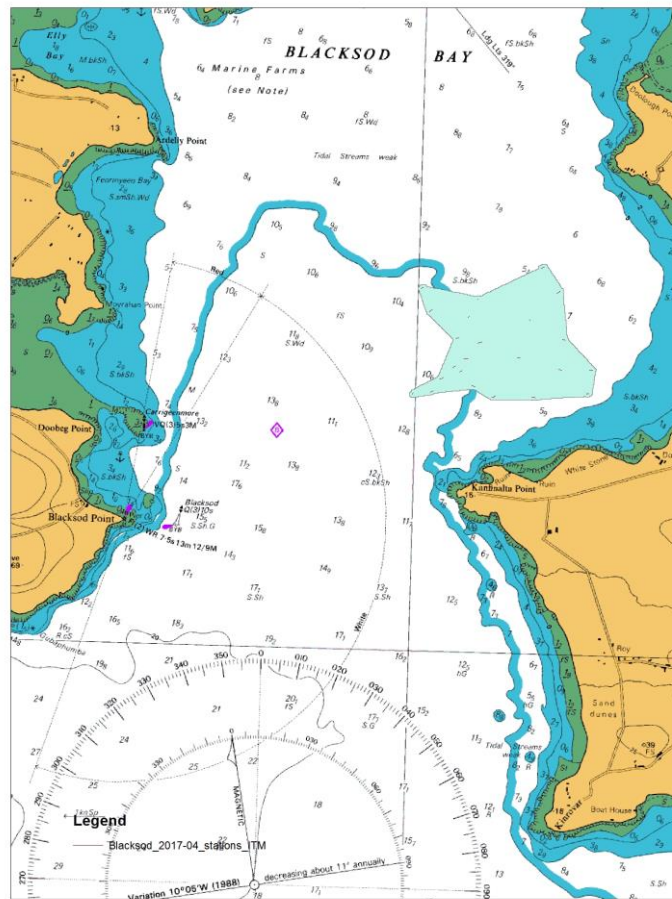
6.   Razor Clam West of Ireland Survey (RCWI) stations 3:Clifden Bay
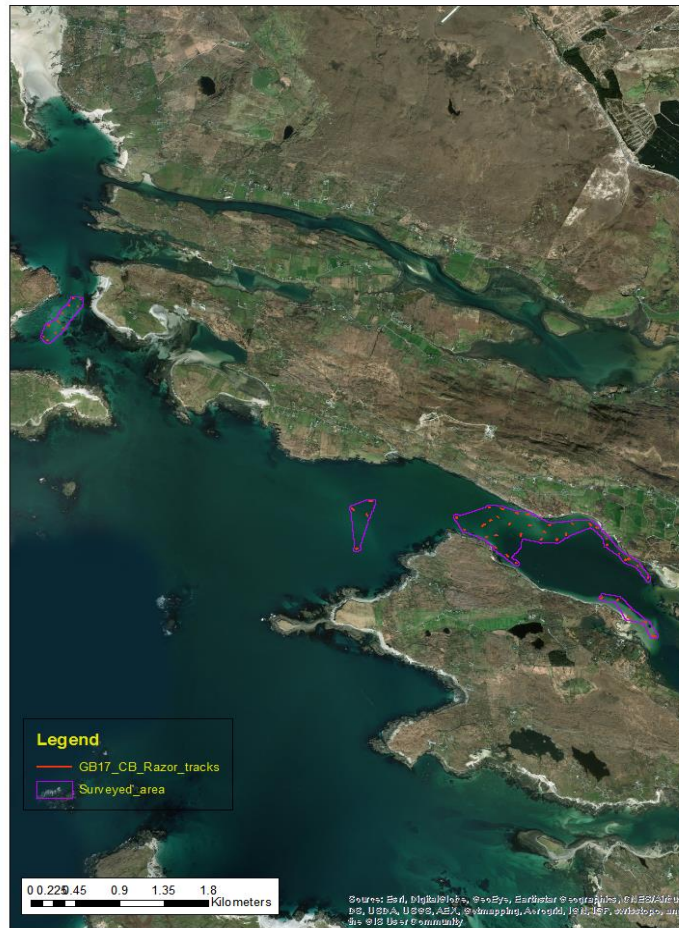
7. For internationally coordinated surveys, provide a link to the latest meeting report of the coordination group.

The Razor clam Irish Sea (RCIS) survey is not coordinated internationally. The RCWI survey report available at: https://oar.marine.ie/handle/10793/1343 page 24 of the Shellfish Stocks and Fisheries Review publication

8.   List the main use of the results of the survey (e.g. indices, abundance estimates, environmental indicators).

•   Obtain biomass estimates for razor clams (Ensis silique and Ensis arcuatus). 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.

•   Calculate size and weight distribution: 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.

 Member State shall specify in which context the results are used (on routine basis), both on an international as well as on a national context.

9. Extended comments (Tables 1G and 1H)
If the Member State has extended AR Comments, these can be placed under this section. If this is the case, a reference to this text box should be provided in the corresponding tables.

NA

(max 450 words per survey)

Name of survey: Scallop Inshore (SIS)

1. Objectives of the survey

Estimation of relative abundance and/or biomass in inshore scallop stocks west of Ireland

2. Description of the methods used in the survey. For mandatory surveys, link to the manuals. Include a graphical representation (map)

Regular grid surveys or where available stratified surveys based on high frequency VMS data or benthic habitats (sediments). Scallop dredge tows. Enumeration of target species and by-catch.

3. For internationally coordinated surveys, describe the participating Member States/vessels and the relevant international group in charge of planning the survey
NA

4. Where applicable, describe the international task sharing (physical and/or financial) and the cost sharing agreement used
NA

5. Explain where thresholds apply
NA

6. No survey was undertaken on scallop in 2017, as the scallop fisheries did not open.
7. For internationally coordinated surveys, provide a link to the latest meeting report of the coordination group.

    NA

8. List the main use of the results of the survey (e.g. indices, abundance estimates, environmental indicators).

9. Extended comments (Tables 1G and 1H)
If the Member State has extended AR Comments, these can be placed under this section. If this is the case, a reference to this text box should be provided in the corresponding tables.

The scallop inshore survey was not considered a national priority in relation to other survey work in 2017 and was not completed as resources were limited, and effort needed to be directed towards priority surveys.

