

ANNUAL REPORT

On the Greek National Fisheries Data Collection Programme for 2014

(IN COMPLIANCE WITH COUNCIL REGULATION (EC) 199/2008, COMMISSION
REGULATION (EC) 665/2008, COMMISSION DECISION 2010/93 EU)

**MINISTRY OF RECONSTRUCTION OF PRODUCTION
ENVIRONMENT & ENERGY**

DIRECTORATE GENERAL FOR FISHERIES

MAY 2015

TABLE OF CONTENTS

I. GENERAL FRAMEWORK	3
II. NATIONAL DATA COLLECTION ORGANIZATION	3
II. A. National correspondent and participating institutes	3
II B Regional and International coordination	5
II B 1 Attendance of International meetings	5
II B 2 Follow-up of regional and international recommendations	5
III MODULE OF THE EVALUATION OF THE FISHING SECTOR	6
III A General description of the fishing sector	6
III B Economic variables	7
III B 1 Achievements: results and deviation from NP proposal	7
III B 2 Data quality: results and deviation from NP proposal	7
III B 3 Follow-up of Regional and international recommendations	10
III B 4 Actions to avoid deviations	12
III C. Metier-related variables	12
III C 1 Achievements: results and deviation from NP proposal	12
III C 2 Data quality: results and deviation from NP proposal	13
III C 3 Follow-up of Regional and international recommendations	14
III C 4 Actions to avoid deviations	14
III D. Recreational fisheries	14
III D 1 Achievements: results and deviation from NP proposal	14
III D 2 Data quality: results and deviation from NP proposal	15
III D 3 Follow-up of Regional and international recommendations	15
III D 4 Actions to avoid deviations	15
III E Stock-related variables	15
III E 1 Achievements: results and deviation from NP proposal	15
III E 2 Data quality: results and deviation from NP proposal	17
III E 3 Follow-up of Regional and international recommendations	17
III E 4 Actions to avoid deviations	18
III E 5 Monitoring of commercial eel	18
III F Transversal variables	22
III F 1 Capacity	22
III F 1 1 Achievements: results and deviation from NP proposal	22
III F 1 2 Data quality: results and deviation from NP proposal	23
III F 1 3 Actions to avoid deviations	23
III F 2 Effort	23
III F 2 1 Achievements: results and deviation from NP proposal	23
III F 2 2 Data quality: results and deviation from NP proposal	25
III F 2 3 Follow-up of Regional and international recommendations	25
III F 2 4 Actions to avoid deviations	25
III F 3 Landings	26
III F 3 1 Achievements: results and deviation from NP proposal	26
III F 3 2 Data quality: results and deviation from NP proposal	26
III F 3 3 Follow-up of Regional and international recommendations	26

III F 3 4 Actions to avoid deviations	26
III G Research surveys at sea	26
III G 1 Achievements: results and deviation from NP proposal	26
III G 2 Data quality: results and deviation from NP proposal	32
III G 3 Follow-up of Regional and international recommendations	32
III G 4 Actions to avoid deviations	32
IV MODULE OF THE EVALUATION OF THE ECONOMIC SITUATION OF THE AQUACULTURE AND PROCESSING INDUSTRY	33
IV A Collection of data concerning the aquaculture	33
IV A 1 Achievements: results and deviation from NP proposal	33
IV A 2 Data quality: results and deviation from NP proposal	33
IV A 3 Follow-up of Regional and international recommendations	33
IV A 4 Actions to avoid deviations	33
IV B Collection of data concerning the processing industry	33
IV B 1 Achievements: results and deviation from NP proposal	35
IV.B.2 Data quality: Results and deviation from NP proposal	35
IV.B.3 Follow-up of Regional and international recommendations	36
IV.B.4: Actions to avoid deviations	36
V. MODULE OF EVALUATION OF THE EFFECTS OF THE FISHING SECTOR ON THE MARINE ECOSYSTEM	36
V. 1. Achievements: results and deviation from NP proposal	38
V 2 Actions to avoid deviations	38
VI. MODULE FOR MANAGEMENT AND USE OF THE DATA	39
VI 1 Achievements: results and deviation from NP proposal	39
VI 2 Actions to avoid deviations	39
VII FOLLOW-UP OF STECF RECOMMENDATIONS	40
VIII LIST OF ACRONYMS AND ABBREVIATIONS	40
IX. COMMENTS, SUGGESTIONS AND REFLECTIONS	40
X. REFERENCES	41
XI. ANNEXES	42

I. GENERAL FRAMEWORK

The current document is an Annual Report (AR) of the work which was carried out in Greece for the year 2014 with reference to the aims described in the Greek National Programme (NP) and the requirements listed in the DCF. The programme has been carried out following the rules of the:

Commission Regulation No 199/2008 establishing a Community framework for the collection, management and use of data in the fisheries sector and support for scientific advice regarding the Common Fisheries Policy

Commission Regulation No 665/2008 laying down detailed rules for the application of Council Regulation (EC) No 199/2008 concerning the establishment of a Community framework for the collection, management and use of data in the fisheries sector and support for scientific advice regarding the Common Fisheries Policy.

Commission Decision 2010/93/EU adopting a multiannual Community programme for the collection, management and use of data in the fisheries sector for the period 2011-2013.

Commission Implementing Decision 2013/5568/EU extending the national programmes for the collection of primary biological, technical, environmental and socio-economic data in the fisheries sector for the period 2011-2013 to the period 2014-2016.

The format of the document follows the most recent guidelines from the Commission (DCF_Guidance_AR_Final v2_26_2_2015.doc and DCF_Standard-Tables_AR_Final v2_26-2-2015.xlsx).

The implementation of 2014 NP was better than 2013. All modules were implemented more completely compared to previous years. There were no major methodological changes in approach compared to previous year.

The updated list of all the derogations requested by Greece and are still valid is presented in **standard table I.A.1**. Regarding the derogations requested on 2009 for eel fisheries sampling and eel biological sampling and variables, they are not valid any more. After the realization of pilot study on eel on 2012, data on eel fisheries and eel biological sampling are collected yearly.

Concerning bilateral and multilateral agreements regarding data collection, MS has not sign such an agreement, therefore the **standard table I.A.2.** is not filled.

II. NATIONAL DATA COLLECTION ORGANIZATION

II. A. National correspondent and participating institutes

The Data Collection Programme is co-ordinated by the General Directorate of Fisheries, Ministry of Reconstruction of Production Environment & Energy, under the national correspondent 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** (ELGO-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 ELGO-DEMETER participates the **Fisheries Research Institute** (F.R.I) and the **Agricultural Economics Research Institute** (AGR.E.R.I). The FRI is a semi state marine research organisation responsible for collection of scientific data on the fisheries sector in North and Central Aegean Sea, on eel and on processing 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-Athens) and the **Institute of Marine Biological Resources of Crete** (I.M.B.R-Crete). The I.M.B.R 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. It also has the management of the database and GIS Fisheries Information System called IMAS-Fish which supports the Data Collection programme.

The contact details of the participating institutes are:

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The national DCF website is under construction. Till its finalization, all the basic information and references concerning Greek data collection programme is hosted in the website of FRI which is the scientific co-ordinator (web-site: <http://www.inale.gr>).

Two national coordination meetings were held, one in Athens on 6/3/2014 and one in Kavala on 5-6/6/2014. The main issues discussed by the representatives of the involved institutes were i) the problems that were faced in the implementation of 2013 NP and ways to overcome them during the 2014 NP ii) the participation in DCF meetings, iii) new data collection framework for the period 2016-2020 iv) financial issues.

II B Regional and International coordination

II B 1 ATTENDANCE OF INTERNATIONAL MEETINGS

The Standard **Table II.B.1** indicates the international meetings that have been attended by Greek scientists.

In the annual budget forecast for 2014, 30 international meetings were indicated as planned to be attended; four of them were cancelled and one was missed, although the registration has been done, due to flight cancellation related to bad weather conditions. So, from the rest 25 planned meetings the Greek scientists participated in 15 meetings. The non participation was due to conflicting with regards to other commitments (mainly experimental surveys). However, Greek scientists have also participated to 3 other meetings that were considered important and relevant to DCF.

II B 2 FOLLOW-UP OF REGIONAL AND INTERNATIONAL RECOMMENDATIONS

The recommendations addressed by the RCM Med & BS and Liaison meetings of 2013 and 2014 as well as the actions taken by the MS are listed in the Standard **Table II.B.2**. There were no STECF Plenary recommendations addressed to MS relating to data collection in the 2013 STECF Plenary meetings.

III MODULE OF THE EVALUATION OF THE FISHING SECTOR

III A General description of the fishing sector

The Greek fishing fleet consists of a large number of vessels. According to the National Fleet Register of 1/1/2014 the fleet consists of 15.785 registered fishing vessels with a total tonnage of 78.033 GT, total power of 455.400 KW and average age of 28 years. From 2008 onwards till 2014 the size of the Greek fleet decreased by 8.3% in the number of vessels, by 12% in tonnage and by 10.4% in engine power (Table III.A.1.1.) which consists a considerable change that affected the sampling opportunities.

Table III.A.1.1 The change in fleet size from 2008 to 2014

Year	2008	2009	2010	2011	2012	2013
N of Vessels	17216	17131	17003	16498	15950	15785
Tonnage (GT)	88706.7	87961.3	86675.5	83570.2	79560.4	78033.6
Engine Power (KW)	508420.2	504762.2	501335.1	481183.3	460825.0	455400.2
Average Age (years)	25.3	26.0	26.6	27.2	27.6	28.3
Average Length (m)	7.5	7.5	7.5	7.5	7.4	7.5

The great majority of the fleet consists of small vessels -average length 7.5m- exploiting the extensive coastline of the mainland, and the shoreline of the numerous Greek islands targeting the coastal fishing stocks.

Specifically, the 96.6% (15239 vessels) of the fishing fleet consists of inshore vessels fishing with static gear in the coastal zone; the 1,6% (254 vessels) consists of purse seiners targeting small pelagic species and the 1.8% (283 vessels) consists of otter trawls. Greek fishing activities cover three GSAs: (a) Aegean Sea (GSA 22), (b) Ionian Sea (GSA 20) and (c) Cretan Sea (GSA 23).

The Greek fishing fleet is categorized in the following three (3) major categories depending on the fishing activity

Demersal fisheries

The demersal fishery in Greece is the otter trawl fishery that consists of 283 vessels with total capacity 27.394 GT and engine power 82.830 KW. Although it represents a small part of the Greek fishing fleet (1.8%), its production represents approximately the 25% of total fisheries production. It is a mixed fishery that targets demersal species and is only one metier (OTB_DES_>=40_0_0). It is a common fishery in the Aegean, Ionian and in a lower extent in Cretan sea and exploits mainly fishing grounds covering the continental shelf and the first part of the slope (depths up to 300 meters) in the national and international waters of the Mediterranean Sea.

Pelagic fisheries

The pelagic fishery in Greece is the purse seine fishery that consists of 254 vessels with total capacity 11.414 GT and engine power 48260 KW.

Purse seine fishery targets mainly small pelagic species (anchovy and sardine), mackerel and horse mackerel as well. It performs fishing trips of short duration (rarely more than 24 hours), because of the vulnerability of the main target species. It is a

common fishery in the Aegean, Ionian and in a lower extent in Cretan sea. It is only one meter (PS_SPF_>=14_0_0).

Coastal fisheries

The coastal fishery in Greece represents the largest part of the Greek fishing fleet. It consists of 15239 vessels which according to their overall length are divided into:

A) Vessels with an overall length of less than 12 meters. This category consists of 14.865 vessels with a total capacity 30173 GT and total power 284798 KW.

B) Vessels with an overall length equal to or greater than 12 meters. This category consists of 374 coastal fishing vessels with a total tonnage 6.220 GT and total power 34128 KW.

The Greece coastal fishery is the largest among all EU countries both in number of vessels and fishermen causing difficulties in the monitoring of fishing activity and production. It has a multi-gear and multi-species character. The most common métiers that have been recorded in coastal fishery are the following:

Set gillnet for demersal fish	GNS_DEF_>=16_0_0,
Set trammelnet for demersal fish	GTR_DEF_>=16_0_0,
Set longlines for demersal fish	LLS_DEF_0_0_0,
Drifting longlines	LLD_LPF_0_0_0,
Pots and traps for demersal species	FPO_DEF_0_0_0,
Beach and boat seine for demersal species	SB_SV_DEF_0_0_0
Hand and pole lines for finfish	LHP_LHM_FIF_0_0_0,
Trolling lines for large pelagic fish	LTL_LPF_0_0_0

However, the first five of them have been selected for sampling purposes according to ranking system as described in the EU Dec. 93/2010. The last three were not selected by the ranking system.

A general description of the Greek fishing sector is given in the **Table III.A.1**

III B Economic variables

Supra region: Mediterranean Sea and Black Sea

III B 1 ACHIEVEMENTS: RESULTS AND DEVIATION FROM NP PROPOSAL

This section focuses on the estimation of economic variables of the fishing sector in Greece. The economic data collected refers to the year 2013 (reference year).

A sample survey was conducted in order to estimate the economic parameters of the fishing sector, while data required for the estimation of the value of fixed assets and annual depreciation costs were calculated by processing records derived from the National Fleet Register.

The target population was the Fleet Register and there were no exclusions of any part of the vessel population. However, it should be emphasized that there are some differences in the composition of the target population, compared to what was described in the 2011-2013 NP proposal, as indicated in table III.B.1. These changes can be explained by the fact that for the 2011-2013 NP proposal the vessel population

of the year 2008 was used. However, from 2008 till 2013 the Greek fishing fleet has decreased by 1431 vessels. Specifically, significant reductions (more than 20%) were observed in demersal boat seiners (about 45%) followed by netters 12-18 and vessels using hooks 12-18 (in both cases the reduction was about 20%). Furthermore, it should be noted that in the case of Greece the segments “Demersal trawlers and/or demersal seiners 6-12” and “Demersal trawlers and/or demersal seiners 12-18” refer to demersal seiners and the segments “Demersal trawlers and/or demersal seiners 18-24” and “Demersal trawlers and/or demersal seiners 24-40” refer to Demersal trawlers.

Another deviation from the NP proposal concerns the clustering of two fleet segments. In the NP proposal no clustering of the fleet segments was considered necessary. But due to changes in the composition of the fleet, as already mentioned, one clustering was considered necessary for confidentiality reasons in 2013 as explained in more detail in the paragraph “Clustering of fleet segments”.

To carry out the sample survey the statistical methods (sample design, sample size, strata allocation, raising factors, variance estimators) described in the 2011-2013 NP proposal have been applied.

Data were collected through face-to-face interviews using a structured questionnaire specifically designed for the survey.

It should be emphasized that no deviations from the NP proposal are listed regarding the methods used for collecting the data and for the estimation of the economic parameters.

The number of sample units per stratum and the planned sample rate is reported in table III.B.1. Standard tables III.B.1 and III.B.3 have been updated with the information collected during the sampling year.

The number of inactive vessels for each length category is presented in table III.B.1. It should be noted that the National Fleet Register does not include any information regarding inactivity of fishing vessels. The number of inactive vessels in Table III.B.1 has been estimated through the data collection survey (random sampling survey).

Clustering of fleet segments

In this section, all the information regarding the clustering of the fleet segments is provided as required by the DCF and following STECF recommendations. Standard Table III.B.2 reports the segments that have been clustered. Clusters are named after the segment that contains the larger population of vessels.

The information regarding clustering is provided for separately “Important segments with distinct characteristics”, “Segments similar to other segments” and “Non-important segments with distinct characteristics” as required.

1. Important segments with distinct characteristics

No clustering was necessary for important segments with distinct characteristics.

2. Segments similar to other segments

Two segments with similar characteristics were clustered together, for confidentiality and sampling reasons. Specifically, the segment “Vessels using hooks 18-24” contains only 8 vessels that were clustered together with the segment “Vessels using hooks 12-18” which contains 129 vessels. Apart from the fact that the clustering of the two fleet segments was necessary for sampling and confidentiality reasons it should also be emphasized that the two fleet segments use similar fishing equipment and fishing patterns and it was also observed that the LOA of the larger vessels was close to 18. For the above reasons clustering was considered not only necessary but also fully justified.

3. Non-important segments with distinct characteristics

No clustering was necessary for non-important segments with distinct characteristics.

Estimation of Capital value and capital cost

For the estimation of the capital value and the capital costs data from the National Fleet Register were also used. The methodology suggested by the study on “evaluation of the capital value, investments and capital costs in the fisheries sector” (No FISH/2005/03) was applied.

In order to estimate the capital value (GCS) three steps were followed:

1. Specification of the composition of the active fleet by age
2. Estimation of price per LOA
3. Calculation of the value of each vintage (year of construction) of the fleet and converting values of all vintages to current prices using price indices.

The year of construction for each vessel was taken from the National Fleet register. For the estimation of price per LOA, data gathered through the survey was also used, as described in more detail in the following Table.

<i>Questions</i>	<i>Answers</i>
1. Which are the reference values taken into account for the estimation of the price per capacity unit (e.g. book value, second hand market, etc...)?	The reference values were estimated through the sample survey. They were also crosschecked with information provided by market stakeholders.
2. Which estimation methods and/or models have been used to estimate the PCU?	The reference values were estimated through the sample survey.
3. If a net value has been used, what is the method used to calculate the gross value? (e.g. formula, figures from the balance sheets, etc...)?	Digressive (replacement) formula: historical value/(1-depreciation rate of each asset) ^{age of the asset} .
4. What type of index price series have been used (e.g. heavy machinery index, etc...)?	Heavy machinery index.
5. What depreciation rates? From where	Hull (7%), Engine, (25%), Electronics

do they come (e.g. national legislation, general scheme excel spreadsheet, etc...)?	(50%), other equipment (35%) (see study No. FISH/2005/03).
6. Which age schedule (service life time) has been used?	Hull (25 years), Engine (10 years), Electronics (5 years), other equipment (7 years).
7. What is the share of each asset on the total value of the capital?	Hull (46%), Engine, (25%), Electronics (2%), other equipment (27%).

Inactive vessels have been included in the evaluation of capital value and capital costs.

III B 2 DATA QUALITY: RESULTS AND DEVIATION FROM NP PROPOSAL

The sampling strategy and the achieved values of the accuracy indicators are presented in **Table III.B.3**.

Data quality is also given in terms of planned sample rate, response rate and achieved sample rate.

All economic variables of Appendix VI are collected through the sample survey and therefore data is consistent.

In the case of the value of capital and annual depreciation costs data from the National Fleet Register was also used, as already mentioned in the previous paragraph.

FTE and engaged crew

Total employment and FTE are estimated according to the methodology suggested by the study on “calculation of labour including FTE (full-time equivalent) in fisheries” (No FISH/2005/14).

In order to estimate the FTE, data from the questionnaires regarding the average number of days at sea, the number of average crew per vessel excluding and including rotation and the average number of hours of work per crew member per day at sea, are gathered.

The estimation of the employment in terms of FTE has been made by assuming a FTE threshold (representing the standard working time for the fishing sector) expressed in terms of yearly hours per man.

The FTE threshold is equal to 2,000 hours per year. It is also assumed that:

- each crewman working annually 2,000 hours or more is counted as one FTE
- each crewman working less than 2,000 hours per year is counted as a percentage of an FTE according to the number of hours worked in relation to the threshold of 2,000 hours
- working time is the time spent on fishing and related activities on board or on shore. This means that working time is only a part of the duration of a fishing trip.

During the data collection extra measures were taken in order to achieve high quality of the collected data. The data collectors were properly educated and detailed written instructions regarding the collected data were provided to them. They were also advised to conduct the institute in charge of economic data processing throughout the data collection process whenever a problem or question arose. Furthermore, each data collector was asked to submit a completed trial questionnaire to ensure that all fields were filled out correctly.

In addition, as soon as data was submitted by the data collectors they were evaluated mainly in terms of missing values and typing errors and the data collector was conducted in case any problem arose.

For a more extensive evaluation of the quality of the collected data several indicators were used. The days at sea, the fuel consumption per day at sea, the number of employees per vessel, Furthermore, the participation (%) of each cost category (e.g. variable costs, fuel costs, wages and salaries, fixed costs e.t.c.) in the total costs of the vessels were used to identify outliers in every fleet segment. Furthermore, the ratio of each cost category (e.g. variable costs, fuel costs, wages and salaries, fixed costs e.t.c.) to the revenues of the vessels were used for the same purpose.

After the extensive evaluation of the collected data the CV of the economic variables was also estimated as another quality indicator. Both the values of the CV of the estimated economic variables and the response rate were adequately high and significantly improved since 2012.

Finally, for the final quality check of the estimated economic variables the DV tool proposed by the JRC was used.

III B 3 FOLLOW-UP OF REGIONAL AND INTERNATIONAL RECOMMENDATIONS

Definition variable “direct subsidies”:	
PGECON 2012 Recommendation	“direct subsidies” should include: refunds of fuel duty, subsidies for temporary cessation, socio-economic compensation for fishermen “direct subsidies” should exclude: Fuel tax exemption ,Subsidies for permanent cessation of fishing activities, investment subsidies (fleet modernization
Follow-up actions needed	Guidelines DCF should be adjusted
Responsible persons for follow-up actions	DGMARE, MS,
Time frame (Deadline)	Beginning 2013
LM comment	No specific comment from LM
MS response	<i>MS already apply the recommendation</i>

The recommendations of PGECON 2013 refer to general issues and do not apply directly to MS

III B 4 ACTIONS TO AVOID DEVIATIONS

The deviations from the NP proposal concern only the target population and the clustering of two fleet segments that, as mentioned in detail above, are explained by changes in the fleet composition during 2008 that was used in the NP proposal and the reference year (2013). These deviations are justified and necessary for sampling reasons and therefore should not be avoided.

There were no other deviations from the NP proposal in the economic data collection. A high response rate was achieved compared to the previous year, since the data collection started on time. Furthermore many actions were taken to achieve high quality data.

III C. Metier-related variables

III C 1 ACHIEVEMENTS: RESULTS AND DEVIATION FROM NP PROPOSAL

The sampling was carried out for the evaluation of length distribution of species in the catches and the quantity of catches and discards. The data have been collected by metier referred to as level 6 of the matrix defined in Appendix IV (EU Dec. 93/2010), and has been agreed at regional level (RCMMed&BS 2009 and 2010), per GSA as defined in Appendix I Level 4 (EU Dec. 93/2010) and for the stocks listed in Appendix VII (EU Dec. 93/2010).

The **Table III.C.1** provides information on the metiers that are realised by the Greek fishing fleet, considered as major and were selected for sampling purpose through the ranking system. The selected metiers are in full agreement with the most recent regional ranking (PGMED 2014). Metiers are given at GSA level, based on the requirements of the Commission Decision (EU Dec. 93/2010).

The **Tables III.C.3** and **III.C.4**, provide information on the sampling strategy and the sampling scheme for the collection of métier related variables, also on the number of trips that were achieved by métier in each GSA for 2014. Sampling has been carried out in each GSA, through concurrent sampling on-board the fishing vessels and on-shore, providing data on all the species that were fished in the first case (on-board) and only on landings in the second case (on-shore). The sampling has been designed taking into account the spatial and temporal variability in order to detect seasonal differences in the demographic structure and composition of the landings for different métiers. The sampling unit was the fishing trip. The discards were estimated for all the metiers that were selected for sampling through the ranking system. More effort was given to sampling at sea in order to have better information on the discards and more representative length and age distribution per species. Therefore the trips at sea are more than the planned in most of the cases.

A brief description of the sampling's coverage per métier is given below:

Bottom otter trawl fisheries targeting demersal species (OTB_DES_>=40_0_0)

The trawl fishery was sampled to a lesser extent compared to what was planned in all GSAs. The sampling intensity was 53% (100 trips instead of 190) in GSA 22, 46% (59 trips instead of 128) in GSA 20 and 17% (10 trips instead of 60) in GSA 23.

Purse seine fisheries targeting small pelagic fish (PS_SPF_>=14_0_0)

The sampling coverage of purse seine fishery has nearly met the sampling requirements in GSAs 20 and 22; the sampling intensity was 97% in GSA 20 (155 out of 160 trips) and 86% (162 out of 188 trips) in GSA 22. In GSA 23 the sampling intensity was poor only 7% (7 out of 96 trips)

Pots and traps for demersal species (FPO_DES_0_0_0)

The pots and traps fishery is realised only in GSA 22. It was sampled more than what was planned however with no additional financial burden on the budget. The sampling intensity was 137% (70 trips instead of 51).

Set gillnet for demersal fish (GNS_DEF_>=16_0_0)

The sampling coverage of gillnet fishery has nearly met the sampling requirements in GSAs 20 and was sampled more than what was planned in GSA 22 however with no additional financial burden on the budget; the sampling intensity was 78% in GSA 20 (112 out of 144 trips) and 123% (285 instead of 232 trips) in GSA 22. In GSA 23 the sampling intensity was poor only 6% (7 out of 120 trips)

Set trammel net for demersal fish (GTR_DEF_>=16_0_0)

The sampling coverage of gillnet fishery has nearly met the sampling requirements in GSAs 20 and was quite good in GSA 22; the sampling intensity was 91% in GSA 20 (247 out of 272 trips) and 65% (329 out of 504 trips) in GSA 22. In GSA 23 the sampling intensity was 26% (34 out of 132 trips)

Set long lines for demersal fish (LLS_DEF_0_0_0),

The set longline fishery was also sampled to a very good extent compared to what was planned in GSAs 20 and 22. The sampling intensity was 77% (170 trips out of 220) in GSA 20 and 93% (252 trips out of 220) in GSA 22. In GSA 23 the coverage was 23% (27 trips out of 120).

Drifting long lines (LLD_LPF_0_0_0).

Regarding the drifting long line fishery, in Greece it targets only swordfish. Bluefin tuna and albacore are by-catch in swordfish fishery. Thus, the métier LLD_LPF_0_0_0 is only for SWO. The drifting long line fishery has met the sampling requirements; the sampling intensity was 102% (362 trips instead of 354). Most of the sampling was realized on shore.

