Annex I
Southern and Central Tyrrhenian Sea (GSA 10)

Summary

4.1.1 Introduction

Based on the results of Fast-scan and interactions with stakeholders, the ten UoAs listed in Table 4.1.1 were identified in the GSA 10. In this list the UoAs using bottom otter trawl nets (OTB) target mainly two different types of target species:

- demersal fish (DEF);
- mixed group of demersal species and deep water species (MDD).

These types were aggregated together in Tables 4.1.1.1 and 4.1.3.1, both in terms of landed volume and value. Considering trawlers landings, about 60% come from boats targeting demersal fish.

Table 4.1.1.1 – List of the UoAs selected for Deeper-mapping in the GSA 10

Italian name	English name	Scientific name	Gear	Group of target species	Mean landing in weight 2015-2016 (Ton)	Mean landing in vaslue 2015-2016 (k Euro)	UoA Identified during the consultation
Alalunga	Albacore	*Thunnus alalunga*	Drift longline	LPF	298	1,497	X
Alici	European anchovy	*Engraulis encrasicolus*	Purse seine	SPF	4,099	11,332	X
Gamberi bianchi o rosa	Deep-water rose shrimp	*Parapenaeus longirostris*	Bottom otter trawl	DEF+MDD	520	3,784	X
Lampughe	Dolphinfish	*Coryphaena hippurus*	Purse seine	LPF	664	2,719	X
Nasello	European hake	*Merluccius merluccius*	Gill net	DEF	308	2,976	
Nasello	European hake	*Merluccius merluccius*	Trammel net	DEF	199	2,632	
Pesce sciabola	Silver scabbardfish	*Lepidopus caudatus*	Fixed longline	DEF	360	1,714	X
Pesce spada	Swordfish	*Xiphias gladius*	Drift longline	LPF	1,644	13,792	X
Seppia mediterranea o comune	Common cuttlefish	*Sepia officinalis*	Trammel net	DEF	221	2,762	X
Totano comune	Broadtail shortfin squid	*Illex coindetii*	Hand lines and rod lines	CEP	165	1,936	X

– DEF: Demersal fish.
– CEP: Cephalopods.
– LPF: Large pelagic fish.
– MDD: Mixed group of demersal species and deep water species.
– SPF: Small pelagic fish.

Source: estimates from MIPAAFT/National Fisheries Data Collection Programme

From the data reported in Table 4.1.1 it is possible to note that the selected UoAs are made up of 6 types of fishing gears: drit and fixed longline, purse seine, used by boats that target both large pelagic and small pelagic fishes, trawl nets, gillnets, trammel nets and lines by hand and rod.

The fleet of boats that use fixed and drifting long lines is mainly found in the fishing ports of Palermo and Milazzo and consists of medium-sized boats (from 12 to 18 meters of length overall, LoA).

Purse seine activity for small pelagics is mainly carried out by medium-sized vessels (12 to 24 meters of LFT), present in the ports of Naples, Castellammare di Stabia, Salerno, Vibo Valentia, Gioia Tauro, Reggio Calabria and Palermo and are active mainly in coastal waters. Pirse seine activity for large pelagics is mainly carried out by large boats (> 24 meters LFT) and mainly targets bluefin tuna. These boats are

mainly present in the ports of Cetara and Salerno and fish mainly in international waters, outside 12 mn from the coast.

Figure 4.1.1 shows the maps of the fishing activity of trawlers (OTB, 2013-2015 period), estimated from the VMS data. The analyzes were carried out with VMS base (Russo et al., 2014) using a grid with 5 km side cells and the values represent the total annual fishing hours per cell of all the trawl boats aggregated also in terms of species target.

From the maps it can be seen how the distribution of trawling activity is more concentrated in Campania, in the Gulf of Naples and Salerno without substantial variations from 2013 to 2015 (MIPAAFT, 2017).

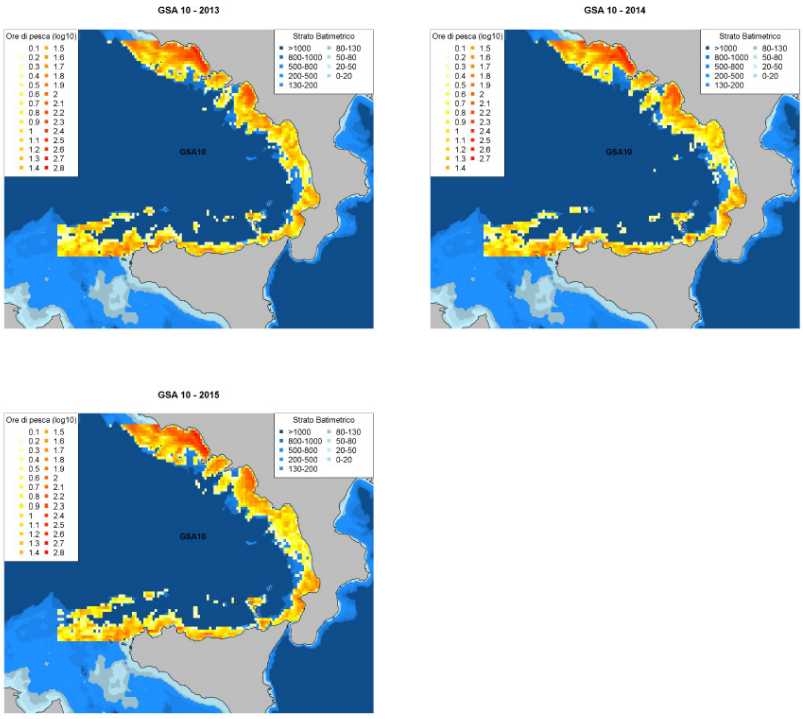


Figure 4.1.1.1 - Fishing activities of the trawling fleet in the GSA10. The values represent the average fishing hours per cell, calculated from the monthly hours for the years 2013 to 2015 (MIPAAFT, 2017).

Finally, the boats that use other passive gear such as trammel net, the gill net and the cephalopod lines are generally small and distributed on the whole coast of the GSA 10.

Regarding the management, at various levels, of the resources involved in the activities selected fisheries (UoA) - international (ICCAT), regional (GFCM), Community (EU / EC) and national (MIPAAF) - see Chapter 3.

4.1.2 Status of target stocks exploited by the selected UoAs

Albacore (*Thunnus alalunga*)

The albacore tuna is fished in the southern Tyrrhenian Sea mainly with drifting longlines. In terms of the status of the resource, the assessment is carried out with a production model (CMSY model, ICCAT, 2017a) combining the fishing statistics of the entire Mediterranean basin, considering that this species is distributed throughout the area and is considered a single stock.

During the last evaluation, which took place in 2017, the historical series of catches available in the ICCAT database has been revised. In 2016, the total Mediterranean landings reported were 3,519 tonnes, similar to those of the last decade. Most of the catches came from longline fishing and Italy is the main producer, with around 57% of landings in the last 10 years. In 2016 Italian capture remained similar to the average of the last five years. Otherwise, 2015 was an unusual year with landing data very different from that of previous years, probably this change is related to the anticipation of management measures related to swordfish that changed the fishing strategy in 2015. Therefore, relative abundance estimates for the 2015 CPUE indices were not used in the evaluation. Since this estimate seems highly influential and perhaps suspect, the production model took into account catch data up to 2015 and relative abundance data (CPUE) until 2014. However, it is important to consider that alternative solutions that include 2015 CPUE are not biologically plausible.

The results of the 2017 evaluation, based on the limited information available, show that the state of the stock is extremely uncertain both in terms of fishing mortality and biomass. Despite the high uncertainty, the results would seem to indicate that the biomass is at a level similar to BMSY, and the fishing mortality is lower than FMSY (Figure 4.1.2.1). However, the ICCAT working group noted the lack of CPUE in 2015 and given the recent downward trend of the series available, reiterates that it is very important to confirm, in the coming years, whether this trend continues or not. The ICCAT also reiterates that the ability to monitor stock trends is limited and that current abundance indices (CPUE from commercial fishing) may be influenced by the management measures undertaken for the swordfish recovery plan.

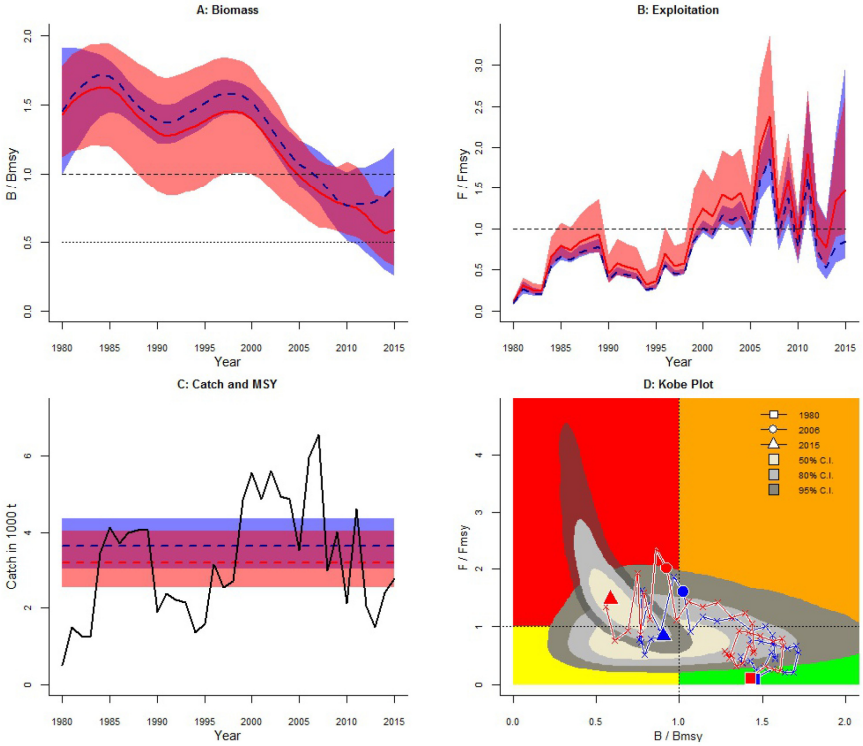


Figure 4.1.2.1 – Results of the evaluation of the albacore (*Thunnus alalunga*) in the Mediterranean Sea (ICCAT, 2017a).

European anchovy (*Engraulis encrasicolus*)

The European anchovy is caught in the southern Tyrrhenian sea mainly with the small pelagic fish. In terms of the status of the resource, the evaluation was carried out with an analytical model (XSA model; STECF, 2017a) combining the biological information and fishing statistics of the GSAs 9, 10 and 11. In accordance with the latest available evaluation fishing mortality shows a growing trend and in 2016 it is higher than the reference value (0.22; Figure 4.1.2.2). Spawning stock biomass (SSB) shows an inverse pattern with biomass growing from 2013 onwards (Figure 4.1.2.2). Recruitment shows a rather stable trend with a general positive trend in the last 4 years (Figure 4.1.2.2).

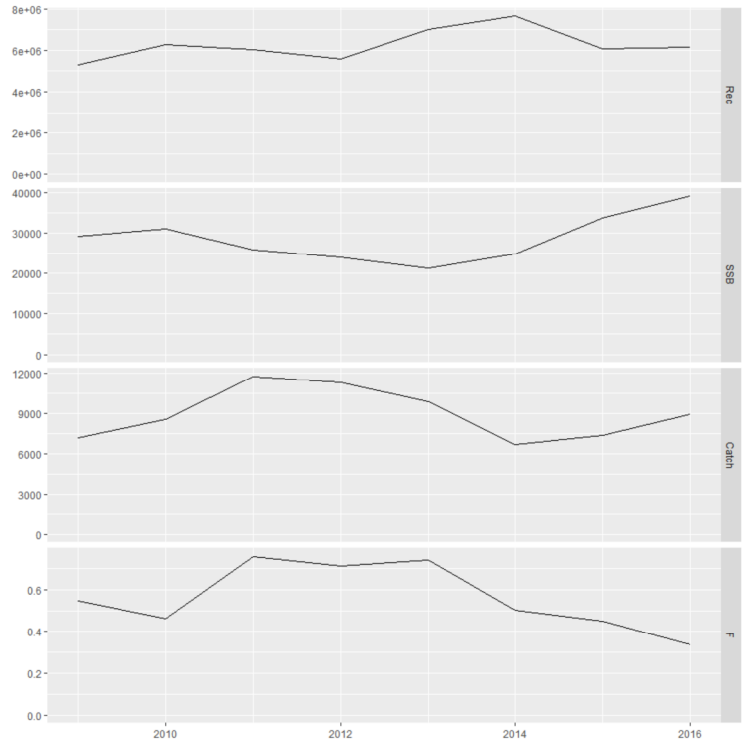


Figure 4.1.2.2 – Results of the evaluation of the European anchovy (*Engraulis encrasicolus*) in GSA 9, 10 and 11 (STECF, 2017a).

Deep-water rose shrimp (*Parapenaeus longirostris*)

The deep-water rose shrimp is fished in the southern Tyrrhenian Sea mainly with trawl nets having as a group of target species both demersal fish and a mixed group composed of demersal species and deep-sea species (DEF: 51%, MDD: 40%). This stock was assessed by combining capture, biological and abundance data from trawl surveys of the GSAs 9, 10 and 11, using an analytical model (XSA, STECF 2017b). The results of this analisis show a fishing mortality that is constant and higher than the reference level (F0.1 = 0.91; Figures). Spawning stock biomass (SSB) showed an increase from 2006 onwards even if the current value is less than the maximum observed at the beginning of the series (Figures 4.1.2.3). Recruitment has shown a steady increase throughout the historical series and in 2016 was at about 87 million (Figures 4.1.2.3).

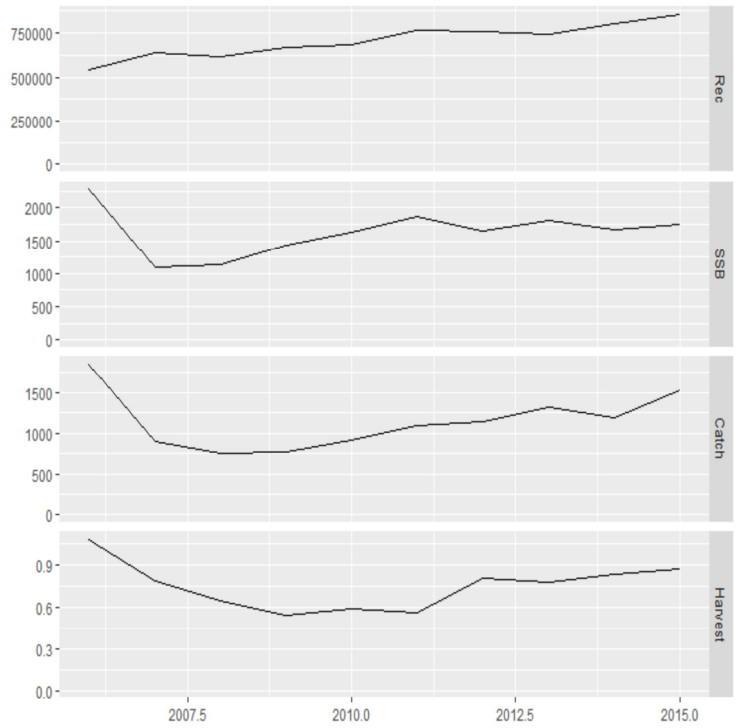


Figure 4.1.2.3 – Results of the evaluation of the Deep-water rose shrimp (*Parapenaeus longirostris*) in GSA 9, 10 and 11 (STECF, 2017a).

Dolphinfish (*Coryphaena hippurus*)

Dolphinfish are fished in the southern Tyrrhenian Sea mainly by purse seine with large pelagic fish as target groups. An attempt to evaluate this resource was done within a STECF working group in 2013 (STECF, 2013) combining the GSAs 5, 6, 10, 15, 16 and 19. Despite this attempt, due to the lack of data it was not possible to provide information on the status of this resource and an estimate of either the abundance or the analytical or empirical refencence points is not available. The landing data available from the economic data-call (AER, 2018) show a decreasing trend of the purse seine targeting large pelagic fish operating in GSA 10 from 2009 to 2014 followed by a sharp increase in the next two years (Figure 4.1.2.4) .

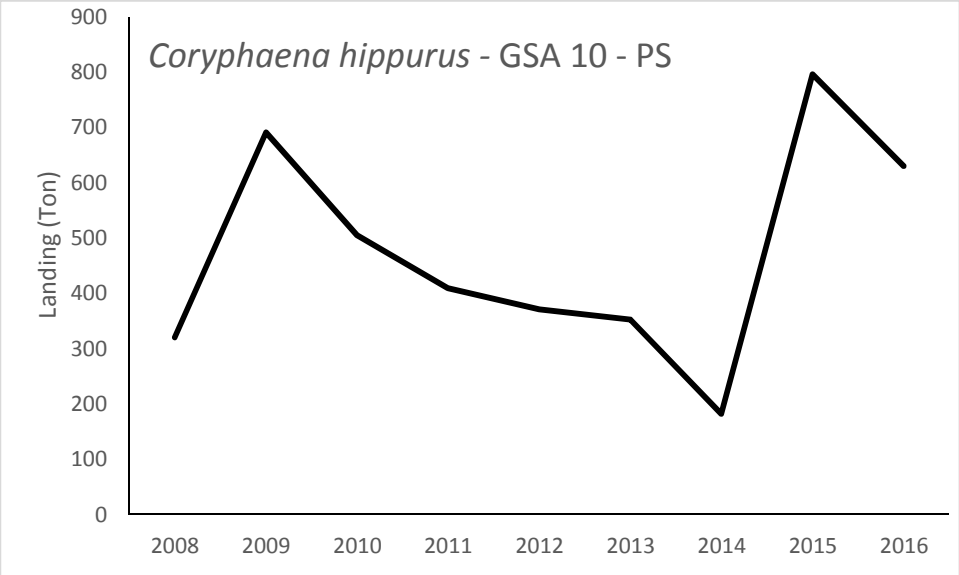


Figure 4.1.2.4 – Trend of the dolphinfish (*Coryphaena hippurus*) landinds fished with purse seines (PS) for large pelagic fish (LPF) from 2008 to 2016 in the GSA 10 (AER, 2018).

European hake (*Merluccius merluccius*)

The European hake is fished in the southern Tyrrhenian Sea with gill net and trammel net, these gears characterize two of the selected UoAs (GNS and GTR) for this species in the GSA10, as well as boats that use the bottom trawl and fixerd longlines. The evaluation is performed by combining the data of the GSA 9, 10 and 11 together and using an analytical model (XSA; STECF, 2015). The exploitation status in terms of fishing mortality shows a stable trend between 1.25 and 0.85, values therefore always higher than the reference value estimated as 0.20 (FMSY = F0.1; STECF 2015; Figure 4.1.2.5). Recruitment shows a general decreasing trend with the highest value observed in 2006, followed by a general decline until 2014 (Figure 4.1.2.5). Spawning stock biomass (SSB) showed a continuous decreasing trend throughout the historical series except for the last two years where a slight recovery is observed (Figure 4.1.2.5).

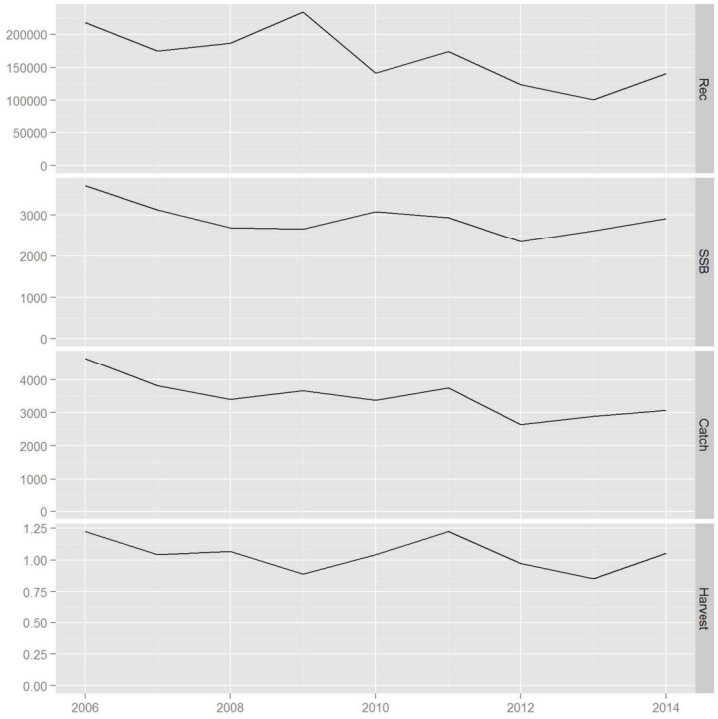


Figure 4.1.2.5 – – Results of the evaluation of the European hake (*Merluccius merluccius*) in GSA 9, 10 and 11 (STECF, 2017).

Silver scabbardfish (*Lepidopus caudatus*)

The silver scabbardfish is fished in the southern Tyrrhenian Sea mainly with fixed longlines for demersal fish. For this species there is no evaluation of the status of the resource in this area nor abundance indices are available. The landed data available from the economic data-call (AER, 2018) show a generally decreasing trend for fixed longline operating in GSA 10 from 2008 to 2016 (Figure 4.1.2.6).

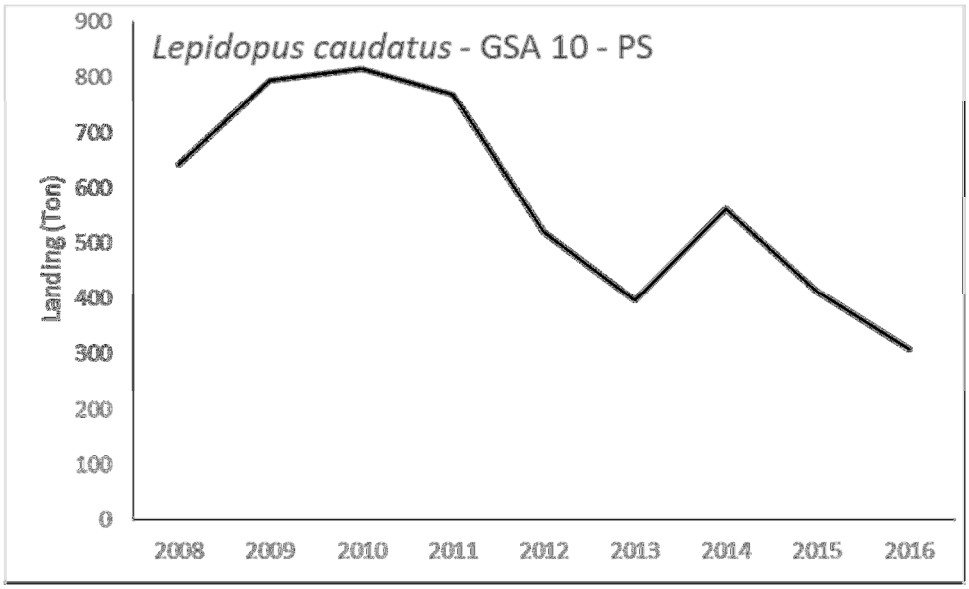


Figure 4.1.2.6 – Trend of the silver scabbardfish (*Lepidopus caudatus*) langinds fished with purse seines (PS) for large pelagic fish (LPF) from 2008 to 2016 in the GSA 10 (AER, 2018).

