

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

Commission Implementing Decision (EU) 2016/1701

on the establishment of a Union framework for the collection, management and use of data in the fisheries sector and support for scientific advice regarding the common fisheries policy and repealing Council Regulation (EC) No 199/2008 (recast).

Commission 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.

Commission Implementing Decision (EU) 2016/1701

laying down rules on the format for the submission of work plans for data collection in the fisheries and aquaculture sectors.

Commission Implementing Decision (EU) 2018/1283

laying down rules on the format and timetables for the submission of annual data collection reports in the fisheries and aquaculture sectors.

GREECE

**Annual Report for data collection in the
fisheries and aquaculture sectors**

2018

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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) (see Table 1). 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 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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1B: Planning of sampling for biological variables	FRI - HCMR
1C: Sampling intensity for biological variables	FRI - HCMR
1D: Recreational fisheries	FRI - HCMR
Pilot Study 1: Relative share of catches of recreational fisheries	FRI
1E: Anadromous and catadromous species data collection in fresh water	FRI
1F: Incidental by-catch of birds, mammals, reptiles and fish	FRI - HCMR
Pilot Study 2: Level of fishing and impact of fisheries on biological resources	FRI - HCMR
1G-1H: List of research surveys at sea MEDITS	FRI - HCMR
1G-1H: List of research surveys at sea MEDIAS	HCMR
Section 2: Fishing Activity Data	
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Section 3: Economic and Social Data	
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Pilot Study 3: Data on employment by education level and nationality	AGR.E.R.I
3B: Population segments for collection of economic and social data for aquaculture	FRI
Pilot Study 4: Environmental data on aquaculture	FRI
3C: Population segments for collection of economic and social data for the processing industry	FRI
SECTION 4: Sampling Strategy For Biological Data From Commercial Fisheries	
4A: Sampling plan description for biological data	FRI - HCMR
4B: Sampling frame description for biological data	FRI - HCMR
4C: Data on the fisheries by Member State	FRI - HCMR
4D: Landing locations Section	FRI - HCMR
SECTION 5: Data Quality	
5A: Quality assurance framework for biological data.	FRI - HCMR
5B: Quality assurance framework for socioeconomic data	AGR.E.R.I
SECTION 6: Data Availability	FRI - HCMR-AGR.E.R.I
SECTION 7: Coordination	FRI
7A: Planned regional and international coordination	FRI - HCMR-AGR.E.R.I
7B: Follow-up of recommendations and agreements	FRI - HCMR-AGR.E.R.I

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SECTION 1: BIOLOGICAL DATA

Text Box 1C: Sampling intensity for biological variables

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

Mediterranean sea

1. Evidence of data quality assurance

The documentation and all the evidence for the quality assurance are available in Table 5A and Text box 5A.

2. Deviations from the Work Plan

- sampling intensity

Length

The sampling scheme of Greece for the length of the catch fractions (landings, discards) is based on the principles of stratified random sampling, employing the métier (level 6) as the basic stratum and it is implemented through concurrent sampling performed by observers at sea and on shore. Hence it is difficult to harmonize the planned number of individuals with the ones that are finally achieved. For the abundant species is very difficult to avoid oversampling, while for the less abundant it is possible to realize all the planned sampling trips without succeed to cover the planned number of individuals. Consequently 18 species (*B. boops*, *E. moschata*, *L. vulgaris*, *L. budegassa*, *M. merluccius*, *M. barbatus*, *M. surmuletus*, *N. norvegicus*, *O. vulgaris*, *P. erythrinus*, *P. longirostris*, *S. pilchardus*, *S. colias*, *S. officinalis*, *S. solea*, *S. smaris*, *T. trachurus*, *T. mediterraneus*) have exceeded the thresholds upwards or downwards (<90% and > 150%).

In some cases the under sampling in commercial fishery was covered by samples taken from the MEDITS survey (*P. longirostris*, *S. smaris* in GSA 23) and vice versa (*E. moschata*, *N. norvegicus*, *S. smaris* in GSA 22, *M. merluccius*, *M. barbatus*, *P. erythrinus* in GSA 23).

Oversampling during the MEDITS survey didn't burden the cost for the program.

For the ICCAT species, the planned number was achieved for all the species relevant for Greece. *T. thynnus* and *T. allalunga* were oversampled due to the high abundance of the species in the fishing period. For *C. hippurus* there was no obligation for sampling according to RCM MED&BS - LP 2016 WP Agreement n.3 referred to PGMed 2013 and 2014.

Under sampling of eel was due to administrative and funding constraints that prevented the realization of the sampling in all the EMUs. Data collected only from EMU 3.

Weight

The sampling intensity of weight was very similar to length intensity for all the species therefore the same explanations apply.

Age, Sex ratio, Sexual maturity

GSA 20: Under sampling of *E. encrasicolus* for age variable, *M. merluccius* for sex ratio & sexual maturity and of *M. surmuletus* for the three variables. Oversampling of *S. pilchardus* for sex ratio & sexual maturity, *M. barbatus* and *P. longirostris* on MEDITS surveys without burden the cost for the program.

GSA 22 Slight under sampling of *E. encrasicolus* for all three variables. Oversampling of *M. barbatus*, *M. surmuletus*, *N. norvegicus* *P. longirostris*, *S. pilchardus* for all three variables.

GSA 23 Slight under sampling of *M. merluccius*, *M. surmuletus* for all three variables.

- methods used for collecting data.

There was no deviation in the methodology used for collecting data. The procedure described in NWP was followed.

- methods used for estimating the parameters.

There was no deviation in the methods used for estimating the parameters. The procedure described in NWP was followed

3. Actions to avoid deviations.

The outcomes of the EU project STREAM and ICES WKBIOPTIM will be used to reassess and adapt the planned minimum number of individuals to be measured for the optimization of sampling effort and intensity.

(max. 1000 words per Region/RFMO/RFO/IO)

SECTION 1: BIOLOGICAL DATA

Text Box 1D - Recreational fisheries

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

1. *Description of the target population*

According to national legislation, there is official ban for most of the species -relevant for Mediterranean Sea for which data should be collected for recreational fisheries (eels, elasmobranchs and highly migratory ICCAT species). For the identification of other highly migratory ICCAT species and elasmobranchs pelagic & demersal, relevant for the Mediterranean, that are not included in the official bans and are probably targets of recreational fishery, MS is running a pilot study that is described in Text box “Pilot Study 1”

2. *Type of survey*

Not applicable

3. *Data Quality*

Not applicable

4. *Data Analysis and processing*

Not applicable

(max. 900 words per survey)

SECTION 1: BIOLOGICAL DATA

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

General comment: This box fulfils paragraph 4 of Chapter V of the multiannual Union programme and Article 2 and Article 4 paragraph (3) point (a) of the Decision (EU) 2016/1701.

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

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 governed by 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 fisheries of 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 fisheries in 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 of the 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).

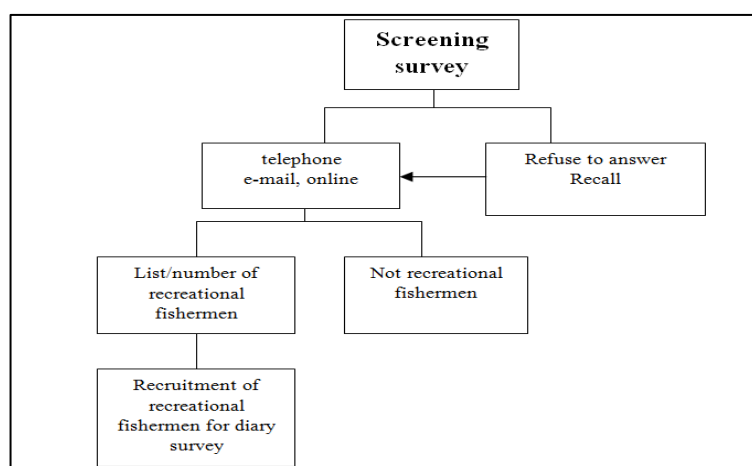


Figure 1. Screening survey. The questionnaire was designed in order to maximize response rates and get the minimum information required to determine the eligibility of the respondent for the more detailed diary research that will follow.

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 activity in 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)

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

Final results of the 1st phase screening survey (which consisted of a sample of 5.516 individuals in a nationwide telephone survey) of the pilot study, indicate that 9% (approximately 800.000 residents) of the population in Greece are recreational fishermen (RFs). Of these, 86% are fishing in the sea, 9% are fishing in inland waters and 5% are fishing in both sea and inland waters. In terms of avidity 53% fish between 1-5 times per year in the sea, 22% 6-10 times, 12% 11-25 times, and the remaining 7% fish 26-50 times per year and 7% fish more than 50 times per year

In terms of the fishing methods we see a combination of techniques often practiced by the same fisherman: 61% of the fishermen fish from the shore using lines, 38% from boats using lines, 12% spearfishing, 9% from boat using longlines and 2% are using other methods. Most of them 66% have declared small amounts of catches (0-5) kgr, while 20% stated that their catch is between 6-15 kgr, 8% catch 16-30 kgr, 3% catch 31-50 kgr and 3% more than 50 kgr per year. In terms of economics 9% spends nothing for their activity, 48% spends 1-50 € per year, 16% spends 51-100 €, 14% 101-250 €, 3% spends 251-500 €, while more than 500 € was spent by 8% of the respondents. There are no deviations from the planned survey so far.

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

The pilot study for recreational fisheries was designed to be completed within the period of 2017-2019 and cover the whole country in terms of the screening survey (1st phase), in terms of the diary survey (2nd phase), along with selected areas in terms of the on-site survey (3rd phase) which commenced in 2019.

During 2018, the screening survey gave us final results of the demographics of the sector. The diary survey consisted of the voluntary participation of recreational fishermen (RF) realized during 2018 and was characterized by the very low participation rate. Only 2,13% of the RF who initially expressed willingness to join in the survey have done so. In addition, the quality of the data provided were in most cases very low and therefore cannot be of any use. However, the pilot study continues through 2019 and in an effort to improve the quantity and quality of the data, the screening survey is planned to be repeated using a larger sample size (16.500 individuals in a nationwide telephone survey) attempting to recruit a larger sample of RF for the diary survey. The realization of the on-site survey in selected areas in the country is on going as planned.

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

The pilot study is on going having finished only the 1st phase of the designed plan. The incorporation of results from the pilot study into regular samplings will be done after it is finished.

(max 900 words)

SECTION 1: BIOLOGICAL DATA

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 multiannual Union programme and Article 2 of the Decision (EU) 2016/1701.

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

1. Method selected for collecting data.

For the three EMUs, where eel fisheries exist in Greece (EMU 1, EMU 2 and EMU 3), biological data (length, age, weight, sex ratio) on silver eels populations were collected, during their spawning migration at the end of the year. The capture of silver eels is done in permanent installed fishing devices 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 second year of the project a study was implemented in the estuarine system of Vistonida in EMU 3.

The main scope of the study was to re-evaluate the methodology that was used the previous year regarding the stock of glass and yellow eel. For the capture of the glass eels new type of traps (fyke nets) were used instead of the traps used during the first year (2017), while for the yellow eels, fyke nets are the gear of preference.

In the following year, (third year of the National Project) the outcomes of the study, will be applied to all EMUs in order to estimate the glass eel recruitment and yellow eel abundance for the Greek population of the species *Anguilla anguilla*.

The study was to be implemented by the Hellenic 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)

2. Were the planned number achieved? Yes/ No NO

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

Administrative and funding constraints didn't allow the implementation of the biological sampling in the Western Greece and West Peloponnese (EMU1 and EMU2, respectively). Only effort and landings were collected in EMU1 and EMU2.

