MINISTRY OF RURAL DEVELOPMENT AND FOOD
DIRECTORATE GENERAL FOR FISHERIES
HELLENIC AGRICULTURAL ORGANISATION-DEMETER

Council Regulation (EC) No 199/2008 of 25 February 2008

concerning the establishment of a Community framework for the collection, management and use of data in the fisheries sector and support for scientific advice regarding the Common Fisheries Policy

Commission Regulation (EC) No 665/2008 of 14 July 2008

laying down detailed rules for the application of Council Regulation (EC) No 199/2008

Commission Implementing Decision (EU) 2016/1251 of 12 July 2016 adopting a multiannual Union programme for the collection, management and use of data in the fisheries and aquaculture sectors for the period 2017-2019

GREECE

Work Plan for data collection in the fisheries and aquaculture sectors

2017-2019

Version 1 – 2016

Kavala, Greece 2016

NATIONAL DATA COLLECTION ORGANIZATION

The Data Collection Programme is co-ordinated by the General Directorate of Sustainable Fisheries, Ministry of Rural Development and Food, under the national correspondent Dr.Apostolos Karagiannakos, whose contact details are:

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The Data Collection Programme for Greece is carried out by two partners, the Hellenic Agricultural Organization – Demeter (HAO-DEMETER) that is the project's Scientific Co-ordinator and the Hellenic Centre for Marine Research (H.C.M.R.). Two institutes from each partner contribute to the realization of the NP. Specifically, from the HAO-DEMETER participates the Fisheries Research Institute (F.R.I) and the Agricultural Economics Research Institute (AGR.E.R.I). The FRI is a semi state marine research organisation responsible for collection of scientific data on the fisheries sector in North and Central Aegean Sea, on eel on processing and aquaculture industry. The AGR.E.R.I is also a semi state research organisation responsible for collection and evaluation of economic data on the fisheries sector. From H.C.M.R. participates the Institute of Marine Biological Resources & Inland Waters of Athens (I.M.B.R.I.W-Athens) and the Institute of Marine Biological Resources & Inland Waters of Crete (I.M.B.R.I.W-Crete). The I.M.B.R.I.W is a semi state marine research organisation responsible for the collection of scientific data on the fisheries sector in South Aegean Sea, Ionian Sea and Cretan Sea. The database where all data including socio-economic, will be stored will be held and stored at the premises of the Ministry of Rural Development and Food. Moreover a web page on Data Collection Programme for Greece, will be developed under the premises of the Ministry of Rural Development and Food.

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CONTENTS

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

General comment: This Box fulfills paragraph 4 of Chapter V of the multi-annual Union programme and Article 2 and Article 4 paragraph (3) point (a) of this Decision.

1. Aim of pilot study

The recreational fishery is a popular activity with great economic and social value in Greece. The legal framework for the collection of catch data from the recreational fishery of the EU Member States is governedby the Regulation (EC) No. 199/2008, Decision 2008/949/EU and Ministerial Decision 5632/104626/2015.Greece has the obligation to report data for eel, elasmobranchs and highly migratory species (ICCAT Convention). However, the recreational fisheriesof eel, bluefin tuna, albacore, swordfish and a certain number of elasmobranch species is prohibited while data for the rest are either not existent or not recorded since the recreational fishing activity is not monitored in the country and no licensing system exists.

In order to plan comprehensive and solid future actions relating to the monitoring of recreational fisheries, a pilot study is proposed so that to estimate as accurately as possible a number of parameters relating to recreational fishermen and their catches in Greece. The primary objectives of the pilot study will be: a) to determine the number of recreational fishermen resident in Greece b) to monitor their fishing activity c) to collect detailed data on the nature and biology of their catches. The study will cover all types of recreational fisheriesin Greece.

2. Duration of pilot study

The duration of the pilot study will be three years and will be implemented in two phases. During the first phase a screening survey will be conducted. It will start the first months of 2017 and will last until the end the year. During the screening survey, the number of recreational fishermen and their demographics will be determined.

Effort will be made so as the results of the first phase of the survey to be presented in the 2017 RCM MED & BS-LP meeting in order to define the next steps of the project.During the first phase of the project, it is expected that data will be gathered by a sufficient number of fishermen, who will have the willingness to cooperate on a voluntary basis with the researchers also for the second phase ofthe study, which will be a 12 month diary survey. The result of the pilot study will be implemented during the 3rd year of the NWP.

In order for the survey to be representative, a sufficient random sample of fishermen will be chosen from all fishing activities (boat, coast and spear fishing). This phase of the project will begin in the first months of 2018 aiming at a detailed monitoring of fishing activity as well as a number of biological parameters of their catch through regular contact (monthly) between the researchers and the participants. A small-scale "on-site"sampling program will be conducted in parallel for collecting additional independent data on catches, size and composition of fish caught by recreational fishermen.

3. Methodology and expected outcomes of pilot study

Screening survey

The screening survey will be done through a telephone/online survey by a commercial company, which will use an ad hoc questionnaire addressed to the households from its database since it is possible for every household to have more than one recreational fishermen. This research will be developed in the way described in Figure 1. The questionnaire's questions will be short and simple (Annex 1).
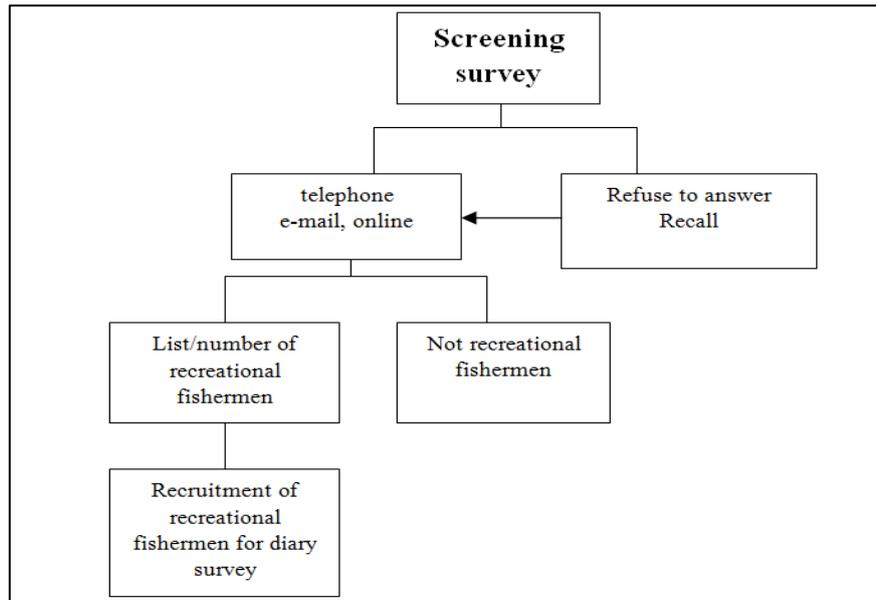
Figure 1. Screening survey.The questionnaire was designed in order to maximize response rates and get the minimum information required to determine the eligibility of the respondent for the more detailed diary research that will follow.

The data collected from the survey will be used for the estimation of the average number of fishermen in each household during the last 12 months. These estimates will be used in combination with the available data of national census in order to assess the total number of inhabitants of the country engaged in recreational fishing.

The demographics such as age, sex, education level, employment status and place of residence will be checked by the company to ensure that they do not deviate from the demographics of the general population.

