



Hellenic Republic
Ministry of Rural Development and Food
Directorate-General for Fisheries

Greek Fishing Fleet 2019 Annual Report

Pursuant to Article 22 of Regulation (EU) No 1380/2013
of the European Parliament and of the Council



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SUMMARY

The Greek fishing fleet is characterised by a very large number of vessels (**14,018 as at 31 December 2019**) but with small overall tonnage (**66,511.28 GT**) and engine power (**392,440.31 kW**). The fleet engages in fishing coastal stocks along the extensive shoreline of Greece's mainland and numerous islands.

The largest segment of the fleet (**96.52%**) is made up of vessels fishing multiple species near the coast using static gear. Only **1.78%** of fishing vessels (250 vessels) target benthic species (striped mullet, red mullet, hake and crustaceans) using bottom otter trawls (OTB) as their main gear, while **1.70%** (239 vessels) target pelagic species, mainly anchovy and sardine, using purse seines (PS) as their main gear.

To assess the condition of fish stocks and quantify the impact of fishing activities, account was taken of older data combined with data obtained through the national fisheries data collection programme for the years from 2014 to 2019 and other available scientific data. Due to various problems, data collection under the programme was interrupted in the period from 2009 to 2011 but gradually resumed from 2012.

The resulting estimates regarding fishing activity and the condition of biologically fishable stocks are set out by fleet segment in the individual chapters of this report.

In drawing up this report, account was taken, as far as possible, of the findings set out in the most recent STECF report on balance and capacity entitled *Scientific, Technical and Economic Committee for Fisheries (STECF) - Assessment of balance indicators for key fleet segments and review of national reports on Member States efforts to achieve balance between fleet capacity and fishing opportunities (STECF-19-13)*, Publications Office of the European Union, Luxembourg, 2019, ISBN 978-92-76-11286-0, doi:10.2760/300448, JRC119006.

It should be noted that since 2003 the Greek fishing fleet has declined significantly as a result of applying common fisheries policy rules, in particular the measure regarding permanent cessation of fishing activities with financial assistance provided for in the operational programmes for fisheries. The greatest reduction concerns smaller vessels (overall length <12 m), as set out in more detail in section 3.

Moreover, the Greek fishing fleet has complied fully with both the entry-exit regime and the reference levels (see section 4).

CHAPTER I FLEET DESCRIPTION

1. DESCRIPTION OF THE FISHING FLEET

According to the national register of fishing vessels (**extract taken on 12 May 2020**), on 31 December 2019 the Greek fishing fleet comprised **14,018 active fishing vessels** with a total gross tonnage of **66,511.28 GT** and total engine power of **392,440.31 kW**.

The situation of the Greek fishing fleet as at 31 December 2019, broken down according to OECD-approved length categories, is illustrated in the table below.

OVERALL LENGTH (m)	NUMBER OF VESSELS	GROSS TONNAGE (GT)
0.00-5.99	4,913	3,329.10
6.00-11.99	8,300	22,592.39
12.00-17.99	392	6,991.30
18.00-23.99	238	11,587.65
24.00-29.99	148	15,895.84
30.00-35.99	25	5,308.00
36.00-44.99	2	807.00
45.00-59.99	–	–
60.00-74.99	–	–
+75.00	–	–
No engine (of the above)	190	91.56

The Greek fishing fleet, which operates almost exclusively in the Mediterranean, is **the EU's largest fleet in terms of the number of vessels**. It falls into three broad categories according to the fishing gear used:

A. Vessels fishing with static gear

These are mainly fishing vessels operating year-round along the coast of the Greek mainland and around the islands with a variety of gear depending on the time of year and the target species. However, there are some large vessels operating with static gear that are fully equipped to carry out fishing trips lasting for several days in Greek waters of the Aegean, Ionian and Cretan Seas and beyond, including most of the international waters of the Eastern Mediterranean.

B. Vessels fishing with towed gear

These are vessels fishing with bottom otter trawls and operating in Greek and international waters of the Aegean, Ionian and Cretan Seas, mainly in FAO/GFCM geographical sub-areas (GSAs) 20, 22 and 23, and in third country waters under bilateral fisheries partnership agreements between the EU and third countries or by virtue of private agreements.

C. Vessels fishing with encircling nets

These are vessels operating in Greek and international waters of the Aegean and Ionian Seas fishing with purse seines and targeting various pelagic species.

Detailed information

A. VESSELS FISHING WITH STATIC GEAR

Vessels in this category operate mostly in coastal waters and account for most of the Greek fleet (**96.52%**) in terms of the number of vessels (**13,529**).

The vessels can be broken down as follows in terms of overall length:

– *Small vessels: **13,212** fishing vessels of an overall length of less than 12 metres, with a total gross tonnage of **25,917.79 GT** and total engine power of **242,932.40 kW**.*

– *Larger vessels: **307** fishing vessels of an overall length of 12 metres or more with a total gross tonnage of **5,284.60 GT** and total engine power of **29,343.12 kW**.*

Coastal fishing is carried out by small-capacity vessels fishing coastal stocks with relatively high-selectivity and low-yield fishing methods and gear (such as nets, longlines, traps and dredges). These fishing activities are vital for coastal areas of Greece as they help maintain the socio-economic fabric of coastal and island communities.

Fishing is carried out by professional fishers holding a professional fishing licence for vessels they own.

Moreover, **225** fishing vessels in this category have a licence that additionally includes ‘seine nets operated from a vessel at anchor’, ‘trawls’ or ‘**winch trawls**’ (**SB**). Fishing with winch trawls is subject to a management plan laid down by Ministerial Decision No 6719/146097 of 29 December 2016 (Government Gazette [GG], Series II, No 4348), as amended, pursuant to Article 19 of Regulation (EC) No 1967/2006, which provides for certain technical measures in the Mediterranean Sea.

The use of such trawls is authorised by derogation, applicable for 3 years from 3 June 2017, from the provisions of Article 13 of the above Regulation, as provided for by Commission Implementing Regulation (EU) 2017/929 of 31 May 2017 establishing a derogation from Council Regulation (EC) No 1967/2006 as regards the minimum distance from coast and the minimum sea depth for boat seine fishing in territorial waters of Greece.

A positive opinion was issued for **162** of the **225** vessels referred to above. These engaged in fishing in the periods from 1 January to 31 March 2019 and from 1 October to 31 December 2019.

B. VESSELS FISHING WITH TOWED GEAR

– Vessels fishing with bottom otter trawls

In 2019 there were **250** vessels operating **mainly** with bottom otter trawls, with a total gross tonnage as at 31 December 2019 of **24,589.20 GT** and total engine power of **74,415.07 kW**.

Although these vessels make up a small portion of the Greek fishing fleet (**only 1.78%**), they account for some **25%** of the total annual fishing yield.

Bottom trawling is a widely used method of fishing in all three GSAs, i.e. the Ionian Sea (GSA 20), the Aegean Sea (GSA 22) and the Cretan Sea (GSA 23), mainly in fishing grounds covering the continental shelf and the first section of the slope (to a depth of around 300 metres) in Greek and international waters of the Mediterranean.

Species found mainly or exclusively on the continental shelf (to depths of 150-200 metres) account for a significant portion (some 15-20%) of catches, and include striped mullet (*Mullus barbatus*), red mullet (*Mullus surmuletus*), hake (*Merluccius merluccius*), various cephalopods (*Octopus vulgaris*, *Eledona moschata*, *Loligo vulgaris*), crustaceans (*Peneus kerathurus*, *Nephrops norvegicus*) and sea bream (*Diplodus annularis*).

Around a third of the fishing vessels in this category (**84 vessels**) carry purse seines (PS) as a second set of gear, which is used only exceptionally.

Management rules are based on EU common fisheries policy (CFP) regulations, and additional measures in the form of temporary bans or area restrictions are laid down under national legislation to ensure sustainable exploitation and the protection of fish stocks.

(a) A **management plan** for fishing with bottom otter trawls, approved by the European Commission, has been in force since early 2014 and is being implemented throughout Greece. The management plan covers the following:

- rules for fishing with the gear in question;
- additional time restrictions;
- annual scientific monitoring of the condition of the target species in relation to reference indicators, based on a monitoring programme, to ensure they are kept within safe biological limits;
- granting of (annual) licences to fish with bottom otter trawls in addition to the vessel's general fishing licence.

A total of **224 annual fishing licences** were granted in **2019** for the use of bottom otter trawls.

(b) A **discard plan**, in force since 1 January 2017, has been established with the aim of reducing discards of benthic species subject to minimum sizes (e.g. Mediterranean hake, striped mullet and prawn) as required by Regulation (EU) No 2017/86 of 20 October 2016 (OJ L 14, 18.1.2017, p. 4), as amended.

- (c) A **multiannual management plan** has been put in place for **giant red shrimp** and **blue and red shrimp** in accordance with GFCM recommendation 42/2018/4. The management plan provides for sustainable fishing of giant red shrimp (*Aristaeomorpha foliacea*) and blue and red shrimp (*Aristeus antennatus*) with bottom otter trawls in the Ionian Sea (sub-areas 19, 20 and 21).

Under Decision 1921/134933 of 7 June 2019 of the Ministry of Rural Development and Food (GG, Series II, No 2346), fishing licences were granted until 31 December 2019 to vessels with a valid general fishing licence and a licence to fish with bottom trawls, and were valid from 1 October 2019 up to and including 31 December 2019, unless withdrawn at an earlier date. Licences were issued on condition that the vessels had a functioning satellite tracking device (vessel monitoring system, VMS) and electronic reporting system (ERS) on board.

In 2019 a total of **172 licences** were granted, for the duration of one year, to fish giant red shrimp and blue and red shrimp (ARA-ARS) using bottom otter trawls.

– Vessels fishing in third-country and international waters of the Mediterranean

This is the smallest segment of the Greek fishing fleet. According to the national register of fishing vessels, as at 31 December 2019 it consisted of **four vessels** of an overall length of more than 20 metres fishing with bottom otter trawls, with a total gross tonnage of **1,062.00 GT** and total engine power of **2,460.47 kW**.

Each vessel has a fishing licence supplemented by an appropriate licence to fish in the waters of third countries, typically issued for three months, under a fisheries partnership agreement between the EU and the third country or under a private agreement with the authorities of a third country. This part of the fleet has shrunk considerably in recent years and continues to do so, as fishing opportunities for such vessels have declined significantly.

No vessels in this category engaged in fishing in 2019.

Fishing vessels operating in international waters of the Mediterranean mainly use **bottom otter trawls**, **purse seines** and **drifting longlines**. Fishing licences are granted on the condition that national and EU legislation, as well as international rules on the preservation and management of fish stocks, are complied with.

Specifically with regard to fishing with bottom otter trawls, licences to fish in international waters cannot be used in FAO/GFCM/GSA sub-areas 20, 22 and 23:

- from 24 May to 15 July every year in all sub-areas; and
- from 16 July to 1 October in part of sub-area 22.

For **2019** a total of **374 licences** were granted to fish in international waters of the Mediterranean, covering all types of gear.

C. VESSELS FISHING WITH ENCIRCLING NETS

– Vessels fishing with purse seines

This segment is made up of **239** vessels fishing with purse seines as their **main** gear, with a total gross tonnage of **10,506.73 GT** and total engine power of **44,498.96 kW**. Vessels using purse seines as their main gear target mainly small pelagic species, operate only in good weather and, due to the vulnerability of the main target species, do not make long fishing trips (rarely more than 48 hours).

Management rules are based on EU common fisheries policy (CFP) regulations, and additional measures in the form of temporary bans or area restrictions are laid down under national legislation to ensure sustainable exploitation and the protection of fish stocks.

A management plan for fishing small pelagic species, i.e. anchovy (*Engraulis encrasicolus*) and sardine (*Sardina pilchardus*), using purse seines was put in place as early as February 2012.

The management plan covers the following:

- rules for fishing with the gear in question;
- a plan for scientific monitoring of the target species based on reference indicators to assess the condition of the target stocks,
- a 'licence to fish for small pelagic species (anchovy and sardine)' granted in addition to the vessel's general fishing licence.

For 2019 a total of **264 one-year licences** were granted to fish for small pelagic species (anchovy and sardine), including, in some cases, to vessels equipped with a purse seine without this being their main gear.

A management plan is in place to reduce discards in small pelagic fishing (anchovy and sardine), as required by Commission Delegated Regulation (EU) 2018/161 of 23 October 2017 establishing a *de minimis* exemption to the landing obligation for certain small pelagic fisheries in the Mediterranean Sea (OJ L 30, 2.2.2018).

D. FISHING WITH ANNUAL FISHING LICENCES

D1. Corals

Under the national institutional framework in place, a nine-month licence may be granted to fish in a given fishing area, and the areas are rotated every five years.

No fishing licence was granted for harvesting red corals in 2019, as no applications were submitted.

D2. Large pelagic species

Fishing targeting large pelagic species: Bluefin tuna (*Thunnus thynnus*), swordfish (*Xiphias gladius*) and albacore (*Thunnus alalunga*), which are covered by a specific management regime, are fished by vessels which, in addition to a general fishing licence, have also been granted a licence to fish the species in question with specific authorised fishing gear.

In **2019** a total of **292 licences** were granted for catching **swordfish** (*Xiphias gladius*) and **albacore** (*Thunnus alalunga*) using LLD, LHM and PS gear, **32** of which concerned albacore using only purse seines (PS).

Greece's initial fishing quota for **bluefin tuna** (*Thunnus thynnus*) in **2019** was **285.11 tonnes**. **65** licences were issued for fishing with hooks and lines.

Nearly **91.9%** of Greece's available quota, i.e. **262 tonnes** (live landed weight), was caught in the period from **11 February** to **3 September 2019**. After Greece and Croatia agreed to exchange **19 tonnes** of tuna, the total available quota increased to **304.11 tonnes**.

Because two different applications are used to record catches of bluefin tuna (BFT), i.e. the electronic logbook (ERS) and the e-BCD application, there are some discrepancies in the records.

This department enters all the data in a table, and one column (Q2) specifically shows the final weight per catch based on the highest assumed weight for each individual fish.

We then cross-check the total live landed weight with the data entered in the port authorities' landing inspection reports, first buyers' sales notes and the tuna catch document (BCD) to ascertain that the quota has not been exceeded.

D3. Sea cucumbers

Presidential Decree 48/2018 (GG, Series I, No 90), as amended by Article 78(4) of Law 4582/2018 (GG, Series I, No 208) and subsequently by Article 52(1) of Law 4647/2019 (GG, Series I, No 204), lays down regulatory measures for fishing sea cucumbers of the genus '*Holothuria spp*', which may be caught by professional fishers only, for use as bait in professional and recreational fishing or for human consumption. The Decree entered into force on 22 May 2018.

The Decree lays down rational management measures for sea cucumber stocks of the genus *Holothuria spp*, terms and conditions for the fishing activity, authorised periods and fishing grounds, minimum weight, maximum number of individuals that may be caught, data recording requirements, conservation measures and penalties.

For all of Greece, a total of **98 licences** were issued to fish for sea cucumbers of the genus *Holothuria spp* for the fishing season starting on 1 November 2018 and ending on 30 April 2019, and **110 licences** were issued for the season starting on 1 November 2019 and ending on 30 April 2020.

D4. Narwal shrimp (*Plesionika narval*)

Decision 1177/57236 of 21 March 2019 (GG, Series II, No 1263), as amended by Decision 1783/116963 of 23 May 2019 (GG, Series II, No 2947), as in force, lays down management measures for narwal shrimp (*Plesionika narval*) fishing.

The Decision lays down rational management measures for the species (also taking into account socio-economic parameters), terms and conditions for the fishing activity, the

authorised gear (FPO) and maximum number of pots and traps that may be used, marking of gear, haul conditions, authorised periods and fishing grounds, data recording and submission requirements and penalties.

Only professional fishers who own a professional fishing vessel are allowed to fish narwal shrimp. The vessel must have a fishing licence to carry out this activity. The fishing licence is granted on condition that the vessel has a valid licence to fish with pots and traps (FPO) and keeps an electronic fishing logbook (ERS).

For all of Greece a total of **29 licences** were issued to fish for narwal shrimp (*Plesionika narval*) for the fishing season starting on 1 May and ending on 31 August 2019.

2. ANALYSIS OF THE BALANCE BETWEEN FISHING CAPACITY AND FISHING OPPORTUNITIES

Stock status assessment

Assessing the balance between fishing capacity and fishing opportunities has been particularly difficult due to missing relevant data as a result of time series interruptions.

The conclusions for the main fleet segments set out below are thus based on a comparative analysis of **available data** from recent years and data obtained through the national fisheries data collection programme, also taking into account biological and socio-economic factors. These will, as far as possible, be updated based on more recent available data from the 2018 and 2019 national fisheries data collection programme.

The following section also includes information from the 2019 report on the implementation of the landing obligation under Regulation (EU) 2015/812.

Small pelagic species

Estimation of anchovy and sardine biomass in the Aegean and Ionian Seas

(Research surveys at sea - MEDIAS)

The body carrying out MEDIAS surveys in Greek waters is the Hellenic Centre for Marine Research (HCMR). The data collected was used to estimate the abundance and biomass of anchovy and sardine stocks with a methodology unrelated to fishing, i.e. the acoustic method.