The **Table III.C.6** provides the achieved length sampling by species and by métier. Landings and discards were monitored for the Group 1, 2 of Appendix VII (EU Dec. 93/2010) and Group 3 species that were decided by 2008 RCM Med and BS. Length data provided for 80 species and 1 family. Most of the species were oversampled with the exception of Shark-like Selachii species.

III C 2 DATA QUALITY: RESULTS AND DEVIATION FROM NP PROPOSAL

In most of the métiers the sampling intensity has met the targets described in the NP proposal. Deviations observed in bottom otter trawl fisheries and can be attributed to difficult weather conditions during the winter months. Also, the four months closure of bottom trawl fisheries (23/5-30/9) deteriorates even more the possibilities to meet the sampling requirements.

The sampling intensity in GSAs 20 and 22 nearly met the targets described in the NP proposal and in many cases have sampled more than what was planned. However, poor coverage indicated in GSA 23 in all the métiers.

Regarding the length sampling most fish stocks were oversampled in terms of the number of length measurements, well exceeding the planned and requested minimum numbers described in the NP.

III C 3 FOLLOW-UP OF REGIONAL AND INTERNATIONAL RECOMMENDATIONS

There is one relevant recommendation from the Liaison Meeting 2014 (LM) listed in row 2 of standard table II.B.2.

III C 4 ACTIONS TO AVOID DEVIATIONS

Reallocation of number of trips between sub-divisions (without any increase in the budget) is considered as a solution for the case of GSA 23. Also, it will be a greater effort to meet the sampling requirements in bottom trawl fisheries.

III D. Recreational fisheries

III D 1 ACHIEVEMENTS: RESULTS AND DEVIATION FROM NP PROPOSAL

Recreational fisheries of bluefin tuna

There is no recreational fishery of bluefin tuna in Greece. According to the Ministerial Decision 170317/162669/20-4-2004 which lays down specific rules for the fisheries of large pelagic species (*Thunnus thynnus*, *Thunnus alalunga* and *Xiphias gladius*) in Greek waters, the fisheries for these species (i) can only be practiced by professional fishermen with a special licence, and (ii) is strictly forbidden for recreational fishermen.

Also, in 2003, a derogation was requested by Greece concerning blue fin tuna and the derogation was justified according to SGRN document: 05-01 Evaluation of NP for 2005_Sec(2005)-255 (pages 55, 103-104)

Recreational fisheries of eels

According to the Ministerial Decision 643/39462/01-4-2013 which lays down specific rules for the eels' fishery, the recreational fishery of eels is prohibited all year throughout the country.

Recreational fisheries of sharks

Sharks and rays are not target but by-catch species in commercial fishery of Greece. In recreational fishery, according to recreational fishing associations, the capture of sharks and rays is rare and random. However, in the submission of the new NP (2016-20) Greece intends to include a pilot study in order to investigate the existence of recreational fishery of sharks.

III D 2 DATA QUALITY: RESULTS AND DEVIATION FROM NP PROPOSAL

Not applicable

III D 3 FOLLOW-UP OF REGIONAL AND INTERNATIONAL RECOMMENDATIONS

There is no relevant recommendation from the Liaison Meeting (LM)

III D 4 ACTIONS TO AVOID DEVIATIONS

Not applicable

III E Stock-related variables

III E 1 ACHIEVEMENTS: RESULTS AND DEVIATION FROM NP PROPOSAL

Biological stock-related variables were collected from surveys, on board sampling, landings and market place spatio-temporally to detect seasonal differences in the structure and composition of the species examined.

The **Table III.E.1** provides the species included in the sampling scheme in compliance with NP 2011-2013.

Concerning the landings of Shark-like selachii, they consist of numerous species with low proportions relative to the total. Therefore, while the total Greek landings of shark-like Selachii is higher than 200 t, the individually attain landings is considerably lower than 200 t. The Shark-like selachii were sampled for biological variables, whenever they were found during sampling as well as during MEDITS scientific survey. However, a minimum number of individuals to be measured at the national level cannot be planned. From the Shark-like selachii species a considerable number of individuals was caught only for the species *Scyliorhinus canicula* in GSA 22 and in a lower extend in GSA 20. The species was sampled for length related variables in both areas.

Also, with the name *Raja clavata* are recorded all the species of the Rajidae family since neither the fishermen nor the fish merchants can separate them. Thus the landings of each species are lower than 200 t. *Raja clavata* is sampled for biological variables, whenever it is found during sampling as well as during MEDITS scientific survey. However, a minimum number of individuals to be measured at the national level cannot be planned.

The **Table III.E.2** provides the biological variables (sex, age, weight, maturity) collected in 2014. For the year 2014 the MS decided to collect again all the variables for all the species, although they were collected during 2013. The decision was based on the fact that data collection for 2013 was held in the second half of the year and in some cases in the last quarter for all the species except for eel and swordfish.

The **Table III.E.3** provides the achieved sample numbers for the stocks sampled according to Greek NP by species and by GSA.

For 18 out of 23 species (78%) the planned number of individuals that had to be measured was achieved for most of the variables and in many cases there was oversampling. The coverage per stock and GSA is given below.

Boops boops: The number of individuals collected met the planned target in GSAs 20 and 22 (~90% for maturity @ length and sex-ratio @ length variables and surpassed it (~135%) for length@weight variable, in GSA 23 the coverage was also good (~60% for all the variable).

Eledone moschata: The species was sampled for biological variables only in GSA 22 and the number of individuals collected was lower than the planned (~32%).

Engraulis encrasicolus: The planned number of individuals was achieved in GSA 22 and over sampling occurred for all the variables (>140%). In GSA 20 the number of individuals collected was over 60% for all the variables while in GSA 23 no sample was available for biological variables since the anchovy fishery is limited in that area.

Illex coindetii: The species was sampled for biological variables only in GSA 22 and over sampling occurred for all the variables (>200%).

Loligo vulgaris: The species was sampled for biological variables in GSA 22 and 20. Over sampling occurred for all the variables in GSA 20 and the coverage was also very good in GSA (~84%).

Lophius budegassa: The species was sampled for biological variables in GSA 22 and 20. In GSA 20 the number of individuals collected for length variables was >70% while for age variables ~60%. In GSA 22 the number of individuals collected for age variables was 65% while for maturity and sex-ratio about half of the planned number.

Merluccius merluccius: The species was sampled for biological variables in all GSAs. In GSA 20 over sampling occurred for all the variables and in GSA 22 the planned number was nearly achieved. In GSA 23 the sampling for age and maturity variables was poor and only for weight@length and sex-ratio@length the coverage was ~50% .

Mullus barbatus: The species was sampled for biological variables in all GSAs. Over sampling occurred in GSAs 20 and 22 for all the variables. In GSA 23 the planned number was nearly archived for the length related variables while for age related variables the coverage was lower (~30%).

Mullus surmuletus: The species was sampled for biological variables in all GSAs. Over sampling occurred in GSAs 22 for all the variables. The planned number was nearly archived in GSA 20 (>75%). In GSA 23 over sampling occurred for the length related variables while for the age related variables the coverage was 55%.

Nephrops norvegicus: The species was sampled for biological variables only in GSA 22 and over sampling occurred for all the variables.

Octopus vulgaris: The species was sampled for biological variables in GSA 22 and 20 and the number of individuals collected was lower than the planned in both areas (29% in GSA 22 ; 1% in GSA 20).

Pagellus erythrinus: The species was sampled for biological variables only in GSA 22 and over sampling occurred for all the variables.

Parapenaeus longirostris: The species was sampled for biological variables in all GSAs. The species was oversampled in GSAs 22 and 20 while in GSA 23 the number

of individuals collected were lower than the planned. The coverage for weight and sex ratio was 55% and for maturity 27%.

Penaeus kerathurus: The species was sampled for biological variables only in GSA 22 and the number of individuals collected was lower than the planned (10%).

Sarda sarda: The species was sampled for biological variables in all GSAs and the number of individuals collected was lower than the planned (<40%)

Sardina pilchardus: The species was sampled for biological variables in GSAs 22 and 20. The species was oversampled in GSA 22 while in GSA 20 the number of individuals collected was about the half of the planned.

Scomber spp.: The species was sampled for biological variables in GSAs 22 and 20. The species was oversampled in both GSAs for nearly all of the variables.

Sepia officinalis: The species was sampled for biological variables in GSAs 22 and 20. The number of individuals collected nearly met the target in GSA 22 but was much lower than the planned in GSA 20 (14%).

Solea solea: The species was sampled for biological variables only in GSA 22 and the number of individuals collected was lower than the planned (14%).

Spicara smaris: The species was sampled for biological variables in all GSAs. The planned number in GSA 20 was achieved for all the variables. In GSA 22 the planned number for the length@weight variable was achieved and was quite good for the other ones (>60%). In GSA 23 the species was not sampled at all.

Trachurus mediterraneus: The species was sampled for biological variables in GSAs 22 and 20. The species was oversampled in GSA 22 while in GSA 20 the number of individuals collected was much lower than the planned (20-25%).

Trachurus trachurus: The species was sampled for biological variables in GSAs 22 and 20. The species was oversampled in GSA 22. In GSA 20 the coverage was ≥ 70 for the weight and age related variables while much lower (19%) for the sex-ratio and maturity variables.

Xiphias gladius: The species was sampled for biological variables in all GSAs. The planned number of individuals for the length@weight variable was not achieved

For the species *Coryphaena hippurus* and *Thunnus alalunga*, according to their landings, no individuals was planned for sampling for 2014 from the relevant PGMed meeting.

For the species *Thunnus thynnus* samples were not available because of the very limited sampling period (less than 3 months).

III E 2 DATA QUALITY: RESULTS AND DEVIATION FROM NP PROPOSAL

The planned number of individuals that had to be measured was achieved for most of stocks and for most of the variables and in many cases there was oversampling. For few stocks the target has not met. The lack of availability of samples for certain stocks was generally related to low landings of these stocks or to small fishing period.

III E 3 FOLLOW-UP OF REGIONAL AND INTERNATIONAL RECOMMENDATIONS

There are no relevant recommendations from the Liaison Meeting (LM).

III E 4 ACTIONS TO AVOID DEVIATIONS

Data collection was in accordance with the NP with no major deviations. Most effort will be given in future in order to have the appropriate samples for all the stocks.

III E 5 MONITORING OF COMMERCIAL EEL

III.E.5. Introduction

i) General information for European eel fishery in Greece.

The population of European eel (*Anguilla anguilla* (L.)) has been reduced and the current fishery is considered to be outside the limits of sustainability. Factors contributing to the decline include the fishing activity, and also other anthropogenic interferences (habitat loss, migration barriers, pollution) and physical factors (e.g. cormorants). Further assessment of the eel's biological status requires additional and continuous data (Dekker, 2005).

For this purpose, the eel was included in the regulations for the data collection of the E.U. (Council Regulation 1543/2000 and Commission Regulations 1639/2001, 1581/2004). According to the new EU Regulation 199/08 (Article 3) the monitoring of the commercial and recreational fishery of the eel in inland waters must be included in the national program of each Member State. The estimates must refer to the total production, effort and biological efforts of the landings.

The fishery for European eel in Greece is limited to the capture of adults during their migration to the Atlantic for reproduction. In Western Greece there is limited fishery of yellow eels, as part of the local tradition of consuming younger eels, a practice that is not found elsewhere in Greece.

It has to be mentioned that the fishery of glass eels is prohibited, and requires special permission from the regional authorities. Also there are no scientific data for the existence of eel recreational fishing until now.

The majority of eels are caught in the lagoons. Most of the lagoons are found in North Greece (estuarine systems of Evros, Nestos and Lake Vistonis) and in Western Greece (Mesolongi and Amvrakikos lagoons). The regional authorities are responsible for the management of the lagoons, while some belong to the Ministries of Development and Economics and some belong to local municipalities. In any case, the economic exploitation of the lagoons is performed for a certain period of time by fishing cooperatives, which lease the lagoons (in most cases for 10 years). The local fishing cooperatives have the exclusive right to exploit the fishes of the lagoons (Koutrakis et al., 2007).

The Hellenic Eel Management Plan defines four Eel Management Units (EMU) (Figure 1.1.1). The management measures concerning fishing restrictions and environmental aspects are applied to all EMUs.

EMU-01 (7 Prefectures, 3 Regions) is located on the North Western Greece. It comprises 70% of the total Hellenic lagoons surface and 45% of the lakes surface. Despite the considerable decrease of the EMU-01 landings (180 t in mid 1980's, 50 t the recent years), the unit remains the most important eel producer. EMU-02 (5 Prefectures, 2 Regions) is located on the Western Peloponnese. It comprises 5% of the total Hellenic lagoons surface and 3% of the lakes. The eel landings of this EMU increased since the mid-1980's, contrary to the general pattern and now represents about 40% of the Hellenic lagoon landings (about 40 t). EMU-03 (4 Prefectures, 1 Region) is located on the North Eastern part of the country. It comprises 24% of the total Hellenic lagoons surface and 9% of the lakes surface. The landings dropped from 70 t in early 1980's to less than 10 t. EMU-04 covers the rest of the country, mainly central eastern continental Greece and the islands of the Aegean Sea (35 Prefectures and 8 Regions). The landings of the EMU-04 are very low.

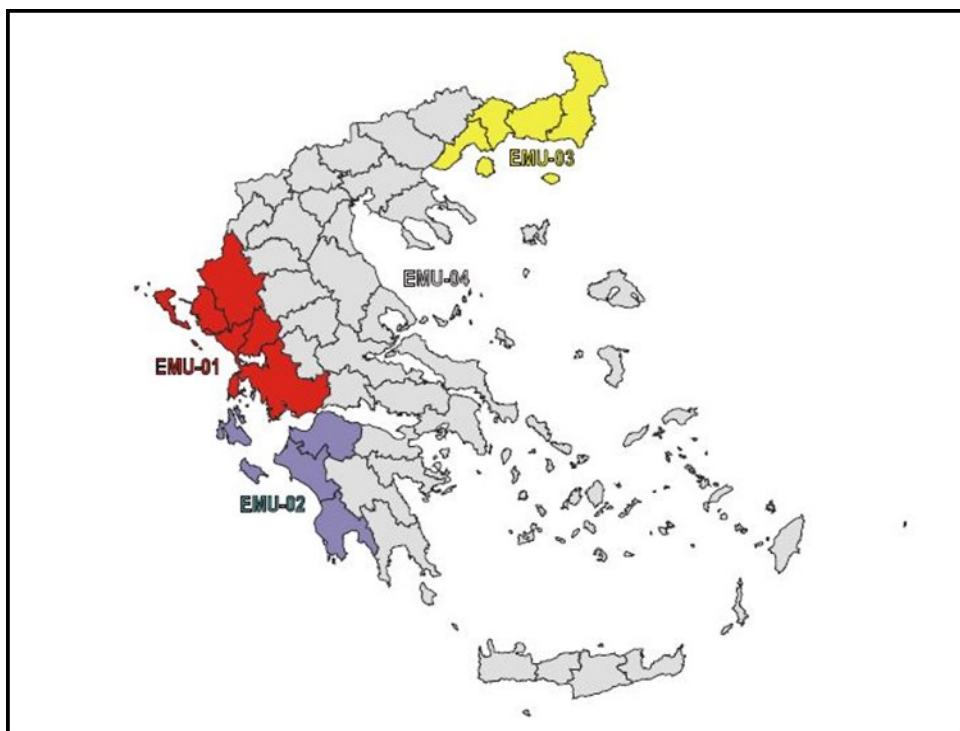


Figure III.E.5.1. Geographical distribution of the Hellenic Eel Management Units (HEMU).

ii) Fishing activity and relevant fishing reforms

Fishing in the lagoons is based on the use of fixed barrier traps, which catch fishes during their seasonal or ontogenic offshore migration. Barrier traps (V-shape traps) are passive, fixed gears and are part of the fence installed at the interface between the lagoon and the sea (for more details see Ardizzone et al., 1988). The traps are covered by a nylon or PVC net (mesh size 14 mm). The traditional barrier fish traps used to be wooden installations, consisting of wooden sticks hammered into the lakebed sustaining a net of reeds. Most of these installations were replaced after 1980 with cement installations (modern barrier fish trap) copied from the Italian "vallicultura" capture systems (Figure 1.4.1). The last two years an effort to increase the selectivity

of the traps was made in the Mesolongi -Aitoliko Lagoons (EMU-1, 40% of total surface of the Hellenic lagoons).

Besides eel migration period, fyke nets were used in some lakes for catching eels. A fyke net is made from a series of bag-shaped nets held open by hoops. Fyke nets equipped with wings and leaders are used in sheltered places in lakes where there is plenty of plant life. The system is secured to the bottom so the fish move with the flow of the water trapped in the bag. By Ministerial Decision 643/39462/01-04-13 (in implementation of Regulation (EC) No. 1100 to 1107) fishing of eels with fyke nets in all the lagoons of the territory is banned. Since 2013, eel fishing in lagoons, in accordance with the above Ministerial Decision, is permitted only by using permanent structures and with the precondition of the mandatory release of 30% of annual lagoon's eel production. Each lagoon's tenants are obliged to promptly inform the regional state fisheries services to upcoming eels fishing, so that the proposed procedure would be applicable.

Fishing in estuaries is conducted primarily by commercial fishermen, who are also using fyke nets. According to the same Ministerial Decision the period November 1st - end of January next year, fishing eels by any means and every tool in the rivers and deltas, around and within 3 nm from the mouth, is prohibited.

Moreover coastal eel fishing can only be conducted by specially licensed professional boats. The owners of these specially licensed vessels should declare to the regional state fisheries services, the number and weight of eels and the catch area.

Small quantities of eels are caught by independent fishermen using longlines. These particular quantities of eels are placed on the internal market and in any case these quantities are not recorded.

III.E.5.1. ACHIEVEMENTS: RESULTS AND DEVIATION FROM NP PROPOSAL

III.E.5.1.1.Eel landings

The total landings of all legally caught eels (ie TL> 30cm) for 2014 in Greece (EMU-1, EMU-2 and EMU-3) were 46.76 t, slightly higher than the 44.83 t of 2013. The recorded landings in 2014 for Western Greece (EMU-1) including the Mesolongi - Aitoliko lagoons, lagoons of Ambrakikos Gulf, Preveza and Lefkada lagoons were 23,7 t. Ilia and Achaia lagoons of Western Peloponnese (EMU-2) eel landings were approximately 21,3 t. Finally the landings recorded in 2014 for Eastern Macedonia and Thrace was 1.76 t (Lake Vistonida and Evros).

III.E.5.1.2. Eel measurements

In the framework of the National Fisheries Collection Program 2014, length, weight, sex, sexual maturity and the number of parasites or the affection of other illnesses measurements were collected for a sample of 1842 eels, from the landings of all the 3 EMUs of Greece that have eel production. Data of age were, also, collected, calculated according to the proper ICES protocol, for a subset of the above sample (704 specimens).

For EMU-3, the total number of specimens measured for Total Length (TL, mm) and Total Weight (TW, mm), was 475 (70 of Lake's Vistonida, 405 of the Evro's Delta),

due to a massive mortality event that occurred in Lake Vistonida during the summer of 2014, total production of eels was devastated, that is the reason why the eel sample of Vistonida is so small. For EMU-1, the total number of specimens that had TL (mm) and TW (mm) calculated, were in total 1306 (942 of the Mesolongi and Aitolikou lagoons, 20 of Arta's lagoon, 185 and 159 of Lefkada and Preveza lagoons respectively) while in EMU-2 61 specimen were measured (Prokopou and Pope lagoons).

III.E.5.1.3. Age assessment

For the discrimination of eel specimens into age classes, the otolith method was used instead of the scale method, as proposed by the age assessment protocol of ICES.

The age of 483 specimens of Mesolongi and Aitoliko Lagoons and 160 of Arta, Preveza and Lefkada lagoons, was calculated for EMU-1. Mean age was estimated at 5.18 years with a standard deviation (SD) equal to 2.18 and the most common age in the sample, was found to be age 4. High SD of the ages is possibly caused by the environmental heterogeneity among the lagoons of the Messologhi-Aitoliko wetland complex. In EMU-2, the age of 61 specimens of Prokopos lagoon were assessed. Sample's mean age was estimated at 3.7 years with a standard deviation (SD) equal to 1.33. Same as 2013, eels of EMU-2 seem to become silvereels faster than in EMU-1.

III.E. 5.1.4. Sexual maturity

For the discrimination of the eel specimen into sexually immature (including all 5 stages of yellow eels, proposed by Duriff et al., 2005) and sexually mature, a combination of 3 indices was used. Those three indexes were, Eye Index (Punkharst et al., 1982), Fin Index (Duriff et al., 2005) and the Mean Minimum Length of Female eels caught while migrating from all Greek lagoons. When all 3 indices gave the same result about a specimen, only then it was accepted to be mature or immature, the rest of specimens that failed to get a common result by all 3 indices were not classified. This method was applied on the total sample, thus 1,842 specimen from all 3 EMUs of Greece.

III.E.5.1.5. Parasites and various diseases

The eels sample collected from Lake Vistonida (EMU-1) in 2014 was tested in the laboratory for parasites revealing that a large number of fish were carrying parasites. Out of the 70 specimens, 50 (70%) were carriers of a parasite, the nematode *Anguillicoloides crassus*. 405 specimens of Evros Delta (EMU-3) were tested so to derive that 89 (21,9%) of them were carrying the nematode. From the Mesolongi - Aitoliko Lagoons a total of 483 specimens were examined, finding that the parasite *A. crassus* was carried by 99 specimens (19.9%). Finally, for EMU-2 a total of 61 specimens were checked for parasites, resulting that 11 specimens (18 %) of the sample were carriers of the parasite. The fact that the biggest proportion of eel specimen of Vistonida lake (70%) are carriers of the nematode is already known from 2013 but it is not clear yet, why this is happening.

III.E.5.2. DATA QUALITY: RESULTS AND DEVIATION FROM NP PROPOSAL

The collection and assessment of eel samples was successful for all 3 EMU's for 2014. The target number of specimens that has been proposed in the Greek Eel Management Plan was met. It worth mention here, that Lake Vistonida (one of the most important eel-producing lakes in the past), faced a severe massive fish mortality and as a result, the sample of specimen collected from this specific lake was proportionally less than the former years.

III.E.5.3.FOLLOW-UP OF REGIONAL AND INTERNATIONAL RECOMMENDATIONS

There are no recommendations about Eel *Anguilla anguilla* (L.) from the Liaison Meeting (LM) for 2013.

III.E.5.4.ACTIONS TO AVOID DEVIATIONS

There are no shortfalls

Eel Report Contributors

For the derivation of the results of the chapter III.E.5 MONITORING OF COMMERCIAL EEL the following organisations collaborated, under the scientific supervision of Dr. Manos Koutrakis:

- Laboratory of Freshwater systems and Lagoons (Scientific Supervisor: Dr. Manos Koutrakis) / FRI (Institute of Fisheries Research) Kavala, Greece
- Division of animal Biology (Scientific Supervisor: Dr. Kostantinos Koutsikopoulos) / Department of Biology, University of Patra, Patra, Greece
- Laboratory of Zoology (Scientific Supervisor: Dr. Ioannis Leonardos) / Department of Biological Applications and Technology Department, University of Ioannina, Ioannina, Greece

III F Transversal variables

III F 1 CAPACITY

III F 1 1 ACHIEVEMENTS: RESULTS AND DEVIATION FROM NP PROPOSAL

Data on fleet capacity for 2014 was available from the National Fleet Register and includes vessels operating in GSA-20, GSA-22 and GSA-23.

The following parameters were estimated:

- Number of professional fishing vessels
- Length
- GT
- kW
- Age

Parameters were estimated annually, by fleet segment, GSA and supra-regions (in case of large pelagic fishery).

III F 1 2 DATA QUALITY: RESULTS AND DEVIATION FROM NP PROPOSAL

Data were collected exhaustively from the fleet register, cover the entire Greek fleet so, no further estimation is required and it is in accordance with the NP with no deviations.

III F 1 3 ACTIONS TO AVOID DEVIATIONS

There are no shortfalls

III F 2 EFFORT

III F 2 1 ACHIEVEMENTS: RESULTS AND DEVIATION FROM NP PROPOSAL

Data on effort were collected for all the required métiers. The main problem relating to the required disaggregation derives by the obligation to be disaggregated by métier (Level 6 of Appendix IV, 4). Official information for the activity of the fleet is not available, since in Greece it is not mandatory for vessels to indicate the type of activity they practice along the year. Each vessel can use all the fishing gears indicated in the license. The majority of the fishing licenses of the Greek fishing vessels allow the use of more than one gear (~96%). This framework is also more complex if we consider the high number of existing métiers, with differences in seasonality and geographical areas.

In order to estimate fishing effort by métier and GSA, the following data sources have been used:

- field survey to detect the prevalent fishing activity
- sample survey to estimate the monthly distribution of activity by métiers. The sample survey was based on a frame of 592 vessels (**Table III.F.2.1.1**) distributed in the 12 major fishing areas (GSA20: N-ION, C-ION, S-ION, GSA-22: ARGSA, EVIA, THERM, THR-LIM, CHI-MIT, CYCL, DODEC, VOL_SPOR, GSA-23: CRETE) (**Figure III.F.2.1.1**) Data on fishing effort, vessel activity and fishing area were recorded by gear using purposely formulated questionnaires. Results for each area, by month and by métier were obtained by applying raising factors to the sampled data.
- VMS data to estimate fishing effort for trawlers (100% of vessels) and purse seines (89.37% of vessels)

Table III.F.2.1.1. The number of vessels per fleet segment and length category that were sampled for effort and landings data in each of the 12 major areas of Greek territory.