Swordfish (*Xiphias gladius*)

The swordfish are fished mainly in the southern Tyrrhenian Sea with drifting long line. In terms of the status of the resource, the evaluation is carried out with an analytical model (XSA, ICCAT, 2016) combining the fishing statistics of the entire Mediterranean basin, considering that this species is distributed throughout the area as a single stock. It is important to note that the evaluation results and projections presented in the 2016 ICCAT report are based on the 2016 evaluation results, including data up to 2015 that were available at the time of the evaluation. Based on several hypotheses on natural death rates and landed levels of undersized fish, the analysis (XSA) indicated that current levels of spawning biomass (SSB) are much lower than those of the 1980s. The results also indicate that recruitment shows a negative trend in the last decade. In terms of fishing mortality, a recent decline has been observed in recent years. The current biomass is lower than BMSY, while fishing mortality F is almost double FMSY (Figure 4.1.2.7). The results therefore indicate that the stock is both overfished in an over-exploitation state (Figure 4.1.2.7).

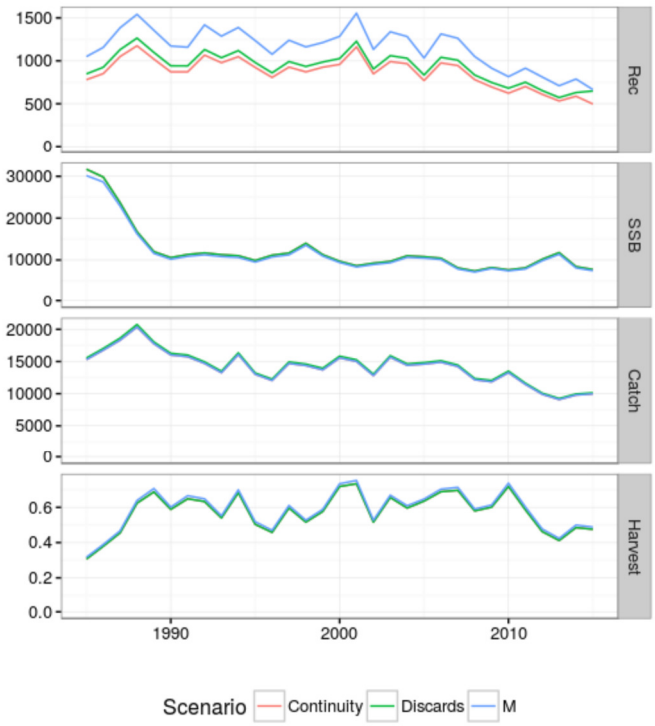


Figure 4.1.2.7 – Results of the evaluation of swordfish (*Xiphias gladius*) in the Mediterranean Sea (ICCAT, 2016).

Common cuttlefish (*Sepia officinalis*)

The common cuttlefish is fished in the southern Tyrrhenian Sea mainly with a trammel net for demersal fish. For this species there is no evaluation of the status of the

resource nor abundance indices are available. The landing data available from the economic data-call (AER, 2018) show a decreasing trend of trammel net landings in GSA 10 from 2008 to 2012 followed by a period with oscillations but generally stable (Figure 4.1.2.8).

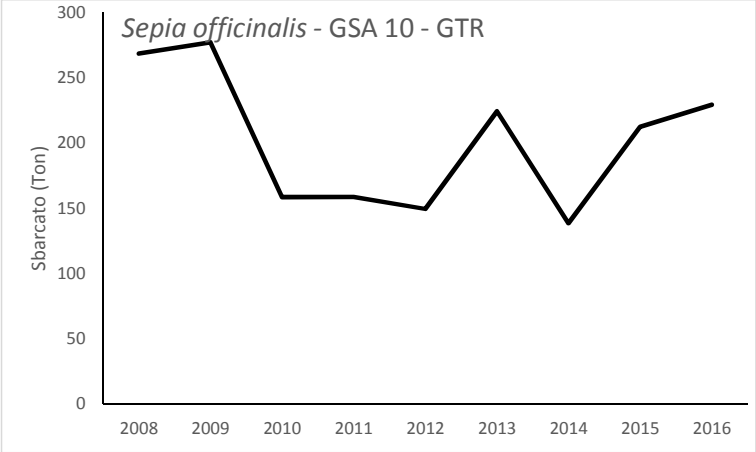


Figure 4.1.2.8 – Trend of the common cuttlefish (Sepia officinalis) landings caught with trammel net (GTR) from 2008 to 2016 in the GSA 10 (AER, 2018).

Broadtail shortfin squid (*Illex coindetii*)

The broadtail shortfin squid is fished in the southern Tyrrhenian Sea mainly by hand and rod lines. For this species there is no evaluation of the status of the resource in this area nor abundance indices are available. The landed data available from the economic data-call (AER, 2018) related to hand-lines are present only for three years (2014-2016) and show an increasing trend (Figures 4.1.2.9).

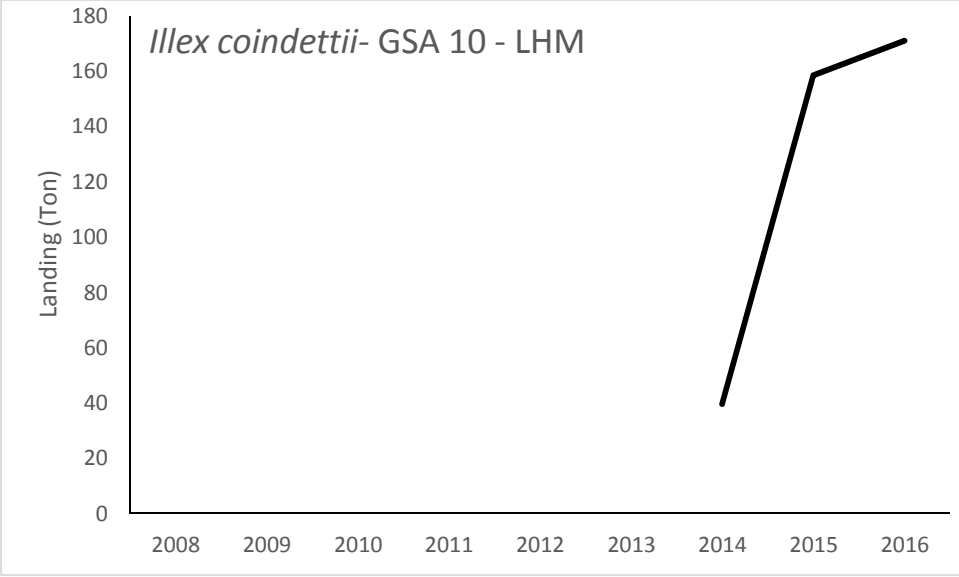


Figure 4.1.2.9 – Trend of the broadtail shortfin squid (*Illex coindetii*) landings caught by hand and mechanised lines from 2014 to 2016 in the GSA 10 (AER, 2018).

4.1.3 List of species exploited by selected UoAs

This section lists the species or groups of species that result in the capture of a specific gear for the respective UoAs selected in the GSA10. In particular:

Table 4.1.3.1 shows the list of species or groups of species detected for the UoA using the bottom otter trawl (OTB) operating in the GSA 10.

Table 4.1.3.2 shows the list of species or groups of species detected for the UoA using the purse seine (PS) for small pelagic fish (SPF) operating in the GSA 10.

Table 4.1.3.3 shows the list of species or groups of species detected for the UoA using the (purse seine (PS) for large pelagic fish (LPF) operating in the GSA 10.

Table 4.1.3.4 shows the list of species or groups of species detected for the UoA using fixed longlines (LLS) operating in the GSA 10.

Table 4.1.3.5 shows the list of species or groups of species detected for the UoA using drifting longlines (LLD) operating in the GSA 10.

Table 4.1.3.6 shows the list of species or groups of species detected for the UoA using the trammel net (GTR) operating in the GSA 10.

Table 4.1.3.7 shows the list of species or groups of species detected for the UoA using gill net (GNS) operating in the GSA 10.

Table 4.1.3.8 shows the list of species or groups of species detected for the UoAs using the hand or mechanised lines (LHP-LHM) operating in the GSA 10.

Table 4.1.3.1 – List of species detected for the UoA using bottom otter trawl (OTB) in the GSA 10. The species underlined are the species detected for the selected UoAs.

Italian name	English name	Scientific name	Mean landing in weight 2015-2016 (Ton)	Percentage (%)
Gamberi bianchi o rosa	Deep-water rose shrimp	*Parapenaeus longirostris*	533.675	14.207
Triglie di fango	Red mullet	*Mullus barbatus*	335.039	8.919
Nasello	European hake	*Merluccius merluccius*	291.147	7.751
Gamberi rossi	Giant red shrimp	*Aristaeomorpha foliacea*	196.864	5.241
Pannocchie	Spottail mantis squillid	*Squilla mantis*	179.337	4.774
Pastinaca	Shortnose greeneye	*Chlorophthalmus agassizi*	151.382	4.030
Sugarello o suro	Atlantic horse mackerel	*Trachurus trachurus*	137.345	3.656
Polpo comune o di scoglio	Common octopus	*Octopus vulgaris*	130.828	3.483
Pesce sciabola	Silver scabbardfish	*Lepidopus caudatus*	119.731	3.187
Altri pesci	Marine fishes nei	*Osteichthyes*	117.913	3.139
Moscardino bianco	Horned octopus	*Eledone cirrhosa*	101.426	2.700
Boghe	Bogue	*Boops boops*	101.260	2.696
Pagello fragolino	Common pandora	*Pagellus erythrinus*	95.173	2.534
Seppia mediterranea o comune	Common cuttlefish	*Sepia officinalis*	81.537	2.171
Alici	European anchovy	*Engraulis encrasicolus*	78.293	2.084
Totano comune	Broadtail shortfin squid	*Illex coindetii*	76.216	2.029
Gambero viola	Blue and red shrimp	*Aristeus antennatus*	64.080	1.706
Moscardino muschiato	Musky octopus	*Eledone moschata*	57.567	1.532
Cefali altri	Mullets nei	*Mugilidae*	56.961	1.516

Italian name	English name	Scientific name	Mean landing in weight 2015-2016 (Ton)	Percentage (%)
Sugarello maggiore	Mediterranean horse mackerel	*Trachurus mediterraneus*	54.295	1.445
Gallinella o cappone	Tub gurnard	*Chelidonichthys lucerna*	48.827	1.300
Budego	Blackbellied angler	*Lophius budegassa*	43.355	1.154
Calamaro mediterraneo	European squid	*Loligo vulgaris*	42.059	1.120
Pagello mafrone	Axillary seabream	*Pagellus acarne*	38.646	1.029
Musdea	Forkbeard	*Phycis phycis*	34.063	0.907
Sardine	European pilchard(=Sardine)	*Sardina pilchardus*	33.709	0.897
Mazzancolle	Caramote prawn	*Penaeus kerathurus*	32.230	0.858
Gronghi	European conger	*Conger conger*	29.518	0.786
Melu' o potassolo	Blue whiting(=Poutassou)	*Micromesistius poutassou*	28.893	0.769
Molluschi	Marine molluscs nei	*Mollusca*	27.825	0.741
Mormore	Sand steenbras	*Lithognathus mormyrus*	26.766	0.713
Triglie di scoglio	Surmullet	*Mullus surmuletus*	25.162	0.670
Zanchetta	Mediterranean scaldfish	*Arnoglossus laterna*	25.032	0.666
Gobetto	Plesionika shrimps nei	*Plesionika spp*	23.551	0.627
Lanzardo	Chub mackerel	*Scomber japonicus*	20.158	0.537
Mendola, mennola	Blotched picarel	*Spicara maena*	19.039	0.507
Cepola	Red bandfish	*Cepola macrophthalma*	17.735	0.472
Lanzardo atlantico	Atlantic chub mackerel	*Scomber colias*	16.572	0.441
Cappellano	Poor cod	*Trisopterus minutus*	15.993	0.426
Zerro, menola	Picarel	*Spicara smaris*	14.749	0.393
Sogliola comune	Common sole	*Solea solea*	13.638	0.363
Linguattola	Spotted flounder	*Citharus linguatula*	13.289	0.354
Murici	Murex	*Murex spp*	12.670	0.337
Scampi	Norway lobster	*Nephrops norvegicus*	12.024	0.320
Totano viola	European flying squid	*Todarodes sagittatus*	10.782	0.287
Razza bianca	White skate	*Raja alba*	9.937	0.265
Scorfano rosso	Red scorpionfish	*Scorpaena scrofa*	9.456	0.252
Rombi altri	Turbots nei	*Scophthalmidae*	9.381	0.250
Pesce prete	Stargazer	*Uranoscopus scaber*	9.008	0.240
Rana pescatrice	Angler(=Monk)	*Lophius piscatorius*	8.949	0.238
Spigole	European seabass	*Dicentrarchus labrax*	8.883	0.236
Pesce san pietro	John dory	*Zeus faber*	8.080	0.215
Scorfano rosa	Slender rockfish	*Scorpaena elongata*	6.678	0.178
Zerro musillo	Curled picarel	*Centracanthus cirrus*	5.905	0.157
Leccia stella	Pompano	*Trachinotus ovatus*	5.863	0.156
Luccio	European barracuda	*Sphyraena sphyraena*	5.784	0.154
Leccia	Leerfish	*Lichia amia*	5.669	0.151
Sarago sparaglione o sparlotto	Annular seabream	*Diplodus annularis*	5.542	0.148
Razze altre	Raja rays nei	*Raja spp*	4.659	0.124
Orate	Gilthead seabream	*Sparus aurata*	4.495	0.120
Cernia di scoglio	Dusky grouper	*Epinephelus marginatus*	3.999	0.106
Pagello rovello	Blackspot(=red) seabream	*Pagellus bogaraveo*	3.874	0.103

Italian name	English name	Scientific name	Mean landing in weight 2015-2016 (Ton)	Percentage (%)
Pesce spada	Swordfish	*Xiphias gladius*	3.791	0.101
Tracine	Weeverfishes nei	*Trachinidae*	3.691	0.098
Razza chiodata	Thornback ray	*Raja clavata*	3.575	0.095
Sarago maggiore	White seabream	*Diplodus sargus*	3.404	0.091
Pesce serra	Bluefish	*Pomatomus saltatrix*	3.062	0.082
Palamita	Atlantic bonito	*Sarda sarda*	2.989	0.080
Seppioline altre	Cuttlefish, bobtail squids nei	*Sepiidae, Sepiolidae*	2.636	0.070
Scorfani di fondale	Blackbelly rosefish	*Helicolenus dactylopterus*	2.171	0.058
Tonnetto	Little tunny(=Atl.black skipj)	*Euthynnus alletteratus*	2.167	0.058
Sgombro	Atlantic mackerel	*Scomber scombrus*	2.026	0.054
Rossetto	Transparent goby	*Aphia minuta*	1.886	0.050
Sarago pizzuto	Sharpsnout seabream	*Diplodus puntazzo*	1.610	0.043
Salpa	Salema	*Sarpa salpa*	1.602	0.043
Ricciole	Greater amberjack	*Seriola dumerili*	1.598	0.043
Calamaretto	Alloteuthis squids nei	*Alloteuthis spp*	1.540	0.041
Dentici	Common dentex	*Dentex dentex*	1.412	0.038
Aragosta	Common spiny lobster	*Palinurus elephas*	1.349	0.036
Rombo chiodato	Turbot	*Psetta maxima*	1.236	0.033
Occhiate	Saddled seabream	*Oblada melanura*	1.234	0.033
Altri crostacei	Marine crustaceans nei	*Crustacea*	1.168	0.031
Ghiozzi	Gobies nei	*Gobiidae*	1.114	0.030
Granchi	Marine crabs nei	*Brachyura*	0.966	0.026
Smeriglio	Porbeagle	*Lamna nasus*	0.958	0.025
Razza quattrocchi	Brown ray	*Raja miraletus*	0.888	0.024
Aguglie	Garfish	*Belone belone*	0.715	0.019
Passera	European flounder	*Platichthys flesus*	0.550	0.015
Rombo liscio	Brill	*Scophthalmus rhombus*	0.545	0.015
Murice spinoso	Purple dye murex	*Bolinus brandaris*	0.541	0.014
Musdea bianca	Greater forkbeard	*Phycis blennoides*	0.500	0.013
Verdesca	Blue shark	*Prionace glauca*	0.479	0.013
Pagro comune	Red porgy	*Pagrus pagrus*	0.398	0.011
Ombrine	Shi drum	*Umbrina cirrosa*	0.397	0.011
Scombroidei	Frigate and bullet tunas	*Auxis thazard, A, rochei*	0.343	0.009
Scorfanotto	Small red scorpionfish	*Scorpaena notata*	0.299	0.008
Palombo	Blackspotted smooth-hound	*Mustelus punctulatus*	0.269	0.007
Pesce castagna	Atlantic pomfret	*Brama brama*	0.247	0.007
Astice	European lobster	*Homarus gammarus*	0.166	0.004
Calamari	Common squids nei	*Loligo spp*	0.164	0.004
Gattuccio	Small-spotted catshark	*Scyliorhinus canicula*	0.123	0.003
Sogliole miste	Soles nei	*Soleidae*	0.059	0.002
Tanute	Black seabream	*Spondyliosoma cantharus*	0.047	0.001
Granceola	Spinous spider crab	*Maja squinado*	0.020	0.001

Source: estimates from MIPAAFT/National Fisheries Data Collection Programme

Table 4.1.3.2 – List of species detected for the UoA using purse seine (PS) for small pelagic fish (SPF) in the GSA 10. The species underlined are the species detected for the selected UoA.

Italian name	English name	Scientific name	Mean landing in weight 2015-2016 (Ton)	Percentage (%)
Alici	European anchovy	*Engraulis encrasicolus*	4098.630	63.920
Sardine	European pilchard(=Sardine)	*Sardina pilchardus*	753.094	11.745
Alaccia	Round sardinella	*Sardinella aurita*	338.680	5.282
Tonnetto	Little tunny(=Atl,black skipj)	*Euthynnus alletteratus*	275.677	4.299
Zerro, menola	Picarel	*Spicara smaris*	78.790	1.229
Boghe	Bogue	*Boops boops*	61.486	0.959
Ricciole	Greater amberjack	*Seriola dumerili*	59.900	0.934
Sugarello o suro	Atlantic horse mackerel	*Trachurus trachurus*	59.737	0.932
Palamita	Atlantic bonito	*Sarda sarda*	57.705	0.900
Lanzardo atlantico	Atlantic chub mackerel	*Scomber colias*	55.877	0.871
Pesce pilota	Pilotfish	*Naucrates ductor*	55.527	0.866
Costardelle	Atlantic saury	*Scomberesox saurus*	51.630	0.805
Mendola, mennola	Blotched picarel	*Spicara maena*	49.839	0.777
Lampughe	Common dolphinfish	*Coryphaena hippurus*	49.340	0.769
Cefalo dorato	Golden grey mullet	*Liza aurata*	40.223	0.627
Salpa	Salema	*Sarpa salpa*	38.421	0.599
Aguglie	Garfish	*Belone belone*	35.419	0.552
Scombroidei	Frigate and bullet tunas	*Auxis thazard, A, rochei*	34.347	0.536
Sgombro	Atlantic mackerel	*Scomber scombrus*	33.804	0.527
Luccio	European barracuda	*Sphyraena sphyraena*	31.402	0.490
Occhiate	Saddled seabream	*Oblada melanura*	27.278	0.425
Lanzardo	Chub mackerel	*Scomber japonicus*	25.912	0.404
Cefalo volpina	Flathead grey mullet	*Mugil cephalus*	19.163	0.299
Sugarello maggiore	Mediterranean horse mackerel	*Trachurus mediterraneus*	16.723	0.261
Alalunga	Albacore	*Thunnus alalunga*	15.605	0.243
Cicerello	Sandeels(=Sandlances) nei	*Ammodytes spp*	9.298	0.145
Pesce serra	Bluefish	*Pomatomus saltatrix*	8.171	0.127
Triglie di fango	Red mullet	*Mullus barbatus*	4.794	0.075
Orate	Gilthead seabream	*Sparus aurata*	4.405	0.069
Leccia stella	Pompano	*Trachinotus ovatus*	4.086	0.064
Nasello	European hake	*Merluccius merluccius*	3.380	0.053
Altri pesci	Marine fishes nei	*Osteichthyes*	3.000	0.047
Mormore	Sand steenbras	*Lithognathus mormyrus*	1.934	0.030
Calamaro mediterraneo	European squid	*Loligo vulgaris*	1.207	0.019
Pagello rovello	Blackspot(=red) seabream	*Pagellus bogaraveo*	0.979	0.015
Calamaretto	Alloteuthis squids nei	*Alloteuthis spp*	0.964	0.015
Pagello fragolino	Common pandora	*Pagellus erythrinus*	0.741	0.012
Pesce pettine o pesce rasoio	Pearly razorfish	*Xyrichtys novacula*	0.625	0.010
Pagro comune	Red porgy	*Pagrus pagrus*	0.616	0.010
Tonnetto striato	Skipjack tuna	*Katsuwonus pelamis*	0.585	0.009
Dentici	Common dentex	*Dentex dentex*	0.584	0.009

Italian name	English name	Scientific name	Mean landing in weight 2015-2016 (Ton)	Percentage (%)
Pagello mafrone	Axillary seabream	*Pagellus acarne*	0.552	0.009
Sarago maggiore	White seabream	*Diplodus sargus*	0.369	0.006
Spigole	European seabass	*Dicentrarchus labrax*	0.344	0.005
Sarago fasciato	Common two-banded seabream	*Diplodus vulgaris*	0.305	0.005
Polpo comune o di scoglio	Common octopus	*Octopus vulgaris*	0.296	0.005
Leccia	Leerfish	*Lichia amia*	0.294	0.005
Pesce spada	Swordfish	*Xiphias gladius*	0.204	0.003
Zerro musillo	Curled picarel	*Centracanthus cirrus*	0.133	0.002
Triglie di scoglio	Surmullet	*Mullus surmuletus*	0.053	0.001
Ombrine	Shi drum	*Umbrina cirrosa*	0.020	< 0.001
Cernia di scoglio	Dusky grouper	*Epinephelus marginatus*	0.010	< 0.001

Source: estimates from MIPAAFT/National Fisheries Data Collection Programme

Table 4.1.3.3 – List of species detected for the UoA using purse seine (PS) for large pelagic fish in the GSA 10. The species underlined are the species detected for the selected UoAs.