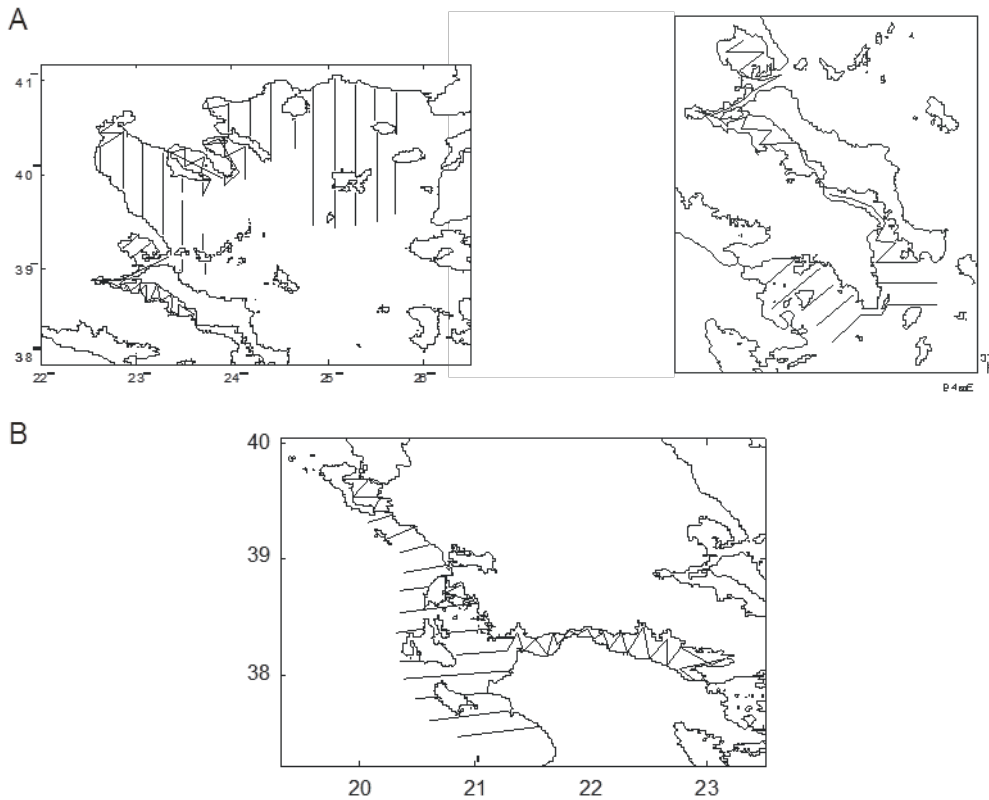
Use of acoustic sampling to estimate the abundance of anchovy and sardine stocks

An acoustic survey was conducted in Greek waters (GSAs 22 and 20) with the HCMR vessel R/V FILIA as part of the MEDIAS project.

The project involved estimating the size and geographical distribution of **anchovy** (*Engraulis encrasicolus*) and **sardine** (*Sardina pilchardus*) stocks in the Aegean and Ionian Seas using the acoustic method.

The methodology followed is in line with the MEDIAS protocol, ensuring compatibility with acoustic surveys carried out elsewhere in the Mediterranean and comparability of the results.

Estimating the abundance of anchovy and sardine using the acoustic method requires knowledge of the length-weight ratio and the species breakdown by length in each area.



Predefined acoustic transects in the Aegean (GSA 22) and the Ionian Sea (GSA 20)

The average frequencies of each length class were estimated using the following formula:

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

where f_j is the mean frequency of anchovy [sic] of length class j ; n_{jk} is the number of anchovy/sardine of length class j in haul k ; N_k is the total number of anchovy/sardine in haul k ; t_k is the duration of haul k and M is the number of hauls in the area (MacLennan and Simmonds, 1992).

For each sub-area the following ratio was also calculated: $\dot{W} = a\dot{L}^b$

where W is the total weight; L is the total length and a and b are constants that are estimated by regression analysis.

Subsequently, the density of targets (F) from the observed echo integrals was estimated according to the equation $F=(K/\langle\sigma\rangle)E$, where K is the calibration factor, $\langle\sigma\rangle$ is the mean acoustic transect and E is the echo integral after partitioning the anchovy and sardine echo (MacLennan and Simmonds, 1992).

$\langle \sigma \rangle$ was calculated for the mean total fish length of each sub-area according to the equation

$$\langle \sigma \rangle = 4\pi \sum_i f_i 10^{TS/10}$$

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 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 sampling area and N_k the transects in A_k . The variance V was estimated as

$$V = \sum_i (A F_i - Q)^2 / [N_i(N_i - 1)]$$

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

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

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

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

Presentation of the preliminary results

Aegean Sea (GSA 22)

The acoustic data was collected along 70 predefined transects in the northern Aegean in June-July 2019 (Figure 1G1 [sic]) using a Simrad ES38-7 38 kHz split beam transducer. The size of the elementary sampling distance unit (ESDU) was one nautical mile. The reflected echo was attributed to fish species by comparing audiograms at the corresponding time intervals. The audiograms were examined to determine sound signals from anchovy and sardine schools based on the acoustic target strength of each species. The acoustic sampling covered a total area of 30,979 km² in the northern Aegean.

The anchovy and sardine biomass could only be estimated once the weight-length ratio and species composition by length had been determined for each area. To obtain this data, 17 pelagic trawls were pulled along the transects in areas with a high concentration of fish.

Hydrographical parameters were recorded in a network of 136 sampling stations in the northern Aegean (Figure 2). At each station of the sampling network, a vertical temperature and salinity profile was made using a Seabird Electronics SBE-19 conductivity, temperature and depth (CTD) profiler. Plankton samples were taken across the 136-station network in the northern Aegean (Figure 2).

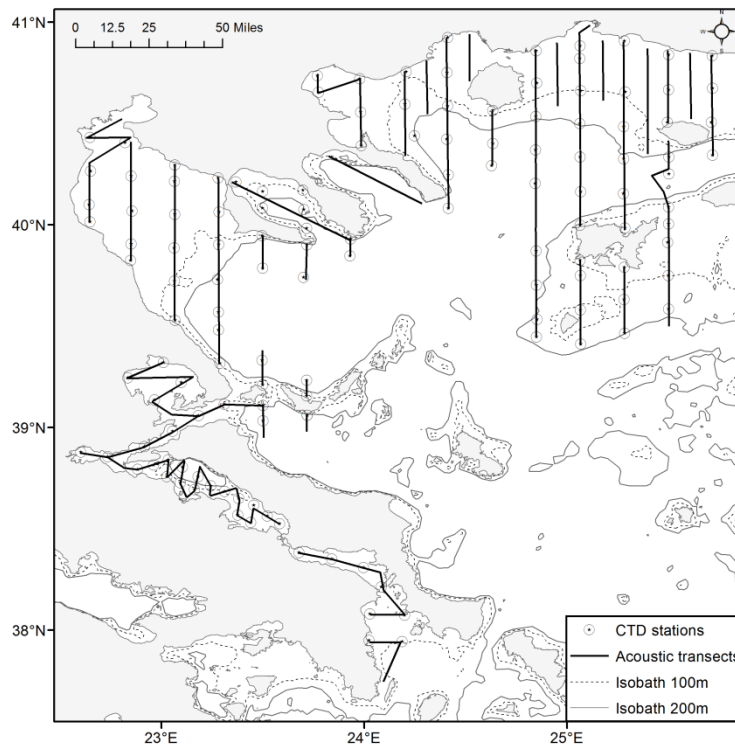
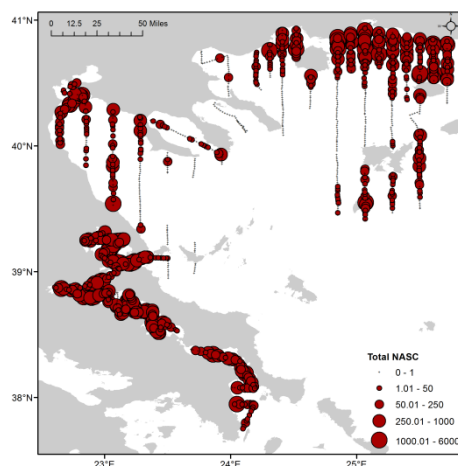
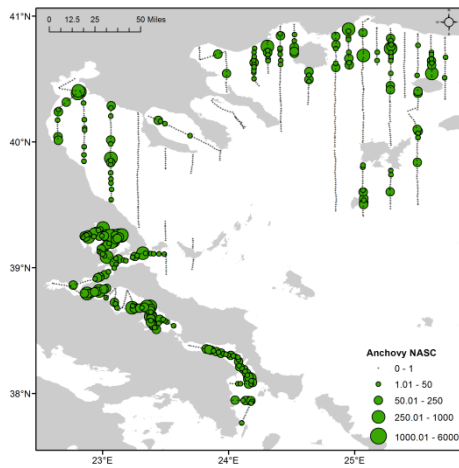


Figure 2. Acoustic transects sampled in the MEDIAS survey of the Hellenic part of northern Aegean Sea (GSA 22) in June-July 2019. The position of CTD and plankton stations sampled are also shown.

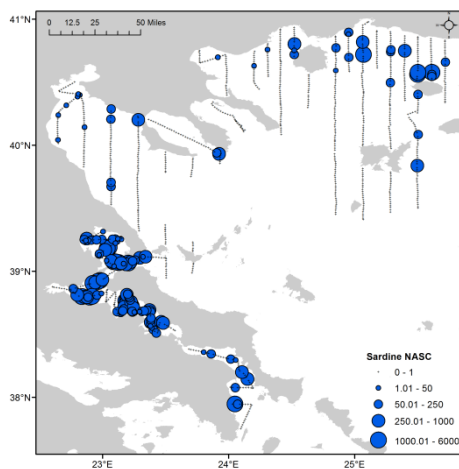
The acoustic sampling maps of the MEDIAS survey in the Greek section of the northern Aegean Sea (GSA 22) are presented below.



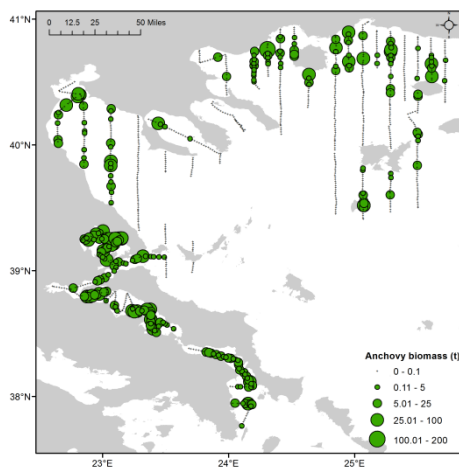
Distribution of the total fish NASC (m²/nm²) per EDSU of northern Aegean Sea (GSA 22) in June-July 2019



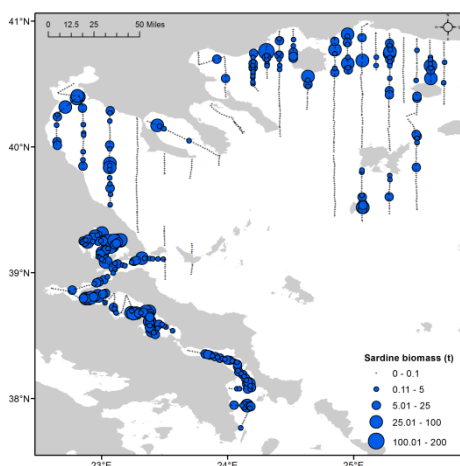
Distribution of the anchovy NASC (m2/nm2) per EDSU of northern Aegean Sea (GSA 22) in June-July 2019



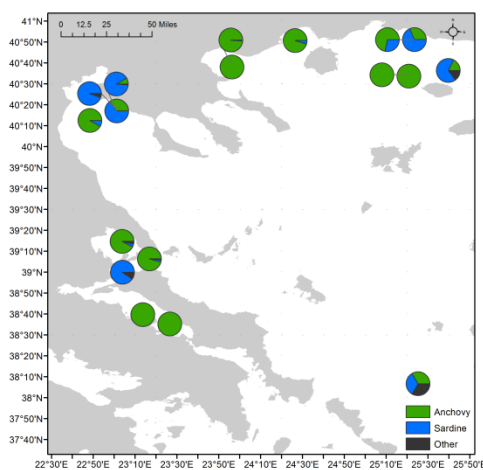
Distribution of the sardine NASC (m2/nm2) per EDSU in northern Aegean Sea (GSA 22) during June-July 2019



Distribution of the anchovy biomass (t) per EDSU in northern Aegean Sea (GSA 22) during June-July 2019



Distribution of the sardine biomass (t) per EDSU Hellenic part in northern Aegean Sea (GSA 22) during June-July 2019



Catch compositions of the hauls (species kg/haul) weighted per hauling hour in northern Aegean Sea (GSA 22) during June-July 2019

Ionian Sea (GSA 20)

The acoustic data was collected along 48 predefined transects in the eastern Ionian Sea in October 2019 (Figure 1G1 [*sic*]) using a Simrad ES38-7 38 kHz split beam transducer. The size of the elementary sampling distance unit (ESDU) was one nautical mile. The reflected echo was attributed to fish species by comparing audiograms at the corresponding time intervals. The audiograms were examined to determine sound signals from anchovy and sardine schools based on the acoustic target strength of each species. The acoustic sampling covered a total area of 10,525 km² in the eastern Ionian Sea.

The anchovy and sardine biomass could only be estimated once the weight-length ratio and species composition by length had been determined for each area. To obtain this data, 11 pelagic trawls were pulled along the transects in areas with a high concentration of fish.

Hydrographical parameters were recorded across a network of 84 sampling stations in the eastern Ionian Sea (Figure 2) [*sic*]. At each station of the sampling network, a vertical temperature and salinity profile was made using a Seabird Electronics SEB-19 conductivity,

temperature and depth (CTD) profiler. Plankton samples were taken across the 84-station network in the eastern Ionian Sea (Figure 2) [sic].

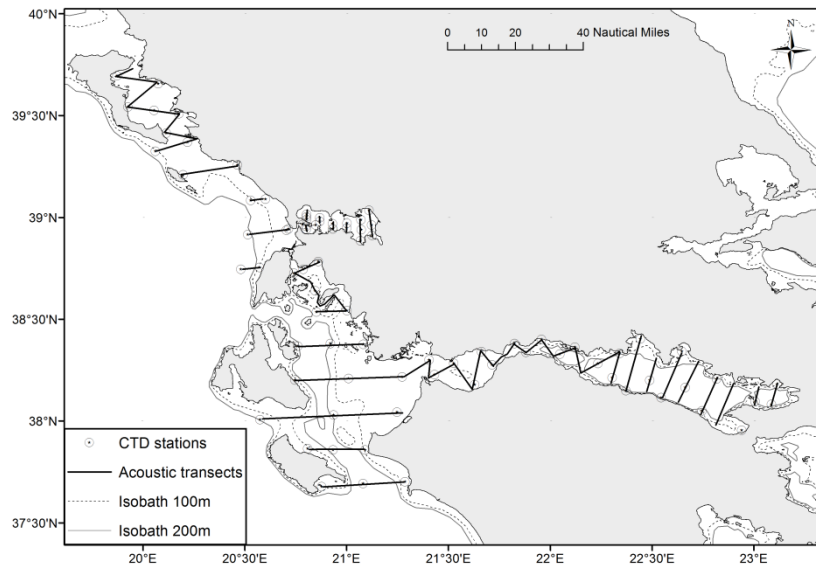
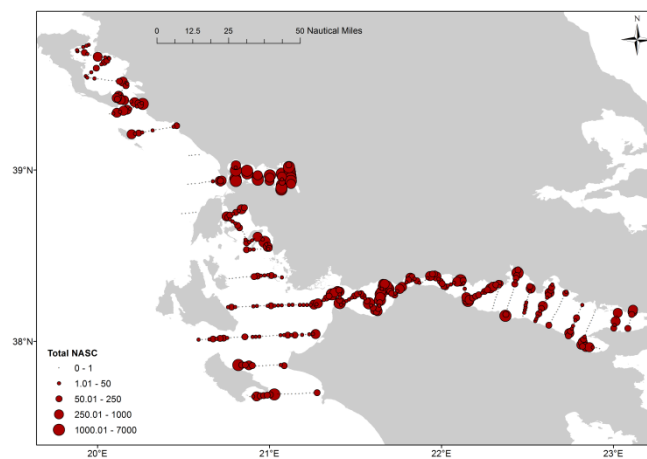
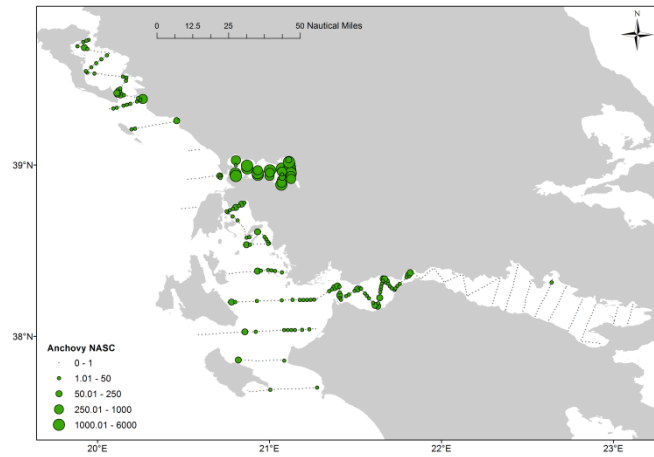


Figure 9 Acoustic transects sampled in the MEDIAS survey of the Hellenic part of Ionian Sea (GSA 20) in October 2019. The position of CTD and plankton stations sampled are also shown.

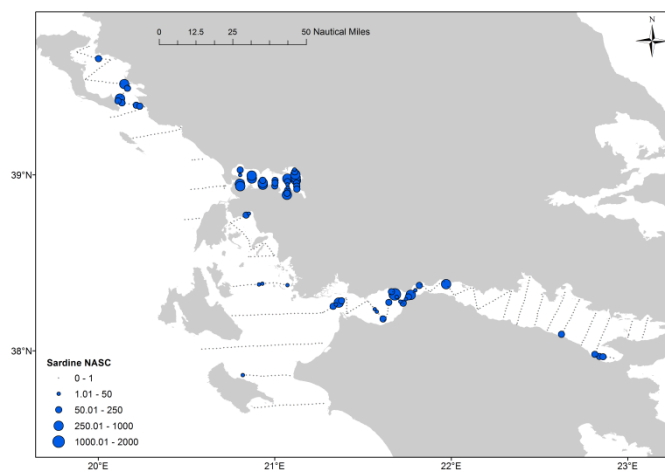
The acoustic sampling maps of the MEDIAS survey in the Greek section of the eastern Ionian Sea (GSA 20) are presented below.



