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WORKSHOP ON TRANSVERSAL VARIABLES

(Linking economic and biological effort data (call) design)

19th -23rd January 2015

Edited by Cristina Castro Ribeiro

Data Collection Framework (DCF) Workshop
(This was a workshop funded by the EMFF and Member States)

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Contact information
Cristina Ribeiro
Address: Maritime Affairs Unit, Via Enrico Fermi 2749, 21027 Ispra VA, Italy
E-mail: cristina.ribeiro@jrc.ec.europa.eu
Tel.: 0039 0332 789329
Fax: 0039 0332 789658

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Abstract
The Workshop on the Transversal Variables took place in Zagreb from the 19th to 23rd of January, 2015 mainly to tackle the issues related to the increasing need of having fisheries fleet economic data and fisheries biologic data on a level of disaggregation that would allow a proper interoperability between datasets to underpin bioeconomic modelling. For that, several analyses were carried out and conclusions taken. These analyses were : 1. comparison of economic and biological effort data calls both with respect to their level of resolution and the landings and effort values obtained from equivalent aggregations was performed. This was compared to what would be needed in order to undertake bioeconomic modelling for a choosen management plan. 2. The description of how MS are calculating effort variables and a proposal on the way forward to harmonize approaches, 3. Conclusions on how to harmonize levels of resolution, the variable definitions and the codification in use amongst data calls, in order to make them comparable and based on coherent standard codifications.

Contents

1 EXECUTIVE SUMMARY

The Workshop on the Transversal Variables took place in Zagreb from the 19th to 23rd of January, 2015.This was a workshop the need for which was first identified by the Planning Group on Economic Issues (PGECON) at its 3rd meeting (May 31 - April 4, 2014). PGECON proposed the realization of an ad-hoc workshop on "Linking economic and biological effort data / call design" in 2014. The need for the workshop was due to the increasing need of having economic and biologic data on a level of disaggregation that would allow a proper interoperability between datasets. The **terms of reference (ToR)** the group addressed were: **A**) Comparison of economic and biological effort data calls (resolution/level of aggregation); experience from management plan evaluation; **B**) Definition of variables (e.g. days at sea vs. fishing days) – what is really required/used/desirable?; **C**) Opportunities for harmonization (resolution, definition, codification); any conclusions for DCMAP? and **D**) Exploration of optimum timing for the data calls and specific data sets.

The workshop had 29 attendees (25 experts from MS, 3 experts from JRC and the focal point from DG MARE). The skills of the experts that attended the WK were deliberately varied through the request for registrations from biologists, economists and data managers. This has allowed a broad coverage on the issues to be discussed. The work was conducted in three subgroups: data crunching (ToR A), variables estimation and definition (ToR B) and Codes Harmonization (ToR C). ToR D was addressed in plenary. Terms of Reference were addressed fully.

ToR A, was addressed using three approaches: 1. Identify what data is available from these three data calls launched by DGMARE (Fleet economic data call, Effort regimes data call and Mediterranean and Black sea data call)[1] and managed by JRC and what data would be required to prepare a dataset to support bio-economic modelling. This analysis has focused on the data structure, rather than on the content and has allowed identification of the convergences and mismatches between data calls and to put forward solutions that would support overcoming the differences; 2. Compare landings and effort data between the data calls and explore the reasons for the different values; 3. Explore how datasets can be used and merged using a case study.

The main conclusion is that though problems were found in terms of dimensionality in each data call individually, the group concluded that by merging the two data sets the dimensions in place would be the ones needed for bio-economic analysis at supra national level.

Additionally, it was identified that there is a strong need for guidance and identification of standards with regards to data provision for the MS. Several specific misunderstandings from the effort data call and the economic data call were identified. Situations such as those arising due to data confidentiality must be objectively tackled by providing clear policy to MS to avoid missing data and/or data rejection during JRC data calls. Maybe EUROSTAT's vast experience might be of good use for JRC. In general the effort and economic landings data sets are relatively comparable. However, an investigation into landings data in both data sets (limited to North Sea demersal species in 2012) revealed several inconsistencies and discrepancies, including mismatch between gears and values. To help resolve this there

[1] The Official data call letters and definitions may be consulted in the DCF website at http://datacollection.jrc.ec.europa.eu/data-calls.

needs to be clarification from some MS on how data are allocated to gear categories, particularly within the economic data call.

On addressing **ToR B**, the group has prepared a full description of the calculation methods each MS uses when estimating effort variables - days at sea and fishing days - under 6 fishing scenarios; This has proved that different calculation methodologies are in place across MS and sometimes within a MS. This has a huge impact on data comparability and data coherence.

The Transversal WS January 2015 agreed to set up common standards for calculating the number of days at sea and number of fishing days and recommends that all MS use this common standard when calculating days at sea and fishing days. In order to have sufficient information for carrying out the various analyses requested by the EU Commission the Transversal WS January 2015 recommends that the status of some of the existing logbook fields (dimension of passive gears, and fishing time) are changed from optional fields to mandatory fields. In addition, MS should make every effort to ensure completion of an existing mandatory field (number of fishing operations).

Calculation of days at sea and fishing days in the EU Member States is carried out using several different methods. Ways to estimate fishing days for passive gears and vessels not carrying logbooks should be examined in a follow up technical workshop. The workshop should also identify the information needed to calculate the estimates and evaluate to what extent the identified information is available through logbooks and other official statistics. The workshop should then agree on harmonized ways to estimate fishing days that can be implemented in MS.

With regard to **ToR C**, the group has thoroughly evaluated the drafted suggestions for standardisation of codes and variable definitions used in both the effort and economic data calls and defined a single approach (where possible). The main variable groups considered were Capacity, Landings and Effort. In reviewing the data call code lists the group also compared the standard codes published by DG MARE in the EC Master Data Register (MDR). This contains data structures and lists of fisheries codes to be used in electronic information recording and exchanges among Member States and for Member States' communications with Norway to record and report fishing activities.

For harmonization on resolution, definition and codification: a set of tables with standard codes and levels of disaggregation to be used in the three data calls for the future was produced; (already aligned with the DGMARE Master Data Register). Also the group suggested standardisation of codes and variable definitions for use in both effort and economic data calls and definition of one single approach (where possible). The main variable groups considered were Capacity, Landings and Effort.

ToR D, discussed the timing for the data calls, however it was agreed that this issue had already been fully addressed by a STECF EWG (EWG 14-17)[2] and therefore further elaboration from the workshop was unnecessary.

Given the important conclusions drawn and the additional work identified, the group has agreed on a roadmap for the way forward to tackle the different problems encountered and put in place solutions. This roadmap entails firstly a presentation of the workshop results to

[2] Scientific, Technical and Economic Committee for Fisheries (STECF) – Preparations for future data collection under the revised DCF (STECF-14-24). 2014. Publications Office of the European Union, Luxembourg, EUR 26954 EN, JRC 93103, 44 pp.

the STECF spring plenary. Second, to have an intermediate workshop with MS to assess how MS data would result from the new standards and to assess to what extent the scenarios identified represent the range of situations MS will find in their own data, so as to guarantee a smooth implementation for the 2016 data calls.

2 INTRODUCTION

The ad-hoc Workshop on Transversal Variables took place on 19th to the 23rd of January in the premises of the Croatian Ministry of Agriculture in Zagreb, Croatia. This was an EMFF funded workshop under the scope of the Data Collection Framework (DCF). The workshop was attended by 25 experts from 18 Member States, 3 experts from the Joint Research Center (JRC) and the focal point from DG MARE.

2.1 Background

The need for the workshop was identified by the Planning Group on Economic Issues (PGECON) at its 3rd meeting (May 31 - April 4, 2014). PGECON proposed the realization of an ad-hoc workshop on "Linking economic and biological effort data /call design" in 2014. The need for the workshop was due to the increasing need of having economic and biologic data on a level of disaggregation that would allow full interoperability between the datasets. Several management plans are stock specific and require economic information on the vessels that exploit that specific stock. This level of information is generally not available because economic data are reported by fleet segment. Impact assessments and evaluation of management plans are examples for which economic data are required at relatively high resolution (disaggregation).

Furthermore, DG MARE addressed the group to discuss the feasible content (and timing) of the new data calls. Up to now the annual economic data call is standardized in terms of content and timing, with minor changes year to year, which unfortunately does not always fit into the metier resolution to support evaluation of management plans. If we are to launch more detailed data calls to help with such evaluations, first we would need to know what (variables, format, level of disaggregation) is feasible to request in those data calls and when it is feasible to make such requests.

The proposal for the realisation of the workshop was therefore welcomed by DG MARE and the government of Croatia offered to convene the meeting in the premises of the Ministry.

2.2 Terms of Reference (ToR) for the workshop

According to the PGECON request, the group should meet in Zagreb to address the following tasks:

A. Comparison of economic and biological effort data calls (resolution/level of aggregation); experience from management plan evaluation
B. Definition of variables (e.g. days at sea vs. fishing days) – what is really required/used/desirable?
C. Opportunities for harmonization (resolution, definition, codification); any conclusions for DCMAP?
D. Exploration of optimum timing for the data calls and specific data sets.

2.3 Organisation

The workshop included a significant number of experts, 25 from 18 different MS. The participants list is included in annex 1. As requested on the announcement of the workshop, the range of expertise in the group was very broad which allowed the organisation of the work by subgroups. Three subgroups were created, the tasks to be addressed and the facilitators are identified in the table below. The workshop was guided by the chair and by facilitators assigned to each group.

Name	Function
Cristina Ribeiro	Chair of workshop.
Finlay Scott	Facilitator/rapporteur Data Crunching subgroup (ToR A).
Steven Holmes	Facilitator/rapporteur Variables subgroup (ToR B).
Matt Elliot	Facilitator/rapporteur Codes Harmonization subgroup (ToR C).

2.4 Background documents

Ahead to the workshop there were already some important outputs to be considered, these are included in the following background documents:

- Evaluation of DCF Data calls and variables managed by JRC In preparation of the new Data Collection Multiannual Programme (DC-MAP). (Annex III- Feasibility of merging data sets coming from the Effort and Economic data calls).
- Bioeconomic Modelling Applied to Fisheries with R/FLR/FLBEIA. (specifically item 5.2 Future Work/ Link with STECF/Effort)
- Evaluation/Scoping of Management plans Data analysis for support of the impact assessment for the management plan of Bay of Biscay anchovy (COM (2009)399 final) (EWG-14-05).

3 THE WORKSHOP

3.1 Comparison of economic and biological effort data calls (resolution/level of aggregation); experience from management plan evaluation.

On addressing ToR A, the main goal of the subgroup is on crunching data to enable the preparation of subsets for a chosen management plan and ensuring data comparability and data quality.

3.1.1 Compiling a data set for bio-economic modeling at the management plan level: **what we need / what we have**

For bio-economic modeling at the management plan (MP) level the different steps are:

1. To **identify fleets segments (fishing_tech*vessel_length) involved in the MP**: i.e. fleet segments in which vessels are targeting species or species assemblages (or using one or several gears) in the area of the plan;

2. For those fleet segments we need **data at the metier level, i.e.** ({gear*species assemblages}*area) data disaggregated according to level 6 of Appendix IV: one

fleet segment, vessels can operate in several métiers i.e. vessels can target other species than those involved in the MP.

→ We want to distinguish between vessel **activities under the Management Plans (MP)** and vessel **activities NOT under the MP**.

→ We need effort, landings and economic data at fleet segment*métier level to be able to assess the impact of the management plan on stocks and fleets segments.

*3.1.1.1 **What we need**: Data needed for bio-economic modeling at the fleet segment*métier level:*

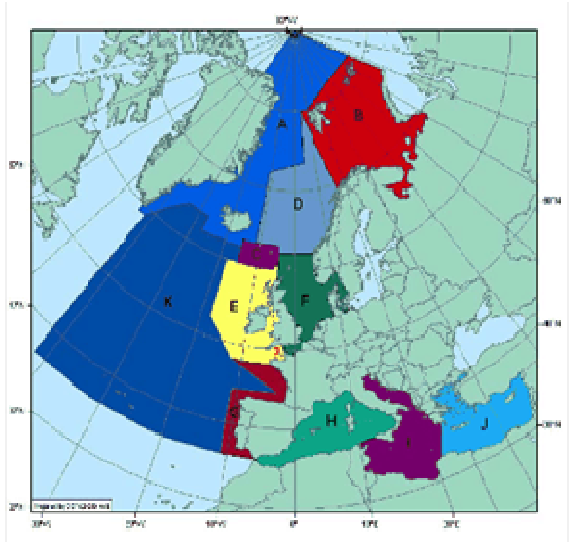
Capacity variables	Transversal variables	Economic variables
Number of vessels	Effort: days at sea, hours at sea, fishing days…	Energy costs
	Landings (in volume) by species + prices	Other variable costs

Definition of métier:

Metier = {gear*species assemblages}*area

with area defined as regions at management plan level.

The **DCF geographical stratification** by region **does not suit all regions at the management plan level,** especially for the North Atlantic. Ecoregions are: North Sea (Cod, plaice and sole MP), Celtic Sea and West of Scotland (Cod, Western Channel sole), Bay of Biscay and Atlantic Iberian waters (Sole, Nephrops/hake).



Graph: map of ecoregions for ecosystems approach to fisheries management (http://www.beaufort-

Table : extract of "Geographical stratification by Region" table, appendix II – Commission decision of 13 December

Geographical stratification by Region

Level	Sub-region/Fishing ground 1) 1	Region 2	Supra region 3
	Cluster of spatial units on level 4 as defined in Appendix I (ICES subdivision)	Baltic Sea (ICES areas III b-d)	Baltic Sea (ICES areas III b-d), North Sea (ICES areas IIIa, IV and VIId) and Eastern Arctic (ICES areas I and II), and North Atlantic (NEA areas V-XIV and NAFO areas).
	Cluster of spatial units on level 3 as defined in Appendix I (ICES Division)	North Sea (ICES areas IIIa, IV and VIId) and Eastern Arctic (ICES areas I and II)	
	Cluster of spatial units on level 3 as defined in Appendix I (ICES/NAFO Division)	North Atlantic (ICES areas V-XIV and NAFO areas)	
	Cluster of spatial units on level 4 as defined in Appendix I (GSA)	Mediterranean Sea and Black Sea	Mediterranean Sea and Black Sea
	RFMOs sampling Sub-areas except GFCM	Other regions where fisheries are operated by EU vessels and managed by RFMOs to which the Community is contracting party or observer (e.g. ICCAT, IOTC CECAF…)	Other regions

1) Sub-regions or fishing grounds are established by Member States for the first programming period (2009-2010); they may be redefined by Regional Coordination Meetings and agreed by STECF if necessary. This level should be consistent with existing geographical divisions.

Sometimes gear level is sufficient to get information on the métier because 1 gear is used to catch 1 species assemblage. But in other cases, 1 gear is used to operate in several métiers; in this case we need information on species assemblages. For example, see the DCF métier level 5 “target assemblage” (see table below)

Table 1: Illustration of the ability of métier level (target assemblage) to distinguish vessels activities

Gear	Species assemblages	DCF métier level 5 “target assemblage”
Example 1 : French DTS targeting anchovy in Bay of Biscay		
OTM (mid water otter trawl)	Anchovy	
OTT (multi-rig otter trawl)	Nephrops	OTT crustaceans
	Demersal fish (sole…)	OTT demersal fish
	Hake	OTT demersal fish
OTB (bottom otter trawl)	Squid	
Example 2 : French pelagic trawlers (TM) targeting anchovy in Bay of Biscay		
PTM (midwater pair trawl)	Anchovy	PTM small pelagic fish
	Sea bass	PTM demersal fish
	Yellowfin tuna	PTM large pelagic fish
	Pilchard	PTM small pelagic fish
OTB	Squid	

Table 2: Extract of “Fishing activity (métier) by Region” table, appendix IV – Commission decision of 18 December 2009

(3) North Atlantic (ICES areas V-XIV and NAFO areas)

Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	LOA classes (m)					
Activity	Gear classes	Gear groups	Gear type	Target assemblage [a]	Mesh size and other selective devices	<10	10- <12	12- <18	18- <24	24- <40	40 &+
Fishing activity	Dredges	Dredges	Boat dredge [DRB]	Molluscs	[b]						
			Mechanised/ Suction dredge [HMD]	Molluscs	[b]						
	Trawls	Bottom trawls	Bottom otter trawl [OTB]	Molluscs	[b]						
				Crustaceans	[b]						
				Demersal fish	[b]						
				Mixed crust-aceans and demersal fish	[b]						
				Mixed cephalopods and demersal fish	[b]						

3.1.1.2 ***What we have****: Data available in the economic and effort data calls*

3.1.1.2.1Transversal variables (effort and landings)

Effort per fleet segment*metier (fleet segment*{gear*species assemblages}*area)

Table 3: Effort variables. Availability by resolution types in the **ECONOMIC data sets** (effort table).

	Temporal resolution		Spatial resolution				Activity resolution			
Variables	Year	Quarter	Supra region	Region	Sub-region (ICES division)	ICES rectangle	Fleet segment	Gear	"Fishery" = target assemblages	Other
SeaDays	X		X				X			
FishDays	X		X				X			
GTFishDays*	X		X				X			
KWFishDays*	X		X				X			
Trips	X		X				X			
Energy costs	X		X				X			
MaxSeaDays	X		X				X			
SeaDays	X		X		X		X			
FishDays	X		X		X		X			
FishDays	X		X		X		X	X	missing	
GTFishDays*	X		X		X		X	X	missing	
KWFishDays*	X		X		X		X	X	missing	

* GTFishDays and KWFishDays variables only available for some fishing fleets segments: dredgers and seiners

Table 4: Effort variables. Availability by resolution types in the **EFFORT data sets** (tables B & C).

	Temporal resolution		Spatial resolution				Activity resolution			
Variables	Year	Quarter	Supra region	Region	Sub-region (ICES division)	ICES rectangle	Fleet segment	Gear	"Fishery" = target assemblages	Other
GTSeaDays		X			X		missing	X	X	vessel_length
KWSeaDays		X			X		missing	X	X	mesh size
SeaDays*		X			X		missing	X	X	specons
Hours fished		X				X	missing	X	X	vessel_length mesh size specons

*SeaDays variable only available for some management plans: Baltic Sea Cod plan, Western Channel Sole, Southern HKE&NEP, Long term plan Cod

Main issues from the economic data set:

- On the activity resolution, the fishery (target assemblages) information is missing;
- The spatial resolution is the ICES division, therefore it is possible to get effort at MP region level only if we can sum effort on ICES division, i.e. no duplicates in effort (currently the way data is being processed there are duplicates on effort figures by gear – (effort is supposed to be provided as full days, so if one has effort in two distinct ICES divisions within one day, as result there will be two days of effort if one tries to sum them up.)

Main issues from the effort data set:

- The fleet segment level on the activity resolution is missing (this information can be fetched by linking eco and effort data sets).
- The fishery should provide information on target assemblages, however as it is now defined it's not linked to DCF métier level 5 "target assemblage"; it's a "free text" variable with different interpretations across MS.
- The spatial resolution is the ICES division and is also available at ICES statistical rectangle therefore it is possible to get effort at management plan region level only if we can sum effort on ICES division/rectangle, i.e. no duplicates in effort.

Recommendation:

The Workshop has identified several ways to get effort variables at fleet segment*metier level:

- In the economic data call (effort table/ effort gear sheet): to replace gear level by DCF métier level 5 or level 6.
- Or in the effort data call (tables B & C):
    - "Fishery" field: free text could be replaced by DCF métier level 5 "target assemblage",
    - To add "fleet segment" resolution.
- Or to make the link between economic data call (effort by fleet segment*gear) and effort data call (effort by gear and métier (DCF level 5 "target assemblage")) using "gear" as a common field between both data calls.

To define the effort variables needed such that when spatial resolution is lower than MP region – for instance ICES division – there is the feasibility of evaluating effort at MP region level with no duplicates in days (currently only possible if using hours fished). Further explanation on double counting of effort is given in section 3.1.2.6 Double counting of effort.

Landings per fleet segment*métier*species (fleet segment*area*{gear*species assemblages}*species)

Table 5: landings variables availability by resolution types in **ECONOMIC data set** (landings table)

	Temporal resolution		Spatial resolution				Activity resolution			
Variables	Year	Quarter	Supra region	Region	Sub-region (ICES division)	ICES rectangle	Fleet segment	Gear	"Fishery" = target assemblages	Other
Landings value	X		X		X		X	X	missing	species
Landings Weight	X		X		X		X	X	missing	species

Table 6: landings variables availability by resolution types in **EFFORT data set** (tables A & E)

	Temporal resolution		Spatial resolution				Activity resolution			
Variables	Year	Quarter	Supra region	Region	Sub-region (ICES division)	ICES rectangle	Fleet segment	Gear	"Fishery" = target assemblages	Other
Landings Weight	X	X			X	X	missing	X	X	vessel_length mesh size specons

Main issues from economic data set:

- {gear*species assemblages} level is missing.

Main issues from effort data set:

- fleet segment level/resolution is missing (but we can get it by linking eco and effort data calls).
- "fishery" could provide information on species assemblages but data are not always submitted ; free text could be replaced by DCF métier level 5 "target assemblage".

Recommendation: One suggestion is to get landings variables at fleet segment*métier level: **the same as for the effort variables**.

Economic variables per fleet segment*métier (fleet segment*{gear*species assemblages}*area)

To disaggregate energy costs and other variable costs at the métier level a method was developed at the WKBEM workshop in 2012 (work is still ongoing). This method uses:

- Energy costs and other variable costs available from the economic data call at fleet segment*supra region level,
- Effort by fleet segment*métier as defined above.

Capacity variables (number of vessels) per fleet segment*metier (fleet segment*{gear*species assemblages}*area)

Table 7: Capacity variable availability by resolution types in **ECONOMIC data call** (capacity table).

	Temporal resolution		Spatial resolution				Activity resolution			
Variables	Year	Quarter	Supra region	Region	Sub-region (ICES division)	ICES rectangle	Fleet segment	Gear	"Fishery" = target assemblages	Other
Number of vessels	X		X				X			
Number of vessels	X		X	X			X	missing		

Table 8: Capacity variable availability by resolution types in **EFFORT data call** (table B).

	Temporal resolution		Spatial resolution				Activity resolution			
Variables	Year	Quarter	Supra region	Region	Sub-region (ICES division)	ICES rectangle	Fleet segment	Gear	"Fishery" = target assemblages	Other
Number of vessels		X		X	X		missing	X	X	vessel_length mesh size specons

Main issues from economic data set:

- Métier level is missing.
- Spatial resolution = DCF region division. It would be more relevant if regions were defined at the management plan level (e.g. North Sea (Cod, plaice and sole MP), Celtic Sea and West of Scotland (Western Channel sole), Bay of Biscay and Atlantic Iberian waters (Sole, Nephrops/hake)).

Main issues from effort data set:

- Fleet segment level is missing.
- Spatial resolution = ICES division. We can't sum on ICES division to get number of vessels at management plan region.
- "fishery" could provide information on species assemblages but data are not always submitted ; free text could be replaced by DCF métier level 5 "target assemblage" or level 6.

Recommendation: Suggestions to get number of vessels at fleet segment*métier level:
In economic data call: adding in Capacity table, a sheet "Capacity region métier": no of vessels per fleet*region*DCF métier level 5 or level 6, with region level defined as closely as possible at management plan region level. In such a situation one vessel shall be accounted for every situation where the vessel has data, i.e, for each combination of fleet segment*métier, allowing a proper

assessment of the number of vessels operating in each fishery. Conversely such data set cannot be added across fishery due to the risk of multiple counting of vessels.

3.1.2 Comparing data sets across data calls

3.1.2.1 Comparing effort in effort and economic data calls

Here we summarize the effort and landings data in the effort and economic data sets at different levels of aggregation, e.g. by year, member state, sub region etc. Inconsistencies and their sources are identified. French data was not used for effort comparison given that effort by type of gear data in the economic data call is not complete for this Country.

The North Sea cod management plan from Annex IIA (EU Legislation No. 39 and 40/2013) was chosen as a case-study. It was found that there is no common measure of effort between the data sets so unfortunately the comparison is limited. However, the exercise still revealed some inconsistencies regarding missing data by country and the mismatch between sub regions.

The cod management plan (EC Reg. 1342/2008) is based on four cod stocks, with the predominant geographical area being the combination of the North Sea, the Skagerrak and the eastern Channel. Within the management plan the other geographical areas included are the Kattegat, West of Scotland and the Irish Sea. We focused on the cod stock in the North Sea and its associated areas (Areas: 2 EU, 3AN, 4 and 7D).