Italian name	English name	Scientific name	Mean landing in weight 2015-2016 (Ton)	Percentage (%)
Tonno rosso	Atlantic bluefin tuna	*Thunnus thynnus*	1028.284	47.296
Lampughe	Common dolphinfish	*Coryphaena hippurus*	663.751	30.529
Tonnetto	Little tunny(=Atl. black skipj)	*Euthynnus alletteratus*	149.398	6.872
Ricciole	Greater amberjack	*Seriola dumerili*	114.189	5.252
Scombroidei	Frigate and bullet tunas	*Auxis thazard, A, rochei*	55.669	2.560
Palamita	Atlantic bonito	*Sarda sarda*	45.227	2.080
Alici	European anchovy	*Engraulis encrasicolus*	23.017	1.059
Pesce pilota	Pilotfish	*Naucrates ductor*	17.895	0.823
Pesce spada	Swordfish	*Xiphias gladius*	11.198	0.515
Sugarello o suro	Atlantic horse mackerel	*Trachurus trachurus*	10.276	0.473
Alalunga	Albacore	*Thunnus alalunga*	7.249	0.333
Occhiate	Saddled seabream	*Oblada melanura*	7.153	0.329
Lanzardo atlantico	Atlantic chub mackerel	*Scomber colias*	5.252	0.242
Tonnetto striato	Skipjack tuna	*Katsuwonus pelamis*	5.075	0.233
Lanzardo	Chub mackerel	*Scomber japonicus*	3.805	0.175
Aguglie	Garfish	*Belone belone*	2.763	0.127
Luccio	European barracuda	*Sphyraena sphyraena*	2.728	0.125
Costardelle	Atlantic saury	*Scomberesox saurus*	2.591	0.119
Altri pesci	Marine fishes nei	*Osteichthyes*	2.569	0.118
Sugarello maggiore	Mediterranean horse mackerel	*Trachurus mediterraneus*	2.489	0.114
Sgombro	Atlantic mackerel	*Scomber scombrus*	2.457	0.113
Istiophoridae	Marlins,sailfishes,etc, nei	*Istiophoridae*	2.385	0.110
Sardine	European pilchard(=Sardine)	*Sardina pilchardus*	2.164	0.100
Cefalo dorato	Golden grey mullet	*Liza aurata*	1.473	0.068
Boghe	Bogue	*Boops boops*	1.273	0.059
Orate	Gilthead seabream	*Sparus aurata*	1.159	0.053
Calamaro mediterraneo	European squid	*Loligo vulgaris*	0.831	0.038
Cefalo volpina	Flathead grey mullet	*Mugil cephalus*	0.607	0.028
Nasello	European hake	*Merluccius merluccius*	0.327	0.015
Mendola, mennola	Blotched picarel	*Spicara maena*	0.256	0.012
Alaccia	Round sardinella	*Sardinella aurita*	0.248	0.011
Salpa	Salema	*Sarpa salpa*	0.091	0.004
Leccia	Leerfish	*Lichia amia*	0.082	0.004
Leccia stella	Pompano	*Trachinotus ovatus*	0.077	0.004
Totano comune	Broadtail shortfin squid	*Illex coindetii*	0.058	0.003
Pesce pettine o pesce rasoio	Pearly razorfish	*Xyrichtys novacula*	0.036	0.002
Mormore	Sand steenbras	*Lithognathus mormyrus*	0.035	0.002
Cernia di scoglio	Dusky grouper	*Epinephelus marginatus*	0.018	0.001

Source: estimates from MIPAAFT/National Fisheries Data Collection Programme

Table 4.1.3.4 – List of species detected for the UoA using fixed longlines (LLS) in the GSA 10. The species underlined are the species detected for the selected UoAs.

Italian name	English name	Scientific name	Mean landing in weight 2015-2016 (Ton)	Percentage (%)
Pesce sciabola	Silver scabbardfish	*Lepidopus caudatus*	360.345	36.753
Nasello	European hake	*Merluccius merluccius*	214.127	21.840
Sugarello o suro	Atlantic horse mackerel	*Trachurus trachurus*	55.481	5.659
Pesce castagna	Atlantic pomfret	*Brama brama*	46.049	4.697
Pagello fragolino	Common pandora	*Pagellus erythrinus*	30.833	3.145
Sugarello maggiore	Mediterranean horse mackerel	*Trachurus mediterraneus*	27.512	2.806
Ricciole	Greater amberjack	*Seriola dumerili*	22.311	2.276
Altri pesci	Marine fishes nei	*Osteichthyes*	20.402	2.081
Boghe	Bogue	*Boops boops*	20.070	2.047
Gallinella o cappone	Tub gurnard	*Chelidonichthys lucerna*	15.403	1.571
Scorfano rosso	Red scorpionfish	*Scorpaena scrofa*	13.817	1.409
Sarago pizzuto	Sharpsnout seabream	*Diplodus puntazzo*	11.208	1.143
Orate	Gilthead seabream	*Sparus aurata*	11.175	1.140
Tonnetto	Little tunny(=Atl. black skipj)	*Euthynnus alletteratus*	10.666	1.088
Pagello mafrone	Axillary seabream	*Pagellus acarne*	10.039	1.024
Gronghi	European conger	*Conger conger*	10.020	1.022
Squali	Dogfishes nei	*Squalus spp*	9.972	1.017
Spigole	European seabass	*Dicentrarchus labrax*	8.664	0.884
Verdesca	Blue shark	*Prionace glauca*	7.520	0.767
Cernia di scoglio	Dusky grouper	*Epinephelus marginatus*	6.906	0.704
Cefali altri	Mullets nei	*Mugilidae*	6.642	0.677
Occhiate	Saddled seabream	*Oblada melanura*	6.358	0.648
Triglie di scoglio	Surmullet	*Mullus surmuletus*	5.738	0.585
Palombo	Blackspotted smooth-hound	*Mustelus punctulatus*	5.735	0.585
Pagello rovello	Blackspot(=red) seabream	*Pagellus bogaraveo*	4.120	0.420
Dentici	Common dentex	*Dentex dentex*	3.983	0.406
Luccio	European barracuda	*Sphyraena sphyraena*	3.614	0.369
Scorfani di fondale	Blackbelly rosefish	*Helicolenus dactylopterus*	3.400	0.347
Totano comune	Broadtail shortfin squid	*Illex coindetii*	2.923	0.298
Lanzardo	Chub mackerel	*Scomber japonicus*	2.808	0.286
Pesce san pietro	John dory	*Zeus faber*	2.792	0.285
Lampughe	Common dolphinfish	*Coryphaena hippurus*	2.187	0.223
Sarago fasciato	Common two-banded seabream	*Diplodus vulgaris*	2.157	0.220
Lanzardo atlantico	Atlantic chub mackerel	*Scomber colias*	2.098	0.214
Sgombro	Atlantic mackerel	*Scomber scombrus*	1.795	0.183
Sarago maggiore	White seabream	*Diplodus sargus*	1.617	0.165
Musdea bianca	Greater forkbeard	*Phycis blennoides*	1.595	0.163
Mormore	Sand steenbras	*Lithognathus mormyrus*	1.219	0.124
Ombrine	Shi drum	*Umbrina cirrosa*	1.168	0.119
Sarago sparaglione o sparlotto	Annular seabream	*Diplodus annularis*	1.123	0.115
Pagro comune	Red porgy	*Pagrus pagrus*	0.808	0.082
Scombroidei	Frigate and bullet tunas	*Auxis thazard, A, rochei*	0.782	0.080

Italian name	English name	Scientific name	Mean landing in weight 2015-2016 (Ton)	Percentage (%)
Palamita	Atlantic bonito	*Sarda sarda*	0.672	0.069
Leccia	Leerfish	*Lichia amia*	0.555	0.057
Leccia stella	Pompano	*Trachinotus ovatus*	0.339	0.035
Pesce serra	Bluefish	*Pomatomus saltatrix*	0.292	0.030
Rombo liscio	Brill	*Scophthalmus rhombus*	0.272	0.028
Salpa	Salema	*Sarpa salpa*	0.229	0.023
Molluschi	Marine molluscs nei	*Mollusca*	0.224	0.023
Istiophoridae	Marlins,sailfishes,etc, nei	*Istiophoridae*	0.179	0.018
Rana pescatrice	Angler(=Monk)	*Lophius piscatorius*	0.149	0.015
Razza chiodata	Thornback ray	*Raja clavata*	0.146	0.015
Budego	Blackbellied angler	*Lophius budegassa*	0.115	0.012
Tonnetto striato	Skipjack tuna	*Katsuwonus pelamis*	0.073	0.007
Murene	Mediterranean moray	*Muraena helena*	0.015	0.002

Source: estimates from MIPAAFT/National Fisheries Data Collection Programme

Table 4.1.3.5 – List of species detected for UoA using drift longlines (LLD) in GSA 10. The species underlined are the species detected for the selected UoAs.

Italian name	English name	Scientific name	Mean landing in weight 2015-2016 (Ton)	Percentage (%)
Pesce spada	Swordfish	*Xiphias gladius*	1643,529	74,060
Alalunga	Albacore	*Thunnus alalunga*	297,927	13,425
Tonno rosso	Atlantic bluefin tuna	*Thunnus thynnus*	137,300	6,187
Lampughe	Common dolphinfish	*Coryphaena hippurus*	51,163	2,305
Tonnetto striato	Skipjack tuna	*Katsuwonus pelamis*	20,601	0,928
Tonnetto	Little tunny(=Atl,black skipj)	*Euthynnus alletteratus*	14,420	0,650
Pesce sciabola	Silver scabbardfish	*Lepidopus caudatus*	13,451	0,606
Nasello	European hake	*Merluccius merluccius*	9,570	0,431
Pesce serra	Bluefish	*Pomatomus saltatrix*	6,020	0,271
Palamita	Atlantic bonito	*Sarda sarda*	5,838	0,263
Luccio	European barracuda	*Sphyraena sphyraena*	4,740	0,214
Scombroidei	Frigate and bullet tunas	*Auxis thazard, A, rochei*	4,291	0,193
Sgombro	Atlantic mackerel	*Scomber scombrus*	2,132	0,096
Pesce castagna	Atlantic pomfret	*Brama brama*	2,030	0,091
Ricciole	Greater amberjack	*Seriola dumerili*	1,574	0,071
Istiophoridae	Marlins,sailfishes,etc, nei	*Istiophoridae*	1,475	0,066
Lanzardo	Chub mackerel	*Scomber japonicus*	0,973	0,044
Altri pesci	Marine fishes nei	*Osteichthyes*	0,935	0,042
Palombo	Blackspotted smooth-hound	*Mustelus punctulatus*	0,423	0,019
Smeriglio	Porbeagle	*Lamna nasus*	0,210	0,009
Cernia di scoglio	Dusky grouper	*Epinephelus marginatus*	0,189	0,009
Verdesca	Blue shark	*Prionace glauca*	0,146	0,007
Sarago maggiore	White seabream	*Diplodus sargus*	0,114	0,005
Pagello fragolino	Common pandora	*Pagellus erythrinus*	0,091	0,004
Gronghi	European conger	*Conger conger*	0,033	0,001

Source: estimates from MIPAAFT/National Fisheries Data Collection Programme

Table 4.1.3.6 – List of species detected for the UoA using trammel net (GTR) in the GSA 10. The underlined species are the species detected for the selected UoAs.

Italian name	English name	Scientific name	Mean landing in weight 2015-2016 (Ton)	Percentage (%)
Mendola, mennola	Blotched picarel	*Spicara maena*	324.913	16.442
Seppia mediterranea o comune	Common cuttlefish	*Sepia officinalis*	220.791	11.173
Nasello	European hake	*Merluccius merluccius*	198.836	10.062
Mormore	Sand steenbras	*Lithognathus mormyrus*	110.266	5.580
Boghe	Bogue	*Boops boops*	71.917	3.639
Triglie di scoglio	Surmullet	*Mullus surmuletus*	70.185	3.552
Polpo comune o di scoglio	Common octopus	*Octopus vulgaris*	69.125	3.498
Sugarello o suro	Atlantic horse mackerel	*Trachurus trachurus*	60.069	3.040
Pagello fragolino	Common pandora	*Pagellus erythrinus*	56.545	2.861
Occhiate	Saddled seabream	*Oblada melanura*	50.502	2.556
Altri pesci	Marine fishes nei	*Osteichthyes*	50.002	2.530
Gallinella o cappone	Tub gurnard	*Chelidonichthys lucerna*	48.061	2.432
Pannocchie	Spottail mantis squillid	*Squilla mantis*	45.574	2.306
Totano comune	Broadtail shortfin squid	*Illex coindetii*	37.733	1.909
Labridae	Wrasses, hogfishes, etc, nei	*Labridae*	36.244	1.834
Palamita	Atlantic bonito	*Sarda sarda*	35.561	1.800
Triglie di fango	Red mullet	*Mullus barbatus*	34.086	1.725
Salpa	Salema	*Sarpa salpa*	32.816	1.661
Serranidae	Groupers, seabasses nei	*Serranidae*	32.379	1.639
Sarago sparaglione o sparlotto	Annular seabream	*Diplodus annularis*	29.046	1.470
Mazzancolle	Caramote prawn	*Penaeus kerathurus*	27.329	1.383
Ricciole	Greater amberjack	*Seriola dumerili*	27.126	1.373
Tonnetto	Little tunny(=Atl,black skipj)	*Euthynnus alletteratus*	24.970	1.264
Sogliola comune	Common sole	*Solea solea*	24.870	1.259
Cefali altri	Mullets nei	*Mugilidae*	23.193	1.174
Scorfano rosso	Red scorpionfish	*Scorpaena scrofa*	18.272	0.925
Calamaro mediterraneo	European squid	*Loligo vulgaris*	18.179	0.920
Pagello mafrone	Axillary seabream	*Pagellus acarne*	15.170	0.768
Scorfano nero	Black scorpionfish	*Scorpaena porcus*	14.025	0.710
Sugarello maggiore	Mediterranean horse mackerel	*Trachurus mediterraneus*	13.174	0.667
Dentici	Common dentex	*Dentex dentex*	10.500	0.531
Aragosta	Common spiny lobster	*Palinurus elephas*	9.827	0.497
Sarago fasciato	Common two-banded seabream	*Diplodus vulgaris*	8.912	0.451
Sarago maggiore	White seabream	*Diplodus sargus*	8.098	0.410
Orate	Gilthead seabream	*Sparus aurata*	7.215	0.365
Razza bianca	White skate	*Raja alba*	7.211	0.365
Pesce sciabola	Silver scabbardfish	*Lepidopus caudatus*	6.185	0.313
Lampughe	Common dolphinfish	*Coryphaena hippurus*	6.018	0.305
Lanzardo atlantico	Atlantic chub mackerel	*Scomber colias*	5.794	0.293
Leccia	Leerfish	*Lichia amia*	5.676	0.287
Musdea	Forkbeard	*Phycis phycis*	5.591	0.283
Pesce san pietro	John dory	*Zeus faber*	5.003	0.253

Italian name	English name	Scientific name	Mean landing in weight 2015-2016 (Ton)	Percentage (%)
Tracine	Weeverfishes nei	*Trachinidae*	4.992	0.253
Pesce serra	Bluefish	*Pomatomus saltatrix*	4.774	0.242
Pagro comune	Red porgy	*Pagrus pagrus*	4.688	0.237
Scorfani di fondale	Blackbelly rosefish	*Helicolenus dactylopterus*	4.108	0.208
Aguglie	Garfish	*Belone belone*	3.981	0.201
Tanute	Black seabream	*Spondyliosoma cantharus*	3.695	0.187
Rana pescatrice	Angler(=Monk)	*Lophius piscatorius*	3.503	0.177
Pesce prete	Stargazer	*Uranoscopus scaber*	3.419	0.173
Gronghi	European conger	*Conger conger*	3.374	0.171
Cernia di scoglio	Dusky grouper	*Epinephelus marginatus*	3.346	0.169
Lanzardo	Chub mackerel	*Scomber japonicus*	3.212	0.163
Scombroidei	Frigate and bullet tunas	*Auxis thazard, A, rochei*	2.732	0.138
Alaccia	Round sardinella	*Sardinella aurita*	2.213	0.112
Pagello rovello	Blackspot(=red) seabream	*Pagellus bogaraveo*	2.094	0.106
Pesce pettine o pesce rasoio	Pearly razorfish	*Xyrichtys novacula*	1.921	0.097
Spigole	European seabass	*Dicentrarchus labrax*	1.815	0.092
Ombrine	Shi drum	*Umbrina cirrosa*	1.793	0.091
Sgombro	Atlantic mackerel	*Scomber scombrus*	1.731	0.088
Istiophoridae	Marlins,sailfishes,etc, nei	*Istiophoridae*	1.582	0.080
Scorfanotto	Small red scorpionfish	*Scorpaena notata*	1.375	0.070
Rombo liscio	Brill	*Scophthalmus rhombus*	1.321	0.067
Budego	Blackbellied angler	*Lophius budegassa*	1.298	0.066
Luccio	European barracuda	*Sphyraena sphyraena*	1.098	0.056
Razza chiodata	Thornback ray	*Raja clavata*	1.093	0.055
Rombo chiodato	Turbot	*Psetta maxima*	0.987	0.050
Rombi altri	Turbots nei	*Scophthalmidae*	0.604	0.031
Murene	Mediterranean moray	*Muraena helena*	0.397	0.020
Astice	European lobster	*Homarus gammarus*	0.378	0.019
Leccia stella	Pompano	*Trachinotus ovatus*	0.272	0.014
Sardine	European pilchard(=Sardine)	*Sardina pilchardus*	0.265	0.013
Granceola	Spinous spider crab	*Maja squinado*	0.189	0.010
Musdea bianca	Greater forkbeard	*Phycis blennoides*	0.188	0.010
Sarago pizzuto	Sharpsnout seabream	*Diplodus puntazzo*	0.129	0.007
Alici	European anchovy	*Engraulis encrasicolus*	0.126	0.006
Pesce castagna	Atlantic pomfret	*Brama brama*	0.121	0.006
Zanchetta	Mediterranean scaldfish	*Arnoglossus laterna*	0.084	0.004
Moscardino bianco	Horned octopus	*Eledone cirrhosa*	0.081	0.004
Ghiozzi	Gobies nei	*Gobiidae*	0.072	0.004
Corvine	Brown meagre	*Sciaena umbra*	0.065	0.003

Source: estimates from MIPAAFT/National Fisheries Data Collection Programme

Table 4.1.3.7 – List of species detected for the UoA using gill nets (GNS) in the GSA 10. The species underlined are the species detected for the selected UoAs.

Italian name	English name	Scientific name	Mean landing in weight 2015-2016 (Ton)	Percentage (%)
Nasello	European hake	*Merluccius merluccius*	319.152	30.074
Sugarello o suro	Atlantic horse mackerel	*Trachurus trachurus*	53.067	5.000
Scombroidei	Frigate and bullet tunas	*Auxis thazard, A, rochei*	41.936	3.952
Ricciole	Greater amberjack	*Seriola dumerili*	39.309	3.704
Palamita	Atlantic bonito	*Sarda sarda*	37.728	3.555
Tonnetto	Little tunny (=Atl. black skipj)	*Euthynnus alletteratus*	35.889	3.382
Sogliola comune	Common sole	*Solea solea*	35.491	3.344
Gallinella o cappone	Tub gurnard	*Chelidonichthys lucerna*	34.002	3.204
Totano comune	Broadtail shortfin squid	*Illex coindetii*	33.812	3.186
Seppia mediterranea o comune	Common cuttlefish	*Sepia officinalis*	32.405	3.054
Triglie di scoglio	Surmullet	*Mullus surmuletus*	28.716	2.706
Polpo comune o di scoglio	Common octopus	*Octopus vulgaris*	25.641	2.416
Lampughe	Common dolphinfish	*Coryphaena hippurus*	24.205	2.281
Boghe	Bogue	*Boops boops*	23.146	2.181
Altri pesci	Marine fishes nei	*Osteichthyes*	17.976	1.694
Pagello fragolino	Common pandora	*Pagellus erythrinus*	17.975	1.694
Musdea	Forkbeard	*Phycis phycis*	14.884	1.402
Lanzardo atlantico	Atlantic chub mackerel	*Scomber colias*	14.287	1.346
Pagello rovello	Blackspot(=red) seabream	*Pagellus bogaraveo*	14.171	1.335
Razza chiodata	Thornback ray	*Raja clavata*	12.792	1.205
Calamaro mediterraneo	European squid	*Loligo vulgaris*	11.410	1.075
Pesce sciabola	Silver scabbardfish	*Lepidopus caudatus*	10.500	0.989
Scorfano nero	Black scorpionfish	*Scorpaena porcus*	9.549	0.900
Lanzardo	Chub mackerel	*Scomber japonicus*	9.471	0.892
Pesce prete	Stargazer	*Uranoscopus scaber*	9.162	0.863
Sarago sparaglione o sparlotto	Annular seabream	*Diplodus annularis*	8.737	0.823
Pagello mafrone	Axillary seabream	*Pagellus acarne*	8.458	0.797
Occhiate	Saddled seabream	*Oblada melanura*	8.357	0.787
Scorfano rosso	Red scorpionfish	*Scorpaena scrofa*	7.840	0.739
Triglie di fango	Red mullet	*Mullus barbatus*	7.504	0.707
Sgombro	Atlantic mackerel	*Scomber scombrus*	6.427	0.606
Orate	Gilthead seabream	*Sparus aurata*	5.807	0.547
Zerro, menola	Picarel	*Spicara smaris*	5.780	0.545
Sarago maggiore	White seabream	*Diplodus sargus*	5.582	0.526
Labridae	Wrasses, hogfishes, etc, nei	*Labridae*	5.563	0.524
Rombo chiodato	Turbot	*Psetta maxima*	5.333	0.503
Cefali altri	Mullets nei	*Mugilidae*	5.292	0.499
Mormore	Sand steenbras	*Lithognathus mormyrus*	5.162	0.486
Scorfani di fondale	Blackbelly rosefish	*Helicolenus dactylopterus*	4.796	0.452
Rana pescatrice	Angler(=Monk)	*Lophius piscatorius*	4.770	0.449
Pesce san pietro	John dory	*Zeus faber*	4.653	0.438
Dentici	Common dentex	*Dentex dentex*	4.644	0.438

Italian name	English name	Scientific name	Mean landing in weight 2015-2016 (Ton)	Percentage (%)
Sarago fasciato	Common two-banded seabream	*Diplodus vulgaris*	4.500	0.424
Aragosta	Common spiny lobster	*Palinurus elephas*	4.169	0.393
Linguattola	Spotted flounder	*Citharus linguatula*	4.030	0.380
Gronghi	European conger	*Conger conger*	3.482	0.328
Leccia stella	Pompano	*Trachinotus ovatus*	3.218	0.303
Budego	Blackbellied angler	*Lophius budegassa*	3.179	0.300
Spigole	European seabass	*Dicentrarchus labrax*	3.071	0.289
Sugarello maggiore	Mediterranean horse mackerel	*Trachurus mediterraneus*	2.676	0.252
Pagro comune	Red porgy	*Pagrus pagrus*	2.630	0.248
Mendola, mennola	Blotched picarel	*Spicara maena*	2.377	0.224
Pesce serra	Bluefish	*Pomatomus saltatrix*	2.118	0.200
Cernia di scoglio	Dusky grouper	*Epinephelus marginatus*	1.762	0.166
Passera	European flounder	*Platichthys flesus*	1.323	0.125
Tanute	Black seabream	*Spondyliosoma cantharus*	1.153	0.109
Cefalo volpina	Flathead grey mullet	*Mugil cephalus*	1.026	0.097
Sarago pizzuto	Sharpsnout seabream	*Diplodus puntazzo*	0.970	0.091
Rombi altri	Turbots nei	*Scophthalmidae*	0.967	0.091
Tracine	Weeverfishes nei	*Trachinidae*	0.913	0.086
Luccio	European barracuda	*Sphyraena sphyraena*	0.902	0.085
Murene	Mediterranean moray	*Muraena helena*	0.867	0.082
Salpa	Salema	*Sarpa salpa*	0.835	0.079
Zanchetta	Mediterranean scaldfish	*Arnoglossus laterna*	0.663	0.062
Moscardino bianco	Horned octopus	*Eledone cirrhosa*	0.585	0.055
Capone coccio	Red gurnard	*Aspitrigla cuculus*	0.564	0.053
Ombrine	Shi drum	*Umbrina cirrosa*	0.452	0.043
Rombo liscio	Brill	*Scophthalmus rhombus*	0.383	0.036
Razza stellata	Mediterranean starry ray	*Raja asterias*	0.282	0.027
Alici	European anchovy	*Engraulis encrasicolus*	0.160	0.015
Aguglie	Garfish	*Belone belone*	0.118	0.011
Corvine	Brown meagre	*Sciaena umbra*	0.096	0.009
Istiophoridae	Marlins,sailfishes,etc, nei	*Istiophoridae*	0.090	0.008
Pesce castagna	Atlantic pomfret	*Brama brama*	0.079	0.007
Razza bianca	White skate	*Raja alba*	0.055	0.005
Totano viola	European flying squid	*Todarodes sagittatus*	0.049	0.005
Mazzancolle	Caramote prawn	*Penaeus kerathurus*	0.040	0.004
Scorfani altri	Scorpionfishes nei	*Scorpaenidae*	0.020	0.002
Serranidae	Groupers, seabasses nei	*Serranidae*	0.018	0.002
Saraghi altri	Sargo breams nei	*Diplodus spp*	0.013	0.001
Granchi	Marine crabs nei	*Brachyura*	0.012	0.001

Source: estimates from MIPAAFT/National Fisheries Data Collection Programme

Table 4.1.3.8 – List of species detected for the UoA using the hand or mechanized lines (LHP-LHM) in the GSA 10. The species underlined are the species detected for the selected UoAs.