(max 450 words per survey)

Name of 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 methods used in the survey. For mandatory surveys, link to the manuals. Include a graphical representation (map)

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

3. For internationally coordinated surveys, describe the participating Member States/vessels and the relevant international group in charge of planning the survey
NA

4. Where applicable, describe the international task sharing (physical and/or financial) and the cost sharing agreement used
NA

5. Explain where thresholds apply
NA

Fig. 12. Stratified random grid for cockle survey in Dundalk Bay SAC/SPA in north Irish Sea

6. Cockle North Irish Sea survey sites 2017
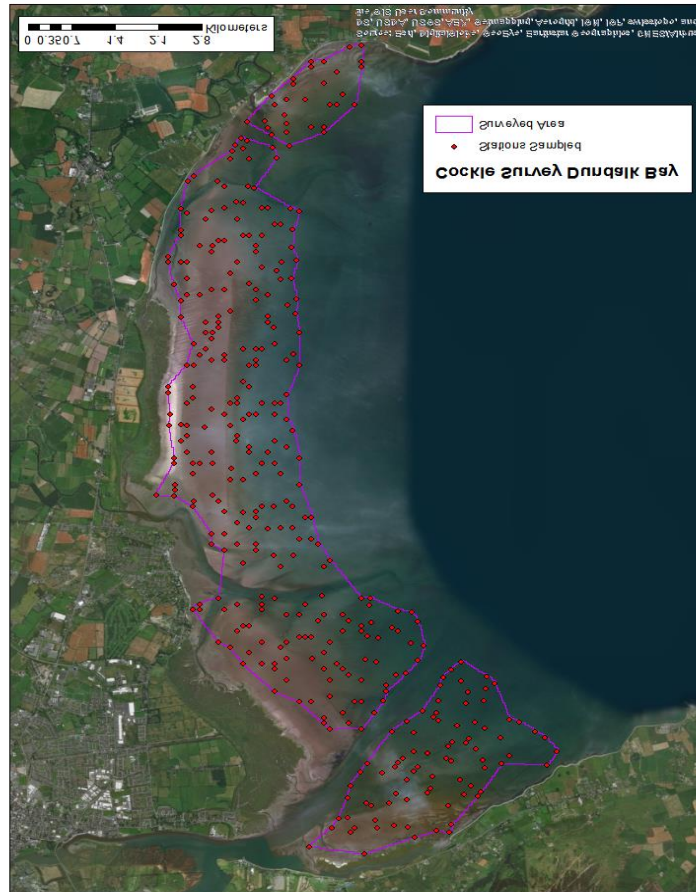
7. For internationally coordinated surveys, provide a link to the latest meeting report of the coordination group.

The Cockle North Irish Sea (CNIS) survey is not coordinated internationally. The CNIS survey report is available at: https://oar.marine.ie/handle/10793/1343 page 36 of the Shellfish Stocks and Fisheries Review publication..

8. List the main use of the results of the survey (e.g. indices, abundance estimates, environmental indicators).

- Obtain biomass estimates for cockle (Cerastoderma edule). 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.

- Calculate size and weight distribution: 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.

9 - Extended comments (Tables 1G and 1H)

If the Member State has extended AR Comments, these can be placed under this section. If this is the case, a

reference to this text box should be provided in the corresponding tables.

NA

(max 450 words per survey)

Name of survey: Oyster West Ireland (OWI)

2.   Objectives of the survey

Estimation of biomass to provide catch advice. Habitat assessment.

2. Description of the methods used in the survey. For mandatory surveys, link to the manuals. Include a graphical representation (map)

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

No map available as locations are very local & dispersed

3. For internationally coordinated surveys, describe the participating Member States/vessels and the relevant international group in charge of planning the survey
NA

4. Where applicable, describe the international task sharing (physical and/or financial) and the cost sharing agreement used
NA

5. Explain where thresholds apply
NA

6.   Oyster West of Ireland survey sites 2017: Galway Bay 1

6.	Oyster West of Ireland survey sites 2017: Galway Bay 2
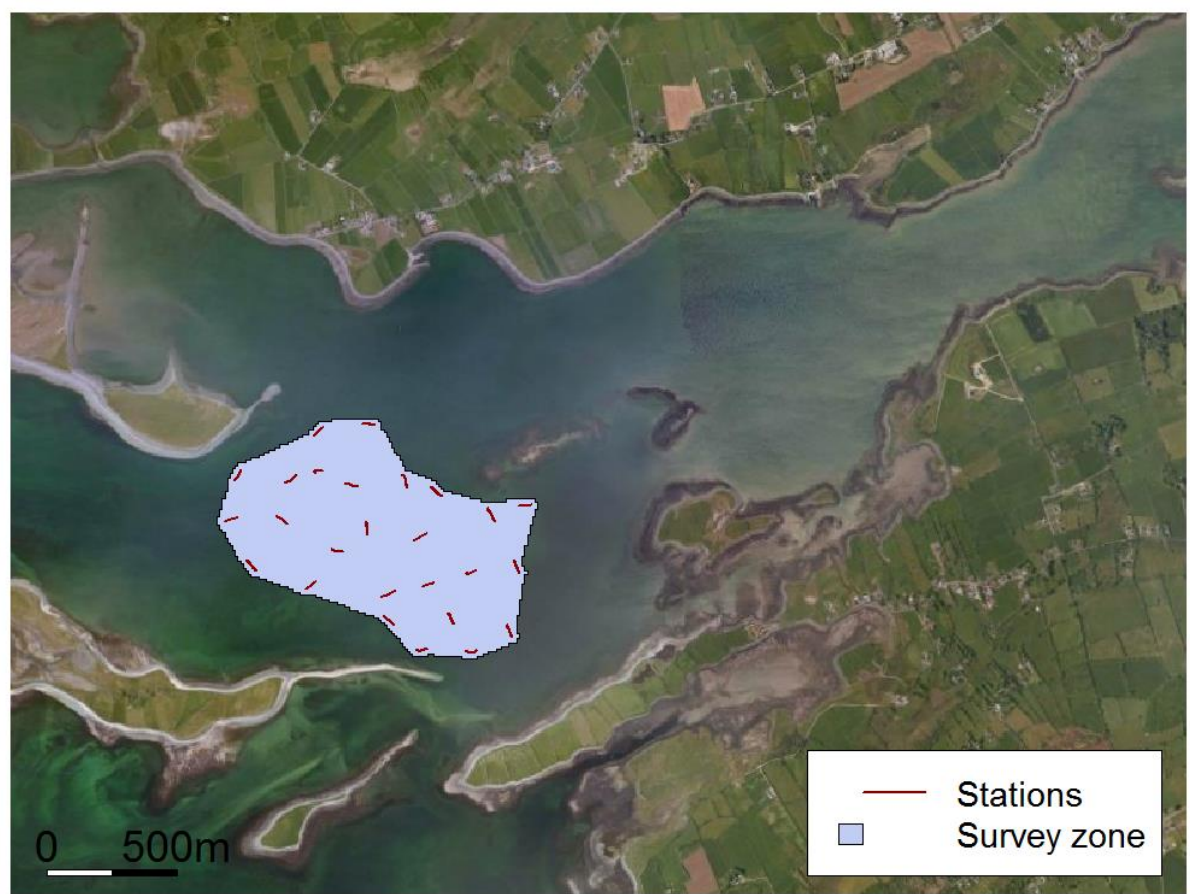
7.	List the main use of the results of the survey (e.g. indices, abundance estimates, environmental indicators). Member State shall specify in which context the results are used (on routine basis), both on an international as well as on a national context.

- Obtain biomass estimates for native oysters (Ostrea edulis). 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.

- Distribution and Biomass of naturalized pacific oysters (Magallana gigas). 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.

- Calculate size and weight distribution: 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.

9. Extended comments (Tables 1G and 1H)
If the Member State has extended AR Comments, these can be placed under this section. If this is the case, a reference to this text box should be provided in the corresponding tables.

NA

(max 450 words per survey)

Table 1H: Research survey data collection and dissemination

For details of data collection on board research surveys, please refer to Table 1H

SECTION 2: FISHING ACTIVITY DATA

Table 2A: Fishing activity variables data collection strategy

Table 2A contains details of Irelands fishing activity variables data collection.