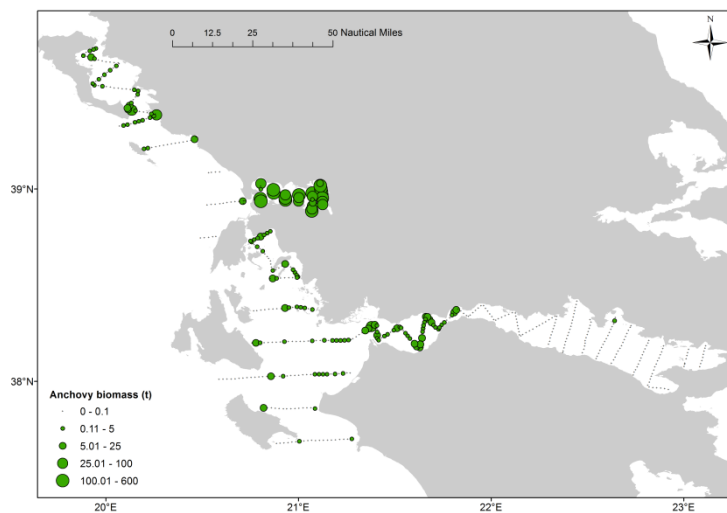
Distribution of the total fish NASC (m^2/nm^2) per EDSU in eastern Ionian Sea during October 2019



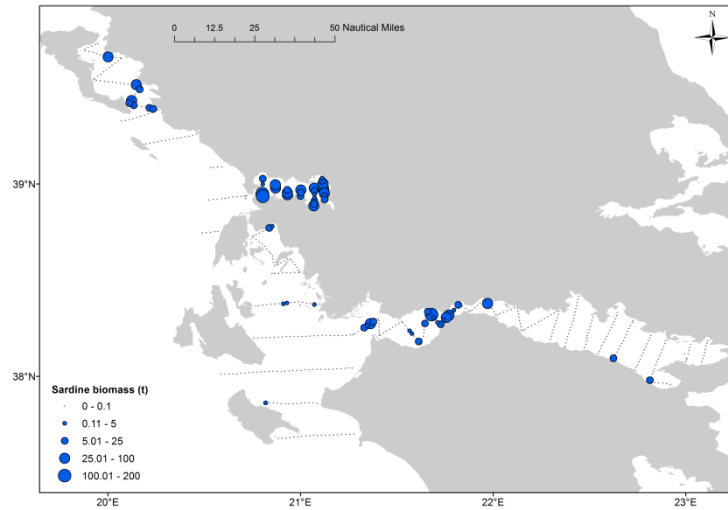
Distribution of anchovy NASC (m^2/nm^2) per EDSU in eastern Ionian Sea during October 2019



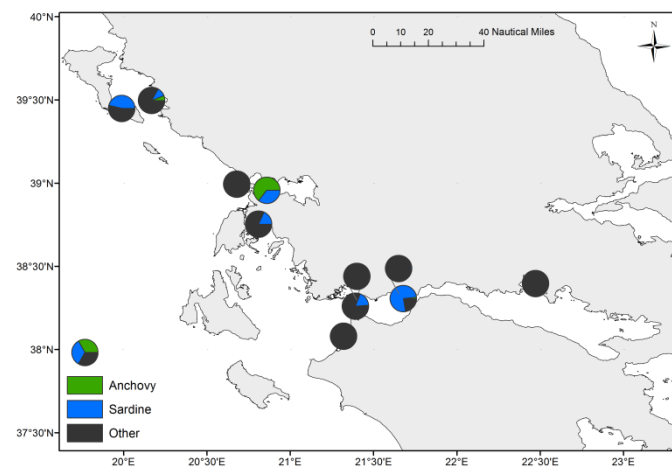
Distribution of sardine NASC (m^2/nm^2) per EDSU in eastern Ionian Sea during October 2019



Distribution of anchovy biomass (t) per EDSU in eastern Ionian Sea during October 2019



Distribution of sardine biomass (t) per EDSU in eastern Ionian Sea during October 2019



Catch compositions of the hauls (species kg/haul) weighted per hauling hour in eastern Ionian Sea during October 2019

Estimates for the Aegean Sea (GSA 22)

The following estimates and abundance indices for GSA 22 will be included in the 2019 fisheries data collection programme (DCF):

Anchovy and sardine:

- Number of individual fish by age
- Biomass by age per target species
- Number of individuals per length class
- Biomass per length class by target species

Biomass estimation of **anchovy** in Aegean Sea per length class based on the results of acoustic survey in 2019

Aegean Sea		
Total biomass (t): 18,333.56		
Length class	Number of individuals	Biomass (t)
45	229	0.09
55	114	0.09
65	114	0.15
75	0	0.00
85	4,765	14.67
95	240,024	1,055.48
105	815,860	4,945.33
115	897,482	7,282.85
125	218,676	2,318.47
135	128,551	1,744.46
145	52,206	890.88
155	3,836	81.08
Total	2,361,858	18,333.56

Biomass estimation of **anchovy** in Aegean Sea per age class based on the results of acoustic surveys in 2019

Aegean Sea		
Age	Number of individuals	Biomass (t)
0	5,223	15.00
1	2,058,401	14,721.10
2	295,748	3,555.04
3	2,486	42.42
4	0	0.00
Total	2,361,858	18,333.56

Biomass estimation of **sardine** in Aegean Sea per length class based on the results of acoustic survey in 2019

Aegean Sea		
Total biomass (t): 28,798		
Length class	No of individuals	Biomass (t)
55	828	1
65	4,140	7
75	13,049	36
85	55,742	229
95	234,321	1,385
105	407,016	3,337
115	131,917	1,457
125	232,545	3,373
135	774,090	14,442
145	183,636	4,328
155	6,155	180
165	642	23
Total	2,044,082	28,798

Biomass estimation of **sardine** in Aegean Sea per age class based on the results of acoustic surveys in 2019

Aegean Sea		
Age	Number of individuals	Biomass (t)
0	818,598	6,207.77
1	1,172,327	21,527.47
2	53,157	1,062.61
3	0	0.00
Total	2,044,082	28,798

Non-target species:

- Length-weight ratio (where a sufficient number of samples is available)
- Length frequency distribution

Length-weight relationships (TW (gr)- TL (mm)) for the main species in Aegean Sea

Species	Ionian Sea
Anchovy (<i>Engraulis encrasicolus</i>)	$TW = 1E-06 * TL^{3.3215}$
Sardine (<i>Sardina pilchardus</i>)	$TW = 8E-07 * TL^{3.4736}$
Round sardine (<i>Sardinella aurita</i>)	$TW = 6E-06 * TL^{3.0513}$
Mediterranean horse mackerel (<i>Trachurus mediterraneus</i>)	$TW = 1E-05 * TL^{2.9278}$
Bogue (<i>Boops boops</i>)	$TW = 3E-06 * TL^{3.2022}$

Estimates for the Ionian Sea (GSA 20)

The following estimates and abundance indices for GSA 20 will be included in the 2019 fisheries data collection programme (DCF):

Anchovy and sardine:

- Number of individual fish by age
- Biomass by age per target species
- Number of individuals per length class
- Biomass per length class by target species

Biomass estimation of **anchovy** in eastern Ionian per age class based on the results of acoustic surveys in 2019

Ionian Sea		
Age	Number of individuals	Biomass (t)
0	847,168	2,366.54
1	4,616,016	17,024.63
2	138,179	1,742.85
3	0	0.00
Total	5,601,363	21,134.02

Biomass estimation of **anchovy** in eastern Ionian per length class based on results of acoustic survey in 2019

Ionian Sea		
Total biomass (t):		
Length class	Number of individuals	Biomass (t)
55	26,901	24
65	0	0
75	275,441	581
85	2,866,696	8,621
95	1,879,608	7,752
105	367,163	2,012
115	12,854	91
125	34,522	310
135	93,558	1,046
145	14,874	204
155	29,748	493
Total	5,601,363	21,134.02

Biomass estimation of **sardine** in eastern Ionian Sea per length class based on results of acoustic survey in 2019

Ionian Sea		
Total biomass (t): 14,811.29		
Length class	No of individuals	Biomass (t)
85	57,171	241
95	226,392	1,351
105	399,318	3,258
115	545,533	5,912
125	232,386	3,267
135	24,432	437
145	1,227	27
155	11,521	317
Total	1,497,979	14,811.29

Biomass estimation of **sardine** in eastern Ionian per age class based on the results of acoustic surveys in 2019

Ionian Sea		
Age	Number of individuals	Biomass (t)
0	489,215	3,658.21
1	996,784	10,825.78
2	11,981	327.31
3	0	0.00
Total	1,497,979	14,811.29

Non-target species:

- Length-weight ratio (where a sufficient number of samples is available)
- Length frequency distribution

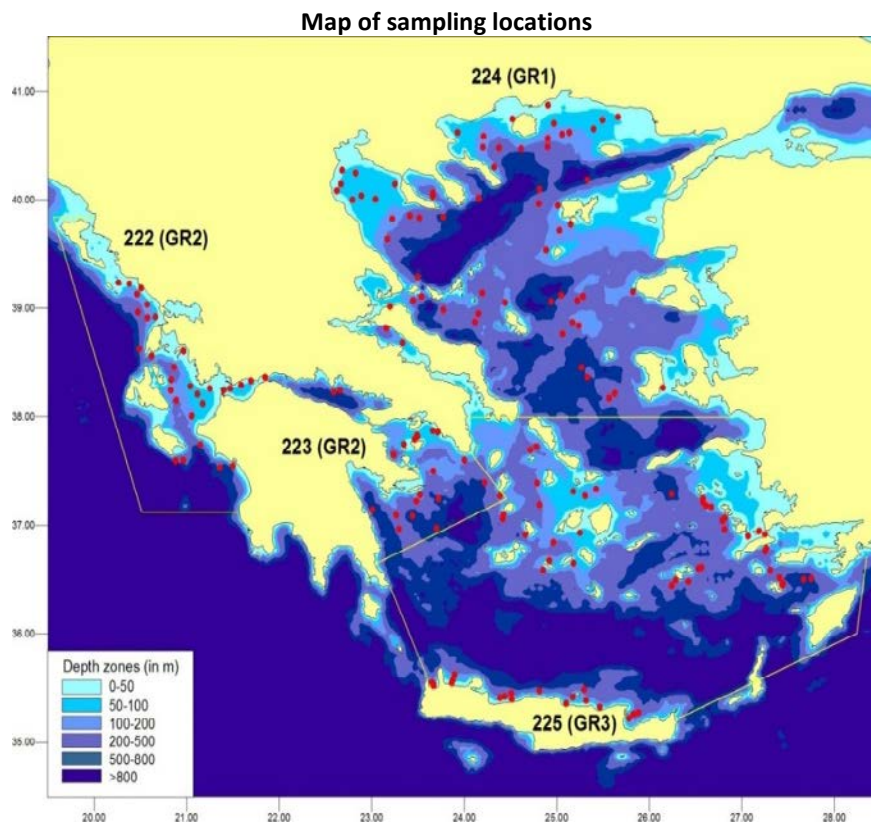
Length-weight relationships (TW (gr)- TL (mm)) for the main species in eastern Ionian Sea

Species	Ionian Sea
Anchovy (<i>Engraulis encrasicolus</i>)	$TW = 1E-05 * TL^{2.8151}$
Sardine (<i>Sardina pilchardus</i>)	$TW = 1E-06 * TL^{3.351}$
Round sardine (<i>Sardinella aurita</i>)	$TW = 6E-06 * TL^{3.0513}$
Mediterranean horse mackerel (<i>Trachurus mediterraneus</i>)	$TW = 1E-05 * TL^{2.9278}$
Bogue (<i>Boops boops</i>)	$TW = 3E-06 * TL^{3.2022}$

Demersal species

The MEDITS survey programme is conducted annually in several areas of the Mediterranean according to a standardised protocol, with the aim of coordinating all experimental sampling with bottom trawls (MEDITS) carried out across the Mediterranean. The main objective of MEDITS survey sampling is to monitor spatial and temporal variations in the abundance of demersal fish stocks.

The latest available experimental bottom trawl sampling data relates to **2018**, when sampling took place in all three management areas (GSAs) of Greek territorial waters (Ionian Sea, Aegean Sea and Cretan Sea). The results are summarised below.



The 2018 MEDITS sampling exercise involved scientists from the Fisheries Research Institute, based in Kavala, which conducted sampling in the northern and central Aegean Sea, and from the two branches of the Marine Biological Resources and Inland Waters Institute of the HCMR, i.e. (a) the Athens branch, which carried out sampling in the Argosaronic Gulf, the Gulf of Corinth and the Ionian Sea, and (b) the Crete branch, which carried out sampling in the southern Aegean Sea and the Cretan Sea. Three commercial trawlers with the required technical specifications were rented, through tendering procedures, to conduct the experimental sampling.

The Fisheries Research Institute carried out sampling in the northern and central Aegean with the vessel 'Megalochari N.Θ.1031' from 18 June to 16 July 2018. The sampling took place at 65 stations. The Crete Branch of the HCMR fisheries research institute carried out sampling in the southern Aegean Sea and the Cretan Sea with the vessel 'Nautilus N.X.154' from 22 June 2018 to 25 July 2018. The sampling took place at 61 stations. The Athens branch of the HCMR fisheries research institute carried out the sampling in the Argosaronic Gulf and the Ionian Sea with the vessel Takis-Mimis N.X.411 from 30 July to 7 September 2018. The sampling took place at the 70 planned stations and seven additional stations.

All the required data was collected during the experimental sampling, which covered depths from 10 to 800 meters divided into five zones (10-50 m, 50-100 m, 100-200 m, 200-500 m and 500-800 m). All fauna species were identified, measured and weighed. Biological parameters (individual length and weight, sex and reproductive maturity) were collected for the reference species, and basic environmental data (temperature, etc.) was recorded to help interpret the biological data.

Survey results

During the sampling, priority was given to collecting biological data for 83 species of fish, cephalopods and decapod crustaceans. The majority of these species were commercial, but some non-commercial species considered as 'ecological indicators' (e.g. certain elasmobranchs) were also included.

The list of species can be found in the MEDITS manual. The data collected allows the abundance index, i.e. the number and weight of individuals per square kilometre of surface area, to be calculated for each species and sampling station and the size composition of the populations of each species to be assessed.

The scope of action (landings, fishing effort) of the various métiers, as defined by the fishing gear used, varied both within and between GSAs 20, 22 and 23 in **2018**. Specifically, in GSA 20 the gear accounting for the most landings by weight on an annual basis was the trammel net (GTR), for which a total of 388,292 sea days were logged, followed by purse seines (PS) and bottom otter trawls (OTB), which also had significant landings (24,858,524 kg and 1,165,357 kg, respectively) but a lower fishing effort than trammel nets and other gear.

In GSA 22 purse seines accounted for the most landings by weight (24,858,524 kg), based on a total of 30,010 sea days, followed by bottom otter trawls with landings of 11,653,572 kg and 38,161 sea days.

Among the various types of gear used in GSA 23, trammel nets accounted for both the most annual total landings by weight (455,682 kg) and the largest fishing effort (51,787 sea days), followed by bottom otter trawls and purse seines, which also had significant landings (364,606 kg and 98,733 kg, respectively) but a lower fishing effort than trammel nets and other gear.

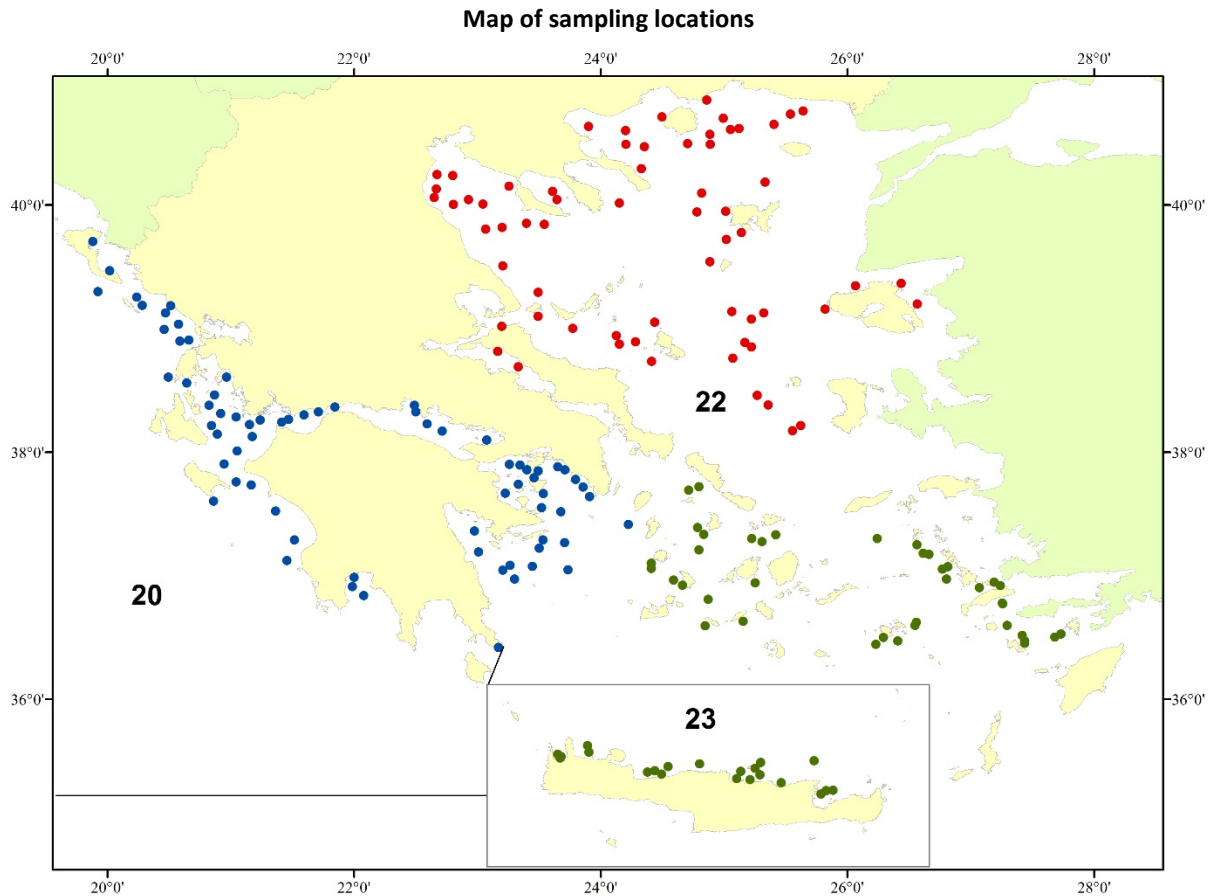
In conclusion, there is considerable variation between the three regions as regards the activity of the six métiers. GSA 22 has both the most landings and the highest level of fishing activity among the regions, with the exception of trammel nets in in GSA 20, which account for both the most landings and the largest fishing effort.

