JOINT RECOMMENDATIONS ON DISCARDS MANAGEMENT PLANS FOR THE SPECIES LISTED IN ANNEX III MED.REG.

(Art. 15 Basic Regulation)

Ref.: 132/2018 May 21,2018

MEDAC
MEDITERRANEAN ADVISORY COUNCIL

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I. THE RATIONALE BEHIND A NEW APPROACH

The landing obligation, established under Reg. 1380/2013, which is now just a few months away from full entry into force, has always been a cause of concern within the MEDAC for various reasons, ranging from the problems related to the construction of a supply chain on land capable of storing and marketing the undersized specimens landed, for uses other than human consumption; for the possible development of a market linked to illegal fish products; the potential weakening of efforts towards the reduction/elimination of the capture of undersized specimens; and for the definition of *de minimis* exemption.

The efforts made by the MEDAC have focused so far on seeking the necessary technical and economic conditions that together would make handling stations on land feasible, this has been carried out by verifying the existence of the factors that influence feasibility in several areas of the Mediterranean Member States and also by assessing aspects of production and the scientific data on the stocks affected, which could form the basis for requests by the Member States for *de minimis* exemption.

These assessments were recently developed within the STECF through a proposal for a more analytical approach, this led the MEDAC to request support from the Member States, inviting them to provide data from the scientific institutes operating in the DCF, while also continuing the activities of the ongoing projects aiming to increase selectivity of fishing gear and related good practices (e.g. Galion, Minouw)[1], which currently have full responsibility for the pursuit of the real goal set within the framework of Mediterranean fisheries legislation: the reduction/elimination of discards made up of undersized specimens.

From the above it emerges that, in view of the complexity of the problem, several actions are being developed simultaneously but independently, without a logical sequence of steps that would draw them together into a single coherent strategy. While increasing selectivity of certain fishing gear is central to some projects, as the LO enters into force for the different stock groups, work continues regardless of this on the scientific basis for the requests for *de minimis* exemption.

The pursuit and the definition of the necessary conditions that would ensure the feasibility of the development of handling stations on land, in which to receive, store, freeze and sell the undersized specimens landed, seems to be considered an independent variable. It is as if the existence or lack of a concrete, operative possibility to comply with the landing obligation and to market this specific product under the conditions laid down within the regulation, while also covering the costs related to this activity, were entirely irrelevant or at best secondary.

It is also clear that if it proves impossible to cover the above-mentioned costs, or if it transpires that these fish products have to be disposed of as “special waste” (which would be obligatory in the absence of buyers) no one - neither public nor private - would be able to sustain the costs.

There are several aspects, however, that remain undefined, such as which parties would be eligible to take the initiative of activating this type of supply chain (that is destined to fail if there is

[1]Annex I

a progressive reduction or elimination of discards), or the existence of an EMFF contribution that depends on this item being envisaged in the respective NOPs of the various Member States.

If the objective of Regulation 1380/2013 was, and still is, that of eliminating the practice of returning unwanted catches to the sea by ending the capture of undersized specimens in the Mediterranean, the MEDAC believes that, in light of the partial entry into force of the LOs, of the assessment of the situation in the various Member States and of the ongoing projects for the improvement of gear selectivity, periodically redefining the *de minimis* exemption is the wrong strategy even if the scientific evaluation of the relative justifications is constantly refined; it amounts to a dead end and will not produce any improvement in the situation, on the contrary, it will worsen bureaucracy and intensify on-board operations for the registration of the discards eligible for *de minimis* exemption in the logbooks.

With this recommendation, the MEDAC therefore aims to propose a new approach which, starting from the data already acquired and in compliance with the Basic Regulation, focuses on the real objective of Article 15: the significant reduction in catches of undersized specimens.

The joint recommendations of the Member States for the granting of *de minimis* exemption, as proposed by the MEDAC, should therefore be considered complementary to the management proposals to reduce capture of undersized specimens that the same Member States will present to the EC.[2]

1. The non-feasibility of landing undersized specimens in the Mediterranean.

The first and most important piece of information acquired in over four years since the regulation was published, is the fact that it is not technically nor economically feasible in any of the eight Mediterranean Member States to create handling stations for the storage, freezing and trade of undersized specimens in order to sell them to industries with a potential commercial interest (feed, cosmetics, lubricants, etc.).

The lack of existing areas or structures available in or near ports and landing sites (affordable ones at least), the costs related to the construction and equipment of storage and processing units, the requirements of the industries questioned (regular quantities guaranteed, uniform product characteristics, prices, transport, etc.), the management costs (personnel, energy, etc.), are all factors which together would entail significant investments (to be amortised) and operating costs (that should be covered by earnings), which are not compatible with the volume of business that

[2] Oceana does not support the approach proposed on granting of "the minimis exemptions" as set in the document, as it considers that it does not fulfil the requirements of CFP art. 15.5. c) were the minimis exemption should be applied only under certain conditions. Oceana condemns the approach of setting de minimis exemptions "as high as possible" as stated in this joint recommendation, and Oceana is not in agreement that it complies with the objective of the Landing Obligations, nor serve its purpose. Finally, Oceana considers that MEDAC should state that the aim of the contribution is to help on gradually eliminating discards, in line with art. 2.5, and that official scientific bodies should evaluate the suitability of the proposals.

can realistically be envisaged in a business plan and which would therefore justify any business venture.

Nor is it conceivable for the public sector to take the initiative, there would be little inclination to burden public accounts with business activities that would cause financial losses. Furthermore, the goal of the progressive elimination of undersized specimens from catches would make the future of this activity particularly uncertain.

Without the stations on land to ensure correct handling of the unwanted part of the catch that is landed, the only viable alternative to comply with the landing obligation would be disposal as special waste (incineration), with costs that would fluctuate around 0.05-0.10 euro/kg, which is clearly unsustainable for the fishing enterprises and difficult to enforce by the city authorities in the Municipalities concerned.

In view of the above, and without going into the reasons underlying the regulation imposing the Landing Obligation, **the landing of undersized fish products in fishing ports cannot be seen as a practice to be carried out even where the necessary conditions are absent, but rather as an eventuality to be eliminated**, so as not to have to deal with problems for which there are no operational or economic solutions.

Rather than multiplying efforts in a direction which would appear to be a dead end, the strategy to be implemented should take a different route, moving away from the need to land the undersized specimens, aiming instead to reduce their capture.

Only in this way, without ever exceeding the *de minimis* limit granted (ideally moving away from it), will it be possible to achieve a situation in which undersized specimens are never landed, thus avoiding the insurmountable problems mentioned above.

To pursue this aim, it is necessary on the one hand to be in a position to count on a *de minimis* limit that is as high as possible, while intervening on the other hand in the short-medium term on the fishing zones/seasons/sectors which give rise to the highest levels of capture of undersized specimens, by means of actions (management plans) aimed at drastically reducing these catches. **In pursuing this objective, these plans will have to take into account the specific nature of the fleets in question and the socio-economic consequences of the spatial/temporal closure measures, paying particular attention to small-scale fisheries.**

II. RECOMMENDATIONS CONCERNING REQUESTS FOR DE MINIMS EXEMPTION

In view of the issues presented in the previous paragraphs and, in particular, in relation to:

a) the aim of reducing catches of undersized specimens as far as possible by means of specific management plans and

b) to remove the risk of being obliged to land these fish products because the *de minimis* exemption threshold has been reached

it is clear that the higher this threshold is set in the coming period the simpler it will be for these management plans to develop their effects without being forced to land this part of the catch which, as described, would have to be destroyed.