Respondents will be asked to answer if they have gone for fishing during the last twelve months (2016) and where, what tools were used, how many trips/days/hours were done in 2016 (so to determine the level of fishing activity which species they caught and if they would be interested to participate in a diary survey to record more detailed and quantitative data during the forthcoming months.(Annex 1)

Diary Survey

Participants for the diary survey will be chosen based on the analysis of demographic data, the fishing activityin order to form a representative sample of recreational fishermen in the country. They will report on a monthly basis the data recorded in their diaries in relation to their fishing trips such as information about the location of fishing, fishing gears used, catches (species, number, weight), if they detained or released the catch, the reason for the release.

On site sampling

Onsite sampling will be carried out in parallel with the diary survey. FRI collaborators will record biological data from three selected sites/ports in order to record in situ both activities (boat, coast and spear fishing) and catches (species, numbers and weight) in order to validate the reliability of the data reported to diaries. Integration of self-reporting tools with independent monitoring tools (such as onsite sampling programmes) allows for cross-checking and audit of self-reported data and also increases incentives within the recreational fishery community to provide accurate self-reported data.

Upon completion of the pilot study the number of active recreational fishermen both in marine and fresh waters and critical qualitative and quantitative data on recreational fishing in Greece will be identified and evaluated for the first time.

(max 900 words)

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

General comment: This Box fulfills paragraph 2 points (b) and (c) of Chapter III of the multi-annual Union programme and Article 2 of this Decision.

Method selected for collecting data.

For the three EMUs, where eel populations exist in Greece (EMU 1, EMU 2 and EMU 3), biological data (length, age, weight, sex ratio) on silver eels populations will be collected, during their spawning migration at the end of the year. The capture of silver eels is done in permanent installed fishing devises in the entrance of the lagoons that are operated by Fishing co-operatives, and they are considered as the most important habitats for the eels.

As for the non-commercial part of the population (glass and yellow eels), during the first year of the project a pilot study will be implemented on allEMUs, where eel populations exist. The study will be implemented in lagoons in one river basin, in each of the EMUs. In EMU 1 the study will take place in the lagoons Tsoukalio - Logarou of the Louros River Basin, in EMU2 in the lagoons Tholi-Prokopanissos of the Axeloos River Basin. Finally, in EMU 3 it will take place in the estuarine system of Vistonida.

The main scope of the pilot study is to standardize the methodology that will be used the following years regarding the stock of glass and yellow eel. The capture of the glass eels will be performed using traps made specifically for this purpose, while for the yellow eels, fyke nets are the gear of preference.

In the following years, (second and third of the National Project) the outcomes of the pilot study, i.e. best fishing gear for glass and yellow eel capture, problems raised during the implementation of the pilot study, solutions used to overcome these problems, will be taken into account in order to provide the first data on glass eel recruitement and yellow eel abundance for the Greek population of the species *Anguilla anguilla*.

The pilot study will be implemented by the Hellenich Fisheries Research Institute with the collaboration of the Departments of Biology in the Universities of Patra and Ioannina, where eel populations exist.

(max 250 words per Area)

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

General comment: This Box fulfills paragraph 3 point (c) of Chapter III of the multi-annual Union programme and Article 2 and Article 4 paragraph (3) point (b) of this Decision.

1. Aim of pilot study

As it is stressed out in MARE/2014/19 project,the control and observation of Protected, Endangered & Threatened (PET) species' incidental by-catches only at the landing sites are ineffective methods of recording them These species are usually released alive or are discarded dead by fishermen at sea. Additionally, under-sized species are not recorded or reported by fishermen, and if they have a commercial value they are being marketed. Therefore a pilot study is proposed,aimingto measure and monitor the fisheries' impacton the marine ecosystem.

2. Duration of pilot study

Greece has designed a sampling program of data collection on fisheries impacts on the Ecosystem for the period 2017-2019 with which is going to monitor all fishery sectors for incidental by-catches of PET and/or otherwise protected species in GSAs 20, 22 & 23.

3. Methodology and expected outcomes of pilot study

Greece has used the results of MARE project in order to design a survey in a way to ensure that all samples and sub-samples are properly randomized, spatial and temporal stratified, and sufficiently replicated for reasonable precision levels.

The sampling for incidental catches will be done by the observers on-board that are allocated to the collection of biological data, in order to be done in a representative way that will allow robust estimates of the actual mortality rate of vulnerable species caused by fishing operations. The sampling will follow the standard data collection procedures and protocols. Additionally three new protocols, each dedicated to specific marine organisms category, namely fish, sharks & rays (Protocol 1), Cetaceans (Protocol 2) and turtles (Protocol 3) will be used, where more detailed information regarding these by-catches will be recorded. Wherever it is feasible, by-catch specimens will be retained in order to record their biological parameters.

This concurrent sampling will keep the cost and the inconvenience to the fishermen at acceptable levels, maintaining also the reliability and representativeness of the collected data at high levels. The information of on board sampling will be cross checked with information from fishermen regarding the incidental by-catch of PET species during the period in-between two board samplings.

On a quarterly basis, a capture rate will be calculated dividing the number of specimens caught during the observations on board by the number of observed days at sea. For each species, the total number of specimens caught by quarter will be estimated with extrapolation of the quarterly capture rate to the total number of fishing days that performed in each quarter.

A similar procedure will be used to process the reported data: for each vessel that monitored and for each species, a quarterly capture rate per vessel will be calculated by dividing the total number of specimens caught with the number of days performed at sea. From this information, an average capture rate will be estimated by quarter (with confidence intervals). These capture rates will be extrapolated to the total number of fishing days performed in each quarter to estimate the total number of specimens caught by quarter and species (with

confidence intervals).

The preliminary results of 2017 data collection of incidental catches will be evaluated during RCM Med&BS 2017 and a list of metiersimportant for incidental catches will be prepared and agreed.The RCM is then expected to select the metierswhich will be sampled through the pilot studies in the following years. Based on the selected metiers, starting from 2018, Greece will perform onboard observations for those métiers which are deemed important for incidental by-catch of PETs.

Relevant material with species identification guidelines will be provided together with data sheets in order to aid fleet observers and the fishermen in accurately identifying the species that are caught and correctly filling in the information. At the same time, training on species identification and completion of data sheets will be provided to the observers which in their turn will inform fishermen involved in the monitoring program. In cases where species cannot be transferred to the laboratory for identification, a photo identification method will be used.

<u>Reference</u>

MARE/2014/19 -SI2.705484 Strengthening regional cooperation in the area of fisheries data collection in the Mediterranean and Black Sea. Deliverable 3.2 Handbook with guidelines for monitoring incidental by catch and processing the collected data.

(max 900 words)

Text Box 1G: List of research surveys at sea

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

1. Objectives of the survey

The objectives of the MEDIAS carried out in the Hellenic part of GSAs 22 and 20 are:

- Assess total pelagic fish echo abundance per EDSU.

- Assess Abundance and Biomass indices estimation of the target species, anchovy (*Engraulisencrasicolus*) and sardine (*Sardinapilchardus*) in the surveyed area by means of acoustics.

- Collect biological information for the population of the target species in the surveyed area by means of midwater trawl hauls.

- Estimate Age and length structure of the population of the target species.

- Collect biological information for all pelagic species represented in the catch composition of the midwater trawl hauls (i.e. Length frequency distribution and Length – Weight relationships).

- Collect environmental information based on CTD sampling in predefined sampling stations

- Assess ecosystem indicators derived from acoustic surveys as described in the MEDIAS handbook (2015) upon request.