Initial comparisons of the region coding between data calls found that area 4 from the effort data matched with a combination of areas 27.4.a, 27.4.b and 27.4.c from the economic data, and effort area 7D corresponded with 27.7.d. Within the economic data there is no differentiation between areas 3AN and 3AS, with the two areas being grouped as 27.3.a.

For further investigation it was decided to also include effort area 3AS so that the data were comparable between the effort and economic datasets. Region 2 EU from the effort data however has no associated area within the economic data. This only accounted for a very small number of observations in the Annex IIA effort data (approx. 97 lines). For the purposes of further investigation this area was removed from future comparisons.

As mentioned above, there is no common effort measure between the data calls. However, the comparison was started using Kw fishing days in the economic data and Kw days at sea in the effort data. By disaggregating the total effort only by year it is possible to see that even though the recorded efforts between the datasets are different (they are different measures so we expect that), the ratio is fairly constant over the years in the study raising the possibility of comparing the two different effort measures.

Table 9: Total effort per year in economic data set and effort data set extracted from the 2014 data calls.

Year	Effort data Kw sea days(million)	Economic data Kw fishing days (million)	Ratio

Year	Effort data Kw sea days(million)	Economic data Kw fishing days (million)	Ratio
2008	142.14	113.97	1.25
2009	144.57	114.15	1.27
2010	140.43	108.68	1.29
2011	127.67	97.22	1.31
2012	125.10	93.53	1.34

When we further disaggregate by country (only one year is shown) the ratio is not consistent so the analysis was halted. However, we can see that there is some missing data.

Table 10: Total effort per country in economic data set and effort data set extracted from the 2014 data calls. (Data for 2008)

Country	Effort data Kw sea days (million)	Economic data Kw fishing days (million)	Ratio
BEL	8.59	5.82	1.48
DEU	11.07	9.12	1.21
DNK	26.08	18.64	1.40
GBR	47.17	39.00	1.21
IRL	0.61	0.11	5.48
NLD	41.19	31.00	1.33
POL	NA	0.48	NA
SWE	7.42	9.80	0.78

This approach can be used in the future when we have a common measure of effort.

3.1.2.2 Comparing landings in effort and economic data calls

In this section we report on the comparability of landings data between the economic and effort data sets. As with the effort comparison, the North Sea was chosen as a case study focusing on cod (COD), and haddock (HAD). The gears landing these species are primarily the bottom trawl gears, otter trawl, demersal seines; beam trawls were included for completeness, so the initial exploration was based on these gears. The year 2012 was taken as an example year; as such any flagged concerns may not necessarily be replicate in other years. Due to unknown reasons to the Workshop the submitted Danish data for 1st quarter of 2012 were not included in the data set held by JRC that was used for the analysis carried out at the workshop. Therefore Danish data was not included in this analysis.

The North Sea area of investigation was based on the stock definition in EC Reg. 1342/2008. As area 2 EU has no equivalent within the economic data call this area was removed from investigations. Within the economic data set there is no differentiation between areas 3AN and 3AS, with the two areas being grouped as 37.3.a. For the purposes of this investigation it was decided to include 3AS.
The areas included within this investigation from each data call are as follows:

Effort	**Economic**
3AN	27.3.a

Effort	Economic
3AS	27.3.a
4	27.4.a
4	27.4.b
4	27.4.c
7D	27.7.d

3.1.2.3 Cod

There are seven member states (MS) landing cod in the North Sea (BEL, DEU, DNK, FRA, GBR, NLD, SWE. Due to the reason given in section 3.1.2.2 for the incomplete data set, the Danish data are not included in the analysis and therefore only six MS are considered in this analysis; in general the landings are comparable between the effort data set and the economic data set. Landings by GBR made up ~ 63 % of the landings in both data sets (Table 11). The percentage difference between the landings in the economic dataset and in the effort data set is on average 11%. Apart from France and Great Britain, the total weight of landings in the effort data call is higher than in the economic data call.

Table 11: Total cod landings (tons) in the economic data call (ICES divisions 27.3.a, 27.4.a, 27.4.b, 27.4.c, 27.7.d) and effort data call (North Sea cod management plan from Annex IIA).

Species	Effort gear:	Economic gear:				
COD	**All gears**	**All gears**				
Data Call	**BEL**	**DEU**	**FRA**	**GBR**	**NLD**	**SWE**
Effort	908.3	2,493.0	972.2	11,804.9	1,717.0	1,022.0
Economic	774.7	2,462.4	1,313.9	12,173.3	1,530.6	953.3
Ratio	1.17	1.01	0.74	0.97	1.12	1.07

The same six member states have COD landings using otter trawls in the North Sea. Landings by GBR made up ~ 80 % of the landings in both data sets (Table 12). The percentage difference between data sets was approximately the same as the one found in the total landings for most member states. There is, however, an issue with how these gears might have been reported in the data calls which may explain the higher percentages for some MS such as NLD.

Table 12: Cod otter trawl landings (tons) in the economic data call (ICES divisions 27.3.a, 27.4.a, 27.4.b, 27.4.c, 27.7.d and gear) and effort data call (North Sea cod management plan from Annex IIA).

Species:	Effort gear:	Economic gear:				
COD	**OTTER**	**OTB, OTT, PTB**				
	BEL	**DEU**	**FRA**	**GBR**	**NLD**	**SWE**
Effort	58.3	755.5	654.1	9,879.3	320.0	669.1
Economic	50.9	733.6	847.7	10,267.5	211.9	675.3
Ratio	1.14	1.03	0.77	0.96	1.51	0.99

The same six member states landed COD using demersal seines in the North Sea (Table 13). According to the effort data set DEU and GBR both landed between 1,000 t and 1,500 t of cod using demersal seines, constituting the majority of the landings. The percentage difference between data sets shows relative differences compared to the percentage differences for total landings. For this particular gear, the ratio between effort landings and economic landings has inverted, with the majority of MS landings higher in the economic data call than in the effort data call.

Table 13: Cod demersal seine landings (tons) in the economic data call (ICES divisions 27.3.a, 27.4.a, 27.4.b, 27.4.c, 27.7.d) and effort data call (North Sea cod management plan from Annex IIA).

Species: Effort gear: Economic gear:
COD **DEM_SEINE** **SDN,"SPR","SSC","SB"**

	BEL	DEU	FRA	GBR	NLD	SWE
Effort	21.5	1,443.6	36.9	1,335.6	609.5	70.8
Economic	24.0	1,455.4	27.4	1,335.3	619.0	71.3
Ratio	0.89	0.99	1.35	1.00	0.98	0.99

There are five member states landing cod using beam trawls in the North Sea. Landings of cod using beam trawls were minimal for all member states; BEL landing the most with ~800 t. There was a large percentage difference between data sets for two of the member states FRA and NLD.

Table 14: Total Cod beam trawl landings (tons) in the economic data call (ICES divisions 27.3.a, 27.4.a, 27.4.b, 27.4.c, 27.7.d) and effort data call (North Sea cod management plan from Annex IIA).

Species: Effort gear: Economic gear:
COD **BEAM** **TBB**

	BEL	DEU	FRA	GBR	NLD
Effort	693.5	27.1	1.3	44.3	541.7
Economic	817.1	26.5	0.6	44.6	758.0
Ratio	0.85	1.02	2.30	0.99	0.71

3.1.2.4 Haddock

There are seven member states landing haddock, using mainly otter trawls, in the North Sea. Due to the reason given in section 3.1.2.2 for the incomplete data set the Danish data are not included and therefore only six MS are considered in this analysis. Total volume of landings between data calls practically equates for all MS except France. Apart for Belgium and Germany, the total volume of haddock landings is higher in the economic data call than in the effort data call.

Table 15: Total haddock landings (tons) in the economic data call (ICES divisions 27.3.a, 27.4.a, 27.4.b, 27.4.c, 27.7.d) and effort data call (North Sea cod management plan from Annex IIA).

Species	Effort gear:	Economic gear:				
HAD	**All gears**	**All gears**				
Data Call	**BEL**	**DEU**	**FRA**	**GBR**	**NLD**	**SWE**
Effort	78.6	672.9	184.1	27,092.8	169.0	312.7
Economic	69.8	668.1	224.4	27,373.4	171.2	315.6
Ratio	1.1	1.0	0.8	1.0	1.0	1.0

The vast majority of landings of haddock using otter trawls are by GBR (~ 22,000 t). The remaining member states have landings < 500 tons each.

Table 16: Total Haddock otter trawl landings (tons) in the economic data call (ICES divisions 27.3.a, 27.4.a, 27.4.b, 27.4.c, 27.7.d) and effort data call (North Sea cod management plan from Annex IIA).

Species:	Effort gear:	Economic gear:				
HAD	**OTTER**	**OTB,"OTT","PTB"**				
	BEL	**DEU**	**FRA**	**GBR**	**NLD**	**SWE**
Effort	0.2	393.9	182.8	21,758.3	33.0	275.8
Economic	0.2	395.9	222.2	21,967.8	23.4	278.5
Ratio	0.9	1.0	0.8	1.0	1.4	1.0

There are six member states landing haddock using demersal seines in the North Sea (Table 17). Again GBR is the major contributor of landings within this category, ~ 5,000 t. Landings by all other member states were minimal. The percentage difference between data sets was minimal for all member states.

Table 17: Haddock demersal seine landings (tons) in the economic data call (ICES divisions 27.3.a, 27.4.a, 27.4.b, 27.4.c, 27.7.d) and effort data call (North Sea cod management plan from Annex IIA).

Species:	Effort gear:	Economic gear:			
HAD	**DEM_SEINE**	**SDN,"SPR","SSC","SB"**			
	BEL	**DEU**	**GBR**	**NLD**	**SWE**

Species:	Effort gear:	Economic gear:			
HAD	**DEM_SEINE**	**SDN,"SPR","SSC","SB"**			
	BEL	**DEU**	**GBR**	**NLD**	**SWE**
Effort	3.9	266.4	5,285.8	134.7	18.1
Economic	4.4	273.6	5,285.8	130.0	20.1
Ratio	0.9	1.0	1.0	1.0	0.9

There are five member states landing haddock using beam trawls in the North Sea (Table 18). Landings by all member states were low. Despite DEU having a relatively large percentage difference between data sets, in actual terms the weight difference is minimal.

Table 18: Haddock beam trawl landings (tons) in the economic data call (ICES divisions 27.3.a, 27.4.a, 27.4.b, 27.4.c, 27.7.d) and effort data call (North Sea cod management plan from Annex IIA).

Species:	Effort gear:	Economic gear:		
HAD	**BEAM**	**TBB**		
	BEL	**DEU**	**GBR**	**NLD**
Effort	65.77	0.04	1.84	6.27
Economic	73.98	0.02	1.84	6.00
Ratio	0.89	2.00	1.00	1.04

3.1.2.5 Double counting of effort

Double counting of effort can occur with higher resolution data, e.g. the sum of all subregions within a region can be higher than the sum of the region. This can apply to active gears when trawls stretch across more than one subregion. Then the same day will be assigned to two subregions, but on the level of a region it will be only one day. Double counting for fixed gear can occur when different types of gear are deployed during the same time. Then the day is counted for each gear separately, but it is only one day for the fishing vessel i.e. on the fleet segment level.

This issue has been partly addressed in footnote 4 of Appendix VIII in 93/2010. However, it is not entirely clear why some effort variables are requested for all levels of resolution (e.g. fishing days) while others are requested only at specific levels of resolution (e.g. days at sea: B1 and C3).

The problem could be reduced (though not solved) if hours instead of days were used. However, reporting hours is not mandatory under the logbook regulation and effort limitations from management plans are based upon days. A possible solution is that effort data might still have to be

requested separately for different levels of resolution to overcome the problem of mismatch due to double counting, depending on the resolutions which are required for a certain purpose. If, for instance, a certain management plan X requires effort data on a subregion level, then the effort dataset should be requested at that specific subregion level. If, in parallel, the same effort data are required on regional level (e.g. for regional analysis), then the data would have to be requested at that level, too. It is likely that for every level of resolution there might be a request by a certain application.

3.1.2.6 Final comments

In general we would be expecting the effort and economic landings data sets to be comparable; however, here we give examples of some discrepancies. These differences might be related with mismatches in the codification used by MS and methodologies to produce the datasets. (e.g In the economic data call, gear types don't correspond to the concept of dominant gear, as in the fleet segment, but to the effective gear used. The splitting of effort into gear types might not have been well implemented by all MS.). Also the figures in the logbook used to estimate the data might be the reason for the differences found; logbook estimates allow a tolerance margin, if these estimates are used to reply to a data call the totals may be different to when final landings totals are used. Therefore the WK considers there is a need for further work and clarification on how data are allocated to gear categories and from which source figures are calculated, particularly within the economic data call, in order to overcome the caveats the group has found.

3.1.3 Linking economic cost data to effort call data for bioeconomic modelling

A trial exercise was performed to explore alternative methods to link the economic cost data to the effort call data. UK otter trawls in the North Sea were chosen as a case study. The main aim was to calculate a standardized economic variable (energy cost per unit effort) from the economic cost and economic effort data, and then apply this to the effort data set. Full details can be seen in the ANNEX. The basic process was:

- Select gear in effort data set ("Otter"),
- Get corresponding gears in economic data set ("OTB" etc.),
- Get Clusters in economic cost data that do some Otter trawling,
- Regress costs in Clusters against economic effort from gears in economic data set,
- Look at Coefficient for Otter gears – this is the standardized crude cost / effort.

The main limitation of this method is that it does not disaggregate by Vessel Length, an important component of the cost structure of the gear. However, vessel size is partly considered through using Kw fishing days as the effort measure because larger vessels tend to have a larger engine for a given gear. Another issue is the difference in Vessel Length categories between the economic and effort data sets.

This case study demonstrates that it may be possible to apply this approach to generate datasets for bioeconomic modelling. It is similar to the approach developed at the WKBEM 2012 workshop which is being further developed at the JRC. The main difference is that the WKBEM approach calculates a standardized variable across the supra region, which is then scaled to the management plan area, whereas the approach here attempts to calculate a standardized variable only for the

management plan area. Consequently, the WKBEM approach uses more data to calculate the standardized variable, allowing for it to be disaggregated by Vessel Length.

3.2 Definition of variables (e.g. days at sea vs. fishing days) – what is really required/used/desirable?

On addressing ToR B, the main goal of the subgroup is to address the following questions about effort definitions and estimation: What are the definitions currently in place; are these variables accurately measuring what one wants/needs to measure; is it possible to address some of the caveats identified with these data sets beforehand;

- how the estimates are calculated (number calendar days, number of 24h time periods, hours/24);
- the way these estimates (especially for "days at sea") can be linked to a gear and a fishing area (is the result a double count, a unique count for the main gear/fishing area of the day, or a prorata value found using fishing time spent in each area/gear ?);
- how to deal with day(s) travel from port to fishing area or between fishing areas. Should we take it into account? If yes, how is it possible to link it to a gear or a fishing area? Is this of relevance for the economic perspective (existence of costs while traveling).

3.2.1 Current Practice in variable calculation

Calculation of days at sea and fishing days in the EU Member States is carried out using several different methods. The Transversal WS January 2015 requested MS to supply the number of days at sea (Annex 4) and fishing days (Annex 5) that would be returned in response to the effort and economic data calls, and also for the purpose of direct effort management (uptake against baselines), for a vessel fishing according to six scenarios (each scenario corresponds to a specific fishing trip pattern, for which either gears or fishing grounds can change). A table of text explaining the derivation of the numbers in tables in annexes 4 and 5 is given in annex 6.

The results from these tables have shown that between MS different approaches are used to handle trip scenarios leading to incomparable ways of measuring fishing effort both in days at sea and fishing days. It should be stressed that debate over the correctness or otherwise of individual MS interpretations of the data request is somewhat irrelevant, it is the lack of consistency between MS when supplying a given variable for a given data call and the lack of consistency within a MS when supplying the same variable to different data calls that is the issue.

3.2.2 Recommended procedure for variable calculation

For the purpose of providing comparable data when complying with the data calls launched by the DGMARE for evaluation of management plans and fisheries economic performance the Transversal WS January 2015 agreed to set up common standards for calculating the number of days at sea and number of fishing days.

Recommendation: that all MS use this common standard when calculating days at sea and fishing days.

The calculation methods agreed attempt to respect the regulations forming the basis of data collection under the DCF and effort management under the effort management regimes, although Scenarios 3, 4 and 5 seem to contradict COM Decision 93/2010 Appendix VIII footnote 4. This should be one issue to consider during the current process of the revision of the DCF. The text contained in relevant regulations is summarized in Table 12.

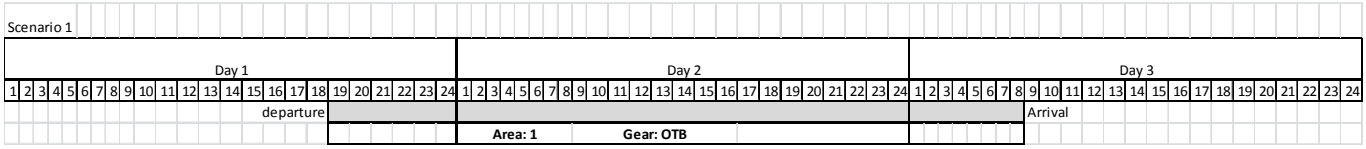
The calculation methods agreed are not necessarily the same as those used for management purposes in the different MS. Differences in number of days at sea and number of fishing days provided by MS authorities and data provided according to the JRC data calls may occur.

Recommendation: The results must be considered in the DCF reviewing process that is now being undertaken, specifically when tackling effort variables. **Data provided according the JRC data calls are not used for direct management purposes i.e. setting of baselines for kWdays.**

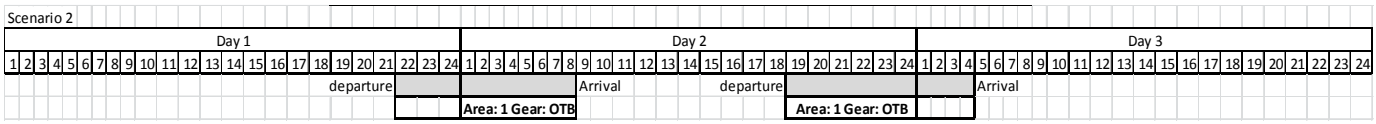
3.2.2.1 Days at Sea

Days at sea is calculated by trip. It is the time between when a vessel leaves the harbor and the return to a harbor. The number of days at sea by a trip is calculated as commenced 24 hour periods expressed in whole numbers. This means for example that a trip of 26 hours will result in 2 days at sea.
When assigning parts of a trip to different areas and/or gears the total number of days at sea should be preserved (no double counting). The days at sea for a fraction of a trip can be expressed as a decimal. The fractions should sum up to the total for that specific trip. The information used to split up a trip could be number of dates by combination (area*gear) or fishing duration if this information is available. The results outlined below assume logbook data according to the minimum required in the control regulation, i.e. that the exact fishing time (within areas or using a given gear) is not known; there are only logbook entries specifying area(s) fished and gear used for each date.

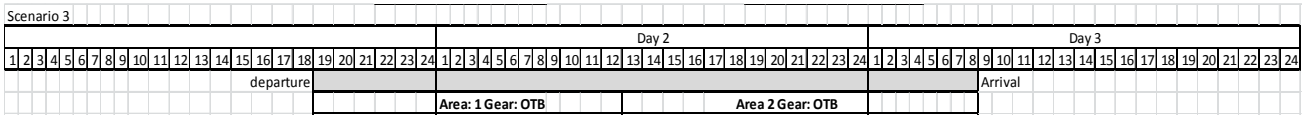
Scenarios:
Scenario 1. Only one gear is used and fishing only occurs in one area. The start of the 24 hour period is at the departure time of the trip. The agreed outcome is **2 days at sea** as the trip is 38 hours and it should be calculated as number of 24 hour periods and rounded up to an integer.



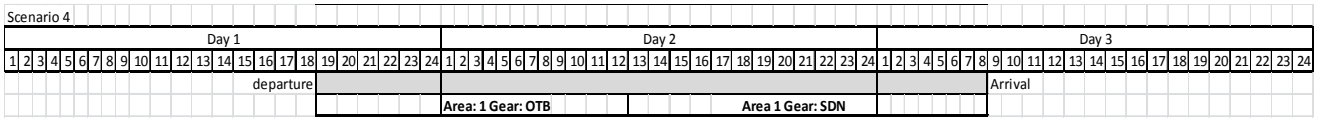
Scenario 2. Only one gear is used and fishing only occurs in one area. However, the return to port occurs on the same day as the departure from port. Each trip is considered as the start of a new 24 hour period. The agreed outcome is **2 days at sea** as there are two separate trips and both trips consist of less than 24 hours.



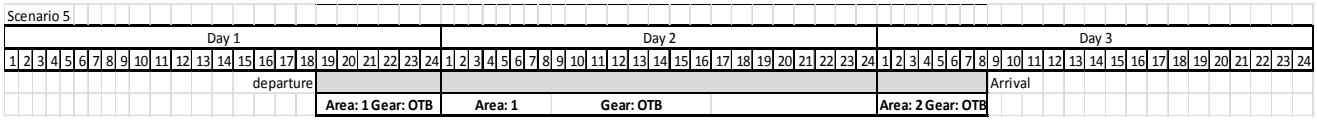
Scenario 3. Fishing has taken place in two different areas with the same gear within the same 38 hour fishing trip. A catch has been reported in each of the areas. The total number of days at sea amounts to 2 and the integrity of the overall number of days at sea per trip should be maintained. The total days in each of the areas or subareas is calculated as the fraction of time spent in each of the areas. The agreed method of calculation in this scenario results in **1 day at sea in each of the areas**. [Fractions calculated from logbook entries; for each area 2 entries from a total of 4. If hours in each area were recorded the fractions could be calculated as 18/38 = 0.47 and 20/38 = 0.53]



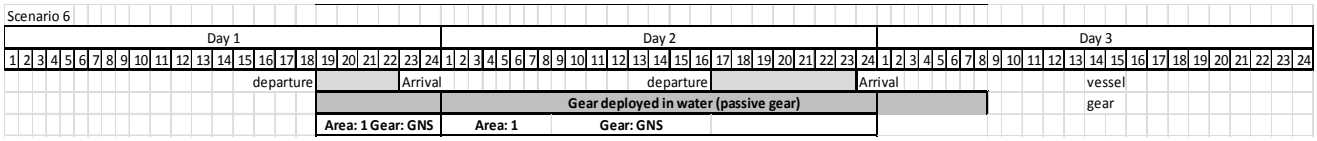
Scenario 4. Fishing has taken place in the same area with two different gears within the same 38 hour fishing trip. A catch has been reported for each of the gears. The total number of days at sea amounts to 2 and the integrity of the overall number of days at sea per trip should be maintained. The total days for each of the gears is calculated as the fraction of time spent using each of the gears. The agreed method of calculation in this scenario results in **1 day at sea for each of the gears**. [Fractions calculated from logbook entries; for each gear 2 entries from a total of 4. If hours in each area were recorded the fractions could be calculated as 18/38 = 0.47 and 20/38 = 0.53]



Scenario 5. Fishing has taken place in two different areas with the same gear within the same 38 hour fishing trip. A catch has been reported in each of the areas. The total number of days at sea amounts to 2 and the integrity of the overall number of days at sea per trip should be maintained. The agreed method of calculation in this scenario results in **1.33 days at sea in area 1 and 0.67 days at sea in area 2**. [Fractions calculated from logbook entries; for area 1, 2 entries and area 2, 1 entry from a total of 3. If hours in each area were recorded the fractions could be calculated as 30/38 = 0.79 and 8/38 = 0.21]



Scenario 6. A fishing trip takes place on two different calendar days to perform fishing operations using a passive gear which is left in the water between fishing trips. Each trip is considered as the start of a new 24 hour period. The agreed outcome is **2 days at sea** as there are two trips and both trips consist of less than 24 hours.