Text Box 2A: Fishing activity variables data collection strategy

All variables were collected as planned in the AWP, with no deviations.

General comment: This box fulfills paragraph 4 of Chapter III of the multiannual Union programme and Article 2, Article 4 paragraph (2) point (b) and Article 5 paragraph (2) of the Decision (EU) 2016/1701. It is intended to describe the method used to derive estimates on representative samples where data are not to be recorded under Regulation (EU) No 1224/2009 or where data collected under Regulation (EU) No 1224/2009 are not at the right aggregation level for the intended scientific use.

General comment: This box is applicable to the Annual Report. This box should provide information on the implementation of the data collection of fishing activity variables of Member States.

1. Description of methodologies used to cross-validate the different sources of data.

The Member State will continue to collect transversal, economic and social parameters, on a daily basis, from vessels < 12 meters in length (LOA) in a national, sentinel vessel programme. 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;
- 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

2. Description of methodologies used to estimate the value of landings.

Buyers and sellers (sales note) data provide estimates of landings by all vessels and value of landings at first

point of sale. In addition the sentinel vessel data from the pilot programme provides data on unit value for species landed by these vessels.

3. Description of methodologies used to estimate the average price (it is recommended to use weighted averages, trip by trip)

Daily landed price figures are collected in the logbooks by all vessels. These averages are weighted by segment, species and trip.

4. Description of methodologies used to plan collection of the complementary data (sample plan methodology, type of data collected, frequency of collection etc)

The sample population for the sentineal programme is designed to represent the diverse inshore fisheries sectoer 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 partiticpants every January. The logbooks record, vessel details and economic data annaully. 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.

5. Deviations from Work Plan methodology used to cross-validate the different sources of data

There were no deviations from the Work Plan in 2017.

Actions to avoid deviations.

As there were no deviations, no remedial actions were neccessary.

6. Deviations from Work Plan methodology used to estimate the value of landings.

There were no deviations from the Work Plan in 2017.

Actions to avoid deviations.

As there were no deviations, no remedial actions were neccessary.

7. Deviations from Work Plan methodology used to estimate the average price.

There were no deviations from the Work Plan in 2017.

Actions to avoid deviations.

As there were no deviations, no remedial actions were neccessary.

8. Deviations from Work Plan methodology used to plan collection of the complementary data

There were no deviations from the Work Plan in 2017.

Actions to avoid deviations.

As there were no deviations, no remedial actions were neccessary.

 (max 900 words per Region)

SECTION 3: ECONOMIC AND SOCIAL DATA

Table 3A: Population segments for collection of economic and social data for fisheries

Table 3A contains details of Ireland's population segments for collection of economic and social data for fisheries.

Text Box 3A: Population segments for collection of economic and social data for fisheries

This text box is applicable to the AR. MS should transfer the information from their accepted WP before filling in the additional section highlighted in grey.

General comment: This box fulfils paragraph 5 points (a) and (b) of Chapter III of the multiannual Union programme and Article 2, Article 4 paragraphs (1), (2) and (5) and Article 5 paragraph (2) of the Decision (EU) 2016/1701. It is intended to specify data to be collected under Tables 5(A) and 6 of the multiannual Union programme.

General comment: This box is applicable to the Annual Report. This box should provide information on the implementation of the fleet socio-economic data collection of Member States.

1. Description of methodologies used to choose the different sources of data

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 clarrify any issues arising with economic an social variables from questionairre.
- 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 table text box 2a for details.

2. Description of methodologies used to choose the different types of data collection

Data collected through EU register, Logbook and Sales notes is treated as census data.

Given the constraints imposed by the voluntary nature of the current data collection regime, the data collection scheme for all economic variables from all metiers segments is a non-probability sample survey based on a probability sample survey design.

In 2010, a Statutory Instrument (S.I. 132 of 2010) was introduced by the MS requiring all fishery sector operators to collect and maintain economic data as listed in Annex XII of the Commission Decision.

3. Description of methodologies used to choose sampling frame and allocation scheme

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.

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 5b of Commission Implenting Decision (2016/1251) 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).

$$n = s^2 \left/ \left(\widehat{\mathrm{CV}}(\bar{y})^2 \bar{y}^2 + \frac{s^2}{N} \right) \right.$$

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). These segments have been presented in their entirety in Table 3A (Sample Rate 'N') but will most likely be clustered with similar segments which have higher number of vessels for data submission.

4. Description of methodologies used for estimation procedures

Recognising the implications and influences imposed by the voluntary nature of the annual survey on the probability sample survey design, the Horvitz-Thompson estimator along with standard appropriate raising techniques will be used, to derive final estimates for each variable collected. However, this methodology is currently under review and it was not complete by the time the work programme was submitted.

Imputation of non-responses and non-response adjustments: Non- responses to the probability Sample survey design will match the characteristics defined by the fleet segment category and were possible predicted using regression analysis.

In accordance with Appendix VI of Commission Decision (2008/199/EC), the Perpetual Inventory Method (PIM) will be applied to estimate capital value and costs for each of the fleet segments.

Capacity indicators and capital value will be estimated for all vessels on the register, regardless of their activity. The following sources will be used to estimate the input parameters to the PIM model:

- Questions on fixed assets, investments, and depreciation from the annual economic survey,
- EU fleet register,
- EU log-book data
- Sentinel vessel programme,

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 will be added to the survey.

5. Description of methodologies used on data quality

The sampling intensity is based on an analysis of the variance of historic, operational data, as these have proved to be the most uniform, with the aim of achieving a precision of 25% at a 95% confidence level. Variances within fixed costs have proved much higher than expected and, as such, quality will be measured at a coverage rate, commensurate with the target precision for the non-operational parameters. The Member State is currently undergoing a review of it statistical methodologies.

Data for the 2017-2019 work Programme will be submitted electronically via interactive PDF forms and website interface to a centralised database, with pre-validation necessary before the accountants can successfully submit the forms. A secondary validation process will be performed on the data once received, and any erroneous data will be queried directly with the vessel owners or their accountants, by survey personnel. Similarly, any erroneous data supplied by vessel owners, contracted under the sentinel vessel programme, will be queried and rectified by survey personnel, as and when it arises, or at the exit interview stage of the programme.

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.

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).

(max 900 words per Region)

6. Deviations from Work Plan methodology for selection of data source

None

Actions to avoid deviations

None required.

7. Deviations from Work Plan methodology to choose type of data collection

No major deviation. Surveys were received from a higer proportion of the under 10m fleet than was planned. This was due to a higher number of vessels applying for grant aid which requires them to complete the economic survey.

Actions to avoid deviations

None required.

8. Deviations from Work Plan methodology regarding sampling frame and allocation scheme

None

Actions to avoid deviations

None required.

9. Deviations from Work Plan methodology used for estimation procedures

None

Actions to avoid deviations

None required.

10. Quality assurance

10.1 Sound methodology

Data is collected using methodologies that follow best practices and guidelines of agreed in expert working groups. These methodolgies are documented and will be made publically avaiable by the end of 2018.

10.2. Accuracy and reliability

Response rate and Achieved sample rate are provided in Table 3A.