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

The methodology applied in the Pan-Mediterranean International Acoustic Survey (MEDIAS) carried out in the Hellenic part of GSAs 22 and 20is the one described in the MEDIAS manual (see MEDIAS Handbook 2015).
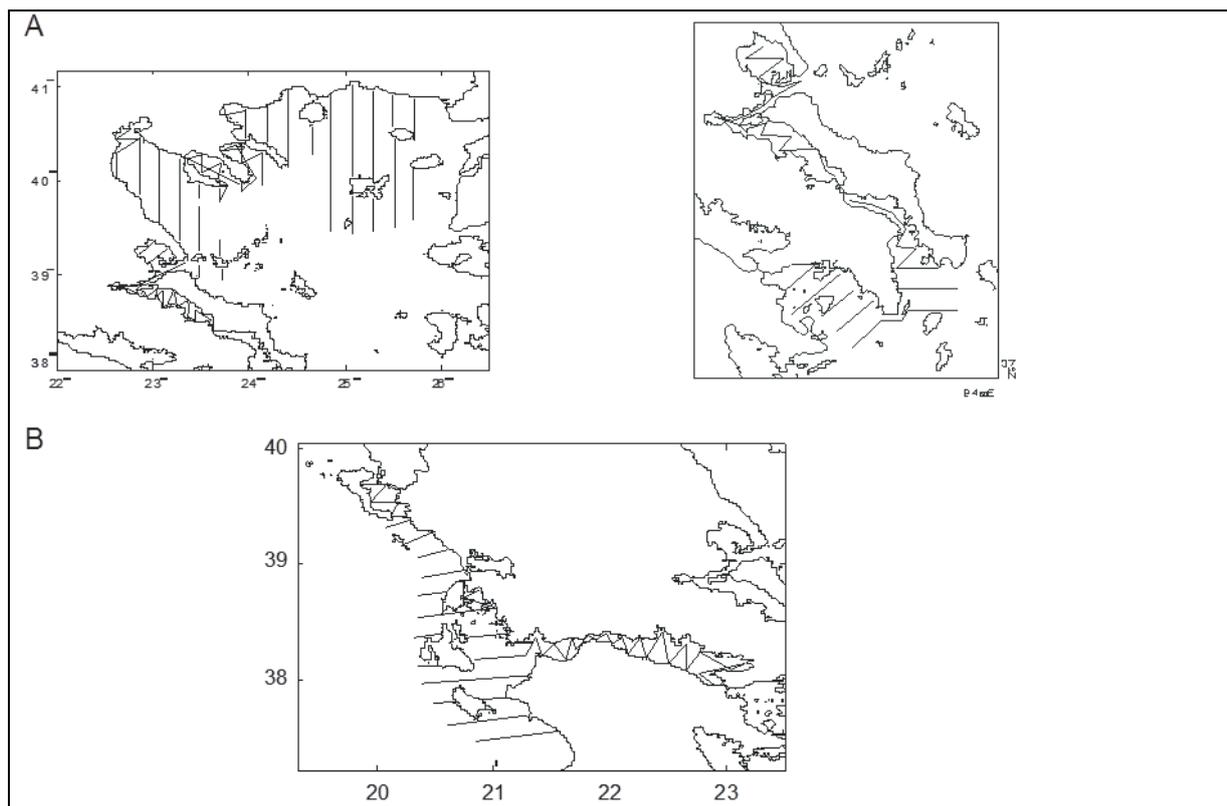
Fig. 1G.1. Pre-defined MEDIAS acoustic transects in Aegean Sea (GSA 22) and Ionian Sea (GSA 20).

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

The Mediterranean International Acoustic Survey (MEDIAS) in Hellenic waters (GSAs 22 and 20) is carried out with the R/V PHILIA owened by the Hellenic Centre for Marine Research. The Institute of Marine Resources and Inland Waters of the Hellenic Centre for Marine Research is the body that carries out MEDIAS in Hellenic waters. The MEDIAS steering committee is the relevant international group in charge of planning the survey.

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

Not applicable

5. Explain where thresholds apply

Not applicable

(max 450 words per survey)

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

1. Objectives of the survey

The main objective of **MEDITS** survey is to identify spatiotemporal variations in the abundance of demersal fish stocks.

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

The methods used in the MEDITS survey are described in the MEDITS manual:
http://www.sibm.it/MEDITS%202011/docs/Medits_Handbook_2013_version_7_25092013.pdf.
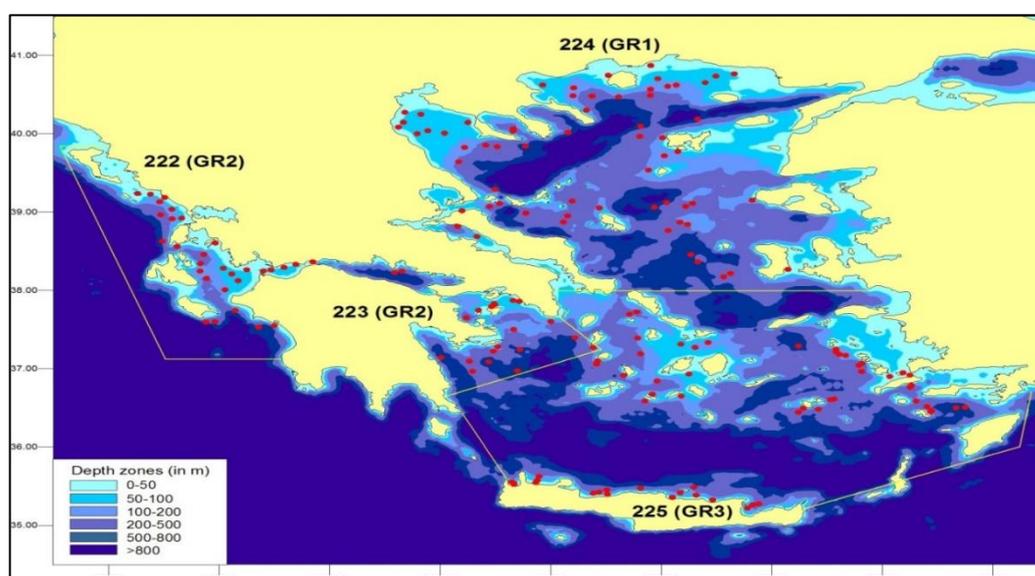
Fig. 1G.2. Map of the sampling areas and sampling stations in the GSAs 20,22,23. Red spotsrepresent the sampling stations.

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

Partcipating member states are Greece, Spain, Italy, France, Croatia. Details for the vessels used for the surveys by member state are described in the MEDITS manual.

Medits Coordination Committee is in charge of planning the Survey.

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

Non applicable

5. Explain where thresholds apply

No thresholds

(max 450 words per survey)

Text Box 2A: Fishing activity variables data collection strategy

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

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

Data on fishing capacity will be collected through the National Fleet Register for the following quantitative aspects: number of fishing boats, gross registered tonnage, engine power, age.

Data on of fishing effort and landing, for the estimation of variables listed in table 4 of Com.Dec.1251/2016, will be collected throught different sources because different requirements derives from EU Legislation according to vessel size.

Fishing vessels >12 m are required to use satellite-based Vessel Monitoring System (VMS), and electronic report system (ERS*); fishing vessels between 10-12 meters are required to fill out paper logbooks, but there are no obligations to record catches below 50 kg; fishing vessels < 10 m are not obliged neither to fill out any type of logbook nor to present sales notesfor catches below a certain threshold (50 kg).

