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Report on the 2nd Workshop on Transversal Variables

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A DCF ad-hoc workshop.

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2016 Report on the 2nd Workshop on Transversal Variables

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Table of contents

1 Executive Summary 3

2 Introduction 5

2.1 Terms of Reference (ToR) for the workshop 5

2.2 Organisation 5

2.3 Data 6

2.4 Background documents 6

3 The Workshop 7

3.1 ToR 2: "Assess to what extent the scenarios identified during the first WK held in Zagreb represent the range of situations MS will find in their own data. In the case different standard fishing trips are identified; devise the standard method to estimate effort for the situations missing." (Subgroup 2 and partly 4)" 8

3.1.1 Basic principles 8

3.1.1.1 Background information for principle 1: 9

3.1.1.2 The reasoning behind principle 3: 10

3.1.1.3 The reasoning behind principle 4: 10

3.1.1.4 Scenario example 11

3.1.2 Criteria 13

3.1.2.1 When is a new area a new area? 13

3.1.2.2 When is a new gear a new gear? 16

3.1.2.3 When to consider gears as used in parallel 16

3.1.3 Analysis of data provided and scenario examples making use of the principles agreed 17

3.1.3.1 Scenario examples 17

3.1.3.2 Scenario examples concentrating on passive gears 27

3.1.3.2.1 Passive gears used in parallel 27

3.1.3.2.2 Trips used to set passive gears in the sea 29

3.1.4 Analysis of data provided 32

3.1.4.1 Proportion of trips by number of rectangles and number of gears 32

3.1.4.2 Implications of using different definitions of Days at Sea and Fishing Days, an illustrative case study. 34

3.1.4.2.1 Considering Hours Fished 34

3.1.4.2.2 Considering Fishing Dates 36

3.1.4.2.3 Catch per unit effort 36

3.1.4.2.4 Conclusion from the analysis 38

3.1.5 Looking beyond 2017 38

3.1.5.1 Haul by haul logbook data 38

3.1.5.2 Data sources in addition to logbooks 41

3.1.6 ToR 2: in summary 41

3.2 ToR 3: Prepare the documentation deemed necessary, to be stored on a publicly accessible repository (e.g. DCF website), that would serve as support for the estimation processes. (Subgroup 1) 44
3.2.1 The algorithm 44
3.2.2 The R script 44
3.2.3 ToR 3: in summary 45
3.3 ToR 1: Assess the results of the new effort estimates following the trial implementation of the effort calculation method recommended at the WK on a MS level. ... 46
3.4 ToR 4: Decide on the most appropriate metrics for fishing effort for passive gears for vessels not required to complete logbooks and for those required to complete logbooks. ... 46
3.4.1 Comment on definition of fishing trip and fishing day 46
3.4.2 Small Scale fisheries: 47
3.4.3 Passive gears: 50
3.4.4 ToR 4: in summary 52
3.5 ToR 5: Identify together with Member States any particular issues that still need to be clarified ahead of the 2017 data calls 53
3.5.1 The 2017 data calls (DG MARE/STECF) 53
3.5.2 The data calls/data submissions 2018 onwards: 54
3.6 AOB - Development of a national transversal data file based on primary data 55
3.6.1 Objective 55
3.6.2 Combining transversal data 55
3.6.3 Proposal for a road-map for development of national transversal data file based on primary data 56
3.6.4 Draft proposal for variables collected according to the Control Regulation and Community Fishing Fleet Register Regulation to be made available for the DCF 56
References 60
List of abbreviations and definitions 61
List of figures 62
List of tables 63
ANNEX 1 - Participants 64
ANNEX 2 – Agenda 66
ANNEX 3 – DG MARE Presentation 67
ANNEX 4 – Data file structure and data formats 69
ANNEX 5 - Method for calculating Days at Sea and Fishing Days 71
ANNEX 6 – R-code: Auxilary Functions – Check/correct data formats. 76
ANNEX 7 – R-code to calculate Days at Sea (das) and Fishing Days (fdas) 89
ANNEX 8 – Example of final output from effort calculation from R-code 92
ANNEX 9 – Summary results of effort calculation 93
ANNEX 10 – Summary of the recommendation on Code Lists produced during the Zagreb Workshop. 97
ANNEX 11 – Fishing Areas (relationship between codes used in Economic and Effort/Med&BS data calls – Result from Zagreb WS) 99

ANNEX 12 – Vessel Overall length (relationship between codes used in Economic and Effort/Med&BS data calls – Result from Zagreb WS - LOA Classes) 102

ANNEX 13 – Fishing Gears (relationship between codes used in Economic and Effort/Med&BS data calls – Result from Zagreb WS) 103

ANNEX 14 – Country Codes (relationship between codes used in Economic and Effort/Med&BS data calls – Result from Zagreb WS) 104

ANNEX 15 – Names Variables and acronyms (for the groups Capacity, Effort, Landing) relationship between codes used in Economic and Effort/Med&BS data calls – Result from Zagreb WS 106

ANNEX 16 – Codes descriptions for data calls (relationship between codes used in Economic and Effort/Med&BS data calls – Result from Zagreb WS) 108

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Abstract

The 2nd Workshop on the Transversal Variables took place in Nicosia from the 22 to the-26 February 2016 mainly to complete and fine-tine the work that has been initialised during the first Workshop that took place in Zagreb in January 2015 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 bio economic modelling. For that, the group has worked on the following according to the Terms of Reference for the Workshop: 1. Assess the results of the new effort estimates following the trial implementation of the effort calculation method recommended at the WK on a MS level; 2. Assess to what extent the scenarios identified during the first WK represent the range of situations MS will find in their own data. When fishing trips outside of the scenarios are identified, devise the standard method to estimate effort for the missing situations; 3. Prepare the documentation deemed necessary, to be stored on a publicly accessible repository, that would serve as support for the estimation processes; 4. Decide on the most appropriate metrics of fishing effort for passive gears for vessels not required to complete logbooks and for those required to complete logbooks; and 5. Identify together with Member States any particular issues that still need to be clarified ahead of the 2017 data calls. Several analyses were carried out and conclusions taken. All ToRs were fully addressed and conclusions taken.

1 Executive Summary

In January 2015, following a proposal from the Planning Group on Economic Issues (PGECON), an ad-hoc workshop took place in the premises of the Croatian Ministry on "Linking economic and biological effort data /call design". The results from this workshop have proved valuable in developing methodologies to answer the increasing need of having fisheries fleet economic data and fisheries biological data on a level of disaggregation that would allow a proper interoperability between datasets. These results have been presented and discussed in several fora, and **the need for a second workshop (Wk) to refine the 1st WK results after tests run by MS experts and to further develop the specific issues related to passive gears was broadly recognized.**

This follow up workshop was hosted by the Ministry of Agriculture, Natural Resources and Environment, in Cyprus and took place in Nicosia from February 22nd to February 26th and the topics to be addressed were as follows:

1. Assess the results of the new effort estimates following the trial implementation of the effort calculation method recommended at the WK on a MS level;

2. Assess to what extent the scenarios identified during the first WK represent the range of situations MS will find in their own data. When fishing trips outside of the scenarios are identified, devise the standard method to estimate effort for the missing situations;

3. Prepare the documentation deemed necessary, to be stored on a publicly accessible repository, that would serve as support for the estimation processes;

4. Decide on the most appropriate metrics of fishing effort for passive gears for vessels not required to complete logbooks and for those required to complete logbooks; and

5. Identify together with Member States any particular issues that still need to be clarified ahead of the 2017 data calls.

The main outputs from the workshops are:

Regarding the topic *completeness of the fishing scenarios identified in Zagreb and the methodology to estimate fishing effort for the whole range of situations* (**ToR 2**):

> New situations were identified, mainly by including the passive gears. A sensible methodology to calculate Days at Sea and Fishing Days was further developed and streamlined. The underlying principles and criteria of the calculation methodologies were detailed and an analysis of possible impact on effort calculation based on the agreed methodology with real data was produced.
>
> These results are presented in Section 3.1 of the report.

Regarding the topic *Prepare documentation deemed necessary, to be stored on a publicly accessible repository, that would serve as support for the estimation processes* (**ToR1** and **ToR3**).

> Documentation to be used by the MS while preparing their datasets to be provided to the DCF end-users was prepared as follow: a descriptive document to support the implementation of the effort algorithms on any platform; an R-script that implements the agreed effort algorithms and computes the effort estimates, Fishing Days (fdas) and Days at Sea (das) and an R-script that checks the format and coding compliance of the data prior to using the R-script for effort calculation. Some examples for effort calculation were produced with real data brought by MS to the WK, (see Annexes 8 and 9).Further testing and development of the R-scripts should be done before they can be considered as final.

These documents are meant to be made available on a DCF website that will serve as an EU repository for the guidance and best practices on the EU Fisheries Data Collection.

Regarding the topic on *passive gears and the relevant effort metrics* (**ToR4**):

The need for a revision of the effort variables for passive gears and for small scale fleets, their definitions and scope of application was identified. Therefore a thorough analysis on how data is collated from logbooks, how such data can be used for effort calculation for passive gears and how MS calculate effort data was made. A new definition for Fishing Days is proposed (Section 3.5.1). This is also because it was identified that the current definition of Fishing Days is not in–line with what is available from logbooks or with what MS use in their effort calculations. Also, taking into account the mandatory information collected from logbooks, and the end-users use of the DCF effort variables as they are specified in annex of Com Dec 93/2010, the WK proposed a new list of mandatory (core) effort variables for passive gears. This list consists of a subset of the current DCF effort variables (Section 3.4.2). Lastly the results from a workshop on the small scale fleets (Nantes 2013) were further analysed by the WK and conclusions about its results drawn.

Furthermore the WK considers paramount ensuring consistency of results across MS and across vessel size categories. For vessels without logbooks additional data tests should be required to ensure effort from these fleets is calculated with the best approximation possible to effort calculations accepted for vessels with logbooks.

For the 2017 data calls (Economic; FDI and Mediterranean & Black Sea) (**ToR5**):

Taking into account the main goal of the work, the WK identified the needs for the 2017 data calls. The variables to be additionally requested to allow full interoperability of datasets are: inclusion of "Days at Sea" calculated according to the standard methodology agreed by the Workshop, the "fleet segment", the "supra region" and the EZZ in the FDI and MED data calls. In addition to transversal data from 2016 the 2017 call should request also 2015 transversal data because the 2017 economic data call will be for 2015 data. This result is presented in Section 3.5 of the report.

A set of tables with standard codes and levels of disaggregation to be used in the three data calls for the future, (and aligned with the EU Master Data Register) is included in the annexes (annexes 10-17) of the report.

As a general conclusion, the WK considers of fundamental importance the reduction in the number of calls by aligning and streamlining their data call content thus ensuring as to ensure that one data provision can serve more than one use.

Lastly, and included in the AOB, the WK discussed a new approach for Transversal data. This was a proposal put forward by the experts from Denmark, based on results from their experience managing transversal data and from the experience with ICES data calls for VMS and their experience with data compilation at regional level under the Regional project - Fish-PI. This new approach is meant to spur the ability to work with raw data nationally without prejudice of rules on confidentiality, and would further streamline and align MS methodologies on using data collected under the control regulation. The approach is presented in Section 3.6 of the report, and a proposed roadmap to share know-how and experience with the other MS to help putting these in place is also put forward.

The results of this Workshop are a sequence of what has been done during the 1st workshop held in Zagreb. Because of that, and when found to be relevant the results from that 1st Workshop were here again incorporated, (Section 3.5). However for a more comprehensive understanding on the results, both reports should be sought.

2 Introduction

The 2nd Workshop on Transversal Variables took place on 22nd to the 26th of February in Hotel Cleopatra in Nicosia, Cyprus. This was an EMFF funded workshop under the scope of the Data Collection Framework (DCF). The workshop was attended by 25 experts from 16 Member States, 3 experts from the Joint Research Centre (JRC) and a focal point from DG MARE. The list of participants is included under annex 1 of this report.

2.1 Terms of Reference (ToR) for the workshop

According to the PGECON 2015 request, the WK should meet to address the following tasks:

1. Assess the results of the new effort estimates following the trial implementation of the effort calculation method recommended at the WK on a MS level.
2. Assess to what extent the scenarios identified during the first WK held in Zagreb represent the range of situations MS will find in their own data. In the case different standard fishing trips are identified; devise the standard method to estimate effort for the situations missing.
3. Prepare the documentation deemed necessary, to be stored on a publicly accessible repository (e.g. DCF website), that would serve as support for the estimation processes.
4. Decide on the most appropriate metrics for fishing effort for passive gears for vessels not required to complete logbooks and for those required to complete logbooks. This work should be done considering relevance to and feasibility for both the data providers and end-users.
5. Identify together with Member States any particular issues that still need to be clarified ahead of the 2017 data calls.

DG MARE's focal point at the workshop, Angel Calvo dos Santos (Unit A3), presented to the WK a short update on the DCF and a brief introduction to the EU Multi-Annual Program for Data Collection and also introduced the policy context, the importance of the transversal data and the expected outcomes of the workshops from DGMARE. The presentation is included in the report under annex 3.

2.2 Organisation

The workshop was attended by 25 experts from 16 different MS. The WK agenda is shown in annex 2. As requested in the announcement of the workshop, the range of expertise in the WK was very broad which allowed the organisation of the work by subgroups. Four 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 the facilitators assigned to each group.

Name	**Function**
Cristina Ribeiro	Chair of workshop
Finlay Scott	Facilitator/rapporteur Data Crunching subgroup (ToR 1 & 3)
Steven Holmes	Facilitator/rapporteur Variables subgroup (ToR 2)
Jorgen Dalskov	Facilitator/rapporteur (ToR 5)

Name	Function
Sebastien Demaneche and Dalia Reis	Facilitator/rapporteur (ToR 4)

2.3 Data

Ahead of the workshop some preparatory work was requested from the experts. The objective was two-fold:

1. The experts were requested to test on their own data how the standardised effort calculations devised in Zagreb worked in practise; this is with the view to anticipate possible issues that might arise when the new methodologies are universally implemented and therefore fine tune the methodologies, if necessary.
2. The experts were requested to bring to the WK a national dataset. The datasets were to support further analyses on fishing trips with the view to defining standard effort estimation in possible new situations. Furthermore, these additional data would also support the exploratory analysis of the effort for passive/static gears. The structure of the data file and data formats is included in annex 4 of this report.

The data sets were provided by all MS attending the workshop and by Croatia, which has collaborated by email. Fifteen datasets of logbook data, by vessel, covering January and February 2014 (Poland submitted a whole year of fisheries data) were brought to the WK. These datasets have been used to support the following developments:

1. Access new fishing scenarios not identified in Zagreb;
2. Characterise patterns of fishing activity in MS fleets, in terms of number of gears used by fishing trip and number of different fishing grounds visited during one fishing trip to support the identification of common and best approach across MS;
3. Develop R code and supporting documentation to calculate the fishing effort, as Fishing Days and Days at Sea, and R code to access MS data completeness and format correctness.

2.4 Background documents

Some important reports were to be considered, these are included in the following background documents:

- Report on the Workshop on Transversal Variables (Linking economic and biological effort data (call) design). Zagreb, 19th to 23rd January 2015.
- Report on the DCF Workshop on "Common understanding and statistical methodologies to estimate/re-evaluate transversal data in small-scale fisheries" Nantes, 21th to 23th May 2013.
- Report on the DCF Workshop on Small-Scale Fisheries Kavala, Greece 12th to 16th September 2005.

3 The Workshop

The results of the workshop will be presented herein after for each Term of Reference (ToR) addressed to the WK. However, for the sake of logic, the report will present the results according to the following sequence:

ToR 2: Assess to what extent the scenarios identified during the first WK held in Zagreb represent the range of situations MS will find in their own data. In the case different standard fishing trips are identified; devise the standard method to estimate effort for the situations missing.

ToR 3: Prepare the documentation deemed necessary, to be stored on a publicly accessible repository (e.g. DCF website), that would serve as support for the estimation processes.

ToR 1: Assess the results of the new effort estimates following the trial implementation of the effort calculation method recommended at the WK on a MS level.

ToR 4: Decide on the most appropriate metrics for fishing effort for passive gears for vessels not required to complete logbooks and for those required to complete logbooks. This work should be done considering relevance to and feasibility for both the data providers and end-users.

ToR 5: Identify together with Member States any particular issues that still need to be clarified ahead of the 2017 data calls.

3.1 ToR 2: "Assess to what extent the scenarios identified during the first WK held in Zagreb represent the range of situations MS will find in their own data. In the case different standard fishing trips are identified; devise the standard method to estimate effort for the situations missing." (Subgroup 2 and partly 4)"

The first transversal variables meeting considered a number of scenarios that were hoped to encompass the majority (if not all) of possible fishing trips in terms of areas visited and gears used that might lead to different interpretations as to how Days at Sea and Fishing Days should be calculated (see section 3.2.2 of that report). It then recommended a standard approach to the calculation in each case. At this meeting real data was considered to see if the standard approaches recommended could be implemented. The data provided was used to search for any un-identified scenarios and, in parallel, the WK considered in detail scenarios concerned with use of passive gears. The WK also agreed on some definitions required for a standard approach and either decided, re-affirmed or revised some basic principles to underpin the calculation methods.

3.1.1 Basic principles

The following set of basic principles was agreed in the WK as a minimum for standardizing effort estimates across MS, across gear types and across vessel sizes:

1 To base the calculation methods on data that are contained in mandatory fields of logbooks [As such the precise fractions (based on fishing time) of Days at Sea by area or gear mentioned in the first transversal variables workshop scenario examples will not be considered further because hours spent in each area or using each gear are not known consistently across MS –see also section 3.1.1.1.].

2 The calculation method can be different to that used for setting kWdays baselines within effort management regimes. Therefore, the data can be used for scientific purposes but **not** directly for management purposes, e.g. for management of effort regimes for which baselines have been defined with a different approach.

The purpose of the principles is to ensure consistency across Member States in the calculation of Days at Sea and Fishing Days when supplied to STECF (or other) data calls.

Note: Whatever method is agreed will **not** be consistent with the methodology used by one or more Member State (the diversity of approaches between MSs reported from the first transversal variables meeting demonstrated this).

3 That separate trips are always counted separately, regardless of whether they are by the same vessel or different vessels, meaning that the fishing trip is the basic unit of observation for effort calculation and that fishing trips are always seen independently regardless of the vessel(s) that has/have performed them.

4 That Fishing Days can be greater than Days at Sea for a trip, e.g., when passive gears are involved, or whenever a fishing trip accounted for 24h hour period at sea but it correspond to two calendar days. This reverses the agreement reached in the first transversal variables meeting and is therefore justified below.

5 When apportioning Days at Sea and Fishing Days between gears and areas each day is treated separately. The total of Days at Sea or Fishing Days for a given day will be the ratio of the total for the trip divided by the number of dates on which fishing occurred. (See section 3.1.3 for worked examples).

6 As stated in the FAO handbook of fisheries statistical standards "For biologists, a good measure of fishing effort should be proportional to fishing mortality. For economists it should be proportional to the cost of fishing." Fishing Days is the measure related to

fishing mortality, Days at Sea is the measure related to the cost of fishing. The measure of Fishing Days should be related to the amount of time a fishing gear or gears are in the sea (best fishing time proxy that is EU-wide available, currently). When gears are used in parallel this measure will not equal the number of days on which fishing occurs for the vessel. To make the distinction clear we introduce the term 'vessel-fishing-days' when describing the vessel activity only. However the working group does not believe such a measure is used in any existing effort calculation. (check section 3.1.3.2.1)

7 As a principle the Workshop agreed that the effort calculation must always allow to summing up effort data across dimensions without resulting in double effort counting. (See annex 5 – sections Calculating Days at Sea and Calculating Fishing Days). Currently, for fishing area, the lowest level of disaggregation that is DCF relevant, is FAO level 3, FAO level 4 for the Baltic and Mediterranean Sea. Therefore the methodology presented in this document for apportioning Days at Sea or Fishing Days on a trip level, takes into account that level and ensures the sum of effort over a trip will always be the same regardless of the level of disaggregation. However anticipating that in the future there may well be no such fishing area limitation the calculation shall be adjusted in such way that this principle will still be verifiable (e.g if Fishing Days needs to be apportioned by ICES rectangle).

3.1.1.1 *Background information for principle 1:*

According to the Control Regulation recordings in the paper logbooks are the minimum requirements. The rules (article 33 of the COMMISSION IMPLEMENTING REGULATION 404/2011 laying down detailed rules for the implementation of Council Regulation (EC) No 1224/2009 establishing a Community control system for ensuring compliance with the rules of the Common Fisheries Policy) are the following:

Completion of fishing logbook in paper format

1. The paper fishing logbook shall be completed with all obligatory information even when there are no catches:

- *daily by not later than 24.00 and before entering the port;*
- *at the time of any inspection at sea;*
- *at the time of events defined in the Community legislation or by the flag Member State.*

2. A new line in the paper fishing logbook shall be filled in:

- *for each day at sea;*
- *when fishing in a new ICES Division or another fishing zone the same day;*
- *when entering fishing effort data.*

3. A new page in the paper fishing logbook shall be filled in:

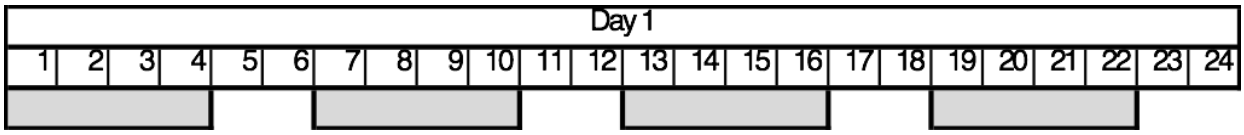
- *when using different gear, or a net of a different mesh size range, to that of the previous gear used;*
- *for any fishing done after a transhipment or an intermediate landing;*
- *if the number of columns is insufficient;*
- *on departure from a port when no landing has taken place.*

4. On departure from a port, or following completion of a transhipment operation, and when catches remain on board, the quantities of each species shall be indicated on a new fishing logbook page.

5. The codes given in Annex XI shall apply to indicate, under the appropriate headings of the paper format fishing logbook, the fishing gear used.

3.1.1.2 *The reasoning behind principle 3:*

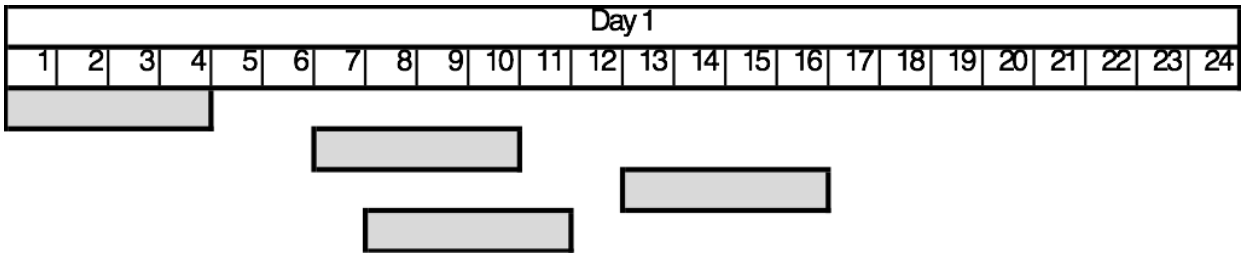
Consider the following examples (assume both have hauls of the same length and catch the same daily total amount of fish):



One vessel makes four trips in one day.

1 If trips considered separately => Days at Sea = Fishing Days = 4

2 If trips are considered together because of the calendar day => Days at Sea = Fishing Days = 1



Four vessels make a trip in one day.

Trips will be considered separately => Days at Sea = Fishing Days = 4

The agreement was that for the single vessel method 1 is used because it makes the measurement of Fishing Days consistent across these two scenarios.

The adoption of this principle means that in one year for one vessel it is potentially possible that Days at Sea and/or Fishing Days be greater than 365. Although counter-intuitive this was agreed as not illogical because both measures are a measure of vessel effort but not calendar days.

3.1.1.3 *The reasoning behind principle 4:*

Basic principle: The purpose of the methodology definition is to ensure consistency across Member States in the calculation of Fishing Days when supplied to STECF (or other) data calls. Whatever method is agreed will not be consistent with the methodology used by one or more Member State for effort management purposes and therefore it is for scientific purposes only and not to be used for effort management (principles 2 and 3 cited above).