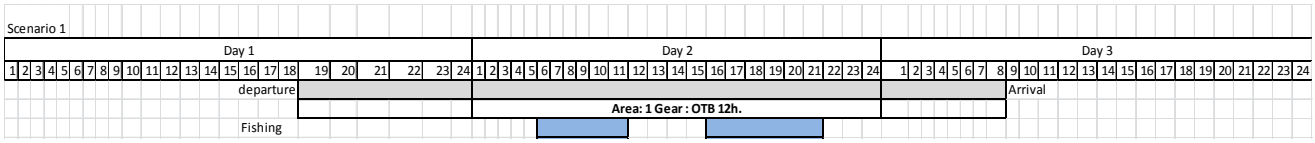


3.2.2.2 Fishing Days

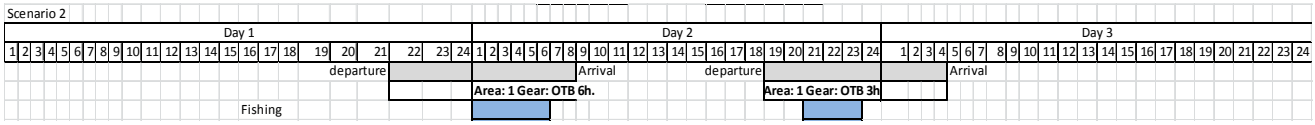
When calculating fishing days different methods are needed for active and for passive gears. Only a few MS have implemented national rules for reporting in logbooks that go beyond the minimum requirement specified in the control regulation. The minimum requirements are not compatible with recording fishing days for all passive gears. The method for calculating the number of fishing days outlined below is mainly based on fishing trips where active gears are used.

Scenarios:

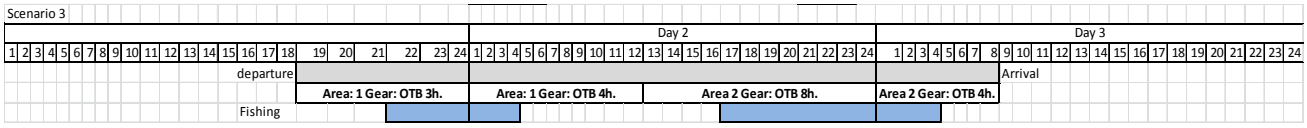
Scenario 1. Only one gear is used and fishing only occurs in one area. Fishing operations take place on one calendar day. The agreed outcome is **1 fishing day** as fishing has taken place within the same date.



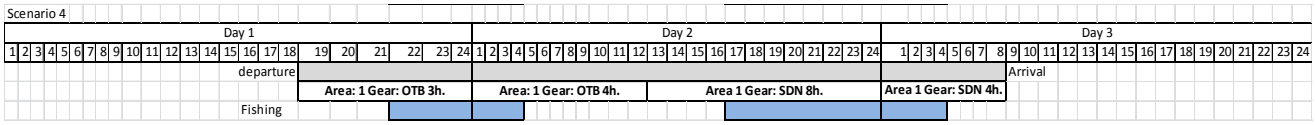
Scenario 2. Only one gear used and fishing only occurs in one area. However, the return to port occurs on the same day as the departure from port and all fishing operations are conducted on the same day. The agreed outcome is **2 fishing days** as fishing has taken place on two different fishing trips.



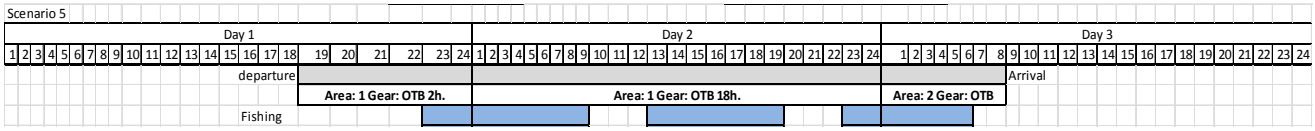
Scenario 3. Fishing has taken place in two different areas with the same gear within the same 38 hour fishing trip. A catch has been reported in each of the areas. Overall number of fishing days and allocation to each area is by the method indicated at the end of the scenarios. The agreed method of calculation results in **2 fishing days** in total, with **one day allocated to area 1 and one day to area 2**.



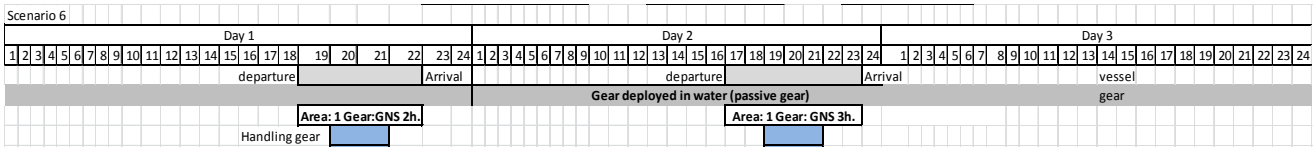
Scenario 4. Fishing has taken place in the same area with two different gears within the same 38 hour fishing trip. A catch has been reported for each of the gears. Overall number of fishing days and allocation to each gear is by the method indicated at the end of the scenarios. The agreed method of calculation results in **2 fishing days** in total, with **one day allocated to gear 1 and one day to gear 2**.



Scenario 5. Fishing has taken place in two different areas with the same gear within the same 38 hour fishing trip. A catch has been reported in each of the areas. A catch is reported only as a single logbook entry for each day. Overall number of fishing days and allocation to each area is by the method indicated at the end of the scenarios. The agreed method of calculation results in **2 fishing days** in total, with 1.33 days allocated to area 1 and 0.67 day to area 2.



Scenario 6. A fishing trip takes place on two different calendar days to perform fishing operations using a passive gear which is left in the water between fishing trips. The agreed method of calculation results in **2 fishing days** in total if fishing days are calculated as for **active gears**. If fishing days **(soaking time)** are recorded the number of **fishing days is 3**.



Method

Step 1: Add the number of fishing dates in a trip. Total number of fishing dates = total of fishing days

Step 2: Compare the total of fishing days to days at sea. If

- The total is ≤ days at sea then leave total of fishing days unchanged,
- The total is > days at sea then make the total of fishing days = total of days at sea

Step 3: Allocate the fishing days between areas according to the proportion of dates in the logbook found for each area. Leave the results for each area as a decimal if necessary (not the total number of fishing days).

So e.g. for scenario 5.

- Trip duration 38 hours resulting in 2 days at sea (38/24 rounded up to whole number)
- Day 1: one logbook entry for area 1
- Day 2: one logbook entry for area 1
- Day 3: one logbook entry for area 2
- So total fishing days = 3
- Reduce total of fishing days to 2
- Area 1 => 2/3*2 = 1.33 fishing days
- Area 2 => 1/3*2 = 0.67 fishing days

3.2.3 The problem of calculating effort for passive gears and for vessels without logbooks

Ways to harmonize and agree on relevant effort estimations for passive gears and vessels not carrying logbooks need to be further explored before conclusions and agreements can be made. The information available differs considerably between MS (annex7) and the way to estimate transversal data differs partly as a consequence of information available.

For passive gears, issues occurred in particular for fishing days. In many member states information on soaking time (duration of time the gears have been fishing) is not available from the control data. Days at sea can be estimated for vessels carrying logbooks but this variable is most likely a poor proxy for fishing mortality as it only relates to the activity of the vessel and not the gear. Ways to improve access to information on (or estimates of) soaking time need to be examined before guidance can be given to MS. Options include requiring more information in logbooks or modelling. This should preferably be done in a technical follow up workshop.

For vessels not carrying logbooks data collected can be less specific than even the basic requirements for logbooks. For example, in some countries only daily or weekly activity summaries are available (without trip specific information, departure and return time in particular) while in other countries sample schemes are in force. Data available from these small scale vessels have been described in the DCF Workshop on "Common understanding and statistical methodologies to estimate/re-evaluate transversal data in small-scale fisheries" Nantes, 21-23 May 2013, http://datacollection.jrc.ec.europa.eu/documents/10213/22901/2013-10-17_Final+report+WK+SSF+May+2013.pdf

The principles recommended above for vessels carrying logbooks have to be followed as far as possible depending on the data available. In many cases non-logbook vessels make trips that can be counted as one day at sea and one fishing day. Nevertheless, issues specific for small scale vessels (e.g. multi-gear or polyvalent vessels) need to be examined before clear guidance can be given to MS. This should preferably be done in a technical follow up workshop.

Recommendation: Ways to estimate fishing days for passive gears and vessels not carrying logbooks should be examined in a follow up technical workshop. The workshop should also identify the information needed to calculate the estimates and evaluate to what extent the identified information is available through logbooks and other collected data. The workshop should then conclude on harmonized ways to estimate fishing days that can be implemented in MS.

The problem of non-mandatory fields in logbooks

The Transversal WS January 2015 produced a table showing the level of detail in reporting in MS logbooks (annex 7). Comparing information provided by each MS shows significant differences. In order to have sufficient information for carrying out the various analyses requested by the EU Commission the Transversal WS January 2015 suggests that the status of some of the existing logbook fields (variables) are changed from optional to mandatory fields. Also a thorough evaluation is needed of the additional obligations set by the Technical Measures regulation with respect to the passive gears so as to access how much information MS should have already available to support passive gear effort estimation. The fields of concern from the logbooks are;

- dimension of passive gears (number and length passive gears) (logbook field no. 10; currently optional),
- number of fishing operations (logbook field no. 12), and

- fishing time (logbook field no. 13; currently optional).

Recommendation: That the status of some of the existing logbook fields (dimension of passive gears, and fishing time) are changed from optional fields to mandatory fields. In addition that MS make every effort to ensure completion of an existing mandatory field (number of fishing operations).

During the process of reviewing the present DCF and the revision process of the new revised DCF several STECF expert groups have analyzed the collection of transversal data (STECF, 2013; STECF, 2014). Most of the data is collected or reported according to the provisions in the control regulation, i.e. via logbooks. In the reviewing process analyses have shown that the level of detail and quality of the transversal data from official logbooks is not sufficient for scientific and management plan evaluation purposes. It is recognized that according to the provisions in the DCF legislation it is possible to carry out additional collection of transversal data. If reliable additional collection of transversal data is to be carried out an additional/supplementary logbook is required. Asking fishermen to fill in two logbooks, one for scientific use and one for official use is not a realistic option. Therefore, in order to avoid that the same information is collected twice and to avoid double work it is recommended that the control regulation is revised so as to make (control regulation) logbook data the only required – and sufficient - source for recording of transversal data.

Table 12: regulations relevant to the collection of fishing effort data.

Regulation	Definition of fishing and effort
REGULATION (EU) No 1380/2013 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 11 December 2013 on the Common Fisheries Policy., amending Council Regulations (EC) No 1954/2003 and (EC) No 1224/2009 and repealing Council Regulations (EC) No 2371/2002 and (EC) No 639/2004 and Council Decision 2004/585/EC	'fishing effort' means the product of the capacity and the activity of a fishing vessel; for a group of fishing vessels it is the sum of the fishing effort of all vessels in the group;
	'fishing activity' means searching for fish, shooting, setting, towing, hauling of a fishing gear, taking catch on board, transshipping, retaining on board, processing on board, transferring, caging, fattening and landing of fish and fishery products;
COUNCIL REGULATION (EC) No 1224/2009 of 20 November 2009 establishing a Community control system for ensuring compliance with the rules of the common fisheries policy.	'fishing activity' means searching for fish, shooting, setting, towing, hauling of a fishing gear, taking catch on board, transshipping, retaining on board, processing on board, transferring, caging, fattening and landing of fish and fisheries products;
COMMISSION IMPLEMENTING REGULATION (EU) No 404/2011 of 8 April 2011 laying down detailed rules for the implementation of Council Regulation (EC) No 1224/2009 establishing a Community control	'fishing trip' means any voyage of a fishing vessel during which fishing activities are conducted that starts at the moment when the fishing vessel leaves a port and ends on arrival in port;

Regulation	Definition of fishing and effort
system for ensuring compliance with the rules of the Common Fisheries Policy	'fishing operation' means all activities in connection with searching for fish, the shooting, towing and hauling of active gears, setting, soaking, removing or resetting of passive gears and the removal of any catch from the gear, keep nets, or from a transport cage to fattening and farming cages;
COMMISSION DECISION of 18 December 2009 adopting a multiannual Community programme for the collection, management and use of data in the fisheries sector for the period 2011-2013 (2010/93/EU)	active vessels: vessels that have been engaged in any fishing operation (more than 0 days) during a calendar year. A vessel that has not been engaged in fishing operations during a year is considered 'inactive';
	days at sea: any continuous period of 24 hours (or part thereof) during which a vessel is present within an area and absent from port;
	fishing days: each day is attributed to the area where the most fishing time was spent during the relevant day at sea. However, for passive gears, if no operation took place from the vessel during a day while at least one (passive) gear remained at sea, that day will be associated to the area where the last setting of a fishing gear was carried out on that fishing trip;
	fishing trip: means any voyage by a fishing vessel from a land location to a landing place, excluding non-fishing trips (a trip by a fishing vessel from a location to a land location during which it does not engage in fishing activities and during which any gear on board is securely lashed and stowed and not available for immediate use);
Cod in the Baltic COUNCIL REGULATION (EC) No 1098/2007 of 18 September 2007 establishing a multiannual plan for the cod stocks in the Baltic Sea and the fisheries exploiting those stocks, amending Regulation (EEC) No 2847/93 and repealing Regulation (EC) No 779/97	'days absent from port' means any continuous period of 24 hours or part thereof during which the vessel is absent from port.
Cod in the Baltic COMMISSION REGULATION (EU) No 1268/2009 of 21 December 2009 excluding ICES	No definition. Reference to COUNCIL REGULATION (EC) No 1098/2007.

Regulation	Definition of fishing and effort
Subdivisions 27 and 28.2 from certain fishing effort limitations and recording obligations for 2010, pursuant to Council Regulation (EC) No 1098/2007 establishing a multiannual plan for the cod stocks in the Baltic Sea and the fisheries exploiting those stocks	
Cod in the North Sea, Skagerrak and the Kattegat COUNCIL REGULATION (EC) No 1342/2008 of 18 December 2008 establishing a long-term plan for cod stocks and the fisheries exploiting those stocks and repealing Regulation (EC) No 423/2004	Calculation of fishing effort. For the purposes of this Regulation, the fishing effort deployed by a group of vessels shall be calculated as the sum of the products of capacity-values in kW for each vessel and the number of days each vessel has been present within an area set out in Annex I. A day present within an area shall be any continuous period of 24 hours (or part thereof) during which a vessel is present within the area and absent from port.
Southern hake and Norway lobster COUNCIL REGULATION (EC) No 2166/2005 of 20 December 2005 establishing measures for the recovery of the Southern hake and Norway lobster stocks in the Cantabrian Sea and Western Iberian peninsula and amending Regulation (EC) No 850/98 for the conservation of fishery resources through technical measures for the protection of juveniles of marine organisms	fishing effort shall be measured as the sum, in any calendar year, of the products across all relevant vessels of their installed engine power measured in kW and their number of days fishing in the area.
Sole in the Bay of Biscay COUNCIL REGULATION (EC) No 388/2006 of 23 February 2006 establishing a multiannual plan for the sustainable exploitation of the stock of sole in the Bay of Biscay	fishing effort shall be measured as the sum, in any calendar year, of the products, calculated for every relevant vessel, of installed engine power measured in kW and the number of days fishing in the area.
Plaice and sole in the North Sea COUNCIL REGULATION (EC) No 676/2007of 11 June 2007establishing a multiannual plan for fisheries exploiting stocks of plaice and sole in the North Sea	No definition for effort even though effort should be measured. For effort no reference to other regulations.
Sole in the Western Channel COUNCIL REGULATION (EC) No 509/2007 of 7 May 2007 establishing a multi-annual plan for the sustainable exploitation of the stock of sole in the Western Channel	No definition for effort even though effort should be measured. For effort no reference to other regulations.

3.3 Opportunities for harmonization (resolution, definition, codification); any conclusions for DCMAP?

The sub-group reviewed code lists and variables and made suggestions for standardisation of codes and variable definitions used in both effort and economic data calls and definition of one single approach (where possible). The main variable groups considered were Capacity, Landings and Effort.

In reviewing the data call code lists the group also compared the standard codes published by DG MARE in the EC Master Data Register (MDR). This contains data structures and lists of fisheries codes to be used in electronic information recording and exchanges among Member States and for Member States' communications with Norway to record and report fishing activities.

The group did not consider the possible impact of any future pan EU fate collection initiatives and in particular the possibilities referenced in the Feasibility Study on data storage and transmission under the future DCF (MARE/2012/22 - Lot 2 (SI2.656640)). This sought to identify overlaps and administrative burdens in fisheries data collection and transmission and future scenarios. The report was published in 2014 and responses to it were still being evaluated by the Commission.

3.3.1 Species

3 alpha species codes used in both data calls and the MDR originate with the FAO Fisheries and Aquaculture Statistics and Information Service (FIPS) which collates world capture and aquaculture production statistics at the species, genus, family or higher taxonomic level:

http://www.fao.org/fishery/collection/asfis/en

The list of species they produce (ASFIS) includes 12 thousand species items selected according to their interest or relation to fisheries and aquaculture. The list is not exhaustive and new items are added annually. Changes may also result from amendments to taxonomic classification.

The main issue identified with species codes concerned possible differences between codes supplied on logsheets and sales notes and those reported. This was identified as a particular issue for a handful of species where EC reporting (including for quota uptake monitoring) was required at a higher taxonomic level than might have been supplied by the fisherman, for example megrim (MEG) vs megrims (LEZ). This issue was recognized by Eurostat and FAO in compilation of aggregate statistics and adjustments made where appropriate.

The workshop advised that the species code list from the effort call should be deleted as it could be employed differently by individual Member States.

The workshop suggested that any species codes and aggregates should at least conform to those listed in TAC and Quota Regulations.

3.3.2 Countries (Annex 8)

Both the MDR and economic data call use the ISO 3166-1 alpha-3 country codes defined in ISO 3166-1, part of the ISO 3166 standard published by the International Organization for Standardization (ISO), to represent countries, dependent territories, and special areas of geographical interest. These codes are also used in Eurostat fisheries statistics legislation. The effort data call uses a number of none standard national and sub-national codes.

The workshop recommended that country codes should align on the ISO 3166-1 standard (as for the economic data call). The exception to this would be countries where sub-national codes were used in the effort call where no compatible standard existed (ESP, GBR and PRT). It was believed this would cause little inconvenience for the countries concerned, however the continued need for the sub-national breakdowns merit further investigation with the countries concerned.

3.3.3 Fishing Areas (Annex 9)

The MDR employs FAO fishing areas. In their totality these comprise nineteen major marine areas covering the waters of the Atlantic, Indian, Pacific and Southern Oceans, with their adjacent seas and eight major inland fishing areas: http://www.fao.org/fishery/area/search/en . The economic data call also uses FAO area codes for transversal data reporting. These are aggregated to a number of supra regions for economic data. By contrast the effort data call has its own area codification. Many of the codes used map neatly to FAO standard codes. However there are exceptions where the effort code denotes a level of greater detail, splitting by EU and non EU waters. Both the MDR and effort calls include codes for Skagerrak (27.3.a.n) and Kattegat (27.3.a.s) which are still pending official adoption for the FAO list.

The workshop concluded that where there was a direct mapping between FAO codes in the economic call the economic call codes should be adopted for effort (for transversal variables).

To allow comparability between areas in the two calls the workshop suggested that an additional variable, EEZ, is included in the economic data call for transversal data. In addition, collection of the data for Skagerrak and Kattegat is mandated by the inclusion of their codes in the MDR and these could be included in the economic call with other sub-areas in the FAO and MDR hierarchy.

3.3.4 Vessel length classes (Annex 10)

The economic and effort data calls employ differing length class classifications which have their origin in the differing rules governing different segments of the fleet. Variations also exist within calls where different classes are employed for different sea areas. It was accepted that the development of a bio-economic model for fisheries management would require harmonisation of length classes to allow interoperability between datasets. The group concluded that maintaining the different length classes by area was valid. It was suggested **that the requirement for distinction of vessels above and below 15m could be dropped to allow comparability between calls**. Changes suggested were in accordance with Commission Decision (2010/93/EU) adopting a multi-annual community programme for the collection, management and use of data in the fisheries sector for the period 2011-2013.

The codification for the economic call was suggested as providing the basis of both lists. The proposed list at Annex 3 removes the LV0012 fleet segment in the Mediterranean area and fleet segments from L1015 to LV1012 and from VL1518 to LV1218 in other areas.

The workshop additionally proposed adoption of the economic data call code notation (e.g. from OXXTXXM to LVXXXX).

3.3.5 Fishing Gears (Annex 11)

Fishing gears used in both calls and the MDR follow the International Standard Statistical Classification of Fishing Gear (ISSCFG) http://www.fao.org/fishery/cwp/handbook/M/en .

The group noted that the 1 January 2015 revision of the MDR gear list, in line with Commission Implementing Regulation (EU) 404/2011, removed a number of codes that were present in DCF data calls. The impacts of this on future data calls was not explored by the workshop, however it was agreed that the DCF would need to be changed to mirror the MDR.

Codes removed are as follows:

Code	Description
SB	Beach seines
OT	Otter trawls (not specified)
PT	Pair trawls (not specified)
TX	Other trawls (not specified)
DRH	Hand dredges
LNP	Portable lift nets
LNB	Boat-operated lift nets
LNS	Shore-operated stationary lift nets
LN	Lift nets (not specified)
FCN	Cast nets
FG	Falling gear (not specified)
GNF	Fixed gillnets (on stakes)
GEN	Gillnets and entangling nets (not specified)
FPN	Stationary uncovered pound nets
FYK	Fyke nets
FSN	Stow nets
FWR	Barriers, fences, weirs, etc.
FAR	Aerial traps
HAR	Harpoons
HMP	Pumps
HMX	Harvesting machines (not specified)

It was noted that the populations of the two calls was different with the effort data call comprising a subset of the economic call. It was anticipated that regional management plans would require an expansion of the scope of the effort data call and it was suggested that this would justify its expansion to match the economic data call population.

The two data calls also employed different levels of gear aggregation (effort gear for effort and fishing tech for the economic call). Whilst these could not be directly related, there was no suggestion that aggregations in either case should change. Transversal data for the economic data call

is since 2014, also supplied at the gear code level which would allow read across to the effort call when the populations were the same.

The workshop noted the STECF recommendation for economic data to be supplied for the entire active fleet rather than just that registered at 1 January, as required by the legislation. This affected just a handful of Member States.

The workshop also highlighted the need for different units within DG MARE (those responsible for control and DCF) to work more closely together to ensure that changes in one area were reflected in the other.

3.3.6 Mesh size range (Annex 12)

The group considered the suitability of mesh ranges set out in the effort data call for active and passive gears. These were absent from the economic data call. No specific suggestions for change were made although it was suggested that other groups might have an interest in doing this because it was verified that the mesh size definition within the effort data call doesn't match with mesh sizes ranges per region as in the Regulation on the Technical Measures (Council Regulation (EC) Nº 850/98).

3.3.7 Variables and dimension names (Annexes 13 and 14)

The subgroup compared the lists of dimensions and variables used in both data calls. It was determined that there were a number of variables not existing in one or other of the calls. These cases are highlighted 'Not applicable' in the table. In addition there are cases where similar acronyms are used in the two calls but the meaning for requested data under these acronyms is different. The group suggested changes to acronyms corresponding to the variable name as provided in the regulation and to keep one acronym type (code) for both data calls where possible.

3.3.8 Management Plans (Annex 15)

The sub-group reviewed the various management plans, many of which were covered by specific legislation. The group started to evaluate the characteristics of fleets impacted by the plans. However this was considered to be too big a task to complete in the workshop. For example:

Management Plan under Council Regulation (EC) No 1342/2008 of 18 December 2008 - Establishing a long-term plan for cod stocks and the fisheries exploiting those stocks and repealing Regulation (EC) No 423/2004

Areas: North Sea, Kattegat, Skagerrak, the eastern Channel, Irish Sea and West of Scotland

Fleet characteristics

Gear description	Gear Code	Mesh range	Vess Length
Bottom trawls and seines	OTB	TR1 equal to or larger than 100 mm,TR2 equal to or larger than 70 mm	>10m
	OTT		
	PTB		

Gear description	Gear Code	Mesh range	Vess Length
	SDN	and less than 100 mm, TR3 equal to or larger than 16 mm and less than 32 mm;	
	SSC		
	SPR		
Beam trawls	TBB	BT1 equal to or larger than 120 mm, BT2 equal to or larger than 80 mm and less than 120 mm;	
	TBB		
Gill nets, entangling nets	GN		
Trammel nets	GT		
Longlines	LL		

It was suggested that this might be done as a separate exercise. The expansion of the scope of the effort call to the entire fleets would cover all the segments affected.

A complete list of plans covered by specific legislation was compiled. A further list of plans for the Mediterranean and Black Sea was attempted but not completed.

The workshop noted that the **MDR contained a list of standard codes** for management plans.