It is therefore a question of assessing the possibility of granting *de minimis* exemptions from the LO, as has already been done in the past for various stocks, but with a different ratio: no longer defining the exemption percentage in relation to the total quantities landed for each stock in question, and on the stock assessments for them, **but pursuant to Article 15, paragraph 5 letter c) ii) of the Basic Regulation**, which refers to disproportionate costs and therefore to the non-feasibility of these landings.

Where this is the reason given for exemption, it is not deemed necessary to define it on the basis of production or biological data (see the STECF analytical approach), it is related instead to the impossibility of carrying out the landing and therefore the need to make landing extremely unlikely.

Hence the recommendation to establish exemption of all stocks from the LOs at the highest levels allowed under Regulation 1380/2013:

DE MINIMIS EXEMPTION PROPOSALS FOR THE 3 MEDITERRANEAN AREAS:

i. [7]% of total annual catches of all species under landing obligation of MedReg Annex III for under MCRS specimens caught by bottom trawls;

ii. [7]% of total annual catches of all species under landing obligation of MedReg Annex III for under MCRS specimens caught by trammel and gill nets;

iii. [7]% of total annual catches of all species under landing obligation of MedReg Annex III for under MCRS specimens caught by hooks and lines.

iv. [7]% of total annual by-catches of small pelagic species (Anchovy, Sardine, Mackerel, Horse mackerel) under landing obligation.

Given that these exemptions from the LO in *de minimis* are to be considered as complementary to "management plans for the reduction of catches of undersized specimens" and considering that these plans would only concern some stocks, if any distinctions should be made then they should distinguish between the stocks not subject to these management plans compared to those stocks that are covered by the management plans.

It is necessary to take into due account the fact that the stocks that will not be subject to "management plans for the reduction of catches of undersized specimens" are those for which

catches of these specimens are low, as a consequence these stocks could have lower levels of *de minimis* exemption without risking the problem of landings.

However, the economic reasons mentioned above would not make this distinction entirely justified in our view.

1. Strategy for not reaching the *De Minimis* threshold: Management plans to reduce catches of undersized specimens

The methodological basis underpinning the "Strategy for not reaching the De Minimis threshold" relates to the following indications from the STECF:

1) "STECF encourages MS to systematically investigate potential studies and existing scientific articles and review their main findings before any request is sent out to the EWG [on the Evaluation of LO joint recommendations]" (STECF-PLEN-17-02[3]).

2) Recognition of the most recent information available[4], requested in the tables defined by STECF in 2016 (STECF 16-10) that aim to provide descriptors of the fishery and the fleet, but above all to identify the species in Annex III of REGMED for each macro-area and gear, for which there are the highest discard rates, meaning an average annual landed quantity (2014-2016) over 100 tonnes.

Consequently, the most up-to-date scientific studies and articles were gathered in order to validate the strategy for not reaching the *de minimis* threshold as well as for the identification of nursery and spawning areas for the species in Annex III of REGMED which are more frequently discarded. While waiting for the results of the ongoing projects on methods and fishing gear modifications aimed at increasing selectivity and therefore reducing discards (such as MINOUW and DISCARDLESS), we report the considerations and/or conclusions of recent scientific studies that foster ways not to equal or exceed the *de minimis* threshold by means of the implementation of management plans to reduce catches of undersized specimens:

- On the basis of the results of the CALL MARE/2014/27[5] "alternative ways to avoid the capture of undersized individuals could be to restrict operations in specific grounds where nurseries occur (i.e. at certain depths, areas and/or over specific types of substrate) or to restrict fishing in certain periods of the year that coincide with the recruitment of exploited species. In any case, many demersal species are known to recruit at the littoral zone, especially in early summer. In some countries, seasonal fishing bans have been enforced in coincidence with this process. A prohibition to operate in the 3 miles stripe or under 50m of depth is already enforced for trawlers (EU Reg. 1967/2006) but further measures can be enforced for those species that recruit in deeper waters. Individuals at length below the MCRS of species living more inshore, that are target of the fisheries

[3] Scientific, Technical and Economic Committee for Fisheries (STECF) – 55th Plenary Meeting Report (PLEN-17-02); Publications Office of the European Union, Luxembourg; EUR 28359 EN; doi:10.2760/53335.

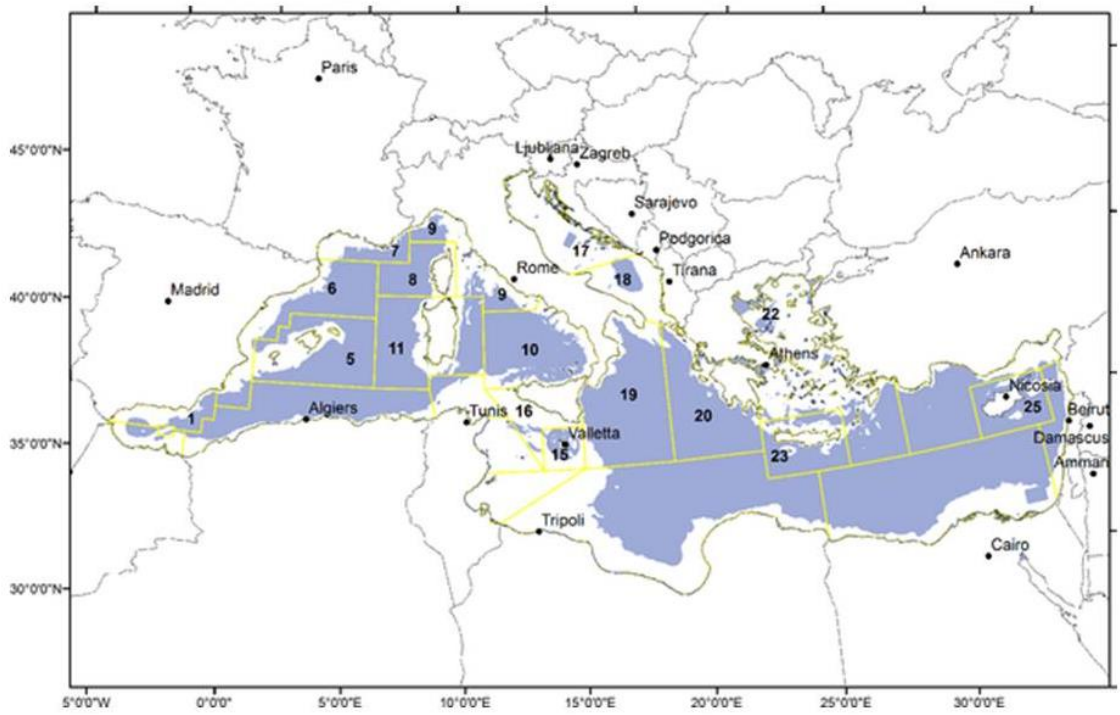
[4] "Data dissemination", https://stecf.jrc.ec.europa.eu/dd/medbs/graphs.

[5] "Study on the evaluation of specific management scenarios for the preparation of MAPs in the Mediterranean and the Black Sea".