Besides the details regarding accuracy and reliability given in the work plan the MS also runs routine data audits, checks and identificion of outliers in our data processing predcures. The data undergos additional validation and quality checks and is pre-validated prior to data submission.

10.3. Accessibility and Clarity

Indicate with Yes or No

- Are methodological documents publicly available? No
- Are data stored in databases? Yes
- Where can methodological and other documentation be found? Methodologies for Economic data are being drafted and will be available on Ireland's DC MAP website http://www.dcmap-ireland.ie/documents/methodologies by the end of 2018.

(max 1000 words)

Pilot Study 3: Data on employment by education level and nationality

This text box is applicable to the AR. MS should transfer the information from their accepted WP before filling in the additional section highlighted in grey.

General comment: This box fulfills paragraph 5 point (b) and paragraph 6 point (b) of Chapter III of the multiannual Union programme and Article 2 and Article 3 paragraph (3) point (c) of the Decision (EU) 2016/1701.It is intended to specify data to be collected under Table 6 of the multiannual Union programme.

General comment: This box is applicable to the Annual Report. This box is intended to provide information on the results obtained from the implementation of the pilot study (including deviations from planned and justifications as to why if this was not the case).

1. Aim of pilot study

Assess feasability of gathering data on social variables from the fisheries and aquaculture sector as listed in Table 6 of the EUMAP multi-annaul programme.

2. Duration of pilot study

Three years. Data gathering excercise, where necessary, will be designed and comence in 2017. The first round of data will then be avaiable in early formats in 2018. The data collection methodology can be redefined in 2018 based on the intital data gathering excerise and improved upon for data collection in 2018 with output in 2019.

3. Methodology and expected outcomes of pilot study

Data will be collected either by direct census or sample survey and by access to indirect sources if these can be identified.

Outcomes of the pilot study are hard to predict without any clear guidance in Table 6 on the metrics to be used for data collection for the variables employment by age, employment by education level, and employment status. Client reaction to questions on education will depend on whether the education level referred to in Table 6 is specific, career related training or primary, secondary, tertiary level formal education. The latter may be a sensitive matter for the client as well as the clients age category, should that data be required in the near future.

(max 900 words)

4. Achievement of the original expected outcomes of pilot study and justification if this was not the case.
All expected achievements were met.

5. Incorporation of results from pilot study into regular sampling by the Member State.
The data collected will be incorporated into annual economic surveys.
(max 900 words)

Table 3B: Population segments for collection of economic and social data for aquaculture

Table 3B contains details of Ireland's population segments for collection of economic and social data for aquaculture.

Text Box 3B - Population segments for collection of economic and social data for aquaculture

This text box is applicable to the AR. MS should transfer the information from their accepted WP before filling in the additional section highlighted in grey.

General comment: This box fulfills paragraph 6 points (a) and (b) of Chapter III of the multiannual Union programme and Article 2, Article 4 paragraphs (1) and (5) and Article 5 paragraph (2) of the Decision (EU) 2016/1701.It is intended to specify data to be collected under Tables 6 and 7 of the multiannual Union programme.

General comment: This box is applicable to the Annual Report. This box should provide information on the implementation of the socio-economic data collection for aquaculture of Member States.

1. Description of methodologies used to choose the different sources of data

The source of variable data are chosen on the basis of quality consistency and accessability. Business owners are found to be the best source for input-output production data and employment breakdown and operational costs data. Detailed accounts, when these can be obtained, also provide an accurate source of operational costs and accounts data. These data sources are more detailed than the abridged accounts found on-line which are also obstained.

Economic Data is also collected as part of national grants or training applications and must be provided to obtrain these grants. Finally local officers can be called on to provide estimates based on their regular visits to non compliant business. Some raw material input data can be sourced from both the census questionnaire survey and from other agency surveys. Bottom mussel seed data taken from landings data for example, is preferred over the in-house Census source, due to greater proximity to real time and close monitoring of activity. Oyster seed input data from the in-house Census can be compared with import data from other sources for quality assessment.

2. Description of methodologies used to choose the different types of data collection

The type of data collection used follow in order of choice and/or necessity:

Direct:- census survey or sample survey questionnaires to clients,

Indirect:- Online sample survey of Business accounts, aggregated data of other surveys conducted in-house or by other state agencies or a combination of methods where appropriate.

Overall the methods used to collect data for a particular variable are those proven over time to be the most effective in terms of accuracy, continuity of supply and minimum burden on the survey population. Thus production input-output volumes, costs and values and employment breakdown are collected by the direct method of census survey as this approach is a long established practice, easily participated in and appreciated by clients as published results quickly follow the survey. Participation level in the production

and employment census is generally about 80% of the total population.

The majority of clients are small operators for whom access to accountants is limited by cost and for many, financial data is sensitive to exposure. Access to full accounts documents from such businessses is limited to those submitted for grants purposes through on-line surveys. Such online data however is limited by exemption law and therefore operational costs data and some accounts data is obtained by direct sample questionnaire.

Sample surveys are non random due to the diverse non-homogenous nature of aquaculture segments and business size in the Rebpublic of Ireland. They consist of a questionaire to a rotating 25% sample of the active commercial businesses annually for operational costs variables, some financial variables not found in abridged accounts and the new socio-economic variables. The latter may be collected by access to indirect sources from excisting data collection excercises or from another agencies. Each business is requested therefore to fill a sample questionnaire once every 4 years and a census questionnaire annually. A larger sample of abridged accounts is obtained on-line; 33% of the population annually. This allows for the continuous on-line data collection from indicator companies annually in the larger segments as well as gathering sample data.

3. Description of methodologies used to choose sampling frame and allocation scheme

The census is conducted on all commercial businesses of the population. That is, all businesses producing stock for purposes of sale and profit generation. This means that non-profit state owned enterprises and moribund businesses (no stock, no employment during surveyed period) are excluded from the frame. The 25 % sample is extracted from the same frame as the census. The rotating 25% sample was chosen by choosing a profile through the population, based on average turnover from each aquaculture segment. The segments are from the templates provided, populated by businesses based on Species and culture technique

4. Description of methodologies used for estimation procedures

Data for non participants of the census is estimated in order of preferred method thus:

- Estimate of the local officer in contact with the non survey participant is used if available.
- Average historical performance of the business has been used to predict variables in instacnes of non-comliance with the surey. The % trend of the nearest participating business. ie if the neighbour is up n% or down n%, the 'n' trend is applied to the historical average of the non-participant.

If neither option above is possible, indirect data from other agencies can be applied to obtain scale of production activity such as seed input, while abridged accounts will be available on-line if the business is a company.

For sampled variables, national level data is estimated from sample data by summing up the total turnover value of the sample, where individuall turnover values were obtained through Census survey, expressing this sample sum as a % value of the national turnover value, also obtained through Census and ascribing this % to the sum values of other sample variables and extrapolating up to the 100 % equivalent values accordingly.

If feed volume data is not acquired by questionnaire then it is generated by applying the average FCR for the species to the weight gained from input weight to sales weight.

The minimum expected wage was calculated by multiplying the national minimum wage by the FTE of the segment obtained through census. The addition of the new related variables 'number of unpaid' and number of hours worked by them may simplify estimations.