Definitions from regulations:

The calculations of Days at Sea are based on the definition given in the DCF Commission Decision (2010/93/EU):

> "Any continuous period of 24 hours (or part thereof) during which a vessel is present within an area and absent from port."

It was agreed to be important to remain consistent with this definition and the calculation methods for Days at Sea are agreed.

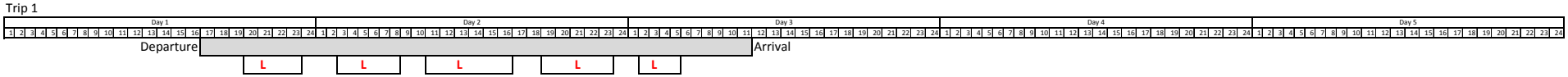
Fishing Days are based on dates recorded in logbooks. Another way to say this is to say they are based on 'calendar days'. In the first transversal variables workshop it was clear that the

number of fishing dates registered in logbooks can exceed the number of 24 hour periods in a trip (and at least one MS has, in the past, submitted to STECF a total of Fishing Days > Days at Sea).

3.1.1.4 *Scenario example*

Two example (theoretical but realistic) trips are given below. Each assumes use of an active gear for the same number of hauls and the duration of hauls are the same, i.e. the fishing effort is the same between the examples:

Trip 1: (L indicates an entry in the logbook; a fishing activity)



For this trip the number of Days at Sea is 2.

There are logbook entries on three separate dates. Therefore using [logbook entries = Fishing Days] gives 3 Fishing Days

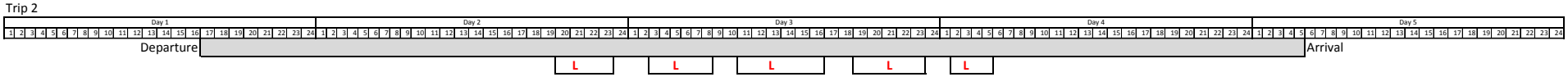
If the idea from the first transversal variables workshop is used to force Fishing Days <= Days at Sea then Fishing Days are adjusted to equal 2. Under principles 4 (and 5) above, the number of Fishing Days remains as 3.

Assume the vessel catches 1000kg of species X. If Fishing Days are used to calculate CPUE:

Forcing Fishing Days <= Days at Sea; CPUE = 1000/2 = 500 Kg/fishing day

Under principles 4 (and 5) above; CPUE = 1000/3 = 333.3 Kg/fishing day

Trip 2: (L indicates an entry in the logbook; a fishing activity)



For this trip the number of Days at Sea is 4.

There are logbook entries on three separate dates. Therefore using [logbook entries = Fishing Days] gives 3 Fishing Days

If the idea from the first transversal variables workshop is used to force Fishing Days <= Days at Sea then Fishing Days are left equal to 3. Under principles 4 (and 5) above the number of Fishing Days remains as 3.

Assume the vessel catches 1000kg of species X. If Fishing Days are used to calculate CPUE:

Forcing Fishing Days <= Days at Sea; CPUE = 1000/3 = 333.3 Kg/fishing day (different to trip 1)

Under principles 4 (and 5) above; CPUE = 1000/3 = 333.3 Kg/fishing day (the same as from trip1)

The reasoning behind NOT adjust Fishing Days (if Fishing Days > Days at Sea) is:

If the end use (or one of the end uses) of Fishing Days is to calculate CPUE then adjusting Fishing Days (to be <= Days at Sea) may increase the CPUE calculated for shorter fishing trips compared to longer trips when in fact the catch and fishing effort of both trips are the same (according to the measure of fishing dates registered in the logbooks), i.e. it would **introduce an inconsistency in CPUE calculation between types of fishing trip.**

Several experts expressed the view that to have Fishing Days greater than Days at Sea on a given trip is simply illogical. It is also clear from the examples above that the amount of time spent on fishing activity is not 3 whole days. It was concluded the problem to an extent is one of semantics (the name of the effort measure contains the word 'days'). If the measure was called 'fishing effort measure' would the fact it can be greater than the number of Days at Sea in a trip seem as problematic? More important, the prime requirements for the measure are that it is:

1. **Consistent over time**
2. **Consistent between types of trip**

An effort measure greater than the total time at sea is counter-intuitive – and without explanation appears illogical – but in the example given it is consistent with the requirements 1 and 2 above. It can also be noted that calculations resulting in more Fishing Days than Days at Sea is consistent with COM Decision 93/2010 (Appendix VIII footnote 4).

At the workshop it was pointed out that a much more accurate measure of CPUE could be achieved if the 'fishing time' field in logbooks was fully completed across Member States. Unfortunately this is not the case currently because it is not mandatory to complete this field in the logbooks. Therefore, because a measure that can be computed across all MSs is required it is not possible to use the Fishing Time field.

Situations when fishing time recording gives more consistent results are presented in section 3.1.5.1, by highlighting how trips exerting the same fishing effort in terms of hours fished can receive different CPUE when using Fishing Days based on recorded fishing dates in the logbooks. An analysis of how CPUE results, for three MS data sets, using the agreed approach compare to alternative approaches (including results based on complete fishing time data) is given in section 3.1.4.2.

3.1.2 Criteria

3.1.2.1 *When is a new area a new area?*

The criteria to be applied depend on the region fished and whether Days at Sea or Fishing Days are being calculated.

DAYS AT SEA

This is a metric regarded as mainly used for economic considerations and the evaluation of the current effort management regimes. In fleet economics, no requirement is foreseen for an area definition more detailed than FAO division level, i.e., level 3 of Appendix 1 of Decision 93/2010, reproduced as Table 1. This applies to all regions fished, ICES, Mediterranean and distant waters with the exception of the Baltic area where level 4 (ICES subdivision) is required. It is also necessary to distinguish between activities inside the EU exclusive economic zone (EEZ), non EU EEZs and international waters.

Criteria: when assessing Days at Sea, a relevant area is identified as a unique combination of FAO division (sub-division for Baltic) and Economic zone.

FISHING DAYS

ICES areas

- Recording of ICES statistical rectangle is mandatory in the logbook. It is only mandatory to record one rectangle per day, the one where most catches were taken form (but in most cases the last rectangle where fishing in a day has taken place is recorded) – if fishing has taken place in several rectangles multiple rectangles may or may not be recorded by the fisher – but each fishing day can at least be assigned to one rectangle and some fishers will record multiple rectangles within a single day.
- Recording of fishing area is mandatory in the logbook (at FAO division level i.e. level 3 of Appendix 1 of Decision 93/2010).
- The boundary of fishing areas can cut through ICES statistical rectangles (see Figure 1). Therefore it is possible to have two records with the same ICES rectangle but different fishing area.
- Recording of economic zone (indicate the fishing zone(s) of non-Member States or the waters outside the sovereignty or jurisdiction of any State) is mandatory in the logbook, using ISO-3 codes.
- The boundary of EU and non-EU EEZs can cut through ICES statistical rectangles (see Figure 1). Therefore it is possible to have two records with the same ICES rectangle but different EEZ.

Criteria: when assessing Fishing Days in ICES areas (FAO fishing Area 27), a relevant area is defined as a unique combination of ICES rectangle and FAO division (sub-division for Baltic) and Economic zone.

Mediterranean

- Recording of GFCM GSA area is mandatory in the logbook.
- The 2015 revision to the regulation of application of the control regulation (Reg. (CE) n.º 404/2011 Amended by Commission Implementing Regulation (EU) 2015/1962 of 28 October 2015) states activity should be recorded by statistical rectangle BUT this is a new initiative (according to a newly defined rectangle scheme) and it will probably take time before recording by these rectangles is widely practiced.

Criteria: Until recording by statistical rectangles is fully implemented, when assessing Fishing Days in the Mediterranean and Black Sea (FAO fishing Area 37, GFCM regulatory area), a relevant area is defined as a GSA area.

Other areas (distant fleets)

Area data needs to be recorded at the level required by the specific RFMO. The reporting requirements for the RFMO areas may change in future but the current requirements are as follows:

NAFO:	level 3 of Appendix 1 of Decision 93/2010
ICCAT:	level 5 of Appendix 1 of Decision 93/2010
CCAMLR:	level 3 of Appendix 1 of Decision 93/2010
IOTC:	level 5 of Appendix 1 of Decision 93/2010

See Table 1 for examples of area specifications at these levels. Also http://www.fao.org/fishery/cwp/handbook/h/en

Criteria: when assessing Fishing Days in Other Regions under different Regional Fisheries management Organisations, such as ICCAT, IOTC, CCAMLR, NAFO, etc., the relevant area should coincide to the most detailed reporting requirements of the RFMO.

Table 1- Reproduction of Appendix 1 of Decision 93/2010, showing the level of detail of fishing areas within each Regional Fisheries Management Organisation, Regional Fisheries Organisation or International Organisation.

	ICES	NAFO	ICCAT	GFCM	CCAMLR	IOTC	Other
Level 1	**Area**	**Area**	**FAO Area**	**Area** e.g. 37 Mediterranean and Black sea	**Area** e.g. 48	**FAO Area**	**FAO Area**
Level 2	**Sub-area** e.g. 27.IV North Sea	**Sub-area** e.g. 21.2 Labrador	**FAO Sub-area**	**Sub-area** e.g.37.1 Western	**Sub-area** e.g. 48.1 Antarctic Peninsula	**FAO Sub-area**	**FAO Sub-area**
Level 3	**Division** e.g. 27.IV c	**Division** e.g. 21.2 H	**Division** 5° x 5°	**Division** e.g. 37.1.2 Gulf of Lions	**Division** e.g. 58.5.1 Kerguelen islands	**Division** 5° x 5°	**Division** 5° x 5°
Level 4	**Subdivision** e.g. 27.III.c.22			**GSA** e.g. GSA 1			
Level 5	**Rectangle** 30’ x 1°	**Rectangle**	**Rectangle** 1° x 1°		**Rectangle** 30' x 1°	**Rectangle** 1° x 1°	**Rectangle** 1° x 1°

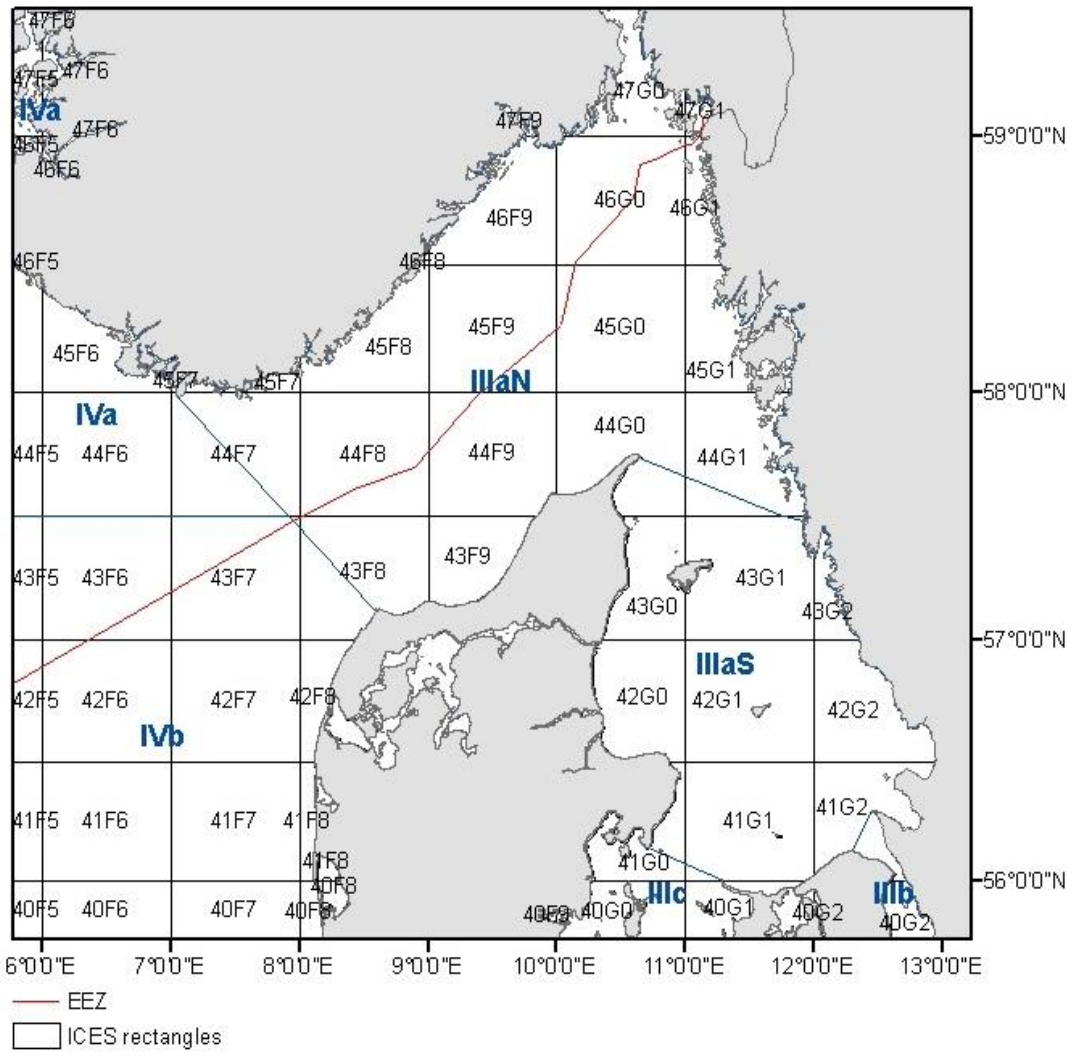


Figure 1- ICES area showing ICES rectangles, the boundary between the EU and Norway EEZs and the boundary between the ICES divisions IIIa and IV (straight line running NW to SE through ICES rectangles 44F7 and 43F8).

3.1.2.2 *When is a new gear a new gear?*

- A new gear code requires a new logbook sheet.
- A new mesh size requires a new logbook sheet.

Criteria: when calculating Days at Sea and Fishing Days a new gear (change of gear within a fishing trip) should be identified as a unique combination of gear (FAO 3-alpha code - See annex 12) and Mesh Size (for gears where mesh size is relevant).

3.1.2.3 *When to consider gears as used in parallel*

The example data sets provided to the workshop confirmed that more than one gear type can be recorded on a single day. This is as expected given the rules for completing logbooks, (see section 3.1.1). The workshop concluded that for active gears it was appropriate to assume any

different gear types recorded were used sequentially. However, the experts concluded that if more than one passive gear has been recorded in a day they have likely been deployed in parallel. Therefore the following logic can be used to determine the two situations.

1. Only a single gear is in the water at any point. Recognised from the data files if:
   i) Only a single gear is recorded on a single day;
   ii) More than a single gear is recorded on a single day but they are all active gears.
2. More than one gear is in the water at the same time. Recognised from the data files if:
   i) More than one passive gear is recorded on a single day;
   ii) Both passive and gear(s) are recorded on a single day.

In the event a vessel uses more than one active and more than one passive gear – active gears can be considered used sequentially and passive gears can be considered used in parallel to each other and the active gears.

3.1.3 Analysis of data provided and scenario examples making use of the principles agreed

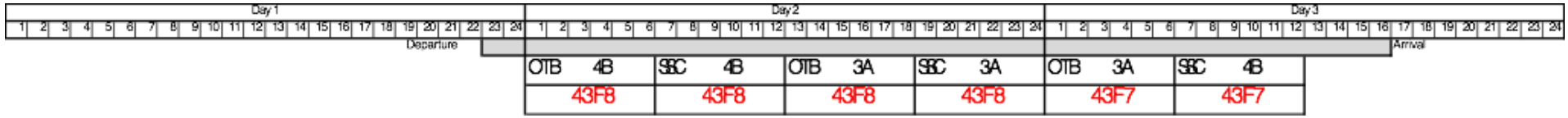
3.1.3.1 *Scenario examples*

The first of the following scenarios is based on real data. The second alters the first in order to force the number of fishing dates recorded in the logbooks to be greater than the total Days at Sea. A third example is introduced to show the situation when the trip total for Days at Sea is greater than the total number of Fishing Days. For these examples each gear uses the same mesh size on each occasion it is used.

A fourth example is given in two parts (fourth example (4a) and fourth example (4b)). Each trip is the same in terms of length, number and times of fishing operations and type of gear used; however in the example 4b one gear type (OTB) is used with two different mesh sizes. A change in mesh size constitutes a new gear and the **Days at Sea** and **Fishing Days** calculations change compared to example 4a.

In each case black letters give the gear code and the ICES division and in example 4 also a mesh size. Red letters give the ICES rectangle. All activity takes place within the EU economic zone.

First example:



Scenario:

The trip is 42 hours long. The total 'Days at Sea' is 2.

There are logbook entries on two calendar days and all gears are active. Therefore the total 'Fishing Days' is 2.

All gears used are active.

Effort calculation:

The allocation of Days at Sea and Fishing Days between gears and areas on each day that fishing occurs is treated separately. The total of Days at Sea or Fishing Days for a day on which fishing occurs will be the total for the trip divided by the number of dates on which fishing was recorded in the log book (i.e. the total 'Fishing Days' for the trip).

DAYS AT SEA:

Total on a day on which fishing was recorded in the logbook (**DT**) = (total Days at Sea)/(total Fishing Days) = 2/2

The gear variable changes with [gear code; mesh size] combination. The area changes with [ICES division;EEZ] combination.

Day one

Number of times on this day we have the combination of gear and area (**GA**), e.g. for OTB+4B, GA = 1

Number of logbook entries on this day (**LE**) = 4 (i.e. OTB+4B, OTB+3A, SSC+4B, SSC+3A)

So DAYS AT SEA for OTB+4B on this day = **(DT)*(GA/LE)** = (1)*(1/4) = 0.25

OTB +3A = 1 => DAYS AT SEA = (1)*(1/4) = 0.25

SSC + 4B = 1 => DAYS AT SEA = (1)*(1/4) = 0.25

SSC + 3A = 1 => DAYS AT SEA = (1)*(1/4) = 0.25

Day two

OTB +3A = 1 => DAYS AT SEA = (1)*(1/2) = 0.5

SSC + 4B = 1 => DAYS AT SEA = (1)*(1/2) = 0.5

FISHING DAYS:

DT = (total Fishing Days)/(total Fishing Days) = 2/2 = 1

The gear variable changes with [gear code; mesh size] combination. The area changes with [ICES rectangle;ICES division;EEZ] combination.

Day one

OTB +4B+43F8 = 1 => FISHING DAYS = (1)*(1/4) = 0.25

OTB +3A+43F8 = 1 => FISHING DAYS = (1)*(1/4) = 0.25

SSC + 4B+43F8 = 1 => FISHING DAYS = (1)*(1/4) = 0.25

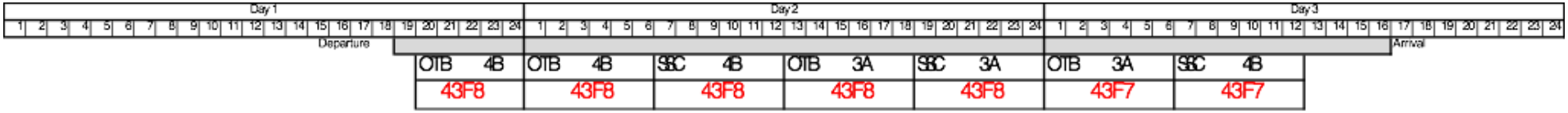
SSC + 3A+43F8 = 1 => FISHING DAYS = (1)*(1/4) = 0.25

Day two

OTB +3A+43F7 = 1 => FISHING DAYS = (1)*(1/2) = 0.5

SSC + 4B+43F7 = 1 => FISHING DAYS = (1)*(1/2) = 0.5

Second example:



Scenario:

The trip is 46 hours long. The total 'Days at Sea' is 2.

There are logbook entries on three calendar days. Therefore the total 'Fishing Days' is 3.

All gears used are active.

Effort calculation:

In this example there are more Fishing Days than Days at Sea. As mentioned for example 1, the trip total is spread equally between days on which fishing was recorded in the log book. In this example the total on a day on which fishing was recorded in the logbook (**DT**) for Days at Sea is therefore 2/3, i.e. not equal to one.

DAYS AT SEA:

DT = *(total Days at Sea)/(total Fishing Days) = 2/3*

The gear variable changes with [gear code;mesh size] combination. The area changes with [ICES division;EEZ] combination.

Day one

OTB +4B = 1 => DAYS AT SEA = (2/3)*(1/1) = 2/3

Day two

OTB +4B = 1 => DAYS AT SEA = (2/3)*(1/4) = 1/6

OTB +3A = 1 => DAYS AT SEA = (2/3)*(1/4) = 1/6

SSC + 4B = 1 => DAYS AT SEA = (2/3)*(1/4) = 1/6

SSC + 3A = 1 => DAYS AT SEA = (2/3)*(1/4) = 1/6

Day three

OTB +3A = 1 => DAYS AT SEA = (2/3)*(1/2) = 1/3

SSC + 4B = 1 => DAYS AT SEA = (2/3)*(1/2) = 1/3

Note: The fishing date totals for Days at Sea do not equal 1. Their sum over the whole trip (2/3+1/6+1/6+1/6+1/6+1/3+1/3 =2) equals the total for Days at Sea for this trip.

FISHING DAYS:

DT = *(total Fishing Days)/(total Fishing Days) = 3/3 = 1*

The gear variable changes with [gear code;mesh size] combination. The area changes with [ICES rectangle;ICES division;EEZ] combination.

Day one

OTB +4B+43F8 = 1 => FISHING DAYS = (1)*(1/1) = 1

Day two

OTB +4B+43F8 = 1 => FISHING DAYS = (1)*(1/4) = 0.25

OTB +3A+43F8 = 1 => FISHING DAYS = (1)*(1/4) = 0.25

SSC + 4B+43F8 = 1 => FISHING DAYS = (1)*(1/4) = 0.25

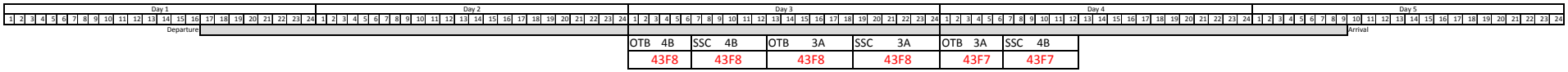
SSC + 3A+43F8 = 1 => FISHING DAYS = (1)*(1/4) = 0.25

Day three

OTB +3A+43F7 = 1 => FISHING DAYS = (1)*(1/2) = 0.5

SSC + 4B+43F7 = 1 => FISHING DAYS = (1)*(1/2) = 0.5

Third example:



Scenario:

The trip is 89 hours long. The total 'Days at Sea' is 4.

There are logbook entries on two calendar days and all gears are active. Therefore the total 'Fishing Days' is 2.

All gears used are active.

Effort calculation:

DAYS AT SEA:

DT = (total Days at Sea)/(total Fishing Days) = 4/2 = 2

The gear variable changes with [gear code; mesh size] combination. The area changes with [ICES division;EEZ] combination.

Day one

OTB+4B = 1 => DAYS AT SEA = (2)*(1/4) = 0.5

OTB +3A = 1 => DAYS AT SEA = (2)*(1/4) = 0.5

SSC + 4B = 1 => DAYS AT SEA = (2)*(1/4) = 0.5

SSC + 3A = 1 => DAYS AT SEA = (2)*(1/4) = 0.5

Day two

OTB +3A = 1 => DAYS AT SEA = (2)*(1/2) = 1.0

SSC + 4B = 1 => DAYS AT SEA = (2)*(1/2) = 1.0

Note: The Days at Sea values calculated for the individual gear-area combinations are different to example one. Their sum (0.5+0.5+0.5+0.5+1.0+1.0) equals the total for Days at Sea.

FISHING DAYS:

DT = (total Fishing Days)/(total Fishing Days) = 2/2 = 1

The gear variable changes with [gear code; mesh size] combination. The area changes with [ICES rectangle;ICES division;EEZ] combination.