Summary of recommendations by code list

Code list	Recommendation
Species	• The list should follow the FAO ASFIS standard as reproduced in the EC Master Data Register (MDR). • The species code list from the effort call should be deleted as it could be employed differently by individual Member States. • Species codes and aggregates should at least conform to those listed in TAC and Quota Regulations.
Countries	• Country codes should align on the ISO 3166-1 standard (as for the economic data call) where possible. • Sub-national codes may be permitted in the effort data call if useful for the MS concerned. (ESP, GBR and PRT). • The need for the sub-national breakdowns might merit further investigation, both in terms of the true need and the possibility to use codes according to international standards already in place.
Areas	• Where direct mappings to FAO codes in the economic call exist the economic call codes should be adopted for the effort (for transversal variables). • To allow comparability between areas in both calls an additional variable, Exclusive Economic Zone (EEZ), should be included in the economic data call for transversal data. • Codes for lower levels of fishing area (eg. Skagerrak and Kattegat) should be included in both calls. These are present in the Master Data Register.
Length classes	• The codification for the economic call should provide the basis of both lists. This removes the VL0012 fleet segment in the Mediterranean area and changes fleet segments from VL1015 to VL1012 and from VL1518 to VL1218 in other areas.

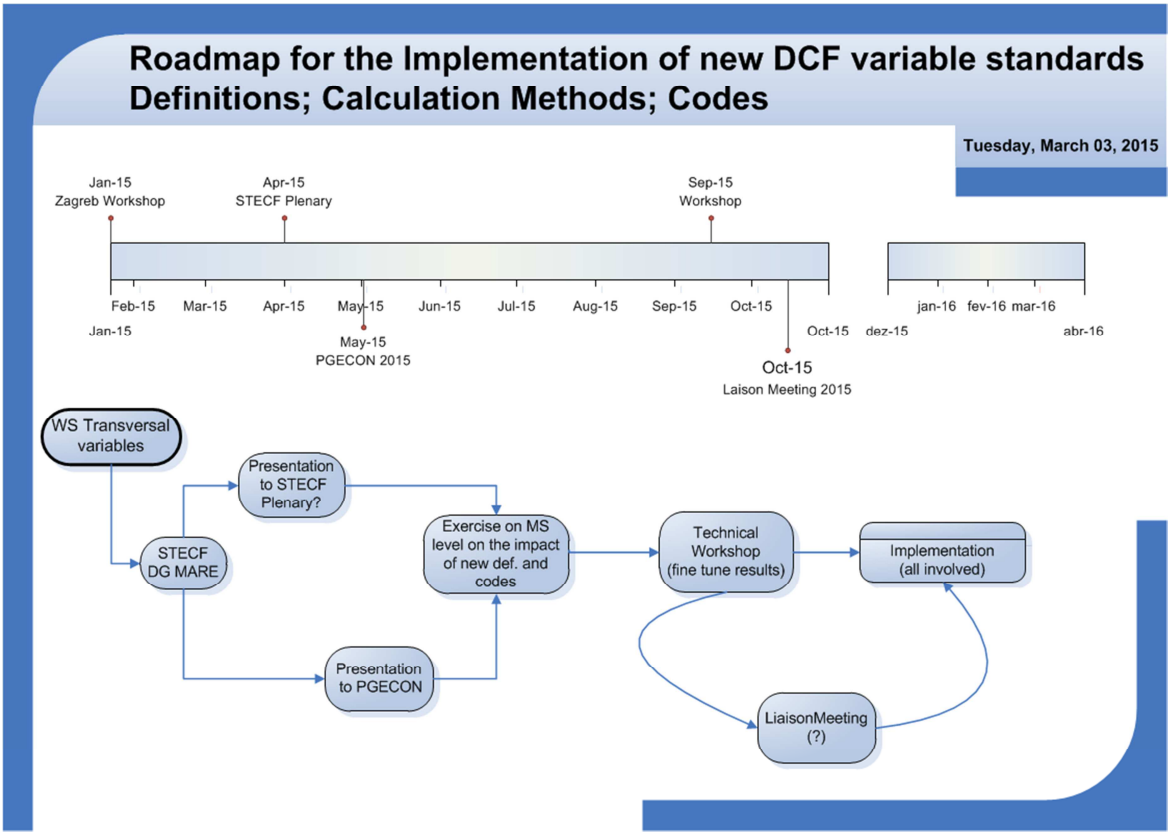
Code list	Recommendation
	• The economic data call code notation (i.e. VLXXXX) should be applied to both calls.
Gears	• MDR list (as a subset of the FAO list) is proposed as the standard. The issue of this being truncated in Implementing Regulation (EC) 404/2011 should be further investigated.
	• Effort data call scope to be expanded to cover all fleet segments and not only those covered by management plans, (at present for some countries part of the fisheries activity is not included).
	• STECF recommendation for economic data to be collected for the fleet active within a year not just registered at 1 January is reiterated.
	• No suggestion that aggregations in either data call should change. Transversal data for the economic data call are also supplied at the gear code level allowing read across to the effort call when the populations are the same.
	• The need for different units within DG MARE (those responsible for control and DCF) to work more closely together to ensure that changes in one area were reflected in the other.
Mesh size	• Investigation should be made to access the merit of aligning the mesh size range with the mesh sizes ranges from the Technical measures regulation (Reg (EC) 850/98).
Variables	• Common variable and dimension names proposed.
Management plans	• Plans listed. Further work to ensure the list is comprehensive and the segments covered is needed.

3.4 Exploration of optimum timing for the data calls and specific data sets.

The group addressed the current ToR by discussing in plenary the advantages and disadvantages of a possible postponing of the economic data call, given this is the data call with the most contentious schedule. However it was acknowledged that the report of STECF EWG 14-17[3] has thoroughly addressed this issue, which enables the end–users of current data calls, (DGMARE through STECF) to take an informed decision when devising the annual calendars for the data calls.

3.5 AoB

The results of the workshop have convinced the group of the need for further work to address the shortcomings identified, namely the implementation of the standard methodologies for effort estimation, agreeing new codes and fine tuning the results after first trial implementation with real data. For that a roadmap of what the group considers to be a good approach has been drawn and is shown below. Two important steps from this roadmap are: 1. to trigger STECF and DG MARE attention for the need to address the issues identified and, 2. to include this outcome in the DCF machinery in due time so PGECON, RCMs and LM have the opportunity to be consulted about the conclusions and recommendations for the future.



[3] Scientific, Technical and Economic Committee for Fisheries (STECF) – Preparations for future data collection under the revised DCF (STECF-14-24). 2014. Publications Office of the European Union, Luxembourg, EUR 26954 EN, JRC 93103, 44 pp.

ANNEX 1 - Participants

Name	Institution	Country
Cristina Ribeiro (Chair)	European Commission. Directorate-General Joint Research Centre Institute for the Protection and Security of the Citizen (IPSC) Unit G.03 MARITIME AFFAIRS.	Italy
Steven Homes	European Commission. Directorate-General Joint Research Centre Institute for the Protection and Security of the Citizen (IPSC) Unit G.03 MARITIME AFFAIRS.	Italy
Finlay Scott	European Commission. Directorate-General Joint Research Centre Institute for the Protection and Security of the Citizen (IPSC) Unit G.03 MARITIME AFFAIRS.	Italy
Angel Andres Calvo Santos	European Commission. DG Maritime Affairs and Fisheries (DG MARE). Unit A3. Belgium.	Belgium
Katrien Verlé	Institute for Agricultural and Fisheries Research (ILVO).	Belgium
Ivana Vukov	Directorate of Fisheries, Ministry of Agriculture of Republic of Croatia.	Croatia
Jørgen Dalskov	DTU Aqua, Technical University of Denmark. National Institute of Aquatic Resources.	Denmark
Josefine Egekvist	DTU Aqua, Technical University of Denmark. National Institute of Aquatic Resources.	Denmark
Andrei Baikov	Fisheries Resources Department, Ministry of Environment.	Estonia
Anssi Ahvonen	LUKE. Natural Resources Institute Finland.	Finland
Pekka Korhonen	LUKE. Natural Resources Institute Finland.	Finland
Sophie Leonardi	IFREMER	France
Sébastien Demanèche	IFREMER	France
Jörg Berkenhagen	Thünen-Institute of Sea Fisheries.	Germany
Irene Tzouramani	Agricultural, Economic and Research Institute. Ministry of Rural Development and Food.	Greece
Antonios Papoutsis	Fisheries Research Institute.	Greece
Lucio Labanchi	MABLY. Ricerca e Statistiche.	Italy
Irina Davidjuka	BIOR, Institute of Food Safety, Animal Health and Environment.	Latvia
Olga Ozernaja	Fish Resources Research Department, Institute of Food Safety, Animal Health and Environment "BIOR".	Latvia
Irina Jakovleva	Fisheries Service, Ministry of Agriculture.	Lithuania
Algirdas Balnis	Fisheries Service, Ministry of Agriculture.	Lithuania
Marianne Aquilina	Department of Fisheries and Aquaculture - Fisheries Resource.	Malta
Eric Muscat	Department of Fisheries and Aquaculture - Fisheries Resource.	Malta
Katell Hamon	Economics of Aquatic Resources. LEI, part of Wageningen UR.	Netherlands
Edo Avdič	Fisheries Research Institute of Slovenia.	Slovenia
Anton Paulrud	Swedish Agency for Marine and Water management.	Sweden
Katja Ringdahl	Swedish University of Agricultural Sciences.	Sweden
Matt Elliott	Her Majesty's Government – Marine Management Organisation.	United Kingdom
Thomas Reilly	Marine Scotland – Science.	United Kingdom

ANNEX 2 – Agenda

WORKSHOP ON TRANSVERSAL VARIABLES
(Linking economic and biological effort data (call) design)
19 – 23 January 2015
Zagreb - Ministry of Agriculture and Fisheries
Agenda

Day 1 (pm):
1. Opening of meeting and housekeeping
2. Terms of reference
3. The Economic and Effort data calls
    A. Economic data call: transversal data, structure and level of disaggregation
    B. Effort data call: transversal data, structure and level of disaggregation
    C. To build a dataset with economic and biological data
4. Identification of Management plans for which subsets of data can be prepared from current data calls;
    A. What data requirement for international assessments of management plans

Days 2, 3 and 4: (Sections 5, 6- 7 and 8 will run in parallel)
5. Revision of codes used in both data calls and definition of one single approach;
6. Variables definition
    A. Regulations Currently in place using effort data and their definition;
    B. How MS are calculating effort measures when preparing their data provisions;
    C. Effort definition from Economic perspective versus from biologic impact perspective;
7. Definition of a consistent framework regarding the definition of effort variables
8. Crunching data to prepare subsets for the identified management plans (on the sequence of section 4)
    A. data comparability
    B. quality assurance

Day 5 (am):
9. Presentation and discussion of the results from each subgroup
10. Addressing ToR 4: Exploration of optimum timing for the data calls and specific data sets.
11. Draft report and review recommendations
12. AOB

ANNEX 3 – ToR A. results from data analysis.

Transversal variable example GBR - North Sea Otter trawl

Data cruching group

Wednesday, January 21, 2015

3.6 Main idea

Starting from a management plan need, try to extract economic data for the fleets affected. We chose to look at the British ottertrawlers in the North Sea cod management plan

```
# define case study
years <- 2012
country <- "GBR"
gear_of_interest <- OTTER
area_of_interest <- c("27.4.a","27.4.b","27.4.c","27.7.d","27.3.a")
```

4 FLEET SEGMENTS IDENTIFICATION

First step was to select the fleets fishing (at least partly) in the North Sea with ottertrawls using the effort data per *gear_type* coming from the economic data.

```
library(plyr)
library(reshape)

##
## Attaching package: 'reshape'
##
## The following objects are masked from 'package:plyr':
##
##     rename, round_any

library(ggplot2)
#read effort data from economic data
setwd("D:/WUR/Working Groups/2015/WSTransversal variable/Data_crunching/")
eff.orig <- read.csv("./effort_by_gear.csv", sep=";")

clu.orig <- read.csv("./cluster.csv", sep=";")

# select fleets fishing in year country, area, gears of interest
subEff  <- subset(eff.orig,country_code==country&year%in% years)
subgear <- subset(subEff,gear_type%in%OTTER &sub_reg %in% area_of_interest)
flt_of_int <- unique(subgear[c('country_code','year','supra_reg','fishing_tech','vessel_length')])
flt_of_int

##       country_code year supra_reg fishing_tech vessel_length
## 26             GBR 2012    AREA27          DTS        VL1218
## 77             GBR 2012    AREA27           PS        VL0010
## 89             GBR 2012    AREA27          FPO        VL0010
## 660            GBR 2012    AREA27          DTS        VL2440
## 1241           GBR 2012    AREA27           PS        VL1218
## 1261           GBR 2012    AREA27          FPO        VL1012
## 1286           GBR 2012    AREA27          DTS        VL0010
## 1311           GBR 2012    AREA27          MGP        VL0010
## 1715           GBR 2012    AREA27           PS        VL2440
## 1780           GBR 2012    AREA27          MGP        VL1012
## 2056           GBR 2012    AREA27          DTS        VL1824
## 2594           GBR 2012    AREA27          TBB        VL1012
## 3404           GBR 2012    AREA27          DTS        VL40XX
## 3680           GBR 2012    AREA27          DRB        VL1218
## 5635           GBR 2012    AREA27          DRB        VL0010
## 5925           GBR 2012    AREA27          PGP        VL0010
## 6011           GBR 2012    AREA27          HOK        VL0010
## 6330           GBR 2012    AREA27          DTS        VL1012
## 8076           GBR 2012    AREA27          HOK        VL1012
## 8710           GBR 2012    AREA27          TBB        VL1218
## 9364           GBR 2012    AREA27          PMP        VL0010
## 10189          GBR 2012    AREA27          MGP        VL1218
```

```
## 10503          GBR 2012    AREA27          DFN        VL0010
## 10703          GBR 2012    AREA27          FPO        VL1218
## 16600          GBR 2012    AREA27          DRB        VL1012
## 17025          GBR 2012    AREA27           PS        VL40XX
```

26 fleet segments were identified

5 ECONOMIC DATA FOR THOSE FLEETS

```
load("./ecovars.orig")
ecovars.orig$year <- as.numeric(as.character(ecovars.orig$year))

# subset gear, year and fleets of interest
subEco <- subset(ecovars.orig,country_code==country&year%in% years)
subEco <- within(subEco,cluster <- paste(supra_reg,fishing_tech,vessel_length,sep=''))
ecoflt <- merge(clu.orig,flt_of_int)
subEco <- merge(subEco,unique(ecoflt[c('country_code','year','cluster')]))
nrow(unique(subEco[c('fishing_tech','vessel_length')]))

## [1] 17

ddply(subEco,.(variable),summarise,value=sum(value,na.rm=T))

##         variable        value
## 1         totves      4421.00
## 2          totkw    624072.25
## 3          totgt    161271.60
## 4      totdeprep 432519321.82
## 5      totrights 670676082.68
## 6      totinvest  42058494.89
## 7         finpos       713.53
## 8       tottrips    319711.00
## 9    totenercons 225671367.07
## 10   totfishdays    303830.21
## 11 totgtfishdays  16346196.07
## 12 totkwfishdays  57519688.76
## 13    totseadays    371759.59
## 14        totjob     11137.16
## 15     totnatfte      8041.44
## 16    totharmfte      8041.44
## 17   totcrewwage 179647433.24
## 18  totunpaidlab  11987304.71
## 19   totenercost 157327346.04
## 20    totrepcost  66760296.73
## 21    totvarcost 128040113.96
## 22  totnovarcost  93720316.94
## 23 totrightscost  32794688.33
## 24    totdepcost  42703600.97
## 25   totlandginc 797281415.06
## 26  totrightsinc   3898044.78
## 27     totdirsub         0.00
## 28   tototherinc  25430989.13
```

26 fleets results in 17 clusters with economic data.
To make sure that all effort for those 17 clusters are accounted for, we must reselect the effort for all the fleets covered by the 17 clusters.

```
efflt <- merge(clu.orig,  unique(ecoflt[c('year','country_code','cluster')]))
nrow(efflt)

## [1] 30

subEff  <- merge(subEff,efflt[c('year','country_code','cluster','supra_reg','fishing_tech','vessel_length')])
```

overview of the effort per gear for those fleets

```
# replace gear code in economic data with the Effort call code
subEff <- within(subEff,gear_eff <- ifelse(gear_type %in% BEAM,"BEAM",
                                    ifelse(gear_type %in% OTTER ,"OTTER",
                                    ifelse(gear_type %in% PEL_TRAWL,"PEL_TRAWL",
                                    ifelse(gear_type %in% DEM_SEINE,"DEM_SEINE",
                                    ifelse(gear_type %in% PEL_SEINE,"PEL_SEINE",
                                    ifelse(gear_type %in% DREDGE,"DREDGE",
```

```
                                    ifelse(gear_type %in% LONGLINE,"LONGLINE",
                                    ifelse(gear_type %in% GILL,"GILL",
                                    ifelse(gear_type %in% TRAMMEL,"TRAMMEL",
                                    ifelse(gear_type %in% POTS,"POTS","OTH")))))))))))

effortG <- ddply(subEff,.(gear_eff),summarise,
                 totfishdays=sum(totfishdays,na.rm=T),
                 totkwfishdays=sum(totkwfishdays,na.rm=T),
                 totgtfishdays=sum(totgtfishdays,na.rm=T))
effortG$percKWfdays <- effortG$totkwfishdays/sum(effortG$totkwfishdays)*100
print(effortG[c('gear_eff','percKWfdays')])

##     gear_eff percKWfdays
## 1       BEAM  1.64502754
## 2  DEM_SEINE  2.33477463
## 3     DREDGE  5.47708030
## 4       GILL  2.90775485
## 5   LONGLINE  1.93382305
## 6        OTH  0.27889906
## 7      OTTER 56.91720839
## 8  PEL_SEINE  0.01056508
## 9  PEL_TRAWL  7.05241462
## 10      POTS 20.42687186
## 11   TRAMMEL  1.01558062
```

Many gears with very low effort should be aggregated, rule of thumb everything with less than 5% will be pooled in gear *OTH*.

```
subEff <- within(subEff,{pooledG <- replace(gear_eff,gear_eff%in% effortG[effortG$percKWfdays<5,'gear_eff'],"OTH"
)})
```

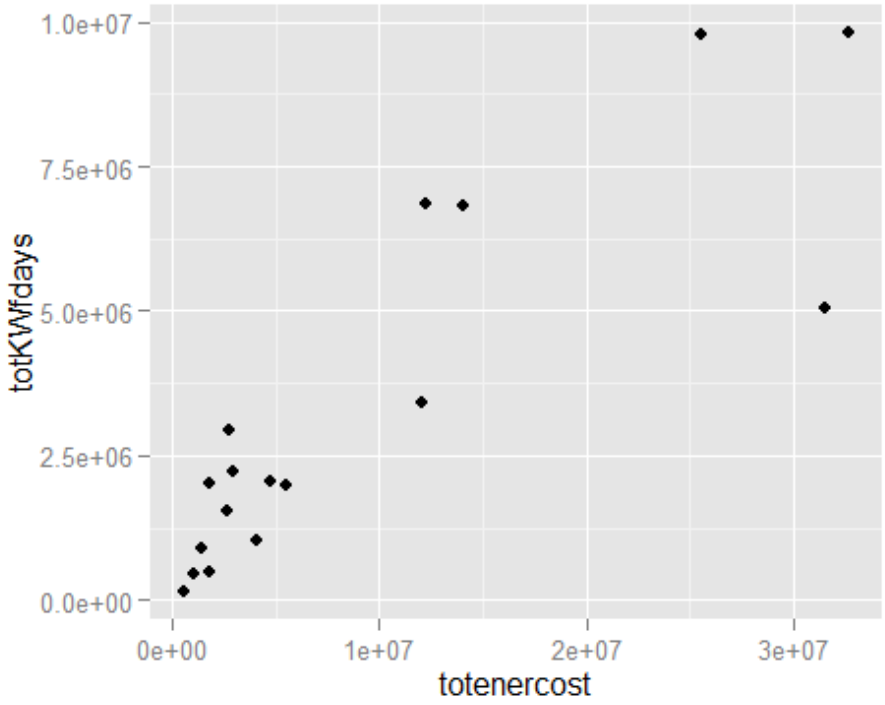
6 ESTIMATION OF VARIABLE COSTS PER GEAR (AS IN THE EFFORT CALL)