In EMU 3 (East Macedonia and Thrace), in 2017 there were some efforts to construct and test traps for glass eels, using artificial habitat collection devices as proposed by Leone et al. (2016), which however, didn't worked as planned. In 2018 new fyke nets were also constructed and were installed in streams and lagoons, but until now no glass eels were captured.

Thus, for 2018, no data were gathered regarding the glass and yellow eels' abundance. Since the pilot study continues also in 2019, and in order to avoid any non-conformity, additional effort will be paid in installing extra fyke nets in EMU 3. Moreover, new fyke net traps for estimating the abundance of yellow eels, were purchased in order to be used in 2019 and the data will be used to build a mathematical model for the abundance calculation of the non-commercial part of the population.

(max 500 words per Area)

SECTION 1: BIOLOGICAL DATA

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

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

1. Results

A preliminary list of vulnerable species occurring in Greece and tentatively threatened by fisheries, including 33 birds, 7 mammals, 3 reptiles, 29 elasmobranchs fish, 1 agnatha fish, 14 bony fish, 2 cephalopods, 3 bivalves, 2 gastropods and 1 coral (Annex I), was established considering the results of the pilot study for monitoring of Protected Endangered and Threatened (PET) species carried out in 2017.

In 2018 the incidental by-catch of Protected Endangered and Threatened (PET) species was recorded by on-board/on-shore observers in eight different métiers (FPO, GNS, GTR, LLD, LLS, OTB, PS, SB) of the Greek fishing fleet. The number of professional fishing trips monitored during 2018 were 1254 for GSA22, 544 for GSA 20 and 76 for GSA 23 respectively.

In the eastern Ionian Sea (GSA 20) by catches of 18 PET species were recorded during demersal fisheries, including 8 elasmobranchs, 7 bony fish and 2 cephalopod species, whereas only 2 bony fish species during small pelagic fisheries (Annex II).

In the Aegean Sea (GSA 22) by catches of 24 PET species were recorded in total. Twenty two of them including 1 reptile, 12 elasmobranchs, 6 fish, 1 gastropod and both elledonid species (Annex II). *Squalus acanthias* was by far the most abundant PET elasmobranch species mainly caught by trawl, as also the majority of *Mustelus asterias* and *M. Mustelus*. A single specimen of the elasmobranchs *Galeorhinus galeus* was reported as by catch of large pelagic fisheries, whereas by catches of small pelagic fisheries (PS) included one loggerhead turtle (*Caretta caretta*), 10 specimen of musky octopus (*Eledone moschata*), 1 specimen of *Alosa fallax* and the exclusive by-catches of sword fish (10 ind.) and bluefin tuna (9 ind.)

In the waters around Crete island (GSA 23), among by catches of demersal fisheries were identified 3 species of elasmobranchs, 2 of bony fish (Annex II) and the musky octopus (*Eledone moschata*). The swordfish *Xiphias gladius* was the only PET species recorded during Purse seine fisheries in this area.

None by-catch of birds and mammals was reported from Greek fisheries in all 3 GSAs.

2. Deviations from Work Plan

There were no deviations from what was planned in the WP.

3. Data quality

Member States shall provide information on sampling protocols and sampling design for incidental by-catch data collection.

In order to record the incidental by-catch of PET species, Greece has adopted the sampling protocols provided by MARE/2014/19 project. These protocols are dedicated to specific marine species groups, namely fish, sharks & rays (Protocol 2), cetaceans (Protocol 3) and sea turtles (Protocol 4). Additional to the MARE/2014/19 protocols, one dedicated to birds (Protocol 5 see Annex I) has been also designed and applied. These protocols, apart from the standard data collection measurements, require the recording of a series of additional information, such several species-specific body size measurements, weight, sex determination, the estimation of the condition of the by-caught specimen etc.

At the same time, the on-board observers followed a training course on rare PET species identification as well as on the completion of the relevant data sheets. Specifically, as far as bottom trawls are concerned, observers have been instructed to check for PET specimens in the catch at the opening of the cod-end; whenever this was not possible, observers were instructed to indicate that the cod-end was not checked in a haul. In gillnets and hook-and-line fisheries, on board observers, were instructed to observe during the whole hauling process in order to be able to record any large incidental by-catches that never came on board. They were also instructed to observe the whole process of shorting. In circumstances where this is not feasible observers were instructed to give an estimate of the proportion of the shorting process that they observed. Additionally, even though mitigation devices are hardly ever used by the Greek fishing fleet, observers have been instructed to report their use, whenever it is observed. Finally, an additional measure to ensure the quality of provided data was the instruction to photograph the entire haul at the opening of the cod-end and before the shorting process begins. Whenever it was possible, observers also photographed the specimens of rare species caught, and, if feasible, they retained them in order to record biological parameters in the laboratory. The recorded data are stored in the databases of the institutions implementing the work plans, which was appropriately modified to be able to accept the corresponding data.

(max 900 words)

SECTION 1: BIOLOGICAL DATA

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 multiannual Union programme and Article 2 and Article 4 paragraph (3) point (b) of the Decision (EU) 2016/1701.
General comment: This box is applicable to the Annual Report. This box is intended to provide information on the results obtained from the implementation of the pilot study.
1. Aim of pilot study 2. Duration of pilot study 3. Methodology and expected outcomes of pilot study (max 900 words)
<i>Brief description of the results obtained (including deviations from planned and justifications as to why if this was not the case).</i> Greece didn't include a pilot study in its Work Plan concerning the impact of fisheries on biological resources and marine ecosystems. However, a pilot study on this issue is planned to take place in the sampling period 2019. More specifically, Greece intends to focus on the impacts of fisheries on the interspecific relationships of marine species, namely on the fish feeding ecology, through sampling, processing and analysing the stomach contents of targeted species. The details of the planned pilot study were discussed in the RCG Med & BS-LP 2018 and were included in the amendment of the Working Plan for 2019. <i>4. Achievement of the original expected outcomes of pilot study and justification if this was not the case</i> Not applicable <i>5. Incorporation of results from pilot study into regular sampling by the MS</i> Not applicable (max 900 words)

SECTION 1: BIOLOGICAL DATA

Text Box 1G: List of research surveys at sea

MEDITERRANEAN ACOUSTIC SURVEY (MEDIAS)

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

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

1. Objectives of the survey

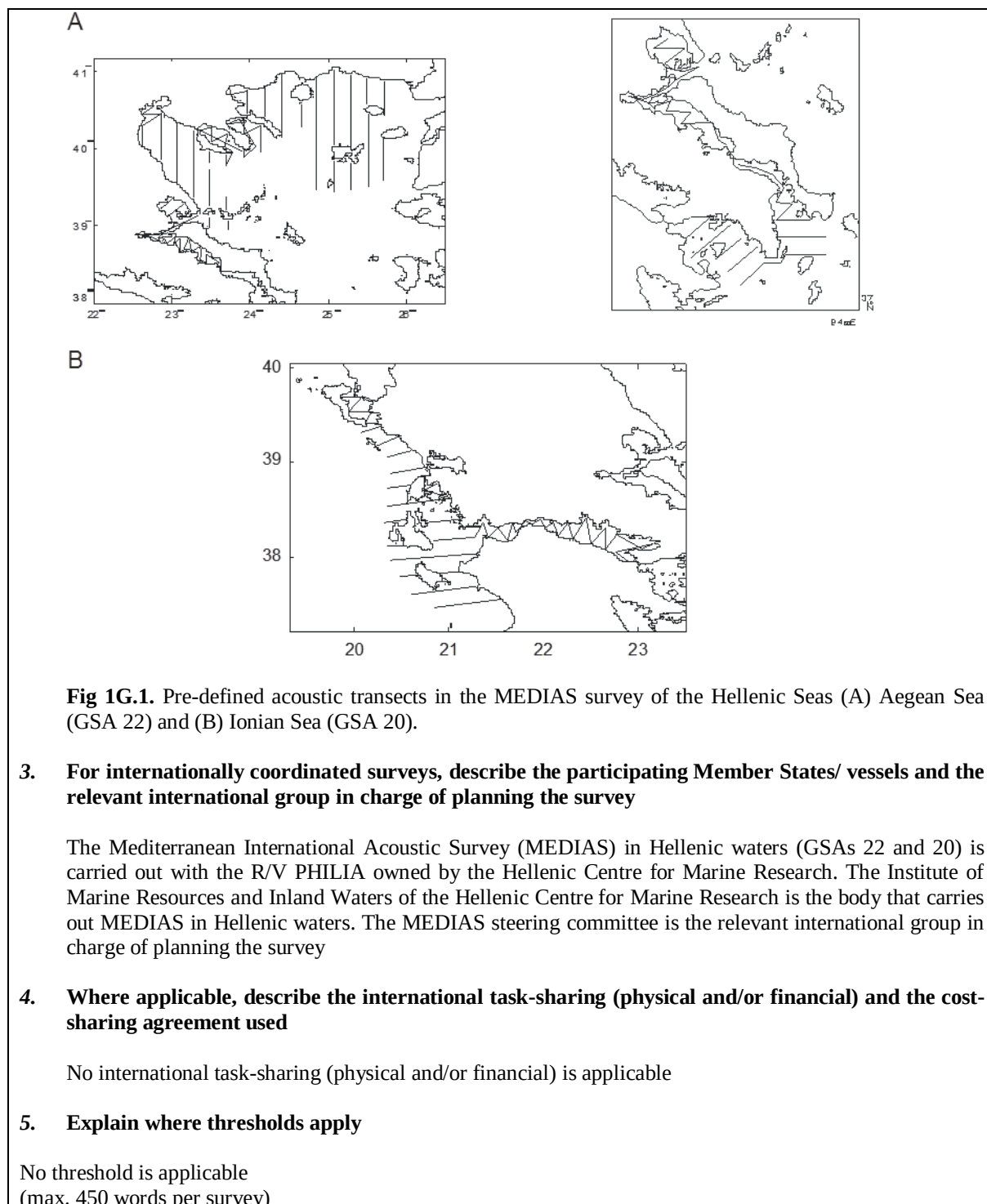
The objectives of the MEDIAS carried out in the Hellenic part of GSAs 22 and 20 are:

- Assess total pelagic fish echo abundance per EDSU.
- Assess Abundance and Biomass indices estimation of the target species, anchovy (*Engraulis encrasicolus*) and sardine (*Sardina pilchardus*) 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 (2018) upon request.

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

The size and the geographic distribution of anchovy (*Engraulis encrasicolus*) and sardine (*Sardina pilchardus*) stocks are estimated in the study areas using acoustic methodology. The methodology of the acoustic survey follows the protocol of MEDIAS (2017) so that results are harmonized and comparable to the other Mediterranean areas.

Acoustic echoes are registered continuously along pre-defined transects (Fig. 1) with a Simrad ES38-7, 38 kHz split-beam echo sounder transducer. The size of the Elementary Distance Sampling Unit (EDSU) is one nautical mile. The partitioning of integrated deflection was done by comparing the echogram at corresponding times. Echograms were examined in order to identify school marks that characterize anchovy and sardine in conjunction with the target strength of each species. Pelagic trawls are regularly held along transects in the positions of high fish concentrations. Hydrographic parameters are recorded over a predefined grid of sampling stations. At each station of the sampling grid vertical profiles of temperature and salinity are obtained by a Temperature-Salinity-Depth (CTD) system SBE-19 of Seabird Electronics.



6. Graphical representation (map) showing the positions (locations) of the realized samples.

Ionian Sea (GSA 20) MEDIAS survey

During the implementation of the DCF in Greece in 2018 one research survey, instead of two, was carried out: in Ionian Sea during November 2018. The survey focused on the delimitation of the juvenile grounds distribution for anchovy and sardine stocks and the biomass estimation of the respective stocks by means of Acoustics.