Day one

OTB +4B+43F8 = 1 => FISHING DAYS = (1)*(1/4) = 0.25

OTB +3A+43F8 = 1 => FISHING DAYS = (1)*(1/4) = 0.25

SSC + 4B+43F8 = 1 => FISHING DAYS = (1)*(1/4) = 0.25

SSC + 3A+43F8 = 1 => FISHING DAYS = (1)*(1/4) = 0.25

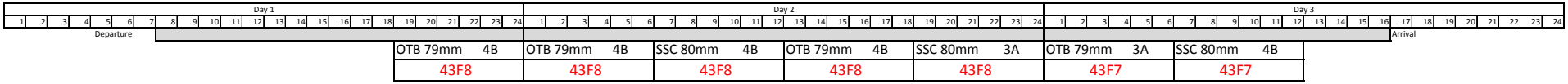
Day two

OTB +3A+43F7 = 1 => FISHING DAYS = (1)*(1/2) = 0.5

SSC + 4B+43F7 = 1 => FISHING DAYS = (1)*(1/2) = 0.5

Note: The Fishing Days values calculated for the individual gear-area combinations remain the same as in example one. Their sum (0.25+0.25+0.25+0.25+0.5+0.5) equals the total for Fishing Days.

Fourth example (4a): Effort measure provision at metier level (DCF level6); no change of mesh size range for a given gear type.



Scenario:

The trip is 57 hours long. The total 'Days at Sea' is 3.

There are logbook entries on three calendar days. Therefore the total 'Fishing Days' is 3.

All gears used are active.

Effort calculation:

DAYS AT SEA:

DT = *(total Days at Sea)/(total Fishing Days) = 3/3=1*

The gear variable changes with [gear code; mesh size] combination. The area changes with [ICES division; EEZ] combination.

Day one

OTB;79mm +4B = 1 => DAYS AT SEA = (1)*(1/1) = 1

Day two

OTB;79mm +4B = 2 => DAYS AT SEA = (1)*(2/4) = 0.5

SSC;80mm + 4B = 1 => DAYS AT SEA = (1)*(1/4) = 0.25

SSC;80mm + 3A = 1 => DAYS AT SEA = (1)*(1/4) = 0.25

Day three

OTB;79mm +3A = 1 => DAYS AT SEA = (1)*(1/2) = 0.5

SSC;80mm + 4B = 1 => DAYS AT SEA = (1)*(1/2) = 0.5

FISHING DAYS:

DT = *(total Fishing Days)/(total Fishing Days) = 3/3 = 1*

The gear variable changes with [gear code;mesh size] combination. The area changes with [ICES rectangle;ICES division;EEZ] combination.

Day one

OTB;79mm +4B+43F8 = 1 => FISHING DAYS = (1)*(1/1) = 1

Day two

OTB;79mm +4B+43F8 = 2 => FISHING DAYS = (1)*(2/4) = 0.5

SSC;80mm + 4B+43F8 = 1 => FISHING DAYS = (1)*(1/4) = 0.25

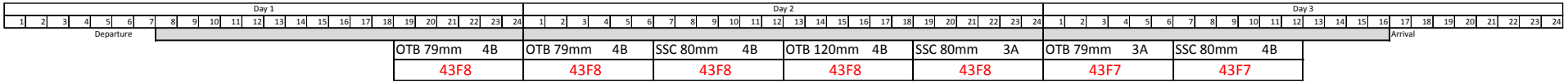
SSC;80mm + 3A+43F8 = 1 => FISHING DAYS = (1)*(1/4) = 0.25

Day three

OTB;79mm +3A+43F7 = 1 => FISHING DAYS = (1)*(1/2) = 0.5

SSC;80mm + 4B+43F7 = 1 => FISHING DAYS = (1)*(1/2) = 0.5

Fourth example (4b): Effort measure provision at metier level (DCF level6)); change between OTB gear with two mesh size ranges..



Scenario:

The trip is 57 hours long. The total 'Days at Sea' is 3.

There are logbook entries on three calendar days. Therefore the total 'Fishing Days' is 3.

All gears used are active.

Effort calculation:

DAYS AT SEA:

DT = *(total Days at Sea)/(total Fishing Days) = 3/3=1*

The gear variable changes with [gear code; mesh size] combination. The area changes with [ICES division; EEZ] combination.

Day one

OTB;79mm +4B = 1 => DAYS AT SEA = (1)*(1/1) = 1

Day two

OTB;79mm +4B = 1 => DAYS AT SEA = (1)*(1/4) = 0.25

OTB;120mm +4B = 1 => DAYS AT SEA = (1)*(1/4) = 0.25

SSC;80mm + 4B = 1 => DAYS AT SEA = (1)*(1/4) = 0.25

SSC;80mm + 3A = 1 => DAYS AT SEA = (1)*(1/4) = 0.25

Day three

OTB;79mm +3A = 1 => DAYS AT SEA = (1)*(1/2) = 0.5

SSC;80mm + 4B = 1 => DAYS AT SEA = (1)*(1/2) = 0.5

FISHING DAYS:

DT = *(total Fishing Days)/(total Fishing Days) = 3/3 = 1*

The gear variable changes with [gear code;mesh size] combination. The area changes with [ICES rectangle;ICES division;EEZ] combination.

Day one

OTB;79mm +4B+43F8 = 1 => FISHING DAYS = (1)*(1/1) = 1

Day two

OTB;79mm +4B+43F8 = 1 => FISHING DAYS = (1)*(1/4) = 0.25

OTB;120mm +4B+43F8 = 1 => FISHING DAYS = (1)*(1/4) = 0.25

SSC;80mm + 4B+43F8 = 1 => FISHING DAYS = (1)*(1/4) = 0.25

SSC;80mm + 3A+43F8 = 1 => FISHING DAYS = (1)*(1/4) = 0.25

Day three

OTB;79mm +3A+43F7 = 1 => FISHING DAYS = (1)*(1/2) = 0.5

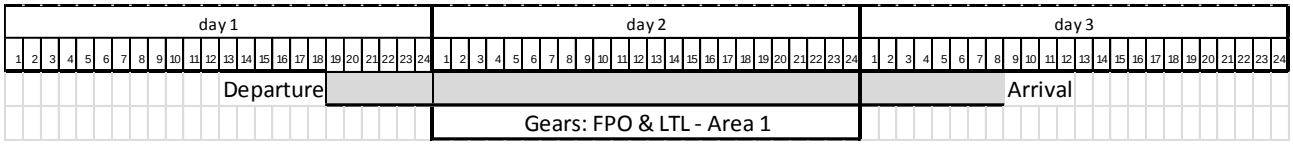
SSC;80mm + 4B+43F7 = 1 => FISHING DAYS = (1)*(1/2) = 0.5

3.1.3.2 *Scenario examples concentrating on passive gears*

3.1.3.2.1 Passive gears used in parallel

Vessels using passive gears can potentially be a very polyvalent fleet in terms of gears used. In some cases, vessels can use more than one gear during the same trip at the same time. In these cases, scenarios defined in the first transversal variables workshop could not be applied and the WK recommends to refer to the Kavala workshop on small scale fisheries (SSF)[1] and what was proposed for the estimation of Fishing Days of polyvalent vessels (per gear and per vessel): "The group discussed how effort by polyvalent activities should be estimated. It was concluded that for a vessel using several gears on the same day each gear would be assigned to one effort day. However one effort day will be attributed to the vessel". The working group recommends to apply this methodology to all Fishing Days where two passive gears are used, assuming they fish at the same time. The scenarios presented below prescribe the way to calculate Fishing Days and Days at Sea in these cases. It should be noted these scenarios apply to vessels completing logbooks.

Scenario P1: The fishing trip occurs on three calendar days. A fishing operation occurs only in one day where two passive gears are used at the same time. Fishing only occurs in one area.



Effort calculation:

The trip is 38 hours long. The total 'Days at Sea' is 2.

DAYS AT SEA:

2 Days at Sea are attributed to the vessel.

Using the principles established for active gears, the total number of Days at Sea attributed to each gear will be 1.

FISHING DAYS:

Fishing operations take place on one calendar day. The agreed outcome is 1 Fishing Day by vessel as fishing has taken place within the same date.

1 Fishing Day is attributed to the vessel (i.e. 1 vessel-fishing-day).

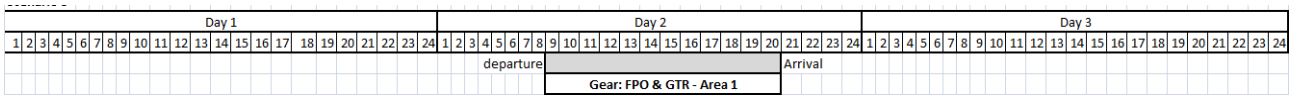
Two passive gears have been used at the same time on the same day, the total Fishing Days attributed to each gear will be 1.

Be aware that in this case it is incorrect to add the Fishing Days by vessel-gear*area combination to get the vessel-fishing-days; the estimation must be done separately.

---

1 Workshop on Small-Scale Fisheries, Kavala (Greece), September 12-16, 2005, http://datacollection.jrc.ec.europa.eu/documents/10213/565485e6-efad-4bdc-9908-e2cf675980f7.

Scenario P2: The fishing trip occurs on only one calendar day. A fishing operation occurs only in one day where two passive gears are used at the same time. Fishing only occurs in one area.



Effort calculation:

The trip is 12 hours long. The total 'Days at Sea' is 1.

DAYS AT SEA:

1 Day at Sea is attributed to the vessel.

Using the principles established for active gears, the total number of Days at Sea attributed to each gear will be 0.5.

FISHING DAYS:

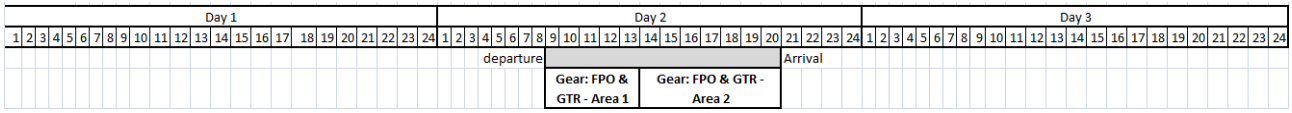
Fishing operations take place on one calendar day. The agreed outcome is 1 Fishing Day by vessel as fishing has taken place within the same date.

1 Fishing Day is attributed to the vessel, (i.e. 1 vessel-fishing-day).

Two passive gears have been used at the same time on the same day; the total Fishing Days attributed to each gear will be 1.

Be aware that in this case it is incorrect to add the Fishing Days by vessel-gear combination to get the vessel-fishing-days; the estimation must be done separately.

Scenario P3: The fishing trip occurs on only one calendar day. A fishing operation occurs only in one day where two passive gears are used at the same time. Fishing occurs in two areas, one after the other.



Effort calculation:

The trip is 12 hours long. The total 'Days at Sea' is 1.

DAYS AT SEA:

1 Day at Sea is attributed to the vessel.

Using the principles established for active gears, the total number of Days at Sea accounted to each gear will be 0.5, the total Days at Sea affected to each area will be 0.5, and 1 Day at Sea will be attributed to the vessel. Consequently, 0.25 Days at Sea will be attributed to each combination of passive gear and area (FPO*area1, GTR*Area1, FPO*Area2 and GTR*Area2).

i.e.

FPO*area1 = 1*0.25 = 0.25

GTR*Area1 = 1*0.25 = 0.25

FPO*Area2 = 1*0.25 = 0.25

GTR*Area2 = 1*0.25 = 0.25

FISHING DAYS:

Fishing operations take place on one calendar day. The agreed outcome is 1 fishing day by vessel as fishing has taken place within the same date.

1 Fishing Day is attributed to the vessel (i.e. 1 vessel-fishing-day).

Two passive gears have been used at the same time on the same day but also in two different areas. As many as four gears may have been in the water at the same time. The total Fishing Days accounted to each gear will be 1, the total Fishing Days attributed to each area will be 1, and 1 fishing day will be attributed to the vessel. Finally, 1 fishing day will be attributed to the each combination of passive gear and area (FPO*area1, GTR*Area1, FPO*Area2 and GTR*Area2) assuming that each gear in each area fish at the same time (namely that they are used in parallel).

i.e.

FPO*area1 = 1

GTR*Area1 = 1

FPO*Area2 = 1

GTR*Area2 = 1

Be aware that in this case it is incorrect to add the Fishing Days by vessel-gear combination (or vessel-gear-area combination) to get the vessel-fishing-days; the estimation must be done separately.

3.1.3.2.2Trips used to set passive gears in the sea

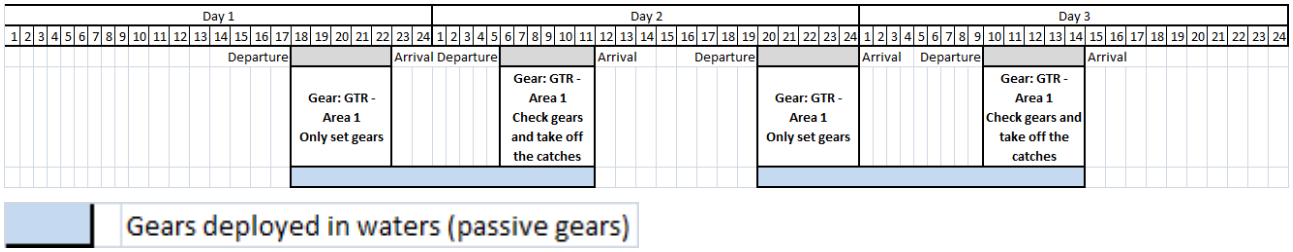
Another behaviour specific to vessels using passive gears is that fishing trips/Days at Sea are used to set/deploy gears in the sea.

A common scenario for fleets operating in some coastal areas is the following: the evening of the first day is used to put the passive gear in the sea and the morning of the second day is used to retrieve the passive gears and the associated catches. Based on these trip characteristics, the workshop defined two new scenarios and identified how many Fishing Days and Days at Sea have to be attributed in these cases.

Another common case for fleets using pots operating in coastal areas is the following: the vessel goes at sea to deploy 100 pots and returns back to the port on the same day. The pots are left in the sea for a whole month, and the vessel goes to sea once a week for checking, rebaiting and deploying the pots back to the water, while it returns to port on the same day. A scenario related to such activity is presented.

In considering the scenarios the workshop considered the principle established for vessels carrying logbooks and operating with active gears that the calculation of the effort measure has to be done trip by trip. The workshop considered also the following definition for a fishing trip: "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." (Reg. (EU) N. º 404/2011) The Control Regulation (Reg. (EU) N. º1224/2009) also includes 'setting' gear within the definition of fishing activity. The WK experts recognize however that logbook data readily available for processing in many MS does not include trips that registered 0-catch (as is the case of most "setting" trips) which poses a challenge for the overall aim of ensuring standardization during the 2017 data call.

Scenario P4: The vessel goes to sea four times successively. Every evening vessel sets trammel nets at the sea and the following morning retrieves the nets from the sea and lands the catch. It is assumed that the fishing activity of the vessel occurs in only one area.



Effort calculation:

Following the definition of a fishing trip (re-produced above) this scenario corresponds to four fishing trips and all these should be recorded in the logbooks. Using this assumption, the count of Days at Sea and Fishing Days are as following:

DAYS AT SEA:

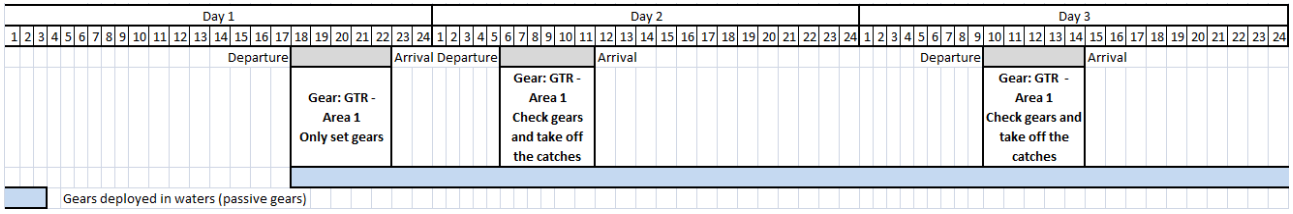
1 Day at Sea is attributed to the vessel for each trip.

For this scenario, 4 Days at Sea are attributed to the vessel and the GTR*Area1 combination.

FISHING DAYS:

Fishing operations are attributed for each trip. Each fishing trip and associated fishing operations take place on only one calendar day. So for this scenario, 4 Fishing Days are attributed to the vessel (or gear*area combination).

Scenario P5: Over a three day period, the vessel goes to the sea every day. The first day is used to set trammel nets in the sea and the other two days are used to retrieve the nets and land the catch. It is assumed that the fishing activity of the vessel occurs in only one area.



Effort calculation:

Following the definition of a fishing trip (re-produced above) this scenario corresponds to three fishing trips. Using this assumption, the count of Days at Sea and Fishing Days are as following:

DAYS AT SEA:

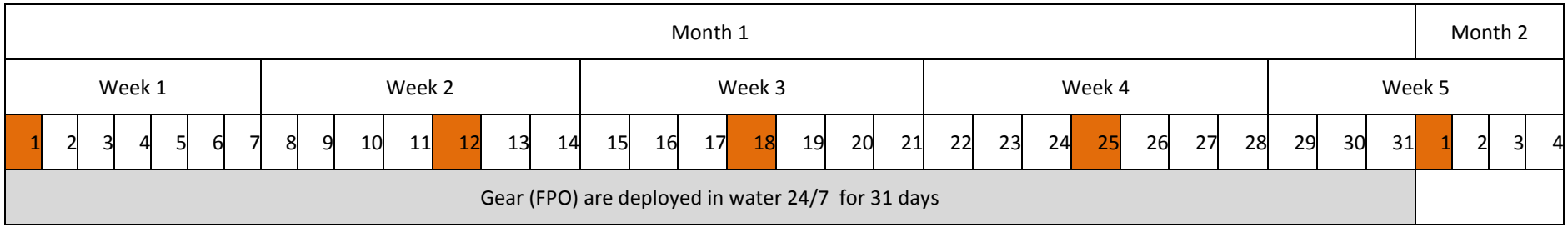
1 Day at Sea is attributed to the vessel for each trip.

For this scenario, 3 Days at Sea are attributed to the vessel and the GTR*Area1 combination.

FISHING DAYS:

Fishing operations are attributed for each trip. Each fishing trip and associated fishing operations take place on only one calendar day. So for this scenario, 3 Fishing Days are attributed to the vessel (or gear*area combination).

Scenario P6: The vessel goes to sea to deploy 100 pots and returns back to the port on the same day. The pots are left at sea for a whole month; the vessel goes to sea once a week for checking, rebaiting and deploying the pots back to water, while it returns to port on the same day.



Following the definition of a fishing trip (re-produced above) this scenario corresponds to five fishing trips. Using this assumption, the count of Days at Sea and Fishing Days are as follows:

DAYS AT SEA:

1 Day at Sea is attributed to the vessel for each trip.

For this scenario, 5 Days at Sea are attributed to the vessel and the FPO*Area combination.

FISHING DAYS:

Fishing operations are attributed for each trip. Each fishing trip and associated fishing operations take place on only one calendar day. So for this scenario, 5 Fishing Days are attributed to the vessel (or gear*area combination).

The workshop noted that for this scenario the fishing day is clearly not assigned to the gear but to the vessel, therefore the number of pots is less relevant. The number of pots is relevant to the effort variable associated with the gear, soaking time, which is 31 days per pot. This is a clear example of why a CPUE for passive gears[2] is practically meaningless when estimated using Fishing Days, as defined by the workshop.

[2] The same applies to active gears when these vary largely in size and/or trawling/hauling time.

3.1.4 Analysis of data provided

3.1.4.1 *Proportion of trips by number of rectangles and number of gears*

Based on data provided by MS, for January and February 2014, it was investigated how many rectangles and gears were reported by trip. Tables 2 and 3 show that, of the countries considered, the majority of the trips have only one rectangle and gear reported.

Table 2- Number of gears reported by trip by country, based on data from January and February 2014, except Polish data that respects the year 2015 (and all months).

Number of gears	0 gears		1 gear		2 gears		3 gears	
	No of trips	%	No of trips	%	No of trips	%	No of trips	%
Poland	5	0%	59857	100%	193	0%	1	0%
Germany	-	-	3044	99%	16	1%	-	-
United Kingdom	-	-	21455	99%	149	1%	-	-
Scotland	-	-	8394	98%	138	2%	5	0%
Latvia	-	-	2242	100%	-	-	-	-
Lithuania	-	-	1433	100%	-	-	-	-
Belgium	-	-	485	100%	-	-	-	-
Denmark	-	-	7733	99%	7	1%	-	-
France	-	-	34580	99%	409	1%	1	0%
Sweden	-	-	3581	99%	18	1%	-	-
Portugal (Azores)	-	-	1305	100%	-	-	-	-
Malta	-	-	220	65%	116	34%	1	0%
Croatia	-	-	7582	100%	-	-	-	-
Italy	-	-	132	100%	-	-	-	-
Slovenia	-	-	457	100%	-	-	-	-
Cyprus	-	-	14	100%	-	-	-	-

Table 3 - Number of rectangles reported by trip by country, based on data from January and February 2014, except Polish data that respects the year 2015 (and all months). (Only the datasets for which ICES rectangle is meaningful were used in this analysis)

	Poland		Germany		UK		Latvia		Lithuania		Belgium		Denmark		France		Sweden		Portugal (Azores)	
Number of rectangles	No of trips	%	No of trips	%	No of trips	%	No of trips	%	No of trips	%	No of trips	%	No of trips	%	No of trips	%	No of trips	%	No of trips	%
1	57840	96%	2817	92%	19771	92%	2120	95%	1247	87%	278	57%	7044	91%	23886	83%	3215	89%	1302	100%
2	1908	3%	156	5%	1157	5%	120	5%	164	11%	129	27%	505	7%	3260	11%	274	8%	3	0%
3	287	0%	49	2%	399	2%	2	0%	18	1%	52	11%	119	2%	751	3%	69	2%	-	-
4	18	0%	9	0%	159	1%	-	-	2	0%	18	4%	46	1%	505	2%	28	1%	-	-
5	2	0%	6	0%	68	0%	-	-	2	0%	6	1%	20	0%	163	1%	11	0%	-	-
6	1	0%	7	0%	29	0%	-	-	-	-	2	0%	4	0%	113	0%	2	0%	-	-
7	-	-	4	0%	10	0%	-	-	-	-	-	-	-	-	53	0%	-	-	-	-
8	-	-	1	0%	7	0%	-	-	-	-	-	-	1	0%	40	0%	-	-	-	-
9	-	-	2	0%	2	0%	-	-	-	-	-	-	-	-	21	0%	-	-	-	-
10	-	-	-	-	1	0%	-	-	-	-	-	-	-	-	10	0%	-	-	-	-
11	-	-	1	0%	-	-	-	-	-	-	-	-	-	-	4	0%	-	-	-	-
12	-	-	2	0%	-	-	-	-	-	-	-	-	-	-	7	0%	-	-	-	-
13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	0%	-	-	-	-
14	-	-	5	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15	-	-	-	-	-	-	-	-	-	-	-	-	1	0%	-	-	-	-	-	-
16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0%	-	-	-	-
17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0%	-	-	-	-
25	-	-	1	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

3.1.4.2 *Implications of using different definitions of Days at Sea and Fishing Days, an illustrative case study.*

In order to explore the implications of different interpretations of the definitions of these variables, alternative methods of calculation were applied to data from three Member States (Belgium, France and Slovenia) as a case study. French Data was used for part of the analysis.

3.1.4.2.1 Considering Hours Fished

In a first step, possible methods to calculate Fishing Days were considered. Assuming that the hours fished are recorded and available, the Fishing Days were calculated by adding-up these number of fishing hours per trip, dividing them by 24 and rounding them up to whole days. In this case, the Fishing Days can be calculated in similar manner to the Days at Sea, in accordance with DCF Commission Decision (2010/93/EU) (see section 2.1.1.3). These two variables can easily be compared and following common logic, the Days at Sea should be larger than the Fishing Days because they encompass, e.g., travelling time to and from fishing grounds, time spent resting at sea, etc. (Figures 2, 3 and 4). It should be noted that both variables in this case are rounded-up to whole days on a trip level, rather than rounding–up the totals to whole days at the end of the calculation.