		Fishing Areas												Total
FLEET_SEG1	Length Class	ARGSAR	EVIA	THERM	THR- LIM	CHI- MIT	CRETE	CYCL	DODEC	N- ION	C- ION	S- ION	VOL- SPOR	
Trawlers (Demersal trawlers)*	VL1218	1	0	0	1	0	0	0	0	0	0	0	0	2
	VL1824	3	1	2	5	1	1	1	1	1	2	1	1	20
	VL2440	14	10	23	16	7	4	2	3	2	3	1	3	88
PurseSeine (Purse seiners)	VL0612													0
	VL1218	3	4	1	1	1	1	1	1	1	2	0	1	17
	VL1824	4	4	2	3	1	1	1	1	1	2	1	2	23
	VL2440	0	4	6	4	1	1	1	0	0	0	0	1	18
BoatSeine	VL0006													0
	VL0612	6	5	2	1	3	1	3	4	5	3	2	1	36
	VL1218	1	1	0	1	1	1	1	1	0	1	1	0	9
	VL1824													0
Bottom longlines (Vessels using hooks)	VL0006	5	5	2	2	4	3	2	3	2	2	3	2	35
	VL0612	10	5	3	3	4	4	3	5	3	3	3	2	48
	VL1218	2	1	1	1	1	1	2	1	1	1	1	1	14
	VL1824	0	0	0	1	0	1	0	0	0	0	0	0	2
Fixed nets (fixed netters)	VL0006	7	8	7	7	11	3	3	4	9	6	5	4	74
	VL0612	18	10	11	12	11	6	7	8	17	10	7	5	122
	VL1218	3	1	1	2	1	2	4	3	1	1	1	1	21
	VL1824	0	0	0	0	0	0	1	1	0	0	0	0	2
Pots and Traps (pots and/or traps)	VL0006	1	1	1	1	1	0	0	1	1	1	1	0	9
	VL0612	1	1	3	2	1	0	0	1	1	1	1	1	13
	VL1218	0	0	0	1	0	0	0	1	0	0	0	0	2
	VL1824	0	0	0	0	0	0	0	1	0	0	0	1	2
Drifting longlines (vessels using other Passive gears)	VL0006	1	1	1	1	1	0	0	1	1	1	1	1	10
	VL0612	1	1	1	1	1	0	1	1	1	1	1	1	11
	VL1218	0	1	1	1	1	1	2	0	1	0	1	1	10
	VL1824	0	0	0	0	0	0	1	0	1	0	1	1	4

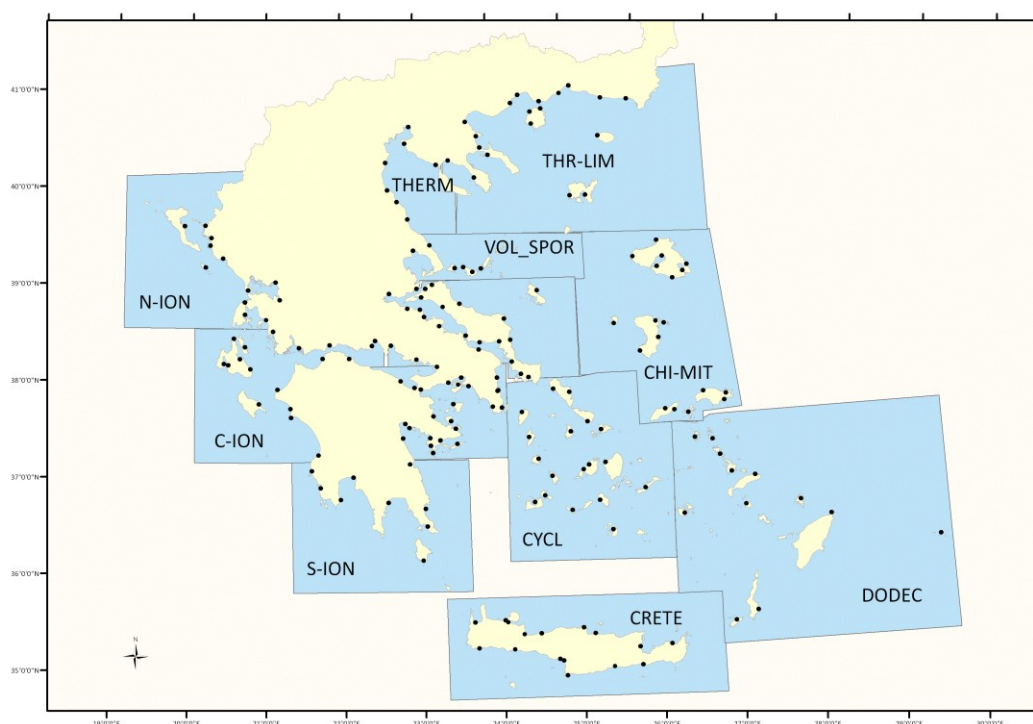


Figure III.F.2.1.1 The 12 major fishing areas for the stratified sampling scheme of the Greek DCF

Statistical methods described in the 2011-2013 NP have been applied. The **Table III.F.1** provides the information collected during the sampling year.

III F 2 2 DATA QUALITY: RESULTS AND DEVIATION FROM NP PROPOSAL

Elementary and aggregated data have been checked to verify their reliability. Consistency among different variables has been analyzed. A census of effort for all bottom trawlers operated in Greek territorial waters has been obtained from VMS data. Concerning purse seines, the estimated fishing effort value from VMS data cover 89.37% of fishing fleet. The remaining data was collected through the sample survey and therefore data is consistent

III F 2 3 FOLLOW-UP OF REGIONAL AND INTERNATIONAL RECOMMENDATIONS

There is no relevant recommendation from the Liaison Meeting (LM)

III F 2 4 ACTIONS TO AVOID DEVIATIONS

Data collection was in accordance with the NP with no deviations.

III F 3 LANDINGS

III F 3 1 ACHIEVEMENTS: RESULTS AND DEVIATION FROM NP PROPOSAL

Landings by métier were sampled in the same way as effort was sampled and outlined above (according to the variables and desegregation levels listed in Appendix VIII). The landings indicators from the sampling programme are:

- Total live weight per vessel
- Total value per vessel
- Unit value per species per vessel

These indicators were disaggregated to live weight or value per day, per kw*day or per effort unit.

Data related to BFT landings are provided by a specific data collection implemented by the national administration in accordance with ICCAT procedures.

The **Table III.F.1** provides the information collected during the sampling year.

III F 3 2 DATA QUALITY: RESULTS AND DEVIATION FROM NP PROPOSAL

Landings data by species and métier have been sampled in detail for all fleet segments. All variables of Appendix VIII were collected through the sample survey and therefore data is consistent. Data quality is given in terms of coverage rate.

III F 3 3 FOLLOW-UP OF REGIONAL AND INTERNATIONAL RECOMMENDATIONS

There is no relevant recommendation from the Liaison Meeting (LM)

III F 3 4 ACTIONS TO AVOID DEVIATIONS

Data collection was in accordance with the NP with no deviations.

III G Research surveys at sea

III G 1 ACHIEVEMENTS: RESULTS AND DEVIATION FROM NP PROPOSAL

According to appendix IX of DCF (EU Dec. 93/2010), the Greek National Programme for 20011-2013 included two surveys:

- MEDITS, MEDiterranean International bottom Trawl Survey
- MEDIAS, MEDiterranean International Acoustic Survey

MEDITS

The Medits Project aims to harmonize sampling of demersal resources in the Mediterranean Sea through Medits bottom trawl survey. The Medits survey is an annual survey that is realized in the continental shelves and slopes of Mediterranean Sea, in depths ranging from 0 m to 800 m. It provides information on benthic and demersal species, in terms of population distribution, abundance, and size composition for 84 species as well as information on abiotic parameters and marine litters.

The MEDITS-GR survey assesses the benthic and demersal resources in the relevant areas of the Greek territory (GSAs 20, 22 and 23). The characteristics of the sampling gear (feature and handling), the design of the survey, the sampling methodology and the processing of samples, follow the instructions of the latest version of MEDITS manual (version 7, 2013).

The sampling scheme comprises sampling stations randomly distributed in 5 different bathymetric zones: 10-50, 50-100, 100-200, 200-500 and 500-800 m. The number of stations in each bathymetric zone is proportional to the area of the zone. This sampling scheme was decided once during the first time that the survey was carried out and it is implemented the same every year without changes.

On board, after each haul, the catches are split into categories and sub-categories as reported in Annex V and XV of the MEDITS manual. For each species of the Annex VI (MEDITS manual) the total weight and number of individuals is collected, excluding the faunistic category V, G, H for which only the total weight is collected. For species caught in big abundance a representative random sub-sample of 100 individuals is measured.

For the 84 species of the MEDITS reference list and all species of the *Epinephelus* and *Scomber* genera, the total number of individuals, the total weight and the individual length is collected. Only for the MEDITS G1 species more biological parameters are collected (individual length, individual weight, sex, maturity, and age).

The bottom water temperature is also recorded at the start and the end of each haul as well as data on litter during MEDITS trawl surveys.

The achievements for 2014 are summarized in Table III.G.1. The survey was accomplished in all the Greek GSAs (GSA 20, 22, 23) and all the planned stations were sampled. Some additional stations were made in all GSAs without burdening the cost of the programme. The survey started on time but was prolonged because of difficult weather conditions especially in the Ionian Sea

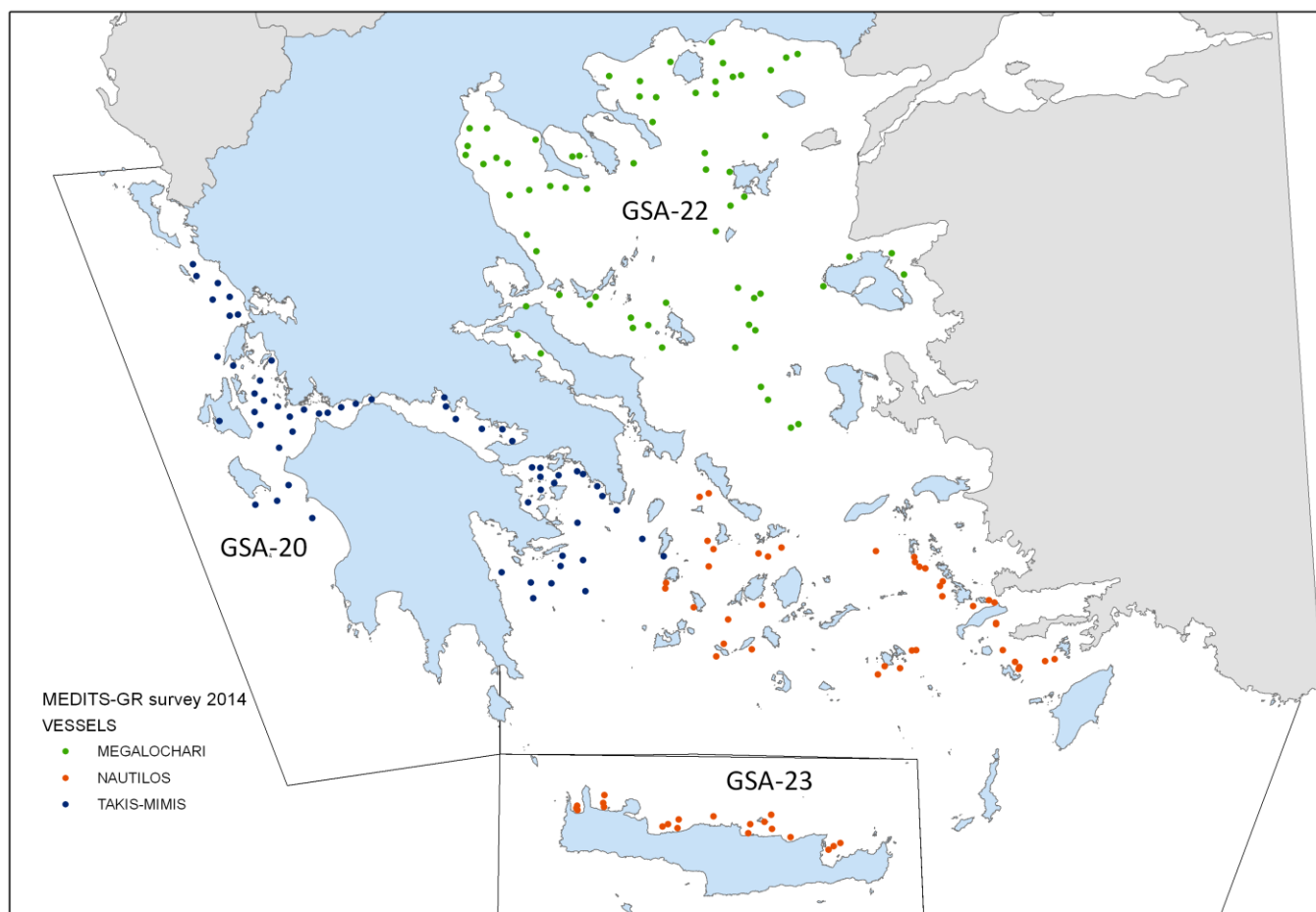


Figure III.G.1.1. Map of the area covered during the MEDITS survey .Sampling stations distribution during the 2014 survey.

MEDIAS

DIRECT ASSESSMENT OF THE BIOMASS OF ANCHOVY AND SARDINE STOCKS IN THE AEGEAN AND IONIAN SEA

During the project two research surveys according to contract were carried out, one in Aegean Sea during June-July 2014 and one in Ionian Sea during September 2014. Collected data were used for:

- Abundance and biomass estimation of anchovy stock and sardine stock by a fishery-independent technique: Acoustics.
- Spawning stock abundance and biomass estimation of anchovy stock by a fishery-independent technique: DEPM.
- The survey focused on the delimitation of the juvenile grounds distribution for anchovy and sardine stocks and the biomass estimation of the respective stocks.

The Standard **Table III.G.1** summarizes the achievements accomplished within the framework of the acoustic surveys.

1. Hydrographic sampling.

Hydrographic parameters were recorded over a grid of 133 sampling stations in Aegean Sea and 53 sampling stations in Ionian Sea (Fig III.G.1.2). 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.

2. Acoustic sampling and stock assessment for anchovy and sardine.

According to the project, the size and the geographic distribution of anchovy (*Engraulis encrasicolus*) and sardine (*Sardina pilchardus*) stocks in Aegean and Ionian Sea were estimated with the acoustic methodology. The methodology of the acoustic survey will follow the protocol of MEDIAS so that results will be harmonized and comparable to the other Mediterranean areas.

Acoustic echoes were registered continuously along 61 pre-defined transects in the Aegean Sea during June-July 2014 and along 31 pre-defined transects in the Ionian Sea during September 2014 (**Fig. III.G.1.2**) with a Biosonics Split Beam 38 kHz DT-X. 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 27635 Km² in Aegean Sea and 8871 Km² in 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, 34 pelagic trawls were held along transects in the positions of high fish concentrations.

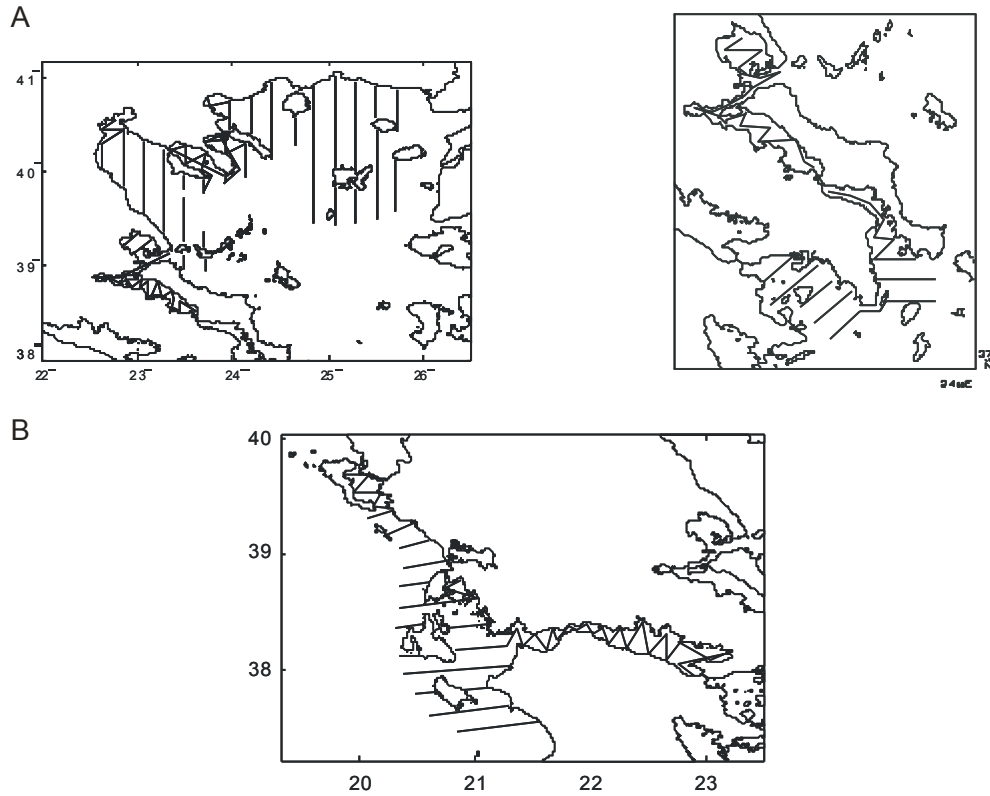


Fig III.G.1.2 Map of the area covered during the MEDIAS survey. Pre-defined transects in A) Aegean Sea during June-July 2014 and B) Ionian Sea in September 2014.

The mean frequencies of each length class were estimated

- In 4 sub-areas in Aegean Sea (in the area east of Thasos, in the area west of Thasos, in Thermaikos gulf, in the wider region of Sporades – N. Euvoikos gulf).
- and in 4 sub-areas in Ionian Sea (in Patraikos gulf, in the south part of Ionian Sea, in the north part of Ionian Sea and in Amvrakikos gulf).

The mean frequencies of each length class were estimated as

$$f_j = \frac{\sum_{k=1}^M \left(\frac{n_{jk}}{t_k} \right)}{\sum_{k=1}^M \left(\frac{N_k}{t_k} \right)}$$

Where f_j is the mean frequency of anchovy/sardine of the length class j ; n_{jk} is the number of individuals of anchovy/ sardine in the length class j at the sampling station k ; N_k is the total number of individuals of anchovy/ sardine at the sampling station k ; t_k is the fishing duration in station k ; and M is the number of sampling station in the area (MacLennan and Simmonds 1992).

Also, the following relationship was estimated for each sub-area:

$$W = a L^b$$

Where W is the total weight; L is the total length and a and b are constants estimated with regression analysis.

The density of targets (F) from the observed echo integrals were estimated according to the equation $F = (K/\langle\sigma\rangle)E$, where K is the calibration factor, $\langle\sigma\rangle$ is the mean cross-section and E is the Echo integral after partitioning (MacLennan and Simmonds 1992). The $\langle\sigma\rangle$ was calculated for the mean total fish length of each area according to the equations $\langle\sigma\rangle = 4\pi \sum_i f_i 10^{TS/10}$, where f_i is the corresponding length frequency as deduced from the fishing samples (MacLennan and Simmonds 1992).

The abundance Q was estimated separately for each sub-area. The abundance Q in each elementary statistical sampling area was calculated from the average density within each sub-area according to the equation:

$$Q = A_k \sum_i F_i / N_k$$

where F_i is the i sample; A_k is the area of each elementary statistical sampling area and N_k is transects in A_k . The variance V was estimated as

$$V = \sum_i (AF_i - Q)^2 / [N_r(N_r - 1)]$$

The data have been log transformed and the means and variances of F estimated according to the following equations:

$$F = \exp(m) G_N[0.5 S / (n-1); V = F^2 - \exp(2m) G_N[S(n-2)/(n-1)^2];$$

where m = average ($\ln F$); S = variance ($\ln F$) and n = independent observations of F.

The total abundance Q_t and its variance are obtained by summing the results for each region $Q_t = Q_1 + Q_2 + \dots$, and $V_t = V_1 + V_2 + \dots$. Standard error of Q_t is the square root of V (MacLennan and Simmonds 1992).

3. Deliverables.

The abundance indices that will be estimated and provided in the DCR report will include NASC (Nautical Area Scattering Coefficient, m^2/nm^2) and Biomass values (t), as listed below:

1. Total fish NASC per EDSU (Elementary Distance Sampling Unit) (Annex I, Tables 1 and 2)
2. Target Species (anchovy and sardine) NASC per EDSU (Elementary Distance Sampling Unit) (Annex I, Tables 1 and 2)
3. Biomass per EDSU per target species (Annex I, Tables 1 and 2)
4. Number of individuals per EDSU per target species (Annex I, Tables 1 and 2)
5. Number of individuals/age/Target species (Annex I, Tables 3-6)
6. Biomass/age/Target species (Annex I, Tables 3-6)
7. Number of individuals/length class/Target species (Annex I, Tables 3-6)

8. Biomass/length class/Target species (Annex I, Tables 3-6)

In addition in the report for the DCR the following items will also be provided:

- 1. Point maps of total pelagic fish NASC per EDSU (Annex I, Fig 2)**
- 2. Point maps of anchovy and sardine NASC per EDSU (Annex I, Fig 3 and 4)**
- 3. Point maps of anchovy and sardine biomass per EDSU (Annex I, Fig 5 and 6)**
- 4. Catch compositions of the hauls: pie-charts indicating biomass per species (Annex I, Fig 7)**

For non-target pelagic species that are considered important in each area, **Length–Weight relationships (where an adequate number of samples is available) and Length frequency distributions in Aegean Sea and Ionian Sea are provided (Annex I, Table 7 and Figs 8-13).**

III G 2 DATA QUALITY: RESULTS AND DEVIATION FROM NP PROPOSAL

MEDITS

The survey was accomplished in all the Greek GSAs (GSA 20, 22, 23). The sampling procedure was carried out based on the methodology defined in the MEDITS instruction manual without any deviations. The survey data were already submitted to the relevant data calls.

MEDIAS

Small deviation of the proposed plan were due to the malfunction of the R/V PHILIA for over 15 days during June 2015. This along with the limited availability of the R/V Philia during July-August impaired the need to skip part of the survey area that exhibited low concentrations of small pelagics. This resulted in the reduced percentage in the number of CTD stations (82%) whereas we succeeded in 87% cover of the planned EDSU (Elementary Distance Sampling Units) for acoustics.

III G 3 FOLLOW-UP OF REGIONAL AND INTERNATIONAL RECOMMENDATIONS

There are no relevant recommendations that apply to MS.

III G 4 ACTIONS TO AVOID DEVIATIONS

MEDITS and MEDIAS

No shortfalls were experienced requiring actions. However, the most important action to avoid any deviations is the funding of the NP proposal on time

IV MODULE OF THE EVALUATION OF THE ECONOMIC SITUATION OF THE AQUACULTURE AND PROCESSING INDUSTRY

IV A Collection of data concerning the aquaculture

IV A 1 ACHIEVEMENTS: RESULTS AND DEVIATION FROM NP PROPOSAL

The current report is the first attempt for the description of the economic situation of the Greek aquaculture sector by collecting and processing information and financial data from the Greek Directorate for aquaculture and products' exploitation.

The data analysis is referred only to the “cages-sea bass & sea bream” segment, since it is the most important segment of aquaculture sector both in terms of production (>80% of total) and economic activity (>90% of total). Also, for this segment the information and financial data that was available from the Greek Directorate for aquaculture and products' exploitation was utilizable. The “Rafts/ Long line – Mussel” is the second most important segment of aquaculture sector having the majority of the units, the 15% of the production and 2% of the total economic activity. However, the financial data of the units of this segment could not be used either because of their poor quality or because the units belong to companies with parallel activities (fish/food processing) or companies that own units in other aquaculture segments and the distinction between different segments' production costs and revenues was not possible. The same situation exists more or less for the rest aquaculture segments also. In order to improve the quality of the information and to cover all the aquaculture segments it has been planned for 2015 a system of onsite visits and interviews with adequately questionnaires.

From the data that was gathered and processed for the segment "sea bass & sea bream cages» adequate data came of the 58% of the units. The data provided were of high quality both in material and in information on financial data, due to the experience in monitoring of the aquaculture sector from the Directorate.

IV A 2 DATA QUALITY: RESULTS AND DEVIATION FROM NP PROPOSAL

The data provided for the segment "cages-sea bream and sea bass" was of high quality both in material and in information given that it was extracted from Greek Directorate for aquaculture and products' exploitation that keep detailed and cross checked records of the sector. For the other segments of the aquaculture sector, no data was provided.

IV A 3 FOLLOW-UP OF REGIONAL AND INTERNATIONAL RECOMMENDATIONS

There are no relevant regional or international recommendations.

IV A 4 ACTIONS TO AVOID DEVIATIONS

In order to provide more detailed data concerning all the segments of the aquaculture sector in Greece, an attempt for thorough research will be done the following year. The research procedures on aquaculture sector will try to combine onsite visits to the

aquaculture units, filling of questionnaires to acquire detailed cost and income data as well as data for all aquaculture segments.

IV B Collection of data concerning the processing industry

In Greece, the traditionally important, due to its geographical location, fishing industry has led to the development of fisheries processing industry on almost all the coastal areas with intense economic activity. For the fiscal year of 2013, there are 169 companies with proven activity of freezing, processing (filleting, salting, drying, marinating, smoking, cooking, canning) of fish, and the de-shelling of mussels of which 144 participated in the survey

Following Greece's NP proposal, the data collection methodology included the mailing of a properly structured questionnaire to the processing industry enterprises, on site visits and interviews and finally data collection from public sources and published balance sheets.

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) number and location of enterprises, and (3) the problems of the enterprises.

A 60 day period was provided for the collection of the required data and the completion of the questionnaire.

Regarding the completion of the questionnaires, only 14 were sent back completed in addition to the 130 questionnaires completed during the onsite interviews (total 144 questionnaires).