Therefore, for vessels > 12 m the monitoring of fishing activity will be done through VMS for effort data and ERS for effort and landings data. However, for specific variables and fleet segments available, VMS and ERS data will be validated with data collected through sample survey using face to face interviews and structured questionnaires and data from biological sampling and observing trips. Specifically, cross check will be done for control data refers to variables *Amountof landings, Days at sea, Number of trips, Value of landings per species, Average price per species* and are available for Demersal trawlers and/or demersal seiners 12-18 m, 18-24 m and 24-40 m, Purse seiners 12-18 m, 18-24 m and 24-40 m, Vessels using hooks 12-18 m, Vessels using drift and/or fixed netters 12-18 m and Vessels using Pots and/or Traps 12-18 m.

For vessels <12m, the monitoring of fishing activity will be realized through sample survey, using face to face interviews withstructured questionnaires and data from biological sampling, as also proposed by MARE/2014/19. The data derived from biological samples provide productivity parameters, such as the CPUE that can be used both as a check-control for the information coming from the Control Regulation and those derived from sampling survey.

Specific procedures will be applied to verify the information obtained from the different sources, relating to the same variable (gears, days, catch and price for species), with the goal to identify and validate the final figure and get an exhaustive picture of the fishery for scientific puroposes.

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

The estimation of value of landings will based on the principles of simple random sampling as decribed under point 4. Recording of landings will be accomplished on a monthly basis.

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

Annual average prices will be estimated from weighted averages of monthly recordings. Estimates will be

obtained using the commonly used stratified random sampling estimatorsas decribed under point 4.

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

The sampling method that is chosen for this survey is simple random sampling, in each fleet segment of the Greek fishing fleet, with the exemption of the segments based on the fishing technique: "Vessels using hooks". In these cases, to improve accuracy, a stratified random sampling approach is used, on métier level (LLS_DEF_0_0_0 and LLD_LPF_0_0_0, which account for the 99% of the vessels in this fishing technique). It is also important to notice that following Commission Decision 2010/93/EU (paragraph A.1.1), for each vessel for which economic variables are collected, the corresponding activity variables have also to be collected.

The sample unit is the vessel and it is selected from the Greek vessel registry (target population, coinciding with frame population). This analysis is based on the most recent Greek vessel registry (available at: http://ec.europa.eu/fisheries/fleet/index.cfm).

Following SGECA 09-02 guidelines, the following clustered segments have been created:

- Segments similar to other segments
- Non-important segments with distinct characteristics

The number of inactive vessels will be estimated from the selected sample, as there is no a priori information on inactivity.

The sample size in each fleet segment is based on: Population size (N), Variance of the population (σ^2), Margin of error (e) and confidence level (1-α). The formula used to estimate the sample size in each fleet segment is (Dattalo, 2008):

$$n = \frac{n_0 N}{n_0 + (N - 1)}, where:$$

$n_0 = \frac{z^2 \sigma^2}{e^2}$ and z, is the z-score, i.e. the number of standard deviations a given proportion is away from the mean

The above formula can be adjusted when the total population is very small, and the n is relatively large (n/N>0.05) (finite population adjustment) (e.g. Thomson, 2002). Is such cases, the adjusted sample size (n_{adj}) is estimated as:

$$n_{adj} = \frac{n}{1 + n/N}$$

The sample size is rounded upwards, if necessary.

N, is determined by the National fleet registry, while σ^2 is based on previous year's estimation of the variable "days at sea". Finally, e, and confidence level are predetermined at: e=0.1 and (1-α)=85% (corresponding to z=1.44). The only exemptions are fleet segments that include métier with minor significance, where e, is increased to 0.2. This is done to better allocate time and effort, sampling the more important fleet segments in Greece. The significance of the métier is determined by its participation to the ranking of métiers in terms of landings, and effort (see Table 4C).

As the population in several important Greek fleet segments is very small, two more restrictions are used to determine sample size, when the above formulas result in a very small sample:

- When the vessel population of a fleet segment is greater than or equal to 60, the sample size should be greater than or equal to 30.
- When the population of a fleet segment is smaller than 60, the coverage rate should be equal to 50%.

Finally, to cope with possible no-responses, an extra sample of the same size as the effective sample is selected.

An extra unit can be chosen for the unit of the same segment, as geographically close as possible to the effective unit to be substituted (Sande, 1982).

The sample is selected randomly, using random number generator (Thompson, 2002). All fishing activity variables are collected monthly with the exemption of the capacity group variables. Finally, it is important to mention that the complementary probability sample survey in fleet segments where control data is available will be used for validation.

References:

Dattalo, P. (2008). *Sample-Size Determination in Quantitative Social Work Research*. Oxford University Press.

Sande, I.G. (1982). Imputation in surveys: Coping with reality. The American Statistician, 36, 145–152.

Thompson, S.K. (2002). Sampling. *Wiley New York*.

* ERS data are coming from the Integrated Monitoring System of Fisheries Activities (OSPA) of the Ministry of Rural Development and Food.

 (max 900 words per Region)

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

General comment: This Box fulfills paragraph 5 points (a) and (b) of Chapter III of the multi-annual Union programme and Article 2, Article 4 paragraphs (1), (2) and (5) and Article 5 paragraph (2) of this Decision. It is intended to specify data to be collected under Tables 5(A) and 6 of the multi-annual Union programme.

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

The majority of economic and social data for fisheries will be collected through sample survey, using face to face interviews and **structured questionnaires.**

However, for specific variables and fleet segments available **control data** will be validated with data collected through the sample survey. Specifically, control data refers to variables *Gross value of landings, Days at sea, Value of landings per species, Average price per species* and are available for Demersal trawlers and/or demersal seiners 6-12 m, 12-18 m, 18-24 m and 24-40 m, Purse seiners 12-18 m, 18-24 m and 24-40 m, Vessels using hooks 12-18 m, Vessels using drift and/or fixed netters 12-18 m and Vessels using Pots and/or Traps 12-18 m.

The Economic variables *consumption of fixed capital* and *value of physical capital* will be estimated using data from **questionnaires** (*replacement value*) as well as data from the **National fleet register** (mean LOA and number of vessels per fleet segment) as proposed by the PIM methodology (EC study No. FISH/2005/03).

The Economic variables of the *fleet variable group* will be estimated using data from the **National fleet register.**

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

As described in the Ad hoc contract commitment No. SI2 725 694 Ref. Ares(2016)2440332 - 26/05/2016 "Methodologies for the socio-economic data described in EU MAP", the ideal survey method is the census. However, special characteristics of the national fleet and limitations such as resources have to be considered in order to choose the appropriate sources of data. The Greek fleet consists of 15,301 vessels, the majority of which are smaller than 12 meters. As a result, control data, balance sheets or other financial records are generally not available. Therefore, the majority of the economic and social variables of the fleet will be collected using a **Probability Sample Survey.**

As already mentioned, for specific variables and fleet segments control data are also available (**Census data**) and will be validated using collected data. Therefore the type of data collection for these specific fleet segments and variables maybe census or probability sample survey depending on the outcome of the validation procedure.

Census will be used for the variables of the *fleet variable* group, sincefor these variables data from the National fleet register will be used. **Census** will also be used for the economic variables *consumption of fixed capital* and *value of physical capital,* since they derive from PIM..

Finally, **Indirect survey** will be used for the economic variable *Value of unpaid labour* since it derives from other surveyed data.