Italian name	English name	Scientific name	Mean landing in weight 2015-2016 (Ton)	Percentage (%)
Totano comune	Broadtail shortfin squid	*Illex coindetii*	164.788	99.080
Nasello	European hake	*Merluccius merluccius*	0.629	0.378
Polpo comune o di scoglio	Common octopus	*Octopus vulgaris*	0.554	0.333
Totano viola	European flying squid	*Todarodes sagittatus*	0.347	0.209

Source: estimates from MIPAAFT/National Fisheries Data Collection Programme

4.1.4 Environmental context

The GSA 10 (Central-Southern Tyrrhenian Sea) extends for 20,255 km^2, considering the area between the coastline (about 10 m) and about 800 m of depth, and falls within the statistical division FAO 37.1.3. The total area concerns the coasts of 5 regions: Lazio (only for a few kilometers), Campania, Basilicata, Calabria (Tyrrhenian side) and Sicily (northern side), for a coastal extension of 1,129 km, and includes 12 maritime Compartments. According to the GFCM-FAO classification, the GSA 10 is enclosed in a stretch of the Tyrrhenian Sea delimited by the coastline and the junction between two ideal perpendicular from the coast towards the open sea: one to the south, 70 miles off the coast of Trapani, and one to North, 90 miles off the Circeo promontory.

The central-southern Tyrrhenian presents one of the most complex structures among the seas that surround the Italian peninsula, due to its morphological, geophysical and dynamic characteristics of the masses of water. The coasts are generally very uneven and the island system is the richest of Italian seas. Moreover, the coastal area is characterized by a system of gullies with peculiar environmental characteristics. The morphology of the central-southern Tyrrhenian funds is similar to that of the oceans, with a well-developed continental shelf and slope, abyssal plains and submarine mountains. The Tyrrhenian Sea can in fact be considered, from a geological point of view, more like an ocean, as a consequence of the prolonged processes of lithosphere distension that have generated a thinning of the crust and the formation of an abyssal plane. The geodynamic evolution of the central-southern Tyrrhenian Sea is highlighted by two main abyssal plains, where maximum depths from 2,900 to 3,600 m are reached, where there are two impressive volcanic buildings of basaltic nature, Vavilov (about 85 miles South-West of the Gulf of Naples) and the Marsili (about 54 miles from the Cilento coast line). In the area near Vavilov there is a less imposing volcano, the Magnaghi, probably not active. In the areas surrounding the Marsili (height 3.500 m, length about 60 km), which rises from the seabed up to about 500 m, is present a mountain range of volcanic origin. These are generally active formations with circulation of hydrothermal fluids that give rise to the hydrothermal sources. This topography influences the circulation of water masses, in particular it has been shown that Vavilov is partially responsible for the persistence, in several seasons, of anticyclonic vortices fed by prod water masses in winter in the North-Western Mediterranean (Western Intermediate Waters). , WIW) (Budillon et al., 2009). The margins of the central-southern Tyrrhenian are rather steep and irregular and in some cases affected by deep incisions. The continental shelf (up to 200 m) is not very developed along the northern edge of Sicily and along the coasts of Calabria and Basilicata, while it has a greater development along the margin of Campania and

Lazio, where it forms, in the northern part, the continuation towards the sea of the alluvial plains of the rivers Garigliano and Volturno and, further south, in the Gulf of Salerno, that of the Sele. In the Gulf of Gaeta the extension of the continental shelf tends to decrease from NO to SE, passing from about 20 km at the mouth of the Garigliano, less than 10 km south of the river Volturno, where the platform is carved by the canyon of Cuma. The alignment between the mainland and the flegrean islands (Campi Flegrei-Procida-Ischia) represents a physiographic, as well as geographical, partition between the Gulf of Gaeta to the north and the Gulf of Naples to the south, where the continental shelf has amplitude between about 2,5 km off the western sector of the island of Capri, and about 10-15 km, off the coast of Sorrento. In the Gulf of Naples, rather offshore, between the islands of Ischia and Capri, the platform is carved by two large canyons: the Magnaghi and the Dohrn. In the same area there is also a bench of sedimentary nature called "Banco di Bocca Grande" with a top of 130 m. The width of the Magnaghi and Dohrn canyons is between a few hundred meters and more than 1 km and their extension extends from the edge of the continental shelf (about 150 m deep) to the batiale plain (D'Argenio et al., 2004) . In the stretch included from Punta Campanella to Amalfi the continental shelf tends to disappear and the bottom quickly reaches depths of over 300 m, while in the stretch from Amalfi to Capo d'Orso the platform stretches for only 2-4 km, reaching 10- 12 km from the coastline near Salerno and expanding up to 15-25 km from the coastline at the mouth of the Sele. The Gulf of Policastro is characterized by sectors with a narrow continental shelf (less than 3 km) and sectors where the continental shelf reaches an area of about 8 km, with a 130 and 140 m escarpment. Where the platform is less developed the upper part of the slope is narrow and bumpy and carved by terraces and canyons. The Strait of Messina separates the continental area of the GSA 10 from that of northern Sicily and is the place where the waters of the central-southern Tyrrhenian and the Ionian mix. The submarine profile of the Strait has, at its widest point (3.2 km wide), a depth between 80 and 120 m. On the Tyrrhenian side the sea floor slowly degrades, while in the Ionian part the slope is very steep, reaching in a few kilometers depth of about 500 m. The Strait outlines the physiographic demarcation between central-southern Tyrrhenian and Ionian and represents an additional morphological barrier for the exchange between the two basins. The fluctuations of the Atlanto-Ionian current (AIS) induce a very particular internal dynamic within the Strait; moreover, even if the tidal excursions in the Mediterranean are relatively small, in the Strait of Messina they become important, since the semi-tides in the Tyrrhenian and the Ionian are generally in opposition. This generates strong vertical and horizontal gradients, so the Ionic waters enter the surface in the Tyrrhenian Sea during the tidal flow from the North and, conversely, the Tyrrhenian waters enter the Ionian at a depth of about 100 m during the flow from the South (Brandt et al. , 1999). The upwelling phenomena, bringing to the surface deep waters, determine in the Strait the presence of superficial waters that are considerably colder than those, at the same depth, of other areas of the Ionian Sea. The salts of nitrogen and phosphorus, transported in the superficial layers from the deep ionic waters, allow the production of a large amount of organic substance, which feeds the trophic network of both the coastal benthic populations and of the pelagic communities. The Strait of Messina is a fundamental transit point for many Mediterranean migratory species (tunnids, swordfish, cetaceans). The peculiarities of the circulation of water masses in the Strait determine the presence of batopelagic fauna in the less deep layers (for example Chauliodus sloani, Argyropelecus hemigymnus), a phenomenon that has fueled, in this area, a rich research on the abyssal fauna especially between the end of the nineteenth and early twentieth

century. The northern coast of Sicily is, like most of the continental coasts, characterized by a steep escarpment, with the bottom reaching the average depth of 500 m at distances between 4 and 15 km from the coast (Figures 4.1.4.1). The Tyrrhenian Sea exchanges water with the rest of the Mediterranean through the canals of Sardinia, Corsica and Sicily, morphological thresholds that prevent the recirculation of the deep layers (Sparnocchia et al., 1999). From the point of view of the movements of the masses of water, the Tyrrhenian is an active area, characterized by a rich mesoscale dynamics (Vetrano et al., 2010; Figures 4.1.4.1). The waters can be classified into three large layers:

- the surface layer, up to about 200 m of depth, occupied by Modified Atlantic Waters (AW), which flow with the Atlantic current from the Strait of Gibraltar and change to become more salty during their journey;
- the intermediate layer from 200 to 700 m of depth, currently occupied by a mixture of intermediate waters - before the nineties called Intermediate Waters Levantine (LIW, Levantine Intermediate Waters) (Gasparini et al., 2005) - that flow from the Strait of Sicily;
- the deep layer occupied by the Deep Tyrrhenian Waters (TDW, Tyrrhenian Deep Waters) that protrudes from the Sardinian Channel along the Sardinia Sea.

Recent scientific evidences, emerging from the work of Millot and collaborators (2006), suggests that dense and deep Tyrrhenian waters (TDW) play a crucial role in the deep circulation of the western basin, but are also one of the main tributaries to the flow of water leaving the Mediterranean towards the Atlantic. A substantial supply of water from the eastern Mediterranean basin (LIW and underlying layers) flows through the Strait of Sicily and enters the Tyrrhenian basin where it sinks and mixes with the waters of the western Mediterranean basin (Sparnocchia et al., 1999). The historical series of oceanographic data, from the sixties to the end of the eighties, show, instead, that the waters leaving the Mediterranean towards Gibraltar were formed by the deep waters of the western basin (WMDW) and the LIW, but there is no indication of other masses of water, in particular of the dense ones that are formed in the Southern Adriatic and in the Aegean, currently known, when they reach the Sicilian Channel, as Eastern Overflow Water (EOW) (Millot et al., 2006). The most recent measurements of temperature and salinity values, collected near the Strait of Gibraltar, indicate that the denser Mediterranean waters, which flow towards the Atlantic, have undergone continuous changes, becoming increasingly hot and salty. So the dense waters that currently flow out of the Mediterranean are the TDW, mainly composed of EOW (the percentage of WMDW is lower). The most dense part of the flow has therefore increasingly assumed the characteristics of the eastern Mediterranean basin, undergoing the influence of the Eastern Mediterranean Transient (EMT), an anomaly due to an important contribution of dense waters coming from the Aegean following particular climatic events, which has generated changes in the composition and circulation of the masses of water in the Mediterranean. The available observations make it possible to establish that the transient reached the Tyrrhenian Sea between April and May 1992 and the impact in the western basin was highest in the two years 1992-1994, when an important portion of the flow from the Strait of Sicily collapsed into the Tyrrhenian Sea reaching the greatest depths (Budillon et al., 2009).

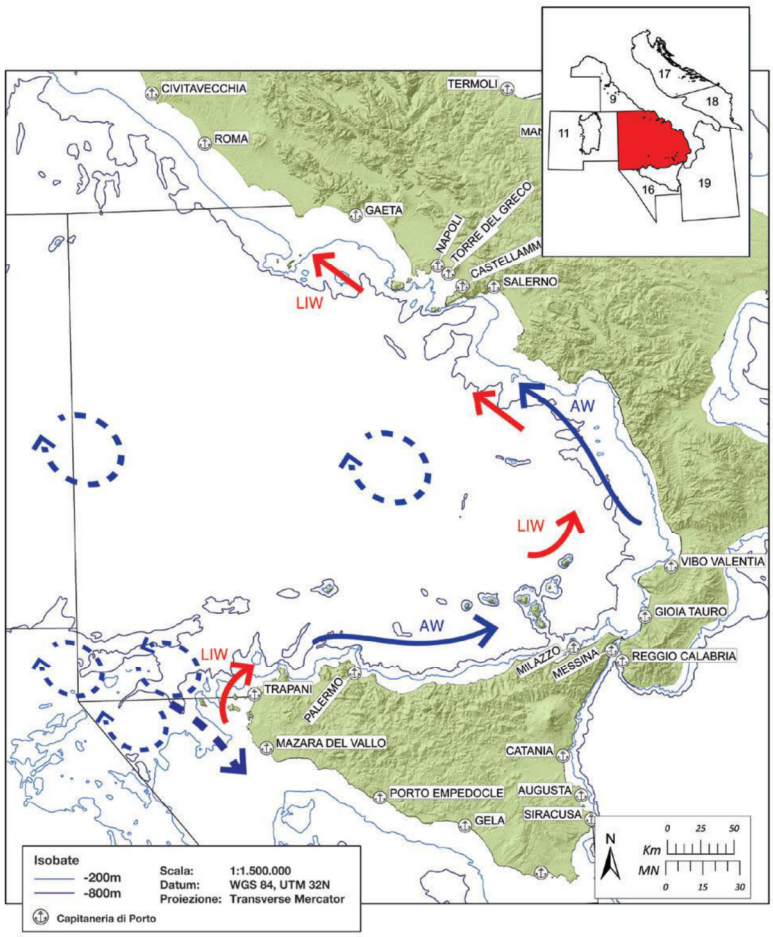


Figure 4.1.4.1 - Circulation of surface currents (AW) and intermediate currents (LIW); AW: waters of Atlantic origin (blue); LIW: waters of Levantine origin (red) (MIPAAFT, 2017).

In the central Mediterranean the velocity of surface currents is rather low, generally less than one node, except in the Strait of Sicily. A branch of the superficial current coming from the western basin and flowing towards the Strait of Sicily separates from the main trunk, lapping the Sicilian northern coasts and joining the cyclonic circulation of the Tyrrhenian, which runs from south to north along the continental coasts. In winter, a further branch of this stream rises up to the Elbe and descends along Sardinia, while another branch feeds a cyclonic vortex in the central-southern basin. This vortex extends in spring almost to lap the coasts of Sardinia and breaks up into two main laps in the summer. The seasonal variations of the general circulation accentuate the strength and structure of the cyclonic currents. On a sub-basin scale, the cyclonic and anticyclonic structures, interconnected with meanders and sometimes characterized by seasonal dynamics, play a key role, both in the genesis of the water masses and in the general thermohaline circulation. The surface temperature (at 5 m depth) can vary from about 13 ° C in February to about 28 ° C in August, while the salinity is in the order of 38.1-38.6 psu.

The central-southern Tyrrhenian laps the coasts of urban areas among the most populated on the planet, such as the city of Naples. The waters of the offshore are considered oligotrophic and the phytoplankton biomass, assessed in the Gulfs of Naples and Salerno in the last decade, seems to float irregularly (Ribera d'Alcalà et al., 2003). The nutrient concentrations in these offshore waters are about 8-9 μM for nitrates and silicates, respectively, and about 0.4 for phosphates (Ribera d'Alcalà et al., 2003). On the coastal level, however, the areas facing the Volturno river have

eutrophic / mesotrophic characteristics, while the coastal strip in front of the city of Naples and the Sarno estuary present localized eutrophication phenomena. The Gulf of Salerno, subjected to less anthropogenic pressure, has mesotrophic characteristics, while along the Cilento coast there are oligotrophic conditions. The central-southern Tyrrhenian presents a high bionomic variety (sensu Pérès and Picard, 1964) with Posidonia oceanica bottoms within 50 m of depth, in particular in the channel between Ischia and Procida, between Acciaroli and Capo Palinuro, in the Gulf of Castellammare in the stretch of coast between Termini Imerese and Cefalù. Within the same bathymetric there are foundations of Cymodocea nodosa, in particular in the stretch of sea between Punta Diamante and Capo Suvero and between Cefalù and the Gulf of Patti. The Posidonia meadows are, as is known, nursery areas of various coastal species, for which they represent Essential Fish Habitat (EFH). Funds debris of Posidonia can be found up to 100 m, in particular in the Gulf of Policastro. In general, in the bathymetric layers up to 100 m, the biocenosis of Coastal Terrigenous Muds (VTC) is more frequent, with the characteristic macrobenthic species Aphrodite aculeata, Stichopus regalis, Alcyonum palmatum and Dorippe lanata, and the biocenosis of coastal detritus (DC), with the presence of Ophiura ophiura and Aporrhais pespelicani. Over 100 m and up to 200 m the Detritico del Largo (DL) biocenosis is frequent, which settles on an organogenic coarse debris matrix and is characterized by the presence of the crinoid Leptometra phalangium, the most abundant of the macro-epibentonic suspensivore organisms in this biocenosis. Other abundant macrobenthic species on these funds are Ophiura ophiura, Echinus acutus, Astropecten irregularis and, to a lesser extent, Cidaris cidaris. The areas most affected by the biocenosis at Leptometra phalangium are the funds of the offshore between Punta Licosa and Capo Palinuro, between Scalea and Capo Bonifati, where intrusions of this biocoenosis have been observed even over 200 m, and off Santo Stefano di Camastra and Palermo.

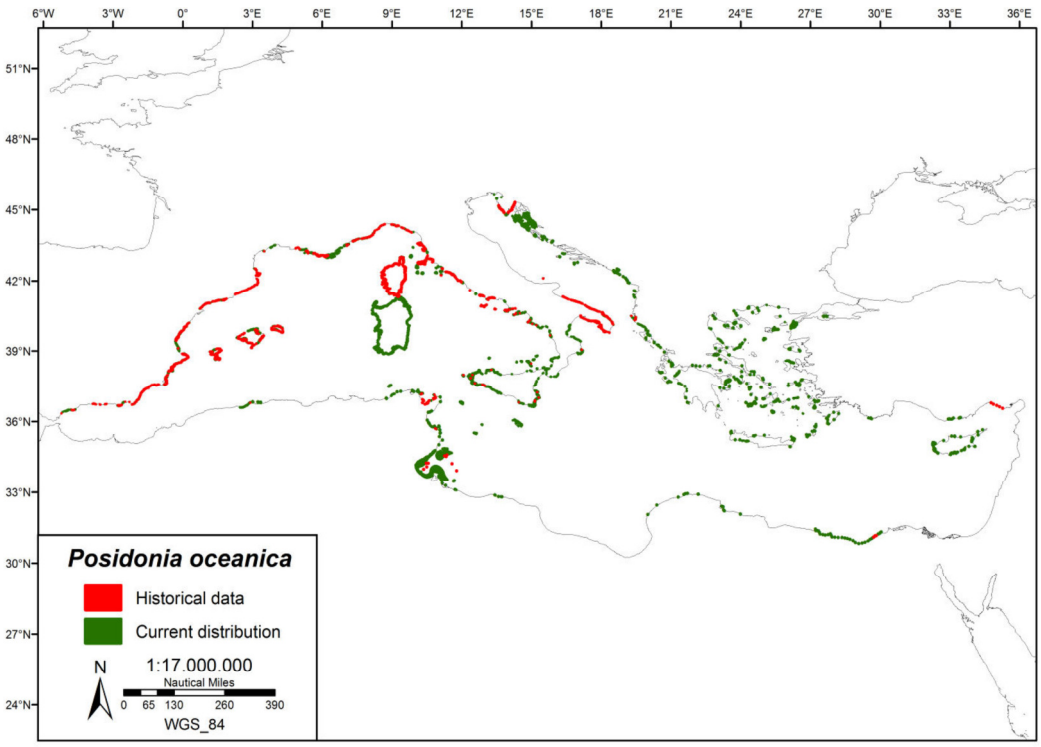
The facies at Leptometra phalangium is considered a hot spot for the high levels of biodiversity and for the concentration of juvenile stages of different species (for example Merluccius merluccius, Parapenaeus longirostris, Trisopterus minutus capelanus, Trachurus trachurus, Spicara flexuosa, Illex coindetii, etc.). The funds over 200 m are instead generally characterized by the biocoenosis of the Batiali muds. In the upper horizon, up to 450 m, among the characteristic species are Parapenaeus longirostris, Nephrops norvegicus, Cidaris cidaris, Funiculina quadrangularis and, in the lower horizon, Aristeus antennatus, Aristaeomorpha foliacea, Geryon longipes, Polycheles typhlops, Isidella elongata, Gryphus vitreus (Spedicato et al., 1998). As evidence of the variety of environments and species that characterize the central-southern Tyrrhenian, it is worth mentioning the presence of cetaceans in the Campano Archipelago area, right near the Cuma canyon, where seven species were regularly registered: Stenella coeruleoalba, Tursiops truncatus, Delphinus delphis, Grampus griseus, Globicephala melas, Physeter catodon and Balaenoptera physalus (Mussi et al., 1998). Some signs of species intrusion from the eastern basin are represented by lessepsian migrants, such as Fistularia commersonii and Syganus luridus (Golani et al., 2007).

Considering the high depth of this basin, many studies have been carried out on the ecology of the mesopelagic organisms to focus on the importance of such animals in the context of the trophic networks between meso and epi-pelagic. The results of recent studies on micronekton in the Southern Tyrrhenian Sea have been examined (Marabello 1994, Guglielmo et al., 1995), together with the relationship between populations of fish and squids that carry out vertical migrations in this area and the

population of organisms that is found constantly in superficial and deep waters. This study seems to confirm the hypothesis of a trophic connection between cephalopods and mesopelagic fish. Furthermore, the analysis clarify the fundamental role of cephalopods as top-links in the trophic chain of mesopelagic fish (Granata et al., 2001).

Distribution of marine seagrasses

In the Southern Tyrrhenian Sea, in almost all coastal areas of the GSA 10, Posidonia oceanica, Cymodocea nodosa and Halophila stipulacea are present (Figures 4.1.4.2). Otherwise Zostera marina and Zoostera noltii are reported only for the Gulf of Naples.