(as *Mullus sp. Pagellus sp*.) or frequent by catch (*Trachurus sp.*) are also present in waters deeper than 50 m, although to a lesser extent compared to the depth range from 10 to 50 m. Thus, there is a fraction of the population that is not under protection of the Reg. 1967/2006. Such fraction could be protected extending the area to be forbidden to trawlers also offshore 50 m and, for example, to 80-100 m depth, at least in some seasons (i.e. late spring-summer), when the young of the year of some key species are still present in more coastal waters".

- Referring to the general conclusion of Colloca et al study (2015)[6], "the on-going spatial measures of fisheries restrictions for trawl fisheries (TFRA – Map 1) in the Mediterranean Sea showed a significant conservation effect mostly for species with nurseries on coastal grounds shallower than 50 m. This was the case of red mullet, common Pandora and common sole with 66.8%, 54.1% and 46.1% of persistent nursery areas under protection (This is mostly due to the trawling ban within 3 nautical miles of the shoreline or 50 m depth, applied through current management measures as defined by Article 13 of EU Council Regulation 1967/2006). On the other hand, the proportion of nursery areas protected was much lower for European hake (15.3%) and Norway lobster (17.8%), whose recruitment occurs on the shelf-break and upper slope below 150 m. Finally, there was minimal overlap between TFRA and recruitment areas for offshore species (i.e. thornback ray, blackmouth catshark, giant red shrimp and deep-water rose shrimp) distributed over the continental slope deeper than 200 m.
- Finally, the study of Colloca et al., (2015) mentioned above "believes that the implementation of spatial management measures to protect areas where juveniles congregate during their first year of life has the potential to substantially improve current fisheries exploitation patterns. As observed by previous studies, the spatial closure of Mediterranean nurseries can yield important benefits to fisheries in terms of increases in resilience to fishing and yields. In addition, it would allow for better compliance with the landing obligation implemented by the new Common Fisheries Policy, and a reduction in the high fishing mortality on juveniles that is currently undermining the productivity of Mediterranean demersal stocks."

[6] The Seascape of Demersal Fish Nursery Areas in the North Mediterranean Sea, a First Step Towards the Implementation of Spatial Planning for Trawl Fisheries.



Map 1 Trawl fishery restricted areas in the Mediterranean Sea Colloca F, Garofalo G, Bitetto I, Facchini MT, Grati F, et al. (2015) The Seascape of Demersal Fish Nursery Areas in the North Mediterranean Sea, a First Step Towards the Implementation of Spatial Planning for Trawl Fisheries. PLOS ONE 10(3): e0119590. https://doi.org/10.1371/journal.pone.0119590

Based on these considerations and conclusions, pending the results of the studies and the data from the Member States, the species for which discard rates are highest, corresponding to significant landed quantities (higher than 100 tons per year, average 2014-2016), were identified by macro-area and gear. This approach aims to reduce the discard rate associated with the capture of individuals below the MLS for the gears concerned, by not equalling or exceeding the *de minimis* threshold, to be achieved by closing the nursery/spawning areas to fisheries operations in the periods identified by the scientific studies available.

2. Geographical Scope and gear descriptions

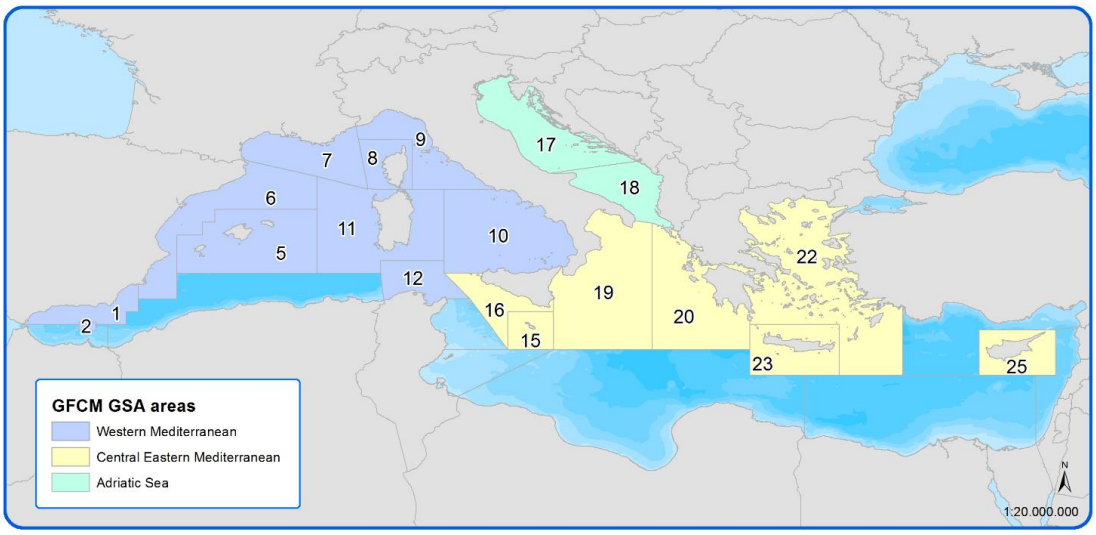
The information reported in this section outlines the geographical scope and the gears considered in the elaboration of the annual average discard rates (2014-2016) from the data currently available in the "data dissemination" section of the DCF.

In order to have several MS involved a sub-regional approach has been identified:

- Western Mediterranean (GSAs 1, 2, 5, 6, 7, 8, 9, 10, 11, 12[7])
- Adriatic Sea (GSAs 17,18)
- Central-Eastern Mediterranean (GSAs 15, 16, 19, 20, 22, 23,25)

[7] Even though GSA 12 is not included in the Commission Proposal regarding West Med and the DCF doesn't report discard data referred to this area, it is included in the map of the sub-regional area as in the previous MEDAC advice and in the Delegated Reg. (EU) 2018/161.

GRAPH 1: GEOGRAPHICAL SUBAREAS SUBJECT TO THE DISCARDS MANAGEMENT PLAN



Gears described below result to be involved in discarding species of RegMed Annex III according to DCF data (available on JRC dissemination section):

Trawl nets

Demersal trawl fisheries employ nets towed by one or two fishing vessels that advance thanks to the use of a propeller. They can be divergent (Bottom Otter trawl -OTB) if the horizontal opening is ensured by otter boards (or doors), or fixed (beam trawl or rake trawl) if the horizontal opening is ensured by a rigid frame. They can also be towed by two vessels of similar power that together ensure the horizontal opening.

There are several kinds of trawl net:

- Beam trawl (TBB - nets with a fixed opening used mainly in sole fisheries);
- Pair trawl nets (PTM);
- Midwater otter trawl (OTM);
- Otter twin trawl (OTT)

Bottom set gillnets

Fixed gillnets are anchored to the sea bed and retain the fish that get caught there as they move.

There are several kinds of fixed gillnet:

- Anchored gillnets (GNS);
- Trammel nets (GTR);
- Combined gillnet-trammel net.

Dredges

These are gears which are dragged along the bottom to catch shellfish. Following tables will provide information related to Mechanised dredges including suction dredges (HMD).

Surrounding nets

Surrounding nets are large netting walls set for surrounding aggregated fish both from the sides and from underneath, thus preventing them from escaping by diving downwards[1]. Following graphs and tables will include information and measures regarding Purse seines (PS);

Hooks and lines

Hooks and lines are gear where the fish is attracted by a natural or artificial bait (lures) placed on a hook fixed to the end of a line or snood, on which they get caught[1]. Following graphs and tables will include information and measures regarding set longlines (LLS).