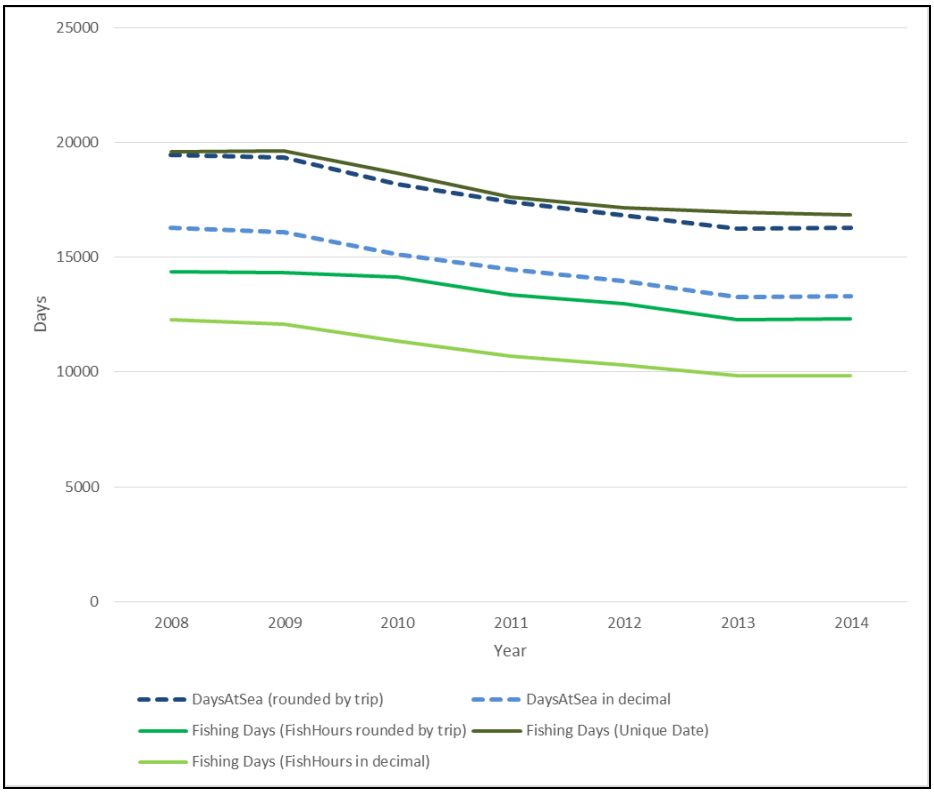


Figure 2- The annual total of Days at Sea and Fishing Days for the whole Belgium fleet calculated according to different methods.

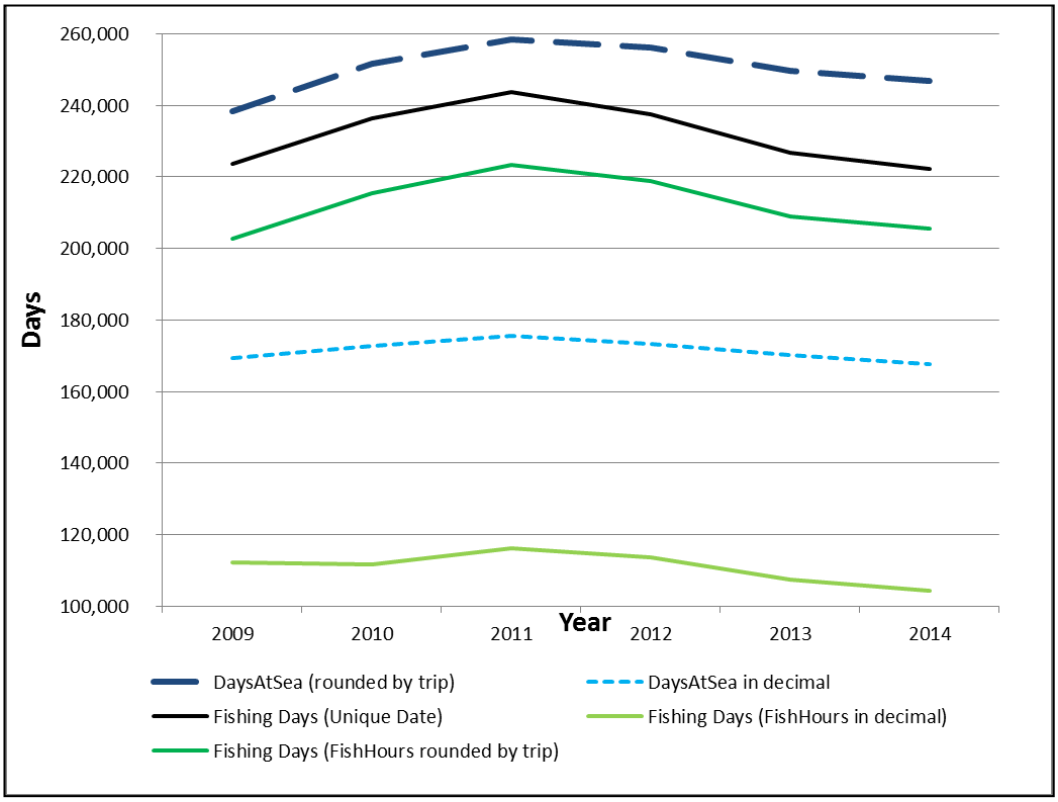


Figure 3 - The annual total of Days at Sea and Fishing Days for the Atlantic French fleet calculated according to different methods.

Figure 4 - The annual total of Days at Sea and Fishing Days for the Slovenian Fleet calculated according to different methods.

Going one step further, both Days at Sea and Fishing Days were calculated again, but this time, decimals were kept (which illustrates the case of rounding-up totals). Fishing Days were calculated by adding-up the number of fishing hours per trip, dividing them by 24 and summing these "decimal days" up for each year. The same principal was applied to Days at Sea. While it is clearly stated in the regulation that Days at Sea should be rounded up to whole numbers, this alternative was used to illustrate that if Days at Sea are not rounded up on a trip level, or only rounded up at the end of the calculation, this can lead to significant differences (Figures 2,3, and 4). Therefore, it remains important that all Member States apply the same rounding-up techniques or none at all. The workshop agreed that for Days at Sea the trip total should be rounded to whole day(s) on a trip by trip basis; however breakdowns by gear-area combination can be left as decimals. In this way the annual totals by gear-area combination will sum to the same total as the whole trip total (see Annex 5).

3.1.4.2.2Considering Fishing Dates

It is not mandatory to collect the hours fished under the Control Regulation and therefore, not all Member States have these data available. Fishing Dates are reported in the logbooks and can be used to mark a fishing day. When considering a Fishing Day as a day based on an entry in the logbook, it is theoretically possible to have more Fishing Days than Days at Sea as is the case for Belgium. Such a situation occurs for example when a vessel leaves port in the evening and returns at mid-day the next day. The vessel conducted a fishing operation in the evening as well as the next morning. The time at sea was less than 24 hours amounting to 1 Day at Sea. However, two dates were recorded in the logbook leading to 2 Fishing Days. This may seem counter-intuitive; however, in this case, the variables Days at Sea and Fishing Days have truly different meanings. Therefore, this is entirely possible (see principle 4 section 3.1.1).

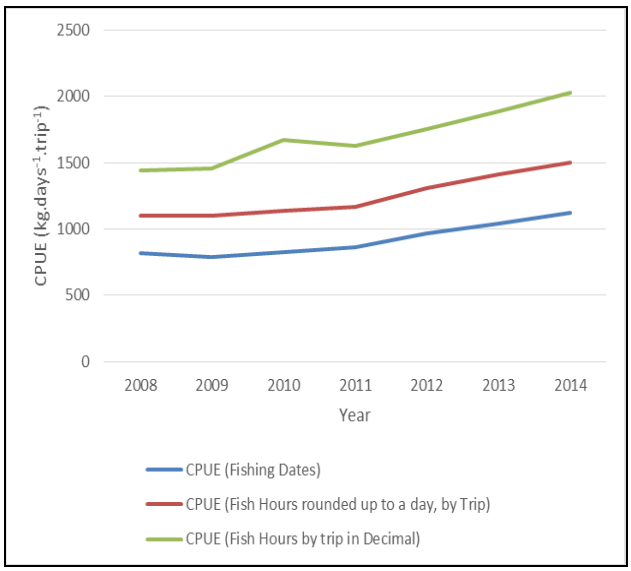
As can be seen in the figure, in order to be able to compare Fishing Days among Member States it is important that a consensus is made to follow the same method. As hours fished are not always available, Fishing Days based on the fishing dates as reported in the logbooks should be used. Even though some MS may have more detailed information, this is a trade off in order to allow comparability at an EU-level.

3.1.4.2.3 Catch per unit effort

In a next step, the catch per unit effort (CPUE) was calculated making use of the 3 ways of calculating Fishing Days as described above:

1. CPUE based on the Fishing Dates as reported in the logbooks
2. CPUE based on the Fishing Hours, divided by 24 and rounded up by trip
3. CPUE based on the Fishing Hours, divided by 24 left in decimals

Based on the sales data, the whole weight of fish was divided by the different Fishing Days and also by the number of trips (Figure 5).



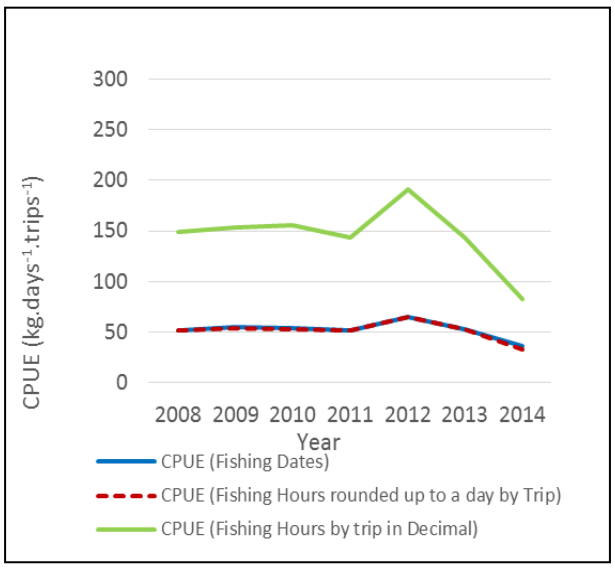
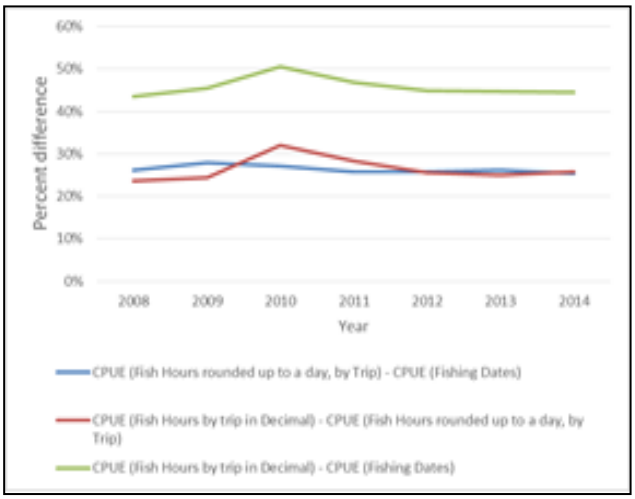


Figure 5 - Annual CPUE for the whole Belgium fleet (graph on the left) and for Slovenian fleet (graph on the right) resulting from the different calculations of Fishing Days. The blue line is the result of the method agreed to calculate Fishing Days

As can be seen on Figure 5, the differences between the CPUE's are large. Figure 6 shows the differences (in percent) between the different CPUE's.



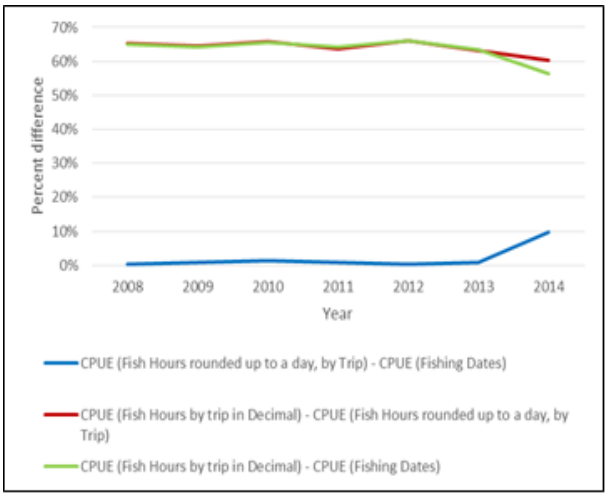


Figure 6 - Percentage differences between annual CPUE for the whole Belgium fleet (graph on the left) and for Slovenian fleet (graph on the right) resulting from the different calculations of Fishing Days.

In Figure 7, the CPUE's were indexed based on 2008. As can be seen on this figure, the trends in CPUE remain very similar or the same. At the end of the day, this is what is of interest for the analyses on an EU level. For modelling purposes where determination of trends is important calculating Fishing Days using fishing date as reported in logbooks doesn't seem to have an important impact on the results, at least not in these examples. We note however that our analysis aggregated effort and catch at annual level. It is possible that when CPUE results are analysed in more disaggregated strata (e.g., stratified by vessel size and/or gear and/or area combinations), the index results becomes more variable compared to methods making use of fishing hours.

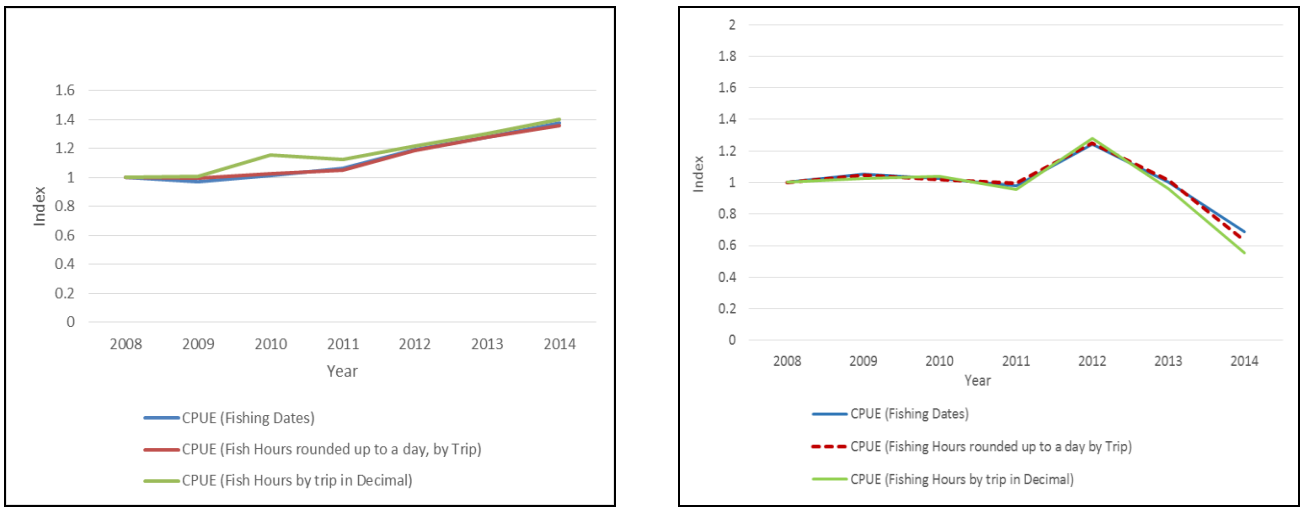


Figure 7 - Annual CPUE for the whole Belgium fleet (graph on the left) and for Slovenian fleet (graph on the right) resulting from the different calculations of Fishing Days indexed to 2008. The blue line is the result of the method agreed to calculate Fishing Days.

3.1.4.2.4Conclusion from the analysis

For the purpose of fleet effort and CPUE analyses, the results from this analysis confirm that it is most important to ensure the consistency on how effort measures are calculated rather than the unit of measurement. The results from these three MS, with different fleets involved and using different gears and modes of fishing, show that the differences found when effort is measured in calendar days or, 24 hours periods (rounded or not) are largely different in scale. On the other hand the results show the same trend when converted to an index or mean standardised. This suggests that consensus is a first priority and that data available based only on Fishing Dates as reported in logbooks remain useful and could already be sufficient to visualize trends.

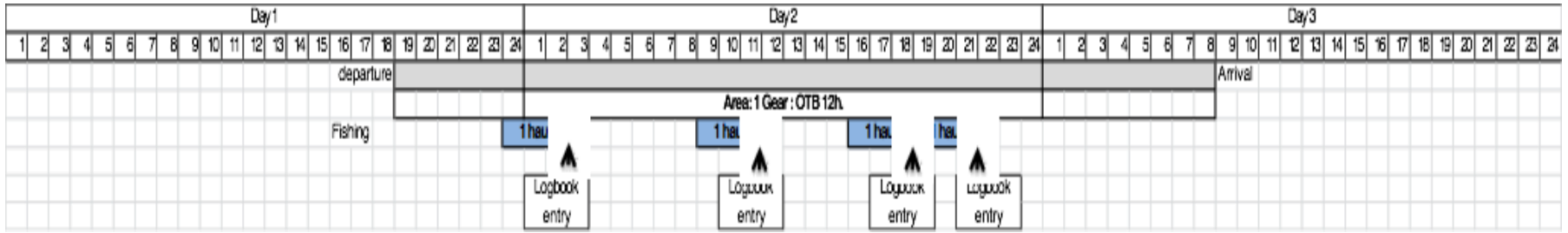
3.1.5 Looking beyond 2017

3.1.5.1 *Haul by haul logbook data*

Some MS have implemented a requirement for each haul (or passive gear use) to be recorded in logbooks. This goes beyond the requirements of the control regulation which only requires one entry per day if the area and gear stay the same (see section 2.1.1.1). The following considers how recording **fishing time** through use of haul by haul data can have advantages in calculating Fishing Days compared to a daily logbook entry.

As a general principle recording of a fishing event (haul or passive gear use) in the logbook is carried out when the gear has been retrieved or hauled on board the vessel and the catch information can be recorded. Therefore, if a fishing event starts (shooting the gear) before midnight (24.00) and ends after midnight the recording in the logbook is the day where the gear is retrieved.

Example 1: The first example shows a trip where a vessel has departed harbour on day 1 at 18.00 hours and returned to harbour on day 3 at 08:00 hours.

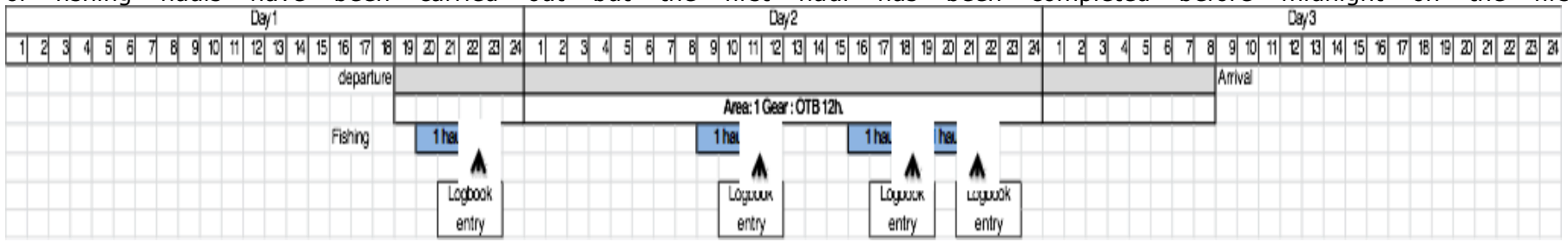


As the **Days at Sea** is the time between when a vessel leaves the harbour and the return to a harbour. The number of **Days at Sea** by a trip is calculated as commenced 24 hour periods expressed in whole numbers. The number of Days at Sea in this example will be **2 Days at Sea**.

If each haul is recorded then four hauls are recorded and if the fishing hours are recorded for each haul then 12 hours of fishing are recorded.

All instances where the gear is retrieved on board take place on the same calendar day. Therefore **1 Fishing Day** is recorded regardless of whether the logbook records on a haul by haul basis or simply once per day.

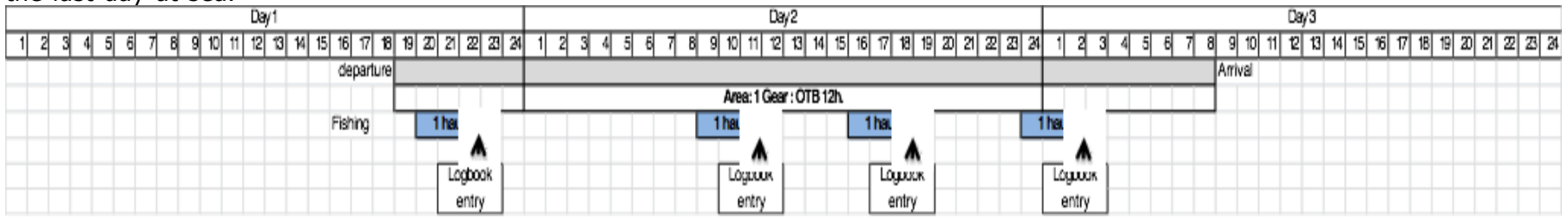
Example 2: This example shows a trip where the vessel leaves harbour and returns to harbour as in the example above. The same number of fishing hauls have been carried out but the first haul has been completed before midnight on the first day.



The number of Days at Sea is the same as in the first example, **2 Days at Sea**.

Using the methods outlined in section 2.1.3 will result in **2 Fishing Days** recorded. The **Fishing Time** measure stays the same as in example 1 (12 hours).

Example 3: The third example shows a trip where the vessel has left harbour and returns to harbour as in examples 1 and 2 above. The same number of fishing hauls have been carried out but the first haul has ended before midnight on the first day and the last haul ended on the last day at sea. .



The number of Days at Sea is the same.

Using the methods outlined in section 2.1.3 will result in 3 Fishing Days. The Fishing Time measure stays the same as in example 1.

The examples show how the present minimum logbook recording requirement can lead to different results when calculating Fishing Days when the actual amount of fishing effort is the same. Even if aggregation of results in large strata may dampen this effect to some extent (section 3.1.4.2) clearly it is desirable that a measure of fishing effort used for calculating CPUE should be reliable (consistent across scenarios) and in line with the actual fishing effort. The outcome of the analysis on effort expressed in terms of Fishing Days shows that a higher quality of effort measure is provided by fishing time. The outcome of the discussions on passive gears was also that soaking time alongside gear dimension provides for a much more appropriate measure of effort than fish dates. A recommended solution would be to record information in the logbook on a haul by haul (or set by set) basis.

Therefore, the Workshop for Transversal data recommends that the Commission in the revision of the Control Regulation consider implementing mandatory requirements for completing the logbook on a haul by haul (active gear) or fishing event by fishing event (passive gear) basis. Furthermore, as a first step towards a more complete and accurate set of information stemming from logbooks, the WK considered that the fishing time filed from the logbook (position n.13) as stated in annex of Reg. (CE) N. º 404/2011) should become mandatory instead of optional as it is nowadays.

3.1.5.2 *Data sources in addition to logbooks*

VMS data can improve the accuracy of fishing effort estimation further either compared to haul by haul logbooks and when VMS data is crossed/compared with logbook. In some areas these is being done already. However, it was not considered further by the WS participants in respect to 2017 data call because there is not yet an EU wide standard for the processing of VMS data.

3.1.6 ToR 2: in summary

Observations:
For the majority of trips only one gear is used in only one rectangle. **Fishing Days vs Days at Sea:** Fishing Days is a measure of fishing effort related to calendar days but should not be considered to represent the number of (whole) days spent fishing. The measure can be greater than the measure of Days at Sea for a given trip and potentially greater than 365 within a year for a given vessel. **Fishing Days & Days at Sea; vessel total vs gear total:** Fishing Days and Days at Sea can be counted more than once for gears that are used in parallel, e.g. if two passive gears are used on the same day each can receive one Fishing Day. The effort for the vessel in a trip is therefore not necessarily equal to the sum of the effort of the gears it employs.

Criteria to be followed when calculating effort (Days at Sea and Fishing Days):
Days at Sea*areas: an area is set to be a unique combination of FAO division (sub-division for Baltic) and Economic zone. **Fishing Days*areas (ICES region):** an area is set to be a unique combination of ICES rectangle, fishing Area and Economic zone in ICES region and a GSA in Mediterranean region. For other fishing areas (outside FAO 27 and 37), an area is defined according to the most detailed spatial reporting requirements of the RFMO). **Gear**: a gear is set to be a unique combination of gear code (see annex 5) and its mesh size, (where relevant). (see annex 5)

Principles:

Consistency: For the sake of **consistency and comparability** it is important that the same method, criteria and principles are used across member states when preparing data for EU wide datasets.