Landings and fishing effort by métier and GSA area

Flag country	GSA	Year	Fishing activity category Level 6	Specify MISC/OT H	Landings (kg)	Effort (days at sea)	Value (€)
GRC	GSA20	2018	FPO_DEF_0_0_0		208,666	8,400	1,314,597
GRC	GSA20	2018	GNS_DEF_>=16_0_0		911,647	95,536	7,694,312
GRC	GSA20	2018	GTR_DEF_>=16_0_0		2,756,993	388,292	25,150,833
GRC	GSA20	2018	LLS_DEF_0_0_0		195,035	54,732	1,800,231
GRC	GSA20	2018	OTB_DEF_>=40_0_0		1,004,705	5,695	9,262,965
GRC	GSA20	2018	PS_SPF_>=14_0_0		2,466,491	4,867	8,407,721
GRC	GSA20	2018	SB-SV_DEF_0_0_0		306,974	4,692	1,131,271
GRC	GSA22	2018	FPO_DEF_0_0_0		2,605,271	40,589	15,949,468
GRC	GSA22	2018	GNS_DEF_>=16_0_0		6,057,588	353,904	48,221,755
GRC	GSA22	2018	GTR_DEF_>=16_0_0		6,526,480	525,694	54,083,067
GRC	GSA22	2018	LLS_DEF_0_0_0		1,558,335	185,256	15,910,423
GRC	GSA22	2018	OTB_DEF_>=40_0_0		11,653,572	38,161	84,173,400
GRC	GSA22	2018	PS_SPF_>=14_0_0		24,858,524	30,010	83,982,985
GRC	GSA22	2018	SB-SV_DEF_0_0_0		612,484	10,463	2,654,338
GRC	GSA23	2018	GNS_DEF_>=16_0_0		45,792	8,063	476,762
GRC	GSA23	2018	GTR_DEF_>=16_0_0		455,682	51,787	3,969,140
GRC	GSA23	2018	LLS_DEF_0_0_0		22,298	14,503	152,907
GRC	GSA23	2018	OTB_DEF_>=40_0_0		364,606	1,514	3,024,779
GRC	GSA23	2018	PS_SPF_>=14_0_0		98,733	773	352,575
GRC	GSA23	2018	SB-SV_DEF_0_0_0		32,251	437	137,219

The **2019** MEDITS experimental sampling exercise with **bottom trawls** also took place in the three management areas (GSAs) of the Greek territory: the Ionian, Aegean and Cretan Seas.

The data collected is still being processed, but the sampling locations are shown below.



Estimates show that the hake stock is in a precarious state, with an F/F_{msy} ratio above 1 (maximum permissible exploitation ratio) according to the experts' preliminary assessment of data from the national fisheries data collection programme of previous years regarding the biological indicators for demersal species in the Aegean Sea (GSA 22).

An indicator value above 1 means that, on average, a fleet segment depends for its revenue on fishing opportunities which in structural terms have been set above levels of exploitation allowing maximum sustainable yields (MSY) to be achieved. This may be a sign of imbalance if it occurs for three successive years.

In accordance with the precautionary approach, which is a basic principle of the common fisheries policy, and to pursue the CFP objectives of conserving living aquatic resources, protecting marine ecosystems and promoting their sustainable exploitation, appropriate management measures should be taken based on adequate scientific evidence.

Reducing fishing capacity by scrapping vessels targeting this specific species among others, using nets and longlines and bottom otter trawls as fishing gear, could help achieve this objective.

In 2017, in line with the action plan submitted together with the 2016 fleet report, a significant number of vessels was selected for scrapping under the 'permanent cessation of fishing activities' measure provided for in the 2014-2020 fisheries and maritime operational programme.

The vessels were scrapped in 2018 and 2019.

The economic viability of the fleet segment consisting of **small coastal vessels** (less than 12 metres in length), irrespective of gear, has been analysed under the national fisheries data collection programme. The data available from the results of the analysis show that, in general, **based on the return on investment indicator versus the next best alternative (RoFTA), return on investment for this segment of the fleet is negative.**

According to the 'observation-based' technical indicator, small-scale coastal fishing was on a downward trend from 2009 to 2018, but 2019 saw a slight improvement.

Compared to **2009**, the indicator values for fleet segments VL0006, VL0612 and VL1218 had fallen by 13.49%, 13.68% and 33.08%, respectively in **2016**. In **2019**, on the other hand, the values fell by 15.82% and 9.07%, respectively, for fleet segments VL0006 and VL0612, whereas for VL1218 they increased by 10.70% yet remain low.

In **2019** the 'observation-based' indicator value for fleet segment **VL0006** was **0.64**, which is a slight improvement on 2018 (0.62) but still lower than in 2016 (0.66). This is a sign of continued under-exploitation ('red light') and possibly of redundant technical capacity.

For fleet segment **VL0612**, the indicator value for **2019** is **0.77**, which is also a slight increase compared to 2016 (0.73). The segment can be considered to have a largely homogenous activity level ('green light'), although it should be noted that the indicator value fluctuates at levels close to the 'red light' area.

The economic crisis in Greece (reduced fishing effort due to the cost of fuel and reduced sales prices for catches) is likely to have contributed to the above indicator values.

Another factor that is likely to have influenced the indicator's negative trend is the rising age of fishers, who may therefore be less able or motivated to make regular fishing trips. Trawlers in segment VL2440 and purse seiners in segments VL1824 and VL2440 achieved a **higher indicator value than in 2018**, continuing a positive trend, while for coastal vessels in segment VL0006 there is a slight improvement.

The economic crisis in Greece (reduced fishing effort due in particular to the cost of fuel and reduced sales prices for catches) is likely to have contributed to the above indicator values.

Another factor that is likely to have influenced the indicator's negative trend is the rising age of fishers, who may therefore be less able or motivated to make regular fishing trips.

VESSEL USE INDICATORS

Year	Fleet	Length	Technical indicator (observed)	Technical indicator (theoretical)
2019	OTB	VL1218 ¹	–	–
		VL1824	0.71	0.65
		VL2440	0.91	0.88
	PS	VL1218	0.75	0.60
		VL1824	0.87	0.81
		VL2440	0.99	0.96
	Coastal	VL0006	0.64	0.43
		VL0612	0.77	0.64
		VL1218	0.39	0.32
2018	OTB	VL1218	0.32	0.23
		VL1824	0.77	0.71
		VL2440	0.82	0.78
	PS	VL1218	0.38	0.28
		VL1824	0.59	0.54
		VL2440	0.78	0.69
	Coastal	VL0006	0.62	0.46
		VL0612	0.71	0.61
		VL1218	0.50	0.39
2016	OTB	VL1218	0.34	0.25
		VL1824	0.80	0.73
		VL2440	0.84	0.80
	PS	VL1218	0.40	0.30
		VL1824	0.58	0.53
		VL2440	0.79	0.68
	Coastal	VL0006	0.66	0.45
		VL0612	0.73	0.59
		VL1218	0.24	0.20
2015	OTB	VL1218	0.41	0.25
		VL1824	0.83	0.74
		VL2440	0.86	0.81
	PS	VL1218	0.41	0.32
		VL1824	0.65	0.55
		VL2440	0.88	0.71
	Coastal	VL0006	0.68	0.43
		VL0612	0.75	0.56
		VL1218	0.25	0.19

¹ The indicator is not suitable for statistical use as the segment includes only five vessels with a very low level of activity.

2014	OTB	VL1218	0.36	0.23
		VL1824	0.74	0.68
		VL2440	0.76	0.75
	PS	VL1218	0.36	0.29
		VL1824	0.61	0.50
		VL2440	0.73	0.64
	Coastal	VL0006	0.72	0.41
		VL0612	0.81	0.53
		VL1218	0.34	0.18
2013	OTB	VL1218	0.38	0.24
		VL1824	0.77	0.70
		VL2440	0.77	0.79
	PS	VL1218	0.38	0.30
		VL1824	0.63	0.51
		VL2440	0.74	0.66
	Coastal	VL0006	0.75	0.42
		VL0612	0.83	0.55
		VL1218	0.35	0.19
2012	OTB	VL1218	0.37	0.24
		VL1824	0.77	0.71
		VL2440	0.79	0.76
	PS	VL1218	0.38	0.30
		VL1824	0.63	0.52
		VL2440	0.75	0.66
	Coastal	VL0006	0.75	0.42
		VL0612	0.85	0.56
		VL1218	0.36	0.19
2011	OTB	VL1218	0.38	0.24
		VL1824	0.77	0.70
		VL2440	0.78	0.76
	PS	VL1218	0.37	0.30
		VL1824	0.63	0.53
		VL2440	0.74	0.68
	Coastal	VL0006	0.75	0.43
		VL0612	0.85	0.56
		VL1218	0.35	0.19
2010	OTB	VL1218	0.37	0.24
		VL1824	0.76	0.72
		VL2440	0.80	0.79
	PS	VL1218	0.37	0.30
		VL1824	0.64	0.51
		VL2440	0.76	0.66
	Coastal	VL0006	0.76	0.42
		VL0612	0.84	0.54
		VL1218	0.35	0.19

2009	OTB	VL1218	0.38	0.24
		VL1824	0.76	0.72
		VL2440	0.78	0.78
	PS	VL1218	0.37	0.30
		VL1824	0.64	0.53
		VL2440	0.74	0.68
	Coastal	VL0006	0.76	0.43
		VL0612	0.85	0.56
		VL1218	0.35	0.19

Information from the report on the implementation of the landing obligation

The following information concerning Greek-registered vessels was submitted for the purposes of the 2019 report on the implementation of the landing obligation to be drawn up by the European Commission in accordance with Regulation (EU) 2015/812:

I. For 2019:

(a) Small pelagic species for which a minimum size is laid down in Annex III to Regulation (EC) No 1967/2006, specifically anchovy, sardine, mackerel and horse mackerel:

Commission Delegated Regulation (EU) No 1392/2014 established a discard plan, including *de minimis* exemptions under Article 15(5)(c) of Regulation (EU) No 1380/2013, subsequently replaced by Regulation (EU) 2018/161.

Under the discard plan it is permitted, by way of derogation from Article 15(1) of Regulation (EU) No 1380/2013, to discard up to 3% of the total annual catches of the aforementioned species fished using purse seines in the Ionian Sea. The same derogation applies to the same species caught using purse seines in the Aegean Sea and off Crete.

(b) Bluefin tuna, for which a catch limit applies:

Fishing vessels targeting bluefin tuna are allowed, under a derogation from Article 15(2) of Regulation (EU) No 1380/2013 laid down by Commission Delegated Regulation (EU) 2015/98, to retain on board, tranship, transfer, land, transport, store, sell, etc. by-catches of up to 5% of the total tuna catch per landing, in terms of the number of individuals, subject to a minimum size (between 8 kg/75 cm and 30 kg/115 cm).

(c) Certain benthic species [*sic*] typically caught:

A discard plan with *de minimis* exemptions is in place under Commission Delegated Regulation (EU) 2017/86, as amended by Regulation (EU) 2018/2036.

Under the discard plan it is permitted, by way of derogation from Article 15(1) of Regulation (EU) No 1380/2013, to discard up to 6% of the total catches in 2019 of the aforementioned species fished using bottom otter trawls in the Ionian Sea. The same derogation applies to the same species caught using bottom otter trawls in the Aegean Sea and off Crete. In addition, a derogation for the same areas and species allows discards of up to 1% of the total annual

catches of coastal vessels fishing with gillnets and trammel nets or a combination of these (GTN, GNS, GTR).

(d) Swordfish, for which a catch limit applies:

Since 1 January 2017 there has been a catch limit on Mediterranean swordfish (MedSWO) (ICCAT Recommendation 16-05). It allows fishing vessels targeting Mediterranean swordfish to retain on board, tranship, transfer, land, transport, store, sell, etc. by-catches of swordfish of up to 5%, by weight or by the number of individual swordfish in the total catch per landing, of below the minimum size of 11.4 kg (whole weight) or 10.2 kg (gilled and gutted weight) or less than 100 cm in length. The above provisions of ICCAT Recommendation 16-05 were incorporated into EU law by Regulation (EU) 2018/191.

(e) Certain demersal species:

A discard plan with *de minimis* exemptions is in place under Delegated Regulation (EU) 2018/2036. Under the discard plan it is permitted, by way of derogation from Article 15(1) of Regulation (EU) No 1380/2013, to discard up to 5% of the total catches in 2019 of the aforementioned species fished using bottom otter trawls in the Ionian Sea.

The same derogation applies to the same species caught using trawlers in the Aegean Sea and off Crete. In addition, a derogation for the same areas and species allows discards of up to 3% of the total annual catches of coastal vessels fishing with gillnets and trammel nets or a combination of these (GTN, GNS, GTR) and up to 1% of the total annual catches of coastal vessels fishing with hooks and lines (LLD, LLS, LHM, LHP, LTL).

All undersized catches of Norway lobster caught with bottom trawls and traps, crawfish and lobster caught with traps or with gillnets and trammel nets (or a combination of these) can also be discarded.

Finally, it is permitted to discard up to 5% of undersized individuals in by-catches of sardine, anchovy, mackerel and horse mackerel caught by bottom trawls.

II. Data collection

ERS data

The electronic recording system (ERS) allows normal catches and any undersized catches (in terms of quantities or, where required, individuals) to be recorded in the fishing logbook and the landing declaration (creation of different lots). Specifically for bluefin tuna (BFT), records are based on the weight and length of each individual. The following data is extracted from the ERS:

i) Species subject to a catch limit

a) Bluefin tuna (BFT)

According to the preliminary ERS data available, in 2019 the quantities (live weight) of normal and undersized individuals of bluefin tuna were as follows:

Total weight (kg) (Weight_Q)	312,692
Total number of individuals	5,738
Weight (kg) of normal individuals (larger than the minimum)	306,705
Number of individuals	5,517
Percentage of total weight	98.09%
Percentage of all individuals	96.15%
Weight of undersized individuals	5,987
Number of individuals	221
Percentage of total weight	1.91%
Percentage of all individuals	3.85%

b) Swordfish (SWO)

According to the preliminary ERS data available, the (landed) quantities of normal and undersized individuals of swordfish were as follows in 2019:

Total weight (kg)	744,791
Total number of individuals	41,615
Weight (kg) of normal individuals (larger than the minimum)	743,678
Percentage of total weight	99.85%
Weight of undersized individuals	1,113
Percentage of total weight	0.15%

All tuna and swordfish catches are inspected by the competent port authorities.

ii) Small pelagic species

According to the available (preliminary) ERS data, the catches and total declared discards of anchovy, sardine, mackerel and horse mackerel were as follows in 2019 (based, however, on an insufficient number of recorded quantities of undersized individuals from both landings and discards):

Species	Code	Catches (kg)	Discards (kg)	Percentage (%)
Anchovy	ANE	21,298,447	1,478	0.007
Horse mackerel	JAX	1,984,018	2,155	0.109
Mackerel	MAC-MAS	2,771,109	163	0.006
Sardine	PIL	17,461,662	11,149	0.064

iii) Benthic species typically caught

According to the available (preliminary) ERS data, the catches and total declared discards of hake, striped mullet and giant red shrimp were as follows in 2019 (based, however, on an insufficient number of recorded quantities of undersized individuals from both landings and discards):

Species	Code	Catches (kg)	Discards (kg)	Percentage (%)
Hake	HKE	2,754,612	1,121	0.041
Striped mullet	MUT	1,434,395	3,937	0.274
Giant red shrimp	DPS	2,661,861	0	0.000

iv) Other demersal species

In **Table 1** below, catch data are presented, in kilograms by species and gear, for 31 species and 11 types of gear for which derogations from the landing obligation were in place in 2019, as well as the total catches and total declared species by gear for vessels keeping an electronic fishing logbook (ERS), regardless of vessel length.

FAO code	FPO	GNS	GTN	GTR	LHM	LHP	LLD	LLS	LTL	OTB	PS	Total nets	Total lines	OTB+ PS	All gears
ANE		28	28	20						807,333	20,491,114	76		21,298,447	21,298,523
ANN	49	1,283	1,008	965		4		59		618	14,798	3,255	63	15,416	18,734
BFT					30,766	46,832	234,124	970					312,692	0	312,692
BSS		649	674	416		3		28		6,021	1,555	1,739	31	7,576	9,346
CTB		337	3,545	3,375				30		1,267	11,810	7,257	30	13,077	20,364
DPS		10		52						2,661,861	144	62		2,662,005	2,662,067
EEA		39	807	940		14	57	5,678	95	238		1,786	5,844	238	7,868
EFJ								41		214			41	214	255
GPD	8	160	258	658			96	6,854	25	526	23	1,076	6,975	549	8,599
GPW		315	170	499		21	43	2,737	221	15,076	463	984	3,022	15,539	19,545
HKE		66,651	4,963	13,062	5	2	939	135,375	1,382	2,666,937	111	84,675	137,703	2,667,048	2,889,427
JAX	14	18,436	9,246	6,003		11		96		627,189	1,356,829	33,685	107	1,984,018	2,017,811
LBE	1		1	85						193		86		193	279
MAC		1,307	25	3,796				17		153,578	84,680	5,128	17	238,258	243,403
MAS		7,798	2,719	5,266		1,541		21		37,631	2,495,220	15,782	1,562	2,532,851	2,550,195
MUR	69	9,872	4,047	43,010			16	211		396,343	2,684	56,930	227	399,027	456,184
MUT	40	13,506	1,519	10,834				33		1,408,536	1,758	25,859	33	1,410,294	1,436,186
NEP	630	287	92	56,625			3			202,127		57,005	3	202,127	259,135
PAC	82	3,768	1,933	6,127			40	3,511		277,771	12,484	11,828	3,551	290,255	305,634
PIL		8,581	5,748	456						237,173	17,224,489	14,785		17,461,662	17,476,447

RPG	161	7,005	1,378	6,349	14	211	418	46,702	80	30,177	15,645	14,732	47,425	45,822	107,979
SBA	84	1,607	278	8,348				2,336		19,094	1,296	10,233	2,336	20,390	32,959
SBG	102	1,588	1,853	5,392	176	91		2,393		68,729	146,398	8,834	2,660	215,127	226,621
SBR		27		93	399			74		4,722	6,184	120	473	10,906	11,499
SHR		14	945	24						121	8,327	983		8,448	9,431
SLO	154	1,620	3,024	105,809				58		526	4	110,453	58	530	111,041
SOL		1,788	102	7,365				2		71,252	10	9,255	2	71,262	80,520
SSB		24	1,700	1,582						384	19,496	3,306		19,880	23,186
SWA	339	383	749	2,035		45	5	4,495	2	2,721	12,375	3,166	4,547	15,096	22,809
SWO		218	614	144	127	429	735,562	7,007	410		234	976	743,535	234	744,745
WRF		60	30	520			27	1,436	19	842		610	1,482	842	2,933
Total quantity per gear	168,403	275,859	157,810	637,696	32,483	78,343	1,309,567	287,755	7,827	19,196,942	50,118,840				
Vessels per gear	50	195	84	320	30	44	155	219	32	217	221				
Total number of species per gear	28	123	100	151	19	35	53	101	28	171	113				

v) Discards declared in the Integrated Fisheries Monitoring System (IFMS)

Table 2 below shows (ERS) discard data declared in the IFMS.