Traps

Traps, large stationary nets or barrages or pots, are gears in which the fish are retained or enter voluntarily and will be hampered from escaping[1]. Following graphs and tables will include information and measures regarding pots (PO).

Recreational fisheries

Catches made with gears that do not permit high survival (like longlines) should be subject to the landing obligation, and if the quantities caught are deemed incompatible with the daily limit that should be allowed at Member State level, such gears should be banned.

3. Species list of Annex III of REGMED

The species with a minimum landing size in the Mediterranean that are subject to the landing obligation from January 1, 2019, pursuant to art. 15 point 1d, proved especially difficult: several attempts, also using the STECF document (Landing Obligation - Part 6 (Fisheries targeting demersal species in the Mediterranean Sea) (STECF-15-19), did not produce adequate results for the drafting of a plan. These issues were discussed in several MEDAC sessions, starting from 2017.

The following lists aim to regroup the Species of Annex III on the basis of different levels of information to be considered in the JR: species and gears already included in the current delegated acts, and the stocks not assessed by STECF in any GSA of the considered macro-area. The first column lists the gears resulting by the combination between those reported in the existing delegated acts and gears with associated discards in the STECF website.

Western Mediterranean (GSAs 1, 2, 5, 6, 7, 8, 9, 10, 11, 12)

Already existing delegated act*		Common name	Scientific name
PS - OTM	ANE	Anchovy	*Engraulis encrasicolus*
PS - OTM	HOM	Atlantic horse mackerel	*Trachurus trachurus*
	DPS	Deep-water rose shrimp	*Parapenaeus longirostris*
OTB - OTT 2019 - GNS - GTR	HKE	European hake	*Merluccius merluccius*
	NEP	Norway lobster	*Nephrops norvegicus*
OTB - OTT 2019 - GNS - GTR	MUT	Red mullet	*Mullus barbatus*
PS - OTM	PIL	Sardine	*Sardina pilchardus*
OTB - OTT 2019 - GNS - GTR	MUR	Surmullet	*Mullus surmuletus*
	SBG	Gilthead seabream	*Sparus aurata*
	PAC	Common pandora	*Pagellus erythrinus*
	SOL	Common sole	*Solea vulgaris*
	BSS	European seabass	*Dicentrarchus labrax*

STOCKS NOT ASSESSED AND INCLUDED IN THE ANNEX III REGMED LIST

Already existing delegated act*		Common name	Scientific name
	SRG	*Sea bream ssp.*	*Diplodus spp.*
	SBA	Spanish sea-bream	*Pagellus acarne*
	SBR	Red sea-bream	*Pagellus bogaraveo*
	RPG	Common sea-bream	*Pagrus pagrus*
PS - OTM	MAZ	Mackerel	*Scomber spp.*
	ANN	Annular sea-bream	*Diplodus annularis*
	CTB	Two-banded sea-bream	*Diplodus vulgaris*
	SHR	Sharpsnout sea-bream	*Diplodus puntazzo*
	SWA	White sea-bream	*Diplodus sargus*
	GPX	Groupers	*Epinephelus spp.*
	SSB	Stripped sea-bream	*Lithognathus mormyrus*
	WRF	Wreckfish	*Polyprion americanus*
PS - OTM	*MAS*		*Scomber japonicus*
PS - OTM	*MAC*		*Scomber scombrus*
	LBE	Lobster	*Homarus gammarus*
	VLO	Crawfish	*Palinuridae*
1-2-5-6 (2017) - HMD	SJA	Scallop	*Pecten jacobaeus*
1-2-5-6 (2017) - HMD	VEN	Carpet-clams	*Venerupis spp.*
1-2-5-6 (2017) - HMD	VEX	Venus-shells	*Venus spp.*

Adriatic Sea (GSAs 17,18)

Already existing delegated act*		Common name	Scientific name
	DPS	Deep-water rose shrimp	*Parapenaeus longirostris*
	PAC	Common pandora	*Pagellus erythrinus*
OTB 2019 - GNS - GTR - TBB	HKE	European hake	*Merluccius merluccius*
	NEP	Norway lobster	*Nephrops norvegicus*
OTB 2019 - GNS - GTR - TBB	MUT	Red mullet	*Mullus barbatus*
OTB 2019 - GNS - GTR - TBB	MUR	Surmullet	*Mullus surmuletus*
PTM - PS only in GSA 17	ANE	Anchovy	*Engraulis encrasicolus*
PTM - PS only in GSA 17	HOM	Atlantic horse mackerel	*Trachurus trachurus*
OTB 2017 - GNS - GTR - TBB	SOL	Common sole	*Solea vulgaris*
PTM - PS only in GSA 17	PIL	Sardine	*Sardina pilchardus*

STOCKS NOT ASSESSED AND INCLUDED IN THE ANNEX III REGMED LIST

Already existing delegated act*		Common name	Scientific name
	SBG	Gilthead seabream	*Sparus aurata*
	SRG	*Sea bream ssp.*	*Diplodus spp.*
	SBA	Spanish sea-bream	*Pagellus acarne*
	SBR	Red sea-bream	*Pagellus bogaraveo*
	RPG	Common sea-bream	*Pagrus pagrus*
PTM - PS only in GSA 17	MAZ	Mackerel	*Scomber spp.*
	ANN	Annular sea-bream	*Diplodus annularis*
	CTB	Two-banded sea-bream	*Diplodus vulgaris*
	SWA	White sea-bream	*Diplodus sargus*
PTM - PS only in GSA 17	*MAS*		*Scomber japonicus*
PTM - PS only in GSA 17	*MAC*		*Scomber scombrus*
	BSS	European seabass	*Dicentrarchus labrax*
	SHR	Sharpsnout sea-bream	*Diplodus puntazzo*
	GPX	Groupers	*Epinephelus spp.*
	SSB	Stripped sea-bream	*Lithognathus mormyrus*
	WRF	Wreckfish	*Polyprion americanus*
	LBE	Lobster	*Homarus gammarus*
	VLO	Crawfish	*Palinuridae*
	SJA	Scallop	*Pecten jacobaeus*
	VEN	Carpet-clams	*Venerupis spp.*
	VEX	Venus-shells	*Venus spp.*

Central-Eastern Mediterranean (GSAs 15, 16, 19, 20, 22, 23,25)

Already existing delegated act*		Common name	Scientific name
OTB 2019	DPS	Deep-water rose shrimp	*Parapenaeus longirostris*
OTB 2019 - GNS - GTR	HKE	European hake	*Merluccius merluccius*
PS	PIL	Sardine	*Sardina pilchardus*
PS	ANE	Anchovy	*Engraulis encrasicolus*
OTB 2019 - GNS - GTR	MUT	Red mullet	*Mullus barbatus*
	HMM	Mediterranean horse mackerel	*Trachurus mediterraneus*