5. Description of methodologies used on data quality

Variable data obtained from both questionnaire and indirect sources such as from other in-house or other agency data or business accounts are compared and the data used will be from the most competent source. Bottom mussel seed input data is taken from landings data if available rather than from the census due to the formers recording at the point of fishing activity. The census is chosen as the best source for oyster seed input due to its recording of what was actually input over what was intended to be input. Turnover, employment and other variables are comparable between questionnaire and accounts sources depending on the style of accounts presentation. To aid in this, only accounts by calendar years are used to compare with calendar based census to check the quality of the latter data source.

(max 1000 words)

6. **Deviations from Work Plan methodology for selection of data source**

None

Actions to avoid deviations

None

7. **Deviations from Work Plan methodology to choose type of data collection**

None

Actions to avoid deviations

None

8. **Deviations from Work Plan methodology regarding sampling frame and allocation scheme**

None

Actions to avoid deviations

None

9. **Deviations from Work Plan methodology used for estimation procedures**

None

Actions to avoid deviations

None

10. Quality assurance

10.1 Sound methodology

Data is collected using methodologies that follow best practices and guidelines fagreed in expert working groups. These methodolgies are documented and will be made publically avaiable by the end of 2018.

Data collection follows two of the three accepted methods; census survey for production, employment , input and some costs variables and non-random sample survey for financial, some costs and the new socio-economic variables. Environmental variables will be collected both directly and by derivation from the census survey. The data sources are the population itself, financial accounts and the datasets of in-house or other agencies and the vehicles for collection are questionnaires, on-line site downloads and by email or phone requests in-house or to other agencies for their relevant aggregated data.

MS methodologies used for deriving variable values and for raising to to national estimation from sample values have been described and documented in previous ARs and at DCF aquaculture workshops and found to be within accepted norms

10.2. Accuracy and reliability

Response rate and Achieved sample rate are provided in Table 3B.

Besides the details regarding accuracy and reliabilituy given in the work plan the MS also runs routine data audits, checks and identificion of outliers in our data processing predcures. The data undergos additional validation and quality checks and is pre-validated prior to data submission.

10.3. Accessibility and Clarity

- **Are methodological documents publicly available?** No
- **Are data stored in databases?** Yes
- **Where can methodological and other documentation be found?**

Methodologies for Economic data are being drafted and will be available on Ireland's DC MAP website http://www.dcmap-ireland.ie/documents/methodologies by the end of 2018.

 (max 1000 words)

Pilot Study 4: Environmental data on aquaculture

This text box is applicable to the AR. MS should transfer the information from their accepted WP before filling in the additional section highlighted in grey.

General comment: This box fulfills paragraph 6 point (c) of Chapter III of the multiannual Union programme and Article 2 and Article 4 paragraph (3) point (d) of the Decision (EU) 2016/1701. It is intended to specify data to be collected under Table 8 of the multiannual Union programme.

General comment: This box is applicable to the Annual Report. This box is intended to provide information on the results obtained from the implementation of the pilot study (including deviations from planned and justifications as to why if this was not the case).

1. Aim of pilot study

Assess feasability of gathering environmental data from aquaculture sector in terms of data quality and consistency over a time period.

2. Duration of pilot study

Three years, 2017-2019.

3. Methodology and expected outcomes of pilot study

Data will be collected by direct census survey and by access to indirect sources if these can be identified and collated. It is not known what level of data quantity or quality will be gathered for Chemical/medicinal inputs. The percentage of mortality should be gathered to a reasonable level of accuracy for intensive mollusc culture such as oysters but it will be more difficult in the case of extensive bottom cultures such as bottom mussels and native oysters.

(max 900 words)

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

Data from indirect sources and other National agencies did not provide the necessary level of detail.

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

Data collection through other existing data sources did not work. As a result, a different approach will be adopted, and data will be collected through the national aquaculture annual survey from 2018.

Table 3C Population segments for collection of economic and social data for the processing industry

Table 3C contains details of population segments for collection of economic and social data for the Irish processing industry.

Text Box 3C - Population segments for collection of economic and social data for the processing industry

This text box is applicable to the AR. MS should transfer the information from their accepted WP, before filling in the additional section highlighted in grey.

General comment: This box fulfils footnote 6 of paragraph 1.1(d) of Chapter III of the multiannual Union programme, Article 2, Article 4 paragraphs (1) and (5) and Article 5 paragraph (2) of Decision (EU) 2016/1701. It is intended to specify data to be collected under Table 11 of the multiannual Union programme.

General comment: This box is applicable to the Annual Report. This box should provide information on the implementation of the socio-economic data collection for aquaculture of Member States.

1. Description of methodologies used to choose the different sources of data

The data collection scheme for all processing sector variables may be collected on a voluntary basis as per Table 11 of Commission Implementing Decisions (EU) 2016/1251. The data source for the target population is the national database of registered processing companies in the seafood sector.

Data in relation to employment will be gathered in an annual employment survey which is sent out to every seafood processing company in the Republic of Ireland. Data collected relates to numbers of employees full-time, part-time and casual including a breakdown by gender.

Data for all other variables will be collected by
- Data submitted voluntarily by processing enterprises via questionnaire
- Abridged Company accounts

2. Description of methodologies used to choose the different types of data collection

Total population sampling will be by non-probability sample survey for all variables excluding employment data which will be gathered by census method.

3. Description of methodologies used to choose sampling frame and allocation scheme

Examining the total number employed by each processors in 2015, there were 92 companies in the "≤ 10" category size, 47 in the "11 – 49" category, and 22 in the "50 – 249" category. A survey sampling rate of

10% in the "≤ 10" category, 30% in the "11 – 49" category, and 35% in the "50 – 249" category is deemed sufficient coverage to get a good representative sample of the sector. This represents a total of 31 companies, or 19% of the total population. As the majority of seafood processing companies in Ireland are limited liability (Ltd) companies they are required to publish abridged accounts on an annual basis. The Member State will carry out an analysis of these audited accounts through the Companies Registration Office (CRO).

Although the voluntary nature of the annual survey prevents the practical development of the sampling frame, the development of such innovation will represent a core function of the DCF staff group.

4. Description of methodologies used for estimation procedures

Recognising the implications and influences imposed by the voluntary nature of the annual survey on the census survey design the best statistical methods will be utilised to derive final estimates for each variable collected.

An estimation of unpaid labour, in any, by family members or other will be ascertained by using best information available in relation to unpaid labour and using total employment and average wages, or national minimum wage, and salaries as an estimator. In time a question may be added to the questionnaire to gather the information on this variable.

Employment will be collected by total engaged in the sector by enterprise, and a national FTE based on the average industrial working week of 40 hours with 20 days annual leave and 9 public holidays. This equates to 230 working days, or 1840 hours annually. This compares with 2000 hours as recommended for a harmonised EU FTE, as stated in Study No FISH/2005/14 "Calculation of labour including FTE (full-time equivalents) in fisheries.

For all other variables the company questionnaire and the abridged company accounts will be examined to complete these parameters.