The size and the geographic distribution of anchovy (*Engraulis encrasicolus*) and sardine (*Sardina pilchardus*) stocks in eastern Ionian Sea (GSA 20) were estimated with the acoustic methodology. The methodology of the acoustic survey follows the protocol of MEDIAS so that results are harmonized and comparable to the other Mediterranean areas.

Acoustic echoes were registered continuously along 44 pre-defined transects in the eastern Ionian Sea during November 2018 (Fig. 1) with a Simrad ES38-7, 38 kHz split-beam echo sounder transducer. The size of the Elementary Distance Sampling Unit (EDSU) was one nautical mile. The partitioning of integrated deflection was done by comparing the echogram at corresponding times. Echograms were examined in order to identify school marks that characterize anchovy and sardine in conjunction with the target strength of each species. Acoustic survey covered a total area of 9785 km² in eastern Ionian Sea. In order to estimate anchovy's and sardine's biomass, the weight-length relationship is required as well as species length frequency distribution per area. Therefore, 15 pelagic trawls were held along transects in the positions of high fish concentrations.

Hydrographic parameters were recorded over a grid of 80 sampling stations in eastern Ionian Sea (Fig 2). At each station of the sampling grid vertical profiles of temperature and salinity were obtained by a Temperature-Salinity-Depth (CTD) system SBE-19 of Seabird Electronics. Plankton sampling took place at a grid of 80 sampling stations in eastern Ionian Sea (Fig 2).

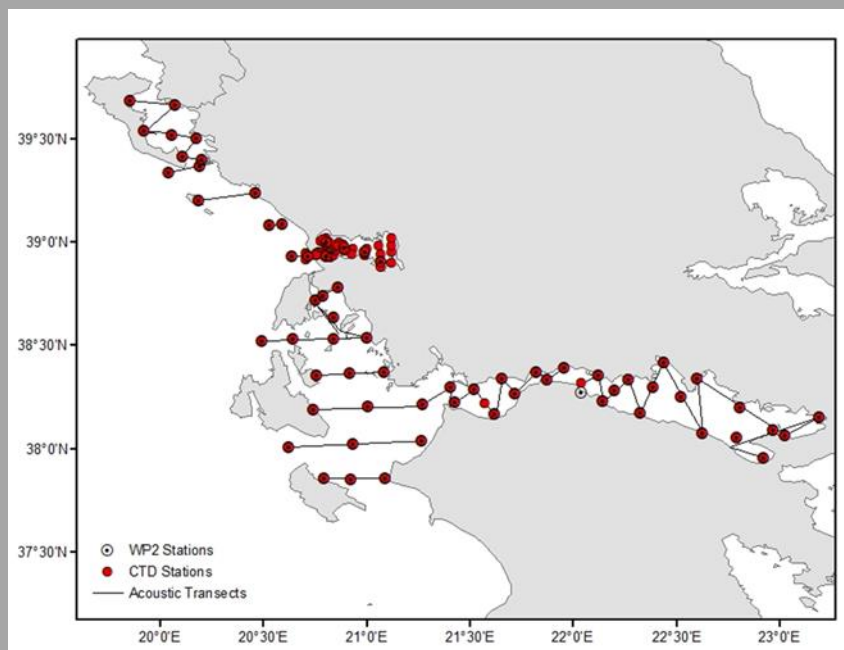


Fig 1. Acoustic transects sampled in the MEDIAS survey of the Hellenic part of Ionian Sea (GSA 20) in November 2018. The position of CTD and plankton stations sampled are also shown.

Maps related to the acoustic samples of the MEDIAS survey in Hellenic part of eastern Ionian Sea (GSA 20) is presented below:

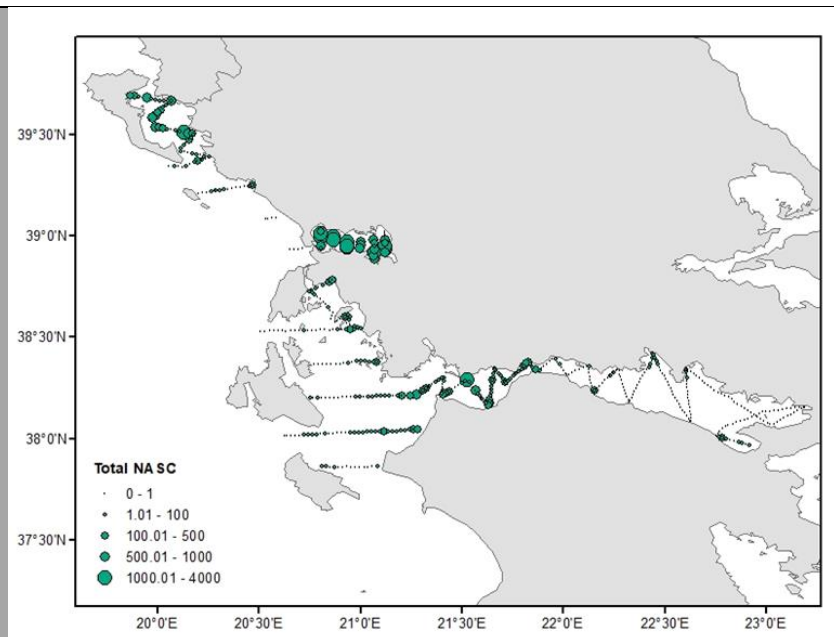


Fig 2. The distribution of the total fish NASC (m^2/nm^2) per EDSU in eastern Ionian Sea during November 2018

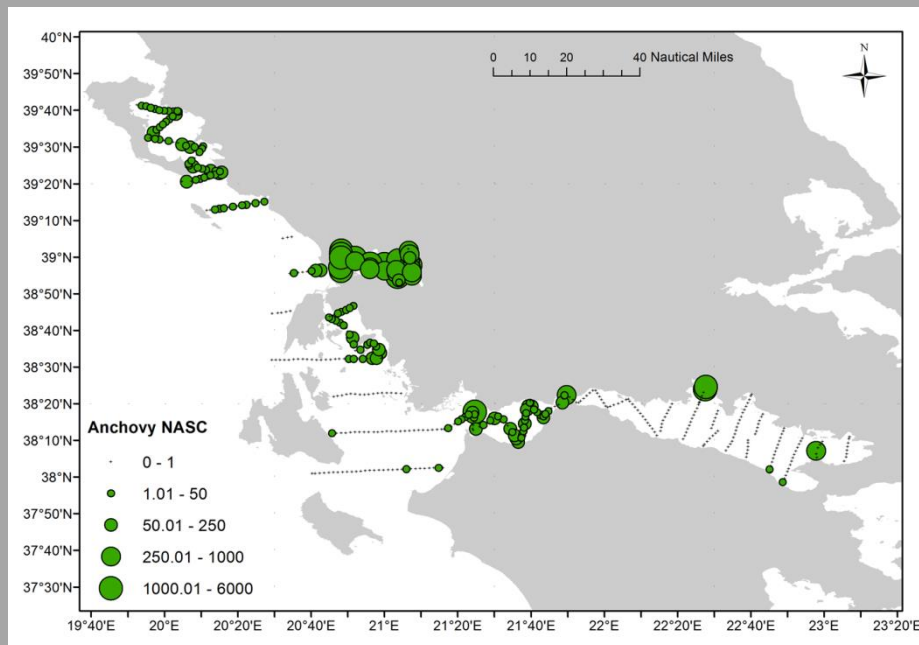


Fig 3. The distribution of anchovy NASC (m^2/nm^2) per EDSU in eastern Ionian Sea during November 2018.

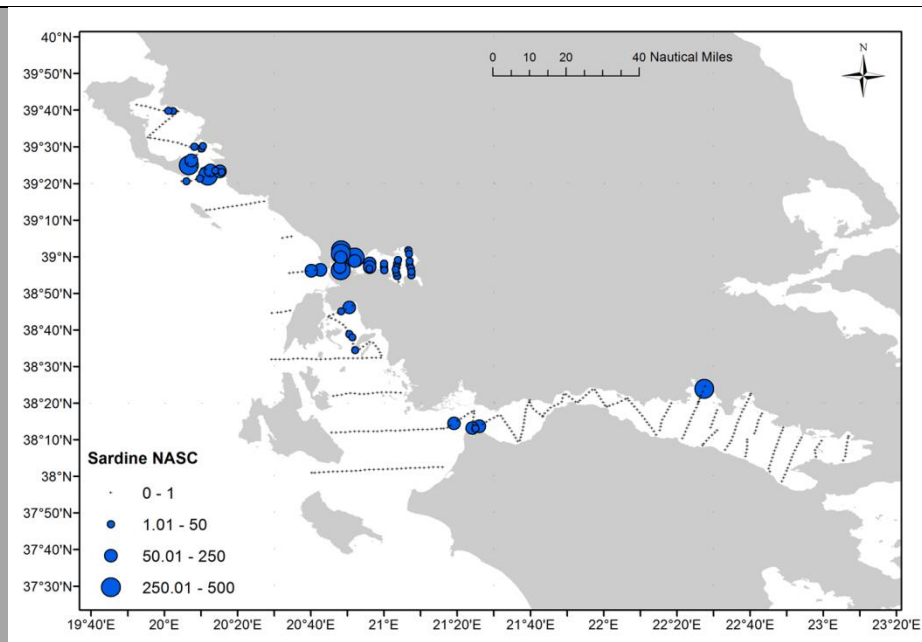


Fig 4. The distribution of sardine NASC (m^2/nm^2) per EDSU in eastern Ionian Sea during November 2018.

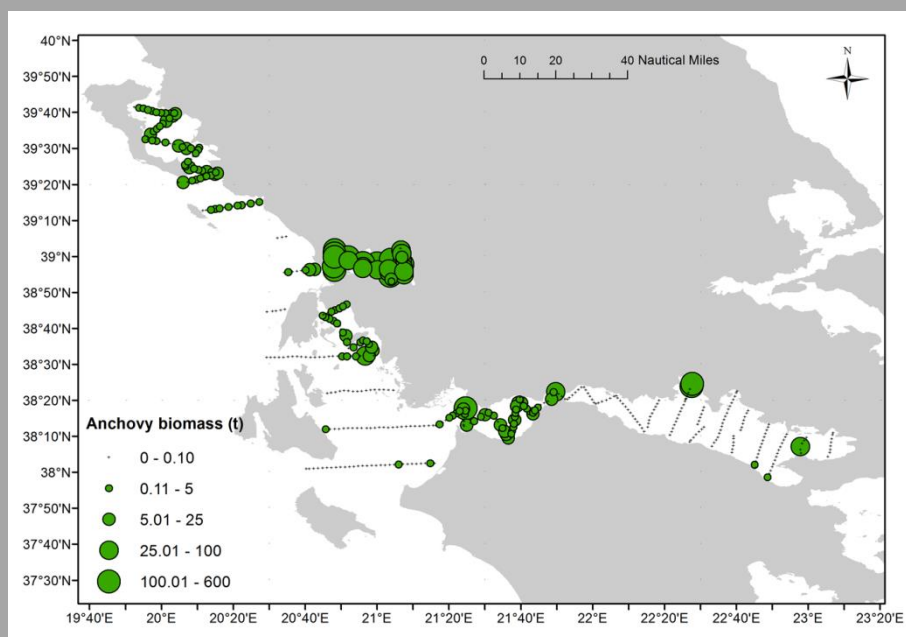


Fig 5. The distribution of anchovy biomass (t) per EDSU in eastern Ionian Sea during November 2018.