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

Following Commission Decision 2010/93/EU (paragraph A.1.1), for each vessel for which economic variables are collected, the corresponding activity variables have also to be collected. Therefore, the sample design for the collection of activity variables coincides with the design for the collection of economic variables.

Details on the sampling frame and allocation scheme in Textbox 2A.

4. Description of methodologies used for estimation procedures

Economic variables are estimated according to the Ad hoc contract commitment No. SI2 725 694 Ref. Ares(2016)2440332 - 26/05/2016 "Methodologies for the socio-economic data described in EU MAP".

The Greek management system does not involve quotas or other fishing rights. Therefore *Income from leasing out quota or other fishing rights, Value of quotas or other fishing right* and *Lease/rental payments for quota or other fishing rights* are expected to be zero.

In the case of Greece, fishing vessels are only used for fishing, since other uses require special permits and the fishing vessels do not fill the requirements for such permits. Therefore, the variable *other income* includes insurance payments for damage/loss of gear/vessel and possibly from leisure fishery.

Personnel costs will be obtained directly from survey. However, in the case a crew share system is used, personnel costs will be calculated as a pecentage of total revenues or as a percentage of revenues minus costs.

Value of unpaid labour will be estimated using the FTE method proposed in the Ad hoc contract.

Consumption of fixed capital and *Value of physical capital* will be estimated using the PIM methodology (EC study No. FISH/2005/03). Specifically, the degressive depreciation function will be used and the capital values will be estimated using replacement value, with the assumption that the engine is renovated every 10 years, electronics every 5 years, other equipment every 7 years and hull never. The share of each asset item in the total vessel price is 60% for hull, 20% for the engine and 10% for both electronics and other equipment. The discount rate is the interest rate on long terms bond.

Finally, it should be mentioned that for all variables estimated through a probability sample survey, the Horvitz-Thompson estimator will be used to estimate total values.

The estimation procedures of the social variables is descussed in ***Pilot study 3. Data on employment by education level and nationality.***

5. Dscription of methodologies used on data quality

The majority of the economic data will be collected through sample survey as already discussed in previous paragraphs. Bias and variability indicators will be used as quality indicators. Particularly, the bias indicators provided will be coverage rates and response rates. The variablity indicator that will be provided for the collected data will be the CV.

It should be noted that the target and the frame population are the same and therefore there is no coverage error.

As far as measurement errors are concerned, the submitted data will be evaluated thoroughly using several indicators and any outliers will be identified and possibly removed. Furthermore, data collectors will be properly educated and written instructions regarding the collection process will be provided to them.

For key economic variables such *as energy consumption* and *energy costs*, imputation techniques will be used.

(max 900 words per Region)

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

General comment: This Box fulfills paragraph 5 point (b) and paragraph 6 point (b) of Chapter III of the multi-annual Union programme and Article 2 and Article 3 paragraph (3) point (c) of this Decision. It is intended to specify data to be collected under Table 6 of the multi-annual Union programme.

1. Aim of pilot study

The aim of the pilot study is to collect data required to estimate the social variables of Table 6 of the multi-annual Union programme, namely *Employment by gender, FTE by gender, Unpaid labour by gender, Employment by age, Employment by education level, Employment by nationality, Employment by employment status and FTE national.* The pilot study will focus on social charecteristics of the engaged crew and unpaid labour of the vessels. Social characteristics involve the gender, the age, the education level and nationality of all crew members and unpaid workers of the vessel. These data will allow the estimation of the social variables of Table 6.

2. Duration of pilot study

The pilot study will be held in 2018. The social variables will be collected from the same vessels as the economic data during that year and the duration of the pilot study will be one year. The social variables will be collected triennually as required by the multi-annual Union programme. Specifications on the collection of the social variables and the duration of the pilot study will be provided by the PGECON workshop that will be held in 2017.

3. Methodology and expected outcomes of pilot study

The pilot study for the social variables will be conducted at national level. All social variables, namely *Employment by gender, FTE by gender, Unpaid labour by gender, Employment by age, Employment by education level, Employment by nationality, Employment by employment status and FTE national* will be estimated based on data collected through sample survey using **questionnaires,** since alternative data sources for these variables are not available. The social variables will be collected from the same vessels as the economic data during that reference year (2018).

Probability Sample Survey will be used for the estimation of the following variables:

- o *Employment by gender,*
- o *Unpaid labour by gender,*
- o *Employment by age,*
- o *Employment by education level,*
- o *Employment by nationality*
- o *Employment by employment status,*

Indirect survey will be used for the social variables *FTE by gender* and *FTE national,* since the derive from other surveyed data as suggested in the Ad hoc contract commitment No. SI2 725 694 Ref. Ares(2016)2440332 - 26/05/2016 "Methodologies for the socio-economic data described in EU MAP".

The social variables will be estimated according to the instructions that will be provided by the PGECON workshop that will be held in 2017.

As far as the *FTE National* variable is concerned it will be estimated according to the study "Calculation of labour including full-time equivalent (FTE) in fisheries"(FISH/2005/14, 'LEI WAGENINGENUR). Specifically, a national threshold representing the total number of hours worked, on a standard and yearly

basis, by a full-time worker in the fishery sector is first defined. FTE national is then calculated using this threshold. If the annual working hours per crew member exceed the threshold, the FTE equals 1 per crew member (annual working hours>national threshold then FTE national =1). If the annual working hours per crew member is less than the threshold then the FTE equals the ratio between the hours worked and the threshold (annual working hours<national threshold then FTE national = annual working hours/national threshold). Iit should be noted that for Greece thethreshold is defined at 1.750 hours, according to the greek legislation (Official Goverment Gazette No 1181 9/June/2011).

The expected outcome of the pilot study is to identify the appropriate methodology to collect and estimate the social variables included in Table 6 of the multi-annual union programme. Specifically, the socio-economic questionnaire will be updated and reassessed, the instructions for the data collectors and the database will also be updated to include the social variables and the estimation procedures will be validated. Another important outcome of the pilot study is the identification of difficulties and problems that maybe encountered during the collection of the social variables and their possible solutions.

(max 900 words)

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

General comment: This Box fulfills paragraph 6 points (a) and (b) of Chapter III of the multi-annual Union programme and Article 2, Article 4 paragraphs (1) and (5) and Article 5 paragraph (2) of this Decision. It is intended to specify data to be collected under Tables 6 and 7 of the multi-annual Union programme.

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

Fish and shellfish have been produced using aquaculture techniques in Greece since early 1960s. The strengthening of the aquaculture industry with the implementation of new techniques and the rapid increase of production commenced in late 1990s, when the amount of captures fish reached a plateau while the demand for aquatic product continued to rise.

The main segments of the Hellenic aquaculture industry are: (a) sea bass and sea bream culture, (b) other marine fish culture, (c) shellfish culture, (d) carp culture, (e) trout culture, (f) eel culture, (g) extensive farming -estuaries & lagoons.

At present, aquaculture (in fact mostly marine culture), is considered a major industry in Greece, not only because of the impressive results in production volumes but also it is significant in socio-economic terms, employing roughly 3,893 employees, mostly men with a percentage ≈78%. Estimations show that the sector provides employment to more than 10,000 people, through direct and indirect activities.

It should be noted that the majority of aquaculture units in Greece, are not financially autonomous entities but belong (in most cases by lease) to larger firms. While aquaculture units can provide information about production volumes and certain cost values, other variables can be acquired only by the financial department of the company that holds the lease of the units. On the other hand, the prerequisite segmented per species or technique variables,generally is not available by the companies accounting offices or the representatives.