Following the NP proposal, the onsite visits were as follows: 103 visits to enterprises with ≤ 10 employees (achieved no. 92.8%), 23 visits to enterprises with >10 and ≤ 49 employees (achieved. no. 85 %,) and 4 visits to enterprises with >49 employees (achieved no.67%). It has to be noted that due to the continuous economic crisis in Greece and due to the personnel layoffs, there was a shifting for a number of companies from the middle section (over 10 and less than 50 employees) to the lower one changing therefore the ratio of the processing companies according to the number of employees.

Additional to the questionnaire data, basic financial ratios of economic liquidity, productivity, structure and activity are estimated for the fiscal year 2013, with the purpose of estimating the basic financial indices of LTD or SA companies that are obliged to publicize their balance sheets and also have the largest sales of seafood products in the Greek and the International food market.

IV B 1 ACHIEVEMENTS: RESULTS AND DEVIATION FROM NP PROPOSAL

The enterprises that received the aforementioned questionnaire were generally positive in providing the required data. The completed questionnaires produced a significantly high percentage of samples (85.2 %), thus ensuring reliability of the estimations and conclusions.

The collected data provided by completed questionnaires (filled out by the companies or during onsite interviews) 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) and (c) World Wide Web (e.g. location, phones, projected investments, sales, general economic data).

The analysis of the financial statements of corporations (gross revenue, net profits, assets, liabilities) and key indicators (profitability, liquidity, economic structure and activity) for the year 2013, consists of processing data acquired from published balance sheets of 43 SA and Ltd companies (24 of freezing and 19 of processing sector) out of a total of 49 companies, (6 companies had not a published balance sheet by the time of the survey). The 43 firms account for over 77% of the fish processing industry based on raw material purchases.

The main difficulties of collection and processing of questionnaire data from companies were the following:

- Distrust and in some cases refusal to provide information, particularly on larger-sized businesses, on questions concerning loans and selling prices of finished products, raw material costs and unpaid labor (including self-employment costs) .
- Difficulties in filling in the questionnaire appeared again mainly in larger companies with more than one activities, especially concerning elements not included in the published sheets i.e. production costs, administration and financing costs.
- Crosschecking questionnaire data was not always feasible due to delayed publication of companies' balance sheets. (6 out of 49 had not a published balance sheet by the completion of the survey)

IV.B.2 DATA QUALITY: RESULTS AND DEVIATION FROM NP PROPOSAL

All requested indicators listed in Appendix XII of Commission Decision 2010/93/EC were collected in the Greek data collection program for the fish processing industry.

As mentioned before, the data sources were the completed questionnaires, data provided by official bodies, the fishing ports, official financial agencies and published balance sheets

For most variables the achieved sample rate and the response rate exceeded 90% (Table IV.B.2.).

Also, according to the NP proposal, the data collection for the variables of Energy Costs and Other Operational Costs was estimated by Probability Sample Survey (Type B in Table IV.B.2). The census method was used for the rest required variables.

Of the 169 active processing companies for the fiscal year 2013, 25 companies either refused to participate or had no published balance sheets or data from official bodies, a percentage acceptable according to the NP proposal (>85%).

IV.B.3 FOLLOW-UP OF REGIONAL AND INTERNATIONAL RECOMMENDATIONS

There are no relevant regional or international recommendations.

IV.B.4: ACTIONS TO AVOID DEVIATIONS

The issue that was observed during previous years concerning companies with parallel activities, appeared on the current study as well. The aforementioned companies did not provide sufficient data for allocation of costs per activity, due to difficulty determining the distribution. This distinction is also not reflected in the balance sheets and financial statements. The only relevant information is derived from questionnaires and relates solely to distinguish sales of finished products. To estimate the relevant energy costs, employed staff and other operating expenses, additional information was requested during the onsite interviews and via telephone. The proper adjustment of the questionnaire, as was suggested in the previous study, was implemented to address the problem.

Furthermore, companies with parallel aquaculture activity, showed no cost when using their own aquaculture products in the processing activity. In this case, the average raw material price for the financial year 2013 was used as the aforementioned cost, a suggestion from companies' representatives during the onsite interviews.

Regarding the research difficulties that were described in B1, actions to avoid or overcome them are as follows:

- Distrust and in some cases refusal to provide information, particularly on larger-sized businesses, on questions concerning loans and selling prices of finished.

To tackle the mistrust of companies, a brief presentation of the research program was attempted and emphasis was placed on the confidentiality of the provided information. Since it was the third consecutive year of the study implementation and most of the companies already took part during the previous ones, the mistrust issues were significantly reduced.

- The issues of difficulties in filling in the questionnaire mainly in larger companies with more than one activities and difficulties in the questionnaire data crosschecking due to delayed publication of companies' balance sheets were addressed with proper adjustment of the onsite interviews questionnaire, specifically adding the following two topics: cost distinction of parallel activities and asking for financial data before the publication of their balance sheets.

V. MODULE OF EVALUATION OF THE EFFECTS OF THE FISHING SECTOR ON THE MARINE ECOSYSTEM

V. 1. ACHIEVEMENTS: RESULTS AND DEVIATION FROM NP PROPOSAL

Indicators 1-4: Conservation status of fish species Proportion of large fish Mean maximum length of fishes Size at maturation of exploited fish species

Data for the Indicators for this module were collected by MEDITS & MEDIAS survey.

Indicators 5-7: Distribution of fishing activities, Aggregation of fishing activities, Areas not impacted by mobile bottom gears.

According to the Commission Regulation (EC) No 2244/2003, fishing vessels larger than 15 meters in total length, are obligated to be equipped with Vessel Monitoring System (VMS), which at regular intervals (every 2 hours) provides data to the fisheries authorities on the location, course and speed of vessels. In case of Greece, all trawlers are equipped with VMS, while the majority of purse seiners (~89%) and 84 coastal vessels have total length greater than 15 meters and therefore are controlled by VMS. The rest of coastal fishing vessels are not obligated to have VMS. For the purposes of the DCF, VMS data are provided by the Hellenic Ministry of Maritime Affairs, Islands and Fisheries and specific routines were implemented for analysis and mapping (Kavadas S. & Maina I). It has already proven possible to link daily VMS positional data with logbook information. The distribution of fishing activities, aggregation of fishing activities and areas not impacted by mobile bottom gears can be mapped and provided as required. Greece continued to manage and analyse all of the relevant resulting data sets, and made these data available to various expert groups under a formal data request.

Indicator 8: Discarding rates of commercially exploited species

Metier based discard sampling is conducted as part of the concurrent sampling at sea programme. Trip specific discard rates by species measured in weight are raised to discard rates by quarter and metier using species landings data.

Indicator 9: Fuel efficiency of fish capture

The collected economic data were used to calculate the indicator of the relationship between fuel consumption and the value of landed catch. It provides information on trends in the fuel efficiency of different fisheries.

V. 2. ACTIONS TO AVOID DEVIATIONS

There are no shortfalls

VI. MODULE FOR MANAGEMENT AND USE OF THE DATA

VI. 1. ACHIEVEMENTS: RESULTS AND DEVIATION FROM NP PROPOSAL

The data are hosted in a centralized integrated database and GIS Fisheries Information System called IMAS-Fish which supports the Data Collection programme. IMAS-Fish was developed between 2003 and 2006. During the development of the IMAS-Fish databases, a particular attention was attached to design the system to fulfill the requirement of the Data Collection Regulation in force at that time. The system was updated to fit with the new DCF requirements. This includes the update of the database structure, the update/constructing of data entry forms and the update of the query tool that support the data mining procedure and EU data calls. In addition, supplementary tests were done to ensure that the system is working properly and is able to provide the expected results. The COST structure was incorporated into IMAS-Fish as well as the required insert/update procedures were constructed.

Use of the data

The data of the surveys (MEDITS and MEDIAS) are stored on ORACLE database server, and a special tool generates output to the relevant international database of each survey.

Biological data from commercial fishery are transmitted to EU organizations for international stock assessment. Greece continued to use the tools developed by the COST project to analyse and report on the sampling data. Greece has also been involved in the plans for the establishment of a regional database.

Greece responded to data requests from the EC in 2014, and achieved successful transmission in all cases.

The continuing effort to upgrade and integrate database as well as to improve the analysis and data mining tools has helped to avoid many shortfalls, with the Greek DCF data.

VI. 2. ACTIONS TO AVOID DEVIATIONS

Not applicable

VII FOLLOW-UP OF STECF RECOMMENDATIONS

The recommendations and the agreements from the RCM Med & BS and Liaison meetings of 2013 and 2014 as well as the actions taken by the MS are listed in the Standard **Table II.B.2**. There were no STECF Plenary recommendations addressed to MS relating to data collection in the 2013 STECF Plenary meetings.

VIII LIST OF ACRONYMS AND ABBREVIATIONS

AR	Annual Report
EC	European Community
EU	European Union
DCF	Data Collection Framework
GFCM	General Fishery Commission for the Mediterranean
GSA	Geographical Sub Areas
ICCAT	International Commission for the Conservation of Atlantic Tunas
MEDIAS	Pan-Mediterranean pelagic survey
MEDITS	Mediterranean International Trawl Survey
MS	Member State
NP	National Programme
PGMED	Mediterranean Planning Group for Methodological Development
RCM MED&BS	Regional Coordination Meeting for the Mediterranean and Black Sea
RDB	Regional data Base
SGRN SUB	Group on Research Needs
STECF	Scientific, Technical and Economic Committee for Fisheries
SAC	Scientific Advisory Committee of GFCM

IX. COMMENTS, SUGGESTIONS AND REFLECTIONS

None

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XI. ANNEXES

ANNEX I. MEDIAS

Table 1.Aegean Sea:Total fish NASC (Nautical Area Scattering Coefficient, in m^2/nm^2)per EDSU (Elementary Distance Sampling Unit), and also NASC, biomass, and abundance of anchovy and sardine (target species) per EDSU.

Aa EDSU	Total NASC	Anchovy NASC	Anchovy biomass (t)	No. of individuals of anchovy	Sardine NASC	Sardine biomass (t)	No. of individuals of sardine
1	0.00	0	0	0	0	0	0
2	0.00	0	0	0	0	0	0
3	0.00	0	0	0	0	0	0
4	0.00	0	0	0	0	0	0
5	0.00	0	0	0	0	0	0
6	0.00	0	0	0	0	0	0
7	2.75	2.75	0.387	57.6	0	0	0
8	0.34	0.344	0.0485	7.21	0	0	0
9	3.85	0	0	0	3.85	0.586	33.9
10	5.38	5.38	0.757	113	0	0	0
11	6.37	6.37	0.897	133	0	0	0
12	1.90	1.52	0.214	31.8	0	0	0
13	109.75	0	0	0	110	16.7	967
14	39.22	10.7	1.51	225	27.9	4.25	246
15	0.61	0.607	0.0855	12.7	0	0	0
16	1.25	0	0	0	0	0	0
17	0.14	0.138	0.0195	2.9	0	0	0
18	0.00	0	0	0	0	0	0
19	7.82	7.82	1.1	164	0	0	0
20	112.75	112	15.8	2340	0.53	0.0808	4.67
21	0.00	0	0	0	0	0	0
22	0.00	0	0	0	0	0	0
23	3.70	0.146	0.0206	3.06	3.1	0.473	27.3
24	2.92	2.91	0.41	61	0.00623	0.00095	0.0549
25	5.72	1.11	0.156	23.2	0	0	0
26	0.00	0	0	0	0	0	0
27	0.43	0.427	0.0601	8.94	0	0	0
28	226.19	0.369	0.052	7.73	226	34.4	1990
29	0.00	0	0	0	0	0	0
30	0.00	0	0	0	0	0	0
31	0.27	0.27	0.0381	5.66	0	0	0
32	819.36	139	19.5	2900	680	104	6000
33	0.00	0	0	0	0	0	0
34	0.00	0	0	0	0	0	0
35	0.00	0	0	0	0	0	0
36	0.00	0	0	0	0	0	0

Aa EDSU	Total NASC	Anchovy NASC	Anchovy biomass (t)	No. of individuals of anchovy	Sardine NASC	Sardine biomass (t)	No. of individuals of sardine
37	0.00	0	0	0	0	0	0
38	0.00	0	0	0	0	0	0
39	0.00	0	0	0	0	0	0
40	0.00	0	0	0	0	0	0
41	0.00	0	0	0	0	0	0
42	0.00	0	0	0	0	0	0
43	0.00	0	0	0	0	0	0
44	0.00	0	0	0	0	0	0
45	0.00	0	0	0	0	0	0
46	0.00	0	0	0	0	0	0
47	0.00	0	0	0	0	0	0
48	0.00	0	0	0	0	0	0
49	0.00	0	0	0	0	0	0
50	0.00	0	0	0	0	0	0
51	0.00	0	0	0	0	0	0
52	0.00	0	0	0	0	0	0
53	0.00	0	0	0	0	0	0
54	0.00	0	0	0	0	0	0
55	0.00	0	0	0	0	0	0
56	0.00	0	0	0	0	0	0
57	0.00	0	0	0	0	0	0
58	0.00	0	0	0	0	0	0
59	0.00	0	0	0	0	0	0
60	6.64	6.64	0.935	139	0	0	0
61	0.00	0	0	0	0	0	0
62	10.75	10.7	1.51	225	0	0	0
63	36.47	36.5	5.14	764	0	0	0
64	57.95	57.9	8.16	1210	0	0	0
65	0.00	0	0	0	0	0	0
66	0.52	0.515	0.0726	10.8	0	0	0
67	0.00	0	0	0	0	0	0
68	148.65	7.24	1.02	152	141	21.6	1250
69	1.19	1.18	0.167	24.8	0.00309	0.000471	0.0273
70	27.80	27.8	3.92	582	0	0	0
71	0.00	0	0	0	0	0	0
72	0.00	0	0	0	0	0	0
73	125.61	3.55	0.5	74.3	122	18.6	1080
74	3.82	3.82	0.538	80	0	0	0
75	1.74	1.74	0.245	36.4	0	0	0
76	61.48	2.26	0.318	47.4	59.2	9.03	522
77	0.00	0	0	0	0	0	0
78	0.00	0	0	0	0	0	0
79	2.52	2.52	0.355	52.8	0	0	0
80	0.72	0.719	0.101	15.1	0	0	0

Aa EDSU	Total NASC	Anchovy NASC	Anchovy biomass (t)	No. of individuals of anchovy	Sardine NASC	Sardine biomass (t)	No. of individuals of sardine
81	0.00	0	0	0	0	0	0
82	0.96	0.643	0.0905	13.5	0	0	0
83	0.75	0.747	0.105	15.7	0	0	0
84	8.76	0.493	0.0695	10.3	8.27	1.26	72.9
85	3.23	1.28	0.18	26.8	0	0	0
86	74.92	71.5	10.1	1500	0.17	0.0259	1.5
87	13.28	13.3	1.87	278	0	0	0
88	2.75	0.43	0.0605	9	2.32	0.354	20.4
89	5.21	5.21	0.734	109	0	0	0
90	0.00	0	0	0	0	0	0
91	0.45	0.446	0.0628	9.35	0	0	0
92	16.30	16.3	2.3	341	0	0	0
93	28.08	0	0	0	28.1	4.28	247
94	0.96	0.957	0.135	20	0	0	0
95	0.81	0.806	0.113	16.9	0	0	0
96	8.82	8.82	1.24	185	0	0	0
97	0.33	0.331	0.0467	6.94	0	0	0
98	0.00	0	0	0	0	0	0
99	1.49	1.49	0.21	31.3	0	0	0
100	0.00	0	0	0	0	0	0
101	0.34	0.344	0.0485	7.21	0	0	0
102	0.00	0	0	0	0	0	0
103	63.44	0	0	0	63.4	9.67	559
104	0.00	0	0	0	0	0	0
105	26.44	26.4	3.72	553	0.0355	0.00542	0.313
106	0.00	0	0	0	0	0	0
107	0.57	0.573	0.0807	12	0	0	0
108	51.06	50.8	7.16	1060	0.131	0.0199	1.15
109	82.50	28.4	4	595	54.1	8.25	477
110	39.49	35.6	5.01	745	3.92	0.598	34.6
111	5.25	5.25	0.739	110	0	0	0
112	138.65	130	18.3	2720	8.66	1.32	76.3
113	0.00	0	0	0	0	0	0
114	11.10	11.1	1.56	232	0	0	0
115	363.50	105	14.8	2190	259	39.5	2280
116	923.60	1.43	0.202	30.1	922	141	8130
117	203.32	16.7	2.34	349	187	28.5	1650
118	4.12	4.12	0.58	86.3	0	0	0
119	3.21	3.21	0.452	67.2	0	0	0
120	0.00	0	0	0	0	0	0
121	5.23	5.23	0.736	109	0	0	0
122	26.52	26.5	3.73	555	0	0	0
123	0.00	0	0	0	0	0	0
124	0.00	0	0	0	0	0	0

Aa EDSU	Total NASC	Anchovy NASC	Anchovy biomass (t)	No. of individuals of anchovy	Sardine NASC	Sardine biomass (t)	No. of individuals of sardine
125	192.10	192	27.1	4020	0	0	0
126	0.00	0	0	0	0	0	0
127	0.00	0	0	0	0	0	0
128	0.00	0	0	0	0	0	0
129	0.00	0	0	0	0	0	0
130	0.00	0	0	0	0	0	0
131	0.00	0	0	0	0	0	0
132	1.59	1.59	0.224	33.2	0	0	0
133	0.00	0	0	0	0	0	0
134	4.21	4.21	0.593	88.2	0	0	0
135	0.00	0	0	0	0	0	0
136	35.03	35	4.93	734	0	0	0
137	0.00	0	0	0	0	0	0
138	0.00	0	0	0	0	0	0
139	0.00	0	0	0	0	0	0
140	0.00	0	0	0	0	0	0
141	0.00	0	0	0	0	0	0
142	0.00	0	0	0	0	0	0
143	0.00	0	0	0	0	0	0
144	0.00	0	0	0	0	0	0
145	0.00	0	0	0	0	0	0
146	0.00	0	0	0	0	0	0
147	0.00	0	0	0	0	0	0
148	0.00	0	0	0	0	0	0
149	0.00	0	0	0	0	0	0
150	0.00	0	0	0	0	0	0
151	0.00	0	0	0	0	0	0
152	0.00	0	0	0	0	0	0
153	0.00	0	0	0	0	0	0
154	0.00	0	0	0	0	0	0
155	0.00	0	0	0	0	0	0
156	0.00	0	0	0	0	0	0
157	0.00	0	0	0	0	0	0
158	0.00	0	0	0	0	0	0
159	0.00	0	0	0	0	0	0
160	0.00	0	0	0	0	0	0
161	0.00	0	0	0	0	0	0
162	0.00	0	0	0	0	0	0
163	0.00	0	0	0	0	0	0
164	0.00	0	0	0	0	0	0
165	0.00	0	0	0	0	0	0
166	0.00	0	0	0	0	0	0
167	0.00	0	0	0	0	0	0
168	0.00	0	0	0	0	0	0

Aa EDSU	Total NASC	Anchovy NASC	Anchovy biomass (t)	No. of individuals of anchovy	Sardine NASC	Sardine biomass (t)	No. of individuals of sardine
169	0.00	0	0	0	0	0	0
170	0.00	0	0	0	0	0	0
171	10.40	10.4	1.47	218	0	0	0
172	34.20	0	0	0	34.2	5.21	301
173	0.00	0	0	0	0	0	0
174	0.00	0	0	0	0	0	0
175	61.60	61.6	8.67	1290	0.0164	0.0025	0.145
176	0.00	0	0	0	0	0	0
177	32.14	32.1	4.53	673	0	0	0
178	1.97	1.97	0.277	41.2	0	0	0
179	0.00	0	0	0	0	0	0
180	26.09	26.1	3.67	546	0	0	0
181	0.00	0	0	0	0	0	0
182	96.18	17.3	2.43	362	78.9	12	696
183	28.99	29	4.08	607	0	0	0
184	7.25	0	0	0	7.25	1.11	63.9
185	81.01	81	11.4	1700	0	0	0
186	37.30	37.3	5.25	781	0	0	0
187	30.06	30.1	4.23	630	0	0	0
188	0.00	0	0	0	0	0	0
189	0.00	0	0	0	0	0	0
190	0.00	0	0	0	0	0	0
191	0.00	0	0	0	0	0	0
192	0.00	0	0	0	0	0	0
193	71.39	3.45	0.486	72.2	66.7	10.2	587
194	63.45	0	0	0	0	0	0
195	11.54	0.301	0.0425	6.31	0	0	0
196	134.24	112	15.7	2340	13.9	2.11	122
197	30.85	11.4	1.61	239	0	0	0
198	23.46	19.5	2.75	409	0	0	0
199	32.92	32.9	4.64	689	0	0	0
200	70.73	70.7	9.96	1480	0	0	0
201	34.24	34.2	4.82	717	0	0	0
202	37.78	37.8	5.32	791	0	0	0
203	0.00	0	0	0	0	0	0
204	6.78	6.41	0.903	134	0	0	0
205	2.16	2.16	0.304	45.3	0	0	0
206	0.00	0	0	0	0	0	0
207	1.54	1.54	0.216	32.2	0	0	0
208	0.00	0	0	0	0	0	0
209	0.00	0	0	0	0	0	0
210	0.00	0	0	0	0	0	0
211	0.00	0	0	0	0	0	0
212	4.02	4.02	0.567	84.3	0	0	0

Aa EDSU	Total NASC	Anchovy NASC	Anchovy biomass (t)	No. of individuals of anchovy	Sardine NASC	Sardine biomass (t)	No. of individuals of sardine
213	4.70	4.7	0.662	98.4	0	0	0
214	272.97	235	33.1	4930	31.7	4.83	279
215	47.73	47.7	6.72	1000	0	0	0
216	288.24	288	40.6	6040	0	0	0
217	73.14	73.1	10.3	1530	0	0	0
218	2.01	2.01	0.284	42.2	0	0	0
219	4.50	4.5	0.634	94.3	0	0	0
220	45.95	6.45	0.908	135	39.1	5.96	345
221	0.14	0.138	0.0195	2.9	0	0	0
222	1.00	1	0.141	21	0	0	0
223	12.35	12.4	1.74	259	0	0	0
224	0.00	0	0	0	0	0	0
225	0.00	0	0	0	0	0	0
226	0.00	0	0	0	0	0	0
227	0.00	0	0	0	0	0	0
228	0.00	0	0	0	0	0	0
229	0.00	0	0	0	0	0	0
230	0.00	0	0	0	0	0	0
231	0.00	0	0	0	0	0	0
232	6.85	0	0	0	0	0	0
233	0.00	0	0	0	0	0	0
234	0.68	0	0	0	0	0	0
235	4.55	4.55	0.641	95.3	0	0	0
236	4.51	3.98	0.56	83.3	0	0	0
237	38.68	33.8	4.75	707	4.16	0.634	36.7
238	2.81	2.81	0.395	58.8	0	0	0
239	2.07	1.21	0.17	25.3	0	0	0
240	29.59	0	0	0	22.4	3.42	198
241	12.68	3.98	0.56	83.3	0	0	0
242	232.12	3.46	0.488	72.5	229	34.9	2020
243	474.10	28.7	4.04	601	445	67.9	3930
244	585.62	15	2.11	314	567	86.5	5000
245	297.44	250	35.3	5240	38.8	5.92	342
246	267.84	128	18	2670	19.8	3.01	174
247	54.40	0	0	0	0	0	0
248	1.31	1.26	0.177	26.3	0	0	0
249	95.78	81.5	11.5	1710	12.1	1.84	106
250	4.27	0.605	0.0853	12.7	0	0	0
251	21.57	0	0	0	21.6	3.29	190
252	23.01	10.8	1.52	226	0	0	0
253	9.40	4.89	0.689	102	0	0	0
254	8.10	4	0.564	83.8	0	0	0
255	0.00	0	0	0	0	0	0
256	0.22	0	0	0	0	0	0

Aa EDSU	Total NASC	Anchovy NASC	Anchovy biomass (t)	No. of individuals of anchovy	Sardine NASC	Sardine biomass (t)	No. of individuals of sardine
257	8.94	0	0	0	0	0	0
258	0.00	0	0	0	0	0	0
259	5.13	5.13	0.722	107	0	0	0
260	0.00	0	0	0	0	0	0
261	0.00	0	0	0	0	0	0
262	0.00	0	0	0	0	0	0
263	0.00	0	0	0	0	0	0
264	0.00	0	0	0	0	0	0
265	0.00	0	0	0	0	0	0
266	0.00	0	0	0	0	0	0
267	0.00	0	0	0	0	0	0
268	0.00	0	0	0	0	0	0
269	0.00	0	0	0	0	0	0
270	0.00	0	0	0	0	0	0
271	0.00	0	0	0	0	0	0
272	0.00	0	0	0	0	0	0
273	0.00	0	0	0	0	0	0
274	0.00	0	0	0	0	0	0
275	0.00	0	0	0	0	0	0
276	0.00	0	0	0	0	0	0
277	42.57	0	0	0	42.6	6.49	375
278	7.66	7.66	1.08	160	0	0	0
279	40.90	0	0	0	40.3	6.15	355
280	0.00	0	0	0	0	0	0
281	0.00	0	0	0	0	0	0
282	0.00	0	0	0	0	0	0
283	0.00	0	0	0	0	0	0
284	0.00	0	0	0	0	0	0
285	0.00	0	0	0	0	0	0
286	0.00	0	0	0	0	0	0
287	0.00	0	0	0	0	0	0
288	0.00	0	0	0	0	0	0
289	0.00	0	0	0	0	0	0
290	0.00	0	0	0	0	0	0
291	0.00	0	0	0	0	0	0
292	0.00	0	0	0	0	0	0
293	80.75	80.7	11.4	1690	0	0	0
294	12.18	12.2	1.72	255	0	0	0
295	32.90	32.9	4.63	689	0	0	0
296	1.10	1.1	0.154	23	0	0	0
297	2.03	2.03	0.286	42.5	0	0	0
298	28.75	19.5	2.75	409	0	0	0
299	23.31	23.3	3.28	488	0	0	0
300	0.00	0	0	0	0	0	0