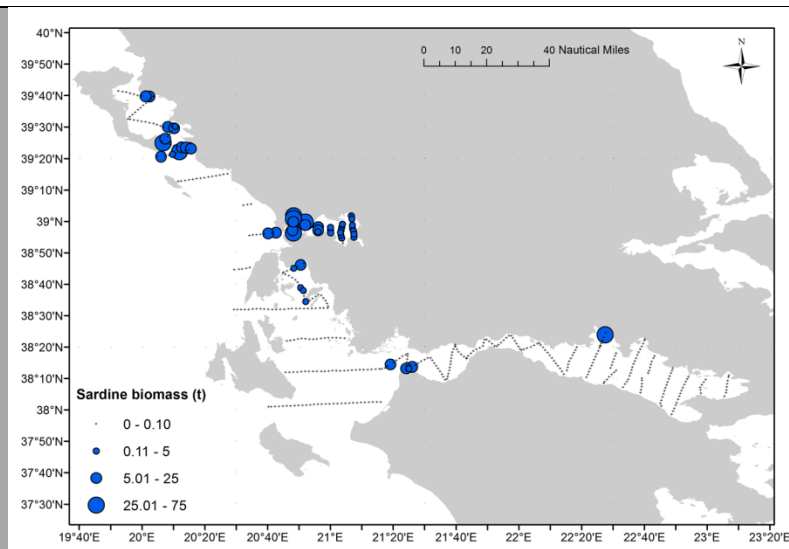


Fig 6. The distribution of sardine biomass (t) per EDSU in eastern Ionian Sea during November 2018.

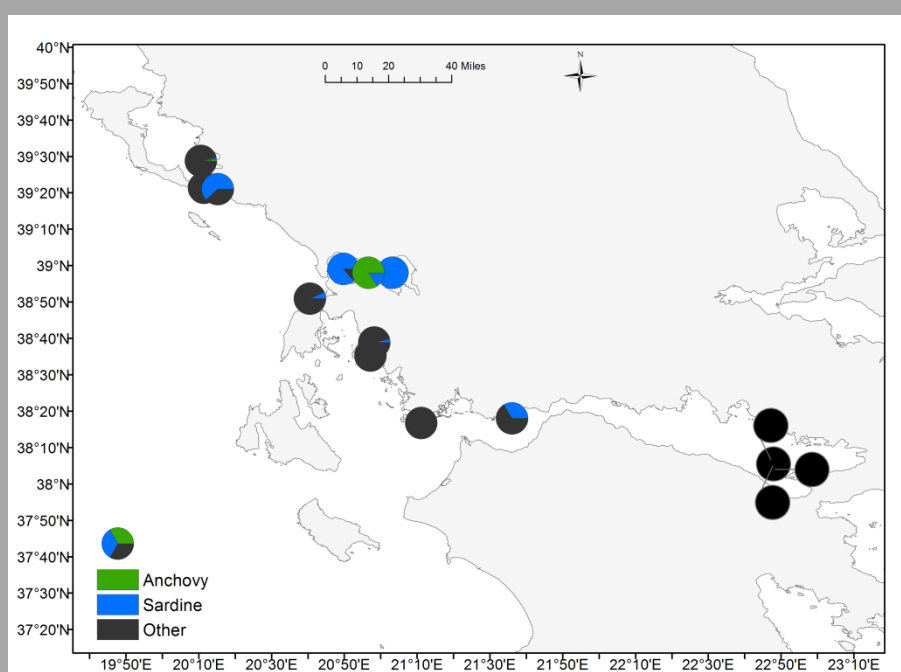


Fig 7. The catch compositions of the hauls (species kg/haul) weighted per hauling hour in eastern Ionian Sea during November 2018.

Aegean Sea (GSA 22) MEDIAS survey

No MEDIAS survey was carried out in the Hellenic part of Aegean Sea (GSA 22) in 2018 as the RV PHILIA was not operational from January 2018 till the end of October 2018.

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

The report for the MEDIAS survey for 2018 can be found at <http://www.medias-project.eu/medias/website/> of the MEDIAS coordination group.

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

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

Abundance indices for anchovy and sardine and any biological information derived from the MEDIAS survey in the Hellenic Seas are used for the stock assessment of anchovy and sardine stocks in Greek waters on routine basis both on an international (EU STECF and GFCM assessment groups) as well as on a national context.

Additional biological data are collected for the non target species, depending on the catch of mesopelagic hauls as well as temperature and salinity profiles in predetermined CTD stations, plankton sampling in predetermined stations and marine mammals observations. However, this information is not used for advice on international or national context.

Ionian Sea (GSA 20) MEDIAS survey

The following abundance estimates and indices are presented below and will be provided to the DCF for GSA 20 in 2018:

For anchovy and sardine:

- Number of individuals/age/
- Biomass/age/Target species
- Number of individuals/length class
- Biomass/length class/Target species

Table 1. Biomass estimation of anchovy in eastern Ionian Sea per length class based on the results of the acoustic survey in 2018.

Ionian Sea		
Total biomass (t): 23 294.79		
Length class	No. of individuals	Biomass (t)
55	31 779 951	27.77
65	156 171 440	219.28
75	402 356 315	848.15
85	1 157 131 137	3 480.02
95	4 033 510 319	16 635.42
105	377 902 041	2 070.82
115	1 224 195	8.69
125	374 276	3.36
135	0	0.00
145	93 569	1.28
Sum	6 160 543 244	23 294.79

Table 2. Biomass estimation of anchovy in eastern Ionian Sea per age class based on the results of the acoustic surveys in 2018.

Ionian Sea		
Age	No. of individuals	Biomass (t)
0	590 307 706	1095.20
1	5 570 169 064	22198.74
2	61 416	0.78
3	5 058	0.07
Sum	6 160 543 244	23 294.79

Table 3. Biomass estimation of sardine in eastern Ionian Sea per length class based on the results of the acoustic survey in 2018.

Ionian Sea		
Total biomass (t): 2886.29		
Length class	No.of individuals	Biomass (t)
95	126 519	0.76
105	121 224 058	989.00
115	134 428 792	1456.91
125	12 929 659	181.79
135	5 751 877	102.83
145	3 482 889	77.83
155	1 528 489	42.06
165	660 712	22.10
175	323 707	13.01
Sum	280 456 702	2886.29

Table 4. Biomass estimation of sardine in eastern Ionian Sea per age class based on the results of the acoustic surveys in 2018.

Ionian Sea		
Age	No. of individuals	Biomass (t)
0	171 257 387	1724.28
1	108 714 136	1144.26
2	485 179	17.75
3	0	0.00
Sum	280 456 702	2886.29

For the non target species:

- Length–Weight relationships (where an adequate number of samples is available)
- Length frequency distributions

Table 5. Length-Weight relationships (TW (gr)- TL (mm)) for the main species in eastern Ionian Sea.

Species	Ionian Sea
Anchovy (<i>Engraulis encrasicolus</i>)	$TW = 1E-05 * TL^{2.8393}$
Sardine (<i>Sardina pilchardus</i>)	$TW = 4E-06 * TL^{3.1217}$
Round sardine (<i>Sardinella aurita</i>)	$TW = 6E-06 * TL^{3.0513}$
Mediterranean horse mackerel (<i>Trachurus mediterraneus</i>)	$TW = 1E-05 * TL^{2.9278}$
Bogue (<i>Boops boops</i>)	$TW = 3E-06 * TL^{3.2022}$

Ecosystem indicators derived from acoustic surveys as described in the MEDIAS handbook (2017) upon request.

Aegean Sea (GSA 22) MEDIAS survey

No MEDIAS survey was carried out in the Hellenic part of Aegean Sea (GSA 22) in 2018, subsequently no abundance indices and estimates can be provided.

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

Major deviations of the proposed plan were due to the fact that the RV PHILIA was not operational before November 2019. Subsequently due to time limitation no survey was carried in the Aegean Sea (GSA 22). The MEDIAS survey was carried out in Ionian Sea (GSA 20) which is surveyed during autumn consistently since 2013. As a result we present reduced percentage of coverage: only 26.58% cover of the planned EDSU (Elementary Distance Sampling Units) for acoustics and 53% in the number of CTD stations.

(max 450 words per survey)

SECTION 1: BIOLOGICAL DATA

Text Box 1G: List of research surveys at sea

- MEDiterranean International bottom Trawl Survey (MEDITS)

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

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

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 available at:

http://www.sibm.it/MEDITS%202011/docs/Medits_Handbook_2017_version_9_5-60417r.pdf

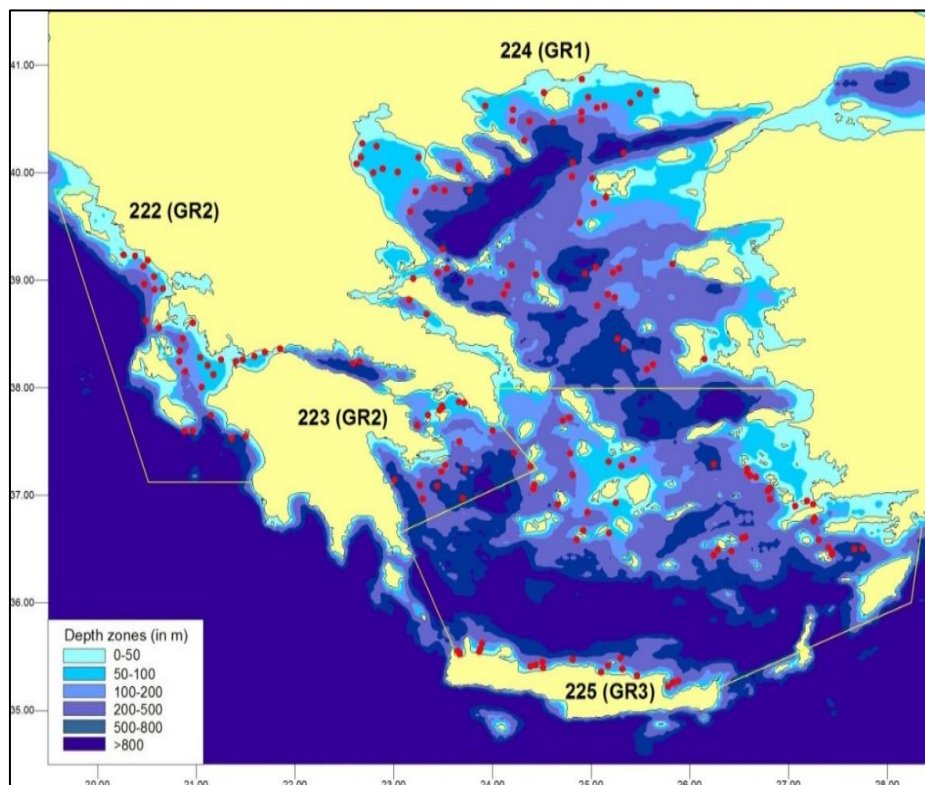


Fig. 1G.2. Map of the sampling areas and sampling stations in the GSAs 20,22,23. Red spots represent the sampling stations

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

Participating 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.
Meditis 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

No international task-sharing (physical and/or financial) is applicable

5. Explain where thresholds apply

No thresholds apply.

(max. 450 words per survey)

6. Graphical representation (map) showing the positions (locations) of the realized samples.

The MEDITS survey was realized in all Greek GSAs during 2018 without any deviation following the methodology described in the latest MEDITS manual.