5. Description of methodologies used on data quality

There are no stated precision requirements for collecting data in the processing industry sector. As such, the Member State is using the percentage coverage of the size categories as the measure of quality. For some parameters, a census will be conducted from publicly available sources. These include employment statistics. The format of the abridged accounts of companies vary significantly in the detail supplied, necessitating the Member State to request additional information from those companies selected in the sampling frame where the data are lacking in the published accounts. This is currently run on a voluntary basis, and hence the quality of the data is dependent on compliance within the industry. Certain data collected via questionnaire will be validated, where possible, against their published end-of-year abridged accounts.

(max 1000 words)

6. Deviations from Work Plan methodology for selection of data source

In 2017, data was collected on a voluntary basis for 2015.

The collection and collation of data from the processing sector was reliant on the use of questionnaires completed in respect of applications for the receipt of EU or National grant aid and audited accounts from the Companies Registration Office (CRO).

For this reason, the achieved sample number for the companies in the size category 11-49 and size category 50-249 was greater than the planned sample number due to a larger number of returns from these companies. For companies with less than 10 employees the achieved sample number was less than the planned sample number as there was not as much information made available.

There was a deviation from the sampling targets detailed in the NP, but the MS has a high degree of confidence that the data source used is of the highest quality. The achieved sample rate was 25 companies

Actions to avoid deviations

MS will focus on achieving a greater response rate from companies with <10 and 11-49 employees.

7. Deviations from Work Plan methodology to choose type of data collection

None

Actions to avoid deviations

None

8. Deviations from Work Plan methodology regarding sampling frame and allocation scheme

As the collection and collation of data from the processing sector was reliant on the use of questionnaires completed in respect of applications for the receipt of EU or National grant aid and audited accounts from the Companies Registration Office (CRO), the MS did not achieve the sampling targets outlined.

Actions to avoid deviations

MS will try to get a greater response rate from companies with <10 and 11-49 employees

9. Deviations from Work Plan methodology used for estimation procedures

None

Actions to avoid deviations

None

10. Quality assurance

10.1 Sound methodology

Data is collected using methodologies that follow best practices and guidelines fagreed in expert working groups. These methodolgies are documented and will be made publically avaiable by the end of 2018.

10.2. Accuracy and reliability

Response rate and Achieved sample rate are provided in Table 3C.

For additional information, briefly describe how raw data inputs, intermediate results and outputs are regularly assessed and validated and how errors are identified, documented and dealt with.

Besides the details regarding accuracy and reliabilituy given in the work plan the MS also runs routine data audits, checks and identificion of outliers in our data processing predcures. The data undergos additional validation and quality checks and is pre-validated prior to data submission.

10.3. Accessibility and Clarity

- **Are methodological documents publicly available?** No.
- **Are data stored in databases?** Yes.
- **Where can methodological and other documentation be found?**

Methodologies for Economic data are being drafted and will be available on Ireland's DC MAP website http://www.dcmap-ireland.ie/documents/methodologies by the end of 2018.

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(max 1000 words)

SECTION 4: SAMPLING STRATEGY FOR BIOLOGICAL DATA FROM COMMERCIAL FISHERIES

Table 4A: Sampling plan description for biological data

Table 4A Contains details of achieved biological sampling quantified in terms of the vessels, trips, and species and length measures.

Some under and oversampling in relation to the AWP targets are highlighted in Table 4A. Specific explanations are given in the AR Comments column in Table 4A, and text on more generalised, over – arching issues are given below in Text Box 4.

Text Box 4A- Sampling plan description for biological data

This text box is applicable to the AR. MS should transfer the information from their accepted WP, before filling in the additional section highlighted in grey.

General comment: This box fulfills Article 3, Article 4 paragraph (4) and Article 8 of the Decision (EU) 2016/1701 and forms the basis for the fulfilment of paragraph 2 point (a)(i) of Chapter III of the multiannual Union programme. This Table refers to data to be collected under Tables 1(A), 1(B) and 1(C) of the multiannual Union programme.

General comment: This box is applicable to the Annual Report. This box should provide information on the deviations from the planned sampling of Member States.

Description of the sampling plan according to Article 5 paragraph (3) of the Decision (EU) 2016/1701

Sampling for population parameters (sex ratio and maturity) of demersal species

These parameters are generally collected on surveys (sampling plans described in Text Box 1G).

Sampling on shore- demersal and pelagic fish species

Guidelines: ICES WGCATCH (statistically sound sampling)

Purpose: Length, age, weight data of landings and sex/maturity of pelagic landings

Design: Class C - sites x time

Expected difficulties: Refusals related to landing obligation

Data archiving: Secure SQL database and RDB

Quality assurance: Data entry checks and database validation, visual inspection of outliers

Analysis: Estimation procedure adapted from COST project.

Sampling frame: top 21 ports x time for demersal, and top 7 ports for pelagics

Sample selection PSU: Port-day - random, weighted by weighted by landings in previous 2 years.

Sample selection SSU: Stock – ad-hoc, based on target number of samples per stock

Sample selection TSU: Size grade – ad-hoc, at least one box per grade

Coverage: sampled ports receive >95% of landings of demersal and pelagic species into Ireland (3% of demersal landings and 15% of pelagic landings are in foreign ports which are covered under bilateral agreements (see

table 7c); <1% of the total landings are sampled.

Stratification: 5 regions, 4 quarters

Targets: 1) number of port visits; 2) number of samples per stock; 3) number of age structures per sample

Quality: No major bias identified, targets are based on optimising precision for 26 demersal stocks and 9 pelagic stocks

Demersal at-sea Pelagic at-sea

Guidelines: ICES WGCATCH (statistically sound sampling)

Purpose: Length, age, weight data of discards and landings of demersal species &Pelagics (excluding Nephrops)

Design: Class A - vessels x time

Expected difficulties: Refusals, mainly related to landing obligation; logistics

Data archiving: Secure SQL database and RDB

Quality assurance: Data entry checks and database validation, visual inspection of outliers

Analysis: R code and markdown

Sampling frame: vessels x time

Sample selection PSU: vessel x time – currently ad-hoc, will move to random draw list, weighted by number of trips or landings in previous years

Sample selection SSU: haul – ad-hoc, dictated by rest periods

Sample selection TSU: discard sample – random box

Coverage: around 1% of the total number of trips are sampled.

Stratification:4 regions, 4 quarters for demersals, 5 regions, 2 quarters for pelagics

Targets: 1) number of observer trips; 2) number of hauls per trip 3) representative amount of commercial fish sampled per haul/trip 4) All discard fish measured per sample unit

Quality: Possible bias due to refusals, precision is determined by number of trips

Crustacean at-sea Sampling on shore for Nephrops

Guidelines: ICES WGCATCH (statistically sound sampling), WKNEPH (2013)

Purpose: Length, sex, maturity data of discards and landings

Design: Class A - vessels x time

Expected difficulties: Refusals, mainly related to landing obligation; logistics

Data archiving: Secure SQL database

Quality assurance: Electronic data capture. Quality assurance using NEMESYS software

Analysis: R code and markdown

Sampling frame: vessels x time

Sample selection PSU: vessel x time – currently ad-hoc, will move to sampling a reference fleet.

Sample selection SSU: haul – ad-hoc

Sample selection TSU: discard sample – random box, catch sample – random box, graded landings (FU16)

Coverage: around 1% of the total number of trips are sampled.