Aa EDSU	Total NASC	Anchovy NASC	Anchovy biomass (t)	No. of individuals of anchovy	Sardine NASC	Sardine biomass (t)	No. of individuals of sardine
301	2.51	2.51	0.353	52.5	0	0	0
302	36.55	35.2	4.96	738	0	0	0
303	83.81	14.3	2.02	300	69.1	10.5	609
304	49.34	49.3	6.95	1030	0	0	0
305	185.20	106	14.9	2220	78.4	12	691
306	28.20	28.2	3.97	591	0	0	0
307	8.09	2.55	0.359	53.4	5.54	0.845	48.8
308	0.80	0.802	0.113	16.8	0	0	0
309	4.44	4.44	0.625	93	0	0	0
310	0.00	0	0	0	0	0	0
311	0.59	0.594	0.0837	12.4	0	0	0
312	2.21	2.21	0.311	46.3	0	0	0
313	1.78	1.78	0.251	37.3	0	0	0
314	0.00	0	0	0	0	0	0
315	0.00	0	0	0	0	0	0
316	0.00	0	0	0	0	0	0
317	0.00	0	0	0	0	0	0
318	0.00	0	0	0	0	0	0
319	0.00	0	0	0	0	0	0
320	0.00	0	0	0	0	0	0
321	0.00	0	0	0	0	0	0
322	0.00	0	0	0	0	0	0
323	0.00	0	0	0	0	0	0
324	0.00	0	0	0	0	0	0
325	0.00	0	0	0	0	0	0
326	0.00	0	0	0	0	0	0
327	0.00	0	0	0	0	0	0
328	0.00	0	0	0	0	0	0
329	0.00	0	0	0	0	0	0
330	38.23	38.2	5.38	801	0	0	0
331	0.00	0	0	0	0	0	0
332	0.00	0	0	0	0	0	0
333	65.09	65.1	9.17	1360	0	0	0
334	17.87	17.9	2.52	374	0	0	0
335	15.38	14.7	2.07	308	0	0	0
336	27.85	27.6	3.88	577	0.256	0.039	2.26
337	20.71	20.7	2.92	434	0	0	0
338	49.36	49.4	6.95	1030	0	0	0
339	13.01	13	1.83	273	0	0	0
340	0.00	0	0	0	0	0	0
341	0.00	0	0	0	0	0	0
342	0.00	0	0	0	0	0	0
343	0.00	0	0	0	0	0	0
344	0.00	0	0	0	0	0	0

Aa EDSU	Total NASC	Anchovy NASC	Anchovy biomass (t)	No. of individuals of anchovy	Sardine NASC	Sardine biomass (t)	No. of individuals of sardine
345	0.00	0	0	0	0	0	0
346	0.00	0	0	0	0	0	0
347	0.00	0	0	0	0	0	0
348	0.00	0	0	0	0	0	0
349	0.00	0	0	0	0	0	0
350	0.00	0	0	0	0	0	0
351	0.00	0	0	0	0	0	0
352	0.00	0	0	0	0	0	0
353	0.00	0	0	0	0	0	0
354	0.00	0	0	0	0	0	0
355	0.00	0	0	0	0	0	0
356	0.00	0	0	0	0	0	0
357	0.00	0	0	0	0	0	0
358	0.00	0	0	0	0	0	0
359	0.00	0	0	0	0	0	0
360	0.00	0	0	0	0	0	0
361	0.00	0	0	0	0	0	0
362	0.00	0	0	0	0	0	0
363	0.00	0	0	0	0	0	0
364	0.00	0	0	0	0	0	0
365	0.00	0	0	0	0	0	0
366	0.00	0	0	0	0	0	0
367	0.00	0	0	0	0	0	0
368	0.00	0	0	0	0	0	0
369	0.00	0	0	0	0	0	0
370	0.00	0	0	0	0	0	0
371	0.00	0	0	0	0	0	0
372	0.00	0	0	0	0	0	0
373	0.00	0	0	0	0	0	0
374	0.00	0	0	0	0	0	0
375	0.00	0	0	0	0	0	0
376	0.00	0	0	0	0	0	0
377	0.00	0	0	0	0	0	0
378	0.00	0	0	0	0	0	0
379	0.00	0	0	0	0	0	0
380	0.00	0	0	0	0	0	0
381	0.00	0	0	0	0	0	0
382	0.00	0	0	0	0	0	0
383	0.00	0	0	0	0	0	0
384	0.00	0	0	0	0	0	0
385	0.00	0	0	0	0	0	0
386	0.00	0	0	0	0	0	0
387	0.00	0	0	0	0	0	0
388	0.00	0	0	0	0	0	0

Aa EDSU	Total NASC	Anchovy NASC	Anchovy biomass (t)	No. of individuals of anchovy	Sardine NASC	Sardine biomass (t)	No. of individuals of sardine
389	0.00	0	0	0	0	0	0
390	0.00	0	0	0	0	0	0
391	0.00	0	0	0	0	0	0
392	26.76	24.3	2.87	853	0.298	0.048	2.86
393	3.95	3.95	0.466	138	0	0	0
394	0.00	0	0	0	0	0	0
395	0.00	0	0	0	0	0	0
396	0.00	0	0	0	0	0	0
397	0.00	0	0	0	0	0	0
398	0.00	0	0	0	0	0	0
399	0.00	0	0	0	0	0	0
400	0.00	0	0	0	0	0	0
401	0.00	0	0	0	0	0	0
402	0.00	0	0	0	0	0	0
403	0.00	0	0	0	0	0	0
404	0.00	0	0	0	0	0	0
405	0.00	0	0	0	0	0	0
406	0.00	0	0	0	0	0	0
407	8.66	8.66	1.02	303	0	0	0
408	33.31	15.8	1.86	553	0	0	0
409	0.11	0.111	0.0131	3.9	0	0	0
410	13.70	13.7	1.62	480	0	0	0
411	0.00	0	0	0	0	0	0
412	246.43	246	29.1	8640	0	0	0
413	135.68	0	0	0	136	21.9	1300
414	413.02	413	48.7	14500	0	0	0
415	202.18	202	23.8	7090	0	0	0
416	183.19	99.7	11.8	3490	83.5	13.5	801
417	19.47	19.5	2.3	682	0	0	0
418	74.18	74.2	8.75	2600	0	0	0
419	1.43	1.43	0.169	50.1	0	0	0
420	4.31	4.27	0.503	150	0	0	0
421	0.00	0	0	0	0	0	0
422	4.64	4.64	0.547	163	0	0	0
423	3.34	3.34	0.393	117	0	0	0
424	26.20	0.0846	0.00997	2.96	26.1	4.21	251
425	17.76	15.3	1.81	537	0.3	0.0484	2.88
426	378.25	14.5	1.71	509	364	58.7	3490
427	0.00	0	0	0	0	0	0
428	332.46	15.6	1.83	545	39.7	6.41	381
429	203.07	161	19	5650	41.9	6.76	402
430	20.24	0	0	0	20.2	3.27	194
431	13.26	13.3	1.56	465	0	0	0
432	21.98	22	2.59	770	0	0	0

Aa EDSU	Total NASC	Anchovy NASC	Anchovy biomass (t)	No. of individuals of anchovy	Sardine NASC	Sardine biomass (t)	No. of individuals of sardine
433	60.40	60.4	7.12	2120	0	0	0
434	162.63	163	19.2	5700	0	0	0
435	132.39	110	13	3870	21.9	3.54	210
436	7.13	5.86	0.691	205	1.27	0.205	12.2
437	136.11	136	16	4760	0.369	0.0596	3.54
438	38.25	38.2	4.51	1340	0	0	0
439	1.80	1.8	0.212	62.9	0	0	0
440	18.22	9.83	1.16	344	8.4	1.35	80.5
441	5.79	5.17	0.609	181	0	0	0
442	16.27	16.3	1.92	570	0	0	0
443	32.44	28.8	3.4	1010	0.134	0.0216	1.28
444	0.00	0	0	0	0	0	0
445	62.21	58.6	6.91	2050	0.442	0.0713	4.24
446	45.87	45.9	5.41	1610	0	0	0
447	47.73	47.7	5.63	1670	0	0	0
448	4.55	4.55	0.537	160	0	0	0
449	9.21	9.21	1.09	323	0	0	0
450	47.82	33.2	3.91	1160	0	0	0
451	7.48	7.48	0.882	262	0	0	0
452	1.06	1.06	0.125	37	0	0	0
453	234.29	234	27.6	8210	0	0	0
454	204.81	205	24.2	7180	0	0	0
455	154.81	136	16.1	4780	0	0	0
456	64.39	56.3	6.64	1970	0	0	0
457	7.04	7.04	0.83	247	0	0	0
458	0.00	0	0	0	0	0	0
459	12.67	12.7	1.49	444	0	0	0
460	16.40	11.7	1.38	409	0.0425	0.00685	0.407
461	23.08	23.1	2.72	809	0	0	0
462	32.73	32.5	3.83	1140	0.031	0.00501	0.298
463	38.91	34.6	4.08	1210	0.527	0.0851	5.06
464	15.24	15.2	1.8	534	0	0	0
465	24.02	22.1	2.61	776	1.89	0.304	18.1
466	639.76	14.3	1.69	501	145	23.4	1390
467	659.32	0	0	0	0	0	0
468	0.00	0	0	0	0	0	0
469	0.00	0	0	0	0	0	0
470	13.23	0	0	0	0	0	0
471	728.33	728	85.9	25500	0	0	0
472	23.31	23.3	2.75	817	0	0	0
473	62.29	61.2	7.21	2140	0	0	0
474	74.66	74.7	8.81	2620	0	0	0
475	37.83	6	0.708	210	0	0	0
476	399.32	241	28.5	8460	158	25.5	1510

Aa EDSU	Total NASC	Anchovy NASC	Anchovy biomass (t)	No. of individuals of anchovy	Sardine NASC	Sardine biomass (t)	No. of individuals of sardine
477	282.47	281	33.1	9840	0.217	0.0349	2.08
478	78.20	39.6	4.67	1390	0.0135	0.00217	0.129
479	9.84	2.8	0.33	98.2	0.983	0.159	9.43
480	144.31	13.7	1.62	481	57.5	9.28	552
481	85.83	0	0	0	12	1.93	115
482	278.57	37.4	4.41	1310	33.7	5.43	323
483	112.80	109	12.8	3810	0.497	0.0801	4.76
484	317.73	311	36.7	10900	0.784	0.126	7.52
485	424.61	131	15.5	4590	292	47.1	2800
486	13.95	13.3	1.57	467	0.0772	0.0125	0.74
487	19.09	18.9	2.23	662	0.0229	0.0037	0.22
488	351.74	86.6	10.2	3040	0.354	0.057	3.39
489	206.47	206	24.3	7210	0.0946	0.0153	0.907
490	404.95	351	41.4	12300	6.6	1.07	63.3
491	977.67	843	99.4	29600	16.5	2.67	158
492	997.34	860	101	30100	16.9	2.72	162
493	957.54	768	90.6	26900	15	2.43	144
494	451.03	389	45.9	13600	7.62	1.23	73.1
495	358.71	281	33.1	9830	5.5	0.887	52.7
496	61.40	42.6	5.02	1490	16.5	2.66	158
497	270.85	207	24.4	7240	39.1	6.31	375
498	150.24	37.7	4.44	1320	0.691	0.111	6.63
499	488.94	437	51.6	15300	6.35	1.02	60.9
500	590.09	514	60.6	18000	9.4	1.52	90.2
501	228.57	201	23.7	7050	3.36	0.542	32.2
502	252.73	0.259	0.0306	9.08	0	0	0
503	17.78	17.8	2.1	623	0	0	0
504	29.35	25.3	2.98	887	4.05	0.654	38.9
505	38.03	32.8	3.87	1150	0.643	0.104	6.17
506	746.61	644	75.9	22600	12.6	2.03	121
507	344.75	297	35.1	10400	5.83	0.94	55.9
508	460.10	13.6	1.6	475	0	0	0
509	41.89	7.73	0.912	271	0	0	0
510	2029.09	1050	124	36800	55.8	9	535
511	10.72	10.7	1.26	376	0	0	0
512	282.49	148	17.5	5200	7.65	1.23	73.3
513	1333.99	697	82.2	24400	36.3	5.85	348
514	38.74	9.45	1.11	331	0.218	0.0352	2.09
515	322.45	179	21.1	6260	8.18	1.32	78.5
516	142.22	76.8	9.06	2690	3.72	0.601	35.7
517	1.74	1.74	0.205	60.9	0	0	0
518	62.64	32.4	3.82	1140	1.72	0.278	16.5
519	13.39	1.24	0.146	43.3	0.196	0.0317	1.88
520	54.42	10.3	1.21	361	5.16	0.833	49.5

Aa EDSU	Total NASC	Anchovy NASC	Anchovy biomass (t)	No. of individuals of anchovy	Sardine NASC	Sardine biomass (t)	No. of individuals of sardine
521	102.15	0	0	0	0	0	0
522	9.65	5	0.59	175	0.0822	0.0133	0.788
523	146.19	74	8.73	2600	3.94	0.635	37.8
524	62.19	32.2	3.79	1130	1.71	0.276	16.4
525	3.77	1.95	0.23	68.3	0.104	0.0167	0.994
526	0.00	0	0	0	0	0	0
527	0.00	0	0	0	0	0	0
528	263.39	136	16.1	4770	7.24	1.17	69.5
529	46.72	24.2	2.85	847	1.28	0.207	12.3
530	0.00	0	0	0	0	0	0
531	0.00	0	0	0	0	0	0
532	179.10	92.6	10.9	3250	4.93	0.795	47.2
533	175.97	88.2	10.4	3090	4.69	0.757	45
534	526.42	253	29.8	8870	12.9	2.07	123
535	874.80	168	19.8	5880	560	90.3	5370
536	65.87	34.5	4.07	1210	1.74	0.281	16.7
537	40.62	21	2.48	736	1.12	0.18	10.7
538	117.38	58.7	6.92	2060	2.96	0.478	28.4
539	78.75	40.1	4.73	1400	2.06	0.332	19.7
540	595.52	129	15.3	4540	357	57.7	3430
541	213.22	110	13	3860	5.86	0.946	56.2
542	520.93	38.7	4.56	1360	482	77.8	4630
543	374.65	155	18.3	5440	219	35.4	2100
544	15.68	8.11	0.956	284	0.431	0.0695	4.13
545	0.00	0	0	0	0	0	0
546	0.00	0	0	0	0	0	0
547	0.00	0	0	0	0	0	0
548	0.00	0	0	0	0	0	0
549	0.00	0	0	0	0	0	0
550	0.00	0	0	0	0	0	0
551	0.00	0	0	0	0	0	0
552	0.00	0	0	0	0	0	0
553	0.00	0	0	0	0	0	0
554	0.00	0	0	0	0	0	0
555	0.00	0	0	0	0	0	0
556	58.87	30.4	3.59	1070	1.62	0.261	15.5
557	12.65	12.7	1.49	444	0	0	0
558	115.02	66.1	7.8	2320	2.78	0.449	26.7
559	35.47	19.7	2.33	692	0.751	0.121	7.2
560	233.74	61.1	7.21	2140	7.86	1.27	75.4
561	1.68	0.47	0.0554	16.5	0	0	0
562	15.27	15.3	1.8	535	0	0	0
563	87.37	15	1.77	526	3.32	0.536	31.8
564	0.00	0	0	0	0	0	0

Aa EDSU	Total NASC	Anchovy NASC	Anchovy biomass (t)	No. of individuals of anchovy	Sardine NASC	Sardine biomass (t)	No. of individuals of sardine
565	0.00	0	0	0	0	0	0
566	0.00	0	0	0	0	0	0
567	0.00	0	0	0	0	0	0
568	0.00	0	0	0	0	0	0
569	0.00	0	0	0	0	0	0
570	0.40	0.4	0.0471	14	0	0	0
571	28.71	28.7	3.39	1010	0	0	0
572	5.12	0.88	0.104	30.8	0.195	0.0314	1.87
573	0.22	0.216	0.0255	7.56	0	0	0
574	69.92	26.9	3.17	942	1.98	0.319	19
575	99.64	0.659	0.0777	23.1	0.0192	0.00309	0.184
576	12.36	7.2	0.85	253	0.236	0.0382	2.27
577	57.48	10.1	1.19	353	2.17	0.351	20.9
578	120.47	20.7	2.44	726	4.58	0.739	43.9
579	24.55	6.55	0.773	230	0.826	0.133	7.92
580	0.00	0	0	0	0	0	0
581	388.20	63.5	7.49	2230	45	7.26	432
582	102.15	24.3	2.87	852	3.57	0.576	34.3
583	38.54	11.2	1.32	393	1.25	0.202	12
584	28.92	6.14	0.724	215	1.05	0.169	10
585	268.00	55.4	6.54	1940	9.75	1.57	93.6
586	444.03	76.3	9	2680	16.9	2.72	162
587	244.50	45.7	5.38	1600	9.12	1.47	87.5
588	37.63	13.8	1.62	482	1.1	0.177	10.5
589	33.42	10.8	1.27	378	1.04	0.168	9.96
590	111.49	29.3	3.46	1030	3.77	0.608	36.2
591	9.37	6.73	0.793	236	0.121	0.0196	1.16
592	5.37	5.37	0.633	188	0	0	0
593	0.00	0	0	0	0	0	0
594	0.00	0	0	0	0	0	0
595	0.00	0	0	0	0	0	0
596	133.77	134	20.6	3220	0	0	0
597	11.49	11.5	1.77	277	0	0	0
598	55.35	55.4	8.53	1330	0	0	0
599	25.62	25.6	3.95	617	0	0	0
600	515.95	3.96	0.61	95.2	512	82.4	4800
601	11.10	11.1	1.71	267	0	0	0
602	20.17	20.2	3.11	485	0	0	0
603	344.50	26.7	4.12	643	318	51.1	2980
604	27.33	8.24	1.27	198	19.1	3.07	179
605	70.18	70.2	10.8	1690	0	0	0
606	3.76	3.76	0.58	90.6	0	0	0
607	9.67	9.67	1.49	233	0	0	0
608	6.06	6.06	0.934	146	0	0	0

Aa EDSU	Total NASC	Anchovy NASC	Anchovy biomass (t)	No. of individuals of anchovy	Sardine NASC	Sardine biomass (t)	No. of individuals of sardine
609	50.09	10.3	1.59	248	39.8	6.4	373
610	0.00	0	0	0	0	0	0
611	77.68	0	0	0	77.7	12.5	728
612	0.00	0	0	0	0	0	0
613	0.00	0	0	0	0	0	0
614	0.00	0	0	0	0	0	0
615	0.00	0	0	0	0	0	0
616	0.00	0	0	0	0	0	0
617	0.00	0	0	0	0	0	0
618	0.00	0	0	0	0	0	0
619	0.00	0	0	0	0	0	0
620	0.00	0	0	0	0	0	0
621	0.00	0	0	0	0	0	0
622	0.00	0	0	0	0	0	0
623	5.26	5.26	0.811	127	0	0	0
624	0.00	0	0	0	0	0	0
625	0.00	0	0	0	0	0	0
626	0.00	0	0	0	0	0	0
627	0.00	0	0	0	0	0	0
628	0.00	0	0	0	0	0	0
629	0.00	0	0	0	0	0	0
630	0.00	0	0	0	0	0	0
631	0.00	0	0	0	0	0	0
632	0.00	0	0	0	0	0	0
633	0.00	0	0	0	0	0	0
634	0.00	0	0	0	0	0	0
635	0.00	0	0	0	0	0	0
636	0.00	0	0	0	0	0	0
637	0.00	0	0	0	0	0	0
638	0.00	0	0	0	0	0	0
639	0.00	0	0	0	0	0	0
640	0.00	0	0	0	0	0	0
641	0.00	0	0	0	0	0	0
642	0.00	0	0	0	0	0	0
643	715.32	695	107	16700	20.5	3.3	193
644	75.42	75.4	11.6	1810	0	0	0
645	0.00	0	0	0	0	0	0
646	29.60	29.6	4.56	712	0	0	0
647	160.99	1.69	0.26	40.6	159	25.6	1490
648	0.00	0	0	0	0	0	0
649	14.50	14.5	2.23	349	0	0	0
650	0.00	0	0	0	0	0	0
651	24.84	24.8	3.83	598	0	0	0
652	0.00	0	0	0	0	0	0

Aa EDSU	Total NASC	Anchovy NASC	Anchovy biomass (t)	No. of individuals of anchovy	Sardine NASC	Sardine biomass (t)	No. of individuals of sardine
653	0.00	0	0	0	0	0	0
654	12.19	12.2	1.88	293	0	0	0
655	115.83	0	0	0	116	18.6	1090
656	522.11	37.5	5.78	902	485	78	4540
657	290.45	19.4	2.99	468	271	43.6	2540
658	1.85	1.85	0.285	44.5	0	0	0
659	131.21	0	0	0	131	21.1	1230
660	32.87	0	0	0	32.9	5.29	308
661	0.00	0	0	0	0	0	0
662	0.58	0.583	0.0899	14	0	0	0
663	363.14	0	0	0	363	58.4	3400
664	0.92	0.923	0.142	22.2	0	0	0
665	13.89	13.9	2.14	334	0	0	0
666	3.25	3.25	0.501	78.2	0	0	0
667	217.07	217	33.5	5220	0	0	0
668	0.00	0	0	0	0	0	0
669	14.87	4.27	0.658	103	10.6	1.71	99.4
670	0.00	0	0	0	0	0	0
671	0.00	0	0	0	0	0	0
672	0.00	0	0	0	0	0	0
673	5.37	5.37	0.828	129	0	0	0
674	0.00	0	0	0	0	0	0
675	0.46	0.459	0.0707	11	0	0	0
676	1.47	1.47	0.226	35.3	0	0	0
677	7.08	7.08	1.09	170	0	0	0
678	8.35	8.35	1.29	201	0	0	0
679	0.00	0	0	0	0	0	0
680	0.00	0	0	0	0	0	0
681	0.00	0	0	0	0	0	0
682	0.00	0	0	0	0	0	0
683	0.00	0	0	0	0	0	0
684	0.00	0	0	0	0	0	0
685	0.00	0	0	0	0	0	0
686	0.00	0	0	0	0	0	0
687	0.00	0	0	0	0	0	0
688	0.00	0	0	0	0	0	0
689	2.14	2.14	0.33	51.5	0	0	0
690	0.00	0	0	0	0	0	0
691	0.00	0	0	0	0	0	0
692	235.42	235	36.3	5670	0	0	0
693	27.33	27.3	4.21	658	0	0	0
694	22.91	22.9	3.53	551	0	0	0
695	46.07	0	0	0	46.1	7.41	432
696	74.52	5.21	0.804	125	69.3	11.2	650

Aa EDSU	Total NASC	Anchovy NASC	Anchovy biomass (t)	No. of individuals of anchovy	Sardine NASC	Sardine biomass (t)	No. of individuals of sardine
697	42.39	26.5	4.08	638	15.9	2.56	149
698	78.94	78.9	12.2	1900	0	0	0
699	264.31	40	6.17	963	224	36.1	2100
700	130.35	35.2	5.43	848	95.1	15.3	892
701	133.43	133	20.6	3210	0	0	0
702	150.62	151	23.2	3620	0	0	0
703	7.07	7.07	1.09	170	0	0	0
704	0.00	0	0	0	0	0	0
705	6.12	6.12	0.944	147	0	0	0
706	146.35	0	0	0	146	23.6	1370
707	23.00	23	3.54	553	0	0	0
708	0.96	0.964	0.149	23.2	0	0	0
709	40.82	40.8	6.29	982	0	0	0
710	0.00	0	0	0	0	0	0
711	0.00	0	0	0	0	0	0
712	0.00	0	0	0	0	0	0
713	0.00	0	0	0	0	0	0
714	0.00	0	0	0	0	0	0
715	0.00	0	0	0	0	0	0
716	52.45	49.8	7.68	1200	2.6	0.418	24.4
717	290.94	32	4.93	769	259	41.7	2430
718	207.40	0.406	0.0626	9.78	207	33.3	1940
719	1239.15	430	66.3	10400	809	130	7580
720	0.00	0	0	0	0	0	0
721	1.63	1.63	0.251	39.1	0	0	0
722	1484.66	94.9	14.6	2280	1390	224	13000
723	0.00	0	0	0	0	0	0
724	303.11	303	46.7	7290	0	0	0
725	0.00	0	0	0	0	0	0
726	0.00	0	0	0	0	0	0
727	1.09	1.09	0.168	26.2	0	0	0
728	400.57	0	0	0	401	64.5	3760
729	0.61	0.607	0.0935	14.6	0	0	0
730	135.57	136	20.9	3260	0	0	0
731	348.56	349	53.7	8390	0	0	0
732	124.62	0	0	0	0	0	0
733	0.21	0.206	0.0318	4.97	0	0	0
734	183.27	183	28.2	4410	0	0	0
735	459.87	11.6	1.78	279	448	72.1	4200
736	228.37	228	35.2	5500	0	0	0
737	193.02	193	29.7	4640	0.0298	0.0048	0.28
738	239.04	0	0	0	239	38.5	2240
739	5.12	5.09	0.785	123	0.0327	0.00526	0.306
740	61.70	3.38	0.521	81.4	58.3	9.38	547