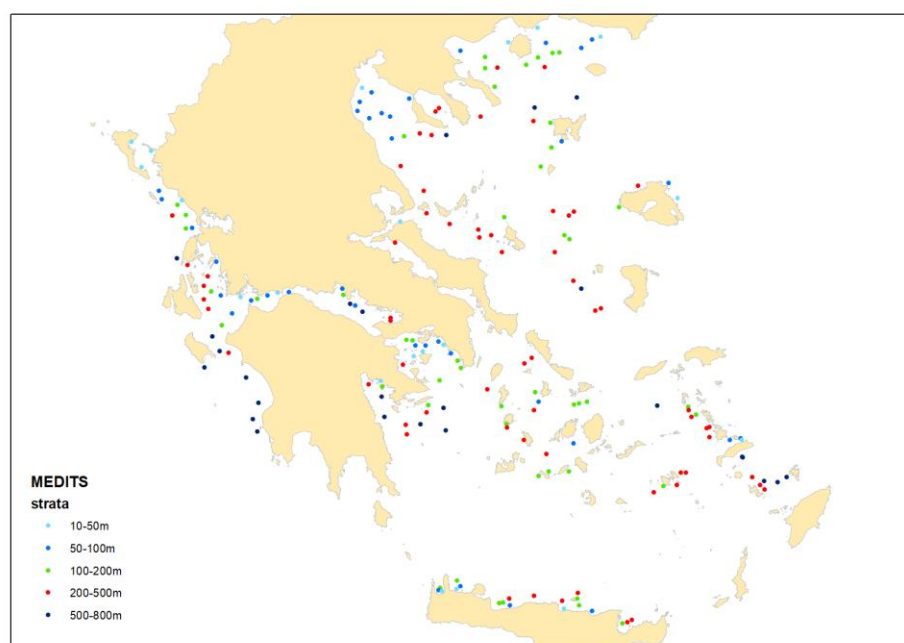


Fig. 1. Map of the sampling areas and sampling stations in the GSAs 20,22,23.

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

The meeting report of the MEDITS Coordination Committee of the MEDITS Survey 2017 is available in the following link:

http://www.sibm.it/MEDITS%202011/docs/MEDITS_2017_report.pdf

The report for the MEDITS survey for 2018, although completed, has not yet been uploaded to the relevant website.

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

MEDITS data are used for demersal species stock assessments (GFCM, STECF groups) and also for indicators estimations used for the evaluation of demersal megafauna communities, of the marine environment and contribute to descriptive indicators mandatory for the Marine Strategy Framework Directive (MSFD) and in numerous European Research Projects, McS, PhDs and Scientific publications in National and International level.

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

The MEDITS surveys were accomplished in the Greek GSAs (20, 22, 23) according to the work plan with no deviations.

(max 450 words per survey)

SECTION 2: FISHING ACTIVITY DATA

Text Box 2A: Fishing activity variables data collection strategy

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

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

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

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 fishing effort and landing, for the estimation of variables listed in table 4 of Com.Dec.1251/2016, will be collected through different sources because different requirements derive 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 notes for 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 Amount of 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 with structured 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 purposes.

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

The estimation of value of landings will be based on the principles of simple random sampling as described 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 estimators as described 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 ($1-\alpha$). The formula used to estimate the sample size in each fleet segment is (Dattalo, 2008):

$n = (n_0 N) / (n_0 + (N-1))$, where:

$n_0 = (z^2 \sigma^2) / e^2$ 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). In such cases, the adjusted sample size (n_{adj}) is estimated as:

$n_{adj} = n / (1 + n/N)$

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 $(1-\alpha)=85\%$ (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

(max 900 words per Region)

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

Validation of the >12 m part of the fleet has not yet taken place.

Actions to avoid deviations.

MS is planning to cross-validate data following the procedure that is described under point 1 in the next year

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

No deviations exist

Value of landings recorded in ERS are sometimes misleading due to the fact that fishers are not very familiar with the ERS software. For this reason, price cell is frequently empty and therefore, value of landings are underestimated.

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

No deviations exist

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

No deviations exist

(max 900 words per Region)

(max 900 words per Region)

SECTION 3: ECONOMIC AND SOCIAL DATA

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

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

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

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

The 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, since for 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 percentage 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 discussed in Pilot study 3. Data on employment by education level and nationality.

5. Description 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 variability 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)

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

No deviation exists

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

No deviation exists

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

According to the Greek NWP, the actual planned sample rate is yearly updated. In other words, the planned sample rate may differ from year to year, because the sample size is reconsidered every year, based on the size of the population and the previous year variance of each stratum. This approach is also recommended by STECF 17-11, Quality Assurance for DCF data and by the Quality Guidelines for the DCf (Moura, 2016, see pages 35-38) (see also section 4 of Textbox 2A).

For the above reason, the actual planned sample rate has been updated with respect to the one reported in the WP and consequently, the response rate reported in Table 3A is different from the values reported in column “Achieved Sample no/Planned sample no.”

To conclude, there are no deviations from the NWP methodology, even though the values in column “Achieved Sample no/Planned sample no.” are not always close to one (either from above or from below).

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

No deviations

10. Quality assurance

10.1 Sound methodology

The data collection scheme follows methodologies, guidelines and best practices agreed in expert groups (in particularly PGECON 2017 and 2018, SGECA09-02, Social and new economic variables workshop PG ECON as well as Moura, 2016).

The majority of the economic data was collected through sample survey as already discussed in previous paragraphs. Bias and variability indicators were used as quality indicators. Particularly, the bias indicators provided were the coverage rates (planned and achieved) and response rates, while the variability indicator provided was the CV. For key economic variables such as energy consumption and energy costs, imputation techniques were used.

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 were evaluated thoroughly using several indicators. Furthermore, data collectors were properly trained in a specially targeted workshop and written guidelines regarding the collection process was provided to them.

MS have already published an updated version of the methodology report (<https://www.agreri.gr/sites/default/files/projects/Methodology%20Report%20version%202.pdf>).

10.2. Accuracy and reliability

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

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

MS source data, intermediate results and statistical outputs are regularly assessed and validated, using data quality indicators and benchmark tables. In case, of extreme values and outliers, internal communication is implemented with data collectors to correct possible typing errors.

Sampling and non-sampling errors are measured and systematically documented according to the European standards. Moreover, internal procedures and guidelines to measure and reduce errors are in place such as:

- Identification of the main sources of error;
- Quantification of sampling errors;
- Identification and evaluation of main non-sampling error sources in statistical processes;
- Special attention to outliers;

Quality reporting on accuracy is guided by EU/regional recommendations and methods. Moreover, tools for preventing and reducing sampling and non-sampling errors are in place (See Methodology report v.2, available at : www.agreri.gr/sites/default/files/projects/Methodology%20Report%20version%202.pdf)

10.3. Accessibility and Clarity

Indicate with Yes or No

Are methodological documents publicly available? YES

Are data stored in databases? YES

Where can methodological and other documentation be found? YES

Provide the web link, if documentation is publicly available

<https://www.agreri.gr/sites/default/files/projects/Methodology%20Report%20version%202.pdf>

(max 1000 words)

SECTION 3: ECONOMIC AND SOCIAL DATA

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 multiannual Union programme and Article 2 and Article 3 paragraph (3) point (c) of the Decision (EU) 2016/1701. It is intended to specify data to be collected under Table 6 of the multiannual Union programme.
General comment: This box is applicable to the Annual Report. This box is intended to provide information on the results obtained from the implementation of the pilot study (including deviations from planned and justifications as to why if this was not the case).
1. Aim of pilot study 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 characteristics 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 triennially as required by the multi-annual Union programme. 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". 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). It should be noted that for Greece the threshold is defined at 1.750 hours, according to the greek legislation (Official Government 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)

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

According to the WP social data collection is implemented parallel with the economic data collection. Indeed, MS gathered social data using the same data collection scheme with the economic survey and therefore, no deviations exist (see also Table 3A).

For the above reason, social data collection also follows the same quality assurance framework with the economic data collection scheme (see point 10, in Textbox 3A and the Methodology report v.2* for more details). The social data collection scheme has been also presented in the special Social and new economic variables workshop PGECON, that took place in Athens, between 19-22 November 2018.

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

According to the EU-MAP, MS should collect social data in a triannual basis, and the first reference year for the collection of these variables was 2017. Social data collection implemented successfully and without deviations. MS is confident that it will successfully collect social data for the next social data call.

* available at: www.agreri.gr/sites/default/files/projects/Methodology%20Report%20version%202.pdf

(max 900 words)

SECTION 3: ECONOMIC AND SOCIAL DATA

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 multiannual Union programme and Article 2, Article 4 paragraphs (1) and (5) and Article 5 paragraph (2) of the Decision (EU) 2016/1701. It is intended to specify data to be collected under Tables 6 and 7 of the multiannual Union programme.

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

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

Fish and shellfish have been produced using aquaculture techniques in Greece since early 1960s. In 1985 there were more or less 15 farms licensed, producing annually 100 tons. Three decades later the production had increased by 1000%, with more than 650 farms producing more than 100 thousand tons.

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

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. There are a few large enterprises that are vertically integrated companies also producing fry, feed for aquaculture industry and equipment. 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 are not available by the companies accounting offices or the representatives.

For the fiscal year 2017, the data was collected according to Greece's "Work Plan for data collection in the fisheries and aquaculture sectors 2017-2019" and included 659 aquaculture units (almost 95% of the total sector).

Regarding marine fin fish sector in Greece, two species are mainly farmed, sea bream and sea bass while at a much smaller scale some other Mediterranean species are farmed such as Meagre, Sharpnose seabream, Red porgy, Turbot, Dentex and Red Seabream. As for inland waters trout is the main farmed species and mussels for the shellfish sector.

Basic source for the collection of economic data for the fiscal year 2017 was the data produced by the survey's questionnaires, complemented and confirmed by data from Integrated Monitoring System of Fisheries Activities (OSPA). The majority of the required economic data was derived from the processing of the balance sheets and financial statements of the companies, however, the socio-economic data needed (employment by gender etc.) were provided by on site visits, interviews, financial records and balance sheets. The volume data provided by the aforementioned sources was crosschecked with data sources of Hellenic Statistical Authority (ELSTAT).

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

The first stage of the data collection methodology consisted 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 was 60 days.

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

The questionnaire included the following 3 topics:

- (1) Cost and profit, (2) Aquaculture techniques and volume, (3) The socio-economic criteria of the sector and
- 4) Pilot study of environmental data.

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

The data collection method is census therefore the questionnaires were sent to all the operating aquaculture enterprises. Additionally, for the economic data, all published annual balance sheets of the operating SA and LTD enterprises in aquaculture sector were processed, added to the questionnaires data which was then complemented and confirmed by the data derived from Integrated Monitoring System of Fisheries Activities (OSPA).

As mentioned in the previous year report, due to a legislation change in Greece, since January 1st 2016, companies are not obliged by law to publish their annual balance sheets on their websites or in printed media and despite their obligation to upload balance sheets on General Commercial Registry, that led to a decrease of publicly available companies' financial information and a much longer period of balance sheets processing. If, at the end of the survey year, an aquaculture enterprise could not demonstrate a published balance sheet, had not replied to questionnaires sent, could not be reached for interview and onsite visit and showed no activity and/or production in National Authorities Records and on Integrated Monitoring System of Fisheries Activities, it was excluded from the sample as non-operational for the corresponded survey year. Each survey year their status is reevaluated.

4. Description of methodologies used for estimation procedures

Small companies and aquaculture units that do not operate under the International Financial Reporting Standards (IFRS) are unable to provide detailed information about cost structure and financial data segmented by 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 IFRS are able to provide the extra information, even about production cost structure. For those variables that needed further segmentation, both social and economic, a non-probability sample survey was applied based on the information provided by the large enterprises that cover adequately the species and the techniques. Regarding the Triennial Pilot Study for social data of aquaculture, for the 4 social categories (age, education, nationality and employment status), the Non-Probability Sample Survey method was used while data was collected from enterprises covering the whole range of the aquaculture sector sample, various locations and different species farms and 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, were 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)

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

There were no deviations

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

There were no deviations

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

There were no deviations

9. Deviations from Work Plan methodology used for estimation procedures

There were no deviations

10. Quality assurance

10.1 Sound methodology

The survey was carried out according to the methodologies described in Greece's "NWP for data collection in the fisheries and aquaculture sectors 2017-2019". The guidelines and practices agreed upon by program's partners and experts, were followed and monitored by monthly work reports and regular work meetings to guarantee proper implementation of the survey schedule.