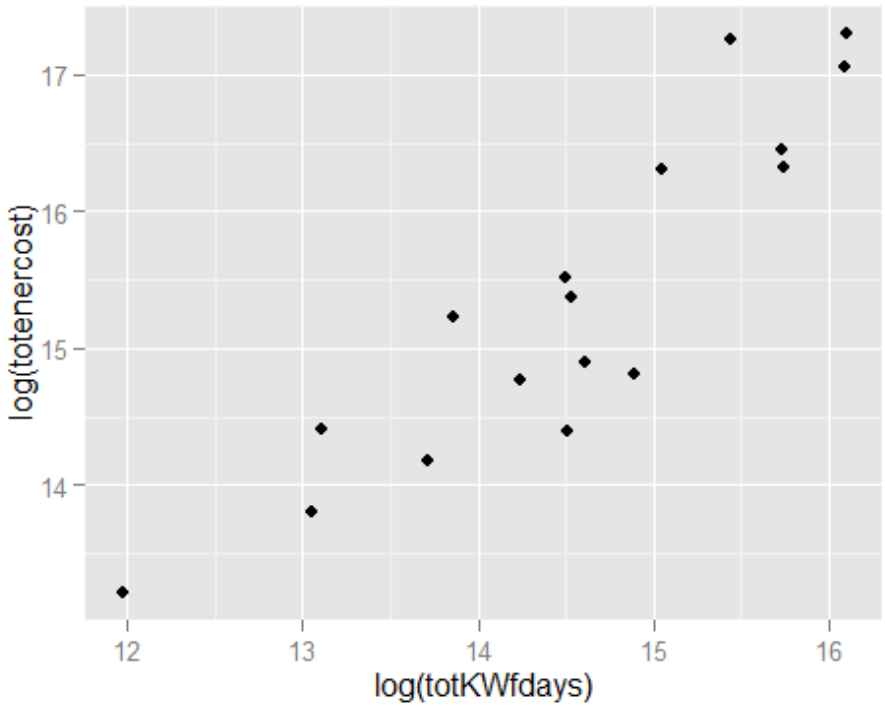
First make the data set, each fleet is an observation with costs and effort per gear in kwfishdays.

```
# make a data.frame with economic
eco_dat <- cast(subset(subEco,template=="expenditures"|variable=="totenercons",-c(template)),
                ... ~ variable)

# add effort per gear type
effKW <- ddply(subEff,.(cluster,year,country_code,pooledG ),summarise,
               KWfishdays=sum(totkwfishdays,na.rm=T),
               fishdays=sum(totfishdays,na.rm=T),
               gtfishdays=sum(totgtfishdays,na.rm=T))

eff_dat <- cast(effKW,cluster+year+country_code ~ pooledG ,
                value= "KWfishdays")
eff_dat1 <- cast(effKW,cluster+year+country_code ~ pooledG ,
                value= "fishdays")
library(gdata)

## gdata: read.xls support for 'XLS' (Excel 97-2004) files ENABLED.
##
## gdata: read.xls support for 'XLSX' (Excel 2007+) files ENABLED.
##
## Attaching package: 'gdata'
##
## The following object is masked from 'package:stats':
##
##     nobs
##
## The following object is masked from 'package:utils':
##
##     object.size

eff_dat1 <- rename.vars(eff_dat1,names(eff_dat1)[!names(eff_dat1)%in% c('cluster','year','country_code')],paste(n
ames(eff_dat1)[!names(eff_dat1)%in% c('cluster','year','country_code')],"_fishdays",sep=""))

##
## Changing in eff_dat1
## From: DREDGE          OTH          OTTER          PEL_TRAWL
## To:   DREDGE_fishdays OTH_fishdays OTTER_fishdays PEL_TRAWL_fishdays
##
```

```
## From: POTS
## To:   POTS_fishdays

eco_dat <- merge(eco_dat,eff_dat)
eco_dat <- merge(eco_dat,eff_dat1)

# replace missing effort value by 0
eco_dat[is.na(eco_dat)] <- 0.00001
unique(subEff$pooledG)

## [1] "OTH"       "POTS"      "OTTER"     "DREDGE"    "PEL_TRAWL"

eco_dat <- within(eco_dat, {totKWfdays <-  DREDGE + PEL_TRAWL + OTTER +
                                  POTS  + OTH
                            totfdays <-  DREDGE_fishdays + PEL_TRAWL_fishdays + OTTER_fishdays +
                                  POTS_fishdays  + OTH_fishdays})
eco_dat

##    country_code year         cluster supra_reg fishing_tech vessel_length
## 1           GBR 2012 AREA27DFNVL0010    AREA27          DFN        VL0010
## 2           GBR 2012 AREA27DRBVL0010    AREA27          DRB        VL0010
## 3           GBR 2012 AREA27DRBVL1218    AREA27          DRB        VL1218
## 4           GBR 2012 AREA27DTSVL0010    AREA27          DTS        VL0010
## 5           GBR 2012 AREA27DTSVL1012    AREA27          DTS        VL1012
## 6           GBR 2012 AREA27DTSVL1218    AREA27          DTS        VL1218
## 7           GBR 2012 AREA27DTSVL1824    AREA27          DTS        VL1824
## 8           GBR 2012 AREA27DTSVL2440    AREA27          DTS        VL2440
## 9           GBR 2012 AREA27DTSVL40XX    AREA27          DTS        VL40XX
## 10          GBR 2012 AREA27FPOVL0010    AREA27          FPO        VL0010
## 11          GBR 2012 AREA27FPOVL1012    AREA27          FPO        VL1012
## 12          GBR 2012 AREA27FPOVL1218    AREA27          FPO        VL1218
## 13          GBR 2012 AREA27HOKVL0010    AREA27          HOK        VL0010
## 14          GBR 2012 AREA27PGPVL0010    AREA27          PGP        VL0010
## 15          GBR 2012  AREA27PSVL40XX    AREA27           PS        VL40XX
## 16          GBR 2012 AREA27TBBVL0010    AREA27          TBB        VL0010
## 17          GBR 2012 AREA27TBBVL1218    AREA27          TBB        VL1218
##    totenercons totcrewwage totunpaidlab totenercost  totrepcost totvarcost
## 1      2540280   2761779.9   2308105.33   1770962.4   870241.54  2537349.5
## 2      5877065   3849808.2    443081.42   4097210.1   965719.24  1714498.1
## 3      7883430   5973793.3         0.00   5495952.5  2443686.11  2832139.4
## 4      4238645   5227282.7    993921.18   2954981.8  2238177.34  3074565.2
## 5      3744740   3244669.4         0.00   2610654.6  1600325.10  2340630.7
## 6     20149193  16680591.1         0.00  14047059.3  7626391.35 11921447.2
## 7     36689200  25571767.0         0.00  25577965.9 10210135.71 21830041.1
## 8     46943975  27993349.0         0.00  32727106.9 12147849.49 30045525.2
## 9     17305700   6180992.4         0.00  12064711.2  2189753.63  6807906.7
## 10    17622665  18775002.7   6499822.18  12285683.9  5937917.35 15996552.7
## 11     3858825   5080596.9         0.00   2690189.2  1214347.08  4159375.5
## 12     6779344   6575012.6         0.00   4726236.2  1688145.14  5067878.5
## 13     2055140   2380894.1   1344964.82   1432745.9   572568.21  2163343.2
## 14     1411685   1503170.0    376953.57    984159.7   476001.44  1093000.8
## 15    45188000  46642716.1         0.00  31502925.0 16367708.45 14818638.0
## 16      789430    313961.7     20456.21    550353.1    67794.28   361948.7
## 17     2594050    892046.1         0.00   1808448.3   143535.27  1275273.4
##    totnovarcost totrightscost  totdepcost       DREDGE        OTH
## 1    1195754.83       9226.68  1089360.97 9.669710e+03 1775241.67
## 2     730669.32      17226.69   436851.30 9.205581e+05   18057.88
## 3    1276567.15      23654.10  1390764.70 1.682857e+06     504.00
## 4    1805605.53       7335.26  1181017.73 9.273358e+04  101635.37
## 5    1095635.64     208766.52   817042.92 2.757092e+04     927.50
## 6    5187289.69    1788483.75  2242690.93 1.806121e+05   71670.66
## 7    7766160.15    5725721.76  7487833.29 3.049970e+04  279393.50
## 8    7604044.19   16042745.19  6187214.18 8.670000e+02 1062871.60
## 9    1755246.60    2190103.07  2318806.98 1.000000e-05  424625.00
## 10   5970240.97      20685.24  4244099.15 2.022313e+04  421054.70
## 11   1467793.80          0.00   870864.36 1.475658e+04   34692.36
## 12   1078021.08      80757.76   848706.24 4.095000e+03   15352.03
## 13    919784.30      17968.47   634365.42 5.814230e+03  866678.44
## 14    457462.86       8867.83   289776.76 8.166359e+04  202468.04
## 15  55168095.26    6578297.37 12346627.79 1.000000e-05    8060.00
## 16     69896.97      12551.88    29394.87 1.766373e+04  135000.83
```

```
## 17    172048.60      62296.76   288183.38 6.081499e+04  406454.46
##         OTTER    PEL_TRAWL         POTS DREDGE_fishdays OTH_fishdays
## 1    32443.78 1.412200e+02 1.873077e+05       149.00000     24543.76
## 2    85307.24 1.700000e+02 1.636613e+04      7556.00000       213.50
## 3   270291.95 1.768000e+03 2.202800e+04      8306.50000         4.00
## 4  1939066.45 1.638305e+04 7.358634e+04       738.80000      1045.46
## 5  1478105.73 8.580000e+03 1.603337e+04       208.00000         5.50
## 6  6458150.27 6.418787e+04 3.205480e+04      1039.50000       370.50
## 7  9424631.56 3.960626e+04 5.440000e+02       124.50000       720.00
## 8  8671918.68 3.935896e+04 4.668500e+04         1.50000      1712.40
## 9  2988432.20 9.250000e+02 1.000000e-05         0.00001       275.00
## 10   80303.29 2.038340e+03 6.336235e+06       325.25000      5578.62
## 11    3839.54 1.000000e-05 2.890948e+06       131.50000       302.80
## 12   14090.00 1.000000e-05 2.020886e+06        29.00000       131.50
## 13    3871.60 4.476000e+01 2.366016e+04        68.50000     16335.70
## 14   97698.01 1.804000e+03 8.304835e+04       564.00000      2484.20
## 15 1162218.00 3.881519e+06 1.000000e-05         0.00001         2.00
## 16    5286.80 1.000000e-05 9.000000e+01       110.50000      1071.50
## 17   22946.00 1.000000e-05 1.000000e-05       280.00000      1987.00
##    OTTER_fishdays PEL_TRAWL_fishdays POTS_fishdays totfdays totKWfdays
## 1          465.50            4.50000    2446.55000 27609.31  2004804.0
## 2          679.00            2.00000     140.00000  8590.50  1040459.3
## 3         1424.50            8.00000     100.00000  9843.00  1977449.1
## 4        17038.21          144.50000     708.23000 19675.20  2223404.8
## 5        10616.25           57.00000     150.75000 11037.50  1531217.5
## 6        31429.56          285.00000     181.75000 33306.31  6806675.7
## 7        24396.77          103.00000       2.00000 25346.27  9774675.0
## 8        13052.53           70.50000     116.00000 14952.93  9821701.2
## 9         1525.90            0.50000       0.00001  1801.40  3413982.2
## 10         760.50           38.30000   85782.38000 92485.05  6859854.6
## 11          58.00            0.00001   21631.10000 22123.40  2944237.0
## 12          76.00            0.00001   10098.00000 10334.50  2054422.7
## 13          70.50            2.00000     544.00000 17020.70   900069.2
## 14         833.60           20.00000     970.45000  4872.25   466682.0
## 15         297.00          919.90000       0.00001  1218.90  5051797.5
## 16          52.00            0.00001       1.00000  1235.00   158041.4
## 17         111.00            0.00001       0.00001  2378.00   490215.5

eco_dat <- within(eco_dat,{varcostpue <- totvarcost/totKWfdays
                           enecostpue <- totenercost/totKWfdays
                           varcostpfd <- totvarcost/totfdays
                           enecostpfd <- totenercost/totfdays
                           otter_prop <- round(OTTER/totKWfdays*100,2)
                           peltr_prop <- round(PEL_TRAWL/totKWfdays*100,2)
                           dredg_prop <- round(DREDGE/totKWfdays*100,2)
                           pots_prop  <- round(POTS/totKWfdays*100,2)})
```






```
## Call:
## glm(formula = totvarcost ~ DREDGE + PEL_TRAWL + OTTER + POTS +
##     OTH - 1, data = eco_dat)
##
## Deviance Residuals:
##      Min        1Q    Median        3Q       Max
## -4198885  -1664526    -38826    382507   6140721
```

```
## Coefficients:
##           Estimate Std. Error t value Pr(>|t|)
## DREDGE      1.0385     1.3507   0.769 0.456821
## PEL_TRAWL   3.0856     0.6737   4.580 0.000632 ***
## OTTER       2.3953     0.1916  12.500 3.07e-08 ***
## POTS        2.1654     0.3658   5.919 7.04e-05 ***
## OTH         2.7376     1.2071   2.268 0.042604 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for gaussian family taken to be 6.768163e+12)
##
##     Null deviance: 2.1262e+15  on 17  degrees of freedom
## Residual deviance: 8.1218e+13  on 12  degrees of freedom
## AIC: 556.56
##
## Number of Fisher Scoring iterations: 2
```

```
##
## Call:
## glm(formula = totenercost ~ DREDGE + PEL_TRAWL + OTTER + POTS +
##     OTH - 1, data = eco_dat)
##
## Deviance Residuals:
##      Min        1Q    Median        3Q       Max
## -5056537  -1654129     59781    658084   5598821
##
## Coefficients:
##           Estimate Std. Error t value Pr(>|t|)
## DREDGE      2.7352     1.4936   1.831  0.09198 .
## PEL_TRAWL   7.2651     0.7450   9.752 4.69e-07 ***
## OTTER       2.7729     0.2119  13.086 1.83e-08 ***
## POTS        1.6190     0.4045   4.002  0.00176 **
## OTH         2.5569     1.3349   1.915  0.07957 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for gaussian family taken to be 8.276494e+12)
##
##     Null deviance: 3.3134e+15  on 17  degrees of freedom
## Residual deviance: 9.9318e+13  on 12  degrees of freedom
## AIC: 559.98
##
## Number of Fisher Scoring iterations: 2
```

Significant estimations for the cost per KW fishing days!

6.1 Merging economic data with the effort data

Vessel length definition at 0, 10 and 15m while eco data are 10, 12, 18, 24, and 40m --> transform into <10m and >10m

```
effdf <- read.csv("UK_EFF_NS_2012.csv")
table(effdf$vessel_length)

##
## O10T15M    O15M    U10M
##      73     100      64

effdf <- within(effdf,VL <- replace(as.character(vessel_length),vessel_length!="U10M","O10M"))
subEff <- within(subEff,{VL <- replace(as.character(vessel_length),vessel_length!="VL0010","O10M")
                         VL <- replace(VL,VL!="O10M","U10M")
                        })

ffeff <- aggregate(effdf[c('gt_days_at_sea','kwfishdays')],by=list(year=effdf$year,VL=effdf$VL,gear=
effdf$gear),FUN=sum,na.rm=T)
```

```
ecoeff <- aggregate(subEff[c('totfishdays','totgtfishdays','totkwfishdays')],by=list(year=subEff$yea
r,VL=subEff$VL,gear=subEff$gear_eff),FUN=sum,na.rm=T)

eff_all <- merge(effeff,ecoeff,all=T)
eff_all <- within(eff_all,{gt_days_at_sea <- round(gt_days_at_sea/1000000,2)
                           kwfishdays     <- round(kwfishdays/1000000,2)
                           totfishdays    <- round(totfishdays/1000000,2)
                           totgtfishdays  <- round(totgtfishdays/1000000,2)
                           totkwfishdays  <- round(totkwfishdays/1000000,2)
                           })
ottereff <- within(subset(eff_all,gear=="OTTER"),{GTratio <- totgtfishdays/gt_days_at_sea
                                                  KWratio <- totkwfishdays/kwfishdays})
ottereff

##    year   VL  gear gt_days_at_sea kwfishdays totfishdays totgtfishdays
## 1  2012 O10M OTTER           6.51      17.46        0.08         11.46
## 12 2012 U10M OTTER           0.13       1.41        0.02          0.20
##    totkwfishdays  KWratio  GTratio
## 1          30.54 1.749141 1.760369
## 12          2.20 1.560284 1.538462
```

The effort available in effort call is in *days at sea* while in the economic data effort per gear is in *fishing days*. When calculating the ratios (GT or KW) fishing days over (GT or KW) days at sea, it appears that the measures of effort in the economic dataset is higher than in the effort dataset. This could indicate that there is double counting of effort by gears (gears are aggregated to match gears in effort call) or by area (areas are merged).
In the effort data, the activity other than OTTER is not recorded. This way it is difficult to estimate the dependency of the fleets on the OTTER activity. This can be done with the effort data from the economic dataset.

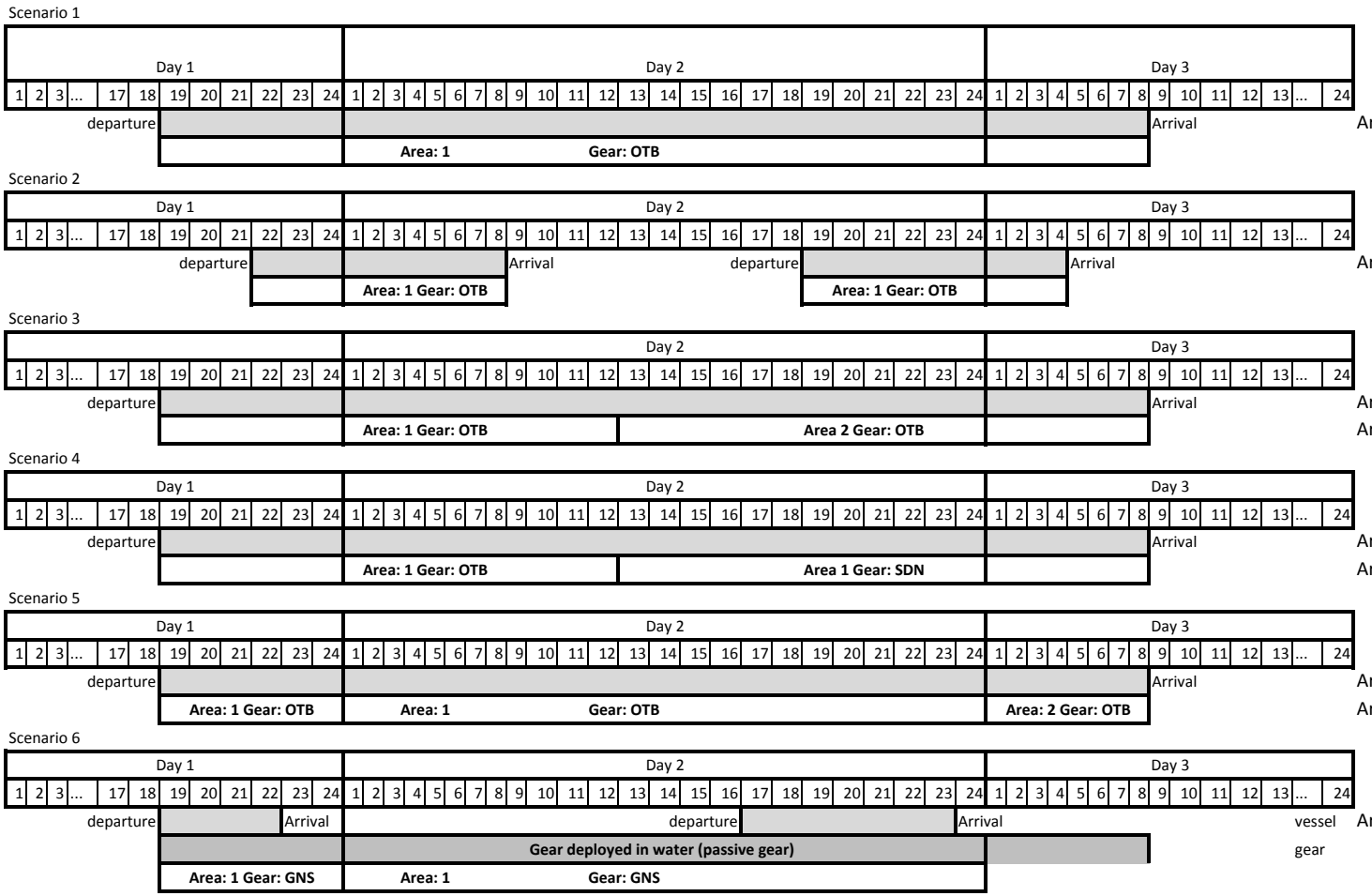
```
# dependency on OTTER activity
depotter <- within(eff_all,{totgt <- ave(totgtfishdays,VL,year,FUN=sum)
                            totfdays <- ave(totfishdays,VL,year,FUN=sum)
                            totkw <- ave(totkwfishdays,VL,year,FUN=sum)
                            days_dep <- round(totfishdays/totfdays*100)
                            kw_dep   <- round(totkwfishdays/totkw*100)
                            gt_dep   <- round(totgtfishdays/totgt*100)})
depotter <- subset(depotter,gear=="OTTER",c(year,VL,gear,gt_dep,kw_dep,days_dep))
print(depotter)

##    year   VL  gear gt_dep kw_dep days_dep
## 1  2012 O10M OTTER     74     68       67
## 12 2012 U10M OTTER     24     17       12
```

The fleet of vessels larger than 10m identified in the economic dataset based on their otter effort seem to be highly dependent on that gear (between 67 to 74% of their total effort depending on the effort measurements). The fleet with vessels smaller than 10m is much less dependent on the otter activity (12 to 24%).
It can also be interesting to check how significant the fleet is for the activity. To look at the significance the whole otter effort should be used, here we only look at the significance within the British effort.

```
# significance of fleet
signotter <- within(subset(eff_all,gear=="OTTER"),{
                            days_sig <- round(totfishdays/sum(totfishdays)*100)
                            kw_sig   <- round(totkwfishdays/sum(totkwfishdays)*100)
                            gt_sig   <- round(totgtfishdays/sum(totgtfishdays)*100)})

signotter <- subset(signotter,select=c(year,VL,gear,gt_sig,kw_sig,days_sig))
signotter

##    year   VL  gear gt_sig kw_sig days_sig
## 1  2012 O10M OTTER     98     93       80
## 12 2012 U10M OTTER      2      7       20
```

The fleet of vessels larger than 10m has a significant share of the total otter effort (80 to 98% of the British effort). The fleets with vessels smaller than 10m has a lower share of the otter effort and the possible impact on the cod stock (2 to 20%).

ANNEX 4 – Days at sea

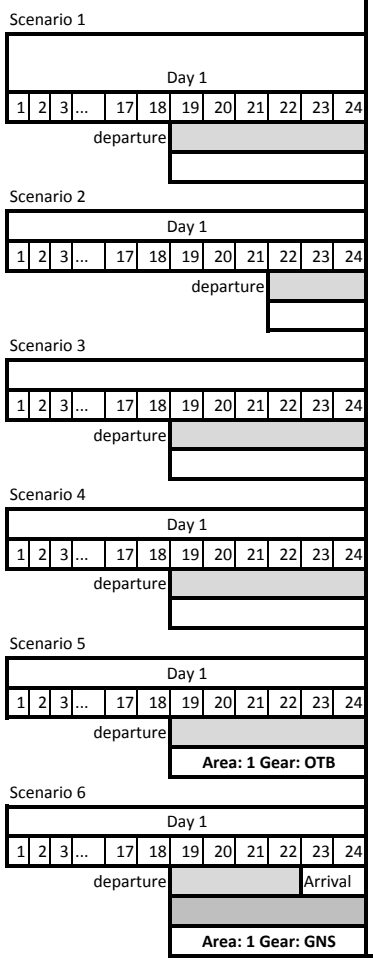


	Belgium		
	Effort data call	Economic data call	Management
Area : 1 & Gear : OTB	2	2	
Area : 1 & Gear : OTB	2	2	
Area 1 & Gear : OTB	1	1	
Area 2 & Gear : OTB	1	1	
Area 1 & Gear : OTB	1*	1*	
Area 1 & Gear : SDN	1*	1*	
Area : 1 & Gear : OTB	2	2	
Area : 2 & Gear : OTB	1	1	
Area : 1 & Gear : GNS	2**	2**	

* A change in Gear during one trip does not occur in the Belgian fleet

** use of passive gear is very limited in the Belgian fleet

ANNEX 4 – Days at sea

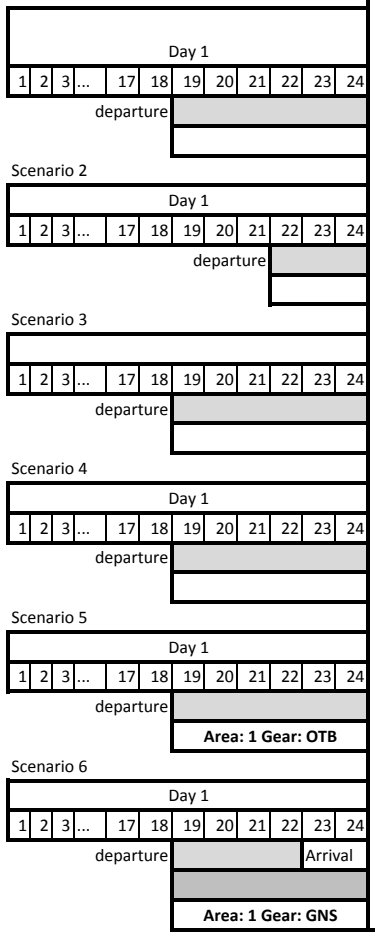


	Croatia			**Denmark**			**Estonia**			**Finland**		
	Effort data call	Economic data call	Manage-ment	Effort data call	Economic data call	Manage-ment	Effort data call	Economic data call	Manage-ment	Effort data call	Economic data call	Manage-ment
Scenario 1	3	3		3	2	2	3	2		2	2	
Scenario 2	3	3		3	2	1	3	2		2	2	
Scenario 3	NA	NA		1.5	1	1	1.5	1		1	1	
				1.5	1	1	1.5	1		1	1	
Scenario 4	1	3		1.5	1	1	1.5	1		1	1	
	1			1.5	1	1	1.5	1		1	1	
Scenario 5	NA	NA		2	1.33	1.33	2	2		2	2	
				1	0.67	0.67	1	1		1	1	
Scenario 6	2	2		2	2	1	2*	2		2	2	

*passive gear is used only in coastal fishery
hours are not measured

ANNEX 4 – Days at sea

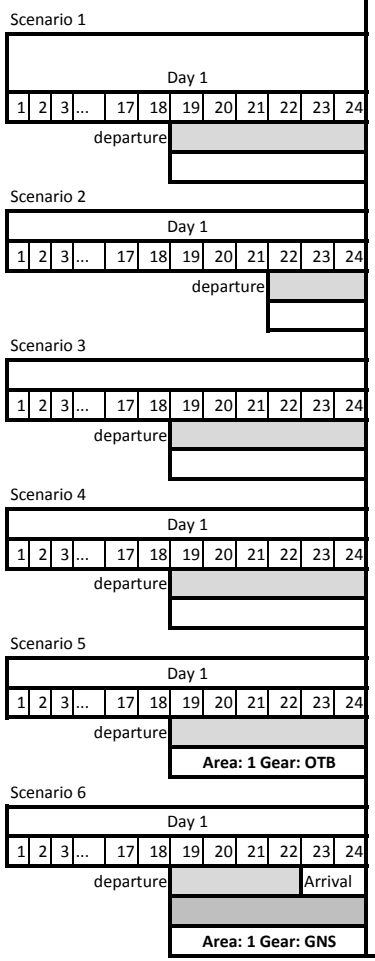
	France			GBR (ENG,GBC, GBG, GBJ, IOM, NIR)			GBR (Scotland)		
	Effort data call	Economic data call	Manage-ment	Effort data call	Economic data call	Manage-ment	Effort data call	Economic data call	Manage-ment
Scenario 1									
departure	3	2		3*	3*	3*	2		2
				3**	3**	2**			
Scenario 2									
departure	3	2		3*	3*	3*	1		2
				3**	3**	1**			
Scenario 3									
departure	1.5	1		1.5***	1.5***	1.5***	1		1
	1.5	1		1.5****	1.5****	1.5****	1		1
Scenario 4				1.5*****	1.5*****	1*****			
				1.5******	1.5******	1******			
departure	1.5	1		1.5*******	1.5*******	1.5*******	1		1***
	1.5	1		1.5********	1.5********	1.5********	1		1***
Scenario 5				1.5*********	1.5*********	1*********			
				1.5*********	1.5*********	1*********			
departure	2	1.33		2***	2***	2***	1		1
Area: 1 Gear: OTB	1	0.67		1****	1****	1****	1		1
Scenario 6				2*****	2*****	1.3*****			
				1******	1******	0.6******			
departure	2	2		2*	2*	2*	2		2
				2**	2**	1**			
Area: 1 Gear: GNS									