The sampling/observation unit – trip basis: When calculating effort the trip is the basic unit. This is true regardless of whether a vessel takes part in more than one trip on a calendar day or uses a trip to set (but not haul) passive gear.

Distribution of effort across days: To apportion Days at Sea and Fishing Days between gears and areas each day is treated separately. The total of Days at Sea or Fishing Days for a day on which fishing occurs will be the ratio of the total for the trip divided by the number of Fishing Days. (see Annex 5 - Method for calculating Days at Sea and Fishing Days)

Distribution of effort within a day: For each unique [gear;area;economic zone] combination the Days at Sea or Fishing Days are calculated as:

(Fishing date reported in the logbook total) * (Number-of-logbook-entries-for-the-combination-in-day/Total-number-of-logbook-entries-that-day) (see Annex 5 - Method for calculating Days at Sea and Fishing Days)

Distribution of effort within a day – gears used in parallel: When calculating Fishing Days, if a vessel employs two or more gear types in parallel the Fishing Days for each gear is counted as if the vessel were only using that gear on that day, (e.g. one fishing day (calendar date) for a vessel using two gears in parallel equates to one fishing day for each combination gear*area. The Fishing Days is a measure related with the fishing gear and therefore cannot be thought on a vessel level. To avoid over-estimation of vessel effort, the vessel-fishing-day is a measure here included but is not meant to be used when Fishing Days are to be calculated. (see section 3.1.3.2.1)

Gears used sequentially or in parallel: If more than one gear type has been used on a single day, whether the gears were used sequentially or in parallel is to be determined by:

- All active gears – sequential
- All passive gears – parallel
- Active and passive gears – any active gears to be considered as used sequentially, any passive gears used in parallel to each other and the active gears. (see section 3.1.3.2)

Conclusion from data analysis:

Data sets from MS show that the majority of the trips have only one rectangle and gear reported. Therefore the number of situations for which the effort calculation might raise doubts regarding the rules agreed on the WK is expected to be very low.

Comparison of effort estimates and CPUE calculation based on different effort units shows that at large aggregation levels (e.g., year), differences among metrics occur mostly on the scale. Relative results are comparable in terms of general trends, indicating that when broad aggregation is carried out, it is more important a consensus among MS about the metrics used than the specific Fishing Day metric adopted.

Recommendation:
The Workshop for Transversal data recommends that the Commission in the revision of the Control Regulation consider implementing mandatory requirements for completing the logbook on a haul by haul or fishing event by fishing event basis. And as a first step to get accurate information on fishing time, to change the collection of fishing time in the logbook from optional to mandatory.

3.2 ToR 3: Prepare the documentation deemed necessary, to be stored on a publicly accessible repository (e.g. DCF website), that would serve as support for the estimation processes. (Subgroup 1)

The members of the subgroup working on ToR 3 collaborated closely with the subgroup working on ToR 2 to produce a series of algorithms that implemented the methods for calculating fishing effort that were developed during the WK. The algorithms were implemented in an R script to allow testing and further development of the method.

3.2.1 The algorithm

Two measures of fishing effort are calculated: Days at Sea and Fishing Days. The method is similar for both measures, the main difference being how passive gears are treated. The total effort of each fishing trip is calculated (based on either the duration of the trip or the number of days that were fished). This effort is then divided amongst the different fishing options (characterised by different fishing gears being used in different areas).

The methods use only mandatory data which means that they can be applied across all Member States. As only mandatory data is used, a series of assumptions are made to allow the effort expended during the fishing trip to be divided by fishing gear and area combinations. Clearly, if additional data were used, such as fishing duration (currently not mandatory), then estimates of fishing effort would become more accurate.

The algorithms are presented in the document "Method for calculating Days at Sea and Fishing Days" under Annex 5. This is a stand-alone guidance document to be made publicly available and which should guide the Member States on the implementation of their algorithms for effort calculation. The document is 'platform independent' meaning that it is not written for a specific software package, allowing Member States to implement the algorithms using their preferred software.

3.2.2 The R script

The algorithms were implemented using R (an open-source language for statistical computing that is freely available). The R scripts allow Member States to use their own data and calculate the different effort measures using the agreed methods. To use the R scripts, it is necessary for the data to be presented using a particular format (for example, times must be given as HH:MM). The necessary data format is described in annex 4 - DOCUMENT ON DATA FORMAT. An R script has also been developed to check the format and contents of the input data. The script provides warnings on some common misspecifications and ensures corrections, where possible, when problems with format are found in the data set. This script is shown in annex 6.

The R script for performing the calculations is found in annex 7. This proved extremely useful for testing and evaluating the effort algorithms as it allowed the developed methods to be confronted by real data. In this way, case studies that had not been foreseen during the initial method development were identified and the method was adapted as a result. Due to time constraints it was not possible to properly review, test and document the software during the course of the WK. As such, the R script should be considered as a 'work in progress'. Although we are making the script available it should not be considered as final. It could serve as a basis for a more 'official' script. A couple of example outputs of the R script are shown in annex 9. A full dataset with the outputs is included in the electronic annexes to this report.

3.2.3 ToR 3: in summary

Documents produced:
Method for calculating Days at Sea and Fishing Days - A descriptive document to support the implementation of the effort algorithms in any platform other than R. **R-script that computes the effort estimates**, Fishing Days (fdas) and Days at Sea (das) according with the rules and method agreed. **R-script that checks for data format and coding** compliance prior to use of the R-script for effort calculation. **Data input format** – A document describing the format of the input data for the R script.

3.3 ToR 1: Assess the results of the new effort estimates following the trial implementation of the effort calculation method recommended at the WK on a MS level.

The implementation of the decisions on effort calculation, Days at Sea and Fishing Days, for each of the fishing trip scenarios as devised in the first WK that took place in Zagreb proved to be impossible before the second workshop. Certain specific information, i.e. how to identify a new fishing gear within a fishing trip – whether a new mesh size and/or a new selective device would be enough, or a completely different gear had been used – and the level of fishing area with relevance for the calculation – whether fishing area, division, sub-division – were missing from the report, preventing adaptation for effort calculation. Therefore, it wasn't possible to have any result from the devised methodology before the workshop.

However, during the workshop effort estimates for 10 MS were calculated based on the datasets brought to the workshop. These calculations were performed using the R scripts shown in annexes 6 and 7, the first one to correct and verify the data and the second one with the implementation of the functions.

For several MS it was possible to calculate effort as Days at Sea (das) and Fishing Days (fdas). A summary of the result for 6 of these Member States is included in Annex 10. From these preliminary results the impact that the two different approaches to Days at Sea (das) and Fishing Days (fdas) - can have is evident, namely for passive gears. For passive gears in most situations the effort as fdas either equates or is bigger than das. This is a direct result of having das calculated as a difference between the date/time of departure and date/time of arrival to port, and having fdas as calendar days, counting the number of days with a fishing operation, (Annex 10). This also justifies the need to consider Fishing Dates per vessel as an alternative measure of effort for some specific purposes.

The analysis performed under ToR 2 for three MS, Belgium, Slovenia and France, shows that these measures tend to be proportional. However, as also mentioned in section – ToR2, further work and including scripts testing should be done before full adoption of the methodology. When addressing ToR5, the WK provides further guidance how such work to further analyse the methodology and the test can be done.

3.4 ToR 4: Decide on the most appropriate metrics for fishing effort for passive gears for vessels not required to complete logbooks and for those required to complete logbooks.

The 2015 Zagreb workshop on transversal variables concluded that ways to harmonize and agree on relevant effort estimations for passive gears and vessels not carrying logbooks needs to be further explored before conclusions and agreements can be made. The same conclusion was drawn by the STECF plenary in their comments. This 2nd workshop on transversal variables took into account these particular issues.

3.4.1 Comment on definition of fishing trip and fishing day

The workshop considered the definition of a fishing trip as it is defined in the Control Regulation (Regulation (EU) No 404/2011),

> **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.

And concluded this definition should be adopted as the definition for the DCF for the sake of framework consistency between the control regulation and the DCF, as already recommended from STECF-13-12.

The workshop reviewed the definition of "fishing day" proposed by STECF-13-12 to be included in the DCF:

> "Any day at sea with fishing operation. In case of passive gears, each day of a remained operational gear counts as fishing day and is associated to the fishing trip during which the gear was deployed."

Since the Fishing time (which is equal to soaking time for passive gears) is currently not a mandatory field in logbooks, there may not be any information on whether gears remain at sea or not; this means that the definition of a "Fishing day" referring to passive gears cannot be followed in practice. The WK suggests that, the definition of "Fishing day" should be changed to:

> **Fishing day** - "Any day at sea with a fishing operation".

3.4.2 Small Scale fisheries:

Recently, several works have highlighted the need to improve our knowledge about small scale fisheries in order to secure their sustainable development (Chuenpagdee et al., 2006[3]; Salas et al., 2007[4]; Chuenpagdee Ed., 2011[5], Guyader O. et al., 2013[6]; FAO, 2015[7]). The European Commission stressed the intention to provide support to the small scale sector under the reformed CFP and to promote small-scale coastal fishing activities[8]. The European Maritime and Fisheries Fund regulation includes many references to small-scale coastal fishing and as an example Article 25 could be mentioned: "With a view to promoting small–scale coastal fishing, Member States having a significant small– scale coastal fishing segment should attach, to their operational

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Chuenpagdee, R., Liguori, L., Palomares, M.D., Pauly, D. 2006. Bottom-up, global estimates of small-scale fisheries catches. Fisheries Centre Research Reports. 14(8), 112 (available at http://www.fisheries.ubc.ca/publications/).

[4]Salas, S., Chuenpagdee, R., Seijo, J.C., Charles, A. 2007. Challenges in the assessment and management of small-scale fisheries in Latin America and the Caribbean. Fisheries Research. 87, 5-16.

[5]Chuenpagdee, R. (Ed.) 2011. World Small Scale Fisheries Contemporary Visions, Eburon Academic Publishers, Delft, 400 p.

[6]Guyader Olivier, Berthou Patrick, Koutsikopoulos Constantin, Alban Frederique, Demaneche Sebastien, Gaspar M. B., Eschbaum R., Fahy E., Tully O., Reynal Lionel, Curtil Olivier, Frangoudes Katia, Maynou F. (2013). Small scale fisheries in Europe: A comparative analysis based on a selection of case studies. Fisheries Research, 140, 1-13. Publisher's official version : http://dx.doi.org/10.1016/j.fishres.2012.11.008 , Open Access version : http://archimer.ifremer.fr/doc/00118/22934/

[7] FAO. 2015. Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication (http://www.fao.org/3/a-i4356e.pdf)

[8]REGULATION (EU) No 1380/2013 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 11 December 2013 on the Common Fisheries Policy (http://ec.europa.eu/fisheries/cfp/index_en.htm, http://ec.europa.eu/fisheries/documentation/publications/leaflet_reform_en.pdf)

programmes, action plans for the development, competitiveness and sustainability of small-scale coastal fishing"[9].

Recently, the WGCATCH ICES Group[10] highlighted that "The under 10m and 10–12m fleet segments are of high importance in all countries in terms of number of vessels and consequently in employment ... Their contributions to total landings are often lower compared to other size segments; however their share of TAC-quota or catches of regulated species can be significant and it must be stressed that underreporting of landings can give a truncated view of this contribution. The importance of SSF must be assessed by fishery, species and region because significant differences can occur between them. It should also be highlighted that the SSF fleet segments are of high importance for fishery spatial management because they usually operate in more coastal areas and probably more sensitive habitats (e.g., nursery grounds) and that socio-economic studies indicate that the large number of vessels involved corresponds to a large number of people employed and dependent on these fisheries" The WGCATCH Group, based on SSF questionnaires provided by country, produced a range of figures addressing the importance of the SSF fishing sector inside European countries.

In this context and following recommendations from the PGMED 2012 & 2013, PGCCDBS 2013 and the conclusions of STECF 12-15 and 13-06 meetings regarding the next new EU-MAP, a DCF workshop[11] about « Common understanding and statistical methodologies to estimate/re-evaluate transversal data in small-scale fisheries » met in Nantes from 21st to 23rd May 2013. 19 experts (7 biologists, 4 economists, 5 statistician, 3 managers) from 9 Member States (Denmark, Finland, France, Germany, Italy, Latvia, Lithuania, Portugal, Sweden) attended the WK. The principal aim of the workshop was to investigate methodological approaches for collecting transversal data for small-scale fisheries and provide useful input for the implementation of the forthcoming new EU-MAP. The WK discussed different regulations actually implemented (CFP, Control Regulation, Management Plan in the Mediterranean Sea, Marine Strategy Framework Directive (MSFD), Natura 2000, Marine Protected Area (MPA), Water directive, ...) and agreed that it is essential to estimate the fishing activities of the SSF in terms of annual Fishing Days, volume and value of catches as a minimum requirement to answer these different regulations.

Following that, the Nantes workshop proposed a list of transversal data to be collected for vessels without logbook obligation understanding that it should be considered as a core set of variables to be collected for these vessels and that the inclusion of other additional variables (e.g. number of nets, …) or more detailed level of aggregation (spatial, technical or temporal) could require a regional approach associated with core end-user needs which could be achieved through more active and influential regional coordination groups (RCGs) in the new EU-MAP.

The Nicosia workshop considered that the fleet without logbooks has to be considered separately with respect to transversal data estimation because there is no Control

[9]REGULATION (EU) No 508/2014 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 15 May 2014 on the European Maritime and Fisheries Fund (http://eur-lex.europa.eu/legal content/DE/TXT/?uri=uriserv:OJ.L_.2014.149.01.0001.01.ENG)

[10]Anon. (2015). Report of the Working Group on Commercial Catches (WGCATCH), 9-13 november 2015, Lisbon, Portugal(http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/SSGIEOM/2015/WGCATCH%20Report_01.pdf)

[11] Anon. (2013). Report of the Working group on Common understanding and statistical methodologies to estimate/re-evaluate transversal data in small-scale fisheries. https://datacollec-tion.jrc.ec.europa.eu/documents/10213/891472/2013-10-17_Final_report_WK_SSF_May_2013.pdf

Regulation obligation to supply EU logbooks for vessels under 10m (this applies to under-8m vessels in the Baltic Sea under cod management plan). Following this statement, the workshop only refers to vessels with and without logbooks thereafter, considering that the definition of small-scale fisheries under the CFP includes also vessels between 10-12m and that any definition has to be linked to the end-user needs such as stock assessment, marine spatial planning, socio-economic studies, MSFD, MPA, management regulation texts, etc.

The workshop agreed on a list of transversal data (taking into account the Nantes workshop proposal) to be collected for vessels without logbooks and adopted the view of the Nantes workshop considering that RCGs should be responsible, apart from the basic information presented in the table, for the management of any additional list of transversal variables or any more detailed level of aggregation. However, RCGs should assess the feasibility to collect such additional information. End users' needs and possible impact on data collection programs should be reviewed in the Regional Coordination Groups (RCG). The proposed list is presented hereafter.

Table 4 - Proposed list of transversal variables to be collected for vessels without logbooks requirement (LOA<10 meters): (as requested by DGMARE this proposal will be presented as an input to the STECF EWG1601)

Heading	***Variable***	***Unit***	***Description***	***Coverage***	***Activity segmentation***	***Reference Period***
Capacity	Number of vessels	Number	Total number of vessels	Community Fishing Fleet Register	Fleet segment	
	GT	Number	Total GT of the vessels in the segment	Community Fishing Fleet Register	Fleet segment	
	kW	Number	Total kW of the vessels in the segment	Community Fishing Fleet Register	Fleet segment	
	Vessel Age	Number	Average AGE of the vessels in the segment	Community Fishing Fleet Register	Fleet segment	
Effort	Number of trips	Number		Active vessels	Fleet segment and gear (level 3)	Quarterly
	Days at Sea	Day		Active vessels	Fleet segment and gear (level 3)	Quarterly
	Fishing Days	Day		Active vessels	Fleet segment and gear (level 3)	Quarterly
	Number of vessels	Number		Active vessels	Fleet segment and gear (level 3)	Quarterly
Landings	Value of landings totals and per species	Euro	Value of landings total and per species	Active vessels	Fleet segment and gear (level 3)	Quarterly
	Live	Tons	Live weight of	Active vessels	Fleet segment and	Quarterly

Heading	*Variable*	*Unit*	*Description*	*Coverage*	*Activity segmentation*	*Reference Period*
	weight of landings		landings in kg total and per species.		gear (level 3)	
	Prices by species	Euro/kg	Price per kg of species landed	Active vessels	Fleet segment and gear (level 3)	Quarterly

Regarding the specificities of the vessels without logbooks requirement, the workshop stressed the fact that transversal data could be estimated through sampling programmes, adapted declarative forms (e.g. coastal log-books, monthly reports, monthly declarative forms, etc.) or sale notes as extensively described in the Nantes workshop and the 2015 WGCATCH report. In this context, the workshop stressed the fact that in many cases departure time and arrival time are not collected such that the "Days at Sea" could not be calculated based on the hours spent at sea and in turn the "24h period definition" could not be applied. In these cases, fishing effort measures have to be estimated differently. Considering that small vessels have generally a daily activity, for vessels without logbooks, it could be assumed that 1 Fishing trip is equivalent to 1 Day at Sea and to 1 Fishing Day. This assumption has to be assessed regionally by fishery, as significant differences can occur between them.

In principle, for vessels with no logbooks, the workshop concluded that fishing effort measures calculation (number of fishing trips, Days at Sea or Fishing Days) has to be in line with the methodology established for vessels carrying logbooks as far as possible considering the data available and the way to collect them. For example, vessels with no logbooks that generally perform trips lasting more than 24h have to be counted as spending two Days at Sea considering the "24h period definition" when only one fishing day might be estimated when fishing occurs only on one "calendar day". In the same way, Days at Sea and Fishing Days must be estimated on a trip basis and for each trip (even a trip to set gears or put pots into the sea) a minimum of one day at sea and one fishing day has to be calculated.

Nevertheless, the workshop stressed the fact that the format and methodology adopted here is based on the vessels with logbooks format that is already consistent across Member States. Several concerns about the effort calculation and the impact the agreed calculations methodologies might have in future for vessels without logbooks, were raised by some experts from countries where such fleets represent an important share of their national fishing fleet It's important to note there are several data formats existing across Member States including adapted declarative forms, sales notes and sampling data and these datasets are stored in different ways creating challenges to the standardization of calculation of Days at Sea and Fishing Days. The Workshop therefore considers that additional work might need to be done to standardise the many existing formats and to be able to apply the methodology and R-scripts developed at this workshop.

3.4.3 Passive gears:

The workshop considered that following the table of "fishing gears" agreed in the Zagreb workshop and on the basis of the approved definition by FAO, passive gears could be defined as gillnets and entangling nets (GNS, GND, GNC, GNF, GTR, GTN, GEN, GN), pots and traps (FPN, FPO, FYK, FWR, FAR, FIX, FSN) and hooks and lines including handlines and longlines (LHP, LHM, LLS, LLD, LL, LTL, LX).

The workshop made a proposal for a core set of effort variables for passive gears for the next EUMAP listed below. This core set of effort variables is defined for each type of gear following the table of "fishing gears" agreed in the Zagreb workshop.

The workshop considered that for passive gears which stay in the sea after the vessel comes back to harbour (e.g. Nets or pots), the term of "Fishing Days" could be meaningful only if it is linked with the "soaking time" of the gear. Nevertheless, "soaking time" is not a mandatory field in logbooks (but see recommendation in section 3.1.5) and the workshop recommended that the need of these additional variables has to be decided regionally as these decisions require a regional approach associated with core end-user needs which could be assumed through more active and influential RCGs in the new DCMAP. Nevertheless, the workshop considered that Fishing Days (as defined at the start of the current section) remains a necessary effort measure to ensure comparison with the other gears (in particular active gears) and has to be calculated for all trips. Indeed, for trips more than one day at sea where passive gears are operated, this effort measure gives additional information compared to Days at Sea.

However the workshop concluded the definition of a fishing day is: "Any day at sea with fishing operation" calculated as calendar days (see above). In other words, Fishing Days equal Days at Sea minus days used to go and to come back from the fishing ground where the fishing operations take place. And the workshop stressed it should be clarified in this case that for passive gears it is meaningless to calculate CPUE estimates based on these proposed definition of Fishing Days as it is meaningful only when CPUE is linked with the "soaking time" of the gears.

Concerning gear dimension (total length of nets, total number of pots/traps and total number of hooks), the workshop noted that it is now a mandatory variable in logbooks since 10/2015 and that this information could be derived from them for vessels with logbooks. For vessels with no logbooks, the workshop considered that there could be differences among regions and that the collection of these additional variables has to be decided regionally as these decisions require a regional approach associated with core end-user needs which could be assumed through more active and influential RCGs in the new DC-MAP. The workshop noted that these additional variables do not belong to the core set of transversal variables mentioned above for vessels with no logbooks.

Table 5 - Relevant effort measures for passive gears.

Fishing Gear	Core set of effort variables
Gillnets and Entangling Nets	Number of trips Days at Sea Fishing Days Total length of nets (for vessels with logbooks)
Pots and Traps	Number of trips Days at Sea Fishing Days Total number of pots/traps (for vessels with logbooks)
Hooks and Lines	Number of trips Days at Sea Fishing Days Total number of hooks (for vessels with logbooks)

3.4.4 ToR 4: in summary

Definitions:
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. **Fishing Days**: Any day at sea with fishing operation.

Small Fishing Vessel's Fleet (Vessels without logbooks) relevant fishing effort metrics:
Relevant variables to be collected as core variables (as previously concluded in the Small Scale Workshop Nantes 2013). Additional variables to be decided regionally depending on specific end-user needs. Core Effort Variables: Number of trips; Days at Sea and Fishing Days Additional work needed to devise common methodology on calculation of Fishing Days and Days at Sea based on data sources other than logbooks.

Effort Variables for passive gears:
Based on the information already collected from control regulations and considering the minimum requirement that is common to all MS, the relevant effort measures for passive gears are: • Number of trips • Days at Sea • Fishing Days • Total length of nets/ Total number of pots/traps/ Total number of hooks (for vessels with logbooks)

3.5 ToR 5: Identify together with Member States any particular issues that still need to be clarified ahead of the 2017 data calls

Ultimately the **main goal** of the work developed in these two sequential workshops, Zagreb 2015 and Nicosia 2016, reads as:

> **To ensure that economic and biological data can be meaningfully fused to allow for a more generic implementation of bio-economic modelling and spur the inclusion of economic advice in fisheries management**.

Having this in mind in answering ToR 5 the WK considers that 2017 data calls should support the following broader analysis:

- contrast the results of effort calculation between the current MS approach (business as usual – BAU) and the new approach proposed by the Workshop (NEW) – inter-calibration analysis; and
- Prepare an EU-Wide dataset of economic and biologic data for 2015.

For that the WK considers the specification for 2017 data calls should be as follows:

3.5.1 The 2017 data calls (DG MARE/STECF)

The data to be requested in 2017 must have the same specifications as in previous years for the Economic data call. For the FDI and MED&BS data calls the following should be requested additionally:

Data as requested in past years (to continue the existing time series of data). For the effort data calculation of Days at Sea should be performed by MSs as before.

Two additional datasets; new versions of the EFF_01_CATCH and EFF_02_EFF tables,

Which include in addition to the regular ones the following **dimensions**:

1. Fleet segment, i.e., main gear and vessel length
2. Supra-region; (definitions as in annex 10 to this report)
3. EEZ

The relevant variable names, definitions, acronyms, codes lists are in annexes 10 to 16 of this report. For a more comprehensive description we recommend the Report from the Zagreb Workshop to be consulted

And should request the **two effort variables** calculated according to the devise methodologies presented in this report:

Days at Sea and Fishing Days.

Additionally**, the scope** of the FDI data call should be broadened to include all EU fleets, not only those that have operation under effort regimes. This is to allow the potential to combine with economic data with respect to any EU fleet.