STOCKS NOT ASSESSED AND INCLUDED IN THE ANNEX III REGMED LIST

Already existing delegated act*		Common name	Scientific name
	PAC	Common pandora	*Pagellus erythrinus*
	NEP	Norway lobster	*Nephrops norvegicus*
OTB 2019 - GNS - GTR	MUR	Surmullet	*Mullus surmuletus*
PS	HOM	Atlantic horse mackerel	*Trachurus trachurus*
OTB - GNS - GTR	SOL	Common sole	*Solea vulgaris*
	SBG	Gilthead seabream	Sparus aurata
	SRG	*Sea bream ssp.*	*Diplodus spp.*
	SBA	Spanish sea-bream	Pagellus acarne
	SBR	Red sea-bream	Pagellus bogaraveo
	RPG	Common sea-bream	Pagrus pagrus
PS	MAZ	Mackerel	Scomber spp.
	ANN	Annular sea-bream	Diplodus annularis
	CTB	Two-banded sea-bream	Diplodus vulgaris
	SWA	White sea-bream	Diplodus sargus
PS	*MAS*		*Scomber japonicus*
PS	*MAC*		*Scomber scombrus*
	BSS	European seabass	Dicentrarchus labrax
	SHR	Sharpsnout sea-bream	Diplodus puntazzo
	GPX	Groupers	Epinephelus spp.
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	LBE	Lobster	Homarus gammarus
	VLO	Crawfish	Palinuridae
	SJA	Scallop	Pecten jacobaeus
	VEN	Carpet-clams	Venerupis spp.
	VEX	Venus-shells	Venus spp.

The letters received by the HLG of the Mediterranean Sea Administrations, respectively, can be found in the summary below:

- Ref. 39/2018 of February 7, 2018: the PESCAMED HLG (FR, IT, SP) would like to receive the MEDAC views to start drafting the JR, regarding which exemptions for the species from the Annex III of the REGMED would be needed.

- Ref.120/2018 of April 20, 2018: the Adriatica HLG (HR, IT, SI) would like to receive the MEDAC views to start drafting the JR, regarding which exemptions for the species from the Annex III of the REGMED would be needed.

4. Composition of catches, landings and discards

The following graphs describe the composition on catches, landings and discards obtained by the Data Collection Framework available in the "data dissemination" section of the STECF[8]. From the most Western Country to the Eastern side of the EU Mediterranean Member States, the average quantities landed and discarded between 2014 and 2016 and referred to each species of Annex III were processed to estimate the discard rate corresponding to each gear. The species already covered by a delegated act are highlighted in grey and the blue line in the graphs points out the 5% of discard rate. The nominal effort (Nominal Effort= [kW days] *1.000.000) is also reported considering the macro-area and the gear described by the data.

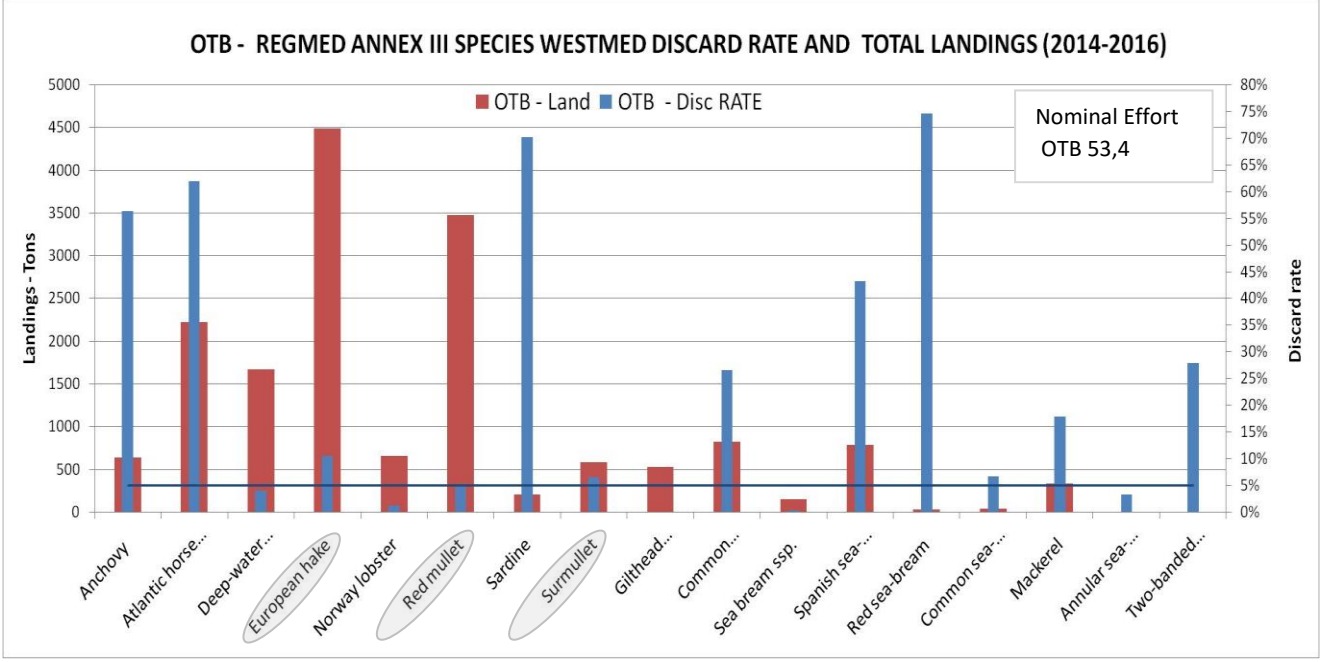
WESTERN MEDITERRANEAN

Concerning the species not already covered by delegated act, in this area the highest rates of Bottom Otter Trawl (OTB) discard are referred to Anchovies, Atlantic Horse Mackerel, Sardine, Common Pandora, Spanish Sea-bream, Red Sea-bream, Mackerel and two-banded sea-bream. Nevertheless, the list of species of which the discarded quantities are greater than 500 tons/year encloses Anchovies, Atlantic Horse Mackerel, Common Pandora and Spanish Sea-bream.

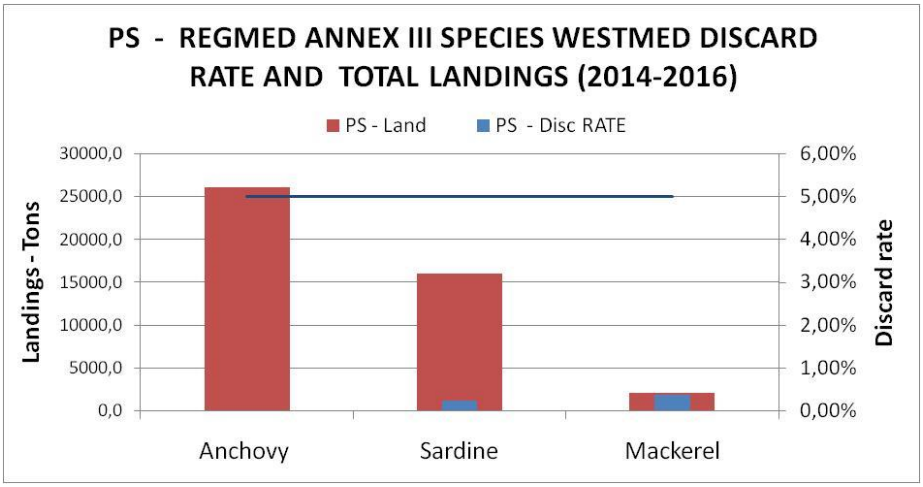
The discard rate of Purse Seiners (PS) never exceeds 5% and the species concerned are already covered by de minimis exemption.