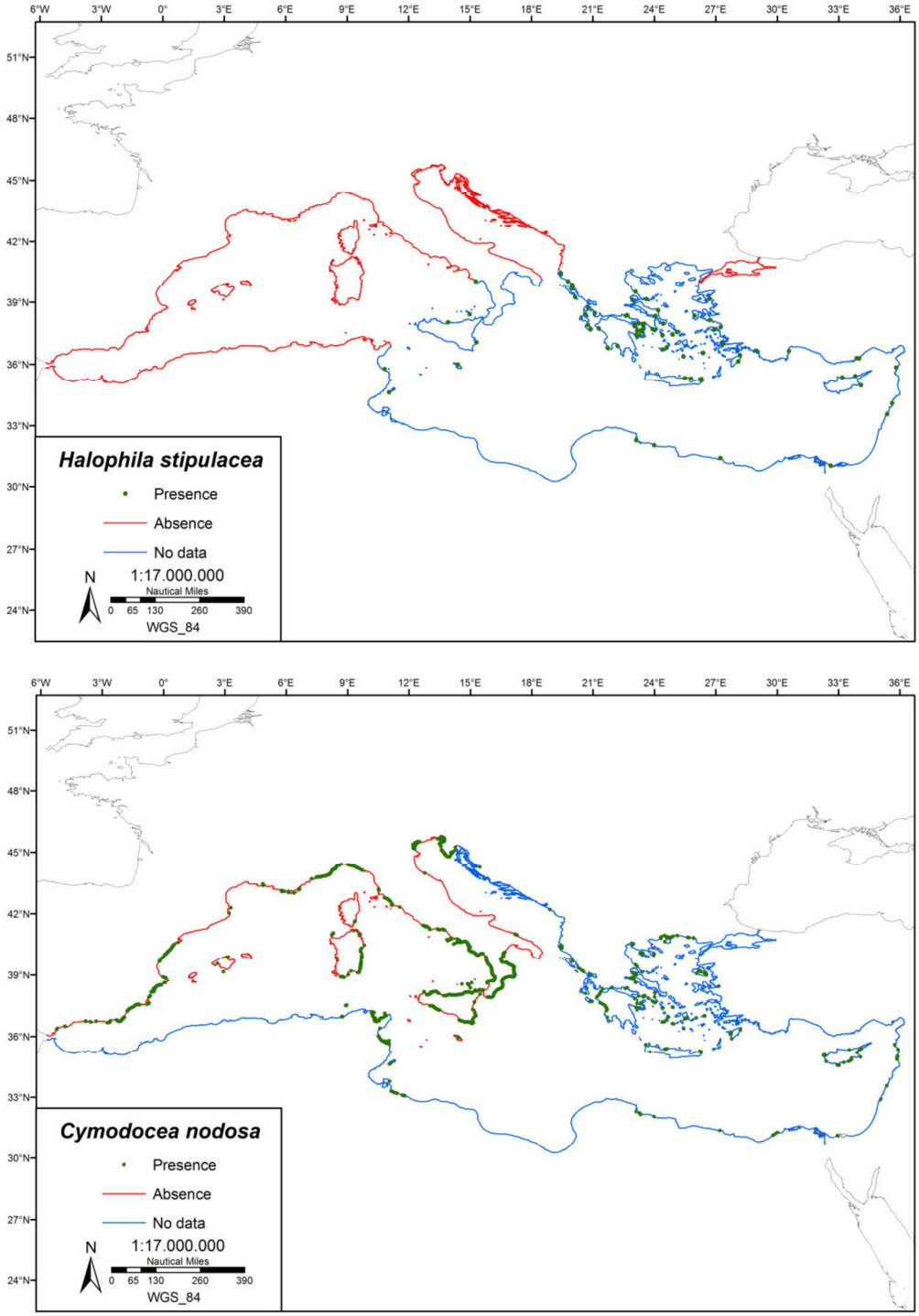


Figure 4.1.4.2 - Maps of the distribution of the main marine phanerogams in Mediterranean Sea (Giannoulaki et al., 2013).

Distribution of coralligenous

In the southern Tyrrhenian Sea some information on the distribution of coralligenous is available for the Sicilian northern coast and for some areas of Lazio and Campania (Figures 4.1.4.3 and 4.1.4.4), while mäerl bottoms seem to be completely absent.

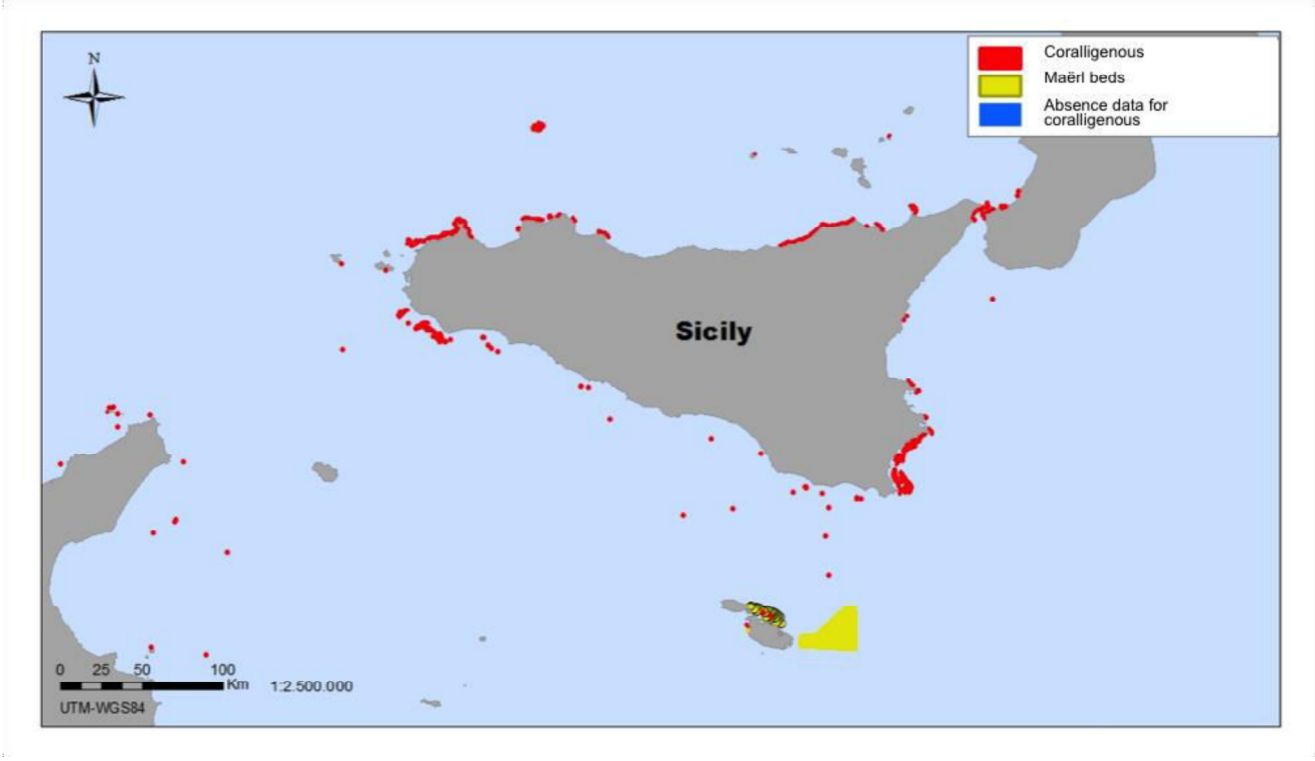


Figure 4.1.4.3 - Map of the distribution of coralligenous bottoms along the Sicilian coasts (Giannoulaki et al., 2013).

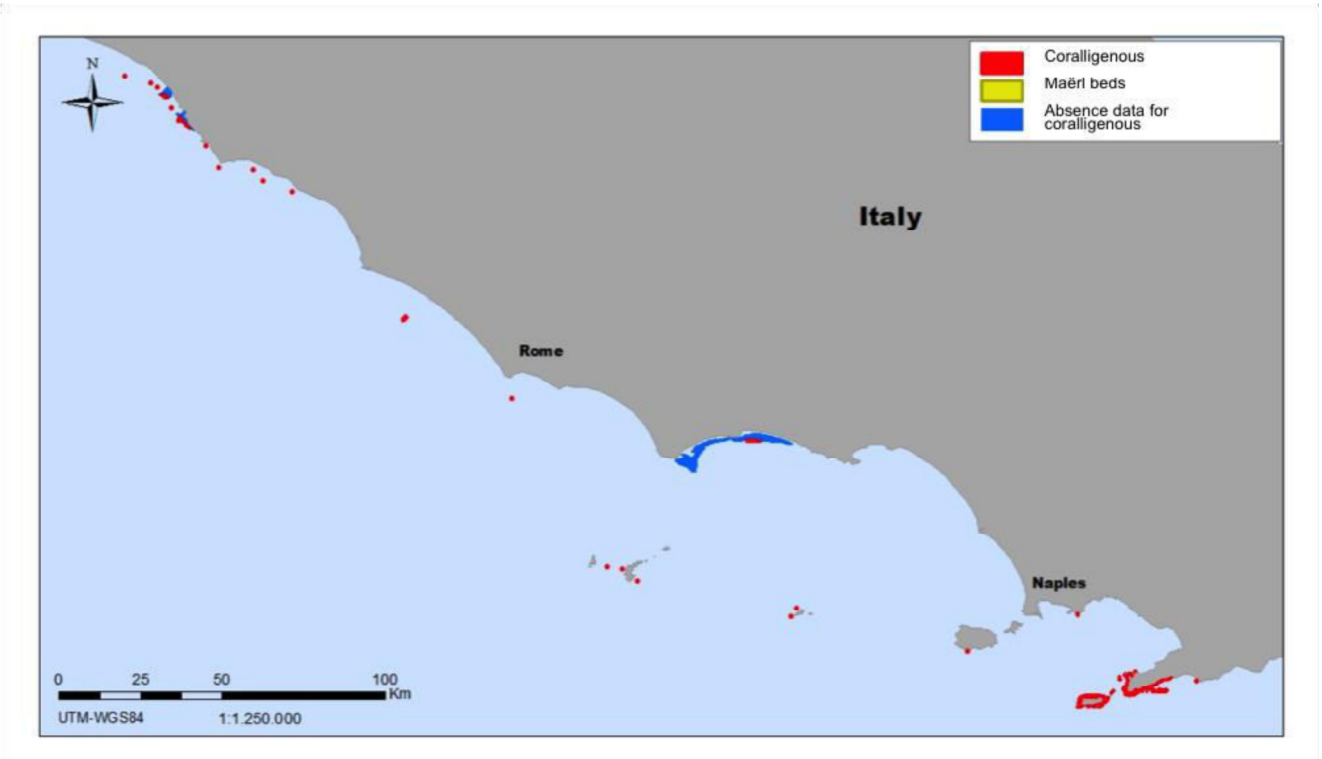


Figure 4.1.4.4 - Map of the distribution of coralligenous bottoms along Lazio and Campania coasts (Giannoulaki et al., 2013).

Deep sea coral biocoenosis

In the southern Tyrrhenian Sea, in the Gulf of Sant'Eufemia, recent investigations with remote controlled video cameras (ROV), conducted mainly along vertical walls of the Calabrian continental shelf between 70 and 130 m depth, have revealed a high concentration of arborescent corals and colonies of gorgonia (Callogorgia verticillata, Paramuricea clavata, Paramuricea macrospina, Bebryce mollis, Villogorgia bebrycoides, Corallium rubrum and Leptogorgia sarmentosa), and antipatists (Antipathella subpinnata, Antipathes dichotoma and Parantipathes larix). These colonies have a high concentration (up to 17 colonies per m^2) and large (over 1.5 m). The topography of this region, however, also includes large gently sloping plains, such as the one in the Gulf of St. Euphemia (Figures 4.1.4.5). In particular, the seabed of this area is identified by numerous small rocky reliefs emerging from a muddy bottom and representing the typical habitat of a biocoenosis called "roche du large".

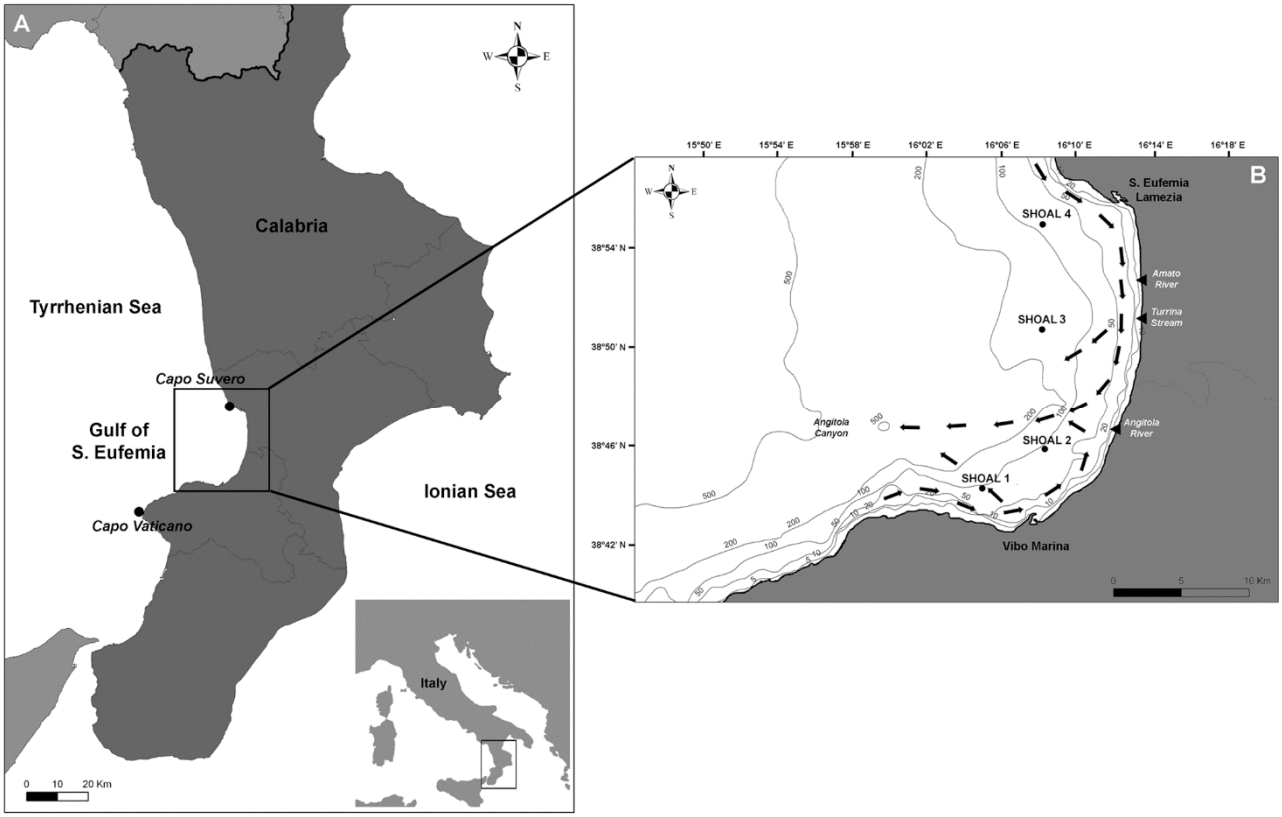


Figure 4.1.4.5 – Map of the Gulf of S. Eufemia (A) and of the shoals (B). The map also shows the position of the mouths of the main rivers of the region and the pattern of circulation (black arrows) of the coastal current that heads towards the Angitola canyon (modified by Bo et al., 2012).

In the Gulfs of Naples and Salerno it is historically documented the presence of red coral (C. rubrum), since it has long been exploited commercially on reefs or shoals up to 200 m deep. In 2010 and 2012, during two ROV monologic campaigns, banks of red corals were detected in 16 of the 25 stations visited, between 45 and 150 m depth (Figure 4.1.4.6).

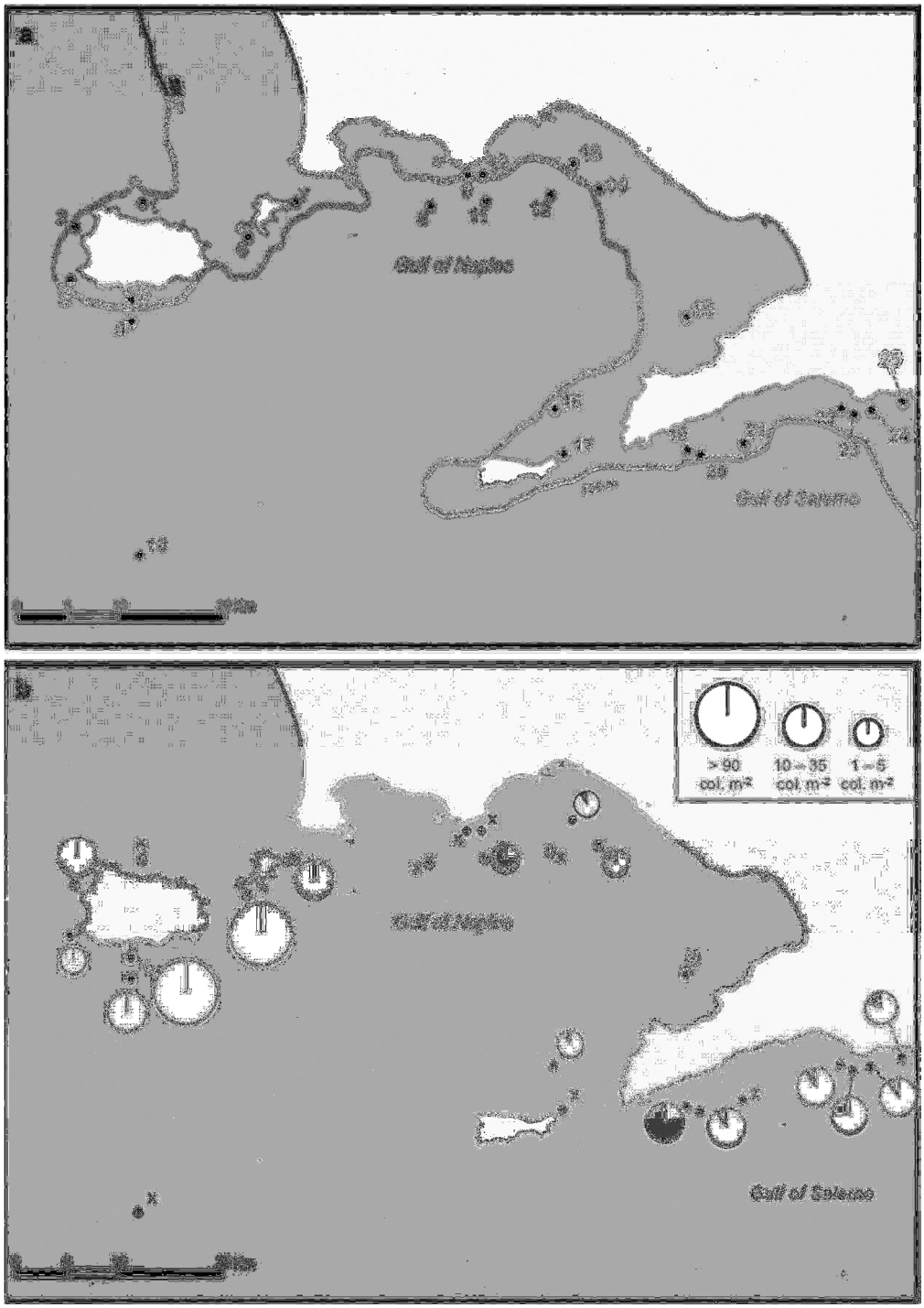


Figure 4.1.4.6 – a: distribution of the sites explored in the study area; b: average density and percentage of dead colonies (gray sectors) and healthy colonies (white sectors). "X" indicates the absence of red coral in the considered site (Bavestrello et al., 2014).

Similar surveys carried out with the ROV but in areas near the Aeolian Islands (OCEANA, 2018) on deep ecosystems around the Sicilian submarine volcanoes have been observed bamboo corals (family Isididae) and other colonies that feature very high biodiversity bottoms.

The ecosystem of Southern Tyrrhenian Sea

The GSA 10 is located entirely in the western Mediterranean ecoregion. In this area, based on the analyzes conducted by Piroddi et al. (2016), the trend of the biomass of the different functional groups (Figure 4.1.4.7) shows that sardine has undergone a decline since the beginning of the study period (1950), which became more pronounced in the last years of the series. A similar result was also observed for demersal fish and pinnipeds, although the model was not able to capture the strong decline of these marine mammals in the 1970s. As for sharks and rays, the model has confirmed a decrease until the end of the 90s and a slight increase in the decade of the 2000s. For anchovy and hake, the model was unable to define the decreasing trend observed. Similarly, benthos and deep sea fishes are also not well described by the madell, mainly due to the limited data available.

A good replicate of the time series of biomass was found for crustaceans and bentopelagic cephalopods, where the model was able to follow most of the fluctuations over time. When analyzes were performed using a biogeochemical model as a driver of alternative primary production, an improvement in model outputs was observed.

From the analyzes carried out, it is expected that the western Mediterranean basin will become more oligotrophic, due to the decrease in surface density influenced by the waters of the Atlantic.

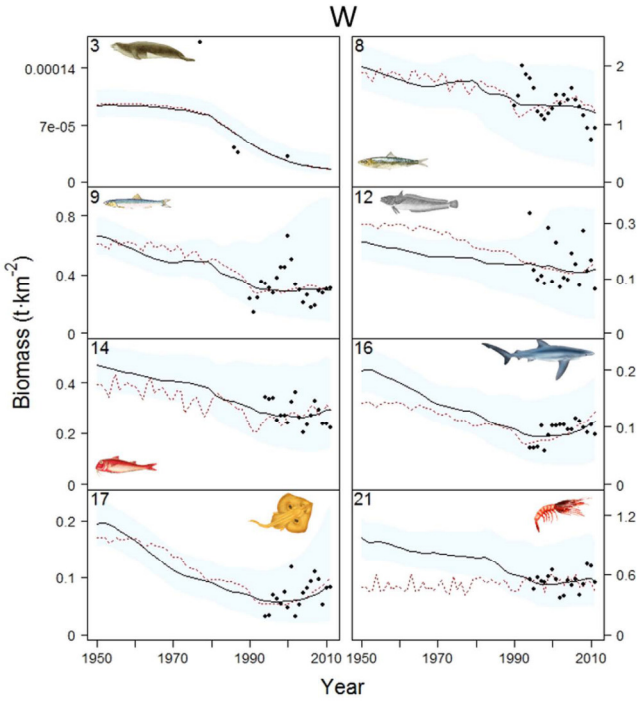


Figure 4.1.4.7 - Representation of the results of the ecosystem model for some functional groups that are observed in the western Mediterranean for the period 1950-2011 (Piroddi et al., 2016).

4.1.5 Socio-economic context. Analysis of the main socio-economic indicators and of market trends in the 10 UoAs selected for the Deeper Mapping

In 2015 the fishing fleet of GSA 10 included 2,542 vessels accounting for more than 18,000 GT; of these, 86% were equally divided between the compartments of Northern Sicily and Campania, while the remaining 14% were registered in those of Tyrrhenian Calabria.