Aa EDSU	Total NASC	Anchovy NASC	Anchovy biomass (t)	No. of individuals of anchovy	Sardine NASC	Sardine biomass (t)	No. of individuals of sardine
741	0.87	0.872	0.134	21	0	0	0
742	0.00	0	0	0	0	0	0
743	0.00	0	0	0	0	0	0
744	0.00	0	0	0	0	0	0
745	20.98	21	3.23	505	0	0	0
746	302.43	302	46.6	7280	0	0	0
747	2.09	2.09	0.322	50.2	0	0	0
748	0.00	0	0	0	0	0	0
749	25.89	20	3.08	480	0	0	0
750	409.37	122	18.7	2930	288	46.3	2700
751	78.09	0.404	0.0623	9.73	77.7	12.5	728
752	31.88	24.7	3.8	594	7.2	1.16	67.5
753	0.13	0.135	0.0207	3.24	0	0	0
754	33.95	5.64	0.87	136	28.3	4.55	265
755	0.04	0.0367	0.00566	0.884	0	0	0
756	0.00	0	0	0	0	0	0
757	0.00	0	0	0	0	0	0
758	0.00	0	0	0	0	0	0
759	256.82	241	37.1	5790	11.6	1.87	109
760	933.55	887	137	21400	43.5	7	408
761	347.88	5	0.77	120	255	41.1	2390
762	300.08	3.12	0.481	75.1	297	47.8	2780
763	9.73	1.16	0.179	28	8.56	1.38	80.3
764	709.83	3.77	0.581	90.7	706	114	6620
765	4.10	3.9	0.601	93.9	0.204	0.0329	1.91
766	0.38	0.38	0.0585	9.13	0	0	0
767	0.94	0.61	0.094	14.7	0.332	0.0534	3.11
768	0.00	0	0	0	0	0	0
769	0.22	0.216	0.0334	5.21	0	0	0
770	0.79	0.79	0.122	19	0	0	0
771	60.13	0	0	0	60.1	9.68	564
772	6.36	6.36	0.98	153	0	0	0
773	45.01	0.228	0.0352	5.5	44.8	7.21	420
774	64.37	63.9	9.85	1540	0.445	0.0715	4.17
775	124.63	46.9	7.22	1130	77.7	12.5	729
776	506.81	5.25	0.809	126	502	80.7	4700
777	149.03	17.5	2.69	421	132	21.2	1230
778	80.96	80.6	12.4	1940	0	0	0
779	0.00	0	0	0	0	0	0
780	0.00	0	0	0	0	0	0
781	0.00	0	0	0	0	0	0
782	0.00	0	0	0	0	0	0
783	0.00	0	0	0	0	0	0
784	0.00	0	0	0	0	0	0

Aa EDSU	Total NASC	Anchovy NASC	Anchovy biomass (t)	No. of individuals of anchovy	Sardine NASC	Sardine biomass (t)	No. of individuals of sardine
785	0.00	0	0	0	0	0	0
786	0.00	0	0	0	0	0	0
787	48.84	48.8	7.53	1180	0	0	0
788	0.00	0	0	0	0	0	0
789	0.00	0	0	0	0	0	0
790	0.00	0	0	0	0	0	0
791	0.00	0	0	0	0	0	0
792	0.00	0	0	0	0	0	0
793	0.00	0	0	0	0	0	0
794	0.00	0	0	0	0	0	0
795	0.00	0	0	0	0	0	0
796	0.00	0	0	0	0	0	0
797	0.00	0	0	0	0	0	0
798	0.00	0	0	0	0	0	0
799	105.93	106	18.6	2330	0	0	0
800	0.00	0	0	0	0	0	0
801	0.00	0	0	0	0	0	0
802	0.00	0	0	0	0	0	0
803	0.00	0	0	0	0	0	0
804	0.00	0	0	0	0	0	0
805	0.00	0	0	0	0	0	0
806	2.61	2.61	0.458	57.4	0	0	0
807	537.90	289	50.7	6350	249	32.1	2770
808	865.35	865	152	19000	0	0	0
809	43.58	43.6	7.65	958	0	0	0
810	0.00	0	0	0	0	0	0
811	0.36	0.359	0.063	7.89	0	0	0
812	0.00	0	0	0	0	0	0
813	3.82	3.82	0.671	84	0	0	0
814	0.00	0	0	0	0	0	0
815	1.72	1.63	0.285	35.7	0	0	0
816	3.06	3.06	0.536	67.2	0	0	0
817	0.00	0	0	0	0	0	0
818	0.00	0	0	0	0	0	0
819	0.99	0	0	0	0	0	0
820	0.00	0	0	0	0	0	0
821	0.66	0.657	0.115	14.4	0	0	0
822	1.50	1.5	0.264	33	0	0	0
823	0.00	0	0	0	0	0	0
824	3.71	3.71	0.65	81.4	0	0	0
825	3.45	0	0	0	0	0	0
826	0.00	0	0	0	0	0	0
827	0.00	0	0	0	0	0	0
828	0.00	0	0	0	0	0	0

Aa EDSU	Total NASC	Anchovy NASC	Anchovy biomass (t)	No. of individuals of anchovy	Sardine NASC	Sardine biomass (t)	No. of individuals of sardine
829	0.00	0	0	0	0	0	0
830	0.00	0	0	0	0	0	0
831	0.00	0	0	0	0	0	0
832	0.00	0	0	0	0	0	0
833	0.00	0	0	0	0	0	0
834	0.00	0	0	0	0	0	0
835	0.00	0	0	0	0	0	0
836	0.00	0	0	0	0	0	0
837	0.00	0	0	0	0	0	0
838	0.00	0	0	0	0	0	0
839	0.00	0	0	0	0	0	0
840	0.00	0	0	0	0	0	0
841	0.00	0	0	0	0	0	0
842	0.00	0	0	0	0	0	0
843	0.00	0	0	0	0	0	0
844	0.00	0	0	0	0	0	0
845	4.01	1.97	0.346	43.3	0	0	0
846	0.30	0.299	0.0525	6.58	0	0	0
847	7.27	7.27	1.28	160	0	0	0
848	5.83	4.51	0.791	99.1	0	0	0
849	38.95	38.9	6.83	856	0	0	0
850	37.54	37.5	6.59	825	0	0	0
851	0.00	0	0	0	0	0	0
852	21.21	8.46	1.49	186	9.56	1.23	107
853	35.34	33.1	5.8	727	2.28	0.293	25.4
854	30.10	28.3	4.96	621	0	0	0
855	425.42	0	0	0	425	54.8	4740
856	15.93	11.1	1.95	245	4.79	0.617	53.4
857	188.34	188	33	4130	0	0	0
858	105.35	3.4	0.596	74.6	0	0	0
859	183.89	2.15	0.378	47.3	150	19.3	1670
860	89.17	1.57	0.276	34.5	0	0	0
861	26.62	5.58	0.98	123	0	0	0
862	0.64	0.642	0.113	14.1	0	0	0
863	3.05	3.05	0.535	67	0	0	0
864	246.78	246	43.2	5410	0	0	0
865	7.73	6.86	1.2	151	0	0	0
866	29.76	20.2	3.54	443	0	0	0
867	0.00	0	0	0	0	0	0
868	0.00	0	0	0	0	0	0
869	74.25	0	0	0	74.3	9.57	828
870	0.00	0	0	0	0	0	0
871	289.40	2.73	0.478	59.9	287	36.9	3190
872	8.48	2.92	0.513	64.3	5.55	0.715	61.9

Aa EDSU	Total NASC	Anchovy NASC	Anchovy biomass (t)	No. of individuals of anchovy	Sardine NASC	Sardine biomass (t)	No. of individuals of sardine
873	12.48	12.5	2.19	274	0	0	0
874	91.74	17.2	3.02	378	74.5	9.6	831
875	40.76	40.8	7.15	896	0	0	0
876	7.36	7.36	1.29	162	0	0	0
877	59.87	59.9	10.5	1320	0	0	0
878	0.00	0	0	0	0	0	0
879	0.00	0	0	0	0	0	0
880	10.93	10.7	1.87	234	0.281	0.0361	3.13
881	11.61	4.26	0.748	93.6	7.35	0.947	81.9
882	21.84	3.87	0.679	85.1	0	0	0
883	0.00	0	0	0	0	0	0
884	0.00	0	0	0	0	0	0
885	2.19	2.19	0.384	48.1	0	0	0
886	5.17	5.17	0.908	114	0	0	0
887	2.76	2.76	0.483	60.5	0	0	0
888	0.00	0	0	0	0	0	0
889	0.00	0	0	0	0	0	0
890	12.05	0	0	0	12.1	1.55	134
891	5.35	0	0	0	5.35	0.689	59.6
892	28.83	0	0	0	28.8	3.72	321
893	0.00	0	0	0	0	0	0
894	0.00	0	0	0	0	0	0
895	1.47	1.47	0.258	32.3	0	0	0
896	16.56	16.6	2.91	364	0	0	0
897	10.49	0	0	0	0	0	0
898	243.77	24.9	4.37	547	219	28.2	2440
899	0.00	0	0	0	0	0	0
900	1.07	1.07	0.188	23.5	0	0	0
901	299.63	49.1	8.62	1080	184	23.8	2050
902	65.12	41.6	7.3	914	23.5	3.03	262
903	25.62	25.6	4.49	563	0	0	0
904	35.24	34.2	6	752	0	0	0
905	23.81	3.26	0.573	71.7	19.2	2.47	213
906	104.75	105	18.4	2300	0	0	0
907	0.50	0.504	0.0885	11.1	0	0	0
908	0.89	0.889	0.156	19.5	0	0	0
909	0.00	0	0	0	0	0	0
910	56.81	5.48	0.962	120	0	0	0

Table 2. Ionian Sea: Total fish NASC (Nautical Area Scattering Coefficient, in m^2/nm^2) per EDSU (Elementary Distance Sampling Unit), and also NASC, biomass, and abundance of anchovy and sardine (target species) per EDSU.

Aa EDSU	Total NASC	Anchovy NASC	Anchovy biomass (t)	No. of individuals of anchovy	Sardine NASC	Sardine biomass (t)	No. of individuals of sardine
1	724.61	282	40	8690	375	47.9	3800
2	1308.63	509	72.3	15700	678	86.6	6860
3	839.22	326	46.4	10100	435	55.5	4400
4	3241.37	1260	179	38900	1680	214	17000
5	1226.20	477	67.7	14700	635	81.1	6430
6	1772.16	689	97.9	21200	918	117	9300
7	1250.13	486	69	15000	648	82.7	6560
8	845.05	328	46.7	10100	438	55.9	4430
9	4426.22	1720	244	53100	2290	293	23200
10	1336.13	519	73.8	16000	692	88.4	7010
11	571.90	222	31.6	6860	296	37.8	3000
12	52.65	20.5	2.91	631	27.3	3.48	276
13	396.95	154	21.9	4760	206	26.3	2080
14	829.42	322	45.8	9940	430	54.9	4350
15	502.76	195	27.8	6030	260	33.3	2640
16	119.14	46.3	6.58	1430	61.7	7.88	625
17	230.46	89.6	12.7	2760	119	15.2	1210
18	228.01	88.6	12.6	2730	118	15.1	1200
19	0.00	0	0	0	0	0	0
20	24.99	6.33	0.866	169	12.7	1.37	172
21	187.15	60	8.2	1600	37.2	4.02	503
22	182.31	58.8	8.03	1570	18.1	1.95	244
23	93.41	32.2	4.4	858	9.91	1.07	134
24	88.99	30.7	4.19	817	9.44	1.02	128
25	115.92	39.9	5.46	1060	12.3	1.33	166
26	95.12	32.8	4.48	874	10.1	1.09	136
27	11.78	4.06	0.555	108	1.25	0.135	16.9
28	0.00	0	0	0	0	0	0
29	4.15	2.48	0.34	66.2	0	0	0
30	13.32	9.75	1.33	260	0.578	0.0624	7.81
31	81.23	81.2	11.1	2170	0.000947	0.000102	0.0128
32	1.67	1.67	0.229	44.6	0	0	0
33	82.95	39.7	5.43	1060	7	0.755	94.5
34	337.38	117	16	3120	35.7	3.85	482
35	79.99	12.4	1.7	331	63.2	6.82	853
36	0.00	0	0	0	0	0	0
37	7.68	7.68	1.05	205	0	0	0
38	8.22	7.73	1.06	206	0.49	0.0529	6.61
39	70.29	24.6	3.37	657	7.39	0.798	99.8
40	114.91	30.7	4.2	820	84.2	9.09	1140
41	3.82	3.82	0.523	102	0	0	0
42	9.63	0	0	0	9.63	1.04	130
43	3.73	1.14	0.155	30.3	2.59	0.28	35
44	16.53	16.5	2.26	441	0	0	0

Aa EDSU	Total NASC	Anchovy NASC	Anchovy biomass (t)	No. of individuals of anchovy	Sardine NASC	Sardine biomass (t)	No. of individuals of sardine
45	59.70	28.8	3.93	767	30.9	3.34	418
46	103.72	13.8	1.88	367	83.3	8.99	1130
47	61.93	0.888	0.121	23.7	61	6.59	825
48	15.85	15.8	2.17	422	0	0	0
49	11.01	11	1.51	294	0	0	0
50	75.63	27.1	3.71	724	14.2	1.54	192
51	23.79	9.14	1.25	244	12.3	1.33	166
52	178.16	11.2	1.53	298	163	17.6	2200
53	104.50	6.2	0.848	165	98.3	10.6	1330
54	67.88	54.4	7.43	1450	13.5	1.46	183
55	11.74	11.7	1.61	313	0	0	0
56	83.44	1.98	0.271	52.8	81.5	8.79	1100
57	94.40	10.5	1.44	281	83.9	9.05	1130
58	8.86	8.86	1.21	236	0	0	0
59	26.78	0.797	0.109	21.3	0	0	0
60	808.96	0	0	0	0	0	0
61	28.07	2.26	0.31	60.4	22.6	2.44	305
62	80.45	55.7	7.61	1480	4.01	0.433	54.2
63	71.86	30.9	4.22	823	41	4.42	554
64	14.26	14.3	1.95	380	0	0	0
65	25.93	25.9	3.54	691	0	0	0
66	50.88	17.1	2.34	457	28.4	3.06	383
67	81.27	47.9	6.55	1280	0	0	0
68	50.45	49.8	6.8	1330	0	0	0
69	432.19	45.8	6.26	1220	382	41.2	5150
70	68.63	17.8	2.44	476	49.5	5.34	668
71	6.72	2.54	0.347	67.7	0.676	0.073	9.13
72	348.95	18.1	2.48	483	306	33.1	4140
73	386.36	133	18.2	3550	41	4.42	554
74	176.60	32.7	4.48	873	104	11.2	1400
75	19.88	19.9	2.72	530	0	0	0
76	7.52	4.76	0.65	127	0.387	0.0418	5.23
77	2.59	2.59	0.355	69.2	0	0	0
78	0.55	0.555	0.0758	14.8	0	0	0
79	0.93	0.157	0.0215	4.2	0	0	0
80	253.93	12.4	1.7	331	221	23.9	2990
81	0.00	0	0	0	0	0	0
82	0.00	0	0	0	0	0	0
83	0.00	0	0	0	0	0	0
84	0.00	0	0	0	0	0	0
85	0.00	0	0	0	0	0	0
86	33.20	15	2.45	366	2.17	0.333	18.4
87	0.00	0	0	0	0	0	0
88	0.00	0	0	0	0	0	0

Aa EDSU	Total NASC	Anchovy NASC	Anchovy biomass (t)	No. of individuals of anchovy	Sardine NASC	Sardine biomass (t)	No. of individuals of sardine
89	0.00	0	0	0	0	0	0
90	0.00	0	0	0	0	0	0
91	0.00	0	0	0	0	0	0
92	0.00	0	0	0	0	0	0
93	0.00	0	0	0	0	0	0
94	0.00	0	0	0	0	0	0
95	54.12	41.8	6.8	1020	2	0.306	17
96	59.51	38.1	6.2	927	0	0	0
97	6.47	0	0	0	0	0	0
98	0.00	0	0	0	0	0	0
99	0.00	0	0	0	0	0	0
100	0.00	0	0	0	0	0	0
101	1.47	1.47	0.24	35.9	0	0	0
102	27.70	21.9	3.56	533	5.84	0.894	49.5
103	3.10	3.1	0.504	75.5	0	0	0
104	6.45	6.45	1.05	157	0	0	0
105	36.32	36.3	5.91	885	0	0	0
106	29.30	29.3	4.77	714	0	0	0
107	20.66	20.7	3.36	503	0	0	0
108	438.55	71.3	11.6	1740	367	56.2	3110
109	12.30	11.6	1.88	282	0	0	0
110	6.44	6.44	1.05	157	0	0	0
111	30.56	20.1	3.28	490	10.4	1.6	88.5
112	233.38	34.1	5.54	830	151	23.2	1280
113	51.03	3.37	0.549	82.2	45.3	6.93	384
114	1.07	0.368	0.06	8.97	0.113	0.0174	0.962
115	0.00	0	0	0	0	0	0
116	0.00	0	0	0	0	0	0
117	0.00	0	0	0	0	0	0
118	0.00	0	0	0	0	0	0
119	0.00	0	0	0	0	0	0
120	0.00	0	0	0	0	0	0
121	0.00	0	0	0	0	0	0
122	0.00	0	0	0	0	0	0
123	0.00	0	0	0	0	0	0
124	0.00	0	0	0	0	0	0
125	0.00	0	0	0	0	0	0
126	0.00	0	0	0	0	0	0
127	1.42	1.42	0.256	26.1	0	0	0
128	0.00	0	0	0	0	0	0
129	0.00	0	0	0	0	0	0
130	0.00	0	0	0	0	0	0
131	0.00	0	0	0	0	0	0
132	0.00	0	0	0	0	0	0

Aa EDSU	Total NASC	Anchovy NASC	Anchovy biomass (t)	No. of individuals of anchovy	Sardine NASC	Sardine biomass (t)	No. of individuals of sardine
133	18.18	8.91	1.61	164	0	0	0
134	0.00	0	0	0	0	0	0
135	0.00	0	0	0	0	0	0
136	3.30	2.42	0.436	44.5	0	0	0
137	16.76	4.78	0.861	87.8	12	1.21	106
138	84.44	44.7	8.05	821	12.7	1.28	112
139	54.64	27	4.86	496	8.81	0.89	78
140	2.68	2.68	0.484	49.3	0	0	0
141	1.25	1.08	0.195	19.8	0	0	0
142	4.84	3.61	0.65	66.3	0	0	0
143	81.68	47	8.47	864	11	1.12	97.8
144	25.26	20.2	3.64	372	1.56	0.158	13.9
145	381.63	183	33	3360	63.3	6.39	560
146	27.20	27.2	4.9	500	0	0	0
147	1.66	1.66	0.3	30.6	0	0	0
148	39.86	13.3	2.41	245	26.5	2.68	235
149	13.47	13.5	2.43	248	0	0	0
150	0.25	0.251	0.0453	4.62	0	0	0
151	18.90	12	2.16	220	0	0	0
152	50.31	48.5	8.73	890	0	0	0
153	0.44	0.444	0.0801	8.17	0	0	0
154	141.95	0.909	0.164	16.7	141	14.2	1250
155	0.00	0	0	0	0	0	0
156	0.00	0	0	0	0	0	0
157	10.92	9.71	1.75	178	0	0	0
158	23.36	23.4	4.21	429	0	0	0
159	0.11	0	0	0	0	0	0
160	6.83	6.52	1.17	120	0	0	0
161	9.18	9.18	1.65	169	0	0	0
162	1.20	1.2	0.216	22	0	0	0
163	3.35	3.35	0.603	61.5	0	0	0
164	8.53	8.53	1.54	157	0	0	0
165	26.87	26.9	4.84	494	0	0	0
166	4.15	3.68	0.663	67.6	0	0	0
167	0.00	0	0	0	0	0	0
168	0.00	0	0	0	0	0	0
169	3.79	3.23	0.582	59.3	0	0	0
170	27.23	19.6	3.54	361	2.42	0.245	21.5
171	13.60	13.5	2.43	247	0	0	0
172	16.80	7.89	1.42	145	2.84	0.287	25.1
173	21.62	8.68	1.56	159	6.26	0.632	55.4
174	1263.19	1260	227	23200	0.577	0.0582	5.11
175	0.00	0	0	0	0	0	0
176	2.82	0	0	0	0	0	0

Aa EDSU	Total NASC	Anchovy NASC	Anchovy biomass (t)	No. of individuals of anchovy	Sardine NASC	Sardine biomass (t)	No. of individuals of sardine
177	35.58	17	3.07	313	5.85	0.59	51.8
178	108.01	50.7	9.14	932	18.3	1.84	162
179	43.92	14	2.53	258	19.1	1.93	169
180	185.28	180	32.4	3300	1.79	0.181	15.9
181	35.18	35.2	6.34	646	0	0	0
182	54.38	26.9	4.85	494	8.76	0.884	77.6
183	15.91	7.36	1.33	135	2.65	0.267	23.4
184	0.00	0	0	0	0	0	0
185	360.45	70.9	12.8	1300	288	29.1	2550
186	4.58	4.58	0.825	84.1	0	0	0
187	119.38	73.3	13.2	1350	14.7	1.48	130
188	11.93	11.2	2.02	206	0	0	0
189	4.30	2.64	0.476	48.5	0	0	0
190	51.69	51.7	9.32	950	0	0	0
191	25.50	3.83	0.69	70.4	20.6	2.08	183
192	301.79	108	19.5	1990	117	11.8	1040
193	10.73	8.9	1.6	163	0.434	0.0439	3.85
194	28.55	27.4	4.66	615	0	0	0
195	0.00	0	0	0	0	0	0
196	0.00	0	0	0	0	0	0
197	0.00	0	0	0	0	0	0
198	0.00	0	0	0	0	0	0
199	0.00	0	0	0	0	0	0
200	0.00	0	0	0	0	0	0
201	0.00	0	0	0	0	0	0
202	0.00	0	0	0	0	0	0
203	0.00	0	0	0	0	0	0
204	0.00	0	0	0	0	0	0
205	0.00	0	0	0	0	0	0
206	0.00	0	0	0	0	0	0
207	561.33	214	36.4	4800	331	53	2640
208	33.50	12.5	2.12	280	9.33	1.49	74.6
209	33.31	9.82	1.67	221	7.36	1.18	58.8
210	147.37	67.8	11.5	1520	33.1	5.29	264
211	74.21	27.3	4.65	613	20.5	3.28	163
212	38.74	14.3	2.43	321	10.7	1.71	85.4
213	43.36	16.1	2.75	362	12.1	1.93	96.5
214	43.34	41.2	7.01	924	0	0	0
215	30.16	5.93	1.01	133	13.1	2.09	104
216	0.00	0	0	0	0	0	0
217	0.00	0	0	0	0	0	0
218	0.00	0	0	0	0	0	0
219	0.00	0	0	0	0	0	0
220	0.00	0	0	0	0	0	0

Aa EDSU	Total NASC	Anchovy NASC	Anchovy biomass (t)	No. of individuals of anchovy	Sardine NASC	Sardine biomass (t)	No. of individuals of sardine
221	0.00	0	0	0	0	0	0
222	0.00	0	0	0	0	0	0
223	0.00	0	0	0	0	0	0
224	0.00	0	0	0	0	0	0
225	23.02	23	3.92	517	0	0	0
226	51.52	23.3	3.96	522	12.5	2.01	100
227	26.38	12.7	2.16	285	1.76	0.282	14.1
228	417.94	180	30.7	4050	128	20.5	1020
229	42.82	26.6	4.53	597	7.2	1.15	57.5
230	146.00	58.8	10	1320	34.3	5.49	274
231	38.42	12.9	2.2	291	8.45	1.35	67.5
232	21.40	21.4	3.64	481	0	0	0
233	20.20	13	2.21	292	3.15	0.505	25.2
234	3.48	0.467	0.0796	10.5	0.35	0.0561	2.8
235	135.18	112	19	2510	9.64	1.54	77
236	39.40	19.1	3.26	429	8.99	1.44	71.8
237	29.52	29.5	5.03	663	0	0	0
238	0.00	0	0	0	0	0	0
239	0.00	0	0	0	0	0	0
240	17.21	17.2	2.93	386	0	0	0
241	0.00	0	0	0	0	0	0
242	0.00	0	0	0	0	0	0
243	0.00	0	0	0	0	0	0
244	0.00	0	0	0	0	0	0
245	44.49	44.5	7.57	999	0	0	0
246	0.00	0	0	0	0	0	0
247	8.50	4.07	0.693	91.5	0	0	0
248	5.80	0	0	0	0	0	0
249	1.23	1.23	0.21	27.7	0	0	0
250	9.76	0	0	0	0	0	0
251	5.45	4.02	0.684	90.3	0	0	0
252	38.86	2.9	0.494	65.1	35.1	5.62	280
253	0.71	0.715	0.122	16	0	0	0
254	0.19	0.194	0.033	4.36	0	0	0
255	109.20	7.36	1.25	165	102	16.3	814
256	85.00	84	14.3	1890	0	0	0
257	0.41	0	0	0	0	0	0
258	0.46	0.462	0.0787	10.4	0	0	0
259	4.36	4.36	0.742	97.9	0	0	0
260	91.38	41.1	7	923	22.3	3.57	178
261	172.08	171	29.1	3840	0.476	0.0763	3.81
262	76.03	13.5	2.29	302	0	0	0
263	27.27	27.3	4.64	612	0	0	0
264	23.76	22.6	3.85	507	0	0	0