10.2. Accuracy and reliability

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

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

Raw data inputs and intermediate results are compared to corresponding previous year data in each category during their entry in the data base and in case of significant differences between the two years or data inconsistencies, an effort is applied for confirmation of the data validity. Also, data is cross checked and confirmed by data from Integrated Monitoring System of Fisheries Activities (OSPA).

10.3. Accessibility and Clarity

Indicate with Yes or No

Are methodological documents publicly available?

NO

Are data stored in databases?

YES

Data is stored first in spreadsheets for processing and then uploaded on a data base.

Where can methodological and other documentation be found?

Provide the web link, if documentation is publicly available

Methodological documentation is not currently available.

The Integrated Monitoring System of Fisheries Activities (OSPA), operating under Ministry of Rural Development and Food, that is used for data cross checking and validation can be found in the following link

Link: <http://portal.alieia.minagric.gr/wps/portal/fishing#>

(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 multiannual Union programme and Article 2 and Article 4 paragraph (3) point (d) of the Decision (EU) 2016/1701. It is intended to specify data to be collected under Table 8 of the multiannual Union programme.

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

1. Aim of pilot study

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). Our concern is that inclusion of mortality and antibiotics data within the survey 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)

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

During 2018, the questionnaire used was sent to a wider than planned variety of enterprises, covering the whole range of the aquaculture sector sample, on various locations and for different species farms and techniques.

Regarding the pilot study results, there was a total lack of participating companies in the pilot study for the medicines used (either regarding the medicine type or the active substance) while a small number of companies provided mortalities data (5 companies to be exact, which operate 62 aquaculture units, representing 8, 8% of the sector based on number of units and 23% based on production volume). Furthermore, the mortalities data were classified as follows: a) diseases, b) weather conditions, c) air and sea predators and d) natural causes mortalities.

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

Based on the results of the pilot study, only mortalities data can be incorporated into regular sampling since it was the only type of data that was possible to be collected during the pilot study. It is estimated that, the aquaculture medicines data can only be collected directly from national authorities responsible for the monitoring of aquaculture medicines application and usage.

(max 900 words)

SECTION 3: ECONOMIC AND SOCIAL DATA

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

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

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

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

The 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.

For the fiscal year 2017, the data was collected according to Greece's "Work Plan for data collection in the fisheries and aquaculture sectors 2017-2019"

For 2017, there were 179 companies with proven activity of freezing, processing of fish, and the de-shelling of mussels of which 169 participated in the survey, including 36 SA and Ltd companies with published annual balance sheets. Those 36 firms account for over 80% of the fish processing industry based on raw material purchases.

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

Additional information was provided by questionnaires completed by companies and the replies were combined with onsite visits and interviews in order to acquire the needed information.

The collected data provided by financial records and questionnaires were 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) business and 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 consisted 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 was 60 days.

The questionnaire included 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 included onsite visits to the companies that had already completed the questionnaire along with a data processing of published balance sheets and financial statements.

The questionnaire included 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, nationality and employment status, and (3) number and location of enterprises.

The collected data from both sources were uploaded regularly on 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 was used for the majority of values was the census and the questionnaire was sent to all the listed companies. Almost 40% of the participating companies sent back fully completed survey questionnaires while on site interviews were arranged for the remaining part.

During the last 6 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 (>94 %), thus ensuring reliability of the estimations and conclusions. As mentioned in also the aquaculture section, due to a legislation change in Greece, since January 1st 2016, companies are not obliged by law to publish their annual balance sheets on their websites or in printed media and despite their obligation to upload balance sheets on General Commercial Registry, that led to a decrease of publicly available companies' financial information and a much longer period of balance sheets processing.

4. Description of methodologies used for estimation procedures

The census method was used for the majority of values. Therefore, the estimation procedure was applied for certain values (e.g. energy cost and unpaid labor) due to inadequate input or companies' reluctance to answer, using the probability sample survey method.

5. Description of methodologies used on data quality

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

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

(max 1000 words)

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

There were no deviations

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

There were no deviations

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

There were no deviations

9. Deviations from Work Plan methodology used for estimation procedures

There were no deviations

10. Quality assurance**10.1 Sound methodology**

The survey was carried out according to the methodologies described in Greece's "NWP for data collection in the fisheries and aquaculture sectors 2017-2019". The guidelines and practices agreed upon by program's partners and experts, were followed and monitored by monthly work reports and regular work meetings to guarantee proper implementation of the survey schedule.

10.2. Accuracy and reliability

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

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

Raw data inputs and intermediate results are compared to corresponding previous year data in each category during their entry in the data base and in case of significant differences between the two years or data inconsistencies, an effort is applied for confirmation of the data validity.

10.3. Accessibility and Clarity

Indicate with Yes or No:

Are methodological documents publicly available?

NO

Are data stored in databases?

YES

Data is stored first in spreadsheets for processing and then uploaded on a data base.

Where can methodological and other documentation be found?

Provide the web link, if documentation is publicly available.

Methodological documentation is not currently available.

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

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

**1. Description of the sampling plan according to Article 5 paragraph (3) of the Decision (EU) 2016/1701
Specification of the purposes, temporal and spatial distribution, frequency by which data will be collected**

Biological data on stocks caught by the Hellenic commercial 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.2016/1251 and 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) (the metier has been selected because 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 and comprises 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 2016/1251 and 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, métier 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 métier 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 elasmobranchs, 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 elasmobranchs 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 methodology described 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.

(max 900 words per region)

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

2. Deviations from the Work Plan

In most of the cases the planned number of trips were realized. In three cases (PS in GSA 23, FPO in GSA 22, LLD) slight under sampling was noticed (however the achievement was >80%) and in some cases there was oversampling in order to achieve the higher possible coverage of length distributions of the main species, and to obtain as much samples as possible for the calculation of the other biological variables.

There was no deviation in the methodology used for collecting data nor in the methods used for estimating the parameters. The procedure described in NWP was followed.

3. Action to avoid deviations

Although there were no major deviations the MS will try to adjust them in the future.

(max. 1000 words per region OR fishing ground)

SECTION 5: DATA QUALITY

Text Box 5A: Quality assurance framework for biological data

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

1. Evidence of data quality assurance

Within this section Member State shall provide information on the methodology used to assure the quality of the data collected, highlighting those aspects where changes have been made during the sampling year. Information shall be provided by each sampling scheme for which data was collected. In the case where the same quality assurance framework is applied to all data collection schemes, information can be provided at general level with the indication “all sampling schemes”.

In those sections of Table 5A where “N” is indicated, Member States shall explain the main constraints and/ or the steps taken to fulfil this obligation. In the cases where a reference documents is requested, Member States shall provide a web link.

In cases where documents are not publicly available, due to institutions internal policy, confidentiality or other reasons, this shall be indicated by the Member State.

In order to identify the data collection process that need improvement and to obtain indications of the data quality in terms of precision and accuracy, the guidelines proposed by the following ICES workshops are used:

Accuracy: The Workshop on Methods to Evaluate and Estimate the Accuracy of Fisheries Data used for Assessment (WKACCU, 2008; http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2008/WKACCU/wkaccu_2008.pdf) focused on the detection of bias in a list of key parameters important for stock assessment e.g. species identification, length and age structure and sex ratio.

Precision: The Workshop on Methods to Evaluate and Estimate the Precision of Fisheries Data used for Assessment (WKPRECISE, 2009; <http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2009/WKPRECISE/WKPRECISE%20Report%202009.pdf>) focused on the detection of the variability of national level fishery statistics e.g. quantities landed, discards, fishing effort and CPUE and biological data in terms of precision.

Regarding the data quality checks and verification procedures for the different stages of the sampling scheme, including the data quality checks for data capture and data validation, the guidelines and the tools developed in the MARE_2014_19 projects (MARE/2014/19 - SI2.705484 and the FishPi projects: <https://datacollection.jrc.ec.europa.eu/docs-links/mare-2014-19>) have been used.

Based on the above, the necessary data quality procedures have been grouped under four pillars in relation to the various stages of a sampling scheme: 1. verification of the data structure; 2. verification of sampling protocol implementation; 3. verification of the data base population protocol; 4. advanced data checks, that would help to identify sources of bias or mistakes at various levels of the sampling scheme. The expansion/modification of the existing “COST” tool has been suggested as the best procedure to achieve the above targets. These tools are to be considered as the first version of a library meant to improve with time and are also included in the current project MARE/2016/22 – SI2.770115 “Strengthening Regional cooperation in the Area of fisheries biological data collection in the Mediterranean and Black Sea (STREAM)”.

Regarding the estimation of sampling intensity for biological variables, these will be based on the methods delivered under MARE/2014/19 Med&BS project (Deliverable 2.5 and 4.2) implementing the Sampling Design tool for optimization of sampling intensity and data quality checks, when these will be finalized. The methodological framework developed in WP2 of MARE/2014/19 Med&BS is implemented in R scripts built

on COSTS tools (COST Project, 2009) and allows to analyse the evolution of the sampling variability with the number of samples, assess whether the current plans over/under-sample the fisheries and propose an “optimal” sampling plan (in terms of number of trips and individuals to sample) disaggregated over strata (e.g. quarters and métiers). In the proposed method, the “optimal” sampling plan is built on the bootstrap approach using data from past years and the resampling method. Taking into account the inter-annual variability, CVs curves are thus built: the trade-off between sampling size and precision was identified in the point where the CV’s curve (decreasing with the increasing numbers of samples) tends to flatten. In addition the ICES WKBIOPTIM 2017(<http://tinyurl.com/y74qbrhb>) aims to test how sampling plan changes (number of fish, hauls and trips) can affect population estimates, using the length distribution. Scientists of the institutes implementing the DCF have been participating in these projects and workshops, aiming to run and adapt the analyses

2. Sampling design

Explain main constraints and/ or steps taken, if ‘N’ (no) was indicated in Table 5A.

Not applicable

3. Sampling implementation

Explain main constraints and/or steps taken, if ‘N’ (no) was indicated in Table 5A.

Not applicable

4. Data capture

Explain main constraints and/ or steps taken, if ‘N’ (no) was indicated in Table 5A.

Not applicable

5. Data Storage

Explain main constraints and/ or steps taken, if ‘N’ (no) was indicated in Table 5A. Please provide a link if the documented revisions are available and not confidential.

Not applicable

6. Data processing

Explain main constraints and/ or steps taken, if ‘N’ (no) was indicated in Table 5A.

Not applicable

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

SECTION 5: DATA QUALITY

Text Box 5B: Quality assurance framework for socioeconomic data

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

1. Evidence of data quality assurance

Evidence of data quality assurance in **Fishing Fleet**

2. Section P3 Impartiality and objectiveness

Explain main constraints and/ or steps taken, if 'N' (no) was indicated in Table 5B

MS indicates "Y" in both questions regarding Section P3

3. Section P4 Confidentiality

Explain main constraints and/ or steps taken, if 'N' (no) was indicated in Table 5B

MS indicates "Y" only in question: "Are procedures for confidential data handling in place and documented?", while in the other two questions, it indicates "N". MS has achieved to comply with the (EU) 2016/679 Regulation on the protection of natural persons with regard to the processing of personal data and on the free movement of such data. However, some extra improvements are also needed to fulfil the requirements for providing a positive answer in the two last questions of this section

4. Section P5 Sound methodology

Explain main constraints and/ or steps taken, if 'N' (no) was indicated in Table 5B

MS indicates "Y" in all questions regarding Section P5.