The effort regimes data call currently is the only one without a full coverage of the fishing fleets. For this analysis to be sensible, the scope of the call for data should be expanded to include as well vessels/fishing trips which have not taken place under a specific effort regime.

Table 6 - Transitional data call for 2017.

Data Call	Economic Data Call	FDI Data call merged with Med data call
Relevant data sets from the data call	All Economic Variables by Fleet segment and supra-region.	Effort and Catches (EFF_01Catch and EFF_02_EFFORT)
Dimensions	Same as in 2016	Three additional dimensions: • Supra-region • fleet segment • EEZ
Relevant Codifications	Gears, Fishing Areas, MS, Fishery, Species (as specified in annex)	Gears, Fishing Areas, MS, Fishery, Species (as specified in annexes 10-16)
Variables name/Acronym:	According to Annex 15	According to Annex 15
Time coverage	2015	2015
Scope	All EU fleets	All EU fleets

3.5.2 The data calls/data submissions 2018 onwards:

A general conclusion from the WK is that the data calls should be reduced in number as much as possible with just one call for Transversal data requested to all MS covering multiple needs (economic and biological) instead of having the FDI call for the Atlantic and a separate data call for Mediterranean and Black Sea. The Mediterranean and Black Sea data call should focus only on the biological data of the stocks, as required for the stock assessments in that region. The economic data call would then comprise only economic data.

3.6 AOB - Development of a national transversal data file based on primary data

3.6.1 Objective

This was an issue brought by the experts from Denmark, which results from their experience managing transversal data and ICES data calls for VMS data, and their experience with data compilation at regional level under the Regional project - Fish-PI.

At the Workshop on Transversal Variables held in 2015, it was recognized that the methods for calculating fishing effort (Days at Sea and Fishing Days) varies considerably between member states.

A common format for primary transversal data would enable distribution of R-scripts that can implement the same methods for all countries when answering data calls. This would make the outputs consistent and reduce work for answering the data calls. It would be optional to use this approach, but could be a help for member states and could reduce the workload, once the raw data have the common format.

It is important to stress that the proposed transversal data file holding primary data is only to be held nationally for confidentially of data reasons.

Guidelines on how to run the common script could be offered to assist running the scripts. The scripts could be developed by the end user or in close contact with the end user to ensure that the output is what is needed.

3.6.2 Combining transversal data

To start this process, the primary data formats for logbook data, sales notes, vessel register or other data sources needed should be defined. It is suggested that this should be done by a small group, and the results from this initial work could be presented at a hands-on workshop where all MS could participate.

Denmark has experience in merging the transversal data, including sales notes, logbook and vessel register information, into one data file, which also includes derived information. Another file holding VMS data should also be created. The principles for doing this could be applied to the common primary data formats. It is recognized that there will be national differences in the data available, and the primary data formats should include the minimum requirements for data by the EU legislation, but only include relevant variables.

Recommendation
The Transversal Workshop recommends that all Member States on a voluntary basis develop national transversal data files holding primary transversal data using common standards and methods. The data to be included in the transversal data files are data collected according to the Control Regulation. In addition, that a common data format is developed. These transversal data file holding primary data are only to be held nationally for confidentially of data reasons.

3.6.3 Proposal for a road-map for development of national transversal data file based on primary data

Action	Timeline
The proposal is put forward to the STECF EWG 16-01 for review and endorsement for possible implementation in the EU-MAP.	March 2016
The proposal presented to the STECF Plenary for review and endorsement.	April 2016
1st Meeting of the group to propose common standards and methods that could be used by Member States (6-8 participants with solid experience in data handling when replying to STECF data calls). This should be a meeting steered by DTU Aqua, since they possess the know-how needed to share with the MS. The WS proposes Josefine Egekvist as chairperson for such WS.	June 2016
2nd Meeting: Hands-on workshop. All interested Member States should attend. And the work should be a follow up of the first meeting still steered by DTU Aqua.	October 2016
Member States, on a voluntary basis, will use the proposed approach creating the national transversal data file.	October 2016 – January 2017

3.6.4 Draft proposal for variables collected according to the Control Regulation and Community Fishing Fleet Register Regulation[12] to be made available for the DCF

Vessel register information

Name of zone	Select to be included in the transversal data file
Country of registration	√
CFR	√
Date of event	√
Licence indicator	√
Registration number	√
External Marking	√
Name of vessel	√

[12]COMMISSION REGULATION (EC) No 26/2004 of 30 December 2003

Name of zone	Select to be included in the transversal data file
Port of registration	√
VMS indicator	√
Main fishing gear	√
Subsidiary fishing gear	√
LOA	√
Tonnage GT	√
Power of main engine	√
Power of auxiliary engine	√
Year of construction	√

Logbook information

Name of the data element (M = Mandatory) (O = Optional) (CIF = Compulsory if applicable)	Select to be included in the transversal data file
CFR number (M)	√
External identification (M)	√
Date, time and port of departure (M)	√
Date, time and port of return (M)	√
Gear type (M)	√
Mesh size (M)	√
Gear dimension (M)	√
Attachments fitted (O)	√
Date (M)	√
Number of fishing operations (M)	√
Fishing time (O)	√
Fishing operation reference number (if applicable) (O)	√
Time of start of operation (O)	√

Name of the data element (M = Mandatory) (O = Optional) (CIF = Compulsory if applicable)	Select to be included in the transversal data file
Finish time of operation (O)	√
Position of start of operation (O)	√
Depth at start (O)	√
Depth at end of operation (O)	√
Position at end of operation (O)	√
Relevant geographical Area	√
Statistical rectangle(M)	√
Third country fishing zone (M)	√
Catches caught and kept on board (M). Minimum conservation reference size	√
Catches caught and kept on board (M). Below the minimum conservation reference size.	√
Estimates of discards (M)	√
Catches, incidental by-catches and release of other marine organisms or animals (M)	√

Landing declaration information

Name of the data element (M = Mandatory)	Select to be included in the transversal data file
CFR (M)	√
Port of landing (M)	√
date of landing (M)	√
Species identification (M)	√
Relevant geographical area (M)	√
Type of product presentation (M)	√
Volume of landing (M)	√
Presentation (M)	√

Sales notes information

Name of the data element (M = Mandatory) (O = Optional)	Select to be included in the transversal data file
CFR (M)	√
Port of landing (M)	√
Date of landing (M)	√
Date of the sale (M).	√
Sale country (M)	√
Sale Location (M)	√
Species identification (M)	√
Relevant geographical area (M)	√
Type of product presentation (O)	√
Individual size/weight (O)	√
Grade (O)	√
Presentation (M)	√
Price (M)	√

VMS information

Name of the data element (M = Mandatory)	Select to be included in the transversal data file
CFR(M)	√
Date (Year, month and date of transmission) (M)	√
Time of transmission (M)	√
Latitude (decimal) (M)	√
Longitude (decimal) (M)	√
Speed (M)	√
Course (M)	√

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List of abbreviations and definitions

BAU	Business As Usual
CCAMLR	Commission for the Conservation of Antarctic Marine Living Resources
CFP	Common Fisheries Policy
CFR	Community Fleet Register number
COM	European Commission
CPUE	Catch per Unit of Effort
das	Days at Sea
DCF	Data Collection Framework
DGMARE	Directorate-General for Maritime Affairs and Fisheries
DT	Total on a day on which fishing was recorded in the logbook
EEZ	exclusive economic zone
EMFF	European Maritime and Fisheries Fund
EU	European Union
EU-MAP	European Multianual Plann
FAO	Food and Agriculture Organization of the Unites nations
FD	Fish date
fdas	Fishing days
FDI	Fisheries Dependent Information
GA	combination of gear and area
GAFD	a series of gear, area and fishing dates
GFCM	General Fisheries Commission for the Mediterranean
GSA	Geographical Sub-Areas
ICCAT	International Commission for the Conservation of Atlantic Tunas
ICES	International Council for the Exploration of the Sea
IOTC	Indian Ocean Tuna Commission
LE	Number of logbook entries on a certain day
MED	Mediterranean Sea
MPA	Marine Protected Area
MS	Member State
MSFD	Marine Strategy Framework Directive
NAFO	Northwest Atlantic Fisheries Organization
PGCCDBS	Planning Group on Commercial Catch, Discards and Biological Sampling
PGECON	Planning Group on Economic Issues,
PGMED	Mediterranean Planning Group for Methodological Development
RCG	Regional Coordination Group
RFMO	Regional Fisheries Management Organization
SSF	Small Scale Fleet
STECF	Scientific, Technical and Economic Committee for Fisheries
ToR	Terms of Reference
VMS	Vessel Monitoring System
WGCATCH	ICES Working Group on Commercial Catches
WK	Workshop

List of figures

Figure 1- ICES area showing ICES rectangles, the boundary between the EU and Norway EEZs and the boundary between the ICES divisions IIIa and IV (straight line running NW to SE through ICES rectangles 44F7 and 43F8). 16

Figure 2- The annual total of Days at Sea and Fishing Days for the whole Belgium fleet calculated according to different methods. 34

Figure 3 - The annual total of Days at Sea and Fishing Days for the Atlantic French fleet calculated according to different methods. 35

Figure 4 - The annual total of Days at Sea and Fishing Days for the Slovenian Fleet calculated according to different methods. 35

Figure 5 - Annual CPUE for the whole Belgium fleet (graph on the left) and for Slovenian fleet (graph on the right) resulting from the different calculations of Fishing Days. The blue line is the result of the method agreed to calculate Fishing Days 37

Figure 6 - Percentage differences between annual CPUE for the whole Belgium fleet (graph on the left) and for Slovenian fleet (graph on the right) resulting from the different calculations of Fishing Days. 37

Figure 7 - Annual CPUE for the whole Belgium fleet (graph on the left) and for Slovenian fleet (graph on the right) resulting from the different calculations of Fishing Days indexed to 2008. The blue line is the result of the method agreed to calculate Fishing Days. 38

List of tables

Table 1- Reproduction of Appendix 1 of Decision 93/2010, showing the level of detail of fishing areas within each Regional Fisheries Management Organisation, Regional Fisheries Organisation or International Organisation. 15

Table 2- Number of gears reported by trip by country, based on data from January and February 2014, except Polish data that respects the year 2015 (and all months). 32

Table 3 - Number of rectangles reported by trip by country, based on data from January and February 2014, except Polish data that respects the year 2015 (and all months). (Only the datasets for which ICES rectangle is meaningful were used in this analysis)..... 33

Table 4 - Proposed list of transversal variables to be collected for vessels without logbooks requirement (LOA<10 meters): (as requested by DGMARE this proposal will be presented as an input to the STECF EWG1601)..... 49

Table 5 - Relevant effort measures for passive gears. 51

Table 6 - Transitional data call for 2017. 54

ANNEX 1 - Participants

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ANNEX 2 – Agenda

2nd WORKSHOP ON TRANSVERSAL VARIABLES

22 – 26 February 2016 Nicosia, Cyprus – Cleopatra Hotel

Agenda

Morning session: 9h-13h; Afternoon session: 14h-18h; **Coffee-breaks: 11h & 16h**

Day 1:

Afternoon session:

1. Opening of meeting and housekeeping
2. DGMARE presentation(Angel Andres CALVO SANTOS)
3. Terms of reference and adoption of the WK agenda
4. Presentations:

- Revisiting the Zagreb Workshop – Outputs from Zagreb WK - Inputs for Cyprus WK.(Cristina Ribeiro)
- Definitions and data format for transversal data (SCRDB & FishPi - Jorgen Dalskov)
- The Small Scale fisheries – overview from DCF Workshop on "Common understanding and statistical methodologies to estimate/re-evaluate transversal data in small-scale fisheries" - Nantes, 21-23 May 2013 (Sebastien Demaneche).

5. Identify the way forward to tackle the ToRs (roadmap)
6. Subgroups formation and tasks distribution

Days 2 and 3

Morning session:

1. Work in subgroups

Afternoon session:

2. One plenary session to wrap up SG works
3. Work in subgroups

Evening of Day 3: **Social dinner "Mezostrati Tavern", in Nicosia center, offered by the Cyprus Government.**

Day 4:

Morning session:

1. Work in subgroups

Afternoon session:

2. Presentation & Discussion of results from Subgroups

Day 5:

Morning session:

3. Presentation & Discussion of results from Subgroups(cont)
4. Draft report
5. AOB

ANNEX 3 – DG MARE Presentation

Second workshop on transversal variables: linking economic and biological data

Angel Calvo MARE A3

Content

1. Brief introduction to the EU Multiannual Programme For Data Collection

2. The policy context: importance of the transversal data and expected outcomes of the workshops

The EU MAP (draft!)

Contains:

1. Definitions not defined elsewhere (CFP, DCF, CR, EMFF)
2. Minimum requirements about quality of data
3. Basic data requirements
4. Lower thresholds for mandatory data collection and surveys
5. Tables in the annex

The EU MAP

Does **not** contain:

1. Specifications about **how** to collect data: in WPs. Examples: metier or design based sampling plan; concurrent or focussed sampling; at shore or in harbour; CCTV or observer sampling or discards. **Results** are defined

2. Details that may vary frequently or by sea basin: decided/published by RCGs: incorporated in WPs. Examples: stock boundaries in some sea basins

What data is collected?

Categories	Types of variables	Sector covered
1. Biological data	A) EU Stocks: species x area B) OR Stocks: species x area C) RFMO and SFPA Stocks: species x area D) Unintended incidental non-commercial by-catch: by species	A) Commercial and recreational fish stocks –Length, age, weight, sex, maturity, fecundity of individual fish. B) Idem C) Idem D) All areas: frequency of occurrence in commercial and recreational catches: birds mammals turtles, fish and other organisms (on red lists IUCN, EU lists)
2. Metier categories	Biological and fishing activity data should be aggregated but not necessarily sampled by metier	Commercial catches
3. Deep sea species	Deep sea species in EU waters with precise geographical location on haul by haul basis	Commercial catches in union waters for all species and vulnerable organisms of the deep sea
4. Fishing activities	Capacity, effort, landings specifications for data recorded under CR or otherwise	All commercial catches in all areas

What data is collected?

Categories	Types of variables	Sector covered
5. Socio-economic data for fisheries fleet	Different categories of income and of costs, employment, size of the fleet or sector, energy, social indicators	Commercial fisheries fleet (recreational sector covered by ESTAT under tourism for economic activity, under biological data for volume catch)
6. Economic and environmental data for aquaculture	Different categories of income and of costs, employment, size of the fleet or sector, energy, social indicators, environmental performance data	Data not covered by ESTAT (everything but production volume). Data already recorded elsewhere that could serve to evaluate environmental performance. Data on freshwater aquaculture if above a certain threshold
7. Aquaculture segmentation	Different categories of species, techniques and enterprises	The entire sector
8. List of research surveys at sea	List with the names and description of the surveys, time of year, species, life stage, area, number of days at sea	fish stocks-fisheries independent data

Thresholds

- No biological data if <1% landings
- No recreational fisheries if <0.1 % fishing mortality
- Simple methodology socio-economic aquaculture if <1% aquaculture production volume and value.
- Always simplified methodology possible for aquaculture sustainability data.
- No aquaculture sustainability data if < 3% of the production volume and value.
- Aquaculture is voluntary if <1% value for marine and <3 % for freshwater.

Thresholds

- Aquaculture variables: energy inputs (Ecological Energy, Industrial Energy, Feed), chemical discharges (Antibiotics, Antifoulants, Biochemical Oxygen demand, Parasiticides, feed additives, contaminants, veterinary medicines), biological inputs and discharges (escapes and pathogens).
- Participation (physical or financial) in research surveys mandatory if >3% of the total EU landings of the preceding 5 years of a stock or species or the total of species in a multispecies survey or the total of all commercial catches in an fisheries ecosystem survey

II POLICY CONTEXT : the importance of transversal data

Increasing needs for scientific advice that links economic and biological effort data:

Socio-economic evaluations of management plans in EU fisheries.

Full implementation of the conservation measures under CFP: Landing obligations, technical measures, etc.

II Objectives of the workshop

*1) In the context of the future DC MAP, a **proposal of guidance** from this workshop to put forward in STECF (7 March)?*

2) Proposal of changes in relation to transversal data for the economic data call 2017?

3) Operational recommendations based on standards (Zagreb, 2015) and tests +conclusions (Nicosia, 2016)?:

3.1 Standards to be implemented

3.2 the passive gears (focus on the SSCF)

ANNEX 4 – Data file structure and data formats

Preparing the data file for the R script

To the use the R script for calculating effort you need a flat CSV file. Each column has a specific format specification which must be followed for the script to work. The names of the columns must match those described here. It is important that they are lower case.

The R script will check the contents of the columns, make sensible corrections if possible (with warnings), and give errors if there is a problem.

The formatting for the dates and times are strict. This allows the code to be used across multiple data sets. Times are reported as hours and minutes. They are character strings with 4 numeric characters. They have the format: *HHMM*. To assist exporting data from a spreadsheet, it is possible to include a colon to separate the HH and MM. The hours and minutes must each be double digits. If the hour is only a single digit, e.g. '7' in the morning, you must add a '0' in front: '07'. To be clear, an entry of '0745' or '07:45' is acceptable, whereas '745' is not.

Notes for exporting from spreadsheet

If you enter the '0745' into a cell in a spreadsheet, it will probably interpret this to be numeric rather than a character string and the leading 0 will disappear. To avoid this you can separate the HH and MM with a colon.

Sometimes exporting data from a spreadsheet can result in unasked for formatting. For example, if you enter a time as '07:45', Excel may automatically convert it to a different time format (e.g. to '07:45:00 AM'). You can use the *Format* → *Cells* menu to force the formatting to be 'HH:MM'.

The format

Column name	**Description**	**Format**	**Notes**	**Example**
eunr_id	Vessel identifier, anonymous	Character string		DEU123456789
loa	Vessel length in cm	Numeric		3654
gt	Gross tonnage	Numeric		355
kw	Engine power	Numeric		1251
trip_id	Unique identifier for fishing trip	Character string		SWE214_2373
depdate	Date of departure	Character string	Has 8 numeric characters: YYYYMMDD	20140214
deptime	Time of departure	Character string	Has 4 numeric characters: HHMM. HH and MM can be separated with a colon, i.e.	07:45 or 0745

Column name	Description	Format	Notes	Example
			HH:MM or HHMM	
retdate	Date of departure	Character string	Has 8 numeric characters: YYYYMMDD	20140214
rettime	Time of departure	Character string	Has 4 numeric characters: HHMM. HH and MM can be separated with a colon, i.e. HH:MM or HHMM	07:45 or 0745
fishdate	Date of fishing	Character string	Has 8 numeric characters: YYYYMMDD	20140214
gear	Gear used for specific fishing operation	Character string	From the MDR	OTB
gear_mesh_size	Given in mm	Integer	Every mm will be considered as a different gear. For example, 81 will be considered as a different gear to 80. You will need to encode your data so that size ranges have the same integer. For example, set all sizes in range 80-89 to be 80.	80
fishing_area	DCF level 3 (level 4 for Baltic)	Character string	Used for *Days at Sea* calculation.	27.4.b
economic_zone		Character string		
rectangle	Rectangle of fishing operation	Character string	For example, ICES rectangle, or GSA+statistical area. For ICES rectangles there should be no symbols (e.g. ') separating the characters and it should all be in upper case (see the list below).	39F8

ANNEX 5 - Method for calculating Days at Sea and Fishing Days

This document describes the method used to calculate the effort measures *Days at Sea* and *Fishing Days*. The intention is that the method can be implemented on different platforms. An R script has been produced that implements this method.

Fisheries without logbooks or equivalent information are not considered.

Background

A fishing trip has one or more fishing activities on dates (fish dates) in specific areas with specific gears. Inside the data there are three measures of area: rectangle, fishing area and economic zone. These are described below. A combination of these three area measures plus the gear provides a unique identifier for each fishing activity on a particular fishing date. Each gear and area combination can occur more than once in a trip, i.e. there may be multiple fishing dates with the same gear and area combination.

It is necessary to calculate two effort measures: *Days at Sea* and *Fishing Days*. We want the total of these measures for each trip. We also need to calculate the effort for each gear and area combination within a fishing trip, depending on the effort measure, i.e. summing over the fishing dates. *Days at Sea* is reported at the gear, fishing area and economic zone level. *Fishing Days* is reported at the gear, fishing area, rectangle and economic zone level.

The method described here only uses mandatory data to calculate effort, for example, start and return dates of the trips, and the fishing dates. It does not use optional data, such as fishing time, even though using it may result in more accurate estimates of effort. This is because we need a 'one size fits all' method that can be applied identically across data sets. The method described in the WK in Zagreb 2015 (the Zagreb method) requires the use of optional data, for example to determine the start and finish time of individual operations. As we are not using optional data, the method presented here does not exactly match the Zagreb method.

Gear and area definitions

Gear is a combination of gear code from the Master Data Register and the mesh size, i.e. the same gear code with different mesh sizes are considered as different gears. For example, OTB 100 is a different gear to OTB 80.

The area measure *fishing area* means DCF level 3 (DCF level 4 for the Baltic), for example, 27.4.b. The area measure *rectangle* means ICES rectangle or GFCM GSAs + statistical area.

Effort calculation

The total *Days at Sea* of a trip is calculated as the number of commenced 24hr periods from the departure date time. It is based on duration (the difference between the departure and return date and

times), not on calendar days. It is not affected by gear types used in the trip. In pseudocode it can be calculated as:

total Days at Sea = ceiling(trip duration in hours / 24)

The total *Fishing Days* of a trip requires consideration of passive and active gears. The total is the sum of the combined *Fishing Days* from passive and active gears on that trip. Every passive gear on a fishing date*area combination, counts as one *Fishing Day*. For active gears, it is calculated as the number of unique fishing dates with active gears in that trip, i.e. look at the fishing dates which have at least one active gear entry and count the number of unique dates.

For example, a trip with a single fishing date which has two active gears and two passives has a total of three *Fishing Days.* The two passive gears contribute one each. The active gears contribute only one between them.

Calculating *Days at Sea*

As noted above, a fishing trip is made up of a series of gear, area and fishing dates (GAFD). Area is a combination of fishing area, rectangle and economic zone. Within a fishing date, each gear and area combination (GA) is unique. The same GA can occur on multiple fish dates and a fish date can have multiple different GAs. As noted above, when calculating *Days at Sea* passive and active gears are treated the same.

To calculate the *Days at Sea* we assume:

- each trip is a discrete event;
- the total effort of a trip is split equally across fish dates, i.e. each fish date gets the same proportion of the total effort;
- within each fish date, the effort is split equally across the GA combinations on that date.

The basic approach is:

- calculate the total effort for each trip;
- split the total effort between each GAFD;
- sum the effort for each GAFD over the fishing dates, and rectangle (*Days at Sea* is reported at the gear, fishing area, and economic zone level).

To do this, we process each trip separately and calculate the proportion of effort that is attributed to each GAFD. The proportions are then aggregated. One way of approaching it is:

Calculate the proportion of the total effort of the trip attributed to each fishing date within that trip:

FDprop = 1 / (number of unique fishing dates in the trip)

Within each fishing date, calculate the proportion attributed to each GA :

GAprop = 1 / (number of GAs on that fishing date)

The proportion of total trip effort for each GA within a fish date is then:

*GAFDprop = GAprop * FDprop*

The proportions are then aggregated over the gear, fishing area and economic zone (fishing date and rectangle are collapsed). The proportions are then multiplied by the total *Days at Sea* to get the effort.

Calculating *Fishing Days*

As noted above *Fishing Days* need to consider passive and active gears.

As with *Days at Sea*, each fishing date is treated independently. The active and passive gears need to be processed separately. The active gears can be processed in the same way as the *Days at Sea*. All of the active gears on a single fish date have one day of effort split equally between them. Within a fishing date the effort for each active gear is:

GAeffort_active = 1 / (number of active GAs on that fishing date)

Each passive gear on every fishing date gets one day of effort (in effect, each gear is in operation simultaneously with all other passive and active gears).

As Fishing Days is reported at the gear, fishing area, rectangle and economic zone level we only need to sum over fishing dates to get the *Fishing Days* for each gear and area combination. The total Fishing Days[13] is the sum over all gear and area combinations.

Example 1 with only active gears

Here we have a single trip with two fishing dates, two active gears and two areas (rectangle, fishing area and economic zone combinations). There are three different gear and area combinations (GAs), two of which feature on both Fishing Days. (Note other trip information such as departure date is not shown).