*TR1
**Other gears
***TR1 area 1
****TR1 area 2
*****Other gears area 1
******Other gears area 2
*******TR1 - gear 1
********TR1 - gear 2
*********Other - gear 1
**********Other - gear 2

*** Experience suggests it is not possible for two methods of fishing to be carried out on the same voyage?

ANNEX 4 – Days at sea



	Germany			Greece			Ireland			Italy		
	Effort data call	Economic data call	Manage-ment	Effort data call	Economic data call	Manage-ment	Effort data call	Economic data call	Manage-ment	Effort data call	Economic data call	Manage-ment
Scenario 1	3	3	2	2	2		3	3	3		3	
Scenario 2	3	2	2	2	1		3	3	3		3	
Scenario 3	1.5	1.5	1	1	1		2	2	2		3	
	1.5	1.5	1	1	1		1	1	1			
Scenario 4	1.5	1.5	1	1	1.5		2*	2*	2*		3	
	1.5	1.5	1	1	1.5		1*	1*	1*			
Scenario 5	2	2	1.58	2	1.33		2**	2**	2**		3	
	1	1	0.42	0	0.67		1**	1**	1**			
Scenario 6	2	2	2	2	0.5		2	2	2		2	
		2			1.5							

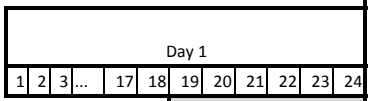
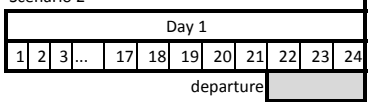
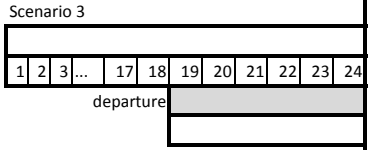
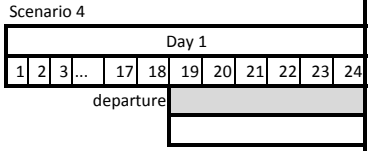
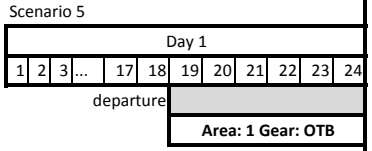
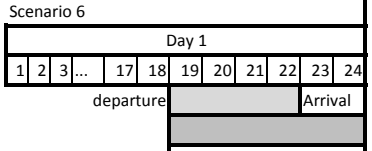
* Day allocation dependent on fishing times in each area
** Day allocation dependent on fishing times with each gear
*** in reation to baselines and MS internal allocation

ANNEX 4 – Days at sea

	Latvia			Lithuania			MALTA			Netherlands		
	Effort data call	Economic data call	Manage-ment	Effort data call	Economic data call	Manage-ment	Effort data call	Economic data call	Manage-ment	Effort data call	Economic data call	Manage-ment
Scenario 1												
Day 1 (1 2 3 ... 17 18 19 20 21 22 23 24)												
departure	2	2		3	3						1.58	
							3	3				
Scenario 2												
Day 1 (1 2 3 ... 17 18 19 20 21 22 23 24)												
departure	2	2		3	3		4	4			0.88	
Scenario 3												
Day 1 (1 2 3 ... 17 18 19 20 21 22 23 24)												
departure	0	0		1.5	1		2	2			0.75	
	2	2		1.5	1		2	2			0.83	
Scenario 4												
Day 1 (1 2 3 ... 17 18 19 20 21 22 23 24)												
departure	2*	2*		1.5	1		2	2			0.75	
	2*	2*		1.5	1		2	2			0.83	
Scenario 5												
Day 1 (1 2 3 ... 17 18 19 20 21 22 23 24)												
departure	2	2		2	2		2	2			1.25	
Area: 1 Gear: OTB	0	0		1	1		1	1			0.33	
Scenario 6												
Day 1 (1 2 3 ... 17 18 19 20 21 22 23 24)												
departure / Arrival	2	2		2	2		2	2			0.46	
Area: 1 Gear: GNS												

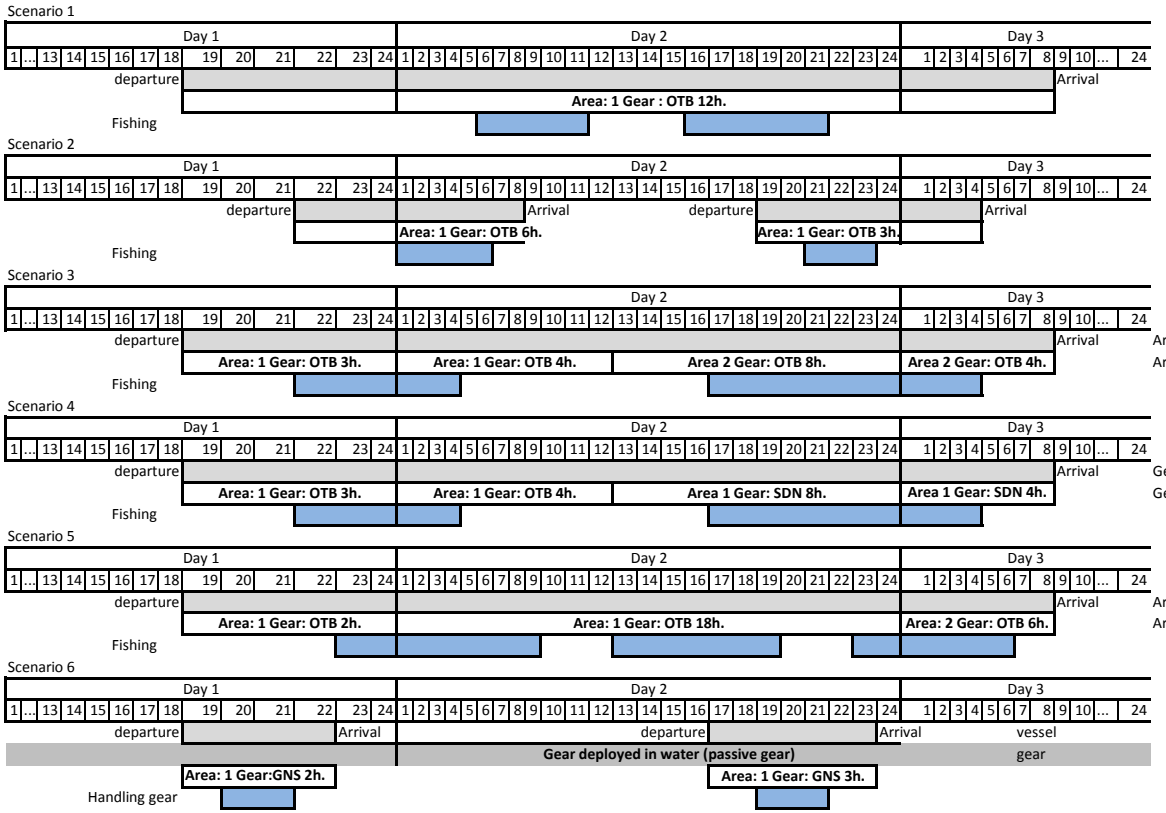
* only for vessels <12

ANNEX 4 – Days at sea

	Slovenia			Sweden		
	Effort data call	Economic data call	Manage-ment	Effort data call	Economic data call	Manage-ment
Scenario 1						
	2	2		2	2	2
Scenario 2						
	2	2		2	2	2
Scenario 3						
	NA	NA		0 (1)	2	1
	NA	NA		2 (1)**	2	1
Scenario 4						
	1	1		0	1	1
	1	1		2*	1	1*
Scenario 5						
	NA	NA		2	2	1.33
	NA	NA		0	1	0.67
Scenario 6						
	2	2		2	2	1

* assuming gear within same management group

** depending if it is areas within or between management areas

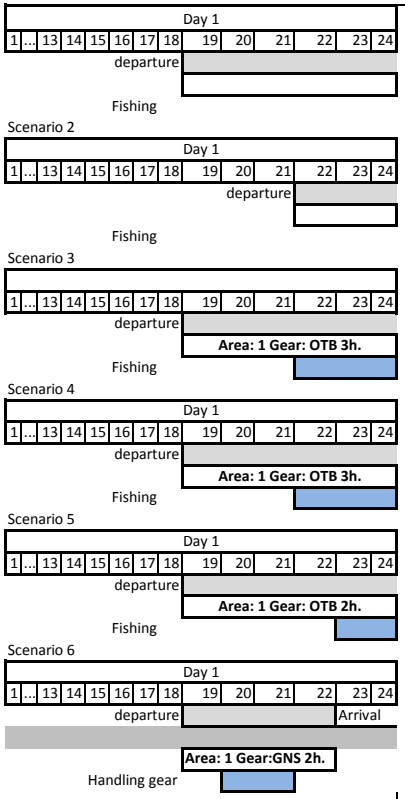


	Belgium	Croatia	Denmark	Estonia
Fishing	1	1	1	1
Fishing	2	1	2	2
Area1:	1	NA	1	1
Area2	2	NA	2	2
Gear1:	1*	1	0	1
Gear2	2*	1	3	2
Area1:	2	NA	2	2
Area2	1	NA	1	1
Handling gear	3	3	2	3*

* Gear type is not changed in one trip

* corresponds to the time the gear was in the water

Scenario 1



Scenario 2

Scenario 3

Scenario 4

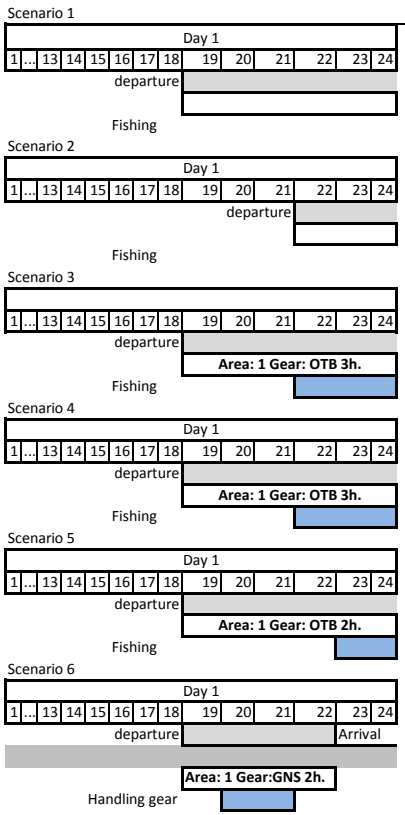
Scenario 5

Scenario 6

	Finland	France (prorata)	France (major area*gear by day)	Great Britain (ENG,GBC, GBG, GBJ, IOM, NIR)	Germany	Greece	Ierland	Italy	Latvia	Lithuania
Scenario 1										
Fishing	2	1	1	1	1	1	1	1	1	1
Scenario 2										
Fishing	2	2	2	2	1	1* 2**	1	2	1	2
Scenario 3										
departure	1	1.333333333	1	1.5	1	1	1		1	2
Area: 1 Gear: OTB 3h.	1	1.666666667	2	1.5	2	1	2	3	1	2
Scenario 4										
departure	1	1.333333333	1	1.5	1	1	1	1	1	2
Area: 1 Gear: OTB 3h.	1	1.666666667	2	1.5	2	NA	2	2	1	2
Scenario 5										
departure	1	2	2	2	2	2	2	2	1	2
Area: 1 Gear: OTB 2h.	1	1	1	1	1	1	1	1	1	1
Scenario 6										
Handling gear	2	2	2	2	2	3	2	2	2	2

*Trawl: This is an unsusal situation in Greece. Tralws do tot interapt their activity during the day (only in case of damages or bad weather situation) in that case we estimate the effort as two days.

**Purse seine: This is the common situation for night PS for small pelagic in Greece.



	Malta	Slovenia
	(1)	
	(2)	
	1	1
	2 (3)	2
	3 (4),(5),(6)	NA
		NA
	2 (7)	1
	2 (8)	2
	(9)	
	3 (10), (11)	NA
		NA
	3	2

(1) According to EC Regulation 2807/83: On entering port after each voyage, masters of all fishing vessels more than 10 metres in length and flying the flag of, or registered in, a Member State, or their agents, shall submit a landing declaration to the authorities at the place of landing.

(2) The log-book shall be completed daily by not later than 24.00 hours, and at the time of arrival in port

(3) According to EC Regulation 404/2011; Day, month, hour and port of return shall be entered before entering port

(4) Area 1: (2 fishing days)
(5) Area 2: (2 fishing days)
(6) According to Regulation 404/2011; a new line should be filled in; (b) when fishing in a new ICES Division or another fishing zone the same day;
(7) One logbook for OTB
(8) One logbook for SDN
(9) According to EC Regulation 404/2011: A new page should be filled in; (a) when using different gear or a net with a mesh size different from that of the previous net used
(10) Area 1: (2 fishing days)
(11) Area 2: (2 fishing days)

	Trip scenario	BEL	DEN	FRA	GBR (ENG,GBC, GBG, GBJ, IOM, NIR)	GBR (SCO)	GRC
Effort data call (Days at sea)	1	Calculation per trip. Number of hours in area (including steaming time) divided by 24. Results rounded up to whole number.	Calculation by trip. Any part of a calendar day added to whole number total. Some sea time excluded from the logbooks, based on a recordtype variable: eg where vessel used for transportation or other tasks not related to fishing.	Calendar days definition (here = 3 days). Each fishing day (here = day2 only) is allocated to the "gear*area" combination where the most fishing time was spent during the relevant day at sea **or** (if fishing time is not available) "au prorata" number combination "gear*area" declared during the relevant day at sea. Day(s) associated to the forward trip (here = day1) or to the return trip (here = day3) are allocated respectiveley to the same "gear*area" combination retained for the first day of fishing (here = day2) and the last day of fishing (here = day2).	Effort calculated per trip including steaming time from/to fishing area (providing it is in the relevant area). For all gear types effort is counted as calendar days from when vessel leaves port and returns to port. Any part day counts as a whole day.	Number of 24 hour periods in the voyage plus an extra day if there's part of a 24 hour period left over. For example, a voyage of 5 days plus a few hours will have 6 days at sea.	Calculation by trip. Number of hours in area (including steaming time) divided by 24. Results rounded up to whole number.
	2	As scenario 1: However, two seperate trips with end and start on same calendar day treated as two seperate days.	As scenario 1: Two trips with end and start on same calendar day treated as if one trip.	As scenario 1. Double counting the day2 is avoided by counting only one half day at sea for each fishing trip achieved during these same relevant day at sea.	Effort calculated per trip including steaming time from/to fishing area (providing it is in the relevant area). For all gear types effort is counted as calendar days from when vessel leaves port and returns to port. Any part day counts as a whole day. To avoid double counting, adjustments are made so that day 2 is only counted once.	One day at sea is given to each individual trip but if the second trip starts on the same day as the end of the first the number of days at sea is reduced by one.	For trawls: As scenario 1. However, this is an unusual situation in Greece. Trawls do not interrupt their activity during the day (only in case of damages or bad weather situation).In that case we estimate the effort as 2 days. For purse seine: Two seperate trips with end and start on same calendar day treated as two seperate days.
	3	Calculation per trip and per Ices Division. Number of hours in each area (including steaming time) divided by 24. Results rounded up to whole number.	Total days at sea calculated as in Scenario 1. Days at sea split according to dates recorded against each area. Result kept as decimal.	As scenario1.	Effort calculated per trip including steaming time from/to fishing area (providing it is in the relevant area). For all gear types effort is counted as calendar days from when vessel leaves port and returns to port. Any part day counts as a whole day. Then the total number of days is divided by 2 to reflect the equal proportion of time spent in the two areas.	Trip days at sea calculated as in scenario 1. Days split evenly across areas.	Calculation per trip and per FAO GSA.
	4	Calculation per trip and per Ices Division. Number of hours in each area (including steaming time) divided by 24. Results rounded up to whole number.	Total days at sea calculated as in Scenario 1. Days at sea split according to dates recorded against each gear. Result kept as decimal.	As scenario 1.	Effort calculated per trip including steaming time from/to fishing area (providing it is in the relevant area). For all gear types effort is counted as calendar days from when vessel leaves port and returns to port. Any part day counts as a whole day. Then the total number of days is divided by 2 to reflect the time spent using the two gear types.	Trip days at sea calculated as in scenario 1. Days split evenly across gears.	NA. For trawls, gear type is not changed in one trip
	5	As scenario 3	Area 1 recorded on two dates, area two one date. Each part 24 hour period rounded up to 2 days and one day respectively.	As scenario 1. No day accounted for forward trip or return trip (a fishing activity is declared for all days at sea of the vessel).	As scenario 3 - but higher proportion of time spent in area 1 is reflected in the calculations	As scenario 3	Calculation per trip and per FAO GSA.
	6	As scenario 2	Departure and arrival on two different days. Therefore trips treated seperately. Therefore 2 days recorded.	As scenario 1. No "soaking time" variable available for passive gears.	Effort calculated per trip (regardless of time gear is in water) including steaming time from/to fishing area (providing it is in the relevant area). For all gear types effort is counted as calendar days from when vessel leaves port and returns to port. Any part day counts as a whole day.	Because trip two departs on separate day to trip one, each trip gains one day at sea and the total is not adjusted.	Number of hours in area divided by 24. Results rounded up to whole number.

	Trip scenario	HRV	IRL	ITA	LIT	SVN	SWE
Effort data call (Days at sea)	1	For each vessel a database of fishing calendar dates at sea is created from control data on departure and arrival in a fishing logbook/report. Days at sea for vessel represent the count of distinct calendar dates for vessel.	Calculation as the number of calender days absent from port.	Definition: any continuous period of 24 hours (or part thereof) during which a vessel is at sea; Days at sea, Calculation by Stratum = S (Vessel Days at sea x Vessel raising factor (RF)); GT-Days at sea= S (GT vessel x Vessel days at sea x RF); KW-Fishing Days= S (KW vessel x Vessel Days at sea x RF)	Calculation by trip. Any part of a calendar day added to whole number total.	Calculation per trip. Number of hours in area (including steaming time) divided by 24. Results rounded up to whole number.	Calculation by trip. Each trip is concidered the start of a 24 hour period. Number of days at sea by trip is calculted as number of comenced 24 hour periods . For vessels not carrying logbooks Sweden has montly fishing journals. These include information on number of vesseldays per month. For these vessels one vesselday is considered one day at sea.
	2	As scenario 1: Regardless of gear used, days at sea are always calculated from the above mentioned. Procedure in development.	As scenario 1: Two trips, ending and starting on the same calendar day counts as one day		As scenario 1: However, two separate trips with end and start on same calendar day treated as one day.	Two seperate trips with end and start on same calendar day treated as two seperate days.	As Scenario 1. As Trip is the basis this scenario will result in 2 days at sea
	3	All fishing activities are attributed to one area.	Calculation as the number of calender days absent from port, where multiple areas entered within the same day, day assigned to area with greatest fishing time reported on said day. If equal fishing time reported, day assigned alphabetically.		Calculation per trip and per Ices Division. Number of hours in each area divided by 24. Results rounded up to whole number.	NA - slovenian fisherman operates just in AREA 37.2.1	Need to be checked! The result of this scenario will depend on what "level" of area is referred to. As an example, for subdivisions in Baltic sea we split the effort but for rectangles within a subdivision we allocte to the dominate one based on catch.
	4	Procedure in development.	As scenario 3: If equal fishing time prefereene is fist given to regualated gear, then assigned alphabetically		Calculation per trip and per Ices Division. Number of hours in each area divided by 24. Results rounded up to whole number.	Calculation per trip and per fishing gear. Number of hours for each gear divided by 24. Results rounded up to whole number.	Will be split if 2 gears that are both either unregulated or regulated (within same group). Will be double counted if it is one regulated and one unregulated gear.
	5	All fishing activities are attributed to one area.	As scenario 3		Calculation per trip and per Ices Division. Number of hours in each area divided by 24. Results rounded up to whole number.	NA - slovenian fisherman operates just in AREA 37.2.1	Need to be checked as for scenario 4
	6	As scenario 1: Soaking time is not inculded in calculation of days at sea.	As scenario 2, treated as two seperate trips. No data avaliable to scientists on gear left set or not		2 days with fishing activity	the time was calculated from the point where each individual unit of gear has been set, to the time when the same unit starts to be removed.	As Scenario 1. As Trip is the basis this scenario will result in 2 days at sea

	Trip scenario	BEL	DEN	FRA	GBR (ENG,GBC, GBG, GBJ, IOM, NIR)	GRC	HRV
Economic data call (Days at sea)	1	Calculation per trip. Number of hours in area (including steaming time) divided by 24. Results rounded up to whole number.	Number of hours from departure to arrival divided by 24. Result rounded up to whole day.	24 hours period definition = any continuous period of 24 hours (or part thereof) during which a vessel is present within an area and absent from port (here = 2 days). The "24 hours period" days are allocated to the different "gear*area" combination declared during the **relevant fishing trip** "au prorata" fishing time spent for each of them during the relevant fishing trip or (if no fishing time available) "au prorata" number combination "day*gear*area" declared during the relevant fishing trip.	Effort calculated per trip including steaming time from/to fishing area (providing it is in the relevant area). For all gear types effort is counted as calendar days from when vessel leaves port and returns to port. Any part day counts as a whole day.	Number of hours where the vessel spend in the sea,absent from the port. Number of hours from deparure to arrival divided by 24. Results could be kept as decimal.	For each vessel a database of fishing calendar dates at sea is created from control data on departure and arrival in a fishing logbook/report. Days at sea for vessel represent the count of distinct calendar dates for vessel.
	2	As scenario 1: However, two seperate trips with end and start on same calendar day treated as two seperate days.	Each trip considered seperately. Each part 24 trip rounded to whole day.	As scenario 1. Each fishing trip is associated to one "24 hours period" day and two days at sea are counting.	Effort calculated per trip including steaming time from/to fishing area (providing it is in the relevant area). For all gear types effort is counted as calendar days from when vessel leaves port and returns to port. Any part day counts as a whole day. To avoid double counting, adjustments are made so that day 2 is only counted once.	We add the hours where the vessel is in the sea.	As scenario 1: Regardless of gear used, days at sea are always calculated from distinct calendar dates for economic purposes.
	3	Calculation per trip and per Ices Division. Number of hours in each area (including steaming time) divided by 24. Results rounded up to whole number.	Hours in each area divided by 24 and result rounded to whole day.	As scenario 1.	Effort calculated per trip including steaming time from/to fishing area (providing it is in the relevant area). For all gear types effort is counted as calendar days from when vessel leaves port and returns to port. Any part day counts as a whole day. Then the total number of days is divided by 2 to reflect the equal proportion of time spent in the two areas.	Hours used on each area.	All fishing activities are attributed to one area.
	4	Calculation per trip and per Ices Division. Number of hours in each area (including steaming time) divided by 24. Results rounded up to whole number.	Hours used on each gear divided by 24 and result rounded to whole day.	As scenario 1.	Effort calculated per trip including steaming time from/to fishing area (providing it is in the relevant area). For all gear types effort is counted as calendar days from when vessel leaves port and returns to port. Any part day counts as a whole day. Then the total number of days is divided by 2 to reflect the time spent using the two gear types.	Hours used on each gear. Results could be kept as decimal.	As scenario 1: Regardless of gear used, days at sea are always calculated from distinct calendar dates for economic purposes.
	5	As scenario 3	Total days at sea calculated as in Scenario 1. Days at sea split according to dates recorded against each area. Result kept as decimal.	As scenario 1.	As scenario 3 - but higher proportion of time spent in area 1 is reflected in the calculations	Hours used on each gear. Results kept as decimal.	All fishing activities are attributed to one area.
	6	As scenario 2	Departure and arrival on two different days. Therefore trips treated seperately. Therefore 2 days recorded.	As scenario 1. No "soaking time" variable available for passive gears.	Effort calculated per trip (regardless of time gear is in water) including steaming time from/to fishing area (providing it is in the relevant area). For all gear types effort is counted as calendar days from when vessel leaves port and returns to port. Any part day counts as a whole day.	Number of hours where the vessel spend in the sea, away form the port. Results kept as decimal.	As scenario 1: Soaking time is not inculded in calculation of days at sea.