TABLE 2

FAO code	Common name	Quantity (kg)	Number of vessels	Months in which declarations were made
ANE	Anchovy	1,478	2	June, October, November, December
ANN	Annular seabream	232	2	all months except September
BSS	Seabass	60	2	November
GPW	White grouper	1	1	September
HKE	Hake	1,121	4	all months except June
JAX	Horse mackerel	2,155	6	all months
MAS	Spanish mackerel	163	3	January, June, October
MUR	Red mullet	345.5	8	all months
MUT	Striped mullet	3,937	4	all months except June
NEP	Norway lobster	3	1	May, September
PAC	Common pandora	1,926	6	all months except August and September
PIL	Sardine	11,149	6	all months except April, July, August, September
RPG	Common sea bream	16	1	November
SBA	Spanish sea bream	404	3	all months except April, May, June, September
SBG	Gilthead bream	541	2	all months except June, July, August, September
SLO	Common spiny lobster	21	6	May, June
SOL	Common sole	16	2	February, March, October, November, December
SWA	White sea bream	7	1	July
SWO	Swordfish	7	8	June, September

IV. The derogations in place have the effect of minimising the socio-economic impact and the impact of the landing obligation on the security of vessels flying the Greek flag (separate stowage and storage of undersized fish; extra staff to manage it, etc.).

As regards port infrastructure and the equipment on board vessels, catches by purse seiners, trawlers and surface longliners are landed in designated ports, as provided for by Article 22 of Regulation (EC) No 1967/2006, with the exception of the quantities which, by way of derogation, are allowed to be discarded. The same applies to catches of bluefin tuna

(Article 30 of Regulation (EU) 2016/1627) and swordfish (paragraph 31 of Recommendation 16-05 and Article 23 of Regulation (EU) 2019/1154), with the exception of discards.

Undersized bluefin tuna, defined as 8-30 kg in weight or 75-115 cm in length, and swordfish of less than 11.4 kg or 100 cm, may be sold provided that the necessary conditions laid down in Regulation (EU) 2016/1627 are met for bluefin tuna and in Recommendation 16-05 and Regulation (EU) 2019/1154 for swordfish.

3. REDUCTION IN FISHING CAPACITY

In recent years the overall number of Greek fishing vessels has dropped significantly, and this downward trend continues even today.

Generally speaking, the main reason the Greek fleet has been shrinking over the past years is that vessels have been withdrawn with financial support under Council Regulation (EC) No 1198/2006.

In 2017, in line with the action plan submitted together with the 2016 fleet report, a significant number of vessels was selected for scrapping under the 'permanent cessation of fishing activities' measure provided for in the 2014-2020 fisheries and maritime operational programme.

The actual scrapping mainly took place in 2018 but continued in 2019. According to data provided by the special managing authority for the 2014-2020 fisheries and maritime operational programme and the corresponding entries in the national register of fishing vessels, **12 fishing vessels were withdrawn from the Greek fishing fleet with financial support in 2019**, leading to a reduction in the fleet's fishing capacity.

Specifically, in 2019 the fleet's fishing capacity was reduced by 67.31 GT and 779.19 kW due to withdrawal with financial support.

Of the 12 vessels concerned, **four** were scrapped (**DES**), reducing capacity by 18.40 GT and 361.67 kW, while the other **eight** have been kept as traditional fishing boats without any fishing activity in the context of protecting Greece's cultural heritage (**RET**), reducing capacity by 48.91 GT and 417.52 kW.

Overall, **between 1 January 2003 and 31 December 2019** the Greek fishing fleet was reduced by **3,330 vessels (17,56%)** through the permanent cessation of fishing activity (**DES**), with or without financial assistance. As a result, fishing capacity fell by **31.26%** in gross tonnage (GT) and **28.32%** in engine power (kW).

In its management of fishing fleet capacity, Greece ensures, as required by the common fisheries policy, that the reference levels for engine power (kW) and tonnage (GT) are not exceeded.

Any new fishing capacity added to the fleet without financial support is always accompanied by the mandatory withdrawal of corresponding capacity without financial support.

4. COMPLIANCE WITH THE ENTRY-EXIT REGIME AND REFERENCE LEVELS

To assess compliance with the entry/exit regime provided for in Article 7 of Regulation (EC) No 1013/2010, we provide the following tables showing the calculation of the baseline for the regime and the reference levels as at **31 December 2019**, based on the most recent update of the national register of fishing vessels kept by the Fisheries Control Directorate of the Ministry of Shipping and Island Policy.

A. Calculation of the 1 January 2003 baseline (GT₀₃ and kW₀₃)

GT _{FR} (1.1.2003)	GT ₁	GT ₂	GT ₃	GT ₄	GT ₀₃
101,401	0	0	4,526	0	105,927

kW _{FR} (1.1.2003)	kW ₁	kW ₂	kW ₃	kW ₄	kW ₀₃
588,554	0	0	1,234	0	589,788

B. Management of entries/exits, as at 31 December 2019

		GT		kW	
1	Fishing capacity as at 1.1.2003	GT _{FR}	101,401	kW _{FR}	588,554
2	Fishing capacity under the entry-exit regime	GT ₀₃	105,927	kW ₀₃	589,788
3	Entry of vessels of over 100 GT with public support	GT ₁₀₀	0	kW ₁₀₀	0
4	Other entries or capacity increase (not included in 3 or 5)		12		85
5	Increase in GT tonnage for safety reasons	GT _S	13		
6	TOTAL ENTRIES (3+4+5)		25		85
7	Exit with public support before 1.1. 2007	*GT _{a1}	11,339	kW _{a1}	60,827
8	Exits with public support after 1.1.2007	*GT _{a2}	19,897	kW _{a2}	104,026
9	Other exits (after 1.1.2003 not included in 7 or 8)		513		2,249
10	TOTAL EXITS (7+8+9)		31,749		167,102
11	Engine power replaced with public support subject to a reduction in power			kW _r	0
12	Fleet fishing capacity as at 31.12.2019 (1+6-10)	GT _t	69,677	kW _t	421,537
13	Upper limit (ceiling) as at 31.12.2019		75,614		424,935

Rows 1, 3, 4, 5, 7, 8, 9, 11, 12: data from the national register of fishing vessels

Row 13: GT ceiling = 2-35%3+5-99%7-96%8 and kW ceiling = 2-35%3-7-8-20%11

According to the above table, in terms of the difference between the capacity ceiling and fishing capacity as at 31 December 2019, the Greek fleet has **available fishing capacity** equivalent to **5,937 GT** and **3,398 kW**.

C. Reference levels as at 31 December 2019

		GT		kW	
1	Reference levels as at 1.1.2003	R(GT) ₀₃	119,910	R(kW) ₀₃	653,497
2	Entry of vessels of over 100 GT with public support	GT ₁₀₀	0	kW ₁₀₀	0
3	Tonnage increase in GT for safety reasons	GT _s	13		
4	Exit with public support up to 31.12.2006	GT _{a1}	11,339	kW _{a1}	60,827
5	Exit with public support after 1.1.2007	GT _{a2}	19,897	kW _{a2}	104,026
6	Engine power replaced			kW _r	0
7	Fleet fishing capacity as at 31.12.2019	GT _t	69,677	kW _t	421,537
8	Reference levels as at 31.12.2019	R(GT) _t	89,597	R(KW) _t	488,644

Situation according to the data in the national register of fishing vessels

Row 8: $R(GT)_t = 1 - 35\% \cdot 2 + 3 - 99\% \cdot 4 - 96\% \cdot 5$ and $R(kW)_t = 1 - 35\% \cdot 2 - 4 - 5 - 20\% \cdot 6$

Note that the national register is updated by entering data from a large number of local port authorities; any changes approved by the administration may therefore appear in the Union fishing fleet register with a certain delay. The process is being constantly improved to minimise delays.

The above table shows the Greek fishing fleet was in compliance with the reference levels as at 31 December 2019.

It is also clear from the table that the fishing capacity of the Greek fleet does not exceed the maximum fishing capacity limits laid down in Annex II to Regulation (EU) No 1380/2013 (84,123 GT and 469,061 kW).

It should also be noted that a number of fishing vessels that appear as active in the national register have been found to be inactive and are gradually being removed from the register. This is a rather lengthy procedure, but once completed the above fleet capacity will have been further reduced.

5. FLEET MANAGEMENT SYSTEM

The Greek fishing fleet is the largest in the EU in terms of numbers. It is mainly made up of small coastal vessels that mostly fish with selective gear, although the gear varies significantly depending on time and location.

Inspecting the fishing activity of small coastal vessels is particularly challenging and costly, as vessels are spread widely across the country's coastal and island regions.

To ensure compliance with the requirements of the revised common fisheries policy and the provisions on the control of fishing activities (Council Regulation (EC) No 1224/2009), the organisational structure of the inspection services is frequently updated with a view to modernising the national penalty system and improving and/or extending the use of new technologies.

The action plan on inspections launched in 2011 focuses on the following priority areas:

- modernising the structure and organisation of inspection authorities and improving their coordination; participation of fishery authorities in inspections, especially in markets, and therefore increasing the number of inspectors and means of inspection (patrol vessels); providing information and training to inspectors;
- updating fishery legislation;
- using IT and modern technology systems to ensure the completeness and reliability of data on vessel fishing activities, inspections, the point system, exchange of data with other Member States and its use in real time, improving the monitoring and control system for tuna catches and implementing the monitoring and control system for swordfish catches;
- financing actions, systems, means, operators' equipment and training of inspectors;
- designing and implementing control programmes as regards tuna and swordfish, fishing activities and marketing, and performing administrative checks on the import and re-export of fishery products from and to third countries.

6. ADAPTING ADMINISTRATIVE FLEET MANAGEMENT PROCEDURES

Since 2015 improvements have been made with respect to the organisational structure and competences of the single control authority and the fisheries inspection authorities of this Ministry and the Ministry of Shipping and Island Policy: upgrade of the fisheries monitoring centre (FMC); full operation of the integrated fisheries monitoring system (IFMS) for the electronic registration and monitoring of data on fishing activities and marketing, which is currently being extended and upgraded; continued procurement and financing of VMS and ERS equipment for fishing vessels; preparation and/or harmonisation with EU rules on marketing control and the setting up of a points system; implementation of electronic registration and monitoring of tuna catches and information/training on new systems provided to users at inspection authorities and other institutions.

Action was also taken with regard to:

- inspection and control programmes relating to fishing activities on board the vessels, in port, at ports where fish products are landed and traded and in auction halls operating throughout Greece. Where infringements were found, penalties were imposed as provided

for in each case, such as fines, suspension of the vessel's and master's fishing licence for a certain number of days and confiscation of products;

- a special control and inspection programme for tuna and participation in the joint deployment programme coordinated by the European Fisheries Control Agency (EFCA), performing checks and inspections on fishing activities carried out by fishing vessels and other economic operators and implementing joint inspection and monitoring activities. The aforementioned actions required a sufficient number of operational means (sea/air/land) and a corresponding number of inspectors, responsible for the monitoring, control and surveillance of fishing activities.

Improving the management system

Apart from setting up and operating an effective and reliable management system, which has largely been achieved, improving the management of the fishing fleet also requires continuous recording of data to allow management measures to be designed in such a way that they respond to actual needs.

One problem encountered in our endeavours to improve the management of the fishing fleet is that – due to the delay in implementing the national fisheries data collection programme over the past few years – the available data is not complete because it does not include the time series required for full scientific documentation.

This problem persists, although the situation is constantly improving.

*In particular, due among other things to the administrative procedure in place for submitting and taking receipt of the relevant report, the results from the previous year are **not available at the time of assessing the situation of the fleet**. This means that the action plan is not included when the annual fleet report is submitted, although the results are then assessed to draw up the relevant measures.*

In view of this, please note that the financial results and economic indicators presented in this analysis have been calculated on the basis of the latest available information, obtained from a survey collecting socio-economic data.

Under Commission Decision 2010/93/EU and the national fisheries data collection programme, data on the value of landings (weight and price of catches) and the fishing effort (days at sea) must be collected on a monthly basis using the transversal variables methodology.

Due to the delay in implementing the national programme in previous years, the data in question is incomplete as neither the recorded landings nor the fishing effort correspond to a full year. The data cannot, therefore, be fully relied on to draw up the relevant chapter.

This issue has been raised in earlier STECF reports², which highlight the difficulties, in terms of further analysis, created by the fact that the data submitted by Greece is incomplete.

Data on the value of landings collected by means of the socio-economic questionnaire cannot be used in those reports since it is not collected in line with the transversal variables methodology.

CHAPTER II SOCIO-ECONOMIC DATA CONCERNING THE SEA FISHING INDUSTRY

This report presents the most recent data available, based on the **2019 report** of the national fisheries data collection programme combined with an analysis of data from previous years.

The economic indicators for the Greek sea fishing fleet presented below were calculated on the basis of economic data collected under the national programme for the collection, management and use of fisheries data and **pertain to 2018**.

The detailed economic data used to calculate the economic indicators, as submitted to the Ministry of Rural Development and Food, was included in the 2019 annual report for that programme.

The socio-economic data collected mainly concerns fishing vessel expenditure, in particular on energy (cost of fuel) and labour costs. Labour costs are made up of crew salaries and wages and the imputed value of unpaid labour carried out on board by the vessel's owner(s).

Data on repair and maintenance costs, variable costs other than fuel and labour costs (such as expenses for food and bait, marketing costs etc.), non-variable costs (accountant fees, vessel insurance costs, etc.) and the cost of annual depreciation is also collected.

² See the 2016 report: Scientific, Technical and Economic Committee for Fisheries (STECF), The 2016 Annual Economic Report on the EU Fishing Fleet (STECF 16-11); Publications Office of the European Union, Luxembourg, EUR 27428 EN, JRC 97371, 434 pp.

II. ASSESSMENT OF THE FISHING SECTOR

A.1: Economic and cross-cutting variables

A.1.a: Socio-economic data on the sea fishing sector^{3,4}

A.1.a.1 Introduction

Collection of economic variables

Socio-economic data on the sea fishing sector for the 2018 reference year was collected in the context of the 2017-2019 national fisheries data collection programme in accordance with the requirements of Regulation (EC) No 1004/2017 and Implementing Decision 2016/1251. The data collected mainly relates to fishing vessel expenditure, in particular on energy (cost of fuel) and labour costs. Labour costs are made up of crew salaries and wages and the imputed value of unpaid labour carried out on board by the vessel's owner(s).

Data on repair and maintenance costs, variable costs other than fuel and labour costs (such as expenses for food and bait, marketing costs etc.), non-variable costs (accountant fees, vessel insurance costs, etc.) and the cost of annual depreciation is also collected. Economic data collected under the national programme includes the value of physical capital and investments in physical capital in the reference year (2018). Moreover, data is collected on employment in fisheries (engaged crew and national/harmonised full-time equivalents (FTE)).

The economic variables were collected by means of a structured questionnaire, as described in detail in the deliverable 'Instructions for filling in the socio-economic questionnaire on the sea fishing sector and for entering the data in the database, 2018'. The data was collected from a sample of vessels selected using the sampling method set out in the national work plan, as summarised in the following paragraph. Data on the fishing fleet's annual fuel consumption, which is a transversal variable, is also collected by means of the socio-economic questionnaire.

The results of the collection of socio-economic data on sea fishing are presented below, including a description of how businesses in the fishing fleet are structured in terms of how many vessels they own. Data regarding the number of vessels per category, the average total length of vessels (in metres), gross tonnage (GT), total engine power (kW) and the average age of vessels (in years) is also assessed and presented as transversal variables. The variables are calculated on the basis of entries in the vessels register in the reference year.

Moreover, this report presents data on the revenue of fishing vessels, in particular the gross value of landings and revenue from direct subsidies⁵. The variables (a) 'gross value of landings', (b) 'average value by species caught' and (c) 'days at sea' are transversal variables collected on a monthly basis per fish species. Moreover, for purse seiners (PS) and trawlers (DTS 1824 and DTS 2440) the data presented is derived from IFMS data processed with the assistance of industry experts.

³ This chapter was co-authored by the Agricultural Economics Research Institute (AGRERI). Scientific supervisor: Dr Eirini Tzouramani, External contributors: Dr Angelos Lionakis, Stamatias Mantziaris, Researcher: Dr Alexandra Sintori, AGRERI employee: Magdalena Bardounioti.

⁴ We would like to thank the researchers who collected the socio-economic data for their assistance and cooperation as well as for their observations and comments. We also thank the fishers who participated in the survey for their availability and cooperation with the researchers.

⁵ Note that data on revenue from the renting of quotas or other fishing rights is also collected under the programme; however, this type of revenue is statistically negligible in Greece.

In the following paragraphs, socio-economic data on Greece's sea fishing sector is initially presented for the entire fleet. The data is then broken down by small-scale and large-scale fishing and by each stratum of the fishing fleet (based on the vessels' length class and main gear). The conclusions drawn from the analysis of the economic data are set out at the end of the chapter, highlighting the most important issues encountered in implementing the survey.

Sampling

The fishing vessel register, which in 2018 included 14,234 vessels, was used as a sampling basis for the selection of the sample of vessels from which economic data was collected. The sample was selected by stratified random sampling. The population was stratified by means of two variables: vessel length and main fishing gear. Table A.1.a.1 shows the stratification of the population based on the aforementioned variables.

Table A.1.a.1. Sampling basis: Stratification of the fleet according to vessel length and main fishing gear

Main fishing gear	Length	Population
Nets	<6	3,645
Nets	>=6 <12	5,744
Nets	>=12 <18	108
Pots and traps	<6	66
Pots and traps	>=6 <12	307
Longlines	<6	1,521
Longlines	>=6 <12	2,001
Longlines	>=12 <18	163
Dredges	>=6 <12	46
Winch trawl	>=6 <12	116
Winch trawl	>=12 <18	28
Bottom trawl	>=18 <24	99
Bottom trawl	>=24 <40	144
Purse seines	>=12 <18	85
Purse seines	>=18 <24	134
Purse seines	>=24 <40	27
TOTAL		14,234

Table A.1.a.2 shows the number of active vessels in the sample and the number of questionnaires collected per stratum. Note that in most categories the coverage rate in the sample is sufficient for the purposes of the survey.