For the fiscal year 2014, 248 companies were recorded in aquaculture sector owning or leasing 498 aquaculture units (consist a 75.34% part of the whole sector while their income make up for 90-95% of the sector's total) and producing a turnover of 448,146,511€ (29,303,797€ sales of fry and 418,843,714€ sales of fish or shellfish in final form). The main species of national aquaculture production are sea bream and sea bass, and hold 72.6% in terms of volume and 94% in terms of value.Of the aforementioned 248 companies that took part in the last year's survey, 97 are SA or Ltd enterprises with published annual balance sheets and yearly financial statements.

Basic source for the collection of economic data during 2017-19 will be the Integrated Monitoring System of Fisheries Activities (OSPA) and a survey will be used for the confirmation and supplementation of the collected aquaculture data.The majority of the required economic data can be derived from the processing of the balance sheets and financial statements of the companies, however, the socio-economic data needed (employment by gender etc.) will be provided by on site visits, interviews, financial records and balance sheets.

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

The first stage of the data collection methodology shall consist of the mailing and completion of a questionnaire based on the previous years' data collection experience and updated with any new prerequisite values.The duration of the first stage will be 60 days.

The questionnaire will include topics of both social and economic data, requesting employment, production and

revenue values along with the company's cost structure and a short enumeration of the company's main problems and predictions.

The second stage will include onsite visits to the companies that completed the questionnaire along with a data processing of published balance sheets and financial statements. The duration of the second stage will be 90 days.

The questionnaire will include the following 3 topics:

(1) cost and profit: value of total sales, personnel costs, energy related costs, value of purchased raw material(fry) and other material necessary for the production, production costs and value of the final product, capital costs, special costs, investments, and debt.

(2) Aquaculture techniques: freshwater, marine fish, cold-water or warm water marine fish, shellfish, Cages, Land based farms, Hatcheries and Nurseries, Rafts or Long line Mussel production, Extensive farming in estuaries and lagoons

(3) The socio-economic criteria of the sector are attributed to: employment per sector, gender employment statistics, number and location of enterprises, and the problems of the enterprises.

The collected data from all sources will be uploaded regularly on the aquaculture sector database (OSPA) in order to update the topic values and the list of companies to be interviewed.

As for the aqua economic prerequisite variables, the previous 2015 survey showed that companies provided only the sales values offry and final product, i.e. the categories that demonstrated sales. The in-between variables remained with zero value since the companies only keep records of the variables that showed sales during the year, and not the ones that were destined for own consumption.

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

The questionnaires will be sent to all the operating aquaculture enterprises. The processing of balance sheets will cover more than 85% of the total number of SA and LTD enterprises obliged to publish their financial statements.

Due to the fact that those companies hold more than 85% of the aquaculture sector's total sales, the census method will be applied to most of their economic variables.

4. Description of methodologies used for estimation procedures

Based on the last survey's data collection experience, few of the companies (specifically the large ones), provided values segmented by aquaculture techniques and species.Companies generally are reluctant to apply segments by species or techniques to the provided economic and social data. Only a few of those operating under the International Financial Reporting Standards (IFRS) are able to provide the extra information, even about production cost structure. Due to the voluntary For those variables that need further segmentation, both social and economic, a non-probability sample survey will be applied based on the information provided by the large enterprises that cover adequately the species and the techniques.

5. Description of methodologies used on data quality

The collected data provided by financial records and questionnaires as well as segmented values provided by non-probability sample survey, will be supplemented with and cross checked by data from the following sources: (a) Prefectural Chambers of Commerce, Industry and Trade (e.g. brand name, location, VAT number, phone and fax numbers) (b) Prefectural Directorates of Fisheries and Veterinary Services, as well as the National Food Control Agency (EFET) and the Hellenic Ministry of Rural Development and Food (e.g. purchase of raw material, production per species, total sales in quantity and value, employment, functioning regulations), (c)Integrated Monitoring System of Fisheries Activities (OSPA) and (d) business and professional online data bases (e.g. location, phones, projected investments, sales, general economic data).

(max 1000 words)

SECTION 3: ECONOMIC AND SOCIAL DATA

Pilot Study 4: Environmental data on aquaculture

General comment: This Box fulfills paragraph 6 point (c) of Chapter III of the multi-annual Union programme and Article 2 and Article 4 paragraph (3) point (d) of this Decision. It is intended to specify data to be collected under Table 8 of the multi-annual Union programme.

1. Aim of pilot study

In Greece, data (mortality, antibiotics, etc.) may be recorded at a aquaculture unit or administrative level, but are not collected at a national level. Aquaculture units are required to keep annual logbooks, which are inspected (not collected) by the national authorities (on-site visits). Ourconcern is that inclusion of mortality and antibiotics data within thesurvey could compromise response rates.

2. Duration of pilot study

The duration of the pilot study will be two years starting from 2018.

3. Methodology and expected outcomes of pilot study

The following 2 years, an effort will be made to gather information, by inserting an appropriate section at the questionnaire, which will be sent only to a small but representative number of enterprises(which represent 50% of sector´s total turnover), those who already publish data on the internet or participate in surveys carried out by universities, institutes and state organizations (Non Probability Survey). According to the results arising from the survey, we reserve the right to change the methodology and to redefine our goals and aspects.

(max 900 words)

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

General comment: This Box fulfills footnote 6 of paragraph 1.1(d) of Chapter III of the multi-annual Union programme, Article 2, Article 4 paragraphs (1) and (5) and Article 5 paragraph (2) of this Decision. It is intended to specify data to be collected under Table 11 of the multi-annual Union programme.

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

The Greek fisheries processing industry sector includes activities like freezing, processing (filleting, salting, drying, smoking, marinating, cooking, canning) of fish, and the de-shelling of mussels.

159 small to medium sized enterprises (SMEs) are engaged to the processing industry (2015 data).During the last twenty years, eight annual surveys were carried out, four by the national authorities and the last four under the « National Fisheries Data Collection Program», collecting data of the Hellenic seafood processing sector in regard to its current and future trends.

The previous surveys and the data collected until now, result in the following facts: From 1998 till 2007 the number of enterprises decreased by 8.57%, but at the same time the total industry production increased by 234%. The years that followed2009, at the peak of the economic crisis, there was a 16.75% decline in number of companies and a 10.08% decline in sales of processedproducts.In 2014 the frozen products industry, presented a 74.37% increase of their production compared to 1998. On the other hand a decrease of in the processing industry compared to 2003 (-53.65%).

According to the latest data, for the fiscal year of 2014, there were 150 companies with proven activity of freezing, processing of fish, and the de-shelling of mussels of which 133 participated in the survey, including 45 SA and Ltd companies with published annual balance sheets. Those 45 firms account for over 82.6% of the fish processing industry based on raw material purchases.

The majority of the required economic data can be derived from the published annual balance sheets and the yearly financial statements of the companies, However, only a few, operating under the International Financial Reporting Standards (IFRS), provide the additional social data and the detailed production cost structure while smaller companies provide little or no data for values such as assets and capital depreciation.

An additional problem that has to be addressed is the complicated distinction between equivalent parallel activities, a case common in Country's fisheries processing sector.

It also should be noted that there is a number of companies with processing activity that is not their main one, considering the added value or the employed personnel attributed to that activity but nonetheless is important for their economic operation.

Questionnaires completed by companiescombined with onsite visits and interviews provide the remaining information needed.