As there are 2 fish dates, each day gets 1/2 of the total effort. Within the first fish date there are 3 GA combinations. Each one therefore gets 1/3 of the effort of that date. Within the second fish date there are 2 GA combinations. Each one therefore gets 1/2 of the effort of that date. The resulting proportions for each GAFD is shown in the table:

[13] It is important to remember 'Principle 6' of the basic principles (section 3.1.1). Although the R code (ANNEX 7) calculates and outputs "" which is based on the Fishing Days of a vessel it is only included to support better understanding of the vessels activity when passive gears are deployed in parallel.

GAFD	Fish date	Gear	Area	FDprop	GAprop	GAFDprop
1	Day 1	1	1	0.5	0.33	0.17
2	Day 1	1	2	0.5	0.33	0.17
3	Day 1	2	2	0.5	0.33	0.17
4	Day 2	1	1	0.5	0.5	0.25
5	Day 2	1	2	0.5	0.5	0.25

We then aggregate the proportions of each GAFD, according to the effort measure. Here area is a combination of rectangle, fishing area and economic zone. This is the area measure used for *Fishing Days*. The proportion of the total *Fishing Days* attributed to each GA is then:

Gear	Area	Total proportion for *Fishing Days*	*Fishing Days*
1	1	(0.17 + 0.25) = 0.42	2 * 0.42 = 0.84
1	2	(0.17 + 0.25) = 0.42	2 * 0.42 = 0.84
2	2	0.17	2 * 0.17 = 0.34

If you were calculating *Days at Sea* you would aggregate the proportions over fishing area and economic zone only. The proportions are then multiplied by the total fishing effort to give the effort for each GA, which is what we need.

(Note these proportions will sum to 1 if calculated accurately.)

<u>Example 2 with only active gears</u>

In this simple example we have only one fishing date, four fishing activities and a single gear. Here we explicitly split the area into fishing area and rectangle. Economic zone is the same for all areas and is therefore not shown. All the gears are active so we use the Days at Sea method for both Days at Sea and Fishing Days.

With only one fishing date, all of the total effort for both effort measures is attributed to that day. We have four unique gear and area (rectangle + fishing area) combinations so each one gets a quarter of the effort of the fishing date. The resulting proportion for each GAFD is therefore also a quarter of the total fishing effort.

GAFD	Fish date	Gear	Rectangle	Fishing area	FDprop	GAprop	GAFDprop
1	Day 1	1	1	X	1	0.25	0.25
2	Day 1	1	2	X	1	0.25	0.25
3	Day 1	1	2	X	1	0.25	0.25
4	Day 1	1	1	Y	1	0.25	0.25

We then aggregate the proportions according to the effort measure.

For *Fishing Days* we aggregate over gear, rectangle, fishing area and economic zone (not shown as same for all entries). This gives us four entries (we collapse the fishing dates but we only have one). We have no passive gears so the total *Fishing Day* effort is 1:

Gear	Rectangle	Fishing area	Total proportion for *Fishing Days*	*Fishing Days*
1	1	X	0.25	1 x 0.25 = 0.25
1	2	X	0.25	1 x 0.25 = 0.25
1	3	X	0.25	1 x 0.25 = 0.25
1	4	Y	0.25	1 x 0.25 = 0.25

For *Days at Sea* we aggregate over gear, fishing area and economic zone. This gives us two entries (we collapse the fishing dates and rectangle). We assume that the total effort is one *Day at Sea.*

ANNEX 6 – R-code: Auxilary Functions – Check/correct data formats.

```
# Auxiliary functions

trim <- function (x) {

#Source: http://stackoverflow.com/questions/2261079/how-to-trim-leading-and-trailing-whitespace-in-r

gsub("^\\s+|\\s+$", "", x)
}

substrRight <- function(x, n){
#Source: http://stackoverflow.com/questions/7963898/extracting-the-last-n-characters-from-a-string-in-r

  substr(x, nchar(x)-n+1, nchar(x))
 }

 checks_format<-function(x, correct=FALSE)
{

print("============================")
print(" STECF Transversal2 checks on formats")
print(" v2, 20160308")
print("============================")

      # v2, 20160308 - added additional checks on dates (ret>dep; fishdate in dep-ret interval)
      # v2, 20160308 - added check on uniqueness of trip_id

if (correct==TRUE)
            {
            print("==============================")
            print("WARNING WARNING WARNING WARNING")
            print("correct=TRUE selected => changes other than simple formatting will be made to the dataset")
            print("The changes are doubtful and implemented only for testing purposes")
            print("Correct input data should run with correct=FALSE")
            print("==============================")
            }

      print("initial summary")
      print(summary(x))

      # checks on column names

            print("checking column names...")

            colnames(x)<-tolower(colnames(x))

            if("gear_dimension" %in% colnames(x)) x$gear_dimension<-NULL
```

```
            if("gear_dimensions" %in% colnames(x)) x$gear_dimensions<-NULL
            if("dimension" %in% colnames(x)) x$dimension<-NULL
            if("num_shots" %in% colnames(x)) x$num_shots<-NULL
            if("fishing_time" %in% colnames(x )) x$fishing_time<-NULL
            if("gear_fishing_time" %in% colnames(x)) x$gear_fishing_time<-NULL

            # forcing column names
            colnames(x)<-
c('eunr_id','loa','gt','kw','trip_id','depdate','deptime','retdate','rettime','fish
date','gear','gear_mesh_size','fishing_area','economic_zone','rectangle')

            # eliminating supplementary columns
            if (ncol(x)>15) {x<-x[,1:15]}


            # all there
            test1<-
sum(!c('eunr_id','loa','gt','kw','trip_id','depdate','deptime','retdate','rettime',
'fishdate','gear','gear_mesh_size','fishing_area','economic_zone','rectangle') %in%
colnames(x))
            if(test1>0){

      print(c('eunr_id','loa','gt','kw','trip_id','depdate','deptime','retdate','re
ttime','fishdate','gear','gear_mesh_size','fishing_area','economic_zone','rectangle
')[!c('eunr_id','loa','gt','kw','trip_id','depdate','deptime','retdate','rettime','
fishdate','gear','gear_mesh_size','fishing_area','economic_zone','rectangle') %in%
colnames(x)])

            stop ("missing columns")}

            # other there
            test2<-sum(!colnames(x) %in%
c('eunr_id','loa','gt','kw','trip_id','depdate','deptime','retdate','rettime','fish
date','gear','gear_mesh_size','fishing_area','economic_zone','rectangle'))
            if(test2>0){
            print(colnames(x)[!colnames(x) %in%
c('eunr_id','loa','gt','kw','trip_id','depdate','deptime','retdate','rettime','fish
date','gear','gear_mesh_size','fishing_area','economic_zone','rectangle')])
            stop ("non_necessary columns")}


            # correct order
            test3<-sum(!colnames(x) %in%
c('eunr_id','loa','gt','kw','trip_id','depdate','deptime','retdate','rettime','fish
date','gear','gear_mesh_size','fishing_area','economic_zone','rectangle'))
            if(test3>0){stop ("incorrect order of columns")}


      # checks column formats

            #'eunr_id'
                  # no checks: free field

            # loa
                  # forcing numeric
                  print("checking format of loa...")
```

```
                  x$loa<-as.numeric(as.character(x$loa))
                  test1<-sum(is.na(x$loa))
                  if(test1>0){print ("ATT:loa missing!")}

            # gt
                  # forcing numeric
                  print("checking format of gt...")
                  x$gt<-as.numeric(as.character(x$gt))
                  test1<-sum(is.na(x$gt))
                  if(test1>0){print ("ATT:gt missing!")}

            # kw
                  # forcing numeric
                  print("checking format of kw...")
                  x$kw<-as.numeric(as.character(x$kw))
                  test1<-sum(is.na(x$kw))
                  if(test1>0){print ("ATT:kw missing!")}


            # depdate

                  print("checking depdate...")

                  # convert to character
                        x$depdate<-as.character(x$depdate)
                  # strip symbols
                        x$depdate<-gsub("[^0-9]","", x$depdate)
                  # missing info
                        test1<-sum(is.na(x$depdate))
                        if(test1>0){stop ("missing values in depdate column:
yyyymmdd needed!")}
                  # certify length
                        test1<-sum(!nchar(x$depdate)==8)
                        if(test1>0){stop ("depdate column wrong format: yyyymmdd
needed!")}

            # deptime

                  print("checking deptime...")

                  # convert to character
                        x$deptime<-as.character(x$deptime)
                  # strip symbols
                        x$deptime<-gsub("[^0-9]","", x$deptime)
                  # missing info
                        test1<-sum(is.na(x$deptime))
                        if(test1>0){stop ("missing values in deptime column: hhmm
needed!")}

                  # corrects some cases
                        if(max(nchar(x$deptime))==2)
                        {
                        print("ATT: change in deptime format: numeric(2)->char(4)")
                        x$deptime<-as.character(x$deptime)
                        x$deptime[nchar(x$deptime)==2]<-
paste(x$deptime[nchar(x$deptime)==2],"00", sep="")
```

```
                        x$deptime[nchar(x$deptime)==1]<-
paste(x$deptime[nchar(x$deptime)==1],"00", sep="")
                        }
                        if(max(nchar(x$deptime))==4)
                        {
                        print("ATT: change in deptime format: numeric(4)->char(4)")
                        x$deptime<-as.character(x$deptime)
                        x$deptime[nchar(x$deptime)==3]<-
paste("0",x$deptime[nchar(x$deptime)==3], sep="")
                        x$deptime[nchar(x$deptime)==2]<-
paste("00",x$deptime[nchar(x$deptime)==2], sep="")
                        x$deptime[nchar(x$deptime)==1]<-
paste("000",x$deptime[nchar(x$deptime)==1], sep="")
                        }
                        if(max(nchar(x$deptime))==5)
                        {
                        x$deptime<-as.character(x$deptime)
                        stop ("deptime column wrong format: 5 characters when hhmm
needed!")
                        }
                        if(max(nchar(x$deptime))==6)
                        {
                        print("ATT: change in deptime format: numeric(6)->char(4)")
                        x$deptime<-as.numeric(x$deptime)
                        x$deptime<-x$deptime/100
                        x$deptime<-as.character(x$deptime)
                        x$deptime[nchar(x$deptime)==3]<-
paste("0",x$deptime[nchar(x$deptime)==3], sep="")
                        x$deptime[nchar(x$deptime)==2]<-
paste("00",x$deptime[nchar(x$deptime)==2], sep="")
                        x$deptime[nchar(x$deptime)==1]<-
paste("000",x$deptime[nchar(x$deptime)==1], sep="")
                        }
                        if(max(nchar(x$deptime))>6)
                        {
                        x$deptime<-as.character(x$deptime)
                        stop ("deptime column wrong format: >6 characters when hhmm
needed!")
                        }
                  # certify length
                        test1<-sum(!nchar(x$deptime)==4)
                        if(test1>0){stop ("deptime column wrong format: hhmm need-
ed!")}
                  # check max
                        test1<-sum(as.numeric(x$deptime)>2359)
                        if(test1>0){stop ("deptime too large (>23:59)!")}


            # retdate

                  print("checking retdate...")

                  # convert to character
                        x$retdate<-as.character(x$retdate)
                  # strip symbols
                        x$retdate<-gsub("[^0-9]","", x$retdate)
```

```
                  # missing info
                        test1<-sum(is.na(x$retdate))
                        if(test1>0){stop ("missing values in retdate column:
yyyymmdd needed!")}
                  # certify length
                        test1<-sum(!nchar(x$retdate)==8)
                        if(test1>0){stop ("retdate column wrong format: yyyymmdd
needed!")}


            # rettime

                  print("checking rettime...")

                  # convert to character
                        x$rettime<-as.character(x$rettime)
                  # strip symbols
                        x$rettime<-gsub("[^0-9]","", x$rettime)
                  # missing info
                        test1<-sum(is.na(x$rettime))
                        if(test1>0){stop ("missing values in rettime column: hhmm
needed!")}
                  # corrects some cases
                  if(max(nchar(x$rettime))==2)
                        {
                        print("ATT: change in rettime format: numeric(2)->char(4)")
                        x$rettime<-as.character(x$rettime)
                        x$rettime[nchar(x$rettime)==2]<-
paste(x$rettime[nchar(x$rettime)==2],"00", sep="")
                        x$rettime[nchar(x$rettime)==1]<-
paste(x$rettime[nchar(x$rettime)==1],"00", sep="")
                        }
                  if(max(nchar(x$rettime))==4)
                        {
                        print("ATT: change in rettime format: numeric(4)->char(4)")
                        x$rettime<-as.character(x$rettime)
                        x$rettime[nchar(x$rettime)==3]<-
paste("0",x$rettime[nchar(x$rettime)==3], sep="")
                        x$rettime[nchar(x$rettime)==2]<-
paste("00",x$rettime[nchar(x$rettime)==2], sep="")
                        x$rettime[nchar(x$rettime)==1]<-
paste("000",x$rettime[nchar(x$rettime)==1], sep="")
                        }
                  if(max(nchar(x$rettime))==5)
                        {
                        x$rettime<-as.character(x$rettime)
                        stop ("rettime column wrong format: 5 characters when hhmm
needed!")
                        }
                  if(max(nchar(x$rettime))==6)
                        {
                        print("ATT: change in rettime format: numeric(6)->char(4)")
                        x$rettime<-as.numeric(x$rettime)
                        x$rettime<-x$rettime/100
                        x$rettime<-as.character(x$rettime)
```

```
                        x$rettime[nchar(x$rettime)==3]<-
paste("0",x$rettime[nchar(x$rettime)==3], sep="")
                        x$rettime[nchar(x$rettime)==2]<-
paste("00",x$rettime[nchar(x$rettime)==2], sep="")
                        x$rettime[nchar(x$rettime)==1]<-
paste("000",x$rettime[nchar(x$rettime)==1], sep="")
                        }
                        if(max(nchar(x$rettime))>6)
                        {
                        x$rettime<-as.character(x$rettime)
                        stop ("rettime column wrong format: >6 characters when hhmm
needed!")
                        }
                  # certify length
                        test1<-sum(!nchar(x$rettime)==4)
                        if(test1>0){stop ("rettime column wrong format: hhmm need-
ed!")}

                  # check max
                        test1<-sum(as.numeric(x$rettime)>2359)
                        if(test1>0){stop ("rettime too large (>23:59)!")}


            # fishdate

                  print("checking fishdate...")

                  # convert to character
                        x$fishdate<-as.character(x$fishdate)
                  # strip symbols
                        x$fishdate<-gsub("[^0-9]","", x$fishdate)
                  # certify length
                        test1<-sum(!nchar(x$fishdate)==8)
                        if(test1>0){print ("fishdate column wrong format: yyyymmdd
needed!")
                        print("e.g.:")
                        print(x[test1,][1,])
                        stop ()}

            # additional checks on dates

                  print("additional checks on dates and times...")

                  # depdate/time>=retdate/time
                        test1<-strptime(paste(x$depdate, x$deptime), format="%Y%m%d
%H%M")>=strptime(paste(x$retdate, x$rettime), format="%Y%m%d %H%M")
                        if(sum(test1)>0){stop ("deptime>=rettime:")}
                  # depdate/time>=retdate/time
                        test1<-strptime(paste(x$fishdate), for-
mat="%Y%m%d")<strptime(paste(x$depdate), format="%Y%m%d") |  strp-
time(paste(x$fishdate), format="%Y%m%d")>strptime(paste(x$retdate), for-
mat="%Y%m%d")
                        if(sum(test1)>0){print ("fishdate<depdate OR
fishdate>retdate:")
                        print("e.g.:")
                        print(x[test1,][1,])
```

```
                        stop ()}


            # trip_id [added 08-03-2016]
                  # must be unique
                  print("checking uniqueness of trip_id...")
                  test1<-tapply(paste(x$trip_id, x$depdate, x$deptime, x$retdate,
x$rettime), x$trip_id, function(x){length(unique(x))})
                  if(sum(test1>1)>0){
                        print ("trip_id does not uniquely identify fishing_trip:")
                        print("e.g.:")

      print(unique(x[x$trip_id==names(test1[test1>1])[1],c("eunr_id","trip_id","dep
date","deptime","retdate","rettime")]))
                        stop ()}

            # gear

                  print("checking gear...")

                  gear_list<-c() # the complete list of gears is included in the
electronic version of the code.

                  # convert to character
                        x$gear<-as.character(x$gear)

                  # removes " " at begining or end
                        x$gear<-trim(x$gear)
                        print ("removing space from beginning and end of some gears
(if they exist)")

                  # missing info
                        print(".checking missing info...")
                        test1<-is.na(x$gear) | (!is.na(x$gear) & x$gear %in%
c("NA",""))
                        if(sum(test1)>0){
                              if(correct==TRUE)
                                    {
                                    print(paste("ATT: missing values in gear column
:,", paste(unique(x[test1,"gear"]), collapse=",")))
                                    x[test1,"gear"]<-"UNK"; print(paste("-
>ATT:",sum(test1),"entries (e.g., trip_id ",paste(unique(x[test1,"trip_id"])[1:3],
collapse=";") ,") assumed gear UNK"))
                                    } else {stop ("missing gear in gear column")}

                              }

                  # is in approved list
                        print(".comparing with approved list...")
                        test1<-!x$gear %in% gear_list
                        if(sum(test1)>0){
                              if(correct==TRUE)
                                    {
                                    print(paste("ATT: gear(s) not in list:,",
paste(unique(x[test1,"gear"]), collapse=",")))
```

```
                                    x[test1,"gear"]<-"UNK";
print(paste("ATT:",sum(test1),"entries (e.g.,
trip_id",paste(unique(x[test1,"trip_id"])[1:3], collapse=";") ,") assumed gear
UNK"))
                                    } else {
                                    stop (paste("non allowed gear in gear column:",
paste(unique(x[test1,"gear"]), collapse=",")))
                                    }
                        }


            #     gear_mesh_size

                  print("checking gear_mesh_size...")

                  # checks for NAs
                  print(".checking missing info...")
                  test1<-is.na(x$gear_mesh_size) | (!is.na(x$gear_mesh_size) &
x$gear_mesh_size %in% c("NA",""))
                  if(sum(test1)>0){
                        if(correct==TRUE)
                        {
                        x[test1,"gear_mesh_size"]<-0;
print(paste("ATT:",sum(test1),"entries (", paste(unique(x[test1,c("gear")]), col-
lapse=",") ,") assumed gear_mesh_size 0"))
                        } else {stop ("missing gear_mesh_size in gear_mesh_size
column")}
                  }
                  # converts to numeric
                  print(".converting to numeric...")
                  x$gear_mesh_size<-as.numeric(x$gear_mesh_size)
                  test1<-is.na(x$gear_mesh_size) | (!is.na(x$gear_mesh_size) &
x$gear_mesh_size %in% c("NA",""))
                        if(sum(test1)>0){
                        print(unique(x[test1,c("gear","gear_mesh_size")]))

                        stop ("non numeric gear_mesh_size in gear_mesh_size col-
umn")}

                  # checks decimal places
                  print(".checking for decimal places...")
                  dec<-x$gear_mesh_size%%1
                  test1<- dec>0
                        if(sum(test1)>0){
                                    if(correct==TRUE)
                                    {
                                    print(paste("ATT: decimal places in
mesh_size:,", paste(unique(x[test1,"mesh_size"]), collapse=",")))
                                    x[test1,"mesh_size"]<-
round(x[test1,"mesh_size"],0); print(paste("ATT:",sum(test1),"entries (e.g.,
trip_id",paste(unique(x[test1,"trip_id"])[1:3], collapse=";") ,") rounded to uni-
ty"))
                                    } else { stop ("mesh_size(s) with decimals")}
                              }
```

```
            # fishing_area

                  print("checking fishing_area...")

                  area_list<-toupper(c()) # the complete list of fishing areas is
included in the electronic version of the code.

                  # convert to character
                        x$fishing_area<-toupper(as.character(x$fishing_area))

                  # removes . at end if exists
                        test1<-substrRight(x$fishing_area,1)=="."
                        if(sum(test1)>0){
                        x$fishing_area[test1]<-substr(x$fishing_area[test1], 1,
nchar(x$fishing_area[test1])-1)
                        print ("removing . from end of some areas in fishing_area
column")}

                  # removes " " at begining or end
                        x$fishing_area<-trim(x$fishing_area)
                        print ("removing space from beginning and end of some areas
in fishing_area column (if they exist)")

                  # missing info
                        test1<-is.na(x$fishing_area) | (!is.na(x$fishing_area) &
x$fishing_area %in% c("NA",""))
                        if(sum(test1)>0){
                                    if(correct==TRUE)
                                    {
                                    print(paste("ATT: missing values in fish-
ing_area:,", paste(unique(x[test1,"fishing_area"]), collapse=",")))
                                    x[test1,"fishing_area"]<-"UNK";
print(paste("ATT:",sum(test1),"entries (e.g.,
trip_id",paste(unique(x[test1,"trip_id"])[1:3], collapse=";") ,") assumed fish-
ing_area UNKN"))
                                    } else { stop ("missing area in fishing_area
column")}
                              }
                  # is in approved list
                        test1<-!x$fishing_area %in% area_list
                        if(sum(test1)>0){
                              if(correct==TRUE)
                                    {
                                    print(paste("ATT: fishing_area(s) not in
list:,", paste(unique(x[test1,"fishing_area"]), collapse=",")))
                                    x[test1,"fishing_area"]<-"UNK";
print(paste("ATT:",sum(test1),"entries (e.g.,
trip_id",paste(unique(x[test1,"trip_id"])[1:3], collapse=";") ,") assumed fish-
ing_area UNK"))
                                    } else {
                                    stop (paste("non allowed fishing_area in fish-
ing_area column:", paste(unique(x[test1,"fishing_area"]), collapse=",")))
                                    }
                        }

            # economic_zone
```

```
                print("checking economic_zone...")

                economic_zone_list<-c('EU','NOR','UNKNOWN')

                # convert to character
                      x$economic_zone<-as.character(x$economic_zone)

                # missing info
                      test1<-is.na(x$economic_zone) |(!is.na(x$economic_zone) &
x$economic_zone %in% c("NA",""))
                      if(sum(test1)>0){
                            if (correct==TRUE)
                                  {
                                  x[test1,"economic_zone"]<-"UNK";
print(paste("ATT:",sum(test1),"entries (e.g.,
trip_id",paste(unique(x[test1,"trip_id"][1:3]), collapse=";") ,") assumed econom-
ic_zone UNK"))
                                  } else {stop ("missing econ zone in econom-
ic_zone column")}
                            }
                # is in approved list
                      test1<-!x$economic_zone %in% economic_zone_list
                      if(sum(test1)>0){
                            if(correct==TRUE)
                                  {
                                  print(paste("ATT: economic_zone(s) not in
list:,", paste(unique(x[test1,"economic_zone"]), collapse=",")))
                                  x[test1,"economic_zone"]<-"UNK";
print(paste("ATT:",sum(test1),"entries (e.g.,
trip_id",paste(unique(x[test1,"trip_id"][1:3]), collapse=";") ,") assumed econom-
ic_zone UNK"))
                                  } else {
                                  stop (paste("non allowed econ zone in econom-
ic_zone column:", paste(unique(x[test1,"economic_zone"]), collapse=",")))
                                  }
                      }


          # rectangle

                # wishlist: current code does not ensure that rectan-
gle*area*economic_zone combination. This can be added when table exists

                print("checking rectangle...")

                rectangle_list<-c() #complete list of ICES rectangle is included
in the electronic version of the code.

                # convert to character
                      x$rectangle<-as.character(x$rectangle)

                # missing info
                      print(".checking for missing rectangles...")
                      test1<-is.na(x$rectangle) | (!is.na(x$rectangle) &
x$rectangle %in% c("NA",""))
```

```
                        if(sum(test1)>0){
                        if(correct==TRUE)
                              {
                                    print("ATT: rectangles missing")
                                    x[test1,"rectangle"]<-"99U9";
print(paste("ATT:",sum(test1),"entries (e.g.,
trip_id,",paste(unique(x[test1,"trip_id"])[1:3], collapse=";") ,") assumed rectan-
gle 99U9"))
                                    } else {stop ("missing rectangle in rectangle
column")}
                              }
                  # is in approved list
                        print(".checking rectangles in approved list...")

                        test1<-!x$rectangle %in% rectangle_list
                        if(sum(test1)>0){
                              if(correct==TRUE)
                              {
                                    print(paste("ATT: rectangle(s) not in rectangle
list:", paste(unique(x[test1,"rectangle"]), collapse=",")))
                                    x[test1,"rectangle"]<-"99U9";
print(paste("ATT:",sum(test1),"entries (e.g.,
trip_id,",paste(unique(x[test1,"trip_id"])[1:3], collapse=";") ,") assumed rectan-
gle 99U9"))
                              } else {stop (paste("non allowed rectangle in rectan-
gle column", paste(unique(x[test1,"rectangle"]), collapse=",")))}
                        }



      # checks and corrects for duplicates

            print("checking duplicates...")

                  test1<-duplicated(x)
                  if(sum(test1)>0){
                              if(correct==TRUE)
                              {
                                    print(paste("ATT:",sum(test1),"duplicated en-
tries removed (e.g., in trip_id,",paste(unique(x[test1,"trip_id"])[1:3], col-
lapse=";") ,")"))
                                    x<-x[!test1,]
                              } else {stop (paste("e.g., duplicate(s) in final da-
taset:", sum(test1)))}
                        }

      print("final summary")
      print(summary(x))

      print("============================")
      print("end of routine")
      print("============================")

x
}
```

```
checks_main_values<-function(x)
{

      #27-02-2016 (v2): correction of trip duration calculations
      #27-02-2016 (v2): minor improvement of captions

print("============================")
print(" STECF Transversal2 some checks on column values")
print(" v2, 20160227")
print("============================")

            windows(10,7)
            par(mfrow=c(3,1))
            boxplot (loa~gear, data=unique(x[c("loa","gear","trip_id")]), ylab="loa
of gear*trip_id", varwidth=TRUE)
            boxplot (gt~gear, data=unique(x[c("gt","gear","trip_id")]), ylab="gt of
gear*trip_id", varwidth=TRUE)
            boxplot (kw~gear, data=unique(x[c("kw","gear","trip_id")]), ylab="kw of
gear*trip_id", varwidth=TRUE)
            print("summary loa")
            print(tapply(as.numeric(x$loa), x$gear, summary))
            print("summary gt")
            print(tapply(as.numeric(x$gt), x$gear, summary))
            print("summary kw")
            print(tapply(as.numeric(x$kw), x$gear, summary))

            windows(10,7)
            par(mfrow=c(3,1))
            boxplot (as.numeric(depdate)~gear, da-
ta=unique(x[c("depdate","gear","trip_id")]), ylab="depdate of gear*trip_id", var-
width=TRUE, las=2, cex.axis=0.7)
            boxplot (as.numeric(retdate)~gear, da-
ta=unique(x[c("retdate","gear","trip_id")]), ylab="retdate of gear*trip_id", var-
width=TRUE, las=2, cex.axis=0.7)
            x$trip_dur_days<-
dif-
ftime(strptime(df2$retdate,format="%Y%m%d"),strptime(df2$depdate,format="%Y%m%d"),
units="days")+1
            boxplot (as.numeric(trip_dur_days)~gear, da-
ta=unique(x[c("trip_dur_days","gear","trip_id")]), ylab="trip_dur_days of trip_id",
varwidth=TRUE)
            print("summary depdate")
            summary(as.numeric(x$depdate))
            print("summary retdate")
            summary(as.numeric(x$retdate))
            print("gear entries:")
            print(table(x$gear))
            print("gear vs mesh_size entries:")
            print(table(x$gear, x$gear_mesh_size))
            print("fishing_area vs economic_zone entries:")
            print(table(x$fishing_area, x$economic_zone))
            print("rectangle vs fishing_area entries:")
            print(table(x$rectangle, x$fishing_area))
            print("rectangle vs economic_zone entries:")
            print(table(x$rectangle, x$economic_zone))
```

```
            print("fishing_area vs rectangle entries:")
            print(table(x$fishing_area, x$rectangle))

print("============================")
print("end of routine")
print("============================")

}
```