Table A.1.a.2. Number of vessels in the sample and collected questionnaires by stratum

Main fishing gear	Length	Number of active vessels	Collected questionnaires
Nets	<6	3,294	59
Nets	>=6 <12	5,162	248
Nets	>=12 <18	106	46
Pots and traps	<6	61	11
Pots and traps	>=6 <12	284	23
Longlines	<6	1,361	36
Longlines	>=6 <12	1,774	126
Longlines	>=12 <18	160	34
Dredges	>=6 <12	16	2
Winch trawl	>=6 <12	110	29
Winch trawl	>=12 <18	26	15
Bottom trawl	>=18 <24	83	27
Bottom trawl	>=24 <40	138	33
Purse seines	>=12 <18	75	24
Purse seines	>=18 <24	130	45
Purse seines	>=24 <40	27	9
TOTAL		12,807	767

Implementation of the survey

The data used to assess the economic variables in the sea fishing sector, as set out in the following paragraphs, was collected from a random sample of vessels using a structured socio-economic questionnaire. The sampling process described in the previous paragraph constituted the first stage of the survey.

This was followed by training of the researchers, with a presentation of the questionnaire and the database in which the data collected through the questionnaires is recorded. The researchers were given the necessary clarifications with respect to collecting socio-economic data and using the database. The researchers were asked to complete a pilot questionnaire as part of their training.

Quality checks and further processing of the socio-economic data took place where this was considered necessary, using the appropriate methodological framework (see the methodology report for more details⁶). The framework also includes the use of specific evaluation indicators⁷. The relevant economic variables were then assessed for the fleet as a whole as well as for its individual segments. Some additional socio-economic indicators were also calculated in the context of this report to help paint a clearer picture of the sea fishing sector and draw conclusions on the sector's viability and importance for the national economy.

A.1.a.2. Structure of the Greek fleet, fishing effort, employment and fishing yield

As can be seen from the data in Table A.1.a.3, in 2018 the fishing vessel register comprised 14,234 vessels with an overall tonnage of 67,095 GT and total engine power of 398,346 kW. The average age of the vessels was 32 years.

The number of vessels, overall tonnage and total engine power fell slightly compared to both 2017 and 2012, whereas the average age of the vessels increased slightly. Note that in 2018 the number of vessels in the register fell by 751 (to 14,234 vessels), mainly due to the implementation of Measure 6.1.10 'Permanent cessation of fishing activities', under the heading 'Scrapping of fishing vessels', of the 2014-2020 fisheries and maritime operational programme.

In 2018 the Greek fleet comprised 12,277 businesses, the vast majority (around 93%) of which owned only one vessel. The table also shows that in recent years the total number of workers has been in constant decline (with a 24% drop overall since 2012). Note also that the figures in Table A.1.a.3 point to continued underemployment in sea fishing, since the overall number of workers is well above the number of full-time equivalents in this sector. Specifically, one worker corresponds to 0.88 FTEs.

With regard to fishing effort, the quantity of fuel consumed by the Greek fleet in 2018, based on the data collected, is estimated at 89,208,240 litres in total, which is 5% less than in 2017. A total of 1,832,232 days at sea were logged, in line with the downward trend of the fleet. When the relevant data was collected in 2019, the total number of days at sea variable for 2017 was not calculated at national level for all segments of the fishing fleet. Due to the late start of the programme this variable was calculated only for trawlers and purse seiners. Note

⁶ Available at <https://www.agreri.gr/sites/default/files/projects/Methodology%20Report%20version%202.pdf>

⁷ Examples include: crew size per stratum, fuel consumption and cost per day at sea, salary per crew member, etc.

also that in 2014 the variable was based on only nine months of the year (April-December). Therefore, the historical data for this variable covers the whole year only with respect to 2012, 2013 and 2015, for which data was collected using the socio-economic questionnaire rather than the transversal variables method provided for by Regulation (EU) No 1224/2009.

Table A.1.a.3. Structure, employment, fishing effort and fishing yield of the Greek sea fishing fleet, 2012-2018

Variable	2012	2013	2014	2015	2016	2017	2018	% change 2018-2017	% change 2018-2012
Number of vessels	16,063	15,954	14,755	15,624	15,182	14,985	14,234	-5%	-11%
Number of inactive vessels	1,531	1,202	1,155	1,210	1,535	1,521	1,423	-6%	-7%
Average age of vessel (years)	26.78	27.61	28.26	29.06	29.43	30.22	32.21	7%	20%
Gross tonnage (GT)	76,211	75,566	72,843	74,699	71,751	71,085	67,095	-6%	-12%
Total capacity (kW)	455,640	454,565	431,166	446,239	430,793	426,683	398,346	-7%	-13%
Number of businesses	13,918	13,871	13,666	12,594	14,207	13,972	12,277	-12%	-12%
Total number of workers	27,559	24,486	23,232	25,407	24,975	22,471	20,923	-7%	-24%
FTEs (national full-time equivalents)	23,945	22,546	20,780	23,431	23,040	20,542	18,342	-11%	-23%
Average yearly wages per worker	5,967	7,575	6,127	6,274	7,465	7,687	7,872	2%	32%
Average yearly wages per FTE	6,868	8,227	6,850	6,803	8,837	8,738	8,979	3%	31%
Days at sea (total)	2,815,808	2,843,714	1,921,836	2,603,840	2,040,825	-	1,832,232	-	-35%
Energy costs	109,056,322	108,188,604	92,446,711	84,432,443	75,789,015	69,414,243	70,210,300	1%	-36%
Energy consumption (litres)	115,096,554	113,673,414	107,319,701	107,015,700	104,897,542	94,118,510	89,208,240	-5%	-22%
Energy cost relative to catch value (€)	0.255	0.259	0.264	0.223	0.163	0.148	0.151	2%	-41%
Energy consumption relative to catch value (€)	0.269	0.272	0.306	0.283	0.226	0.201	0.192	-4%	-29%
Sales revenue from catches	427,837,048	418,072,659	350,261,580	378,350,308	464,594,132	468,539,588	449,071,380	-4%	9%

2018 saw a marginal increase in energy costs, redressing the sharp decrease in 2017. A similar trend can be observed for other variables, including the cost of energy relative to catch value (+2%) and energy consumption relative to catch value (-4%). Sales revenue is estimated at €449,071,380, a slight decline compared to 2017.

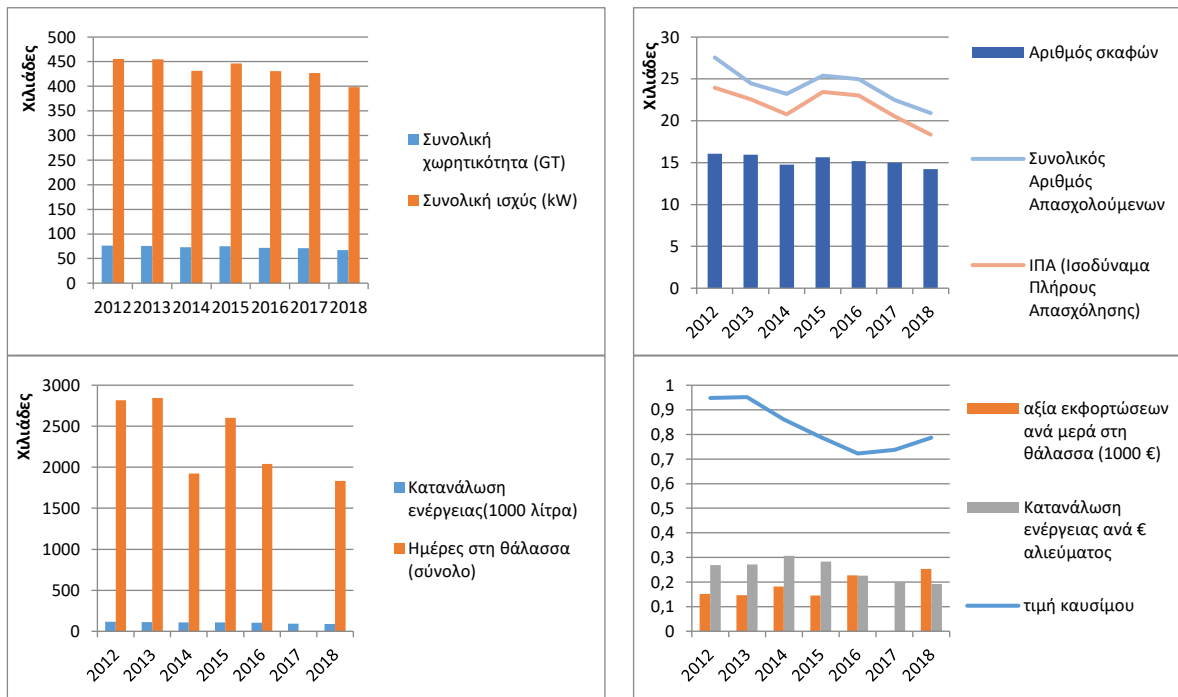


Figure A.1.a.1. Structure, employment, fishing effort and fishing yield of the Greek fleet, 2012-2018

Key:

Χιλιάδες = Thousands

Συνολική χωρητικότητα (GT) = Total tonnage (GT); Συνολική ισχύς (kW) = Total engine power (kW)

Αριθμός σκαφών = Number of vessels; Συνολικός Αριθμός Απασχολούμενων = Total number of workers;
ΙΠΑ (Ισοδύναμα Πλήρους Απασχόλησης) = Full-time equivalents (FTEs)

Κατανάλωση ενέργειας (1000 λίτρα) = Energy consumption (1,000 litres); Ημέρες στη θάλασσα (σύνολο) = Days at sea (total)

Αξία εκφορτώσεων ανά μέρα στη θάλασσα (€ 1000) = Value of landings per day at sea (€ 1,000);

Κατανάλωση ενέργειας ανά € αλιεύματος = Energy consumption relative to catch value (per €);

Τιμή καυσίμου = Cost of fuel

A.1.a.3. Expenditure and financial results

As can be seen from Table A.1.a.4, the sea fishing fleet draws its revenue almost exclusively from the sale of catches. Direct subsidies make up just a fraction of total revenues and relate to fuel duty refunds in cases where fuel is not purchased directly at a duty-free price. Note that, in accordance with Commission Decision 2010/93/EU, reduced duties on inputs such as fuel are not regarded as direct subsidies, whereas refunds of fuel duties are counted as such.

In 2018 the overall revenue of the Greek fishing fleet was €450,364,791. As can be seen from the figures in Table A.1.a.4, the vessels made net profits for the third consecutive year (€78,687,518) although profits have fallen compared to 2017. It is worth noting, however, that the fleet's financial results have been on a continuing upward trend since 2013. Note also that, as in previous years, the income that actually reflects fishers' economic situation and living standards (net profit and remuneration of the imputed value of labour) is quite high.

Table A.1.a.4. Expenditure and financial results in the fishing sector, 2012-2018

Variable		2012	2013	2014	2015	2016	2017	2018	% change 2018-17	% change 2018- 2012	
Revenue	Sales revenue from catches	427,837,048	418,072,659	350,261,580	378,350,308	464,594,132	468,539,588	449,071,380	-4%	↓	5%
	Direct subsidies	0	3,747,195	5,075,829	2,635,936	2,768,528	1,701,601	1,293,410	-24%	↓	N/A
Expenditure	Crew wages and salaries	73,367,684	105,420,429	67,278,063	77,354,959	91,281,222	74,123,474	69,205,957	-7%	↓	-6%
	Imputed value of unpaid labour	91,089,486	80,058,019	75,062,991	82,050,233	95,160,109	99,534,130	95,494,252	-4%	↓	5%
	Energy costs	109,056,322	108,188,604	92,446,711	84,432,443	75,789,015	69,414,243	70,210,300	1%	↔	-36%
	Repair and maintenance costs	40,144,431	43,168,187	34,308,680	35,636,500	32,995,944	28,269,340	25,112,136	-11%	↓	-37%
	Other variable costs	83,917,813	77,604,070	74,033,627	78,249,174	77,901,956	57,250,926	63,661,874	11%	↔	-24%
	Non-variable costs	7,749,586	6,747,994	7,139,387	6,482,234	6,476,903	8,331,749	8,031,302	-4%	↓	4%
	Annual depreciation	53,514,201	58,675,084	26,844,329	24,206,436	36,283,271	36,492,379	39,961,452	10%	↔	-25%
Financial results	Gross value added	186,968,896	186,110,999	147,409,004	176,185,893	274,198,841	306,974,931	283,349,179	-8%	↓	52%
	Gross profit	22,511,726	632,551	5,067,950	16,780,701	87,757,511	133,317,327	118,648,969	-11%	↓	427%
	Net profit	-31,002,475	-58,042,533	-21,776,379	-7,425,735	51,474,240	96,824,948	78,687,518	-19%	↓	
	Profit and remuneration for imputed value of labour	60,087,011	22,015,486	53,286,612	74,624,498	146,634,349	196,359,078	174,181,770	-11%	↓	190%
Capital value	Depreciated replacement value of physical capital (€)	226,071,892	242,619,052	113,968,237	99,787,479	151,622,928	160,303,189	153,732,751	-4%	↓	-32%
	Value of investments (€)	30,207,167	24,111,423	26,140,333	27,767,435	25,718,634	30,387,903	27,008,253	-11%	↓	-11%
	Financial position (%)	2.92	1.54	0.55	0.37	0.50	1.35	-	-	-	-

Economic indicators	Net profit margin (%)	-7.25	-13.76	-6.13	-1.95	11.01	20.59	17.47	-15%	↘	N/A
	RoFTA (%)	-13.71	-23.92	-19.11	-7.44	33.95	60.40	51.18	-15%	↗	N/A
	Gross value added / FTE	7,808	8,255	7,094	7,519	11,901	14,944	15,448	3%	↗	98%
	Gross profit margin (%)	5.26	0.15	1.43	4.40	18.78	28.35	26.35	-7%	↗	401%
	Gross value added / revenue	0.44	0.44	0.41	0.46	0.59	0.65	0.63	-4%	↘	44%
	Net profit margin and remuneration for imputed value of labour (%)	14.04	5.22	15.00	19.59	31.37	41.76	38.68	-7%	↘	175%

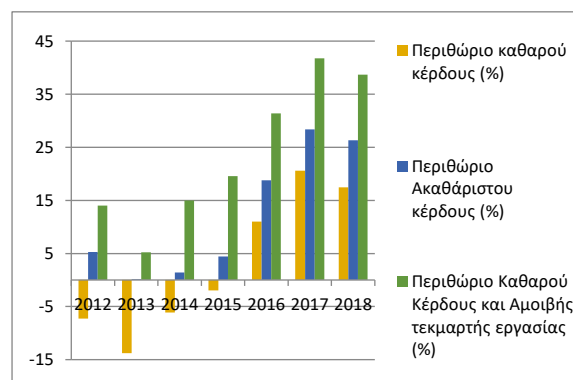
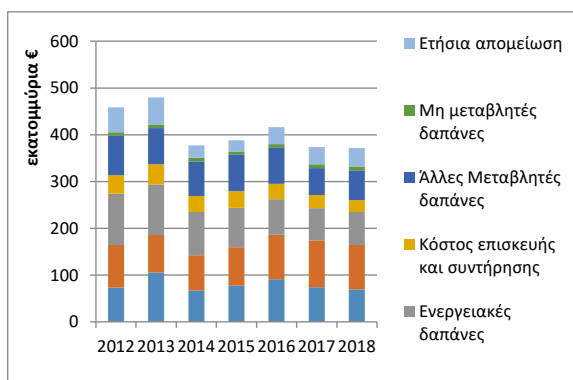
The fleet's total expenditure, at €371,677,273, was virtually unchanged from 2017, thus confirming the trend observed that year. In 2017 most types of variable expenditure fell significantly compared to 2016, as a result of fishing businesses aiming to reduce the use of inputs as much as possible to improve their liquidity. As can be seen from Table A.2.a.4 and Figure A.1.a.2, the main expenditure items of the Greek fleet are the imputed cost of unpaid labour at around €95 million (26% of total expenditure), followed by energy costs and crew salaries and wages at around €70 million (19% of total expenditure each). Energy costs, which had temporarily fallen behind expenditure on crew salaries and wages in 2017, returned to second place in the ranking of fishing vessels' individual expenditure items. It is worth noting that, for the first time since 2012, energy costs increased marginally.

The fourth largest expenditure item, after energy costs [*sic*], are other variable costs, which account for 15% of total expenditure.

Repair and maintenance costs dropped by 11% compared to 2017, non-variable costs also fell slightly and, finally, the annual depreciation of capital value increased by around 10% to €40 million ⁸.

With regard to financial results, the strong upward trend of the previous year gave way to a small decline in gross value added of -8%.

Gross profit also fell by 11%, whereas, as already mentioned, the sea fishing industry recorded a net profit. The invested capital (total depreciated replacement value of physical capital) in the fishing sector amounts to €153 million, a slight decrease compared to 2017, whereas total investments in 2018 are estimated at €27 million, which is slightly lower than in 2017. Lastly, Table A.1.a.4 shows that for the other economic indicators the picture is similar to that of 2017.



⁸ This increase is due to a change in the parameters for implementing the perpetual inventory method (PIM) to estimate the depreciation of physical capital, with a view to converging with the other countries participating in the programme.

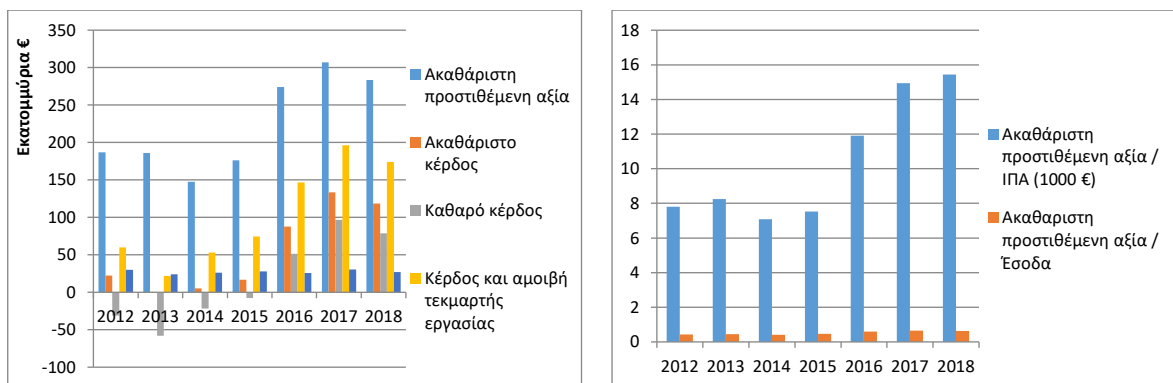


Figure A.1.a.2. Revenue, expenditure and financial results of the Greek fishing fleet, 2012-2018

Key:

Εκατομμύρια € = € million

Ετήσια απομείωση = Annual depreciation; Μη μεταβλητές δαπάνες = Non-variable costs; Άλλες μεταβλητές δαπάνες = Other variable costs; Κόστος επισκευής και συντήρησης = Repair and maintenance costs; Ενεργειακές δαπάνες = Energy costs

Περιθώριο καθαρού κέρδους (%) = Net profit margin (%); Περιθώριο Ακαθάριστου κέρδους (%) = Gross profit margin (%); Περιθώριο Καθαρού Κέρδους και Αμοιβής τεκμαρτής εργασίας (%) = Net profit and remuneration of imputed value of labour margin (%)

Ακαθάριστη προστιθέμενη αξία = Gross added value; Ακαθάριστο κέρδος = Gross profit; Καθαρό κέρδος = Net profit; Κέρδος και αμοιβή τεκμαρτής εργασίας = Profit and remuneration of imputed value of labour

Ακαθάριστη προστιθέμενη αξία / ΙΠΑ (1000 €) = Gross added value / FTE (€1,000); Ακαθάριστη προστιθέμενη αξία / Έσοδα = Gross added value / revenue

A.1.a.4. Structure of and financial data on small-scale and large-scale fishing in Greece

Tables A.1.a.5 and A.1.a.6 sum up data on the structure, fishing effort, employment and yield of small-scale and large-scale fishing in Greece, respectively⁹.