	Trip scenario	IRL	LIT	MLT	NED	SVN	SWE
Economic data call (Days at sea)	1	Calculation as the number of calender days absent from port.	Calculation by trip. Any part of a calendar day added to whole number total.	Definition: any continuous period of 24 hours (or part thereof) during which a vessel is at sea; Days at sea, VESSELS LESS 10m- Calculation by Stratum = S (Vessel Days at sea x Vessel raising factor (RF)); Fishing Days=Σ(fishing days by gear x RF); GT fishing days by gear= S (GT vessels x Vessel fishing days by gear x RF); KW-Fishing Days by gear= S (KW vessel x Vessel fishing days by gear x RF). VESSELS OVER 10m- Calculation by Stratum = S (Vessel Days at sea); Fishing Days=Σ(fishing days by gear); GT fishing days by gear= S (GT vessel x Vessel fishing days by gear); KW-Fishing Days= S (KW vessel x Vessel fishing days by gear).	The number of hours at sea, devided by 24, division of days within a trip based on the value of landings from the areas	Calculation per trip. Number of hours in area (including steaming time) divided by 24. Results rounded up to whole number.	Calculation by trip. Each trip is concidered the start of a 24 hour period. Number of days at sea by trip is calculted as number of comenced 24 hour periods . For vessels not carrying logbooks Sweden has montly fishing journals. These include information on number of vesseldays per month. For these vessels one vesselday is considered one day at sea.
	2	As scenario 1: Two trips, ending and starting on the same calendar day counts as one day	As scenario 1: However, two separate trips with end and start on same calendar day treated as one day.	as 1	as 1	Two seperate trips with end and start on same calendar day treated as two seperate days.	As Scenario 1. As Trip is the basis this scenario will result in 2 days at sea
	3	Calculation as the number of calender days absent from port, where multiple areas entered within the same day, day assigned to area with greatest fishing time reported on said day. If equal fishing time reported, day assigned alphabetically.	Calculation per trip and per Ices Division. Number of hours in each area divided by 24. Results rounded up to whole number.	as 1	as 1	NA - slovenian fisherman operates just in AREA 37.2.1	Swedish logbook holds information on a haul to haul basis. When the vessel changes area and starts to fish a new 24 hour period starts to be counted. This may result some duble counting compared to the days at sea/trip. In the actual example days at sea is though 2
	4	As scenario 3: If equal fishing time preferecne is fist given to regualated gear, then assigned alphabetically	Calculation per trip and per Ices Division. Number of hours in each area divided by 24. Results rounded up to whole number.	as 1	as 1	Calculation per trip and per fishing gear. Number of hours for each gear divided by 24. Results rounded up to whole number.	As for scenario 3
	5	As scenario 3	Calculation per trip and per Ices Division. Number of hours in each area divided by 24. Results rounded up to whole number.	as 1	as 1	NA - slovenian fisherman operates just in AREA 37.2.1	see scenario 3. In the example area 1 gets 2 days at sea and area 2 gets 1 day at sea
	6	As scenario 2, treated as two seperate trips. No data avaliable to scientists on gear left set or not	2 days with fishing activity	as 1	as 1	the time was calculated from the point where each individual unit of gear has been set, to the time when the same unit starts to be removed.	as for scenario 2

	Trip scenario	DEN	GBR (ENG,GBC, GBG, GBJ, IOM, NIR)	IRL	SWE
Manage-ment (Days at sea, 24 hour rule)	1		Effort calculated per trip including steaming time from/to fishing area (providing it is in the relevant area). For TR1 days effort is counted as calendar days from when vessel leaves port and returns to port. Any part day counts as a whole day. For all other gear types, days counted as 24 hour periods from when vessel leaves port to when it returns to port (i.e. number of hours divided by 24	Calculation as the number of calender days absent from port.	Number of hours from departure to arrival divided by 24. No of days at sea is commenced 24 hour periods. 24 hours periods are counted continously and not by trip. If a vessel stays in harbour >24 hours (or > remaining part of 24 hour) a new period will start when the next trips start.
	2	If a vessel is in harbour less than 24 hours, the counting of the hours continues. The total time at sea for the two trips is < 24 hours. Therefore total days at sea = 1 after rounding to whole number.	Effort calculated per trip including steaming time from/to fishing area (providing it is in the relevant area). For TR1 days effort is counted as calendar days from when vessel leaves port and returns to port. Any part day counts as a whole day. To avoid double, counting adjustments are made so that day 2 is only counted once. For all other gear types, days counted as 24 hour periods from when vessel leaves port to when it returns to port (i.e. number of hours divided by 24 and rounded up to whole no.)	As scenario 1: Two trips, ending and starting on the same calendar day counts as one day	see scenario 1
	3		Effort calculated per trip including steaming time from/to fishing area (providing it is in the relevant area). For TR1 days effort is counted as calendar days from when vessel leaves port and returns to port. Any part day counts as a whole day. Then the total number of days is divided by 2 to reflect the equal proportion of time spent in the two areas. For all other gear types, days counted as 24 hour periods from when vessel leaves port to when it returns to port (i.e. number of hours divided by 24 and rounded up to whole no.) Then the total number of days is divided by 2 to reflect the equal proportion of time spent in the two areas.	Calculation as the number of calender days absent from port, where multiple areas entered within the same day, day assigned to area with greatest fishing time reported on said day. If equal fishing time reported, day assigned alphabetically.	Dependent on area, in the Baltic a new 24 hour period will start when a vessel changes management area; in Skagerrak, Kattegat, North Sea the 24 hour period continues and is split by the different management areas.
	4		Effort calculated per trip including steaming time from/to fishing area (providing it is in the relevant area). For TR1 days counted as calendar days from when vessel leaves port and returns to port. Any part day counts as a whole day. Then the total number of days is divided by 2 to reflect the equal proportion of time spent using two gear types. For all other gear types, days counted as 24 hour periods from when vessel leaves port to when it returns to port (i.e. number of hours divided by 24 and rounded up to whole no.) Then the total number of days is divided by 2 to reflect the equal proportion of time using two gear types.	As scenario 3: If equal fishing time preferecne is fist given to regualated gear, then assigned alphabetically	Days at sea only estimated for geargroups of regulated gears.
	5		As scenario 3 - but higher proportion of time spent in area 1 is reflected in the calculations	As scenario 3	see scenario 3
	6		Effort calculated per trip (regardless of time gear is in water) including steaming time from/to fishing area (providing it is in the relevant area). For TR1 days counted as calendar days from when vessel leaves port and returns to port. Any part day counts as a whole day. For all other gear types, days counted as 24 hour periods from when vessel leaves port to when it returns to port (i.e. number of hours divided by 24 and rounded up to whole no.)	As scenario 2, treated as two seperate trips. No data avaliable to scientists on gear left set or not	see scenario 2

		FRA	GBR (ENG,GBC, GBG, GBJ, IOM, NIR)	HRV	IRL	ITA	LIT	MLT	SVN	SWE
Fishing day	1	See method used for days at sea (day(s) eventually associated to the forward trip or to the return trip are no counted). Allocation "au prorata" fishing time spent for economic datacall.	Counted as days with fishing activity = activity days - depends when started fishing	For each vessel a database of calendar fishing dates is created from control data on effort in a fishing logbook/report. Fishing days per gear are calculated counting distinct calendar fishing dates per FAO gear. Fishing time associated to a certain fishing date is devided with 24. For each 24 h period an additional fishing date is generated an added to the database for each FAO gear. Fishing days represent the count of distinct fishing dates.	Calculation as the number of calender days on which fishing operations occur	Definition: any continuous period of 24 hours (or part thereof) during which a vessel use a gear; Fishing Days, Calculation by stratum = S (Vessel Fishing days x Vessel raising factor (RF)); GT-Fishing Days= S (Vessel GT x vessel Fishing days x RF); KW-Fishing Days= S (vessel KW x vessel Fishing days x RF)	two separate hauls on the same calendar day treated as one day	Definition: any continuous period of 24 hours (or part thereof) during which a vessel is at sea; Days at sea, VESSELS LESS 10m- Calculation by Stratum = S (Vessel Days at sea x Vessel raising factor (RF)); Fishing Days=Σ(fishing days by gear x RF); GT fishing days by gear= S (GT vessels x Vessel fishing days by gear x RF); KW-Fishing Days by gear= S (KW vessel x Vessel fishing days by gear x RF). VESSELS OVER 10m- Calculation by Stratum = S (Vessel Days at sea); Fishing Days=Σ(fishing days by gear); GT fishing days by gear= S (GT vessel x Vessel fishing days by gear); KW-Fishing Days= S (KW vessel x Vessel fishing days by gear).	Each day is attributed to the area where the most fishing time was spent during the relevant day at sea	fishing day equal to days at sea
	2		Activity days counted per trip		As scenario 1: Two trips, but fishing occurs on same calendar day so counts as one day		Fishing days counted by trip		Two seperate trips with end and start on same calendar day treated as two seperate days.	fishing day equal to days at sea
	3		Activity days split between areas	NA	Calculation as the number of calender days on which fishing opeerations occur, where multiple areas entered within the same day, day assigned to area with greatest fishing time reported on said day. If equal fishing time reported, day assigned alphabetically.		Each day is attributed to the area where the fishing time was spent during the relevant day at sea.		NA - slovenian fisherman operates just in AREA 37.2.1	fishing day equal to days at sea
	4		Activity days split between gear types		As scenario 3: dominant gear identified with fishing time. If equal fishing time, preferecne is fist given to regualated gear, then assigned alphabetically		Each day is attributed by used gear		When two fishing gears are used in the same fishing day, fishing day is allocated to the most used gear at that day.	fishing day equal to days at sea
	5		Activity days split between areas	NA	As scenario 3		The total number of dates are attributed to the gear in area with most fishing time.		NA - slovenian fisherman operates just in AREA 37.2.1	fishing day equal to days at sea
	6		Activity days counted when hauling gear - no reference to soak times	Currently, fishing days for passive gears are calculated dividing fishing time/24. However we recognize the procedure has to be changed to limit the fishing day according the fishing trip dates. Since some fisherman input soaking time in fishing reports and not actual fishing time. For passive gears, this calculation represents soaking time.	As scenario 2, treated as two seperate trips. No data avaliable to scientists on gear left set or not		2 days with fishing activity		For passive gears, the time is calculated from the point where each individual unit of gear has been set, to the time when the same unit starts to be removed.	fishing day equal to days at sea

Information available	Belgium	Croatia	Denmark	Estonia	Finland	France	Germany
Vessels with loggboks							
Departure and arrival from port (date and time)	Yes	Yes	Yes	YES for trawl fishery. Not applied for coastal fishery with vessels less than 12 m.	yes	Yes	Yes
Start /end of fishing operations (date and time) (information haul by haul)	No	No	No (before 2015)	YES for trawl fishery, NO for coastal fishery (passive gear, vessels under 12 m), only date of demanding and gear type are marked	yes-at least fishing time	No (may-be in some Electronic-logbooks recently)	Yes
Information on haul level since	No	No	2015	2010	?	May-be recently for e-logbooks	before2003
Duration of fishing operation by date	Yes	Yes, summed for all operations in one date.	Not mandatory for all vessels before 2015	yes	yes	Yes (fishing time by "date*gear*area")	Yes
Number of fishing operations by date	Yes	Yes	Not mandatory for all vessels before 2015	yes	yes	Yes (number of fishing operation by"date*gear*area")	Yes
Number of fishing operations by date*gear*management area	Yes	Yes	Not mandatory for all vessels before 2015	yes	yes	Yes (number of fishing operation by "date*gear*area")	Yes
Number of dates by vessel for which passive gears are deployed (soaking time)	Yes, however quality of information questionable	Yes	No	yes	no	No	Yes
Duration (hours) by vessel and date for which passive gears are deployed	No	No	No	no	cold be estimated with some assumptions	No	Yes
Number of passive gear by vessel and date	No	Yes	No	yes	cold be estimated with some assumptions	Yes but quality of information need to be explored (dimension of the gear is as well available for active gears)	Yes
Soaking time by census or sampled information	No	Census	No	census (days) from 2015 for coastal fishery	census	No	Census
Area: one rectangle by date	Yes	Yes	Not mandatory for all vessels before 2015, but many fill in several rectangles by date	yes	yes	Yes (one rectangle as a minimum but fishermen could describe more rectangle)	Yes
Area: rectangle by fishing operation (haul by haul)	Yes	No	Not mandatory for all vessels before 2015	Yes	yes	No (may-be recently for e-logbooks)	Yes
Area: geographical position by fishing operation (haul by haul)	No	No, only for vessels >15 m with e-logbook and VMS. Extrapolated from VMS information, for vessels > 15m. For purse seiners and trawlers by end of 2015 haul by haul from e-logbook and VMS information.	Not mandatory for all vessels before 2015	yes	from vms	No (may-be recently for e-logbooks)	Only for certain zones (NOR)
Area: geographical position by fishing operation (from VMS information)	Yes	No, only for vessels for BFT catcihng vessels, all purse seiners and trawlers by end of 2015	Yes, used for scientific purposes	yes	yes	Yes (information on rectangle in logbooks are cross-validated with VMS data)	Yes
Gear: FAO codes availabe	Yes	Yes	Yes	yes	yes	Yes	Yes
Gear: More detailed information than FAO codes availabe	Yes	Yes	Only for Skagerrak and Kattegat since 2013		yes	No (Based on an algorithm, an estimation of the "métier" of the vessels based on species composition and annual fishing activity calendars is calculated)	?
Data population: Are trips and/or dates within a trip without catches available for effort calculations		Yes	Yes	yes	basically yes, data quality is unclear		Yes
Data population: Are all vessels that have been active included in the calculations	Yes	Yes	Dependent on data call	yes	yes		Dependent on data call.
Reasons to not include vessels		NA	For the economic data call are only vessels registered 1 January included. Only vessels with an income above a theshold are included	NA			Not applicable
Comments	Information on fishing time in the logbook is available					Completeness of the information available is evaluate against annual fishing activity calendars available on an exhaustive way fo all vessels of the fishing fleet register (almost exhaustive for all regions and vessels over 10m.)	

Information available	Greece	Italy	Lithuania	Malta	Slovenia	Sweden
Vessels with loggboks	yes from 2015 electronic logbookfor vessels >12m	NO				
Departure and arrival from port (date and time)	yes from 2015 electronic logbookfor vessels >12m	NO	yes	Yes	Yes	Yes
Start /end of fishing operations (date and time) (information haul by haul)	No	NO	yes only since 2014 for vessels with an overall length equal to or greater than 15 meters	Date only - Maybe in the future with electronic logbooks	No	Yes
Information on haul level since	NO	NO	2008	Maybe in the future with electronic logbooks	yes, from 2006	before2003
Duration of fishing operation by date	yes from 2015 electronic logbookfor vessels >12m	NO	yes	Yes	yes	Yes
Number of fishing operations by date	yes from 2015 electronic logbookfor vessels >12m	NO	yes	Yes	yes	Yes
Number of fishing operations by date*gear*management area	yes from 2015 electronic logbookfor vessels >12m	NO	yes	Yes	yes	Yes
Number of dates by vessel for which passive gears are deployed (soaking time)	NO	NO	yes	Yes	no	No
Duration (hours) by vessel and date for which passive gears are deployed	yes from 2015 electronic logbookfor vessels >12m	NO	yes	Yes	yes	Yes but quality of information need to be explored
Number of passive gear by vessel and date	yes from 2015 electronic logbookfor vessels >12m	NO	yes overall length	Yes	yes	Yes but quality of information need to be explored
Soaking time by census or sampled information	YES	NO	census	Census	census	census
Area: one rectangle by date	yes from 2015 electronic logbookfor vessels >12m	NO	yes only for the Baltic Sea	Yes	yes	Yes
Area: rectangle by fishing operation (haul by haul)	yes from 2015 electronic logbookfor vessels >12m	NO	yes only for the Baltic Sea	No (maybe in the future with electronic logbooks)	yes	Yes
Area: geographical position by fishing operation (haul by haul)	yes from 2015 electronic logbookfor vessels >12m	NO	yes only since 2014 for vessel vessels with an overall length equal to or greater than 15 meters	No (maybe in the future with electronic logbooks)	yes	Yes
Area: geographical position by fishing operation (from VMS information)	YES	NO	yes	No (maybe in the future with electronic logbooks)	yes	
Gear: FAO codes availabe	YES	NO	yes	Yes	yes	Yes
Gear: More detailed information than FAO codes availabe	NO	NO	yes	Yes (target species for some gears)	yes; for OTB	Yes
Data population: Are trips and/or dates within a trip without catches available for effort calculations	YES	NO	yes	Yes; only if available (but probably trips without a catch are not always reported in logbooks)	yes	Dates within trips without catches included but entire trips without catches excluded
Data population: Are all vessels that have been active included in the calculations	YES	NO	yes	Yes	yes	Dependent on data call.
Reasons to not include vessels	For the economic data call are only vessels registered 1 January included	NO		-		For the economic data call are only vessels registered 1 January included
Comments		Logbooks are existing but not used in data collection		-		

Information available	Belgium	Croatia	Denmark	Estonia	Finland	France		Germany
Vessels without logbooks		All trawlers and purse seiners regardles of LoA are obligated to fulfill the LB. All other vessels < 10m LoA are required by national legislation to fulfill monthly fishing reports.		All vessels have log books. Around 3000 in coastal fishery, approx. 40 in trawl fishery in baltics and 5 vessel in long distant fishery. All ships longer than 15 m have ERS system. 12-15 m ships dont have ERS, if the trips last less than 24 hours, there are 7 ships of this kind.	vessels <10m, monthly report	France (vessels under 10m. FAO 27 + FAO 37 (partly)	France (vessels under 10m. FAO 37 +Overseas)	
Departure and arrival from port (date)	No	Yes	No		no	Yes (information day by day by gear*area, fishing forms)	Yes (available for a sample)	No
Duration of fishing operation by date*gear*management area	No	Yes	No		no	Yes (Duration of the trip, fishing time is not available in fishing forms)	Yes (available for a sample)	No
Number of fishing operations by date*gear*management area	No	Yes	No		no	No	No	No
Number of days by gear*management area	No	Yes	No		yes	Yes (information day by day by gear*area, fishing forms)	Yes (available for a sample)	Yes (sample)
Number of days known from salesslips	No	No	Yes		no	Yes	Yes	Yes (correction factor from survey applied to monthly records)
Number of dates by vessel for which passive gears are deployed (soaking time)	No	Yes	No		by days	No	No	No
Duration (hours) by vessel and date for which passive gears are deployed	No	Yes	No		no	Yes (gear fishing time day by day by gear*area, fishing forms)	Yes (available for a sample, gear fishing time)	No
Number of passive gear by vessel and date	No	Yes	No		yes, some quality issues	Yes but quality of information need to be explored (dimension of the gear is as well available for active gears)	Yes (available for a sample, dimension of the gear ias as well available for active gears)	For sample from survey
Soaking time by census or sampled information	No	Census	No		census	census	sample	sample
Source of information	No	LB for purse seiners and trawlers. Monthly fishing reports for all others.	Sales slips		Montly report, cencus	Fishing forms (Description of their daily fishing activity is asked with the main fishing area, fishing effort and specific effort (gear time, dimension, mesh size) data, gear(s) used and catches. Each column correspond to a « day*gear*mesh size*dimension*area » (logevent) activity)	Sample of landings and effort data collected at land (catch assessment survey)	Sales notes, containing month information, are combined with survey data to get an adjustment factor
Area: Management area	No	Yes, national management zone	Yes		yes	Yes	Yes	Not directly, but for small vessels the fishing area can be estimated though home port
Area: one rectangle by date	No	No	No		No, but dominant rectangle by month	Yes (one rectangle as a minimum but fishermen could describe more rectangle)	Yes (available for a sample with one rectangle as a minimum but fishermen could describe more rectangle)	Not directly, but for small vessels the fishing area can be estimated though home port; concrete date not available
Area: rectangle by fishing operation (haul by haul)	No	No	No		no	No	No	No
Area: geographical position by fishing operation (haul by haul)	No	No	No		no	No	No	No
Gear: FAO codes availabe	No	Yes	No		yes	Yes	Yes	No
Gear: More detailed information than FAO codes availabe	No	No	No		yes	No (Based on an algorithm, an estimation of the "métier" of the vessels based on species composition and annual fishing activity calendars available on an exhaustive way for all active vessels is calculate)	Yes (métier are sampled)	
Data population: Are trips and/or dates within a trip without catches available for effort calculations	No	Yes	No		soaking time for passive gears			No
Comments		Information available in fishing reports per effort: gear - FAO date and time of departure-arrival time of fishing quantity of gear number of fisherman national management zones				Completeness of the information available is evaluate against annual fishing activity calendars available on an exhaustive way fo all vessels of the fishing fleet register (almost exhaustive for vessels less than 10m and FAO 27, For FAO 37 complementary data are sampled and no data available for overseas)	Sampling scheme is based on the annual fishing activity calendars available on an exhaustive way for all vessels of the fishing fleet register.	Sales notes indicate the period of activity (month or even quarter); this is transleated into days; these days are compared with the days collected by survey; the ratio "survey:salesnote" is applied to all sales notes to get an estimate for the segment

Information available	Greece	Italy	Lithuania	Malta	Slovenia	Sweden
Vessels without logbooks	**Greece: all informations derived from Sample Survey**	**ITALY: all informations derived from Sample Survey (coverage 12%)**	vessels with an overall length less than 8 meters are compliting logbooks under national legislation	Malta (Sampling Survey for Vessels <10m)	In Slovenia all fishing vessels, also those under 10 meters, are obligated to fulfill the LB	
Departure and arrival from port (date)	NO	period (week or month)	Not by dates but by days per month	No (per week)		No
Duration of fishing operation by date*gear*management area	YES	NO	Not by dates but by days per month	Yes (average by gear and fishing area; NOT by date and NOT for all passive gears		No
Number of fishing operations by date*gear*management area	NO	NO	Not by dates but by days per month	Yes (average by gear and fishing area; NOT by date NOT for all passive gears)		No
Number of days by gear*management area	YES	days by gear; area just for vessels >15 mt (more o less)	yes	Yes (Number of fishing days and nuumber of trips by gear)		Yes
Number of days known from salesslips	NO		no	No		Yes
Number of dates by vessel for which passive gears are deployed (soaking time)	YES	NO	Not by dates but by days per month	Not by date but by day		Not by dates but by days
Duration (hours) by vessel and date for which passive gears are deployed	YES	No date; hours by vessel estimated; days passive gears deployed (no date)	no	No date; hours by vessel estimated; days passive gears deployed (no date)		No
Number of passive gear by vessel and date	YES	Number of passive gear by vessel BUT no Date	Not by dates but by days per month	Number of passive gear by vessel BUT no Date		Yes but quality of information need to be explored
Soaking time by census or sampled information	only from sample information	could be estimated	census	Sampled		census
Source of information	Fishing forms (Description of their daily fishing activity is asked with the main fishing area, fishing effort and specific effort (gear time, dimension, mesh size) data, gear(s) used and catches.	sample survey: Data collectors Network	Montly fishing reports including information on area, gears and fishing days by month	Monthly sampling survey		Montly fishing journals including information on area, gears and fishing days by month
Area: Management area	YES	NO	yes	Yes		Yes
Area: one rectangle by date	YES	By period (week or month) checked with vms	yes	No (dominant fishing area)		No, but rectangle by month
Area: rectangle by fishing operation (haul by haul)	NO	No	yes, because all small-scaled vessel is fishing in one rectangle	No		Yes
Area: geographical position by fishing operation (haul by haul)	NO	No	no	No		Yes
Gear: FAO codes availabe	YES	Yes	yes	Yes		Yes
Gear: More detailed information than FAO codes availabe	Yes (métier are sampled)	Metier	metier	Metier and target species		Yes
Data population: Are trips and/or dates within a trip without catches available for effort calculations	YES	this event does not exist (data available)	yes	Data available		Yes
Comments				Sampling scheme is based on all "active" and "inactive" vessels less than 10m LOA registered in the Fleeet Register, as at 1st January of that reference year		