Polyvalent passive vessels – which include boats up to a length of 18 m involved in small-scale fisheries or using exclusively passive gears – accounted for 81% of the fishing fleet of GSA 10 and for 28% of GT, supplying 32% of the volume of landings and 41% of their value. In fact, despite the presence of some areas with a strong specialisation in highly productive techniques, such as trawling and purse seining, fishing activities in GSA 10 are still largely artisanal. Several ports show a marked social and economic dependence on small-scale fisheries. A large number of artisanal vessels employ fixed gears such as set gillnets, set longlines, and pots and traps on untrawlable bottoms.

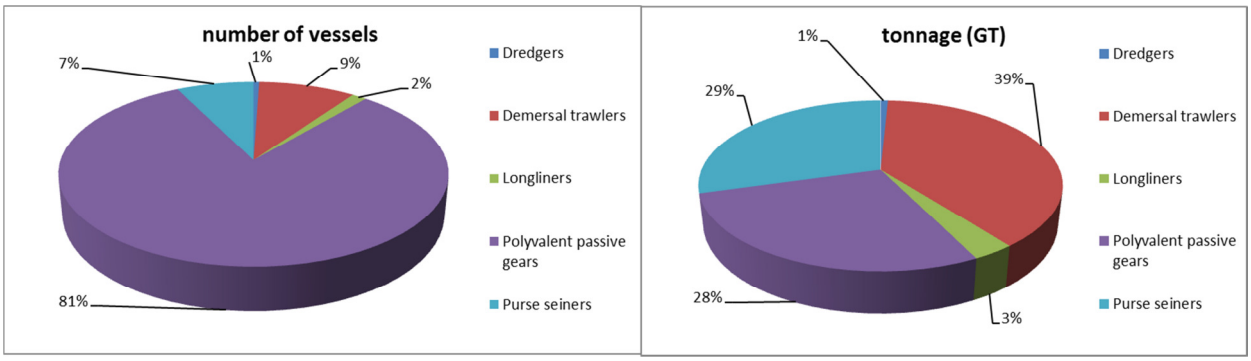


Figure 4.1.5.1 – Composition of the fleet registered in the ports of GSA 10 in relation to predominant fishing technique, vessel number, and tonnage (2017 data). *Source:* MIPAAFT / National Fisheries Data Collection Programme. Data processed by NISEA.

Notably, vessel polyvalence has declined in the past few years. A number of regulations that have recently come into force (mainly Ministerial decree 28.7.2016, which allows vessels to carry on board no more than one gear at a time) have contributed, directly or indirectly, to raise the level of specialisation, although the process has also been driven by declining consumer interest in some species (MIPAAFT, 2017).

A highly important fishery in GSA 10 targets large (bluefin tuna) and small (European anchovy) pelagics with purse seines. This fishery has an especially strong and well-known tradition in the area around Salerno and in Northern Sicily. Of the about 200 vessels that are involved in this fishery in GSA 10, less than 100 target large pelagics such as little tunny, common dolphinhfish, and bluefin tuna (all under the catch quota system). In the northern area of GSA 10, some large tuna purse seines are also employed to target small pelagics. Some boats that no longer hold tuna catch quotas

exclusively target small pelagics, whereas others target alternately bluefin tuna and small pelagics. Purse seines (*ciancioli*) are often used as polyvalent passive gears.

A typical fishing technique employed in GSA 10 targets common dolphinhfish with purse seines using *cannizzi*, floating structures made from palm branches and leaves, as fish aggregating devices. Until a few years ago, this technique was mostly used along the Tyrrhenian coast of Sicily, around the Aeolian Islands, in the lower Ionian Sea, and in the Malta Channel, but it has recently spread to the coast of Campania.

Set gillnets and handlines are typically used in the Aeolian Islands and along the Tyrrhenian coast of Sicily, especially to catch broadtail shortfin squid. The technique using handlines and fishing lights to attract the fish is highly selective and provides the chief source of income for some hundred small vessels as well as an important supplementary source for larger vessels.

A certain number of boats target swordfish and/or bluefin tuna with drifting longlines, some travelling as far as GSAs 11 and 9. Some vessels employ set longlines to catch species like European hake, silver scabbardfish, pomfret, and scorpionfish. These vessels, which do not exceed 18 m LOA, alternate multiple passive gears including set gillnets and purse seines, and are thus highly polyvalent; for instance, longlines as a fishing technique account for only 2% of vessels and for 3% of tonnage.

Several areas of GSA 10 are characterised by conflicts among different types of fishermen and of commercial fishing. For instance, in Campania recreational fishing strongly interferes with and damages commercial fishing, because a large amount of fish caught by recreational fishermen find their way to the market. In the past few years the problem has grown into an emergency for small-scale fisheries operators. Moreover, as stressed in a recent paper (Gambino et al., 2016), in some areas such as the southern part of GSA 10, fishing is illegal rather than recreational. Further damage comes from illegal fishing with drifting longlines that target swordfish and bluefin tuna and from scuba divers who catch octopus. The product is often sold directly to the final consumers or to restaurants (MIPAAFT, 2017).

The fishing activities carried out in the 10 UoAs of GSA 10 that have been selected for the Deeper Mapping (listed in Table 4.1.1.1) employ virtually the full range of fishing gears: from purse seines to handlines, from drifting to set longlines, from trawls to set gillnets (gillnets as well as trammel nets). The estimated number of vessels which in 2017 practiced a *métier* based on a combination of gear and group of target species according to EU Data Collection Framework (DCF) programme codifications is reported in Table 4.1.5.1. Notably, since the utilisation of a gear does not exclude the use of another gear in the course of the same year and, in some cases, even of the same day, it is impossible to sum vessel and crew numbers.

Table 4.1.5.1 – Structural and production indicators for the 10 UoAs selected in GSA 10 (2017 data)[1]

Gear (species defining the selected UoA)	Group of target species	Number of vessels	Estimated crew number	Total value of landings (€ 000)	Value of landings of species of the selected UoA (%)
Purse seines *(European anchovy, Common dolphinfish)*	SPF	198	990	18,266,624	60%
	LPF	91	182	4,133,355	35%
Handlines and pole-lines *(Broadtail shortfin squid)*	CEP	119	238	3,778,153	59%
Set longlines (*Silver scabbardfish*)	DEF	179	536	6,542,407	42%
Drifting longlines (*Albacore, Swordfish*)	LPF	204	639	8,662,654	81%
Set gillnets (anchored) (*European hake*)	DEF	391	783	10,353,375	31%
Bottom otter trawl *(Deep-water rose shrimp)*	DEF	124	390	15,984,917	15%
	MDD	63	188	10,063,352	15%
Trammel nets (*European hake, Common cuttlefish)*	DEF	705	1,411	17,566,934	20%

- CEP: Cephalopods
- DEF: Demersal fish
- MDD: Mixed demersal and deep-water species
- SPF: Small pelagic fish
- LPF: Large pelagic fish

Source: MIPAAFT / National Fisheries Data Collection Programme. Data processed by NISEA.

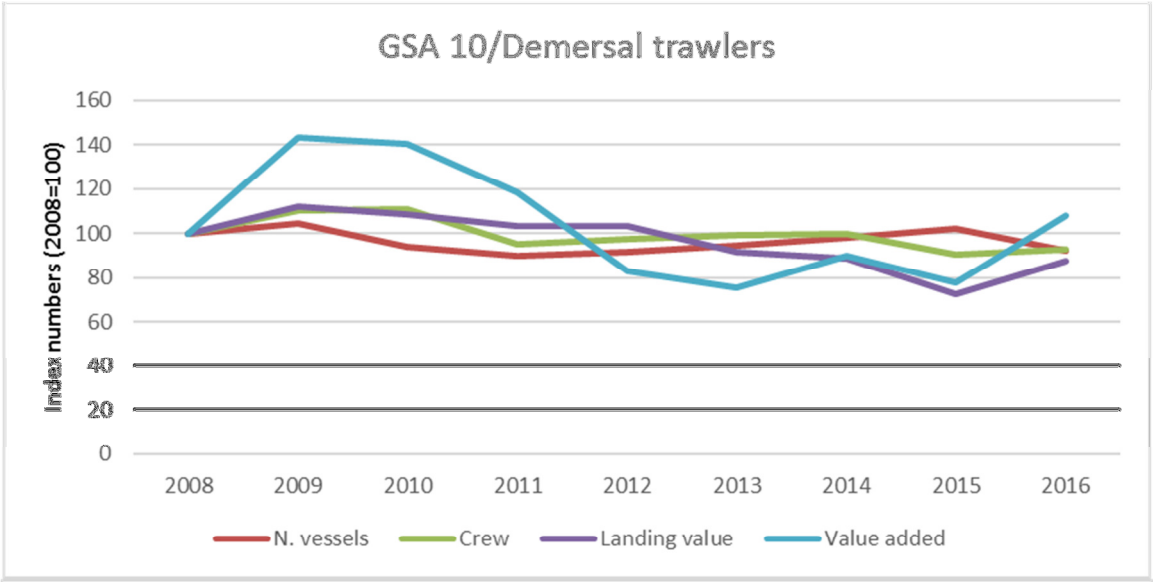
The 10 UoAs selected for the Deeper Mapping belong to the three main fleet segments defined by Commission Regulation (EC) No 1639/2001, as follows:

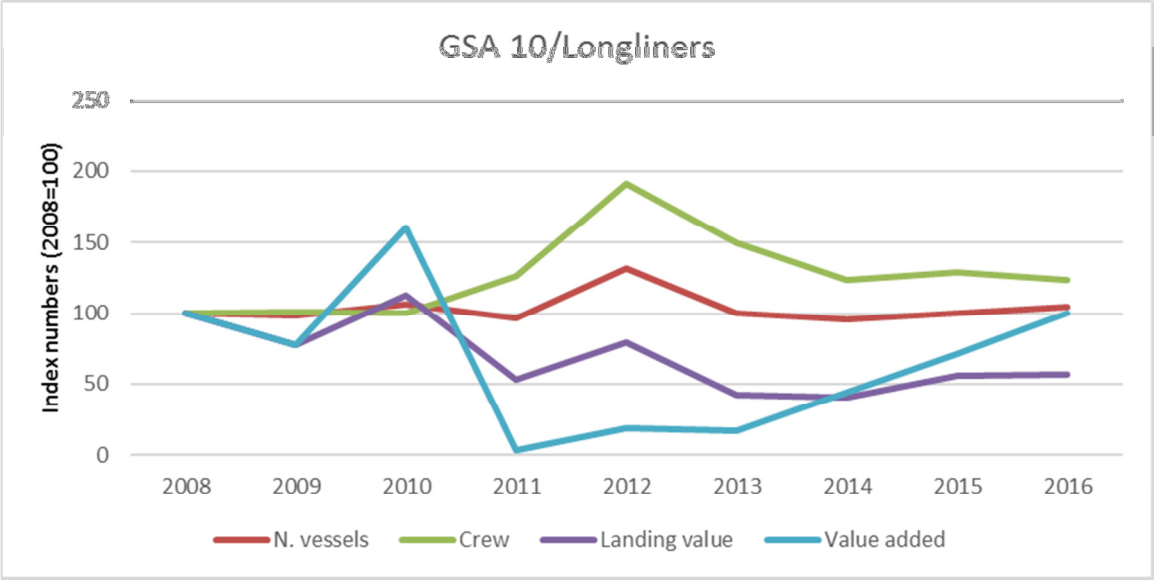
- purse seiners (PS): in the UoAs using predominantly *ciancioli*;
- vessels, longer and shorter than 12 m, using polyvalent passive gears (PGP): in the UoAs where vessels use predominantly passive gears like trammel nets, gillnets and, in some cases, longlines and purse seines, but not as the predominant gear;
- vessels using hooks (HOK): in the UoAs using predominantly longlines (set and drifting);

[1] Crew numbers are based on the average job figures reported in the period in question for the fleet segment to which the 10 UoAs belong (where a segment includes vessels using predominantly a given gear).

- demersal trawlers and demersal seiners (DTS): in UoAs using predominantly demersal bottom otter trawls.

The next figure shows the 2008-2016 trends of the main structural indicators (vessel and crew number) and production variables (value of landings and value added) of the fleet segments to which the 10 UoAs of GSA 10 belong.





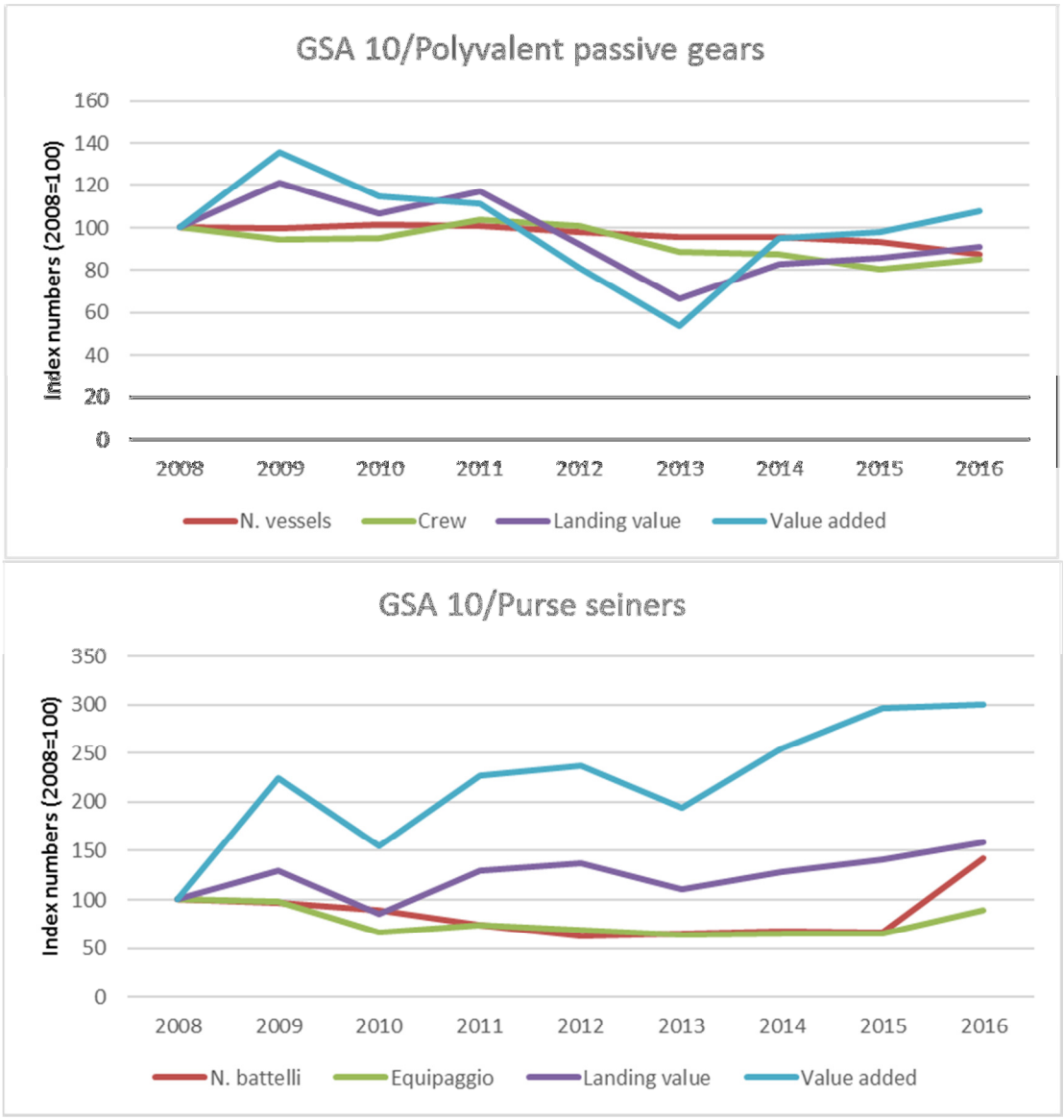


Figure 4.1.5.2 – Trends of the structural and production indicators of the fleet segments to which the 10 UoAs selected in GSA 10 belong; index numbers 2008-2016 (2008=100). *Source:* MIPAAFT / National Fisheries Data Collection Programme. Data processed by NISEA.

As illustrated in the diagram, trawler and crew number were fairly stable in the final part of the period, whereas the two economic performance indicators – gross value of landings and, especially, value added – improved beginning in 2015.

All the indicator trends relating to the vessels that use predominantly longlines were much more unstable, especially in the early part of the period. A decline in landing volumes was followed by a decline in their value, whereas the stable level of operating costs resulted in a reduction in the value added of this fleet segment. However, a recovery begun in 2011 has now restored the latter indicator to the levels of 2008.

In the case of polyvalent passive gears, the value of landings fell from 2009 to 2013; the value added also decreased. However, a recovery can be noted in the last few years of the series.

A very different situation, characterised by an excellent performance of the economic indicators, is apparent for the vessels using purse seines as the predominant gear, especially for bluefin tuna, European anchovy, and European pilchard. A slight reduction in vessel and crew number followed by an increase in the last year of the series reflects not an increment in the number of vessels holding a licence, but in those using predominantly this gear. Both landing value and value added also show a clear upward trend.

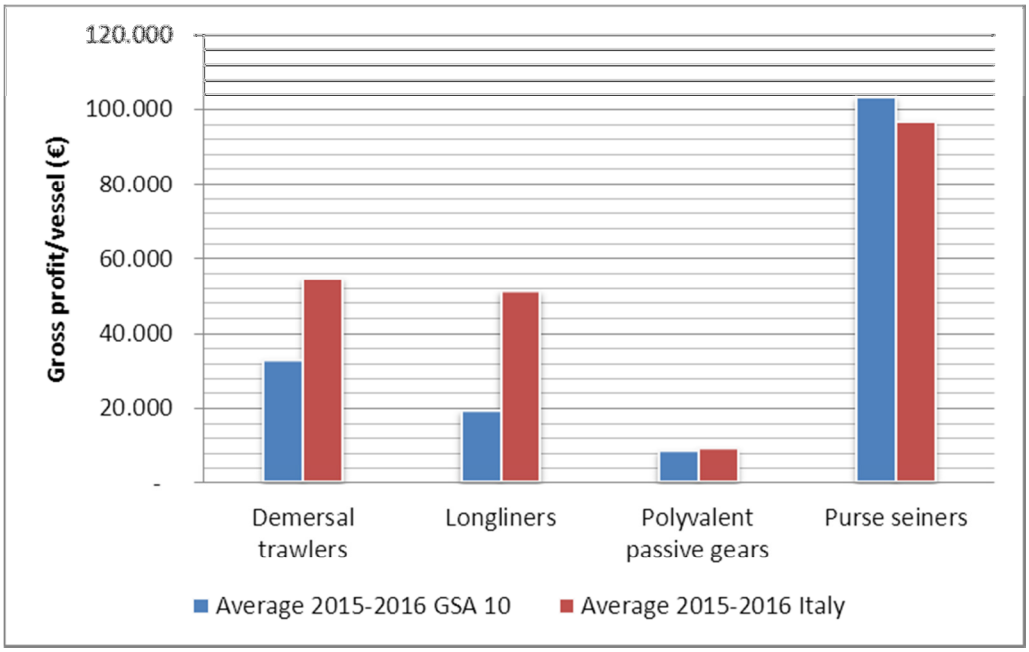


Figure 4.1.5.3 – Gross profit *per* vessel for each fleet segment of the 10 UoAs selected in GSA 10. Comparison with the 2015-2016 Italian national average. *Source:* MIPAAFT / National Fisheries Data Collection Programme. Data processed by NISEA.

As shown by the trend data, in 2015 and 2016 the purse seiner fleet achieved a good economic performance, with a gross profit *per* vessel of more than €100,000, compared with the Italian national average of €96,000. The figures of the other segments are considerably lower, particularly those of trawlers, where gross profit *per* vessel was nearly half the national average. Despite their excellent recovery in the last two years of the series, especially in terms of value added, the performance of trawlers and longliners was however still lower than the national average.

The 10 UoAs selected for the Deeper Mapping of GSA 10 are listed below. For each UoA, this report provides quarterly production figures (landed volume and sale price) for 2015-2017 and data regarding consumption of domestic and imported product (as available). The main source for import, export, and consumption data, ISMEA, has no information about local product sales on the main wholesale markets of Campania, Tyrrhenian Calabria, and Sicily.

- Albacore: drifting longlines
- European anchovy: purse seines
- Deep-water rose shrimp: bottom otter trawls

- Common dolphinfish: purse seines
- European hake: gillnets and trammel nets
- Silver scabbardfish: set longlines
- Swordfish: drifting longlines
- Common cuttlefish: trammel nets
- Broadtail shortfin squid: handlines.

Albacore:

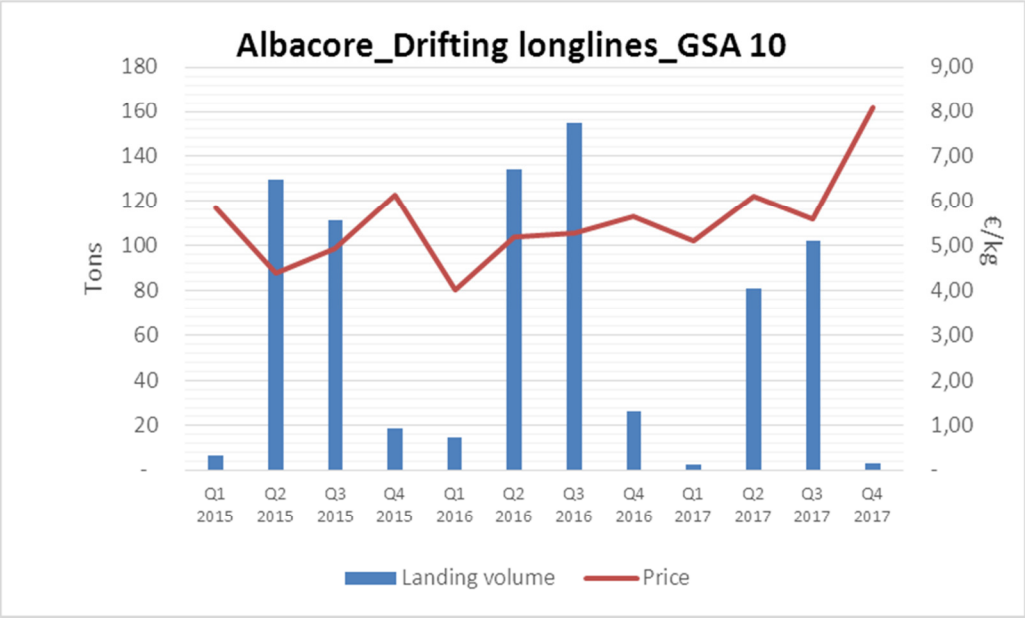


Figure 4.1.5.4 – Average volumes and production prices of albacore (ALB) landed by vessels using drifting longlines (LLD) in GSA 10 (2015-2017 quarterly [Q] data). *Source:* MIPAAFT / National Fisheries Data Collection Programme. Data processed by NISEA.

In 2015-2017, the average annual landings of albacore caught by vessels operating drifting longlines in GSA 10 declined to slightly under 200 tons in 2017. Production shows a marked seasonality, as the fishing season usually runs from May to October. In contrast, the average first sale price rose to more than €6 / kg in 2017, showing a peak in the last quarter of 2017 due to limited supply.