The collected data provided by financial records and questionnaires will be supplemented and cross checked by data from the following sources: (a) Prefectural Chambers of Commerce, Industry and Trade (e.g. brand name, location, VAT number, phone and fax numbers) (b) Prefectural Directorates of Fisheries and Veterinary Services, as well as the National Food Control Agency (EFET) and the Hellenic Ministry of Rural Development and Food (e.g. purchase of raw material, production per species, total sales in quantity and value, employment, functioning regulations) and (c) businessand professional online data bases (e.g. location, phones, projected investments, sales, general economic data).

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

The first stage of the data collection methodology shall consist of the mailing and completion of a questionnaire based on the previous years' data collection experience and updated with any new prerequisite values.

The questionnaire will include topics of both social and economic data, requesting employment, production and revenue values along with the company's cost structure and a short enumeration of the company's main problems and predictions.

The second stage will include onsite visits to the companies that completed the questionnaire along with a data processing of published balance sheets and financial statements.

The questionnaire will include the following topics: (1) value of total sales per processed products, (2) personnel costs, (3) energy related costs, (4) quantity and value of purchased processed raw material and other material necessary for the production, (5) production costs and value of the final product, (6) capital costs, (7) special costs, (8) investments, and (9) debt. The socio-economic criteria of the sector are attributed to: (1) employment per sector, (2) employment statistics including gender, age, education level and nationality, (3) number and location of enterprises, and (4) the problems of the enterprises

The collected data from both sources will be uploaded regularlyon the processing industry database in order to update the topic values and the list of companies to be interviewed.

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

The data collection scheme that will be used for the majority of values will be the census. The questionnaire will be sent to all the listed companies and the onsite interviews will be scheduled as follows: to all enterpriseswith ≥ 11 employers and to 80% of the enterprises with ≤ 10 employers (stratified random sampling strategy) in the sector.

During the last 5 years of fisheries processing data collection, the enterprises that received the aforementioned questionnaire, were generally positive in providing the required data. The completed questionnaires produced a significantly high percentage of sample (>85 %), thus ensuring reliability of the estimations and conclusions.

The estimated number of enterprises not responding and/or fail to obtain sufficient data from all other available sources is very small (<10-15% according to previous studies).

4. Description of methodologies used for estimation procedures

As it was mentioned above, the census method will be used for the majority of values. Therefore, the estimation procedure will be applied for certain values(e.g. energy cost and unpaid labor) due to inadequate input or company's reluctance to answer,using the probability sample survey method.

5. Description of methodologies used on data quality

Provided the main methodology for the data collection is census, estimation is limited to only a few variables.

All variables gathered from different sources will be compared and cross-checked for their credibility. The questionnaire data, especially for the small companies with no published balance sheets, will be crosschecked with the corresponding Prefectural National Authorities records to verify volumes and values as well as with previous years' surveys.

(max 1000 words)

Text Box 4A: Sampling plan description for biological data

General Comment: This Box fulfills Article 3, Article 4 paragraph (4) and Article 8 of this Decision and forms the basis for the fulfilment of paragraph 2 point (a)(i) of Chapter III of the multi-annual Union programme. This Table refers to data to be collected under Tables 1(A), 1(B) and 1(C) of the multi-annual Union programme.

Description of the sampling plan according to Article 5 paragraph (3) of this Decision

Specification of the purposes, temporal and spatial distribution, frequency by which data will be collected

Biological data on stocks caught by the Helleniccommercial fishery will be collected through sampling. The catch quantities by species will be used for the estimation of volume and length frequency of all catch fractions (landings, discards, unwanted catches) for the stocks of Tables 1A, 1 B, 1 C of Com.Imp.Dec.2016/1251and GFCM-DCRF Annexes A.1, A.2, A.3. Data will be collected by métier referred to level 6 as set out in Table 2 of the aforementioned decision in quarterly basis and for all the Hellenic GSAs (GSA20-Ionian Sea, GSA22-Aegean Sea, GSA-23 Cretan Sea). The reference list of metiers that was agreed at Regional level during the RCM Med&BS 2009 has been used for the selection of the metier that have to be sampled. The selection of metiers was based on the ranking system described in the Commission Decision 2010/93/EU. The reference year was 2014 because that data were available for the whole year while on 2013 & 2015 data were available only for the last quarter of the year. The ranking performed at GSA level and the selected metiers are the followings:

- OTB_DEF_>=40_0_0   (all GSAs)

- PS_SPF_>=14_0_0   (all GSAs)

- FPO_DEF_0_0_0   (only in GSA 22)

- GNS_DEF_>=16_0_0   (all GSAs)

- GTR_DEF_>=16_0_0   (all GSAs)

- LLD_LPF_0_0_0   (all GSAs)

- LLS_DEF_0_0_0   (all GSAs)

- SB_SV_DEF_0_0_0   (in GSAs 20 and 22) (themetier hasbeenselectedbecause it is in Management plan)

Source of data, procedures and methods to collect and process data

Target and frame population

The source of data is the official national fleet registry used to classify vessels by fleet segment and area, and the DCF data collection system of the year 2014, used for the effort data that were attained based on the sampling scheme.The Primary Sampling Unit (PSU) will be the fishing trip. The target population (stratum) will be the number of trips of all commercial vessels per GSA, for the reference year (2014) (Table 4D). The frame population will be the number of trips of the commercial vessels that fish in the selected by the ranking metiers, at GSA level (Table 4C). The PSU selection will be done through random-draw of a trip by metier and per GSA, with the option to replace the trip in case that the vessel's owner refuses the cooperation (Table 4B).

Sampling stratification and allocation scheme

The sampling scheme that will be used is based on the principles of stratified random sampling andcomprises

sampling trips that will be performed at sea, on shore (landing sites) and at market. The Hellenic coastline and marine area will be divided in 12 major areas and stratified cluster sampling will be carried out using these areas as clusters in order to ensure data representative of the target population. The sampling trips will be implemented quarterly for one year period. The catch fractions that will be covered are Landings and Discards. At sea, on shore and market sampling will provide data for landings; while at sea sampling will also provide data on discards. The sampling will be carried out by observers on board, on shore, at market.The species/stocks that will be covered, for estimation of volume and length of catch fractions, will be the ones listed in Tables 1A, 1B, 1C of Com.Imp.Dec 2016/1251and GFCM-DCRF Annexes A.1, A.2, A.3. The total number of trips to be sampled was defined proportionally to the effort (number of days at sea for each métier). The calculation of sample sizes for the number of trips to be sampled by métier was based on the 2014 data. In cases of métiers with high variability in the landings, the number of trips to be sampled was further increased. The number of trips that will be sampled by métier and GSA, as well as all the information for the sampling plan is described in Table 4A. The minimum number of fishing trips to be sampled will be at least 1 trip per month, for each métier, in each GSA and major area in the GSA (if the métier is performed in the area).

Regarding the large pelagic fishery, according to the Ministerial Decision 5632/104626/2015 which lays down specific rules for the fisheries of large pelagic species (Thunnus thynnus, Thunnus alalunga and Xiphias gladius) in Greek waters, metier LLD_LPF_0_0_0, the fisheries for these species can only be practiced by professional fishermen with a special license issued annually. The fishing period for large pelagic fish in Greece is 9 months, in national and international waters.

According to the General Directorate of Sustainable Fisheries, Ministry of Rural Development and Food that issue the licenses, for 2017, 79 vessels >15m will hold special license; the 5% of them corresponds to 4 vessels. For vessels <15m 225 will hold special license, 5% of them contribute to 11 vessels. In the NWP 258 trips were planned for metier LLD_LPF_0_0_0, (~ 28 trips per month), which exceeds the requirements of the recovery plan for Mediterranean swordfish (~ 2 trips per month per vessel).