Stratification: 6 FUs, 4 quarters

Targets: 1) number of trips

Quality: Possible bias due to refusals,bias due to seasonal variation, precision is determined by number of trips

Crustacean at-sea Molluscs at-sea (crab lobster, bivalves)

Guidelines: ICES WGCATCH (statistically sound sampling)

Purpose: Length, weight data of discards and landings of shellfish (except Nephrops), biomass estimates for bivalves

Design: Class A - vessels x time, stratified random or grid sampling for bivalves

Expected difficulties: Refusals, logistics, weather

Data archiving: Secure SQL database

Quality assurance: Data entry checks and database validation, visual inspection of outliers

Analysis: R, Arcmap, spatial analysis

Sampling frame: crustaceans: vessels x time, bivalves: stock distributional extent for bivalves

Sample selection PSU: crustaceans: vessel x time – currently ad-hoc. Bivalves: haul

Sample selection SSU: census, all hauls sampled

Sample selection TSU: random sample or total catch

Coverage: crustaceans: <1% of the total number of trips are sampled (Inshore fleet). Bivalves: full coverage of geographic stock distribution area

Stratification: crustaceans: 5 regions, 3 quarters, Bivalves: none

Targets: 1) number of catch sampling trips; 2) number of hauls per trip

Quality: Crustaceans: Possible bias due vessel selection (mainly larger vessels are sampled)

Sampling on shore (crab lobster, bivalves, whelks)

Guidelines: ICES WGCATCH (statistically sound sampling)

Purpose: Length, age (where possible), weight data of landings of shellfish species (Pecten, Homarus, Cancer, Buccinum)

Design: Class C - sites x time

Expected difficulties: Prior grading of landings, time constraints at processing plants

Data archiving: Secure SQL database and RDB

Quality assurance: Data entry checks and database validation, visual inspection of outliers

Analysis: Estimation procedure adapted from COST project where possible

Sampling frame: ports targeted based on location of >80% of landings.

Sample selection PSU: Fishing trip or 'fishing trip x ICES rectangle' or 'bulk landing'

Sample selection SSU: Unit of landing (box, bag, tank)

Sample selection TSU: Size grade – ad-hoc

Coverage: samled ports receive >80% of landings of Pecten and Buccinum >80% and >20% of landings of Homarus and Cancer. <1% of trips sampled.

Stratification: 3 regions, 6-9 months

Targets: 1) number of port visits; 2) number of samples per stock; 3) number of age structures per sample where

possible

Quality: poor identification of origin in bulk landings, bias due to poor spatial coverage

(max 900 words per region)

Deviation from the sampling plan according to Article 5 paragraph (3) of the Decision (EU) 2016/1701:

Deviations from the Work Plan

Deviations from the Work plan are highlighted in Table 4A, and explanations for each specific incident are given in the AR comments in that table. Below are more details relating to sampling deviations in general.

Catch Sampling Programme:

Ireland experienced difficulties in accessing catch sampling trips for observers, during 2017, mostly on the demersal fleets. This arose in response to several situations on the ground, such as the Landing Obligation, the introduction of the penalty points system, an on – going court case (taken by the industry against the Government) and concerns about insurance whilst observers were on board ship. The MI was in constant talks throughout the year with Industry representatives, and our parent Government department, DAFM. In August 2017, an external contract was established with a company called Emerald Marine (EM), with a view to centralising the logistics of the catch sampling programme, and by doing so, ensure greater success in trip fulfilment. Emerald Marine were also tasked with ensuring the 4S principles were applied to the programme, using vessel lists and logging all refusals, and engaging with the industry in a positive way through a concerted outreach effort.

As a result of this new approach, all Q4 at sea sampling targets were reached.

Action to avoid deviations

Open dialogue was maintained with the fishing Industry and its representatives, throughout 2017, and the consequences of non – cooperation with the catch sampling programme was explained. Support was also sought from DAFM to reinforce this message.

A contract was initiated with Emerald Marine, in August 2017, in the hopes of improving cooperation with the programme, and this approach was very successful, as all Q4 targets were reached. The Emerald Marine contract remains in place in 2018.

Emerald Marines first step was to contact the fish producer's organisations, to inform them of the changes made to observer programme and to inform them that they would be running the logistics from that point forward. This process involved phone calls and emails between the producer

organisations and Emerald Marine. A document was composed for the fish producer organisations to circulate to their members informing them of the changes to the programme, and that Emerald Marine would be running the new programme. This included contact details for Emerald Marine and encouraged skippers and crew to contact the company if they had any questions, comments or feedback.

Emerald Marine undertook considerable effort to increase the database of vessels used for collection of catch sampling data by the Marine Institute. As a result of this effort, the number of vessels contacted to participate in the program has been greatly increased, leading to a substantial increase in the number of active participants. Many of those contacted hadn't been contacted previously and were unaware of the catch sampling program. The addition of these new vessels has improved the quality and quantity of data collected, while also reducing the burden of longer term participants.

Emerald Marine organised a series of open industry meetings around the country, most at major fishing ports. This was an attempt to meet stakeholders face to face and to gain as much feedback as possible on the new programme and how it was being received. These meetings were advertised via word of mouth when speaking to vessels contacted on the vessel contact log, through the Marine Institute, the Irish fishing press and an email to the producer's organisations for circulation to their members.

At Christmas time, Emerald Marie approached the Marine Institute to issue a joint letter of thanks to all the vessels that had taken part in the at sea catch sampling programme since Emerald Marine began co-ordinating it. They also used this letter to ask skippers and vessel owners for feedback on the programme. This letter was well received by the industry and led to some positive comments during phone conversations in 2018.

In the first quarter of 2018, Emerald Marine re-contacted all the vessels that had declined to participate in the programme. The aim of this was firstly to see if they would re-consider their non-participation, and secondly to try and get more feedback on what they saw as the issues that prevented them from participating. Emerald Marine also attend the Skippers Expo in Q2 of 2018, this was again used as an opportunity to meet stakeholders face to face and try to gain valuable feedback on the programme and how it was viewed from the industries point of view.

Emerald Marine has also attended two industry science partnership meetings to give presentations on how their co-ordination of the sampling at sea programme was progressing. These meetings offered another excellent opportunity to engage with stakeholders to identify possible issues or conflicts that may arise in the future. Efforts are continuing in 2018 to ensure that all at sea sampling targets are met.

 (max. 1000 words per region OR fishing ground)

Table 4B: Sampling frame description for biological data

Table 4B contains descriptions of Irish Sampling Frames for biological data.

Table 4C: Data on the fisheries by member state

Table 4C contains data on Irelands Fisheries in 2017. Some changes occurred compared with the reference years and the AWP, and these are highlighted.

Table 4D: Landing Locations

Landing Locations are detailed in Table 4D

Table 5A: Quality assurance framework for biological data

The current Quality Assurance Framework relating to biological data is outlined in Table 5A.

Significant progress was made in 2017, which is highlighted in the table and also in the text box below.

Text Box 5A: Quality assurance framework for biological data

This text box is applicable to the AR.

General comment: This box is applicable to the Annual Report. This box fulfills Article 5 paragraph (2) point (a) of the Decision (EU) 2016/1701. This box is intended to specify data to be collected under Tables 1(A), 1(B) and 1(C) of the multiannual Union programme.Use this box to provide additional information on Table 5A.