Aa EDSU	Total NASC	Anchovy NASC	Anchovy biomass (t)	No. of individuals of anchovy	Sardine NASC	Sardine biomass (t)	No. of individuals of sardine
265	67.21	63	10.7	1410	0	0	0
266	22.11	14.9	2.54	336	7.16	1.15	57.2
267	24.45	24.2	4.11	543	0.127	0.0203	1.01
268	31.19	31.2	5.31	700	0	0	0
269	53.23	24.7	4.2	554	9.43	1.51	75.3
270	20.84	12.5	2.12	280	0	0	0
271	12.01	0	0	0	11.2	1.8	89.5
272	34.78	13.8	2.35	310	9.38	1.5	74.9
273	0.00	0	0	0	0	0	0
274	21.32	0	0	0	20.2	3.24	162
275	10.97	11	1.87	246	0	0	0
276	32.27	32.3	5.49	725	0	0	0
277	0.00	0	0	0	0	0	0
278	0.00	0	0	0	0	0	0
279	0.00	0	0	0	0	0	0
280	0.00	0	0	0	0	0	0
281	0.00	0	0	0	0	0	0
282	0.00	0	0	0	0	0	0
283	0.00	0	0	0	0	0	0
284	0.00	0	0	0	0	0	0
285	21.28	18.1	3.09	407	0	0	0
286	62.55	0	0	0	0	0	0
287	0.00	0	0	0	0	0	0
288	0.00	0	0	0	0	0	0
289	0.00	0	0	0	0	0	0
290	0.00	0	0	0	0	0	0
291	0.00	0	0	0	0	0	0
292	0.00	0	0	0	0	0	0
293	0.00	0	0	0	0	0	0
294	0.00	0	0	0	0	0	0
295	4.12	0	0	0	0	0	0
296	15.37	6.96	1.18	156	3.35	0.537	26.8
297	0.82	0.307	0.0522	6.89	0.23	0.0368	1.83
298	0.78	0.779	0.133	17.5	0	0	0
299	70.65	1.8	0.306	40.4	68.2	10.9	545
300	2.49	1.91	0.325	42.8	0	0	0
301	80.47	3.36	0.572	75.4	75.8	12.1	605
302	0.00	0	0	0	0	0	0
303	0.00	0	0	0	0	0	0
304	0.00	0	0	0	0	0	0
305	0.00	0	0	0	0	0	0
306	0.00	0	0	0	0	0	0
307	0.00	0	0	0	0	0	0
308	0.00	0	0	0	0	0	0

Aa EDSU	Total NASC	Anchovy NASC	Anchovy biomass (t)	No. of individuals of anchovy	Sardine NASC	Sardine biomass (t)	No. of individuals of sardine
309	0.00	0	0	0	0	0	0
310	0.00	0	0	0	0	0	0
311	0.00	0	0	0	0	0	0
312	0.00	0	0	0	0	0	0
313	0.00	0	0	0	0	0	0
314	202.29	0	0	0	0	0	0
315	0.00	0	0	0	0	0	0
316	19.49	19.5	3.32	438	0	0	0
317	0.00	0	0	0	0	0	0
318	4.03	0.755	0.129	17	0.378	0.0605	3.02
319	0.00	0	0	0	0	0	0
320	0.00	0	0	0	0	0	0
321	0.00	0	0	0	0	0	0
322	16.38	6.52	1.11	146	0	0	0
323	21.51	21.5	3.66	483	0	0	0
324	0.00	0	0	0	0	0	0
325	0.00	0	0	0	0	0	0
326	11.62	11.6	1.98	261	0	0	0
327	32.62	32.6	5.55	732	0	0	0
328	423.34	22.3	3.8	501	331	53.1	2650
329	192.31	0	0	0	192	30.8	1540
330	0.00	0	0	0	0	0	0
331	166.51	59.2	10.1	1330	107	17.2	857
332	82.55	34.2	5.82	768	5.58	0.894	44.6
333	478.12	45.4	7.73	1020	363	58.1	2900
334	5.14	0.678	0.115	15.2	0.339	0.0543	2.71
335	0.00	0	0	0	0	0	0
336	3.20	3.2	0.545	71.9	0	0	0
337	0.92	0.924	0.157	20.7	0	0	0
338	354.10	0.843	0.144	18.9	350	56.1	2800
339	0.81	0.808	0.138	18.1	0	0	0
340	1.72	1.72	0.293	38.7	0	0	0
341	45.82	3.95	0.673	88.8	33.8	5.41	270
342	204.26	4.39	0.747	98.5	199	31.9	1590
343	27.94	6.74	1.15	151	21.2	3.39	169
344	48.63	3.88	0.661	87.1	44.8	7.17	357
345	48.07	6.22	1.06	140	40.3	6.46	322
346	139.97	28.1	4.79	631	12.9	2.07	103
347	33.76	33.8	5.75	758	0	0	0
348	0.00	0	0	0	0	0	0
349	144.14	42.9	7.3	962	11.7	1.87	93.4
350	56.24	56.2	9.57	1260	0	0	0

Table 3.Biomass estimation of anchovy in Aegean and Ionian Sea per length class based on the results of the acoustic surveys in 2014.

Aegean Sea			Ionian Sea		
Total biomass (t): 23287.50			Total biomass (t): 13228.292		
Length class	No. of individuals	Biomass (t)	Length class	No. of individuals	Biomass (t)
52.5	31 447 304	28 791	52.5	0	0
57.5	96 997 404	118 688	57.5	0	0
62.5	157 236 522	250 991	62.5	829 210	1 058
67.5	31 447 304	64 159	67.5	0	0
72.5	0	0	72.5	3 313 038	6 827
77.5	0	0	77.5	32 430 497	82 906
82.5	0	0	82.5	42 270 715	132 261
87.5	2 439 240	11 383	87.5	689 842 239	2 610 587
92.5	29 835 597	166 227	92.5	884 398 595	4 005 358
97.5	310 948 805	2 049 050	97.5	132 662 262	712 259
102.5	840 551 387	6 496 471	102.5	102 308 595	645 660
107.5	627 909 800	5 648 866	107.5	48 714 212	358 595
112.5	456 178 613	4 744 068	112.5	125 846 000	1 073 012
117.5	123 196 354	1 471 729	117.5	113 217 657	1 111 017
122.5	72 351 282	987 144	122.5	109 337 865	1 227 649
127.5	45 995 497	712 927	127.5	43 054 280	550 144
132.5	20 830 694	365 004	132.5	28 676 228	414 933
137.5	5 935 645	117 045	137.5	7 268 904	118 555
142.5	2 202 649	48 673	142.5	7 329 764	134 178
147.5	160 582	3 961	147.5	2 111 063	43 202
152.5	40 145	1 101	152.5	0	0
157.5	40 145	1 221	157.5	0	0
Sum	2 855 744 972	23 287 500	Sum	2 373 611 124	13 228 200

Table 4.Biomass estimation of anchovy in Aegean and Ionian Sea per age class based on the results of the acoustic surveys in 2014.

Age	No. of individuals	Biomass (t)	Biomass	No. of individuals	Biomass (t)
0	342 083 414	436 752.98	0	4 142 249	7.88
1	2 697 745 785	22 282 982.98	1	2 341 948 479	12822.22
2	40 627 439	567 555.52	2	27 098 184	389.46
3	7 217	208.52	3	422 213	8.64
Sum	2 855 744 972	23288.15	Sum	2 855 744 972	13228.2

Table 5.Biomass estimation of sardine in Aegean and Ionian Sea per length class based on the results of the acoustic surveys in 2014.

Aegean Sea			Ionian Sea		
Total biomass (t): 44781.469			Total biomass (t): 20653.196		
Length class	No. of individuals	Biomass (t)	Length class	No. of individuals	Biomass (t)
87.5	1 266 309	7 154	97.5	17 440 244	146 052
92.5	1 001 826	6 749	102.5	150 126 732	1 392 971
97.5	5 065 234	40 312	107.5	115 390 319	1 180 487
102.5	18 249 270	170 163	112.5	195 136 941	2 191 343
107.5	20 637 624	223 761	117.5	132 515 155	1 626 879
112.5	69 021 832	864 244	122.5	150 242 285	2 009 032
117.5	121 749 960	1 749 543	127.5	87 997 064	1 277 271
122.5	263 768 872	4 325 068	132.5	36 280 074	569 814
127.5	215 929 658	4 018 851	137.5	9 008 272	152 647
132.5	141 618 182	2 977 229	142.5	480 250	8 756
137.5	51 085 132	1 207 623	147.5	315 593	6 176
142.5	18 617 942	492 825	152.5	379 008	7 941
147.5	11 388 763	336 254	157.5	330 983	7 409
152.5	3 999 291	131 227	162.5	8 720 122	360 721
157.5	2 252 106	81 846	167.5	17 440 244	146 052
162.5	873 593	35 051	172.5	150 126 732	1 392 971
			177.5	115 390 319	1 180 487
			182.5		
			187.5		
			192.5		
			197.5		
			202.5		
			207.5		
			212.5	115 390 319	1 180 487
Sum	946 525 594	16 667 900	Sum	904 363 042	10 937 500

Table 6.Biomass estimation of sardine in Aegean and Ionian Sea per age class based on the results of the acoustic surveys in 2014.

Age	No. of individuals	Biomass (t)	Age	No. of individuals	Biomass (t)
0	185 469 046	3009.06	0	199 137 788	1930.09
1	438 170 584	7621.97	1	627 283 441	7584.38
2	322 885 963	6036.87	2	69 221 691	1062.31
3	0	0.00	3	8 720 122	360.72
Sum	946 525 594	16 667 .90	Sum	904 363 042	10937.50

Table 7.Length-Weight relationships(TW (gr)- TL (mm)) for the main species in Aegean and Ionian Sea.

Species	Aegean Sea	Ionian Sea
Anchovy (<i>Engraulis encrasicolus</i>)	$TW = 3E-06TL^{3.1884}$	$TW = 2E-06TL^{3.2322}$
Sardine (<i>Sardina pilchardus</i>)	$TW = 7E-07TL^{3.5165}$	$TW = 6E-06TL^{3.048}$
Round sardinella (<i>Sardinella aurita</i>)	$TW = 1E-05TL^{2.9282}$	$TW = 6E-06TL^{3.0513}$
Mediterranean horse mackerel (<i>Trachurus mediterraneus</i>)	$TW = 1E-05T^{2.9532}$	$TW = 1E-05TL^{2.9278}$
Atlantic horse mackerel (<i>Trachurus trachurus</i>)	$TW = 6E-06TL^{3.0519}$	$TW = 1E-05TL^{2.9325}$
Bogue (<i>Boops boops</i>)		$TW = 3E-06TL^{3.2022}$
Chub mackerel (<i>Scomber colias</i>)	$TW = 2E-06*TL^{3.2407}$	$TW = 2E-06*TL^{3.2571}$

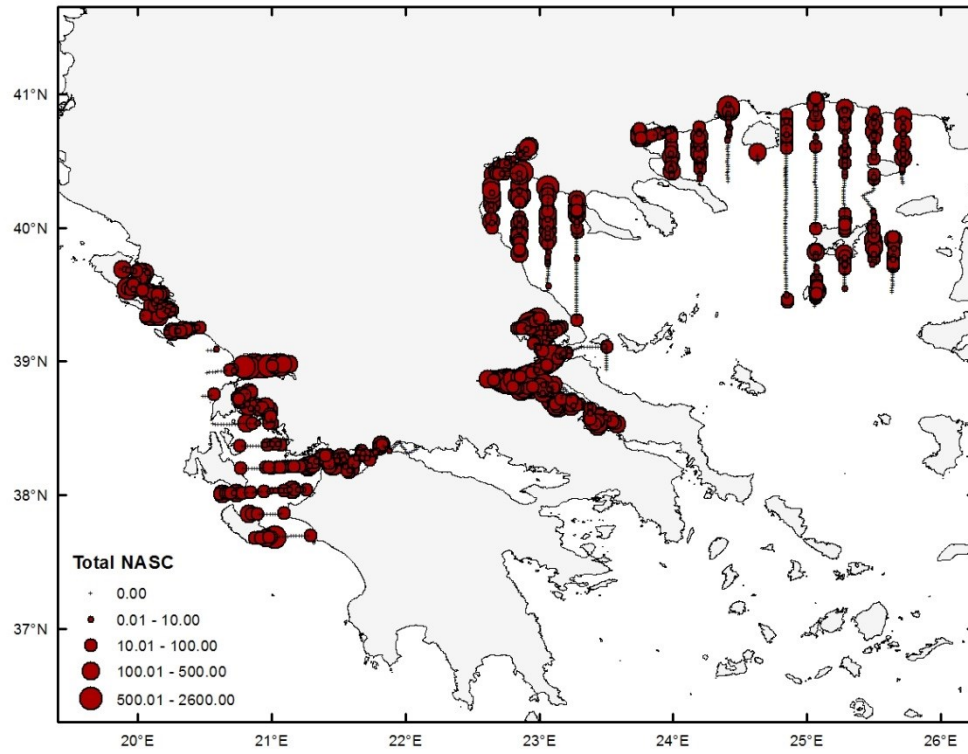


Fig 2. The distribution of the total fish NASC (m^2/nm^2) per EDSU in Aegean and Ionian Sea during June-July and September 2014, respectively.

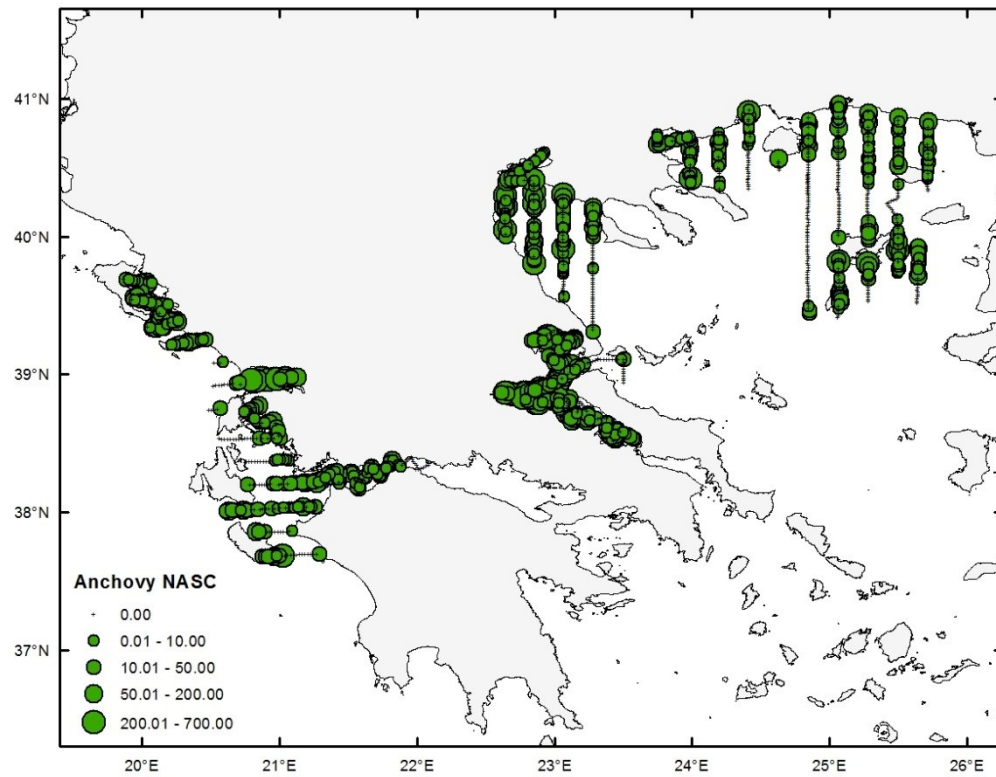


Fig 3. The distribution of anchovy NASC (m^2/nm^2) per EDSU in Aegean and Ionian Sea during June-July and September 2014, respectively.

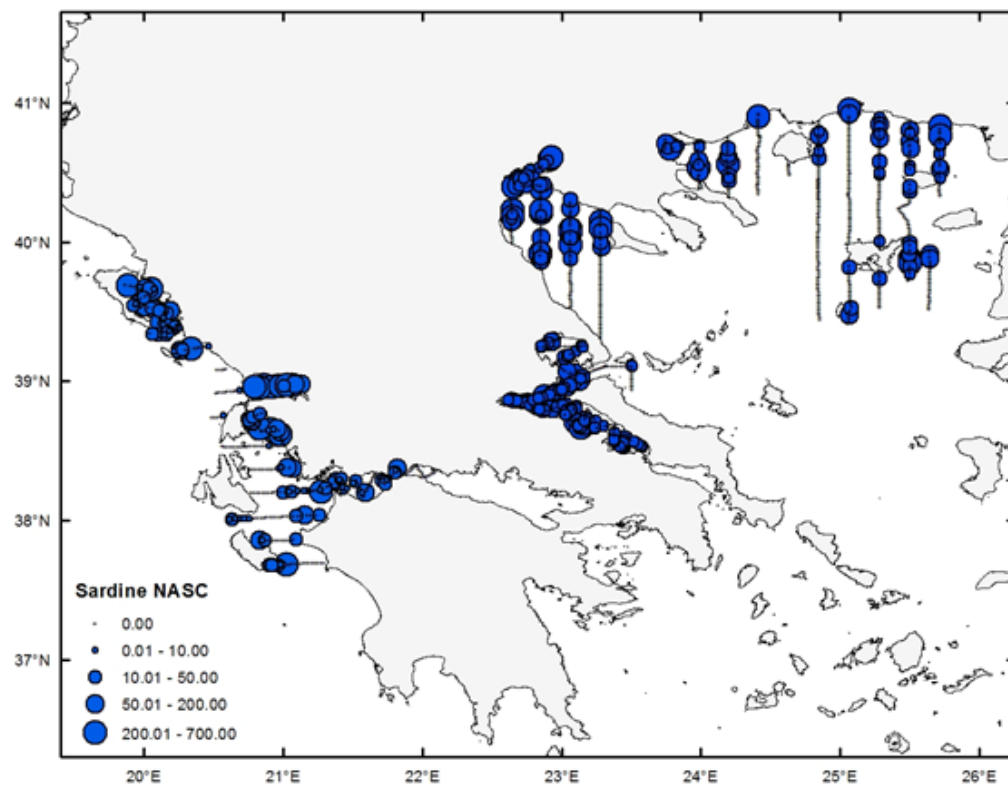


Fig 4. The distribution of sardine NASC (m^2/nm^2) per EDSU in Aegean and Ionian Sea during June-July and September 2014, respectively.

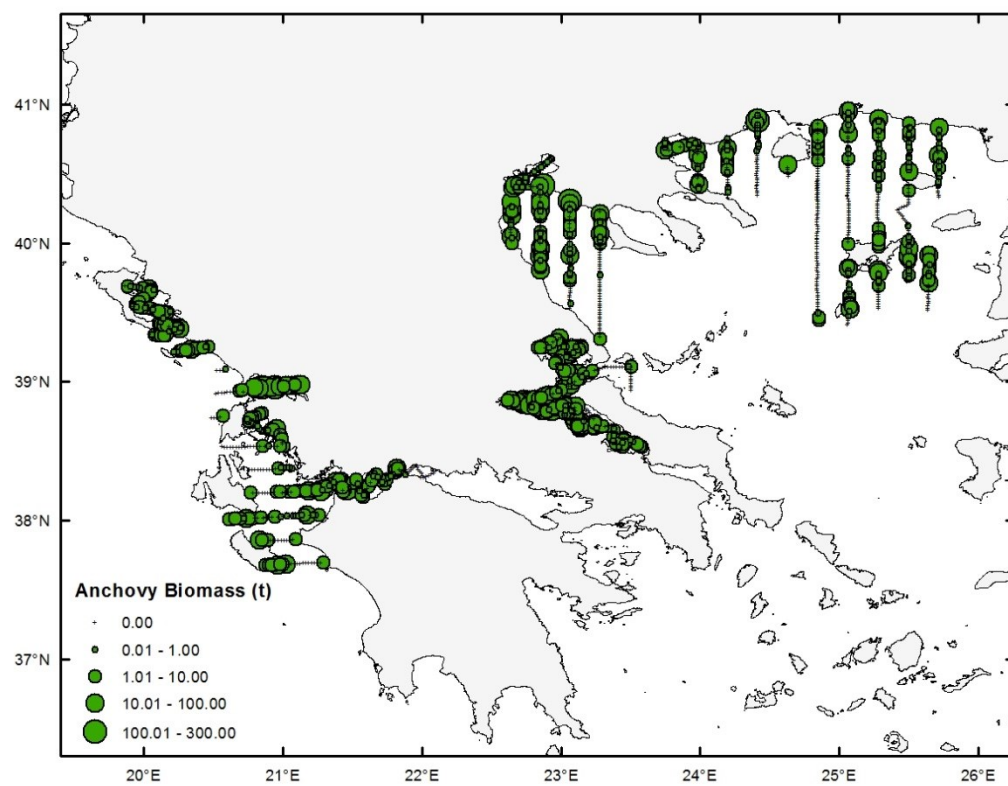


Fig 5. The distribution of anchovy biomass (t) per EDSU in Aegean and Ionian Sea during June-July and September 2014, respectively.

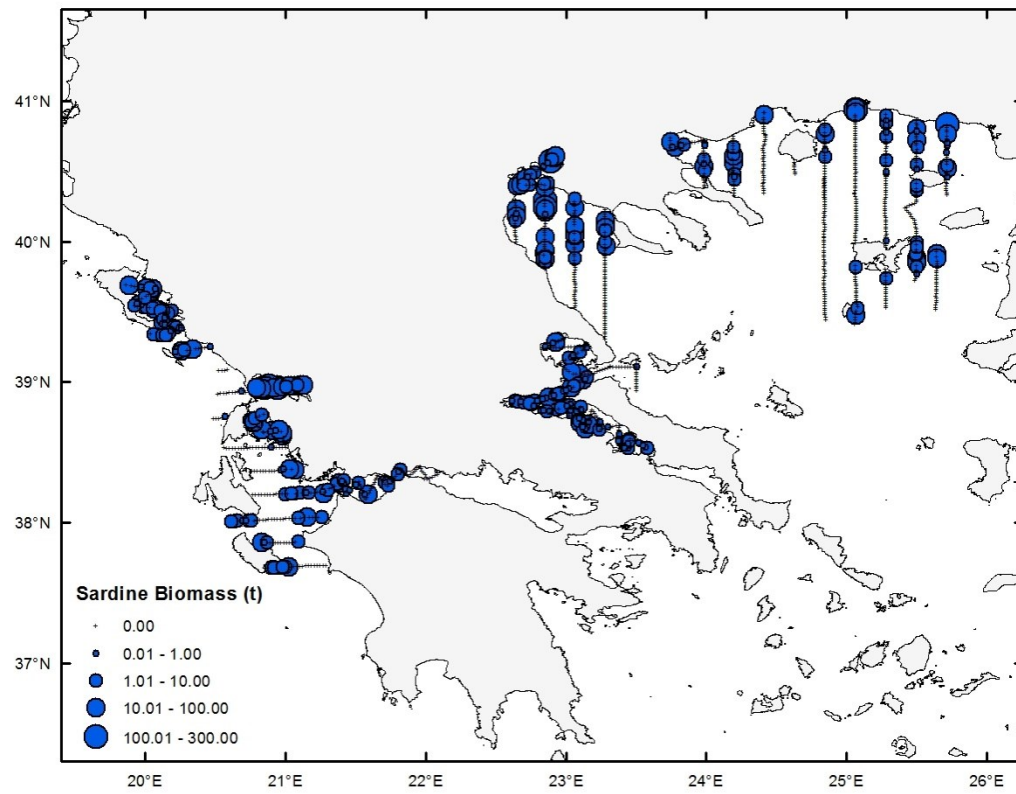


Fig 6. The distribution of sardine biomass (t) per EDSU in Aegean and Ionian Sea during June-July and September 2014, respectively.

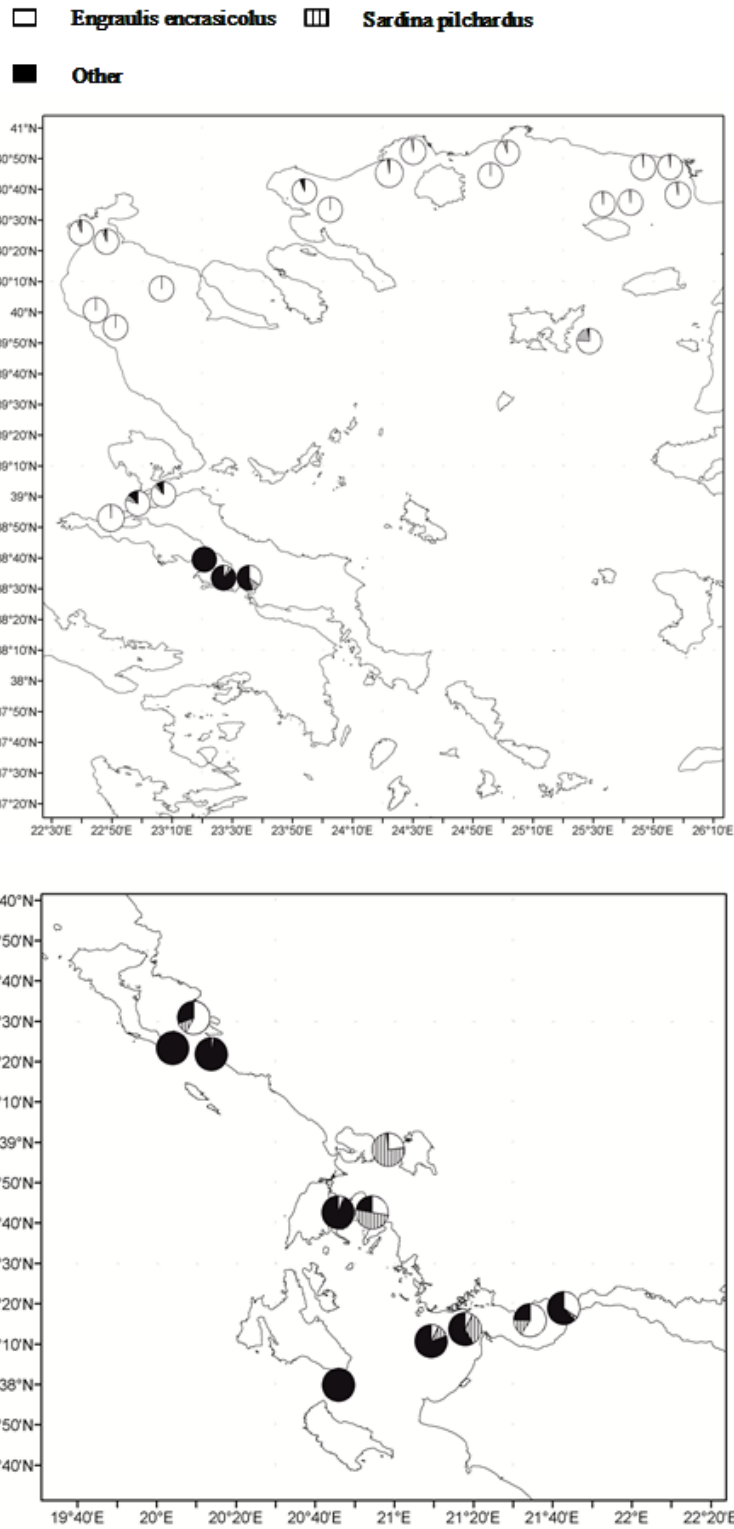


Fig 7. The catch composition of the hauls (species kg/haul) weighted per hauling hour a) in Aegean Sea and b) in Ionian Sea during June-July and September 2014, respectively.