As can be seen from the tables, 94% of all the vessels in the fleet engage in small-scale fishing. The tables also show that the number of vessels declined over the past year in both coastal and mid-distance fishing. Vessels engaged in small-scale fishing are older on average, and have declined even more in terms of gross tonnage and engine power in relation to the number of vessels. One reason for this could be that the vessels that were withdrawn had greater tonnage and engine power than the average for coastal vessels. Such vessels also had a greater economic incentive to participate in the permanent cessation measure. By contrast, despite a decline in numbers, the tonnage of mid-distance vessels remained stable and engine power fell only slightly.

The total number of workers declined in small-scale fishing but increased in mid-distance fishing. It is worth noting, however, that underemployment fell in small-scale fishing but increased in mid-distance fishing. Lastly, average wages per worker and per FTE fell compared to 2017 in mid-distance fishing, whereas the corresponding indicator values increased with regard to coastal fishing.

⁹ Small-scale fishing involves vessels less than 12 m in length. Large-scale fishing involves vessels with a length of 12 m and above (mid-distance fishing).

The breakdown of expenditure is similar to that of the previous year in both small-scale and mid-distance fishing. Accordingly, the main expenditure item for small-scale fishing is the imputed value of unpaid labour (40%), followed by wage costs (18%) and energy costs (17%). In large-scale fishing the main expenditure items are other variable costs (mainly marketing costs) at 26%, followed by crew salaries and wages and energy costs, each accounting for 22%. Finally, there was a marginal decline in sales revenue in coastal fishing (-2%) and a slight decline in mid-distance fishing (-6%).

Table A.1.a.5. Structure of the small-scale Greek fishing fleet in 2012-2018, fishing effort, employment and fishing yield

Variable	2012	2013	2014	2015	2016	2017	2018	% change 2018- 2017	% change 2018- 2012
Number of vessels	15,139	15,038	13,850	14,708	14,319	14,126	13,446	-4.8	-11.2
Number of inactive vessels	1,488	1,159	1,088	1,141	1,447	1,425	1,384	-2.9	-7.0
Average age of vessel (years)	27	28	28	29	30	31	32	3.2	18.7
Gross tonnage (GT)	30,138	29,897	27,613	29,406	29,061	28,714	26,329	-8.3	-12.6
Total capacity (kW)	287,564	285,456	265,919	280,366	274,826	272,248	249,399	-8.4	-13.3
Total number of workers	22,529	19,708	18,222	20,420	19,613	18,132	16,435	-9.4	-27.0
FTE (national full-time equivalent)	19,724	17,885	15,782	18,490	17,799	16,213	15,161	-6.5	-23.1
Average yearly wages per worker	5,744	7,599	6,260	6,218	6,568	7,155	7,580	5.9	31.9
Average yearly wages per FTE	5,029	6,896	5,421	5,630	7,237	8,002	8,216	2.7	63.4
Days at sea (total)	-	-	1,921,836	2,603,840	1,928,836	-	1,708,859	-	-
Energy costs	57,557,178	60,246,282	52,567,939	49,009,374	45,345,077	37,325,894	38,519,066	3.2	-33.1
Energy consumption (litres)	50,283,598	48,705,410	45,752,146	47,823,940	45,029,099	35,702,516	33,607,780	-5.9	-33.2
Energy cost relative to catch value (€)	0.244	0.259	0.259	0.220	0.192	0.169	0.178	5.5	-27.0
Energy consumption relative to catch value (€)	0.213	0.210	0.226	0.215	0.191	0.162	0.156	-4.0	-27.1
Sales revenue from catches	235,877,167	232,288,624	202,868,115	222,546,553	236,329,149	220,743,073	216,126,619	-2.1	-8.4

Table A.1.a.6. Structure of the mid-distance Greek fishing fleet in 2012-2018, fishing effort, employment and fishing yield

Variable	2012	2013	2014	2015	2016	2017	2018	% change 2018-2017	% change 2018- 2012
Number of vessels	924	916	905	916	863	859	788	-8%	-14.7
Number of inactive vessels	43	43	67	69	88	96	43	-55%	0.0
Average age of vessel (years)	24	25	26	27	28	29	30	3%	23.5
Gross tonnage (GT)	46,072	45,669	45,231	45,292	42,690	42,371	42,417	0%	-7.9
Total capacity (kW)	168,076	169,109	165,246	165,873	155,966	154,435	148,946	-4%	-11.4
Total number of workers	5,031	4,778	5,010	4,987	5,362	4,339	4,488	3%	-10.8
FTE (national full-time equivalent)	4,221	4,661	4,998	4,941	5,241	4,329	3,181	-27%	-24.6
Average yearly wages per worker	12,119	10,635	8,714	8,992	10,746	9,391	8,941	-5%	-26.2
Average yearly wages per FTE	12,119	10,635	8,714	8,992	10,991	9,413	12,614	34%	4.1
Days at sea (total)	-	-	93,699	160,423	111,989	-	123,373	-	-
Energy costs	51,499,144	47,942,322	39,878,772	35,423,069	30,443,938	30,785,345	31,691,234	3%	-38.5
Energy consumption (litres)	64,812,957	64,968,004	61,567,555	59,191,759	59,868,443	57,455,359	55,600,459	-3%	-14.2
Energy cost relative to catch value (€)	0.268	0.258	0.271	0.170	0.133	0.124	0.128	3%	-52.4
Energy consumption relative to catch value (€)	0.338	0.350	0.418	0.283	0.262	0.232	0.224	-3%	-33.6
Sales revenue from catches	191,959,881	185,784,035	147,393,465	208,982,455	228,264,984	247,796,515	232,944,761	-6%	21.4

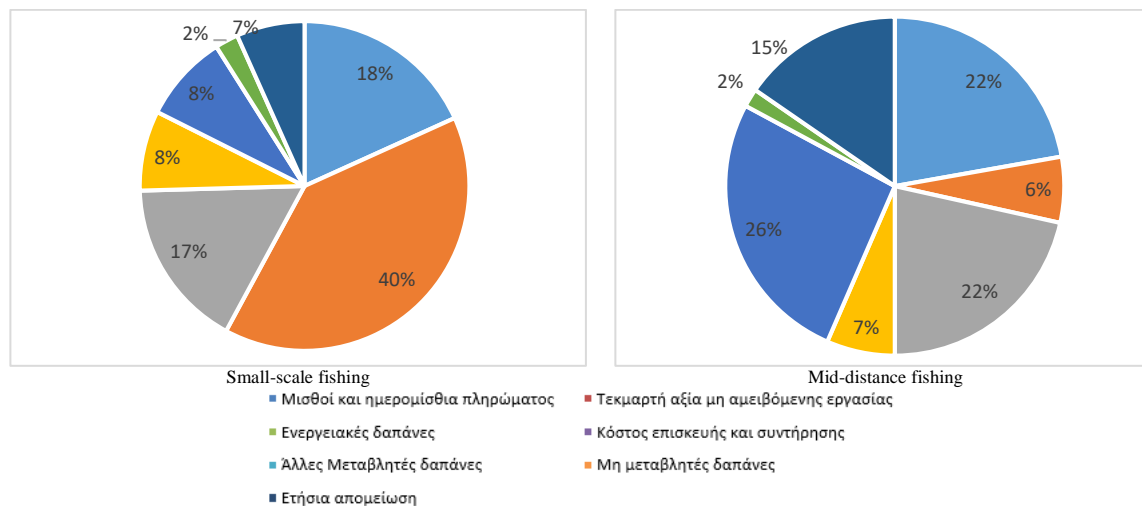


Figure A.1.a.4. Share of each type of expenditure in total expenditure of (a) small-scale fishing and (b) mid-distance fishing

Key:

Μισθοί και ημερομίσθια πληρώματος = Crew salaries and wages; Ενεργειακές δαπάνες = Energy costs; Άλλες Μεταβλητές δαπάνες = Other variable costs; Ετήσια απομείωση = Annual depreciation; Τεκμαρτή αξία μη αμειβόμενης εργασίας = Imputed value of unpaid labour; Κόστος επισκευής και συντήρησης = Repair and maintenance costs; Μη μεταβλητές δαπάνες = Non-variable costs

Lastly, as regards financial results and economic indicators, mid-distance fishing saw a decline of 9-17%, with the exception of the 'gross value added / FTE' indicator, which shows a considerable increase due to the reduced number of FTEs in the reference year.

In coastal fishing some indicators, such as 'gross value added / FTE', are virtually unchanged, and some have fallen further from already negative values (e.g. net profit margin and RoFTA).

Table A.1.a.7. Expenditure and financial results in small-scale fishing, 2012-2018

Variable	2012	2013	2014	2015	2016	2017	2018	% change 2018-17	% change 2018-12
Revenue									
Sales revenue from catches	235,877,167	232,288,624	202,868,115	222,546,553	236,329,149	220,743,073	216,126,619	-2.1	-8.4
Direct subsidies	–	3,611,349	4,476,639	2,402,045	2,490,956	1,897,882	1,255,180	-33.9	
Expenditure									
Crew wages and salaries	24,613,785	61,542,925	29,542,208	39,096,183	39,564,077	40,861,452	37,781,404	-7.5	53.5
Imputed value of unpaid labour	88,688,818	74,366,188	69,244,763	75,875,157	89,255,089	88,871,423	86,789,957	-2.3	-2.1
Energy costs	57,557,178	60,246,282	52,567,939	49,009,374	45,345,077	37,325,894	38,519,066	3.2	-33.1
Repair and maintenance costs	26,488,344	30,462,503	22,393,893	23,808,484	18,657,345	17,610,492	15,919,736	-9.6	-39.9
Other variable costs	34,739,510	32,643,116	30,393,627	31,660,887	24,756,687	19,285,510	22,561,965	17.0	-35.1
Non-variable costs	3,854,803	4,163,533	4,182,432	3,923,889	3,461,654	5,114,891	5,775,071	12.9	49.8
Annual depreciation	31,792,823	34,181,973	13,109,737	13,670,111	13,247,910	15,014,048	14,831,063	-1.2	-53.4
Financial results									
Gross value added	113,237,333	108,384,539	97,806,863	116,545,964	146,599,342	141,406,287	134,605,961	-4.8	18.9
Gross profit	-65,270	-27,524,574	-980,108	1,574,625	17,780,176	11,673,411	10,034,600	-14.0	
Net profit	-31,858,093	-61,706,547	-14,089,845	-12,095,487	4,532,266	-3,340,637	-4,796,463	43.6	-84.9
Profit and remuneration for imputed value of labour	56,830,725	12,659,641	55,154,918	63,779,670	93,787,355	85,530,786	81,993,494	-4.1	44.3
Capital value									
Depreciated replacement value of physical capital (€)	137,536,291	143,896,490	58,234,707	57,740,682	56,085,651	63,007,525	61,052,383	-3.1	-55.6
Value of investments (€)	25,069,059	19,024,071	20,829,880	21,254,460	16,126,887	20,089,833	19,215,657	-4.4	-23.3
Financial position (%)	0.25	0.08	0.44	0.34	0.91	–	–		

Economic indicators	Net profit margin (%)	-13.51	-26.16	-6.80	-5.38	1.90	-1.50	-2.21	47.1↗	-83.7
	RoFTA (%)	-23.16	-42.88	-24.19	-20.95	8.08	-5.30	-7.86	48.2↗	-66.1
	Gross value added / FTE	5,741	6,060	6,197	6,303	8,236	8,722	8,878	1.8↗	54.6
	Gross profit margin (%)	-0.03	-11.67	-0.47	0.70	7.45	5.24	4.62	-12.0↘	–
	Gross value added / revenue	0.48	0.46	0.47	0.52	0.61	0.64	0.62	-2.5↘	29.0
	Net profit margin and remuneration for imputed value of labour (%)	24.09	5.37	26.60	28.35	39.27	38.42	37.72	-1.8↘	56.6

Table A.1.a.8. Expenditure and financial results in large-scale fishing, 2012-2018

Variable	2012	2013	2014	2015	2016	2017	2018	% change 2018-17	% change 2018-12	
Revenue	Sales revenue from catches	191,959,881	185,784,035	147,393,465	208,982,455	228,264,984	247,796,515	232,944,761	-6%	21.4
	Direct subsidies	–	135,846	599,190	233,892	277,571	963,846	38,230	-96%	
Expenditure	Crew wages and salaries	48,753,899	43,877,504	37,735,856	38,258,777	51,717,144	31,773,768	31,424,553	-1%	-35.5
	Imputed value of unpaid labour	2,400,668	5,691,831	5,818,228	6,175,076	5,905,020	8,975,549	8,704,295	-3%	262.6
	Energy costs	51,499,144	47,942,322	39,878,772	35,423,069	30,443,938	30,785,345	31,691,234	3%	-38.5
	Repair and maintenance costs	13,656,087	12,705,684	11,914,787	11,828,015	14,338,600	9,330,073	9,192,400	-1%	-32.7
	Other variable costs	49,178,303	44,960,954	43,640,001	46,588,287	53,145,269	37,683,708	41,099,909	9%	-16.4
	Non-variable costs	3,894,783	2,584,461	2,956,955	2,558,345	3,015,249	2,500,541	2,256,231	-10%	-42.1
	Annual depreciation	21,721,379	24,493,111	13,734,592	10,536,324	23,035,361	22,025,010	21,308,330	-3%	-1.9
Financial results	Gross value added	73,731,564	77,726,460	49,602,141	112,818,630	127,599,500	167,496,849	48,743,218	-11%	101.3
	Gross profit	22,576,998	28,157,125	6,048,057	68,384,777	69,977,335	126,747,531	108,614,369	-14%	381.1
	Net profit	855,619	3,664,015	-7,686,535	57,848,453	46,941,975	104,722,521	87,306,039	-17%	
	Profit and remuneration for imputed value of labour	3,256,287	9,355,846	-1,868,306	64,023,529	52,846,994	113,698,070	96,010,334	-16%	
Capital value	Depreciated replacement value of physical capital (€)	88,535,601	98,722,562	55,733,531	42,046,797	95,537,276	96,252,094	92,680,368	-4%	4.7
	Value of investments (€)	5,138,108	5,087,352	5,310,453	6,512,975	9,591,746	7,440,557	7,792,596	5%	51.7
	Financial position (%)	11.60	3.93	1.91	0.54	6.05	–	–		
Economic indicators	Net profit margin (%)	0.45	1.97	-5.19	27.65	20.54	42.10	37.47	-11%	
	RoFTA (%)	0.97	3.71	-13.79	137.58	49.13	108.80	94.20	-13%	
	Gross value added / FTE	17,468	16,677	9,924	22,831	24,346	38,692	46,757	21%	167.7
	Gross profit margin (%)	11.76	15.14	4.09	32.69	30.62	50.95	46.62	-9%	296.4
	Gross value added / revenue	0.38	0.42	0.34	0.54	0.56	0.67	0.64	-5%	66.2
	Net profit margin and remuneration for imputed value of labour (%)	1.70	5.03	-1.26	30.60	23.12	45.71	41.21	-10%	

A.1.a.5. Fleet composition

Table A.1.a.9 shows a breakdown of the Greek fleet into 16 segments/strata according to main fishing gear and vessel length.

Table A.1.a.9. Breakdown of the Greek fleet based on main fishing gear and vessel length

Fleet segment	Main fishing gear	Length (metres)	Inactivity rate (%)
DTS 6-12 m	Winch trawl	6-12	5.2%
DTS 12-18 m	Winch trawl	12-18	5.2%
DTS 18-24 m	Bottom trawl	18-24	12.5%
DTS 24-40 m	Bottom trawl	24-40	4.1%
DFN 0-6 m	Nets	0-6	9.6%
DFN 6-12 m	Nets	6-12	10.1%
DFN 12-18 m	Nets	12-18	2.0%
FPO 0-6 m	Pots and traps	0-6	7.7%
FPO 6-12 m	Pots and traps	6-12	7.7%
HOK 0-6 m	Longlines	0-6	10.5%
HOK 6-12 m	Longlines	6-12	11.3%
HOK 12-18 m	Longlines	12-18	2.0%
DRB 6-12 m	Dredges	6-12	67.0%
PS 12-18 m	Purse seines	12-18	12.2%
PS 18-24 m	Purse seines	18-24	3.0%
PS 24-40 m	Purse seines	24-40	0.0%

The table also shows the percentage of inactive vessels per segment/stratum¹⁰. Table A.1.a.10 shows the vessels' average length, gross tonnage, total engine power and the average age of active vessels in each segment of the fleet.