Introduction of a Quality Management System (QMS)

The Marine Institute is the designated National Oceanographic Data Centre for the Republic of Ireland and as such the focal point for international oceanographic data exchange in Ireland. The institute is a reference source for any Oceanographic and Marine Research data originating from Ireland, as well as a national node of the International Oceanographic Data and Information Exchange (IODE) programme of the Intergovernmental Oceanographic Commission (IOC) of UNESCO.

In order to ensure excellence and continued development in these roles, the MI has made a commitment to adopt a Quality Management System (QMS) to guide all its data management processes from collection, storage, quality control, provision and statutory reporting.

As part of this QMS, a Quality Manual is being drafted which identifies who the stakeholders and main customers are for the data products, Including the EU Commission, and ICES amongst others for the DCF Data. This Manual also describes the quality standards which are being followed.

Each section within the MI dealing with environmental data has undertaken the task of identifying and documenting all their relevant data handling processes and procedures. This includes FEAS data collected under the DCF. The flow of data, from collection to end product within the MI, has been visually described using a process flow. Each flow is linked to the relevant written instructions or Standard Operating Procedures (SOP) which describe the detail of each step within the flow. The advantage of this approach for DCF data collection is that it can highlight where improvements can be made if necessary. It can also be used as a very effective training tool, ensuring consistency in the collection of data.

STOCKMAN

The Stockman port sampling database application continued to be developed during 2017 with constant feedback from the analysts' team. Extra functions included refining fields in the Sampling Trip Metadata, to align more closely with the Regional database format. A fishing grounds map was also included to allow cross checking and further QC per sampling event. The full functionality of the QC process for age reading and inter reader checks was also incorporated into STOCKMAN, allowing historic data ranges based on the year selected in the Data QC section to be selected , which facilitates the production of historical ALK's for comparison. We continued developing the Sampling Tracking Module and added more extensive Quality Control functions.

Sampling design

Fully documented and in line with Internationally agreed best practice and STECF, WGBIOP and EU Commission recommendations.

Sampling implementation

Sampling programmes fully implemented.

Data capture

Data capture fully documented as per Table 5A

Data Storage

Data storage is fully documented as per Table 5A

Data processing

Data storage is fully documented as per Table 5A

Shellfish Database

The Shellfish Database has been developed in SQL to house the data collected by the Inshore Section of FEAS. The data handled by the Inshore group includes survey, port and at sea observer data collected on a range of species. The Shellfish Database will act as a central holding facility for data and allow for easier validation, extraction and analysis of datasets. An Upload Utility has been

built in-house to transfer the historic datasets that have been stored in flat Excel files, a process which began is 2017 and will continue into 2018. A new front end GUI (Graphical User Interface) is currently in development. This GUI will allow users enter data directly into the database via a remote link. The GUI will include data validation checks, mandatory fields, links to centrally controlled reference tables and other functions which will enable the user to enter the data in an efficient quality controlled manner. The GUI is currently in Phase 2 testing and is expected to be officially launched towards the end of 2018.

Sampling design

Fully documented and in line with Internationally agreed best practice.

Sampling implementation

Sampling programmes fully implemented.

Data capture

Data capture is being finalised in 2018 with the testing and refinement of the new Shellfish Database. Data capture will be fully documented and made publically available once testing is completed.

Data Storage

Data storage is being finalised in 2018 with the testing and refinement of the new Shellfish Database. Data storage will be fully documented and made publically available once testing is completed.

Data processing

Data processing is being finalised in 2018 with the testing and refinement of the new Shellfish Database. Data processing will be fully documented and made publically available once testing is completed.

 (max. 900 words per Region/RFMO/RFO/IO OR sampling scheme)

Table 5B: Quality assurance framework for socioeconomic data

Table 5B contains details of Irelands Quality Assurance Framework for Socioeconomic data.

Text Box 5B: Quality assurance framework for socioeconomic data

This text box is applicable to the AR.

General comment: This box fulfills Article 5 paragraph (2) point (b) of the Decision (EU) 2016/1701. This box is intended to specify data to be collected under Tables 5(A), 6 and 7 of the multiannual Union programme. Use this box to provide additional information on Table 5B.

Evidence of data quality assurance

Section P3 Impartiality and objectiveness
NA

Section P4 Confidentiality
NA

Section P5 Sound methodology
NA

Section P6 Appropriate statistical procedures

There are many institutes and government bodies which have control of different aspect of data with are pertinent for DC MAP purposes. These agencies are currently redrafting Data Sharing Agreements (DSA) so that there is a clear data usage policy when sharing data for the purpose of fulfilling Ireland's DC MAP responsibilities. These revised DSA are due to be complete in the next year.

Section P7 Non-excessive burden on respondents
NA

Section P8 Cost effectiveness
NA

Section P9 Relevance
NA

Section P10 Accuracy and reliability
NA.

Section P11 Timeliness and punctuality
NA

Section P12 coherence and comparability
NA

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SECTION 6: DATA AVAILABILITY

Table 6A: Data availability

The schedule for data availability can be seen in Table 6A. All data was made available as planned, without any significant delays.

Table 7A Planned regional and international coordination

For details of attendance by Ireland at relevant national and international meetings in 2017, please see Table 7A.

Table 7B: Follow-up of recommendations and agreements

Table 7B contains recommendations from RCMs/RCGs, Liaison Meeting, STECF and survey planning groups, relevant to Ireland and to the 2017 sampling year. All responsive actions have been highlighted. The table varies slightly from the original version of the AWP 2017 – 2019 (submitted in October 2016), and more accurately reflects all the relevant recommendations.

The IBTS WG made 6 recommendations, addressed to the ICES data centre, WGNSSK, and SCICOM. No recommendations were directed specifically to the MS's to action. WGBEAM made 7 recommendations, addressed to the ICES data centre, DIG, SSGIEOM, ACOM, and SICOM. None of which were directed specifically to the MS's to action. WGIPS, made a total of 3 recommendations, directed at WGBIOP, ICES data centre, HAWG and WGFAST. No recommendations were directed specifically to the MS's to action. WGNEPS made 2 recommendations, directed at WGNSSK, SCICOM, and the RCM's. No recommendations were directed specifically to the MS's to action.

No new recommendations arose during discussions at the 51st plenary meeting of the STECF (PLEN-16-01). 3 recommendations arose during discussions at the 52nd plenary meeting of the STECF (PLEN-16-02), all relating to the Landing Obligation and these are highlighted in Table 7B. 3 recommendations arose during discussions at the 53rd plenary meeting of the STECF (PLEN-16-03), all relating to the Mediterranean region and directed at The EU Commission, STECF, EWG's, FAO, and GFCM. None of the recommendations were relevant to Ireland.

Table 7C: Bi- and multilateral agreements

Table 7C contains details of Ireland's bi – lateral agreements with Scotland, France and Denmark, which were rolled over from 2016 into the period 2017 – 2019, In line with RCM – NA (2016) recommendation 11:

"RCM NA recommends that, where required, formal bilateral agreements set up for the period from 2014-2016 are carried forward until regional sampling plans are agreed".