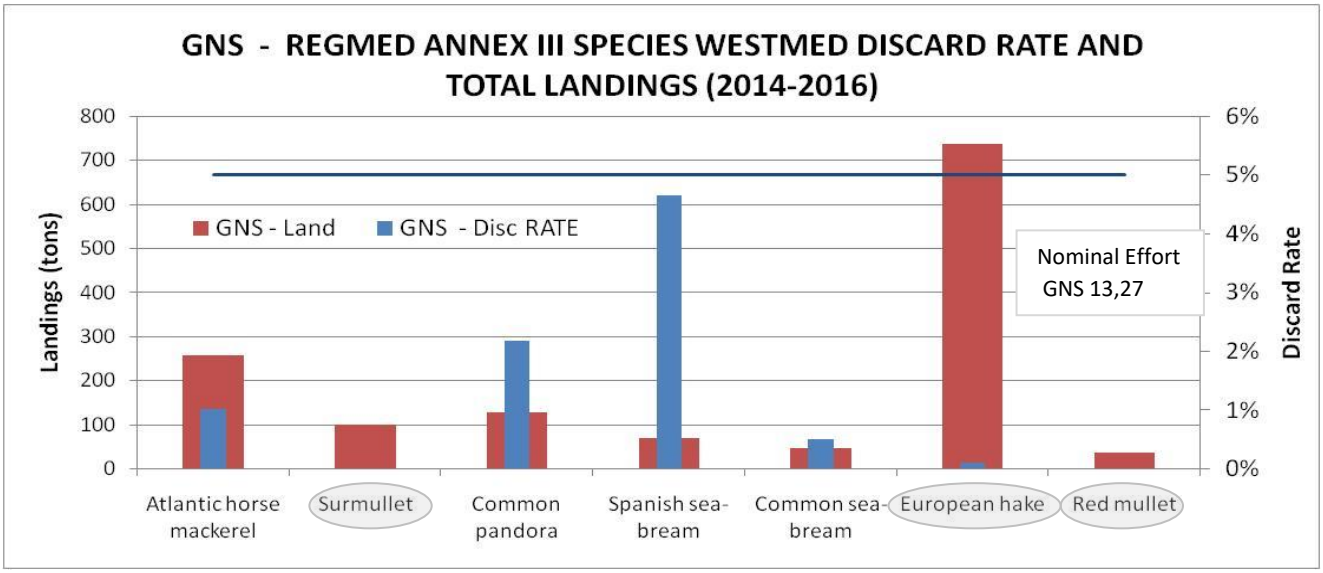
Even if the variety of species caught by gill and trammel nets (respectively GNS and GTR) is greater than the purse seiners, the discard rate never exceeds 5% of total catches.

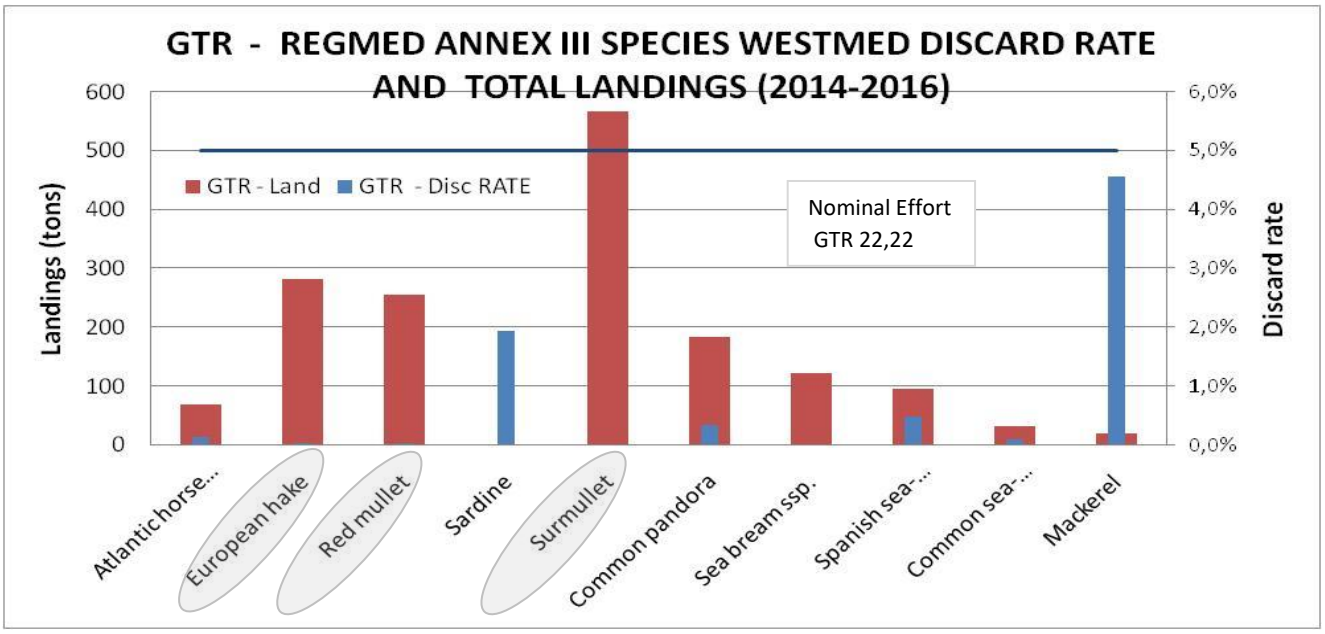
Discard rates related to Midwater Otter Trawl (OTM) and Otter Twin Trawl (OTT) raise over to 5% only when associated to species already covered by the delegate act.