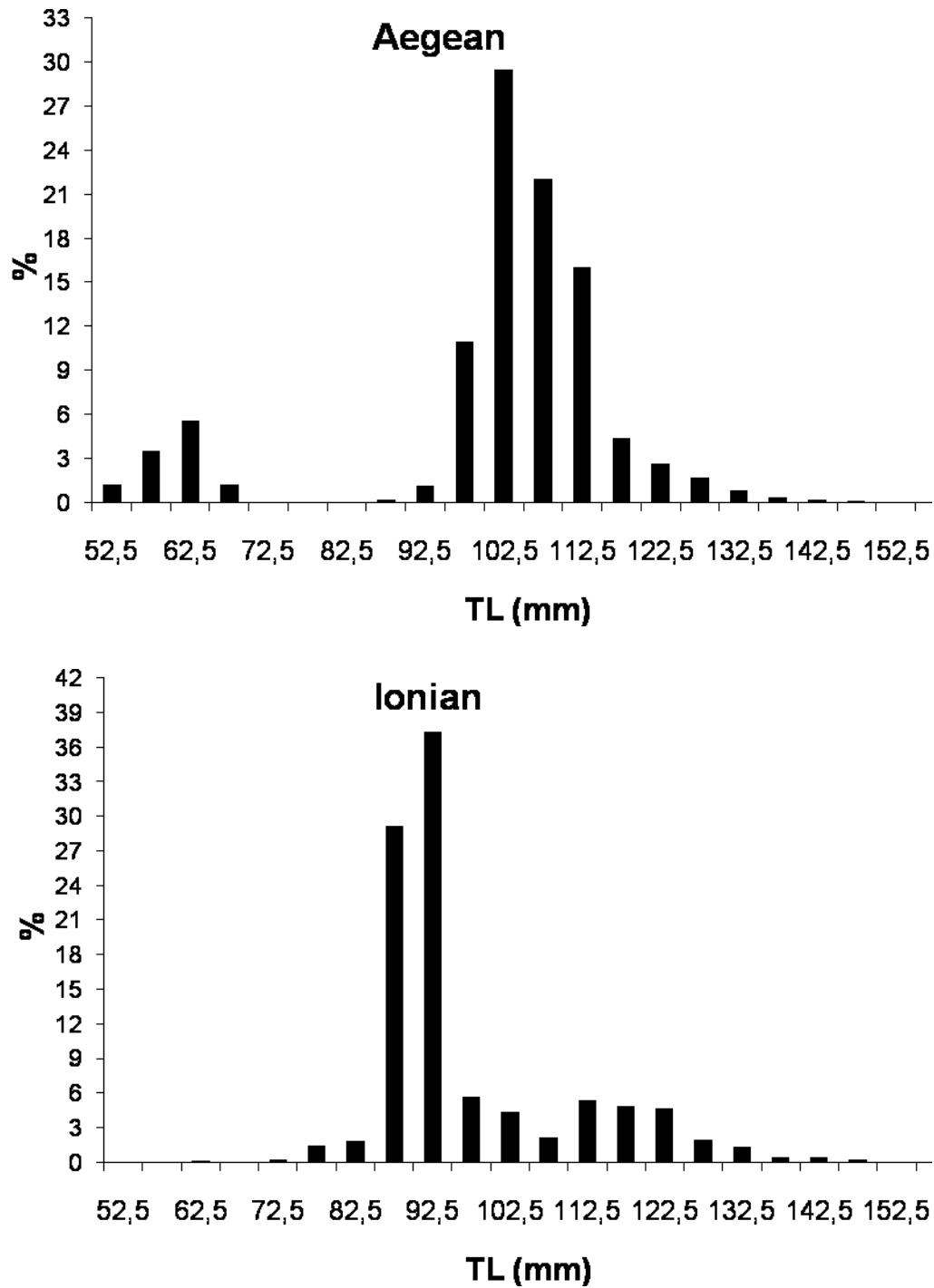


Fig 8. Anchovy (*Engraulis encrasicolus*): Length frequency distribution in Aegean and Ionian Sea during June-July and September 2014, respectively.

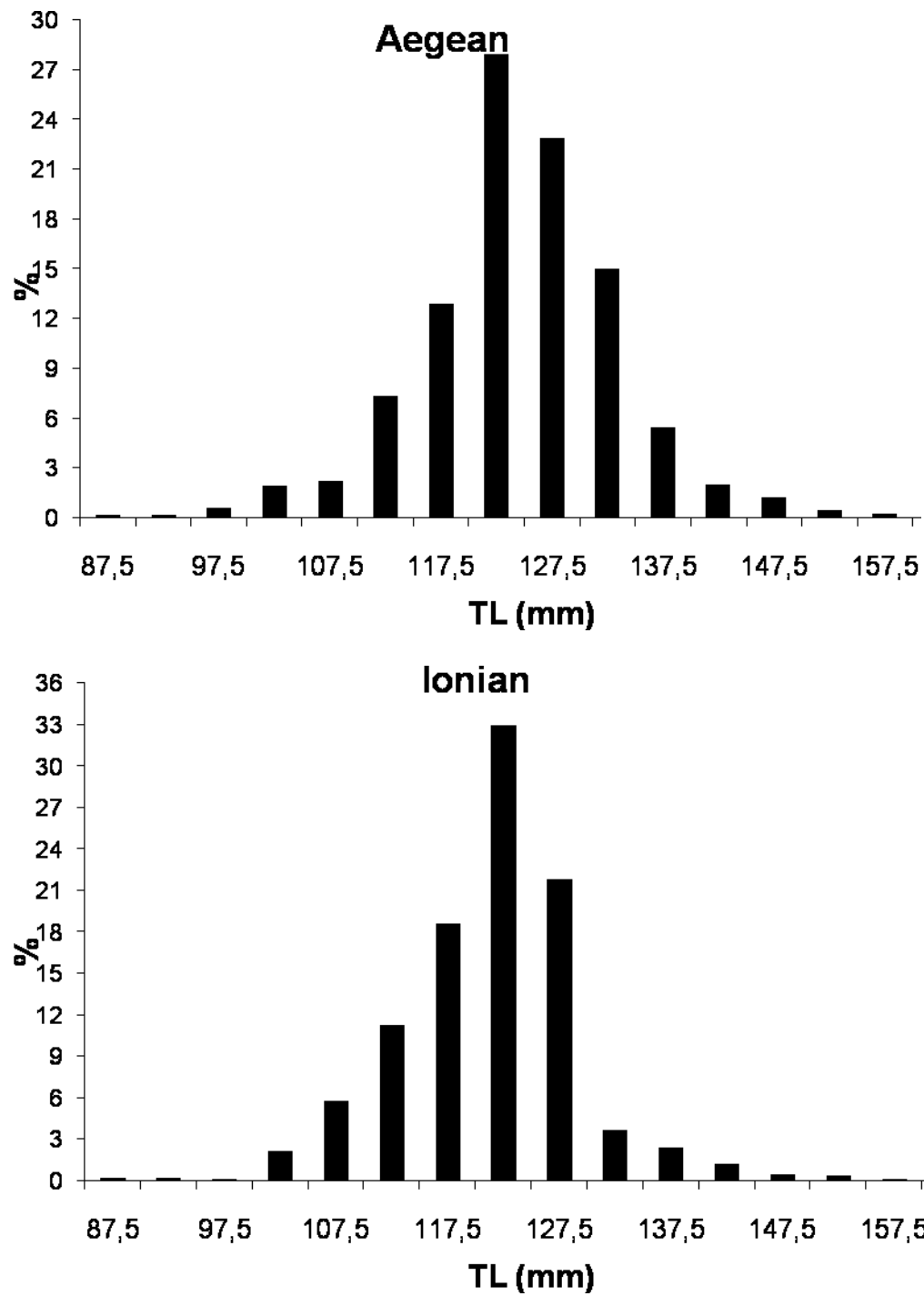


Fig 9. Sardine (*Sardina pilchardus*): Length frequency in Aegean and Ionian Sea during June-July and September 2014, respectively.

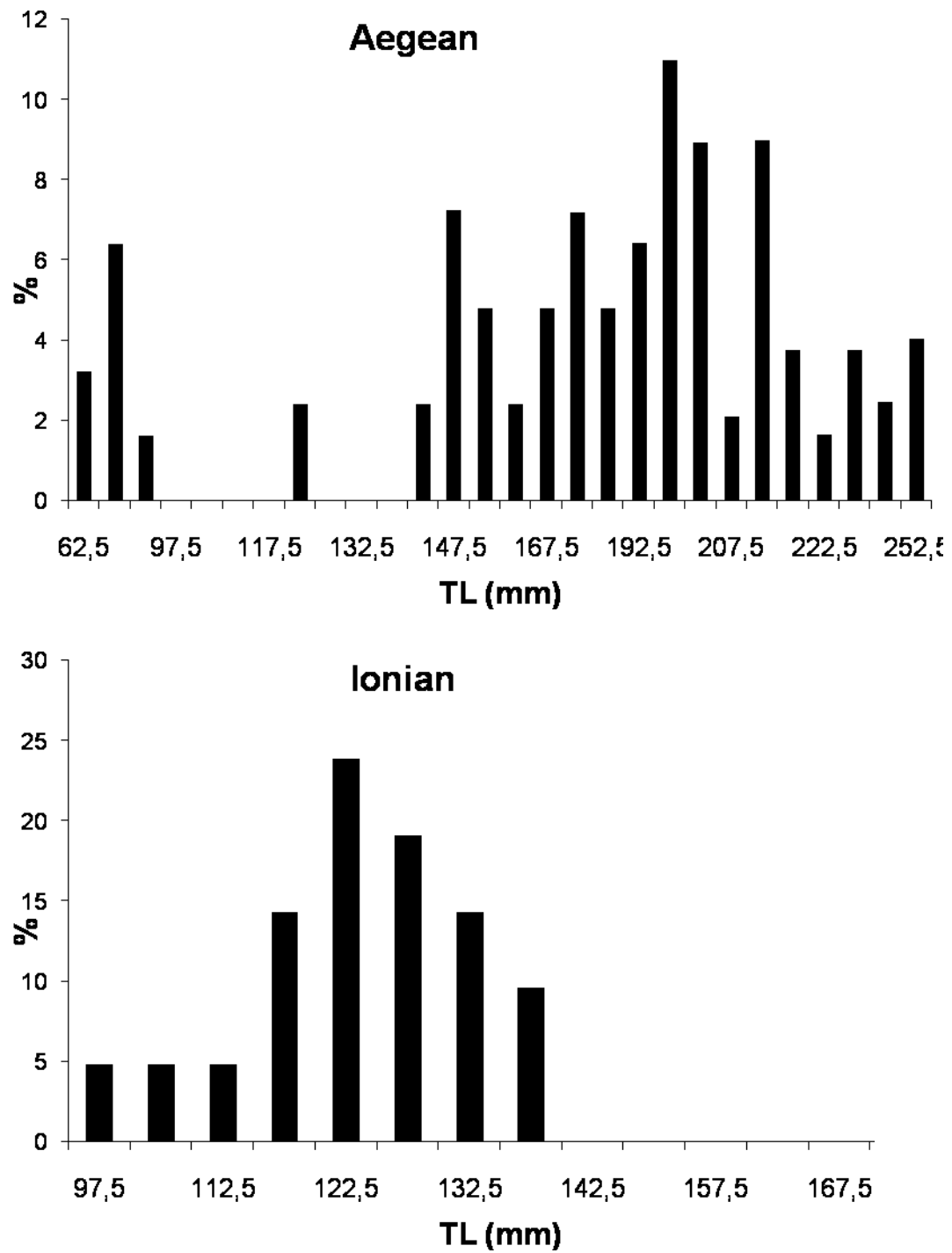


Fig 10. Round sardinella (*Sardinella aurita*): Length frequency distribution in Aegean and Ionian Sea during June-July and September 2014, respectively.

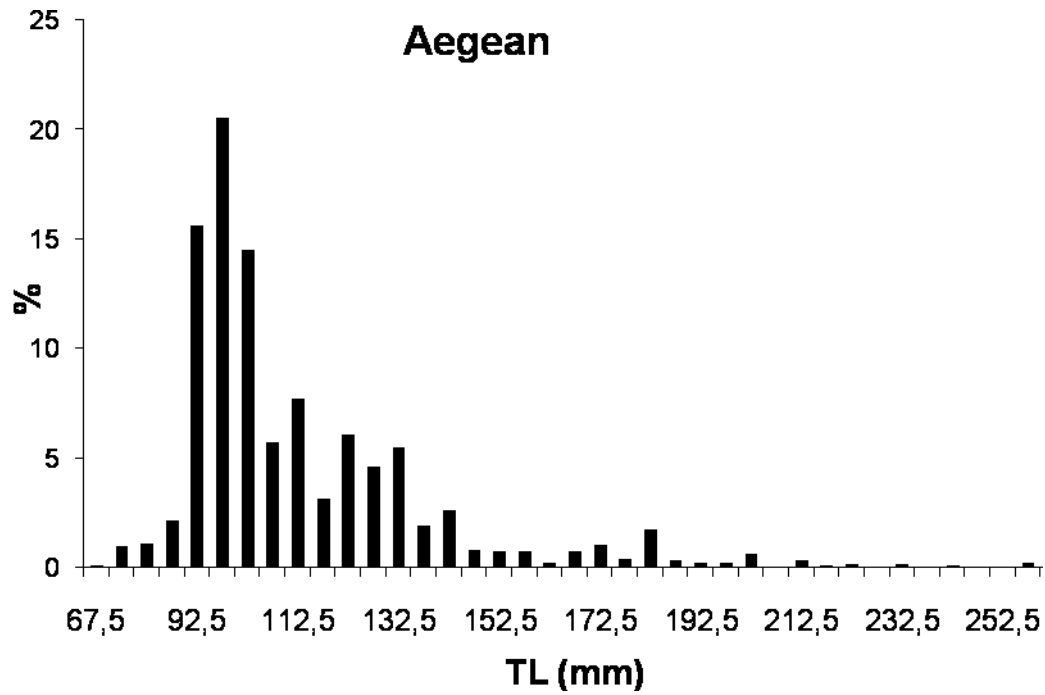
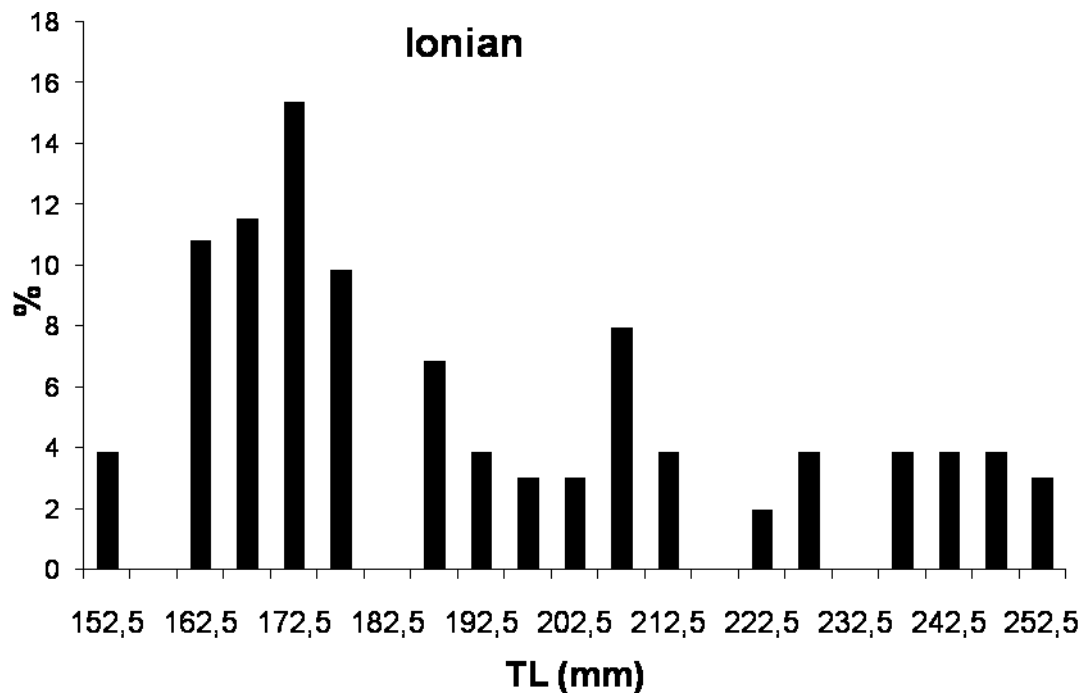


Fig 11. Mediterranean horse mackerel (*Trachurus mediterraneus*): Length frequency distribution in Aegean and Ionian Sea during June-July and September 2014, respectively.

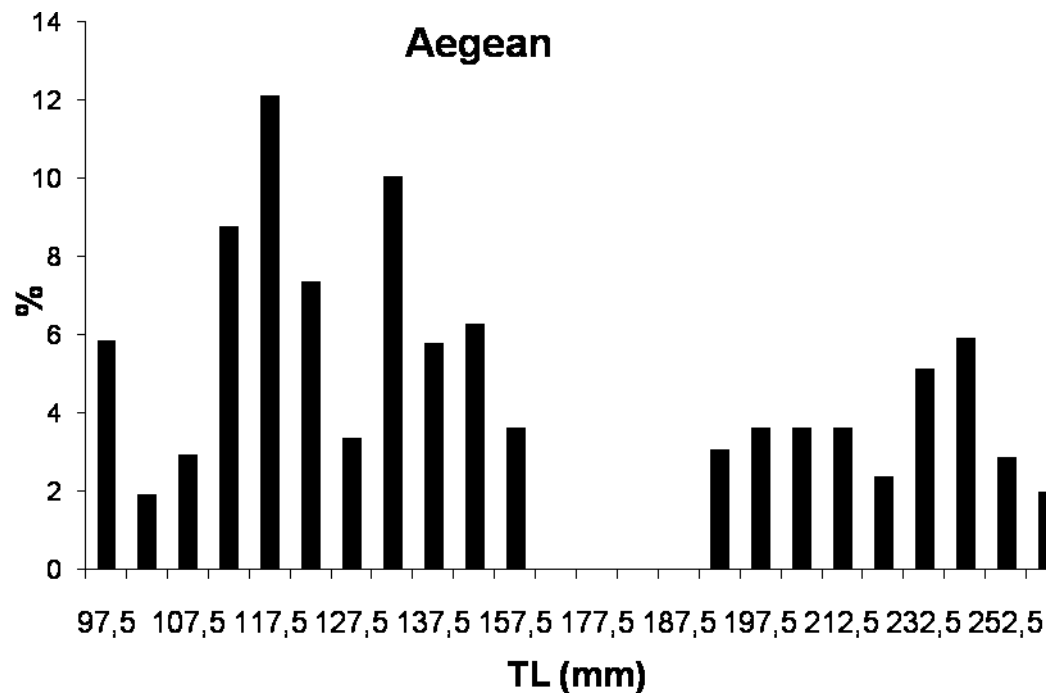
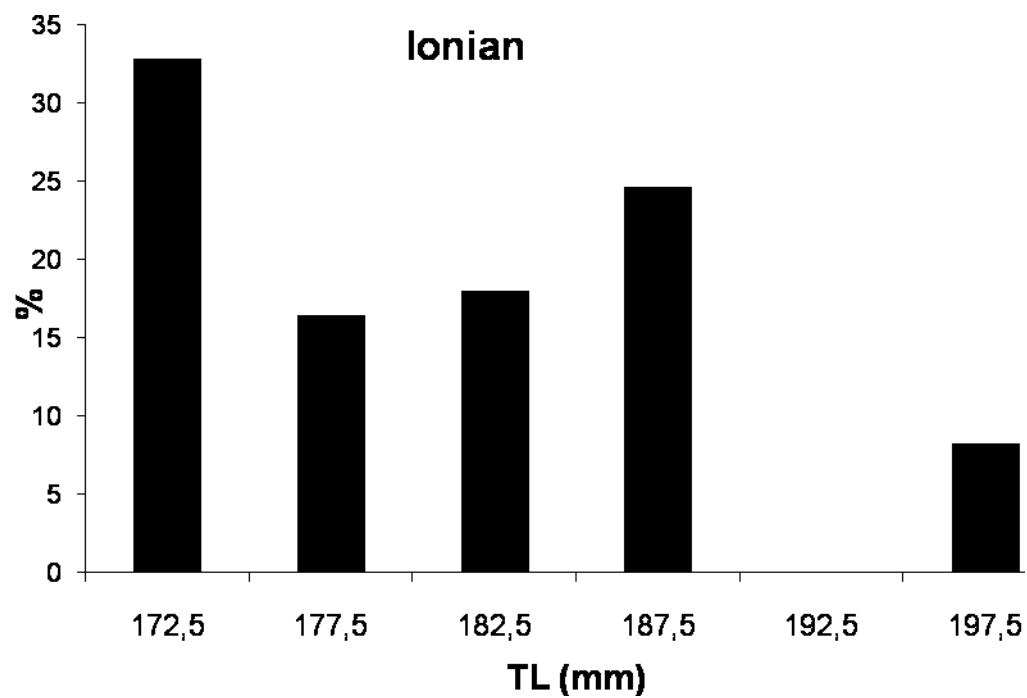


Fig 12.Chub mackerel (*Scomber colias*): Length frequency distribution in Aegean and Ionian Sea during June-July and September 2014, respectively.

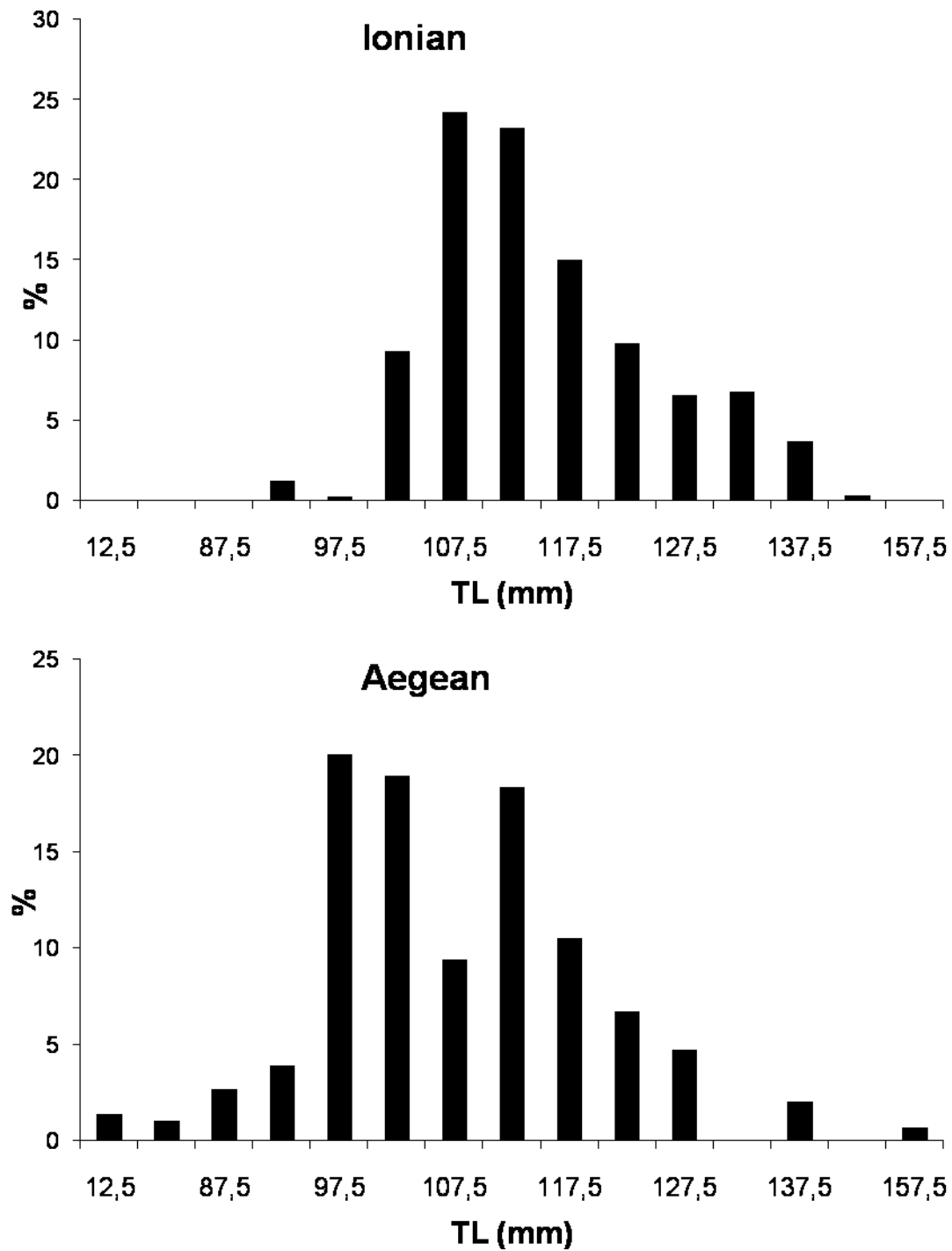


Fig 13.Atlantic horse mackerel (*Trachurus trachurus*): Length frequency distribution in Aegean and Ionian Sea during June-July and September 2014, respectively.