ANNEX 8 – Country Codes

Master Data Register		Economic data call		Effort data call	
Code	Country	Code	Country	Code	Country/region
BEL	Belgium	BEL	Belgium	BEL	Belgium
BGR	Bulgaria	BGR	Bulgaria	BUL	Bulgaria
CYP	Cyprus	CYP	Cyprus	CYP	Cyprus
DEU	Germany	DEU	Germany	GER	Germany
DNK	Denmark	DNK	Denmark	DEN	Denmark
ESP	Spain	ESP	Spain	SPC	Spain (Canaries island)
				SPN	Spain (mainland)
				ESP	Spain (med DB)
EST	Estonia	EST	Estonia	EST	Estonia
FIN	Finland	FIN	Finland	FIN	Finland
FRA	France	FRA	France	FRA	France
GBR	U.K. of Great Britain and Northern Ireland	GBR	United Kingdom	ENG	United Kingdom (England and Wales)
				GBC	United Kingdom (Alderny/Sark/Herm)
				GBG	United Kingdom (Guernsey)
				GBJ	United Kingdom (Jersey)
				IOM	United Kingdom (Isle of Man)
				NIR	United Kingdom (Northern Island)
				SCO	Scotland
IRL	Ireland	IRL	Ireland	IRL	Ireland
ITA	Italy	ITA	Italy	ITA	Italy
LTU	Lithuania	LTU	Lithuania	LIT	Lithuania
LVA	Latvia	LVA	Latvia	LAT	Latvia
MLT	Malta	MLT	Malta	MLT	Malta
NLD	Netherlands	NLD	Netherlands	NED	Netherlands
POL	Poland	POL	Poland	POL	Poland
PRT	Portugal	PRT	Portugal	POR	Portugal (mainland)
				PTA	Portugal (Azores)
				PTM	Portugal (Madeira)
ROU	Romania	ROU	Romania	ROM	Romania
SVN	Slovenia	SVN	Slovenia	SVN	Slovenia
SWE	Sweden	SWE	Sweden	SWE	Sweden
GRC	Greece	GRC	Greece	GRC	Greece
HRV	Croatia				

Annex 9 - Fishing Areas

Effort/Med database	Economic database		
code	Supra Region	FAO_3_4	Area
-1	NA	None	NA
4	AREA27	27.4	North Sea
12	AREA27	27.12	North Atlantic
22	AREA27	27.3.C.22	Baltic
23	AREA27	27.3.B.23	Baltic
24	AREA27	27.3.D.24	Baltic
25	AREA27	27.3.D.25	Baltic
25.28	AREA27	27.3.D	Baltic
26	AREA27	27.3.D.26	Baltic
27	AREA27	27.3.D.27	Baltic
28	AREA27	27.3.D.28	Baltic
28.2	AREA27	27.3.D.28	Baltic
29	AREA27	27.3.D.29	Baltic
30	AREA27	27.3.D.30	Baltic
31	AREA27	27.3.D.31	Baltic
32	AREA27	27.3.D.32	Baltic
37	AREA37	37	Mediterranean & Black sea
37.1	AREA37	37.1	Mediterranean & Black sea
37.2	AREA37	37.2	Mediterranean & Black sea
37.3	AREA37	37.3	Mediterranean & Black sea
37.4	AREA37	37.4	Mediterranean & Black sea
99	NA	None	NA
1 COAST	AREA27	27.1.B	North Sea
1 RFMO	AREA27	27.1.A	North Sea
10 EU	AREA27	27.10.A	North Atlantic
10 RFMO	AREA27	27.10.B	North Atlantic
12 RFMO	AREA27	27.12	North Atlantic
14A	AREA27	27.14.A	North Atlantic
14B COAST	AREA27	27.14.B	North Atlantic
14B RFMO	AREA27	27.14.B	North Atlantic
2 COAST	AREA27	27.2.A	North Sea
2 EU			
2 RFMO	AREA27	27.2.B	North Sea
22-24	AREA27	27.3	Baltic
24-28	AREA27	27.3.D	Baltic
25-28	AREA27	27.3.D	Baltic
29-32	AREA27	27.3.D	Baltic
34.1.1 COAST	OFR	34.1.1	Others
34.1.1 EU	OFR	34.1.1	Others
34.1.2 COAST	OFR	34.1.2	Others

Effort/Med database	Economic database		
code	Supra Region	FAO_3_4	Area
34.1.2 EU	OFR	34.1.2	Others
34.1.2 RFMO	OFR	34.1.2	Others
34.1.3 COAST	OFR	34.1.3	Others
34.1.3 RFMO	OFR	34.1.3	Others
34.2.0 COAST	OFR	34.2.0	Others
34.2.0 EU	OFR	34.2.0	Others
34.2.0 RFMO	OFR	34.2.0	Others
34.3.1.1	OFR	34.3.1	Others
37.1.1	AREA37	37.1.1	Mediterranean & Black sea
37.1.2	AREA37	37.1.2	Mediterranean & Black sea
37.1.3	AREA37	37.1.3	Mediterranean & Black sea
37.2.1	AREA37	37.2.1	Mediterranean & Black sea
37.2.2	AREA37	37.2.2	Mediterranean & Black sea
37.3.1	AREA37	37.3.1	Mediterranean & Black sea
37.3.2	AREA37	37.3.2	Mediterranean & Black sea
37.4.1	AREA37	37.4.1	Mediterranean & Black sea
37.4.2	AREA37	37.4.2	Mediterranean & Black sea
37.4.3	AREA37	37.4.3	Mediterranean & Black sea
3AN	AREA27	27.3.A	North Sea
3AS	AREA27	27.3.A	North Sea
5 EU			
5A	AREA27	27.5.A	North Atlantic
5B COAST	AREA27	27.5.B	North Atlantic
5B EU	AREA27	27.5.B	North Atlantic
5B RFMO	AREA27	27.5.B	North Atlantic
6A	AREA27	27.6.A	North Atlantic
6B EU	AREA27	27.6.B	North Atlantic
6B RFMO	AREA27	27.6.B	North Atlantic
7A	AREA27	27.7.A	North Atlantic
7B	AREA27	27.7.B	North Atlantic
7C EU	AREA27	27.7.C	North Atlantic
7C RFMO	AREA27	27.7.C	North Atlantic
7D	AREA27	27.7.D	North Sea
7E	AREA27	27.7.E	North Atlantic
7F	AREA27	27.7.F	North Atlantic
7G	AREA27	27.7.G	North Atlantic
7H	AREA27	27.7.H	North Atlantic
7J	AREA27	27.7.J	North Atlantic
7J EU	AREA27	27.7.J	North Atlantic
7J RFMO	AREA27	27.7.J	North Atlantic
7K EU	AREA27	27.7.K	North Atlantic
7K RFMO	AREA27	27.7.K	North Atlantic
8A	AREA27	27.8.A	North Atlantic

Effort/Med database	Economic database		
code	Supra Region	FAO_3_4	Area
8B	AREA27	27.8.B	North Atlantic
8C	AREA27	27.8.C	North Atlantic
8D EU	AREA27	27.8.D	North Atlantic
8D RFMO	AREA27	27.8.D	North Atlantic
8E EU	AREA27	27.8.E	North Atlantic
8E RFMO	AREA27	27.8.E	North Atlantic
9A	AREA27	27.9.A	North Atlantic
9B EU	AREA27	27.9.B	North Atlantic
9B RFMO	AREA27	27.9.B	North Atlantic
BSA	AREA27	BSA	North Atlantic

Annex 10 - Vessel Length Classes

Area	LOA economic.	LOA efffort
Baltic Sea	VL0010	VL0008
Baltic Sea	VL0010	VL0810
Baltic Sea	VL1012	VL1012
Baltic Sea	VL1218	VL1218
Baltic Sea	VL1824	VL1824
Baltic Sea	VL2440	VL2440
Baltic Sea	VL40XX	VL40XX
Mediterranean	VL0006	VL0006
Mediterranean	VL0612	VL0612
Mediterranean	VL1218	VL1218
Mediterranean	VL1824	VL1824
Mediterranean	VL2440	VL2440
Mediterranean	VL40XX	VL40XX
Other	VL0010	VL0010
Other	VL1012	VL1012
Other	VL1218	VL1218
Other	VL1824	VL1824
Other	VL2440	VL2440
Other	VL40XX	VL40XX
All	none	none

Annex 11 - Gears and gear classes

Gear classes	Description	Economic data call		Effort data call	
		Gear code_eco	fishing_tech	Gear code_eff	Gear group
DREDGES	Boat dredges	DRB	DRB	DRB	DREDGE
DREDGES	Mechanised dredges including suction dredges	HMD	DRB	HMD	DREDGE
DREDGES	Hand dredges	DRH	DRB		
GILLNETS AND ENTANGLING NETS	Driftnets	GND	DFN	GND	GILL
GILLNETS AND ENTANGLING NETS	Set gillnets (anchored)	GNS	DFN	GNS	GILL
GILLNETS AND ENTANGLING NETS	Encircling gillnets	GNC	DFN		
GILLNETS AND ENTANGLING NETS	Trammel nets	GTR	DFN	GTR	TRAMMEL
GILLNETS AND ENTANGLING NETS	Combined gillnets-trammel nets	GTN	DFN		
LIFT NETS	Boat-operated lift nets	LNB	DFN		
LIFT NETS	Shore-operated stationary lift nets	LNS	DFN		
HOOKS AND LINES	Handlines and pole-lines (mechanised)	LHM	HOK	LHM	LONGLINE
HOOKS AND LINES	Handlines and pole-lines (hand-operated)	LHP	HOK	LHP	LONGLINE
HOOKS AND LINES	Drifting longlines	LLD	HOK	LLD	LONGLINE
HOOKS AND LINES	Set longlines	LLS	HOK	LLS	LONGLINE
HOOKS AND LINES	Troll lines	LTL	HOK	LTL	LONGLINE
SEINE NETS	Danish seines	SDN	DTS	SDN	DEM_SEINE
SEINE NETS	Pair seines	SPR	DTS	SPR	DEM_SEINE
SEINE NETS	Scottish seines	SSC	DTS	SSC	DEM_SEINE
SEINE NETS	Beach seines	SB	DTS		
SURROUNDING NETS	Purse seines	PS	PS	PS	PEL_SEINE
SURROUNDING NETS	Lampara nets	LA	PS		
TRAPS	Pots and Traps	FPO	FPO	FPO	POTS
TRAPS	Stationary uncovered pound nets	FPN	FPO		
TRAPS	Fyke nets	FYK	FPO		
TRAWLS	Bottom otter trawl	OTB	DTS	OTB	OTTER
TRAWLS	Otter twin trawl	OTT	DTS	OTT	OTTER
TRAWLS	Bottom pair trawl	PTB	DTS	PTB	OTTER
TRAWLS	Midwater otter trawl	OTM	TM	OTM	PEL_TRAWL
TRAWLS	Pelagic pair trawl	PTM	TM	PTM	PEL_TRAWL
TRAWLS	Beam trawl	TBB	TBB	TBB	BEAM

Annex 12 - Mesh size range

Mobile gears

<16

16-31

32·54

55-69

70-79

80-89

90-99

100-119

>=105[1]

>=120

Passive gears

10-30

31-49

50-59

60-69

70-79

80-89

90-99

100-109

110-149

110-156[2]

150-219

157-219[2]

>=220

-1[3]

[1] To be used for mobile gears in the context the fishing effort management scheme applied in the Baltic Sea

[2] To be used for passive gears in the context the fishing effort management scheme applied in the Baltic Sea

[3] To be used only with longlines

.

Annex 13 - Variables requested for economic and effort data calls (for the groups Capacity, Effort, Landing)

	Effort data call		Economic data call			
	Acronym	**Description**	**Acronym**	**Unit**	**Description**	**Suggested Acronym**
Variables	LANDINGS	landing in tonnes	totWghtLandg	KG	Weight of landings per species	totWghtLandg
	FISHING_ACTIVITY	days at sea or days absent from port	totSeaDays	DAYS	Days at Sea	totDaysatSea
	FISHING_CAPACITY	gross tonnage or kW	totGT	TONS	Total GT	totGT
			totKw	KW	Total kW	totkW
	NOMINAL_EFFORT	kW times days at sea	NA*			totkWDaysatSea
	GT_DAYS_AT_SEA	gross tonnage times days at sea	NA			totGTDaysatSea
	NO_VESSELS	simple integer value of vessels	totVes	NUMBER	Number of vessels	totVessels
	EFFECTIVE_EFFORT	hours fished	NA			totHoursFished
	FISHING_CAPACITY_KW	kW (Only for the Baltic Sea)	totKw	KW	Total kW	totkW
	FISHING_CAPACITY_GT	Gt (Only for the Baltic Sea)	totGT	TONS	Total GT	totGT
	FISHING_ACTIVITY_DAYS	days at sea (Only for the Baltic Sea)	totSeaDays	DAYS	Days at Sea	totDaysatSea
	NA		avgAge	YEARS	Mean age	avgAge
	NA		avgLOA	METRES	Mean length overall	avgLengthOverall
	NA		totFishDays	DAYS	Fishing days	totFishDays
	NA		totKwFishDays	KWDAYS	kW fishing days	totkWFishDays
	NA		totGTFishDays	GTDAYS	GT fishing days	totGTFishDays
	NA		totTrips	NUMBER	Number of trips	totTrips
	NA		MaxSeaDays	DAYS	Max Days at Sea	MaxDaysatSea
	NA		totEnerCons	LITRES	Energy	totEnerCons

	Effort data call		Economic data call			
	Acronym	**Description**	**Acronym**	**Unit**	**Description**	**Suggested Acronym**
					Consumption	
	NA		totValLandg	EURO	Value of landings per species	totValLandg
	NA		totWghtCatch	KG	Total weight of catches per species (SAL, COD, ELE)	totWghtCatch

*NA – not applicable

Annex 14 – Codes descriptions for data calls

	Effort data call		Economic data call		Suggested Acronym	Suggested Description
	Acronym	**Description**	**Acronym**	**Description**		
Codes	COUNTRY	country code	NA		CountryCode	country 3 letters code
	YEAR	year in four digits	YEAR	year in four digits	Year	year in four digits
	QUARTER	quarter as one digit	NA		Quarter	quarter as one digit
	VESSEL_LENGTH	vessel length according to the code list	VESSEL_LENGTH	Appendix III	VesselLength	Appendix III
	GEAR	gears according to the code list			GearGroup	Appendix IV, Level 3
	NA	NA	GEAR TYPE	Appendix IV, Level 4	GearType	Appendix IV, Level 4
	NA	NA	FISHING TECHNIQUE	Appendix III, gears according to the JRC code list	FishingTechnique	Appendix III, gears according to the JRC code list
	MESH_SIZE_RANGE	mesh size according to the code list	NA		MeshSizeRange	mesh size according to the code list
	FISHERY	species complex and gear or metier	NA		Fishery	species complex and gear or metier
	AREA	ICES division or sub-area	SUB_REGION	FAO level 3, 4	SubRegion	FAO level 3, 4*
	NA	NA	SUPRA_REGION	Appendix II, Level 3 (AREA27, AREA37, OFR)	SupraRegion	Appendix II, Level 3 (AREA27, AREA37, OFR)
	NA	NA	REGION	Appendix II, Level 2 (BS, MBS, NA, NS, OFR)	Region	Appendix II, Level 2 (BS, MBS, NA, NS, OFR)
	SPECON	Specific conditions associated to fishing effort regimes	NA		Specon	specific conditions associated to fishing effort regimes
	SPECIES	fish species	SPECIES	fish species FAO code	Species	fish species FAO ASFIS code
	GEAR	the code "REGGEAR" or "NONGEAR" (Only for the Baltic Sea)	NA		RegGearCode	REGGEAR- for all regulated gears as defined in COUNCIL REGULATION (EC) No 1098/2007, NONGEAR - in case regulated gears were never used
	AREA	the code according CR 1098/2007, "A","B","C" (Only for the Baltic Sea)	NA		Area	areas in accordance with definitions of COUNCIL REGULATION (EC) No 1098/2007 (A,B or AB)
	ID	unique identifier	NA		ID	unique identifier
	RECTANGLE	text, 4 letters like 44F6	NA		Rectangle	Statistical rectangle, 4 letters like 44F6

* Or to lowest level of detail as dictated by the MDR

Management plans by Regulation

No	Title	When agreed	Areas covered/Countries	Target	Regulation	Special conditions	Status (adopted/pending
1	Recovery plan for cod: North Sea, Kattegat, Skagerrak, the eastern Channel, Irish Sea and West of Scotland	February 2004, revised November 2008.	ICES III, IV, VIa, VIIa and VIId.	originally, to increase the quantities of mature fish to sustainable levels; now, to reduce fishing mortality to rate which can maximise long-term sustainable yield. Initial fishing mortality target rate is set at 0.4. Rate of year-on-year changes in TAC varies with level of stock.	Council Regulation (EC) No 423/2004 of 26 February 2004 Council Regulation (EC) No 1342/2008 of 18 December 2008 Council Regulation (EU) No 1243/2012 of 19 December 2012 amending Regulation (EC) No 1342/2008 establishing a long-term plan for cod stocks and the fisheries exploiting those stocks	Incentives for Member States to reduce discards and establish cod-avoidance programmes.	Adopted
2	Recovery plan for Northern hake	April 2004.	Kattegat, Skagerrak, North Sea, the Channel, West of Scotland, all around Ireland and Bay of Biscay.	increase the quantities of mature fish in the Northern hake stock to at least 140 000 tonnes.	Council Regulation (EC) No 811/2004 of 21 April 2004		Adopted
3	Recovery plan for Southern hake and Norway lobster	20 December 2005.	Cantabrian Sea and Western Iberian Peninsula.	increase the spawning stock biomass of Southern hake to 35 000 tonnes for two consecutive years. For Norway lobster, rebuild stocks to within safe biological limits.	Council Regulation (EC) No 2166/2005 of 20 December 2005		
4	Multi-annual plan for sole, Bay of Biscay	23 February 2006.	Bay of Biscay (ICES VIIIa and VIIIb).	bring spawning stock biomass to above the precautionary level of 13 000 tonnes in 2008.	Council Regulation (EC) No 388/2006 of 23 February 2006	Specific conditions: vessels catching more than 2 000 kg of sole per year will require a special permit. A ceiling is set of 100 kg of sole per sea trip.	
5	Multi-annual plan for sole, Western Channel	7 May 2007.	Western Channel (ICES VIIe).	reduce fishing mortality rate by 20 % compared to the average of 2003-2005 or achieve a fishing mortality rate of 0.27 for appropriate age groups – whichever is the higher.	Council Regulation (EC) No 509/2007 of 7 May 2007		Adopted
6	Multi-annual plan for sole and plaice, North Sea	11 June 2007.	North Sea.	ensure precautionary biomass for plaice of 230 000 tonnes and for sole of 35 000 tonnes by gradually reducing fishing mortality on sole from its current level of 0.35 to 0.2 and on plaice from 0.58 to 0.3.	Council Regulation (EC) No 676/2007 of 11 June 2007		
7	Measures for the recovery of eel	18 September 2007.	Area covered: EU estuaries and rivers that flow into seas in ICES areas III, IV, VI, VII, VIII, IX and the Mediterranean.	national eel management plans should enable at least 40 % of the level of adult eels, which in the absence of fishing and other human activity would migrate, to be able to escape to the sea to spawn.	Council Regulation (EC) No 1100/2007 of 18 September 2007		

No	Title	When agreed	Areas covered/Countries	Target	Regulation	Special conditions	Status (adopted/pending
8	Multi-stock multiannual plan for the management of fisheries in the Baltic	18 September 2007.	ICES SD 22-32.	ensure sustainable exploitation by gradually reducing and maintaining mortality rates no lower than 0.6 for cod between 3 and 6 years in the Western Baltic and 0.3 for cod between 4 and 7 years in the Eastern Baltic.	Council Regulation (EC) No 1098/2007 of 18 September 2007	exclusion of small-scale vessels below 8m. Flexibility for effort management for small-scale vessels between 8 and 12 metres in length. Vessels of an overall length equal to or greater than eight metres carrying on board or using any gears for cod fishing shall hold a special permit.	Adopted
9	Multi-annual plan for cod, Baltic		ICES SD 22-32.		COM/2014/0614 -6 October 2014 - Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing a multiannual plan for the stocks of cod, herring and sprat in the Baltic Sea and the fisheries exploiting those stocks, amending Council Regulation (EC) No 2187/2005 and repealing Council Regulation (EC) No 1098/2007 - COM(2014) 614	the target fishing mortality shall be reached by 2015 and maintained onwards for the stocks concerned within the following ranges:Western Baltic cod 0.23-0.29, Eastern Baltic cod 0.41-0.51, Central Baltic herring 0.23-0.29, Gulf of Riga herring 0.32-0.39, Bothnian Sea herring 0.13-0.17 , Western Baltic herring 0.25-0.31, Baltic Sprat 0.26-0.32 . ensuring the conservation of the stocks of plaice, brill, flounder and turbot in line with the precautionary approach.	Pending
10	Long-term plan for West of Scotland herring	18 December 2008.	Area covered: international and EU waters in ICES zones Vb and VIb, and the northern part of ICES zone VIa excluding the Clyde.	to reduce fishing mortality to rate which can maximise long-term sustainable yield. Target fishing mortality rate of 0.25 when stock is over 75 000 tonnes, and 0.2 when stock is between 75 000 and 50 000 tonnes. Closure triggered when stock falls below 50 000 tonnes. Rate of year-on-year changes in TAC varies with level of stock.	Council Regulation (EC) No 1300/2008 of 18 December 2008		Adopted
10	Recovery plan for Greenland halibut				Council Regulation (EC) No 2115/2005 of 20 December 2005 establishing a recovery plan for Greenland halibut in the framework of the Northwest Atlantic Fisheries Organisation		Adopted
11	Recovery plan for Bluefin tuna				Regulation (EU) No 500/2012 of 13 June 2012 amending Council Regulation (EC) No 302/2009 concerning a multiannual recovery plan for bluefin tuna in the eastern Atlantic and Mediterranean		
					Council Regulation (EC) No 302/2009 of 6 April 2009 concerning a multiannual recovery plan for bluefin tuna in the eastern Atlantic and Mediterranean, amending Regulation (EC) No 43/2009 and repealing Regulation (EC) No 1559/2007		
					Council Regulation (EC) No 1559/2007 of 17 December 2007 establishing a multi-annual recovery plan for bluefin tuna in the Eastern Atlantic and Mediterranean and amending Regulation (EC) No 520/2007		Adopted

Management plans for the Mediternaean (incomplete)

Management plan name	Region	Details	Regulation (if appropriate)	MS	How data requirement met (DCF/Regulation/other)
Management plan for Purse seine net targeting sardine&anchovies. "Srdelara"	Med&BS	PS targeting SPF	Mediterranean Regulation (C.R. (EC) No1967/2006) (art.19)	HRV	DCF, specific study
Management plan for bottom trawl fisheries	Med&BS	OTB	Mediterranean Regulation (C.R. (EC) No1967/2006) (art.19)	HRV	DCF, specific study
Management plan for shore seine nets and purse seine nets (excluding purse seine net – srdelara and tunolovka)	Med&BS	PS, SB	Mediterranean Regulation (C.R. (EC) No1967/2006) (art.19)	HRV	DCF, specific study
Management Plan for Dredges: Beam Trawl, Dredge for Noah's Ark and Hydraulic Dredge	Med&BS	DRB	Mediterranean Regulation (C.R. (EC) No1967/2006) (art.19)	HRV	DCF, specific study
Multiannual management plan for fisheries on small pelagic stocks in the GFCM-GSA 17 (Northern Adriatic Sea) and on transitional conservation measures for fisheries on small pelagic stocks in GSA 18 (Southern Adriatic Sea)	Med&BS	All targeting SPF in GSA 17 and 18	Recommendation GFCM/37/2013/1	ITA, HRV, SLO	DCF, specific study
Management plan of the Purse Seine Fishery EC 1967/2006	Med&BS		EU 1967/2006 for technical measures (EU 1534, EU 1639)	Greece	DCF- Data on Landings-Greek National Program for Collection of Fisheries /
Management plan of the Bottom Trawlers	Med&BS		EU 1967/2006 and EC 93/2010	Greece, GSAs 20,22, 23	VMS data (EC No 2244/2003), MEDITS survey, Greek National Statistical Service, unofficial reconstructed data set of effort/landings problems with DCF data set (limited time series data set)
Management plan for Greek beach seines	Med&BS		EU 1967/2006	Greece	Data collected through specific national program
Management plan for the Bottom Otter Trawler Fishery	Med&BS	OTB	EU Council Regulation (EC) 1967/2006 and (EC) 2371/2002	MLT	Data collected through NP for DCF
Management plan for the Lampara Fishery	Med&BS	PS targeting SPF	EU Council Regulation (EC) 1967/2006 and (EC) 2371/2002	MLT	Data collected through NP for DCF
Management plan for the Doliphinfish Fishery	Med&BS	LA targeting LPF	EU Council Regulation (EC) 1967/2006	MLT	Data collected through NP for DCF
Management plan for the "Tartarun" Fishery	Med&BS	SV targeting DEMSP	EU Council Regulation (EC) 1967/2006 and (EC) 2371/2002	MLT	Data collected through NP for DCF

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