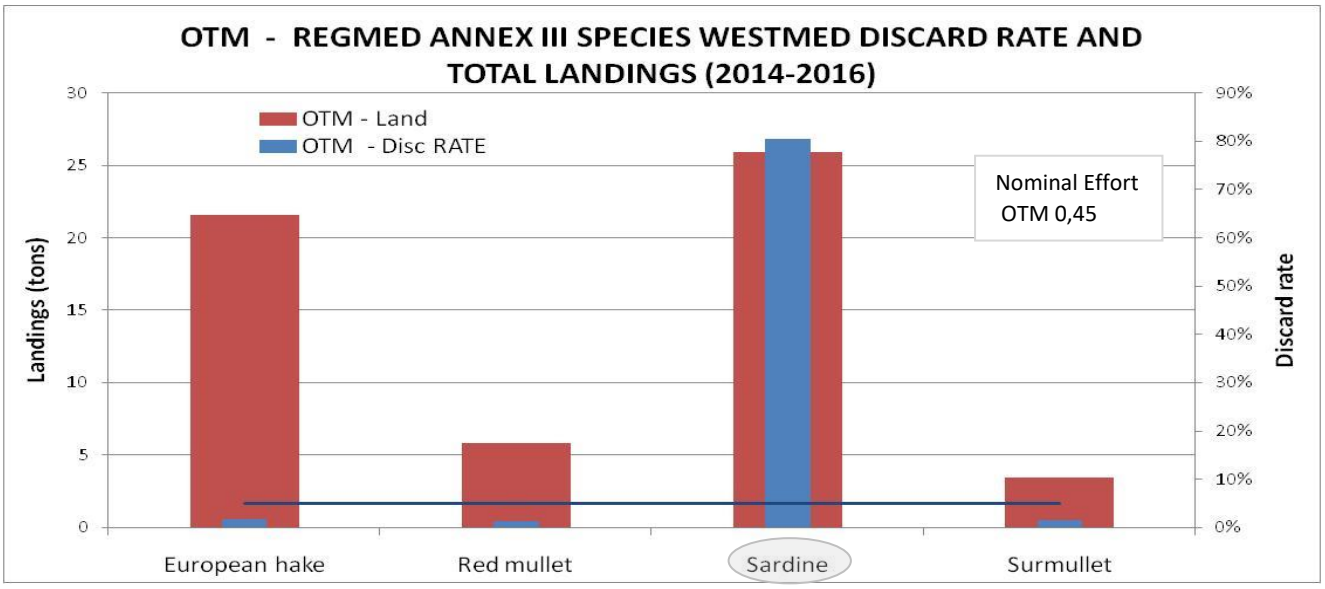


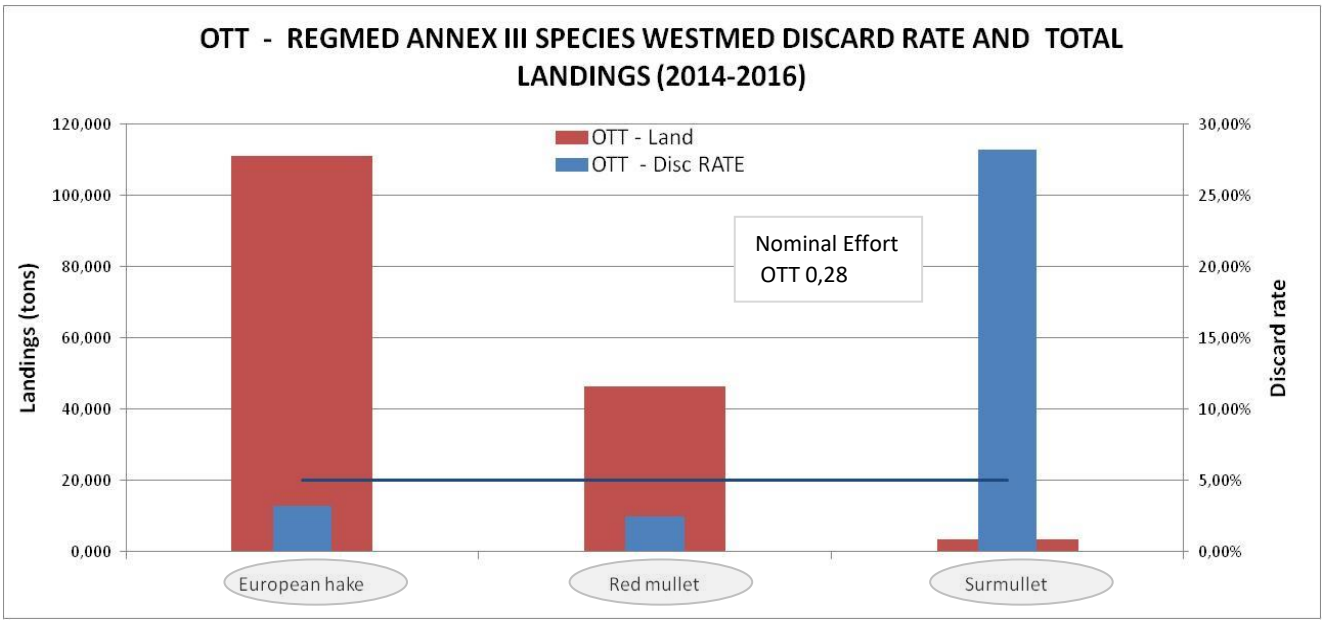
[8] https://stecf.jrc.ec.europa.eu/dd/medbs/graphs


PS - REGMED ANNEX III SPECIES WESTMED DISCARD RATE AND TOTAL LANDINGS (2014-2016)
PS - Land
PS - Disc RATE
Landings - Tons
Discard rate
30000,0
25000,0
20000,0
15000,0
10000,0
5000,0
0,0
6,00%
5,00%
4,00%
3,00%
2,00%
1,00%
0,00%
Anchovy
Sardine
Mackerel


GNS - REGMED ANNEX III SPECIES WESTMED DISCARD RATE AND TOTAL LANDINGS (2014-2016)
GNS - Land
GNS - Disc RATE
Landings (tons)
Discard Rate
800
700
600
500
400
300
200
100
0
6%
5%
4%
3%
2%
1%
0%
Nominal Effort
GNS 13,27
Atlantic horse mackerel
Surmullet
Common pandora
Spanish sea-bream
Common sea-bream
European hake
Red mullet


GTR - REGMED ANNEX III SPECIES WESTMED DISCARD RATE AND TOTAL LANDINGS (2014-2016)
GTR - Land
GTR - Disc RATE
Landings (tons)
Discard rate
600
500
400
300
200
100
0
6,0%
5,0%
4,0%
3,0%
2,0%
1,0%
0,0%
Nominal Effort
GTR 22,22
Atlantic horse...
European hake
Red mullet
Sardine
Surmullet
Common pandora
Sea bream ssp.
Spanish sea-...
Common sea-...
Mackerel