The data collection scheme follows methodologies, guidelines and best practices agreed in expert groups (in particularly PGECON 2017 & 2018, Social and new economic variables workshop PG ECON, SGECA09-02 as well as Moura, 2016).

The majority of the economic data was collected through sample survey as already discussed in previous paragraphs. Bias and variability indicators were used as quality indicators. Particularly, the bias indicators provided were the coverage rates (planned and achieved) and response rates, while the variability indicator provided was the CV. For key economic variables such as energy consumption and energy costs, imputation techniques were used.

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 were evaluated thoroughly using several indicators. Furthermore, data collectors were properly trained and written guidelines regarding the collection process was provided to them.

MS have already published an updated version of the Methodology report v.2. (available at: <https://www.agreri.gr/sites/default/files/projects/Methodology%20Report%20version%202.pdf>)

5. Section P6 Appropriate statistical procedures

Explain main constraints and/ or steps taken, if 'N' (no) was indicated in Table 5B. Please provide a link if the documented revisions are available and not confidential.

In one out of four questions, the reply of the MS is "N" and specifically in question: "Is there consistency between administrative and other statistical data?" According to Moura (2016), documentation about

administrative and statistical processes should exist, describing the differences between administrative and statistical processes regarding definitions, concepts, coverage, etc. Possible differences in concepts will be thoroughly studied, and measures to deal with these differences will be taken, if necessary. This documentation is still under construction.

Documented revisions are available at: <http://agreri.gr/el/node/93>

6. Section P7 Non-excessive burden on respondents

Explain main constraints and/ or steps taken, if 'N' (no) was indicated in Table 5B.

Duplication of data-collected is not avoided. MS plans to organize data collection and administrative data in such a way that duplication of data collected will be avoided. However, this plan has not yet implemented.

7. Section P8 Cost effectiveness

Explain main constraints and/ or steps taken, if 'N' (no) was indicated in Table 5B.

8. Section P9 Relevance

Explain main constraints and/ or steps taken, if 'N' (no) was indicated in Table 5B.

End users are already listed and updated.

9. Section P10 Accuracy and reliability

Explain main constraints and/ or steps taken, if 'N' (no) was indicated in Table 5B. Information on this principle should be briefly explained in Text boxes 3A, 3B and 3C. Description of methodologies used on data quality.

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

MS source data, intermediate results and statistical outputs are regularly assessed and validated, using data quality indicators and benchmark tables. In case, of extreme values and outliers, internal communication is implemented with data collectors to correct possible typing errors.

Sampling and non-sampling errors are measured and systematically documented according to the European standards. Moreover, internal procedures and guidelines to measure and reduce errors are in place such as:

- Identification of the main sources of error;
- Quantification of sampling errors;
- Identification and evaluation of main non-sampling error sources in statistical processes;
- Special attention to outliers;

Quality reporting on accuracy is guided by EU/regional recommendations and methods. Moreover, tools for preventing and reducing sampling and non-sampling errors are in place (See Methodology report, v.2, (available at:

<https://www.agreri.gr/sites/default/files/projects/Methodology%20Report%20version%202.pdf>)

10. Section P11 Timeliness and punctuality

Explain main constraints and/ or steps taken, if 'N' (no) was indicated in Table 5B

MS indicates "Y" in the question regarding Section P11

11. Section P12 coherence and comparability

Explain main constraints and/ or steps taken, if ‘N’ (no) was indicated in Table 5B

There are already procedures and guidelines to monitor internal coherence. These procedures deal with consistency between preliminary and final data and between micro data and aggregated data.

About statistics comparability, sampling scheme has changed during the reference period 2012-2017, and this is why statistics in some segments are not comparable over time (MS answered “N” in question: “Are statistics comparable over time?”). Moreover, the delay at the beginning of the National Programs, in previous years, have created important time gaps. Finally, it has to be noticed that the National Programme was not implemented during the period 2009-2012. MS has already started to organize the database and plans to finalize it until the end of the Work Plan period. Doing this, MS is going to eliminate time gaps and ensure statistics comparability.

12. Section P13 Accessibility and Clarity

Explain main constraints and/ or steps taken, if ‘N’ (no) was indicated in Table 5B. Information and links to documentation on this principle should be briefly explained in Text boxes 3A, 3B and 3C. Description of methodologies used on data quality.

MS indicates “Y” in the question regarding Section P11. Documentation can be found in <http://www.agreri.gr/en/node/93>.

(max. 900 words per Region/RFMO/RFO/IO/NSB OR sector)

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

1. Evidence of data quality assurance

Evidence of data quality assurance in **Aquaculture/Processing**

2. Section P3 Impartiality and objectiveness

MS indicates “Y” in both questions regarding Section P3

3. Section P4 Confidentiality

MS indicates “N” in all three questions regarding Section P4. Data sources for both sectors, aquaculture and processing, are companies' published balance sheets and questionnaires. Since balance sheets are available mostly online from companies' websites and Ministry of Finance's databases, due to enterprises' obligation to publicize them, confidentiality is mainly pointed out during pre-data collection communications and during on site interviews, where interviewees are assured about the confidentiality of the data they provide, and no personal data is collected. Although the importance of confidentiality and the procedures to collect and input survey data maintaining confidentiality is strongly emphasized during survey planning and survey meetings, the confidentiality procedures are not clearly documented and protocols to enforce confidentiality between DCF partners and external users are not in place. The new improved database will ensure confidentiality by permitting specific users with recorded account names and passwords to input and manage survey data for both aquaculture and processing sectors.

4. Section P5 Sound methodology

MS indicates “Y” in all questions regarding Section P5.

The data collection methodology follows the National Work Plan 2017-2019 while the previous surveys followed Greece's National Proposal for data collection. Most of the economic data was collected via census method. As it is mentioned in the previous Text boxes, the estimation procedure was applied for certain values (e.g. energy cost and unpaid labor) due to inadequate input of small companies or companies' reluctance to answer, using either the non-probability sample survey method (in aquaculture) or probability sample survey method (in processing), using the corresponding and more descriptive data of large companies again according to National Work Plan.

5. Section P6 Appropriate statistical procedures

Regarding financial data, questionnaires are designed according to Greece's administrative financial data and according to accounting regulations and standards. Quantitative and socio-economic data are collected according to Greece's National Work Plan.

6. Section P7 Non-excessive burden on respondents

Duplication of data-collected is avoided by following a specific schedule for onsite visits for filling out questionnaires and balance sheets processing, according to a list of companies that participated in previous surveys that is continuously updated to exclude non-operating companies during the survey year, those without publicized balance sheets and/or those refused to provide any data.

7. Section P8 Cost effectiveness

Data input and processing is under monitoring by spreadsheet tools to avoid input of false data by comparing new values to values of previous years surveys, taking into consideration the companies' previous potential and economic performance. Of course the new data base that is currently under construction will provide more efficient tools for the same purposes.

8. Section P9 Relevance

End users are already listed and updated.

9. Section P10 Accuracy and reliability

The guidelines and practices agreed upon by program's partners and experts, were followed and monitored by monthly work reports and regular work meetings to guarantee proper implementation of the survey schedule and avoid possible errors. Any errors are recorded and actions to avoid them are decided during the meetings

10. Section P11 Timeliness and punctuality

MS indicates "Y" in the question regarding Section P11

11. Section P12 coherence and comparability

Internal coherence is monitored during data collection, following the agreed upon procedures and during data entry and comparison to the previous years recorded data.

Aquaculture and processing companies' financial data, as well as socio-economic data is comparable over time as it follows Greece's National Work Plan and previous survey years' National Proposal for types of values according to accounting regulations and standards.

12. Section P13 Accessibility and Clarity

Are methodological documents publicly available? No

Are data stored in databases?

Yes.

Data is stored first in spreadsheets for processing and then uploaded on a data base. An improved database is currently under construction.

Where can methodological and other documentation be found?

Methodological documentation is not yet available.

The Integrated Monitoring System of Fisheries Activities (OSPA), operating under Ministry of Rural Development and Food, that is used for data cross checking and validation can be found in the following link

Link: <http://portal.alieia.minagric.gr/wps/portal/fishing#>

ANNEXES

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

Preliminary list of vulnerable species for which By-catches were monitored in Greece in 2018 and recorded specimen per GSA				
Vulnerable Species Group	Species	GSA 20	GSA 22	GSA 23
birds	<i>Calonectris diomedea</i>			
birds	<i>Chlidonias niger</i>			
birds	<i>Gavia stellata</i>			
birds	<i>Gelochelidon nilotica</i>			
birds	<i>Hydrobates pelagicus</i>			
birds	<i>Hydrocoloeus minutus</i>			
birds	<i>Larus audouinii</i>			
birds	<i>Larus cachinnans</i>			
birds	<i>Larus canus</i>			
birds	<i>Larus fuscus</i>			
birds	<i>Larus genei</i>			
birds	<i>Larus ichthyaetus</i>			
birds	<i>Larus melanocephalus</i>			
birds	<i>Larus michahellis</i>			
birds	<i>Larus ridibundus</i>			
birds	<i>Mergus merganser</i>			
birds	<i>Mergus serrator</i>			
birds	<i>Morus bassanus</i>			
birds	<i>Pelecanus onocrotalus</i>			
birds	<i>Phalacrocorax aristotelis</i>			
birds	<i>Phalacrocorax carbo</i>			
birds	<i>Podiceps auritus</i>			
birds	<i>Podiceps cristatus</i>			
birds	<i>Podiceps grisegena</i>			
birds	<i>Podiceps nigricollis</i>			
birds	<i>Puffinus mauretanicus</i>			
birds	<i>Puffinus yelkouan</i>			
birds	<i>Rissa tridactyla</i>			
birds	<i>Stercorarius longicaudus</i>			
birds	<i>Stercorarius parasiticus</i>			
birds	<i>Stercorarius pomarinus</i>			
birds	<i>Sterna hirundo</i>			
birds	<i>Sternula albifrons</i>			
mammals	<i>Delphinus delphis</i>			
mammals	<i>Stenella coeruleoalba</i>			
mammals	<i>Tursiops truncatus</i>			
mammals	<i>Grampus griseus</i>			
mammals	<i>Ziphius cavirostris</i>			
mammals	<i>Phocoena phocoena</i>			
mammals	<i>Monachus monachus</i>			
reptiles	<i>Caretta caretta</i>		3	
reptiles	<i>Dermochelys coriacea</i>			
reptiles	<i>Chelonia mydas</i>			
elasmobranch	<i>Alopias vulpinus</i>			
elasmobranch	<i>Carcharhinus plumbeus</i>			
elasmobranch	<i>Carcharias taurus</i>			
elasmobranch	<i>Carcharodon carcharias</i>			
elasmobranch	<i>Centrophorus granulosus</i>	2	3	
elasmobranch	<i>Cetorhinus maximus</i>			
elasmobranch	<i>Dipturus batis</i>		2	
elasmobranch	<i>Galeorhinus galeus</i>	1	2	
elasmobranch	<i>Gymnura altavela</i>	4	7	
elasmobranch	<i>Heptanchias perlo</i>			
elasmobranch	<i>Hexanchus griseus</i>	1	4	
elasmobranch	<i>Isurus oxyrinchus</i>			1
elasmobranch	<i>Lamna nasus</i>			
elasmobranch	<i>Leucoraja circularis</i>			
elasmobranch	<i>Leucoraja melitensis</i>		1	
elasmobranch	<i>Mobula mobular</i>			
elasmobranch	<i>Mustelus asterias</i>	1	30	
elasmobranch	<i>Mustelus mustelus</i>	10	44	
elasmobranch	<i>Mustelus punctulatus</i>	3	2	
elasmobranch	<i>Odontaspis ferox</i>			
elasmobranch	<i>Oxyrinchus centrina</i>		15	1
elasmobranch	<i>Prionace glauca</i>			
elasmobranch	<i>Rhinobatos rhinobatos</i>			
elasmobranch	<i>Rostroraja alba</i>		1	
elasmobranch	<i>Sphyrna zygaena</i>			
elasmobranch	<i>Squalus acanthias</i>	5	338	2
elasmobranch	<i>Squatina aculeata</i>			
elasmobranch	<i>Squatina oculata</i>			
elasmobranch	<i>Squatina squatina</i>			
agnatha fish	<i>Petromyzon marinus</i>			
bony fish	<i>Acipenser gueldenstaedtii</i>			
bony fish	<i>Acipenser naccarii</i>			
bony fish	<i>Acipenser stellatus</i>			
bony fish	<i>Acipenser sturio</i>			
bony fish	<i>Alosa fallax</i>	7	47	
bony fish	<i>Anguilla anguilla</i>	4		
bony fish	<i>Epinephelus marginatus</i>	10	17	8
bony fish	<i>Hippocampus guttulatus</i>		3	
bony fish	<i>Hippocampus hippocampus</i>	1	1	
bony fish	<i>Huso huso</i>			
bony fish	<i>Sciaena umbra</i>	54	171	3
bony fish	<i>Thunnus thynnus</i>		12	
bony fish	<i>Umbrina cirrosa</i>	1	35	
bony fish	<i>Xiphias gladius</i>	1	10	1
cephalopods	<i>Eledone cirrhosa</i>	5	508	
cephalopods	<i>Eledone moschata</i>	118	9726	16
cephalopods	<i>Eledone spp.</i>	10		
bivalves	<i>Acanthocardia tuberculata</i>			
bivalves	<i>Callista chione</i>			
bivalves	<i>Donax trunculus</i>			
gastropods	<i>Bolinus brandaris</i>		26	
gastropods	<i>Patella spp.</i>			
corals	<i>Corallium rubrum</i>			