Biological data on weight, age distribution, sex ratio and maturity will be collected for the stocks listed in Tables 1A, 1B, 1C of Com.Imp.Dec 2016/1251 and GFCM-DCRF Annexes A.1, A.2, A.3. Data sources will be the commercial samples collected through sampling at sea, on shore and at market per GSA and the samples from scientific surveys. The stratification of stocks for data collection follows the structure of previous years as it was also adopted in GFCM-DCRF 2016. The stocks included in the sampling scheme are listed on Table 1A of NWP. The stocks that their landings are below 200 t or the share of the country in the EU Mediterranean landings is below 10% will not be sampled. Also, the stocks of GFCM-DCRF Annexes A.2 that their landings are less than 3% of the national landings will not be sampled. The planning of sampling for biological variables is presented in Table 1 B of NWP and complies with the agreement N.2 of RCM MED&BS-LP 2016. The sampling intensity is presented in Table 1C of NWP and is based on previous year's knowledge. From 2018 sampling intensity will be calculated using the tool devised by the MARE/2014/19 project in this regard, according the agreement N.3 of RCM MED&BS-LP 2016. The biological variables (weight, sex ratio, maturity) will be collected spatio-temporally to detect seasonal differences in the structure and composition of the species examined.

Regarding the elasmobranches, for most of the species, their landings are negligible. However, in order to comply with the Agreements N.1 & 2 of RCM MED & BS-LP 2016 length data and other biological information will be collected concurrently for all elasmobranches species, as reported in the GFCM-DCRF Appendix A.3 and in the Tables 1C and 1.D of the Com.Imp.Dec.1251/2016. Due to the low occurrence of these species no planning scheme and sampling intensity can be applied.

Methodologies used for estimation and quality assurance procedures

The estimation of the length structure of the catches will be made using the methodologydescribed in Workshop on Sampling Calculation and Methodology for Fisheries Data (WKSCMFD) (ICES 2004), which allows estimating the precision, in terms of coefficient of variation (CV) for each length class and for the whole LFD at métier level. Age distribution of landings will be calculated using the estimated quarterly LFD of landings and the quarterly proportion of landings of age i in the length class j, estimated from the age-length keys (ALKs). ALKs by quarter will derive from age sub-samples of the length samples, taken as fixed number

per length class. For the estimation of the age distribution both analytical and bootstrap methods will be used.For discards the length frequency distributions will be calculated from the proportions of sampled discard weights, numbers and total landings. Calculations will be made by size class and quarterly before being summed to give total annual discards by size class. Discards will be added to landings data to give the total catches, which then is used for stock assessment.

Concerning biological variables estimation procedures will be the following:The age compositions will be estimated from two-stage sampling where random length samples will be taken and length-stratified age samples will be used to construct an age-length-key. The length distributions will be obtained from random samples.A length-weight relationship will be created and fitted to estimate weight-at-length, and weight-at-age will be estimated from this using an age-length-key. Sex-at-age will be estimated using a sex-age-length-key. Maturity-at-age will be estimated using a maturity-age-length-key or, if appropriate, a sex-maturity-age-length-key.CVs for maturity-at-age and size-at-age, for all sampled species, will be calculated annually at GSA level. Estimates will be made using the "open source" tool developed in the frames of the COST project (Vigneau, 2008), which allows to assess the accuracy of the biological parameter estimates collected for stock assessment purposes.

<u>References</u>

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Vigneau J., 2008 - Common tool for raising and estimating properties of statistical estimates derived from the Data Collection Regulation (COST). European Commission, FISH/2006/15– lot 2, Project no: SI2.467814. Title: Studies and Pilot projects for carrying out the common fisheries policy.

(max 900 words per Region)

ANNEXES

Annex 1.

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

Screening Survey - Questionnaire

Q1. Did you or a member of your household fished in the Hellenic territory in marine (coastal waters, ports) or inland waters (lakes, rivers, reservoirs) during the last 12 months (2016)?

A. Yes ……………….
B. No

Q2.How often did you fish during the last 12 months (2016) within the Hellenic territory in marine / coastal waters or ports?

A. 1-5 times
B. 6-10 times
C. 11 to 25 times
D. 26-50 times
E. > 50 times

Q3. What method of fishing did you use in marine / coastal waters or ports?

A. From the Coast
A1. Line
A2. Fishing rod
A3. Other ....
B. Boat
B1. Line/fishing rod
B2. Long line
B3. Traps
B4. Other ....
C. Spearfish
D. Other

Q4. Did you or a member of your family fished during the last 12 months any of the following organisms?

A. Eel
B. Sharks
C. Skates
D. Tunas
E. Swordfish

Q5. How often did you fish during the last 12 months (2016) within the Hellenic territory in inland waters (lakes, rivers, reservoirs)?

A. 1-5 times
B. 6-10 times
C. 11 to 25 times
D. 26-50 times
E. > 50 times

Q6. What method of fishing did you use in inland waters (lakes, rivers, reservoirs)?

A. From the Coast
A1. Line
A2. Fishing rod
A3. Nets
A3. Other ....
B. Boat
B1. Line/fishing rod

B2. Nets
B3. Traps
B4. Other ....

Q7. Your Gender is:

A. M

B. F

Q8. Your age is:

A. 6-14
B.14-25
C. 26-45
D.46-60
E. >60

Q9. In which county is your residence ?

....

Q10. In which county did you fish during the last 12 months ?

....

Q11. What is your level of education?

A. No education
B. Primary
C. Secondary
D. Bsc degree
E. Masters/Phd
F. I don't Know

Q12. In which of the following groups do you belong?

A. Pupil / Student / Trainee
B. Worker / Employee
C. Self-employed / Freelance
D. Retired
E. Jobseekers
F. None of the above

Q13. How many people belong to your household ? (Including yourself)?

....

Q14. Are you interested in participating in a 12-month diary survey?

A. Yes ……………………..(contact details: email …………….. mobile tel:...............................)

B. No

Annex 2.

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

Protocol 1.Catch Summary Sheet

Vessel Name:	Reg No:
Haul No:	Haul Area:
Type of gear being used:	Trip Code:

Shot	Hauled
Date: Time: Depth: Speed over Ground: Lat: Lon:	Date: Time: Depth: Speed over Ground: Lat: Lon:
Tow or gear soak duration hrsmins Tow Direction: Warp Length: Door Spread:	Wind direction & force: Sea State:
Comments:	

Species Caught:	No of Individuals:	Weight (kg):

Protocol 2. Data sheet for size recording: Fish, sharks and rays

Trip Code	Haul No	Species	TL (cm)	DW (cm)	Weight (kg)	Sex	Condition	Released	ID image	Notes

Protocol 3. Data sheet for cetacean by catch recording

Date		Time		Haul No	
Trip Code				ID Specimen	
Species					

Condition	Excellent	Good	Poor	Comatose	Dead

TBL (cm)		Sex	M
GFD (cm)			F
Weight (kg)			ND

ID Image

Notes

Protocol 4. Data sheet for sea turtle by catch recording

Date			Time		Haul No	
Trip Code					ID Specimen	
Species						

Condition	Excellent	Good	Poor	Comatose	Dead

CCL (cm)		LCL (cm)		Sex	M
CCW (cm)		LCW (cm)			F
Weight (kg)					ND

ID Image

Notes