ANNEX 7 – R-code to calculate Days at Sea (das) and Fishing Days (fdas)

```
DaS_Calculator <- function(filename) {

  # Read in file
  mainTab <- read.table(filename, sep = ",", as.is = TRUE, header = TRUE, col-
Classes = c("deptime" = "character", "rettime" = "character"))

  cat("\n")

  cat("Welcome to the wonderful world of days at sea calculation, sit back and en-
joy the ride \n")

  cat("-------------------------------------------------------------------------
--------------- \n")

  # Vector of passive gears
  pas.gears <-
c("LNP","LNB","LNS","LN","FCN","FG","GNS","GND","GNC","GNF","GTR","GTN","GEN","GN",
"FPN","FPO","FYK","FSN","FWR","FAR","FIX","HAR","LHP","LHM","LLS","LLD","LL","LTL",
"LX")

  # Define whether gear is passive or not
  mainTab$is_gear_pas[mainTab$gear %in% pas.gears] <- "Y"
  mainTab$is_gear_pas[! (mainTab$gear %in% pas.gears)] <- "N"

  # Create variables of date/time class
  mainTab$voy_start <- strptime(paste(as.character(mainTab$depdate),
as.character(mainTab$deptime), sep = " "), format = "%Y%m%d %H%M")
  mainTab$voy_end <- strptime(paste(as.character(mainTab$retdate),
as.character(mainTab$rettime), sep = " "), format = "%Y%m%d %H%M")

  # Extract each unique trip with voyage start and end date/time data
  tot.days.by.trip.id <- mainTab[! duplicated(mainTab$trip_id),
which(names(mainTab) %in% c("eunr_id", "trip_id", "voy_start", "voy_end"))]

  # Calculate the days at sea based on commenced 24 hour periods rounded up
  tot.days.by.trip.id$tot_days <- ceil-
ing(as.numeric(difftime(tot.days.by.trip.id$voy_end, tot.days.by.trip.id$voy_start,
units = "hours") / 24))

  # Add ID to main table based on combination of fishdate and trip_id
  mainTab$fishdate_id <- paste(mainTab$fishdate, mainTab$trip_id, sep = "_")

  # Count the number of times a fishdate is repeated per trip
  unique.date.counts <- setNames(as.data.frame(table(mainTab$fishdate_id), string-
sAsFactors = FALSE), c("fishdate_id", "no_of_fishdates"))
  unique.date.counts$trip_id <- substr(unique.date.counts$fishdate_id, 10,
nchar(unique.date.counts$fishdate_id))

  # Count the total number of unique fishdates in a trip
  tot.unique.days.by.trip <- set-
Names(as.data.frame(table(unique.date.counts$trip_id)), c("trip_id",
"tot_fishdays"))
```

```
  # Calculate the proportion of the trip that each whole day should be allocated
  tot.unique.days.by.trip$divider <- 1 / tot.unique.days.by.trip$tot_fishdays

  # Merge data frames
  allocate.weighting <- merge(unique.date.counts[, c("fishdate_id", "trip_id",
"no_of_fishdates")], tot.unique.days.by.trip[, c("divider", "trip_id",
"tot_fishdays")], by = "trip_id")

  # Calculate the proportion that each fishdate should be allocated, e.g. if a
fishdate is repeated twice in a trip that days allocation would be halved
  allocate.weighting$proportion <-  allocate.weighting$divider / allo-
cate.weighting$no_of_fishdates

  # Merge data frames
  weighted.das <- merge(allocate.weighting, tot.days.by.trip.id[, c("tot_days",
"trip_id")], by = "trip_id")

  # Multiply the total days at sea by the calculated proportion
  weighted.das$das <- weighted.das$tot_days * weighted.das$proportion

  mainTab <- merge(mainTab, weighted.das[, c("fishdate_id","tot_fishdays","das")],
by = "fishdate_id")

  # Subset mainTab into active gears and passive gears for calculating fishing days
  activeTab <- mainTab[mainTab$is_gear_pas == "N", ]
  passiveTab <- mainTab[mainTab$is_gear_pas == "Y", ]

  # Count the number of times a fishdate is repeated per trip
  unique.date.counts.a <- setNames(as.data.frame(table(activeTab$fishdate_id),
stringsAsFactors = FALSE), c("fishdate_id", "no_of_fishdates"))
  unique.date.counts.a$trip_id <- substr(unique.date.counts.a$fishdate_id, 10,
nchar(unique.date.counts.a$fishdate_id))
  unique.date.counts.p <- setNames(as.data.frame(table(passiveTab$fishdate_id),
stringsAsFactors = FALSE), c("fishdate_id", "no_of_fishdates"))
  unique.date.counts.p$trip_id <- substr(unique.date.counts.p$fishdate_id, 10,
nchar(unique.date.counts.p$fishdate_id))

  # Count the total number of unique fishdates in a trip
  tot.unique.days.by.trip.a <- set-
Names(as.data.frame(table(unique.date.counts.a$trip_id)), c("trip_id",
"tot_fishdays"))
  tot.unique.days.by.trip.p <- set-
Names(as.data.frame(table(unique.date.counts.p$trip_id)), c("trip_id",
"tot_fishdays"))

  # Calculate the proportion of the trip that each whole day should be allocated
  tot.unique.days.by.trip.a$divider <- 1 / tot.unique.days.by.trip.a$tot_fishdays
  tot.unique.days.by.trip.p$divider <- 1 / tot.unique.days.by.trip.p$tot_fishdays

  # Merge data frames
  allocate.weighting.a <- merge(unique.date.counts.a[, c("fishdate_id", "trip_id",
"no_of_fishdates")], tot.unique.days.by.trip.a[, c("divider", "trip_id",
"tot_fishdays")], by = "trip_id")
```

```
  allocate.weighting.p <- merge(unique.date.counts.p[, c("fishdate_id", "trip_id",
"no_of_fishdates")], tot.unique.days.by.trip.p[, c("divider", "trip_id",
"tot_fishdays")], by = "trip_id")

  # Calculate the proportion that each fishdate should be allocated, e.g. if a
fishdate is repeated twice in a trip that days allocation would be halved
  allocate.weighting.a$proportion <-  allocate.weighting.a$divider / allo-
cate.weighting.a$no_of_fishdates

  # Calculate fishing days for active gears
  allocate.weighting.a$fdas <- allocate.weighting.a$tot_fishdays * allo-
cate.weighting.a$proportion

  # Calculate fishing days for passive gears
  allocate.weighting.p$fdas <- allocate.weighting.p$tot_fishdays * allo-
cate.weighting.p$divider

  activeTab <- merge(activeTab, allocate.weighting.a[, c("fishdate_id", "fdas")],
by = "fishdate_id")

  passiveTab <- merge(passiveTab, allocate.weighting.p[,c("fishdate_id", "fdas")],
by = "fishdate_id")

  mainTab <- rbind(activeTab, passiveTab)

  mainTab

}
```

ANNEX 8 – Example of final output from effort calculation from R-code

fishdate_id	X	eunr_id	loa	gt	kw	trip_id	depdate	deptime	retdate	rettime	fishdate	gear	gear_mes	fishing_area	economic_zone	rectangle	is_gear_pas	voy_start	voy_end	tot_fishdays	das	fdas
20140102_119259	3	BEL7634	3780	390	1200	119259	20140101	1630	20140103	1800	20140102	TBB	79	27.7.D	EU	30F0	N	01/01/2014 16:30	03/01/2014 18:00	2	1.5	1
20140102_119279	6	BEL6760	3822	384	1200	119279	20140102	400	20140104	2000	20140102	SSC	79	27.7.D	EU	29F0	N	02/01/2014 04:00	04/01/2014 20:00	3	1	1
20140102_119358	9	BEL7249	2594	207	1048	119358	20140102	1110	20140104	1055	20140102	OTB	79	27.4.C	EU	32F1	N	02/01/2014 11:10	04/01/2014 10:55	3	0.66667	1
20140102_119395	22	BEL6680	3789	385	959	119395	20140102	1200	20140112	1215	20140102	TBB	79	27.4.C	EU	33F2	N	02/01/2014 12:00	12/01/2014 12:15	11	1	1
20140102_119401	39	BEL7189	3778	388	1181	119401	20140102	1145	20140107	1030	20140102	TBB	79	27.4.C	EU	32F2	N	02/01/2014 11:45	07/01/2014 10:30	6	0.83333	1
20140102_119402	44	BEL7121	3720	275	1122	119402	20140102	1140	20140105	925	20140102	TBB	79	27.4.C	EU	32F2	N	02/01/2014 11:40	05/01/2014 09:25	4	0.75	1
20140102_119403	51	BEL7510	3429	234	706	119403	20140102	1500	20140105	1450	20140102	TBB	79	27.4.C	EU	31F1	N	02/01/2014 15:00	05/01/2014 14:50	4	0.75	1
20140102_119408	61	BEL7151	3783	388	706	119408	20140101	2300	20140105	2200	20140102	TBB	79	27.4.C	EU	33F2	N	01/01/2014 23:00	05/01/2014 22:00	4	1	1
20140102_119416	71	BEL6280	3781	385	1200	119416	20140102	1150	20140105	1145	20140102	TBB	79	27.4.C	EU	31F2	N	02/01/2014 11:50	05/01/2014 11:45	4	0.75	1
20140102_119417	78	BEL7120	3367	273	1200	119417	20140102	945	20140107	940	20140102	TBB	79	27.4.C	EU	34F2	N	02/01/2014 09:45	07/01/2014 09:40	6	0.83333	1
20140102_119419	82	BEL7635	3307	264	1200	119419	20140102	1145	20140105	2140	20140102	TBB	79	27.4.C	EU	31F2	N	02/01/2014 11:45	05/01/2014 21:40	4	1	1
20140102_119422	89	BEL5797	3611	351	1178	119422	20140102	1100	20140105	1020	20140102	TBB	79	27.4.C	EU	32F2	N	02/01/2014 11:00	05/01/2014 10:20	4	0.75	1
20140102_119424	94	BEL7633	3796	388	1200	119424	20140102	1150	20140105	1145	20140102	TBB	79	27.4.C	EU	31F2	N	02/01/2014 11:50	05/01/2014 11:45	4	0.75	1
20140102_119459	121	BEL7210	2393	126	221	119459	20140102	1100	20140105	1900	20140102	TBB	79	27.7.D	EU	30F1	N	02/01/2014 11:00	05/01/2014 19:00	4	1	1
20140102_119480	134	BEL7631	2382	69	221	119480	20140102	115	20140105	2215	20140102	TBB	79	27.7.D	EU	30F1	N	02/01/2014 01:15	05/01/2014 22:15	4	1	1
20140102_119483	136	BEL7389	2394	130	221	119483	20140102	200	20140104	1500	20140102	TBB	79	27.7.D	EU	30F1	N	02/01/2014 02:00	04/01/2014 15:00	3	1	1

ANNEX 9 – Summary results of effort calculation

MS1	DRB		GNS		GTR		OTB		SDN		SSC		TBB	
	das	fdas	das	fdas	das	fdas	das	fdas	das	fdas	das	fdas	das	fdas
27.4.B			7	6			106	84					24	22
27.4.C			30	30			72	72			1	1	501	753
27.7.A													16	15
27.7.D	118	117			0	18	1	1	4	4	95	91	1744	1740
27.7.E	4	4									2	1	30	28
27.7.F							1	1					429	408
27.7.G							46	36					113	106
27.7.H													4	4
Total	**122**	**121**	**37**	**36**	**0**	**18**	**226**	**194**	**4**	**4**	**98**	**93**	**2861**	**3074**

MS6	GNS		OTB		OTM		PTM	
	das	fdas	das	fdas	das	fdas	das	fdas
27.3.D.25			1	1				
27.3.D.26	174	198	67	54	41	36		
27.3.D.28					18	16	55	14
27.3.D.29					16	12		
27.6.A					2	1		
27.7.B					8	5		
47.1.3					40	2		
Total	**174**	**198**	**68**	**55**	**125**	**72**	**55**	**14**

MS7	FPO		GNS		GTR		LA		LLD		LLS		LTL		OTB		PS		SV	
	das	fdas	das	fdas	das	fdas	das	fdas	das	fdas	das	fdas	das	fdas	das	fdas	das	fdas	das	fdas
37.1.1									4	2										
37.2.2	1	1	1	1	1	1	9	6	484	431	71	73	1	1	79	39	0	1	1	1
37.3.1									20	1										
UNK									4	2										
Total	**1**	**1**	**1**	**1**	**1**	**1**	**9**	**6**	**511**	**436**	**71**	**73**	**1**	**1**	**79**	**39**	**0**	**1**	**1**	**1**

MS5	DRB		FPO		GNS		GTR		LHP		LLD		LLS		OTB		PS		SV		TB	
	das	fdas	das	fdas	das	fdas	das	fdas	das	fdas	das	fdas	das	fdas	das	fdas	das	fdas	das	fdas	das	fdas
37.2.1	428	422	83	71	216	234	913	861	21	21	9	10	149	150	5187	5230	2041	2404	287	272	32	41

MS10	GEN		OTT		DRB		FPO		GN		GNC		GND		GNS		GTR		HMD		LHP		LL	
	das	fdas	das	fdas	das	fdas	das	fdas	das	fdas	das	fdas	das	fdas	das	fdas	das	fdas	das	fdas	das	fdas	das	fdas
27.2.A																								
27.2.B			24	17																				
27.4.A			749	642	306	261	3232	1532													20	20	6	4
27.4.B			418	369	109	78	4058	2680	52	45					15	2	8	8	257	242			15	15
27.4.C			73	73			788	450	91	90			50	50	22	22	53	55	91	91			74	74
27.6.A			764	662	988	782	8524	2675											58	40			65	44
27.6.B									44	26														
27.7.A	2	2	1	1	141	117	1949	429	16	16			6	6					1287	1183				
27.7.B																								
27.7.C																								

MS10	GEN		OTT		DRB		FPO		GN		GNC		GND		GNS		GTR		HMD		LHP		LL	
	das	fdas	das	fdas	das	fdas	das	fdas	das	fdas	das	fdas	das	fdas	das	fdas	das	fdas	das	fdas	das	fdas	das	fdas
27.7.D	7	7	1	1			890	735	505	513			113	113	16	16	325	336	715	693				
27.7.E	103	103	201	199			901	881	626	631	18	18	118	118	249	238	18	16	290	290	134	136		
27.7.F	26	26	22	21			246	238	128	126	22	21	8	8	51	43			8	9	63	63	1	1
27.7.G							69	69	22	18					65	47	2	1	4	4				
27.7.H			1	1											78	68								
27.7.J															136	106							18	12
27.7.K									36	24					96	78								
27.8.A															59	49								
27.8.B															14	11								
27.8.C															1	1								
27.8.D															55	46								
27.9.A																								
UNK																								
Total	**138**	**138**	**2254**	**1986**	**1543**	**1237**	**20656**	**9689**	**1520**	**1489**	**40**	**39**	**295**	**295**	**855**	**727**	**405**	**416**	**2710**	**2552**	**217**	**219**	**179**	**150**

MS10(cont)	LLD		LLS		LX		MIS		OT		OTB		OTM		PT		PTB		PTM		SSC		TB		TBB		TBN		UNK	
	das	fdas	das	fdas	das	fdas	das	fdas	das	fdas	das	fdas	das	fdas	das	fdas	das	fdas	das	fdas	das	fdas	das	fdas	das	fdas	das	fdas	das	fdas
27.2.A											28	20	4	4																
27.2.B											35	28																		
27.4.A			72	45			36	16			2392	1693	40	36	18	14	492	408			275	232	37	31			187	144	582	91
27.4.B									223	215	1590	1359	9	8			5	5			2	2	34	31	264	240	1288	1250	107	2
27.4.C					1	1			76	74	10	8	12	12			1	1	40	38	2	2			503	474				
27.6.A			48	28			17	12	5	4	2872	2322	367	170			45	38	28	10			31	23			539	491	754	300
27.6.B											22	15																		

MS10(cont)	LLD		LLS		LX		MIS		OT		OTB		OTM		PT		PTB		PTM		SSC		TB		TBB		TBN		UNK	
	das	fdas	das	fdas	das	fdas	das	fdas	das	fdas	das	fdas	das	fdas	das	fdas	das	fdas	das	fdas	das	fdas	das	fdas	das	fdas	das	fdas	das	fdas
27.7.A					7	7			2	2	171	160	2	2			1	1									640	614	15	3
27.7.B											13	11	52	33							3	2								
27.7.C											36	31																		
27.7.D					12	12			206	207	2	2	5	4					32	15	139	132			48	49				
27.7.E					9	9			1094	1024	81	56	71	71					26	4	1	1			786	725			2	2
27.7.F									46	43															79	74				
27.7.G									2	1	26	20									1	1			4	3				
27.7.H			6	1							74	58							3	1					198	165				
27.7.J			5	4			1	1			341	276	58	21					9	2										
27.7.K											14	11	8	2																
27.8.A																														
27.8.B																														
27.8.C													1	1																
27.8.D																														
27.9.A													1	1																
UNK	257	216									82	53																		
Total	**257**	**216**	**131**	**78**	**29**	**29**	**54**	**28**	**1654**	**1569**	**7788**	**6120**	**627**	**363**	**18**	**14**	**544**	**452**	**138**	**69**	**423**	**371**	**102**	**85**	**1882**	**1730**	**2654**	**2499**	**1460**	**398**

ANNEX 10 – Summary of the recommendation on Code Lists produced during the Zagreb Workshop.

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. • 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

Code list	Recommendation
	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.

ANNEX 11 – Fishing Areas (relationship between codes used in Economic and Effort/Med&BS data calls – Result from Zagreb WS)

Effort/Med data call/ database	Economic data call/database		
code	Supra Region	FAO Area Codes	Area description
-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

Effort/Med data call/ database	Economic data call/database		
code	Supra Region	FAO Area Codes	Area description
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
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

Effort/Med data call/ database	Economic data call/database		
code	Supra Region	FAO Area Codes	Area description
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
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 12 – Vessel Overall length (relationship between codes used in Economic and Effort/Med&BS data calls – Result from Zagreb WS - LOA Classes)

Effort data calls should align with DCF classes.

Area	LOA economic (DCF)	LOA effort
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 13 – Fishing Gears (relationship between codes used in Economic and Effort/Med&BS data calls – Result from Zagreb WS)

Gear classes	Description	Economic data call		Effort data call	
		Gear code	fishing_tech	Gear code	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 14 – Country Codes (relationship between codes used in Economic and Effort/Med&BS data calls – Result from Zagreb WS)

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

Master Data Register		Economic data call		Effort data call	
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 15 – Names Variables and acronyms (for the groups Capacity, Effort, Landing) relationship between codes used in Economic and Effort/Med&BS data calls – Result from Zagreb WS

	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	tottrips

	Effort data call		Economic data call			
	Acronym	**Description**	**Acronym**	**Unit**	**Description**	**Suggested Acronym**
					trips	
	NA		MaxSeaDays	DAYS	Max Days at Sea	maxdaysatsea
	NA		totEnerCons	LITRES	Energy Consumption	totenercons
	NA		totValLandg	EURO	Value of landings per species	totvallandg
	NA		totWghtCatch	KG	Total weight of catches per species (SAL, COD, ELE)	totwghtcatch

ANNEX 16 – Codes descriptions for data calls (relationship between codes used in Economic and Effort/Med&BS data calls – Result from Zagreb WS)

	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
	VES-SEL_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
	-	-	GEAR TYPE	Appendix IV, Level 4	geartype	Appendix IV, Level 4
	NA	NA	FISHING TECH-NIQUE	Appendix III, gears accord-ing to the JRC code list	fishingtech-nique	Appendix III, gears according to the JRC code list
	MESH_SIZE_RA NGE	mesh size accord-ing 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 (AR-EA27, AR-EA37, 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 condi-tions 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 reg-ulated gears as de-fined in COUNCIL REGULATION (EC) No 1098/2007, NONGEAR -in case regulated gears were never used
	AREA	the code accord-ing CR 1098/2007, "A","B","C" (Only for the Baltic Sea)	NA		area	areas in accordance with definitions of COUNCIL REGULA-TION (EC) No 1098/2007 (A,B or AB)

	Effort data call		Economic data call		Suggested Acronym	Suggested Description
	Acronym	**Description**	**Acronym**	**Description**		
	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

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