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

Preliminary list of vulnerable species for which By-catches were monitored in Greece in 2018 and recorded specimen per GSA and Gear						
GSA	Year	Fisheries Scheme	Vulnerable Species Group	Species	Fishing Gear	Specimens No
20	2018	demersal at sea	elasmobranch	<i>Centrophorus granulosus</i>	LLS	2
20	2018	demersal at sea	elasmobranch	<i>Galeorhinus galeus</i>	GTR	1
20	2018	demersal at sea	elasmobranch	<i>Gymnura altavela</i>	GTR	2
20	2018	demersal at sea	elasmobranch	<i>Gymnura altavela</i>	OTB	2
20	2018	demersal at sea	elasmobranch	<i>Hexanchus griseus</i>	LLS	1
20	2018	demersal at sea	elasmobranch	<i>Mustelus asterias</i>	OTB	1
20	2018	demersal at sea	elasmobranch	<i>Mustelus mustelus</i>	GNS	1
20	2018	demersal at sea	elasmobranch	<i>Mustelus mustelus</i>	GTR	2
20	2018	demersal at sea	elasmobranch	<i>Mustelus mustelus</i>	LLS	1
20	2018	demersal at sea	elasmobranch	<i>Mustelus mustelus</i>	OTB	6
20	2018	demersal at sea	elasmobranch	<i>Mustelus punctulatus</i>	LLS	1
20	2018	demersal at sea	elasmobranch	<i>Mustelus punctulatus</i>	OTB	2
20	2018	demersal at sea	elasmobranch	<i>Squalus acanthias</i>	LLS	3
20	2018	demersal at sea	elasmobranch	<i>Squalus acanthias</i>	OTB	2
20	2018	demersal at sea	bony fish	<i>Alosa fallax</i>	GTR	4
20	2018	demersal at sea	bony fish	<i>Alosa fallax</i>	OTB	2
20	2018	demersal at sea	bony fish	<i>Anguilla anguilla</i>	GTR	4
20	2018	demersal at sea	bony fish	<i>Epinephelus marginatus</i>	GTR	2
20	2018	demersal at sea	bony fish	<i>Epinephelus marginatus</i>	LLS	7
20	2018	demersal at sea	bony fish	<i>Epinephelus marginatus</i>	OTB	1
20	2018	demersal at sea	bony fish	<i>Hippocampus hippocampus</i>	SB	1
20	2018	demersal at sea	bony fish	<i>Sciaena umbra</i>	GTR	51
20	2018	demersal at sea	bony fish	<i>Sciaena umbra</i>	LLS	1
20	2018	demersal at sea	bony fish	<i>Sciaena umbra</i>	SB	1
20	2018	demersal at sea	bony fish	<i>Umbrina cirrosa</i>	GTR	1
20	2018	demersal at sea	bony fish	<i>Xiphias gladius</i>	LLS	1
20	2018	demersal at sea	cephalopods	<i>Eledone cirrhosa</i>	OTB	5
20	2018	demersal at sea	cephalopods	<i>Eledone moschata</i>	GTR	2
20	2018	demersal at sea	cephalopods	<i>Eledone moschata</i>	OTB	110
20	2018	demersal at sea	cephalopods	<i>Eledone moschata</i>	SB	6
20	2018	demersal at sea	cephalopods	<i>Eledone spp.</i>	OTB	10
20	2018	small pelagic at sea	bony fish	<i>Alosa fallax</i>	PS	1
20	2018	small pelagic at sea	bony fish	<i>Sciaena umbra</i>	PS	1
22	2018	demersal at sea	reptiles	<i>Caretta caretta</i>	OTB	1
22	2018	demersal at sea	reptiles	<i>Caretta caretta</i>	SB	1
22	2018	demersal at sea	elasmobranch	<i>Centrophorus granulosus</i>	OTB	3
22	2018	demersal at sea	elasmobranch	<i>Dipturus batis</i>	OTB	2
22	2018	demersal at sea	elasmobranch	<i>Galeorhinus galeus</i>	LLS	1
22	2018	demersal at sea	elasmobranch	<i>Gymnura altavela</i>	GTR	1
22	2018	demersal at sea	elasmobranch	<i>Gymnura altavela</i>	LLS	6
22	2018	demersal at sea	elasmobranch	<i>Hexanchus griseus</i>	OTB	4
22	2018	demersal at sea	elasmobranch	<i>Leucoraja melitensis</i>	OTB	1
22	2018	demersal at sea	elasmobranch	<i>Mustelus asterias</i>	OTB	30
22	2018	demersal at sea	elasmobranch	<i>Mustelus mustelus</i>	GTR	7
22	2018	demersal at sea	elasmobranch	<i>Mustelus mustelus</i>	LLS	8
22	2018	demersal at sea	elasmobranch	<i>Mustelus mustelus</i>	OTB	29
22	2018	demersal at sea	elasmobranch	<i>Mustelus punctulatus</i>	OTB	2
22	2018	demersal at sea	elasmobranch	<i>Oxynotus centrina</i>	OTB	15
22	2018	demersal at sea	elasmobranch	<i>Rostrolaja alba</i>	LLS	1
22	2018	demersal at sea	elasmobranch	<i>Squalus acanthias</i>	LLS	8
22	2018	demersal at sea	elasmobranch	<i>Squalus acanthias</i>	OTB	330
22	2018	demersal at sea	bony fish	<i>Alosa fallax</i>	GNS	10
22	2018	demersal at sea	bony fish	<i>Alosa fallax</i>	GTR	11
22	2018	demersal at sea	bony fish	<i>Alosa fallax</i>	OTB	25
22	2018	demersal at sea	bony fish	<i>Epinephelus marginatus</i>	GNS	17
22	2018	demersal at sea	bony fish	<i>Epinephelus marginatus</i>	GTR	1
22	2018	demersal at sea	bony fish	<i>Epinephelus marginatus</i>	LLS	2
22	2018	demersal at sea	bony fish	<i>Epinephelus marginatus</i>	OTB	13
22	2018	demersal at sea	bony fish	<i>Hippocampus guttulatus</i>	GNS	1
22	2018	demersal at sea	bony fish	<i>Hippocampus guttulatus</i>	SB	2
22	2018	demersal at sea	bony fish	<i>Hippocampus hippocampus</i>	GTR	1
22	2018	demersal at sea	bony fish	<i>Sciaena umbra</i>	FPO	2
22	2018	demersal at sea	bony fish	<i>Sciaena umbra</i>	GNS	31
22	2018	demersal at sea	bony fish	<i>Sciaena umbra</i>	GTR	79
22	2018	demersal at sea	bony fish	<i>Sciaena umbra</i>	LLS	57
22	2018	demersal at sea	bony fish	<i>Sciaena umbra</i>	OTB	1
22	2018	demersal at sea	bony fish	<i>Sciaena umbra</i>	SB	1
22	2018	demersal at sea	bony fish	<i>Thunnus thynnus</i>	GNS	3
22	2018	demersal at sea	bony fish	<i>Umbrina cirrosa</i>	GNS	2
22	2018	demersal at sea	bony fish	<i>Umbrina cirrosa</i>	GTR	27
22	2018	demersal at sea	bony fish	<i>Umbrina cirrosa</i>	LLS	2
22	2018	demersal at sea	bony fish	<i>Umbrina cirrosa</i>	SB	4
22	2018	demersal at sea	cephalopods	<i>Eledone cirrhosa</i>	OTB	508
22	2018	demersal at sea	cephalopods	<i>Eledone moschata</i>	FPO	5
22	2018	demersal at sea	cephalopods	<i>Eledone moschata</i>	GTR	59
22	2018	demersal at sea	cephalopods	<i>Eledone moschata</i>	OTB	9618
22	2018	demersal at sea	cephalopods	<i>Eledone moschata</i>	SB	34
22	2018	demersal at sea	gastropods	<i>Bolinus brandaris</i>	FPO	1
22	2018	demersal at sea	gastropods	<i>Bolinus brandaris</i>	GNS	10
22	2018	demersal at sea	gastropods	<i>Bolinus brandaris</i>	GTR	13
22	2018	demersal at sea	gastropods	<i>Bolinus brandaris</i>	LLS	2
22	2018	large pelagic at sea	elasmobranch	<i>Galeorhinus galeus</i>	LLD	1
22	2018	small pelagic at sea	reptiles	<i>Caretta caretta</i>	PS	1
22	2018	small pelagic at sea	bony fish	<i>Alosa fallax</i>	PS	1
22	2018	small pelagic at sea	bony fish	<i>Thunnus thynnus</i>	PS	9
22	2018	small pelagic at sea	bony fish	<i>Xiphias gladius</i>	PS	10
22	2018	small pelagic at sea	cephalopods	<i>Eledone moschata</i>	PS	10
23	2018	demersal at sea	elasmobranch	<i>Isurus oxyrinchus</i>	GTR	1
23	2018	demersal at sea	elasmobranch	<i>Oxynotus centrina</i>	OTB	1
23	2018	demersal at sea	elasmobranch	<i>Squalus acanthias</i>	LLS	2
23	2018	demersal at sea	bony fish	<i>Epinephelus marginatus</i>	GTR	1
23	2018	demersal at sea	bony fish	<i>Epinephelus marginatus</i>	LLS	7
23	2018	demersal at sea	bony fish	<i>Sciaena umbra</i>	GTR	3
23	2018	demersal at sea	cephalopods	<i>Eledone moschata</i>	GTR	1
23	2018	demersal at sea	cephalopods	<i>Eledone moschata</i>	LLS	1
23	2018	demersal at sea	cephalopods	<i>Eledone moschata</i>	OTB	14
23	2018	small pelagic at sea	bony fish	<i>Xiphias gladius</i>	PS	1