Table A.1.a.10. Main characteristics of the fishing fleet by segment, 2018

Fleet segment	Number of active vessels	GT	kW	Average age	Average length
DFNVL0006	3,294	2,246.10	30,681.25	35.24	4.95
DFNVL0612	5,162	13,952.52	121,449.31	29.57	7.81
DFNVL1218	106	1,651.29	9,580.29	27.45	13.46
DRBVL0612	16	32.89	364.47	29.03	7.88
DTSVL0612	110	590.56	5,885.51	53.76	9.69
DTSVL1218	30	501.39	3,572.68	49.63	13.58
DTSVL1824	83	4,197.52	22,058.90	38.08	21.50
DTSVL2440	138	18,730.44	45,119.60	25.47	28.20
FPOVL0006	61	37.53	695.96	32.55	4.96
FPOVL0612	284	732.40	7,648.75	28.39	7.72
HOKVL0006	1,361	972.14	13,008.70	36.72	4.95
HOKVL0612	1,774	5,150.56	44,438.15	30.90	7.82
HOKVL1218	160	3,229.42	16,490.66	24.91	14.20
PSVL1218	75	1,645.96	10,129.39	42.82	15.82
PSVL1824	130	6,304.02	26,770.60	29.13	21.11
PSVL2440	27	2,429.03	6,577.01	18.93	26.90
INACTIVEVL0006	523	362.58	4,935.20	35.64	4.95
INACTIVEVL0612	861	2,370.85	20,885.84	30.20	7.84
INACTIVEVL1218	17	1,966.29	2,078.78	31.68	14.28
INACTIVEVL1824	16	828.11	4,012.95	32.44	21.19
INACTIVEVL2440	6	814.37	1,961.72	24.44	27.99

To establish the economic variables for each segment of the fleet, the variables were calculated on the basis of the vessels in the sample from each segment. To extrapolate the variables to the population, account was taken of the overall population of vessels in each segment and the rate of inactivity. The results are set out in Table A.1.a.11, and Figure A.1.a.4 shows the overall expenditure share of each cost category for each segment of the fleet.

¹⁰Under Commission Decision 2010/93/EU, a vessel is considered 'inactive' if it has not been engaged in fishing during the reference year (2018).

Table A.1.a.11. Basic economic variables per segment of the Greek fleet, 2018

	DFN0006	DFN0612	DFN1218	DRB0612	DTS0612	DTS1218	DTS1824	DTS2440	FPO0006	FPO0612	HOK0006	HOK0612	HOK1218	PS1218	PS1824	PS2440
Employment																
Engaged crew	3,796	7,868	304	40	353	92	458	836	67	438	1,437	2,436	588	606	1,265	339
Full-time equivalents	3,080	7,868	304	39	288	62	458	836	51	394	1,006	2,436	588	174	420	339
Average salary per worker	7,065	7,912	6,948	6,428	6,633	6,396	9,545	9,980	7,712	9,985	5,662	8,160	10,643	7,614	8,738	8,224
Average wages per FTE	8,709.19	7,911.83	6,943.75	6,539.72	8,144.47	9,547.61	9,543.86	9,975.81	10,172.49	11,099.28	8,083.81	8,160.77	10,638.70	26,575.80	26,307.32	8,224.05
Fishing effort																
Fuel consumption (litres)	4,587,965	18,553,529	1,190,513	80,000	610,062	282,967	9,317,519	27,353,273	62,553	1,111,584	2,013,524	6,588,563	4,996,593	2,364,516	7,278,080	2,817,000
Days at sea	266,444	1,134,931	21,901	253	12,351	3,241	15,577	29,793	4,342	44,696	43,442	202,400	8,649	9,460	19,493	15,259
Revenue	40,934,894	109,058,974	5,311,396	474,080	3,077,870	1,144,366	23,967,974	74,192,307	1,032,314	9,328,015	15,621,516	37,854,136	19,677,787	13,629,152	60,207,757	34,852,252
Sales revenue from catches	40,855,951	108,086,297	5,289,966	472,080	3,064,594	1,144,366	23,967,974	74,192,307	1,032,314	9,290,824	15,560,672	37,763,888	19,677,787	13,629,152	60,207,757	34,835,452
Direct subsidies	78,942	972,677	21,430	2,000	13,276	-	-	-	-	37,190	60,845	90,249	-	-	-	16,800
Expenditure (€)	40,056,878	110,794,286	5,675,799	542,899	4,568,618	1,482,268	17,735,129	44,446,390	765,349	7,438,469	15,024,756	42,987,007	20,137,272	11,536,913	33,072,647	11,590,535
Crew wages and salaries	7,130,241	20,311,070	1,150,544	149,904	1,203,508	268,245	3,207,607	6,938,761	39,262	1,069,350	1,521,703	6,356,365	3,728,588	3,984,554	9,641,422	2,504,832
Imputed value of unpaid labour	19,689,885	41,938,307	961,565	107,200	1,138,077	320,147	1,163,835	1,404,643	477,464	3,303,867	6,614,082	13,521,076	2,529,471	629,643	1,411,870	283,122
Energy costs	5,899,865	21,424,211	894,072	60,400	619,850	202,092	5,035,166	14,503,507	87,733	1,019,058	2,452,862	6,955,088	3,726,798	1,538,948	4,128,498	1,662,153
Repair and maintenance costs	2,378,783	8,475,908	454,993	36,000	295,589	49,313	1,355,410	3,168,215	41,868	526,618	919,197	3,245,772	1,449,288	532,731	1,512,448	670,000
Other variable costs	2,413,064	10,485,462	576,149	91,200	589,910	285,029	3,748,321	10,131,995	49,481	382,879	1,985,674	6,564,294	5,855,985	3,708,017	12,021,646	4,772,768
Non-variable costs	1,029,208	2,750,160	167,508	10,360	132,736	29,286	358,145	447,538	16,581	247,849	474,233	1,113,945	444,814	204,375	468,514	136,050
Annual depreciation	1,515,833	5,409,168	1,470,968	87,835	588,948	328,154	2,866,644	7,851,731	52,960	888,848	1,057,006	5,230,466	2,402,328	938,646	3,888,248	1,561,611
Invested capital																
Depreciated replacement value (€)	5,728,436	18,670,952	5,907,014	350,567	2,043,163	1,156,195	10,695,311	31,431,999	206,989	3,499,895	3,938,117	20,355,464	9,790,192	3,448,753	15,082,326	6,807,855
Total investments (€)	3,185,689	10,595,629	602,126	172,800	384,241	108,853	630,185	2,540,455	43,587	434,402	854,406	3,544,903	1,551,059	789,063	1,332,356	238,500
Financial position (€)	0.00	2,266,442.52	281,888.38	0.00	79,048.57	10,165.04	138,220.73	1,299,764.95	0.00	87,436.27	0.00	520,991.04	516,733.30	156,094.67	923,979.14	99,935.71
Economic Indicators (€)																
Gross value added*	29,213,974	65,923,234	3,218,674	276,120	1,439,784	578,645	13,470,931	45,941,052	836,651	7,151,611	9,789,550	19,975,037	8,200,902	7,645,081	42,076,651	27,611,281
Gross profit	2,393,849	3,673,856	1,106,565	19,016	-901,801	-9,747	9,099,489	37,597,648	319,925	2,778,393	1,653,766	97,596	1,942,844	3,030,885	31,023,359	24,823,327
Net profit	878,016	-1,735,311	-364,403	-68,819	-1,490,749	-337,902	6,232,845	29,745,917	266,965	1,889,545	596,760	-5,132,870	-459,485	2,092,239	27,135,111	23,261,716
Profit and remuneration for imputed value of labour	20,567,901	40,202,995	597,162	38,381	-352,672	-17,755	7,396,680	31,150,560	744,429	5,193,412	7,210,842	8,388,206	2,069,986	2,721,882	28,546,981	23,544,838
Profitability indicators (€)																
GVA/income	0.71	0.60	0.61	0.58	0.47	0.51	0.56	0.62	0.81	0.77	0.63	0.53	0.42	0.56	0.70	0.79
Labour productivity**	9,487	8,379	10,582	7,023	5,008	9,389	29,410	54,930	16,471	18,151	9,727	8,201	13,942	44,032	100,144	81,449
RoFTA (%)***	0.18	-0.06	-0.03	-0.17	-0.70	-0.26	0.61	0.98	1.32	0.57	0.18	-0.22	-0.02	0.64	1.83	3.45
Net profit margin****	2.14	-1.59	-6.86	-14.52	-48.43	-29.53	26.00	40.09	25.86	20.26	3.82	-13.56	-2.34	15.35	45.07	66.74

*Gross value added: Revenue - (energy costs + repair and maintenance costs + other variable costs + non-variable costs)

**Labour productivity: Gross value added / FTE

***RoFTA (%) (return on assets): (revenue - expenditure) / depreciated replacement value

****Net profit margin: profit/revenue (%)

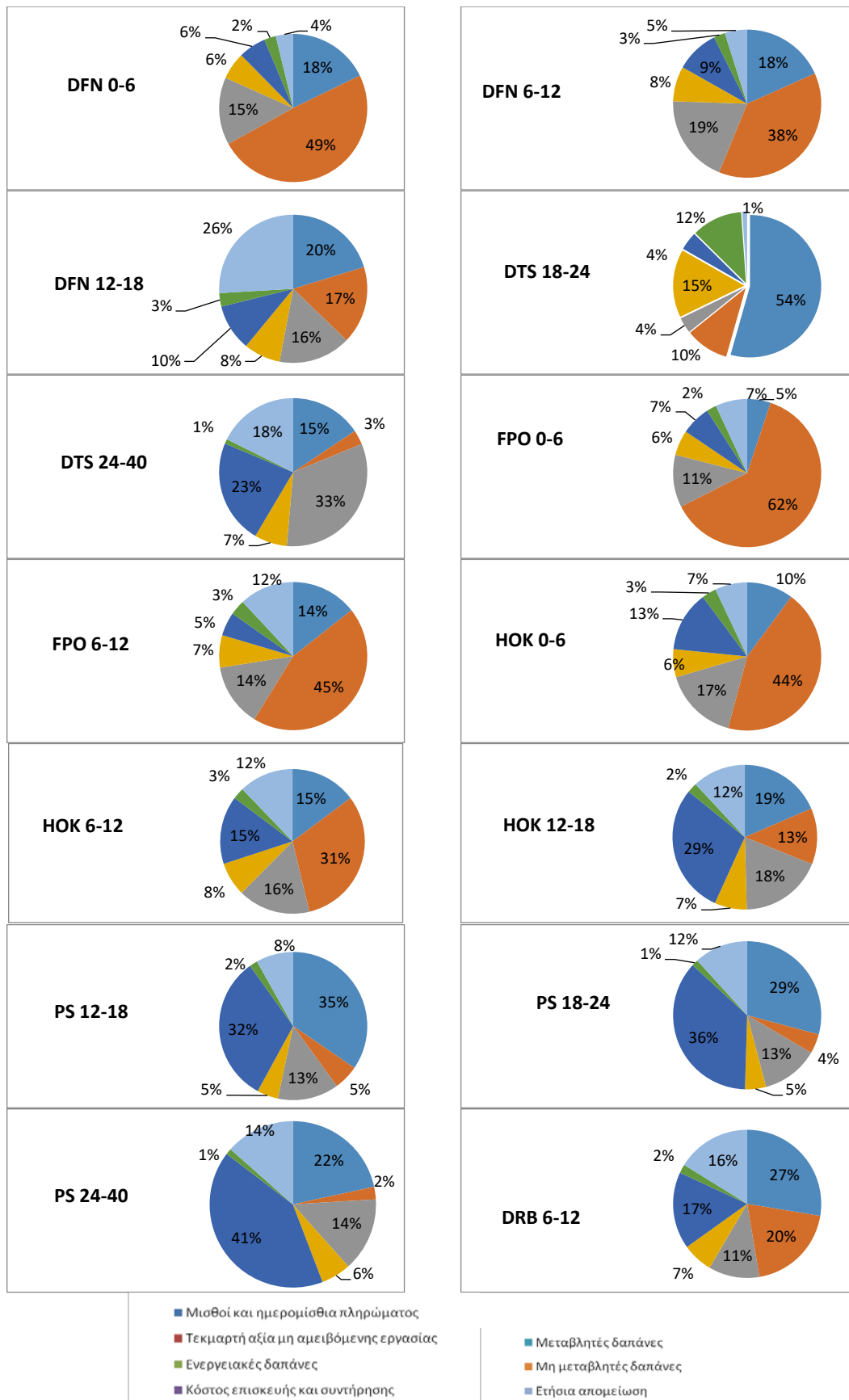


Figure A.1.a.5. Breakdown of expenses for each segment of the Greek fleet

Key:

Μισθοί και ημερομίσθια πληρώματος = Crew salaries and wages; Τεκμαρτή αξία μη αμειβόμενης εργασίας = Imputed value of unpaid labour; Ενεργειακές δαπάνες = Energy costs; Κόστος επισκευής και συντήρησης = Repair and maintenance costs; Μεταβλητές δαπάνες = Variable costs; Μη μεταβλητές δαπάνες = Non-variable costs; Ετήσια απομείωση = Annual depreciation

A.1.a.5. Conclusions and problems of the survey

This report sets out the basic economic variables for the Greek fishing fleet with respect to the 2018 reference year. The variables were collected under the 2019 national fisheries data collection programme. The economic variables were collected from a sample of fishing vessels using a structured questionnaire.

The sample was selected by stratified random sampling as provided for by the programme. The **2018** national fishing vessel register was used as a sampling basis and stratification of the population was based on vessel length and main fishing gear. The fishing fleet was divided into 16 segments, eight of which comprise vessels engaged in small-scale fishing, i.e. all vessels less than 12 metres in length.

The above analysis shows a downward trend in the number of vessels and the total number of workers in the period from 2012 to 2018. Revenue from the sale of catches fell marginally compared to 2017 in both medium-distance and coastal fishing. As regards individual fleet segments, it is worth noting that 9 of the 16 segments achieved net profits, which was also the case for the fleet as a whole.

This result could be interpreted to mean that the least profitable vessels have left the sea fishing fleet, or that the vessels in operation have become more efficient, mainly by reducing their use of inputs. It is worth noting that, despite slightly less favourable financial results and economic indicators compared with 2017, the longer-term trend is clearly positive in both mid-distance and coastal fishing.

Moreover, the sum of profits and remuneration for imputed labour is positive in nearly all coastal fishing segments (seven of eight) and quite high overall. This indicator is more suitable for assessing the standard of living in particular of coastal fishers, as it also takes into account work put in by family members who thus contribute to the household income. The indicator values show that fishers earn a positive income from their activity.

CHAPTER III
BIOLOGICAL SUSTAINABILITY INDICATORS

A. Calculation of the ‘sustainable harvest’ indicator

The ‘sustainable harvest’ indicator (see Chapter 10 of the Regulation) has been calculated for a number of demersal and small pelagic stocks in geographical sub-areas (GSAs) 20 (Ionian Sea) and 22 (Aegean Sea). The final weighted F/F_{msy} harvest indicators for trawlers, coastal vessels and purse seiners are 0.87, 0.97 and 0.72, respectively.

F/F_{msy} values are shown below for the stocks taken into account, along with the weighting given to each stock based on its catch value expressed in euro (€ thousand).

In each case, account was taken of the main species, i.e. those making up the majority of the catch and with the highest economic value.

Two species were taken into account for purse seiners, five for trawlers and eight for coastal vessels.

Purse seiners (PS)

GSA	Species	F/F _{msy}	Catch value
22	Anchovy (ANE)	0.47	20,671
22	Sardine (PIL)	1.03	14,244
20	Anchovy (ANE)	0.23	530
20	Sardine (PIL)	1.14	1,746

Bottom otter trawls (OTB)

GSA	Species	F/F _{msy}	Catch value
22	Hake (HKE)	1.1	10,921
22	Red mullet (MUT)	0.65	6,087
22	Striped mullet (MUR)	0.66	2,561
22	Pink shrimp (DPS)	0.73	6,061
22	Spicara smarís (SPC)	0.18	395
20	Hake (HKE)	1.54	1,429
20	Red mullet (MUT)	0.52	725
20	Striped mullet (MUR)	0.46	51
20	Pink shrimp (DPS)	0.85	110
20	Spicara smarís (SPC)	0.48	36

Coastal vessels

GSA	Species	F/F _{msy}	Catch value
22	Hake (HKE)	1.1	14,997
22	Red mullet (MUT)	0.65	12,113
22	Striped mullet (MUR)	0.66	9,337
22	Bogue (BOG)	0.77	4,292
22	Octopus (OCC)	0.65	11,002
22	Common pandora (PAC)	1.5	6,443
22	Common cuttlefish (CTC)	1.54	11,130
22	Spicara smarís (SPC)	0.18	1,057
20	Hake (HKE)	1.54	4,456
20	Red mullet (MUT)	0.52	2,928
20	Striped mullet (MUR)	0.46	310
20	Bogue (BOG)	0.61	748
20	Octopus (OCC)	0.76	1,150
20	Common pandora (PAC)	1.25	1,012
20	Common cuttlefish (CTC)	0.91	2,721
20	Spicara smarís (SPC)	0.48	415

For a small number of stocks, the sustainable harvest indicator (F/F_{msy}) was calculated on the basis of population estimates by GFCM and EU (STECF) working groups and in the context of a European cooperation programme financed by DG MARE (RECFISH). For the remaining stocks the estimates were made specifically for the purposes of this report.

In the vast majority of cases, as a result of the national fisheries data collection programme not having been implemented for a number of years, the estimates involve a large degree of uncertainty due to time gaps in the data series, which required a number of assumptions to be made in the methods used.

These uncertainties should be taken into account and examined on a case-by-case basis, in particular if the estimates are used for management purposes.

Similar comments have also been made by the EU and GFCM expert working groups, which have mostly been unable to propose management measures based on quantitative assessments of the condition of the stocks.

B. Fishing effort

Fishing effort is estimated on the basis of vessel monitoring system (VMS) data for vessels fishing with bottom trawls, purse seines and winch trawls and vessels licensed to fish large pelagic species or to fish in international waters. For all other coastal vessels, fishing effort was monitored and recorded through the **2019** national fisheries data collection programme.

In this regard, Greek waters are divided into several geographical sub-areas characterised by different metiers.

The metiers selected for sampling are in line with the reference list of Mediterranean metiers adopted by the Mediterranean and Black Sea Regional Coordination Meeting in 2009 and updated annually since then. The selection of metiers was based on the classification system set out in Decision 2010/93/EU.

The data used for the classification of metiers was the average value of landings, the value of catches and fishing effort for the years 2014 and 2016, for which data is available for the entire year.

Selected metiers by geographical sub-area

Metier	Target species	Code	Area of data collection
Bottom trawl	Demersal species	OTB_DES_>=40_0_0	All geographical sub-areas
Purse seines used at night	Small pelagic fish	PS_SPF_>=14_0_0	All geographical sub-areas
Trammel nets	Demersal species	GTR_DES_>=16_0_0	All geographical sub-areas

Gillnets	Demersal species	GNS_DES_>=16_0_0	All geographical sub-areas
Set longline	Demersal fish	LLS_DEF_0_0_0	All geographical sub-areas
Surface longline	Large pelagic fish	LLD_LPF_0_0_0	All of Greece
Traps	Demersal species	FPO_DES_0_0_0	Only sub-area 22
Winch trawl (fishing activity chosen because it is included in a management plan)	Benthic species	SB_SV_DEF_0_0_0	Sub-areas 20 and 22