Consumption and import-export data are not available for albacore.

European anchovy:

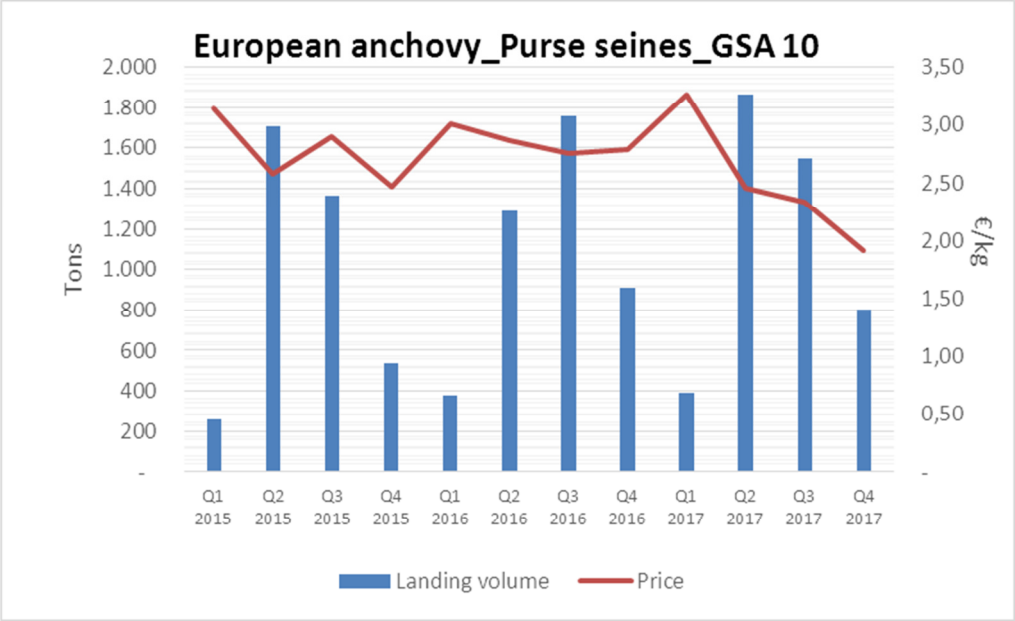


Figure 4.1.5.5 – Average volumes and production prices of European anchovy (ANE) landed by vessels using purse seines (PS) in GSA 10 (2015-2017 quarterly [Q] data). *Source:* MIPAAFT / National Fisheries Data Collection Programme. Data processed by NISEA.

Landings of European anchovy with purse seines rose from 3,600 tons in 2015 to more than 4,600 tons in 2017, confirming the high productivity of GSA 10 for this species. The fishing season for this species is usually from May to October. As landings increased price fell, declining from an average value of €2.77 / kg in 2015 to €2.49 / kg in 2017; a peak at €3.26 / kg can be noted in the first quarter of 2017.

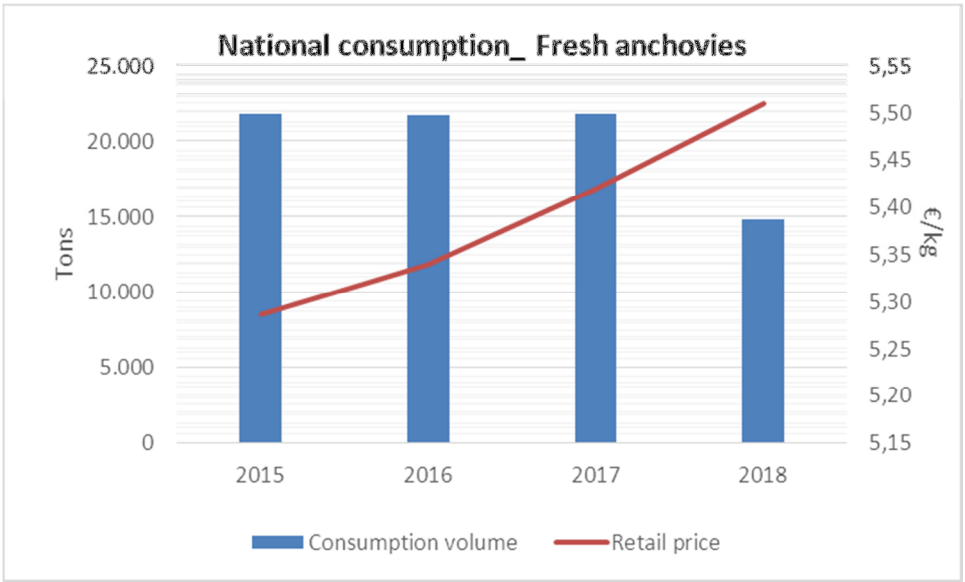


Figure 4.1.5.6 – National consumption volume and retail price of European anchovy (ANE) in 2015-2018 (2018 data available until 31 August). Source: EUMOFA. Data processed by NISEA.

The data regarding the consumption of fresh European anchovy in Italy exhibit a constant trend in terms of volume and an upward trend (+4%) in terms of sale price, which in 2018 (data available until 31 August) reached approximately €5.50 / kg.

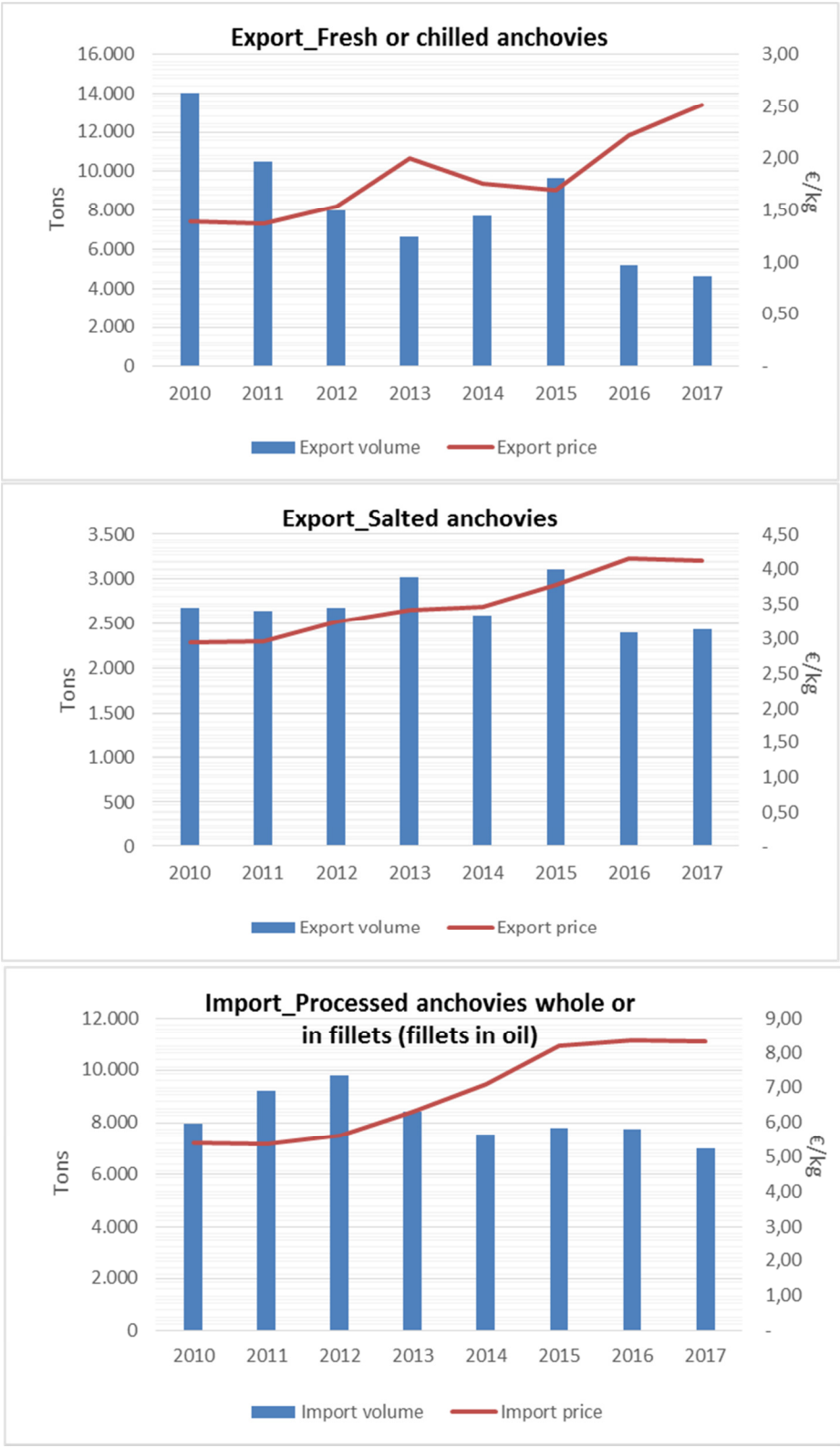


Figure 4.1.5.7 –Export and import volumes and prices of fresh, chilled, and processed anchovies. Italian national data (2010-2017). Source: ISMEA. Data processed by NISEA.

In 2010-2017, exports of fresh and chilled European anchovy were higher than the exports of other anchovy products, but exhibited a downward trend that resulted in a higher price (€2.50 / kg in 2017). The export price of the processed product also increased, to €4 / kg.

Despite the high domestic production (about 40,000 tons in 2017), the Italian fish processing industry, a highly successful sector of the Italian food processing sector, is heavily dependent on imports. In particular, about 7,000 tons of European anchovy preserves or preparations, whole or in fillets, were imported in 2017 at a very high average price that exceeded €8 / kg, compared with slightly more than €6 / kg in 2013.

Deep-water rose shrimp:

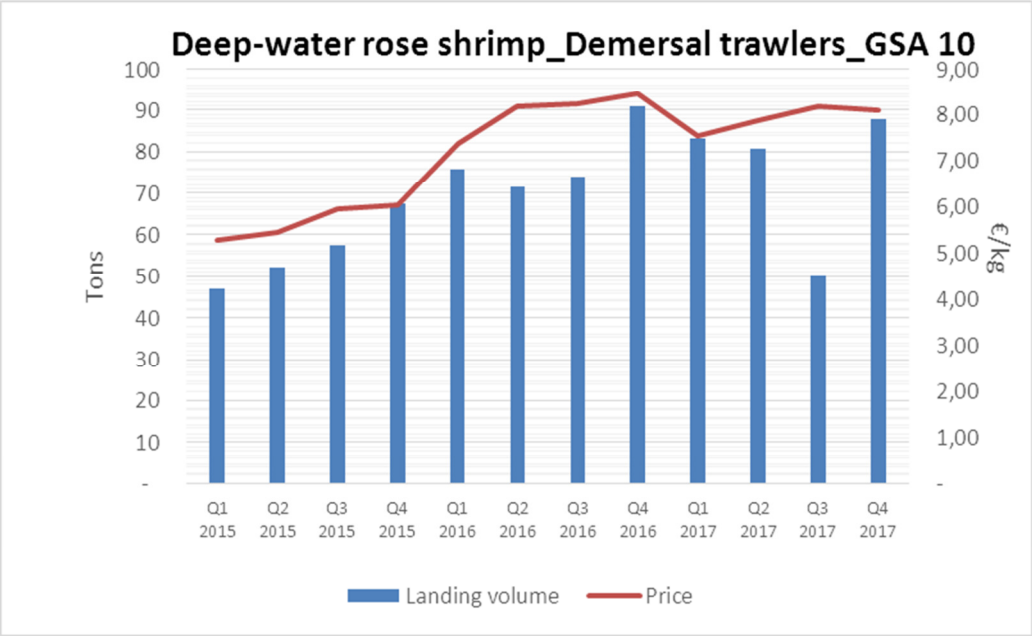


Figure 4.1.5.8 – Average volumes and production prices of deep-water rose shrimp (DPS) landed by vessels using bottom otter trawls (OTB) in GSA 10 (2015-2017 quarterly [Q] data). Source: MIPAAFT / National Fisheries Data Collection Programme. Data processed by NISEA.

The average annual landings of deep-water rose shrimp caught by trawlers in GSA 10 increased from 224 tons in 2015 to about 302 tons in 2017. The higher supply, clearly determined by rising demand, was associated with an increase in the average landing price from €5.69 / kg in 2015 to €8 / kg in 2017, which resulted in a more than proportional increase in the overall value of landings.

Consumption figures are available neither for deep-water rose shrimp nor for any other shrimp species, whereas import-export data are available for shrimp species in general.

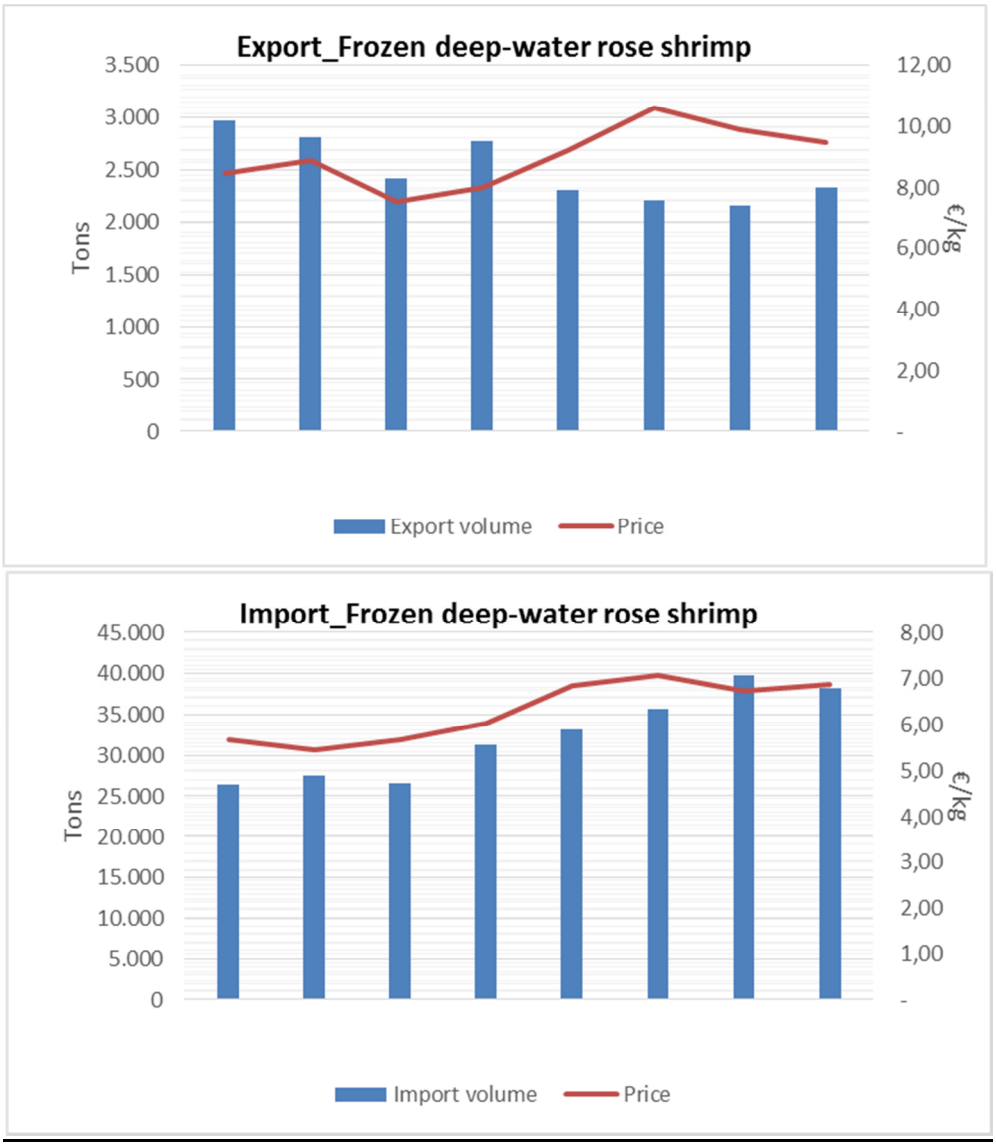


Figure 4.1.5.9 – Export and import volumes and prices of frozen shrimp. Italian national data (2010-2017). Source ISMEA. Data processed by NISEA.

Italians' propensity to consume shrimp is confirmed by the import data of various shrimp species, whose volume far exceeded 37,000 tons in 2017. The average prices reported for 2017 (about €7 / kg) pool all shrimp species.

Common dolphinfish:

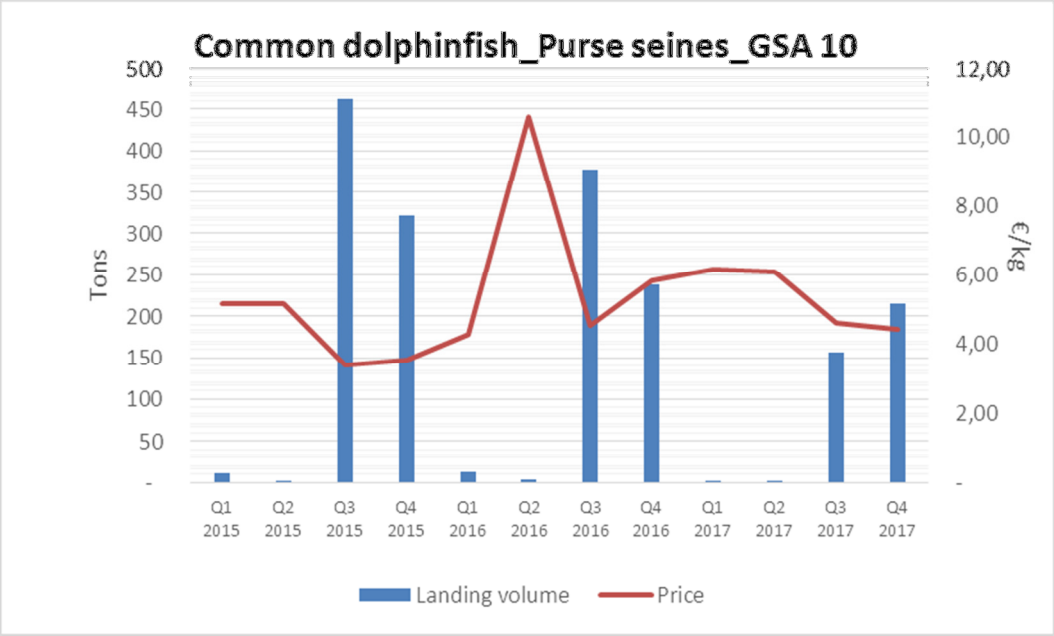


Figure 4.1.5.10 – Average volumes and production prices of common dolphinfish (DOL) landed by vessels using purse seines (PS) in GSA 10 (2015-2017 quarterly [Q] data). Source: MIPAAFT / National Fisheries Data Collection Programme. Data processed by NISEA.

The average annual landings of common dolphinfish with purse seines plummeted (-56%) to less than 400 tons in 2017. Production is strongly seasonal (3rd and 4th quarter). In contrast, the first sale price is not stable, since in 2016 it showed peaks at €10 / kg, especially in the second quarter, when supply was low, whereas in 2017 it was slightly above €5 / kg. These data reflect a stable market demand for the species.

Consumption and import-export data are not available for common dolphinfish. Since the species is not widely distributed, it has limited relevance on the national market in terms of both landings and consumption.

European hake:

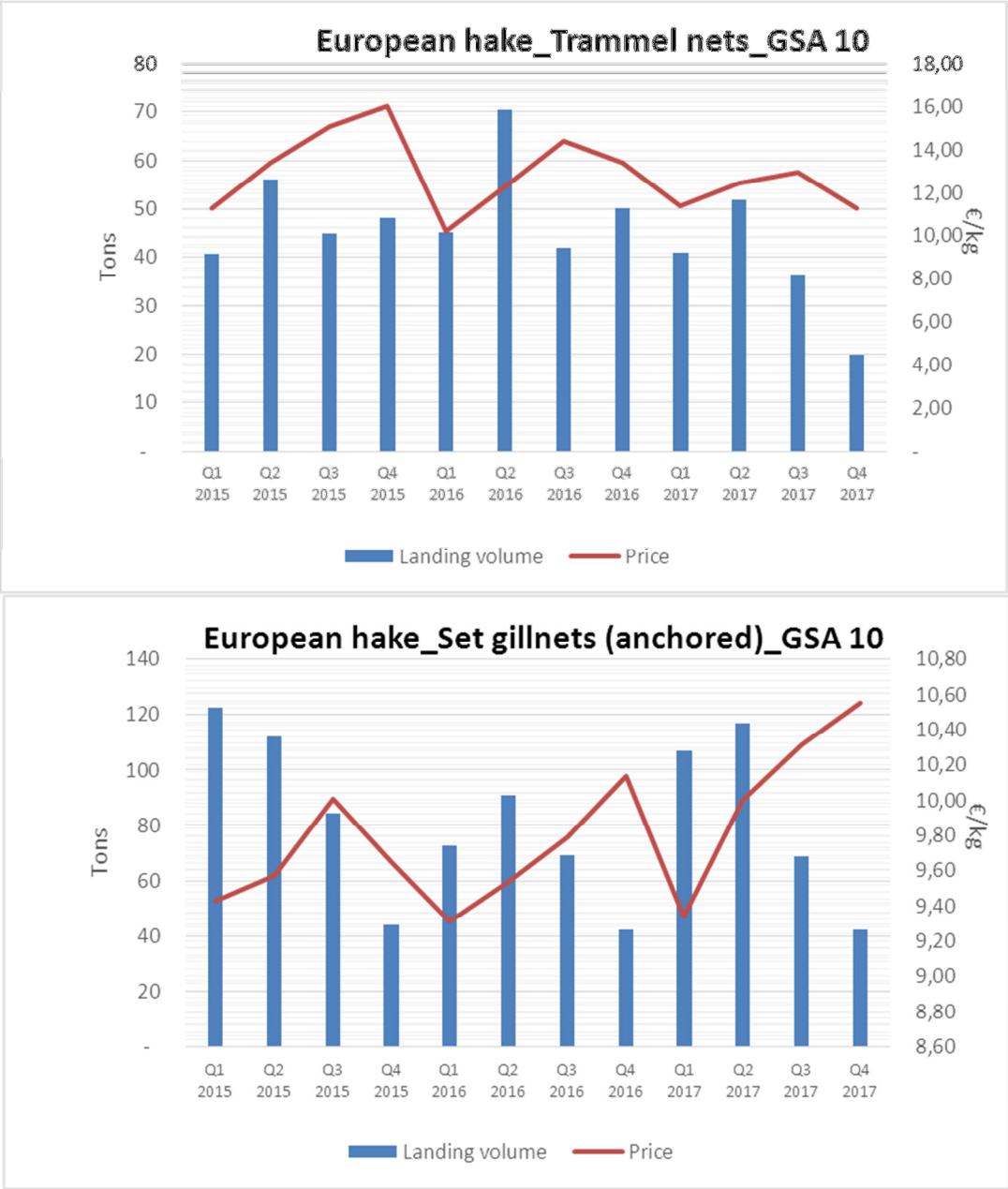


Figure 4.1.5.11 – Average volumes and production prices of European hake (HKE) landed by vessels using trammel nets (GTR) and set gillnets (GNS) in GSA 10 (2015-2017 quarterly [Q] data). Source: MIPAAFT / National Fisheries Data Collection Programme. Data processed by NISEA.

The average annual landings of European hake caught with trammel nets or other set gillnets in GSA 10 have been declining. In 2017, the landed volume of trammel nets was about 150 tons, whereas the volume landed by the other set gillnets was more than 300 tons. However, average landing prices were respectively more than €12 / kg and €9.70 / kg.

Import data, but not consumption volume or price figures, are available for frozen hake fillets.

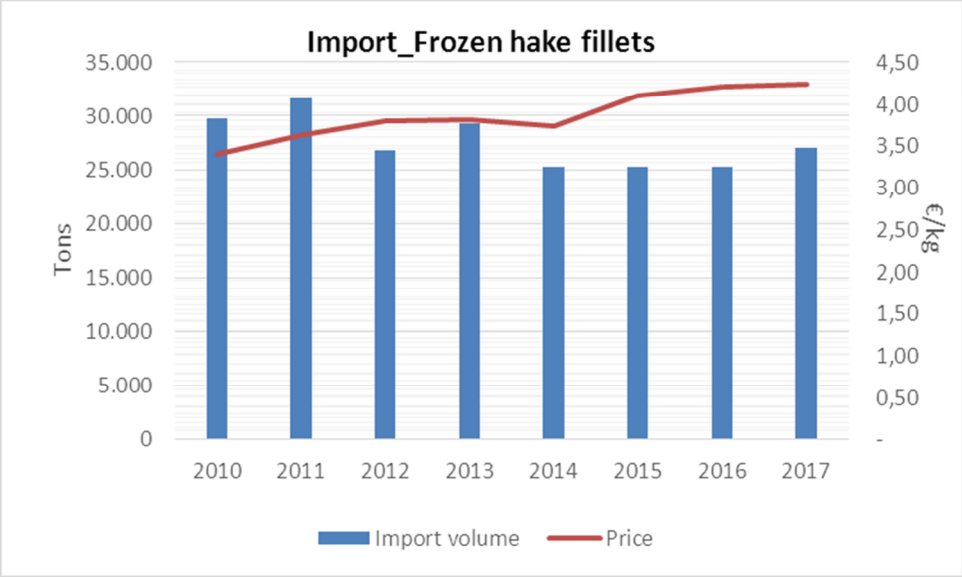


Figure 4.1.5.12 – Import volume and price of frozen hake fillets. Italian national data (2010-2017). Source ISMEA. Data processed by NISEA.

The demand for European hake by Italian consumers and its poor supply are reflected in the strong imports of European hake fillets – which in 2017 exceeded 25,000 tons – and in their upward price trend.

Silver scabbardfish:

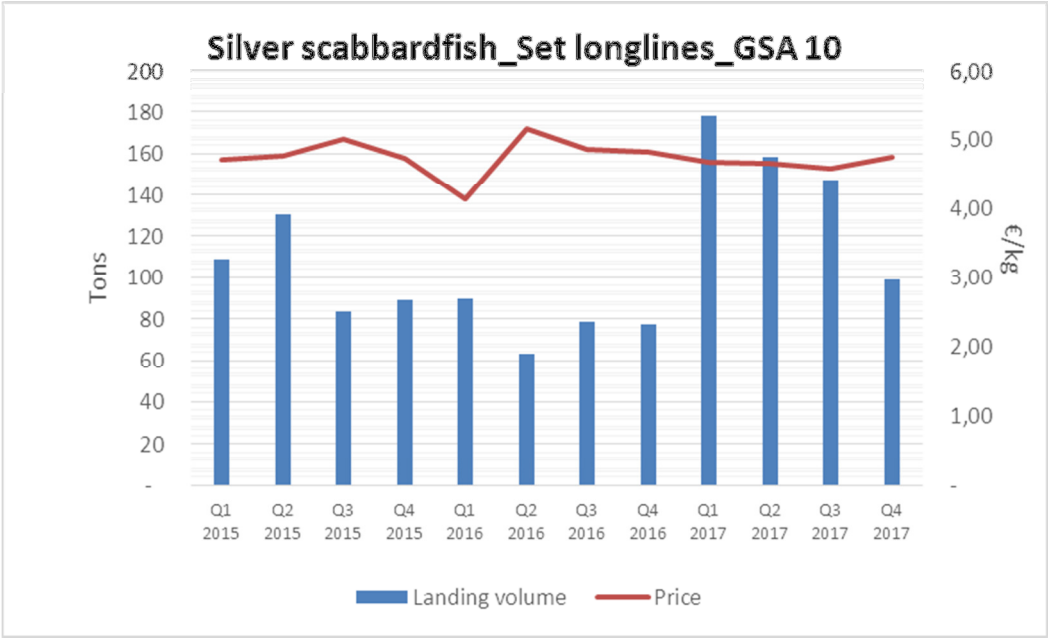


Figure 4.1.5.13 – Average volumes and production prices of silver scabbardfish (SFS) landed by vessels using set longlines (LLS) in GSA 10 (2015-2017 quarterly [Q] data). Source: MIPAAFT / National Fisheries Data Collection Programme. Data processed by NISEA.

The volume of silver scabbardfish landed by vessels using set longlines in GSA 10, predominantly along the Tyrrhenian coast and in the Strait of Sicily, has been rising. Landings, which in 2017 reached 600 tons (up by 41% from 2015), are not characterised by a marked seasonality. The first sale price is fairly stable at slightly less than €5 / kg.

Information gathered from local operators indicated that scabbardfish caught in the Tyrrhenian area (especially Calabria) commands a higher price than the one caught in the Strait of Sicily, respectively €3 / kg and €5 / kg.

Consumption data and import-export price figures are not available for silver scabbardfish. Its limited geographical distribution involves a limited relevance on the national market in terms of both landings and consumption. However, the landing price differential between the Calabrian Tyrrhenian area and the Strait of Sicily also affects sale prices, which are respectively €5 / kg and €10 / kg.

Swordfish:

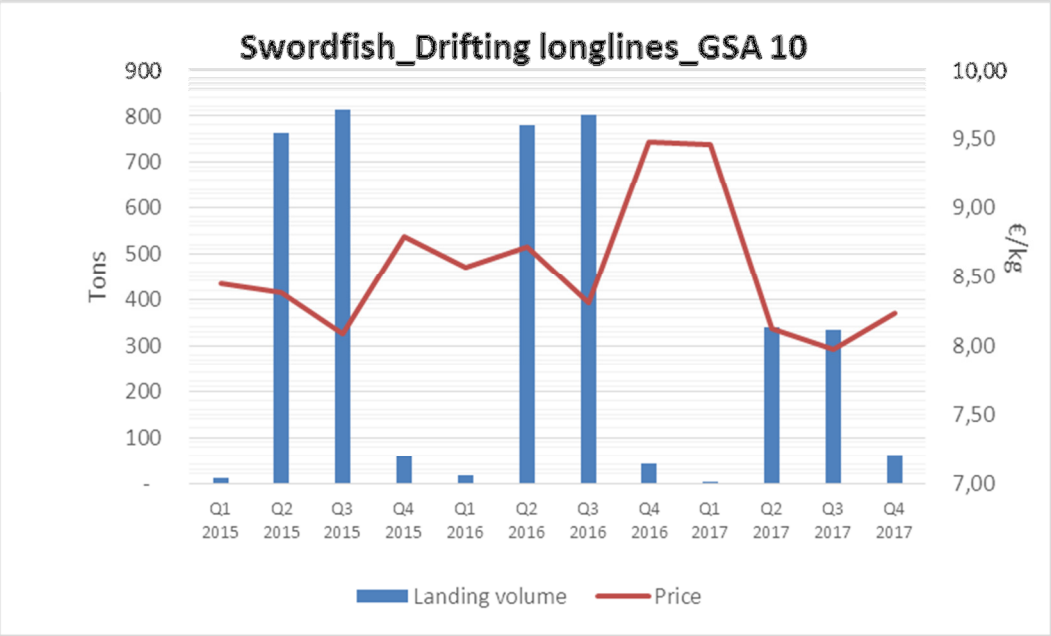


Figure 4.1.5.14 – Average volumes and production prices of swordfish (SWO) landed by vessels using set longlines (LLD) in GSA 10 (2015-2017 quarterly [Q] data). Source: MIPAAFT / National Fisheries Data Collection Programme. Data processed by NISEA.

In 2015-2017, average annual swordfish landings in GSA 10 declined, reaching a trough in 2017, the year when quotas were introduced. The species shows a typically marked seasonality (2nd and 3rd quarter).

In contrast, average prices have been fairly stable, slightly exceeding €8.50 / kg and peaking in winter, when supply is lowest.

Swordfish consumption and price data are not available, whereas import volumes and prices reflect the high demand for this species. These data refer to frozen product.

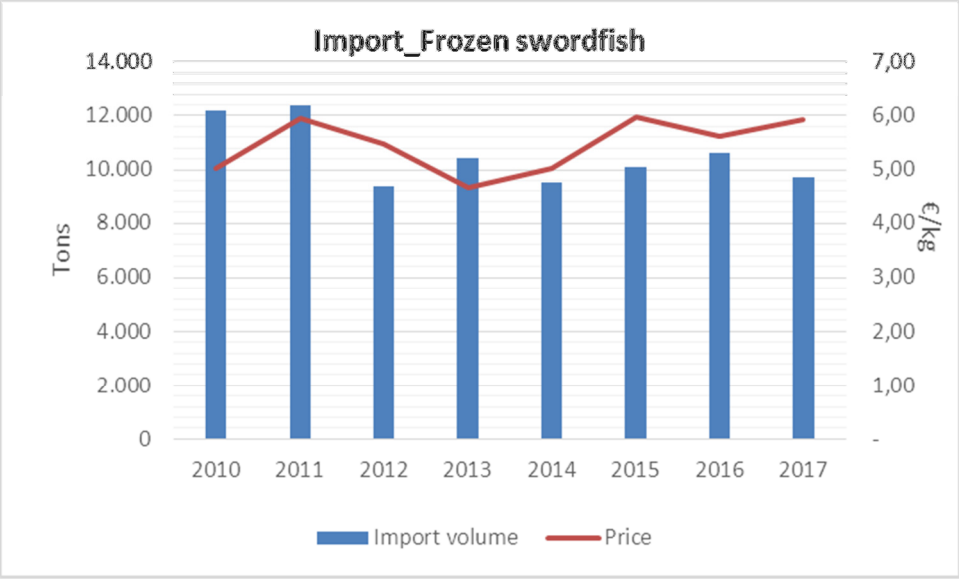


Figure 4.1.5.15 – Import volumes and prices of frozen swordfish. Italian national data (2010-2017). Source ISMEA. Data processed by NISEA.

In Italy, swordfish is highly appreciated both as a restaurant dish (Hotel-Restaurant-Café, HoReCa sector) and as a product to be cooked at home. As a result, imports are high also on the wholesale market. Imports slightly declined (-3%) from 2015 to 2017, whereas prices are virtually stable, showing very limited oscillation from one year to the next, since they increased by 1% from 2015 to 2017, and by 18% from 2010 to 2017.

Common cuttlefish:

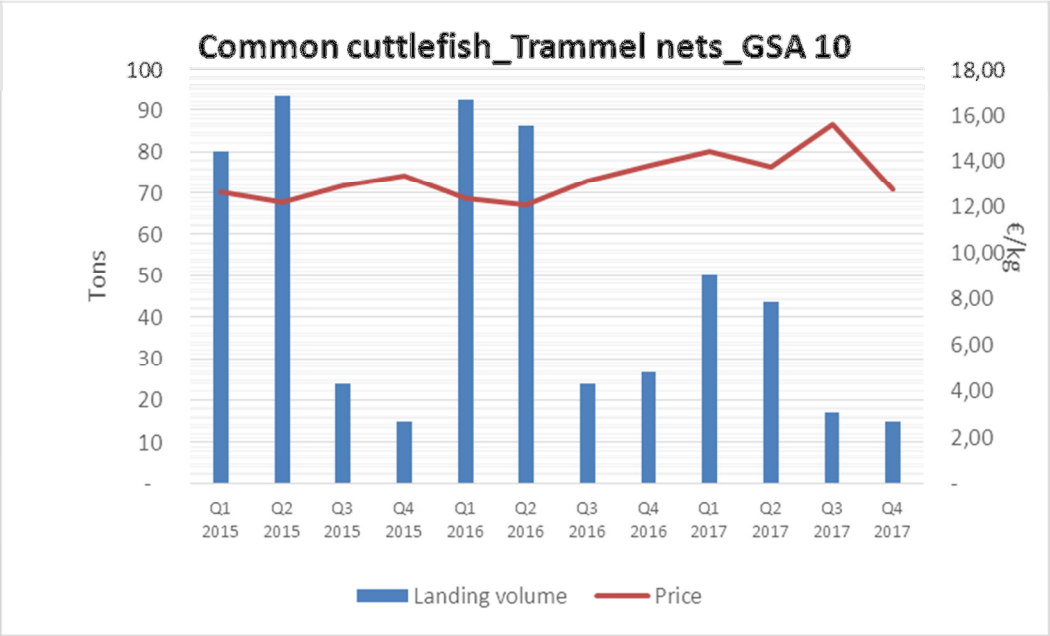


Figure 4.1.5.16 – Average volumes and production prices of common cuttlefish (CTC) landed by vessels using trammel nets (GTR) in GSA 10 (2015-2017 quarterly [Q] data). Source: MIPAAFT / National Fisheries Data Collection Programme. Data processed by NISEA.

In 2015-2017, the average annual landings of common cuttlefish caught with trammel nets in GSA 10 plummeted (-41%) to 125 tons in 2017. The peaks seen in winter (1st quarter) and late spring (2nd quarter) are due to seasonality of the species. The average first sale price increased by 11% to more than €14 / kg in 2017, reflecting the high demand for the species and the high quality of the cuttlefish caught with trammel nets.

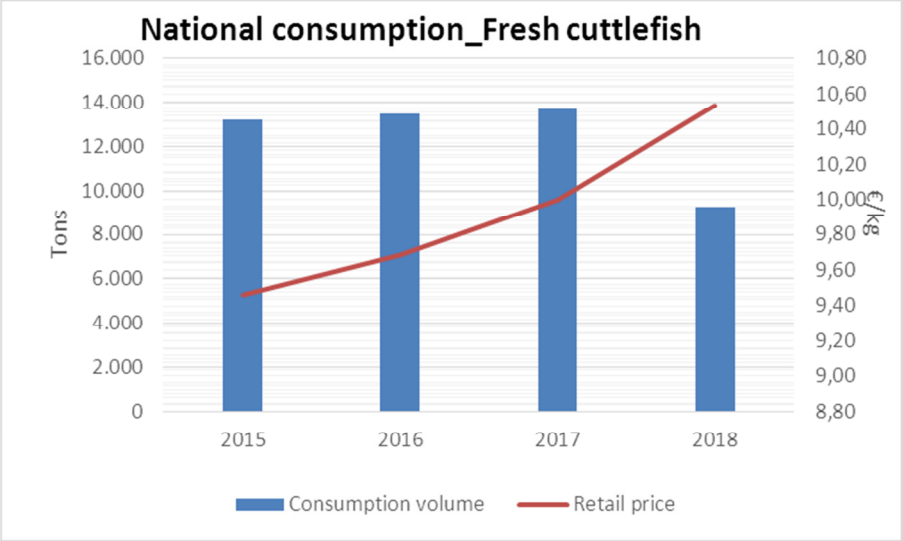


Figure 4.1.5.17 – National consumption volumes and retail price of fresh cuttlefish in 2015-2018 (2018 data available until 31 August). Source: EUMOFA. Data processed by NISEA.

The diagram shows a slight increase in the national consumption of fresh cuttlefish and a marked price increase, demonstrating the strong propensity of Italian consumers to buy it. The lower level of the average sale price compared with the first sale price is explained by the fact that the market price is an average national value and does not, as such, take into account the very high propensity of some consumers to buy this product, especially in some areas of southern Italy.

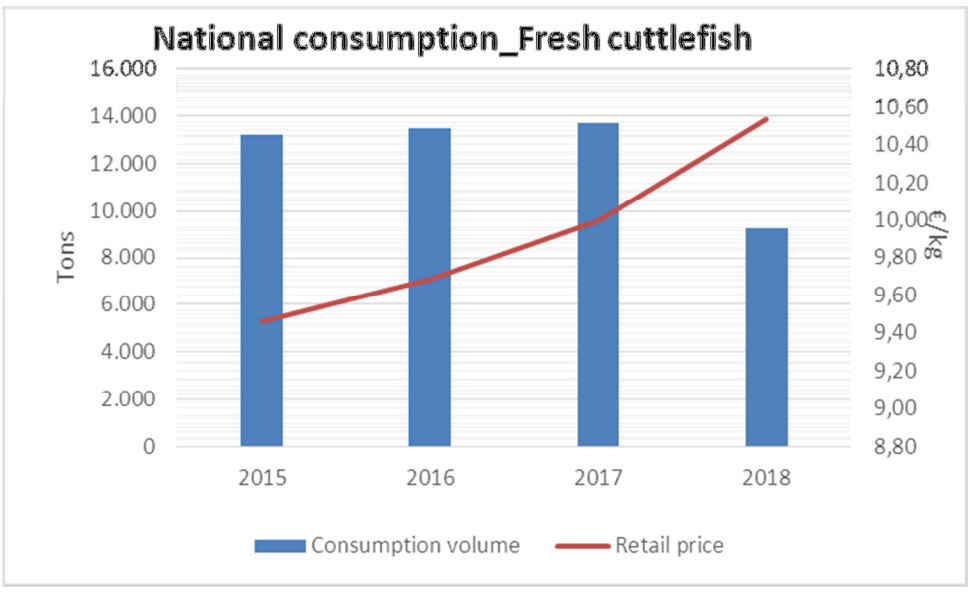


Figure 4.1.5.18 – Import volume and price of frozen cuttlefish. Italian national data (2010-2017). Source: ISMEA. Data processed by NISEA.

Italy is heavily dependent on cuttlefish imports (*i.e.* frozen cuttlefish and squid). Import volumes have however been declining to about 13,000 tons in 2017, whereas prices have been rising.

Broadtail shortfin squid:

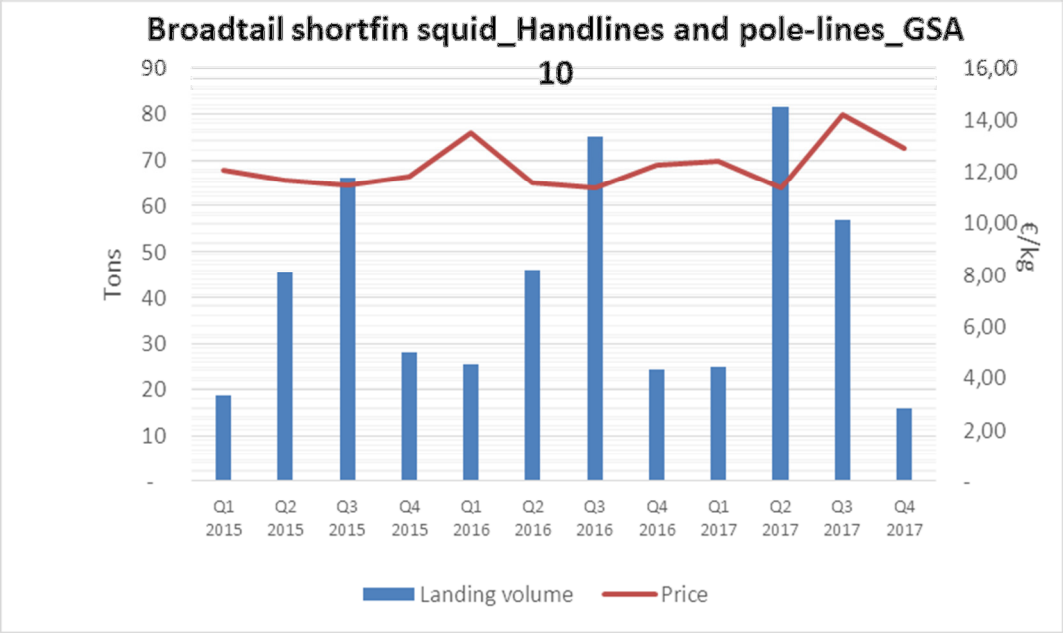


Figure 4.1.5.19 – Average volumes and production prices of broadtail shortfin squid (SQM) landed by vessels using handlines and pole-lines (LHP-LHM) in GSA 10 (2015-2017 quarterly [Q] data). Source: MIPAAFT / National Fisheries Data Collection Programme. Data processed by NISEA.

The annual landing volumes of broadtail shortfin squid caught with handlines (a typical technique in GSA 10) were fairly stable (160-180 tons) in 2015-2017. Production peaks in late spring (2nd quarter). The average price is also quite stable and was never less than €11 / kg.

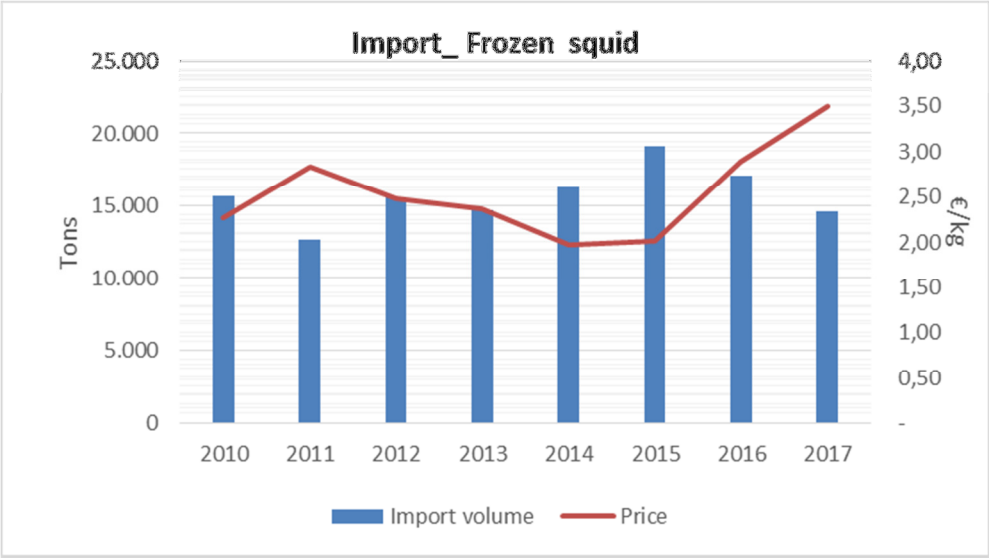


Figure 4.1.5.20 – Import volume and price of frozen squid. Italian national data (2010-2017). Source: ISMEA. Data processed by NISEA.

Italians' high propensity to consume cephalopods and the country's dependence on imports are reflected in this diagram, which shows rising import volumes and prices. In 2017 imports of frozen squid reached a level slightly below 15,000 tons.