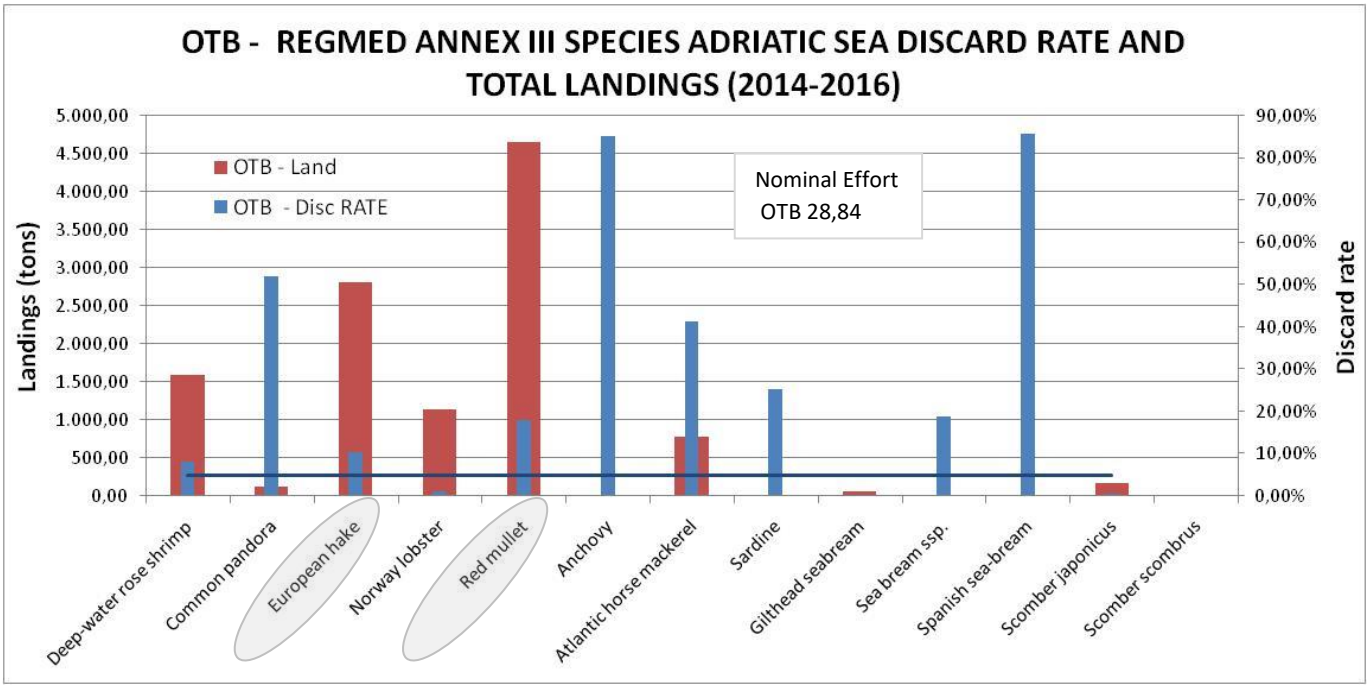

OTM - REGMED ANNEX III SPECIES WESTMED DISCARD RATE AND TOTAL LANDINGS (2014-2016)
OTM - Land
OTM - Disc RATE
Nominal Effort
OTM 0,45
Landings (tons)
Discard rate
30
25
20
15
10
5
0
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
European hake
Red mullet
Sardine
Surmullet

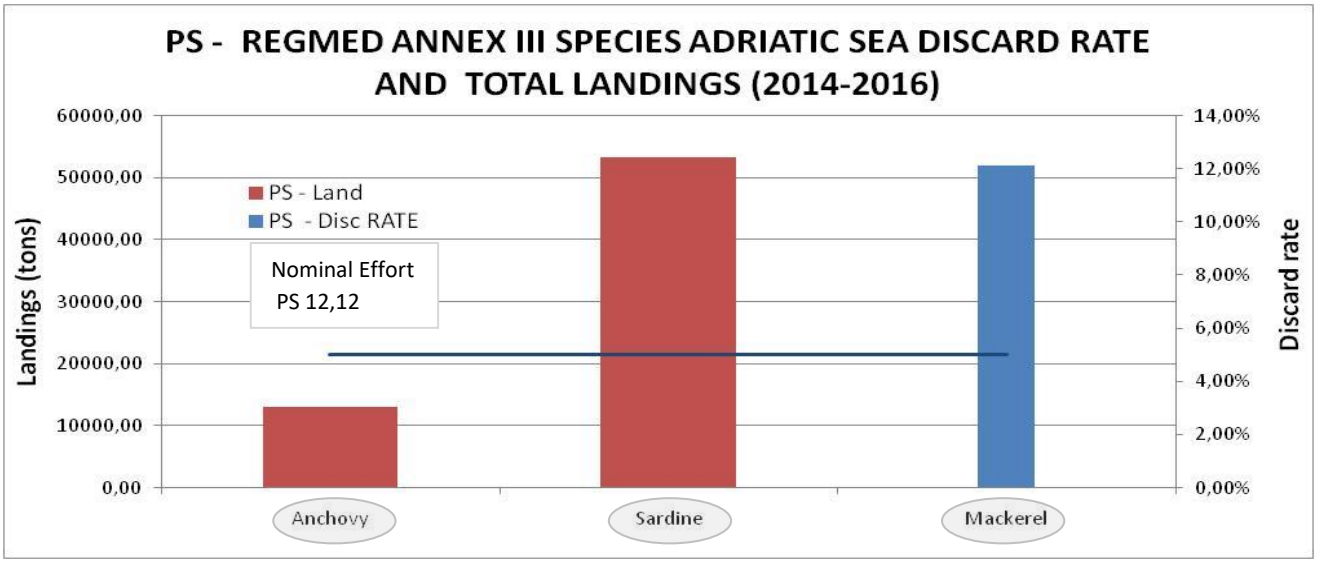

OTT - REGMED ANNEX III SPECIES WESTMED DISCARD RATE AND TOTAL LANDINGS (2014-2016)
OTT - Land
OTT - Disc RATE
Nominal Effort
OTT 0,28
Landings (tons)
Discard rate
120,000
100,000
80,000
60,000
40,000
20,000
0,000
30,00%
25,00%
20,00%
15,00%
10,00%
5,00%
0,00%
European hake
Red mullet
Surmullet

ADRIATIC SEA

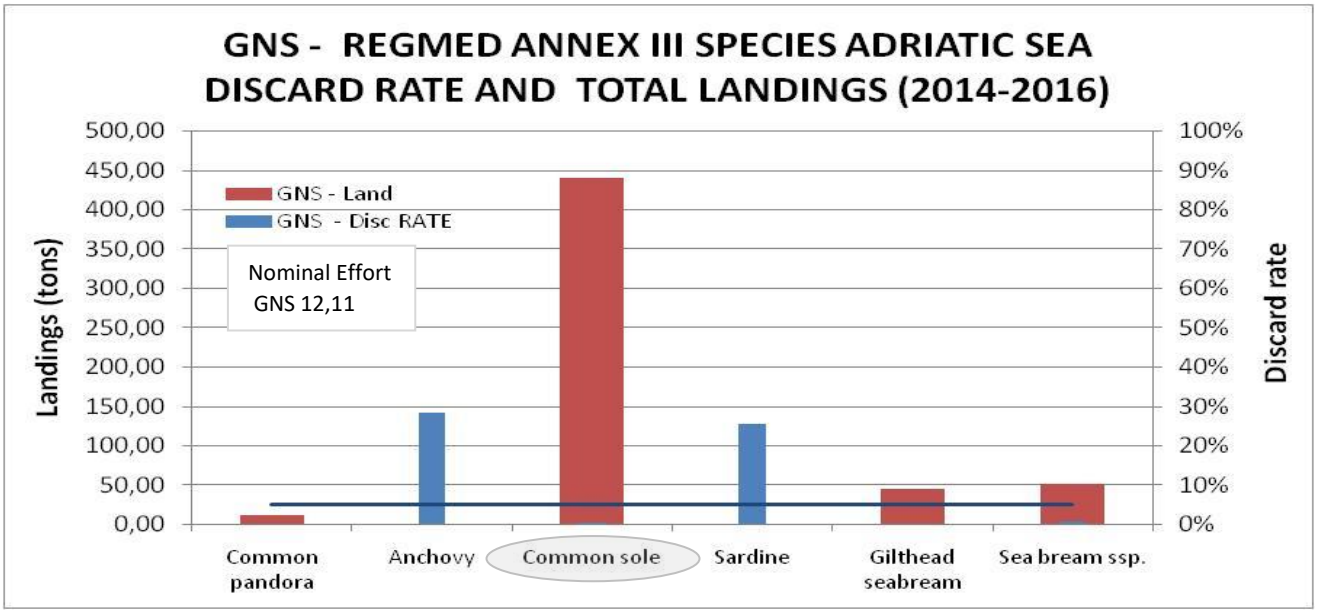
In the Adriatic area when the discard rate of Bottom Otter Trawls (OTB) raises over 5% the corresponding landings values doesn't exceed 140 ton/year (Common Pandora), with the exception of the species already covered by exemption. Only the discard rate of deep-water rose shrimp is about 8% and landings are higher than 1500 tons/year.

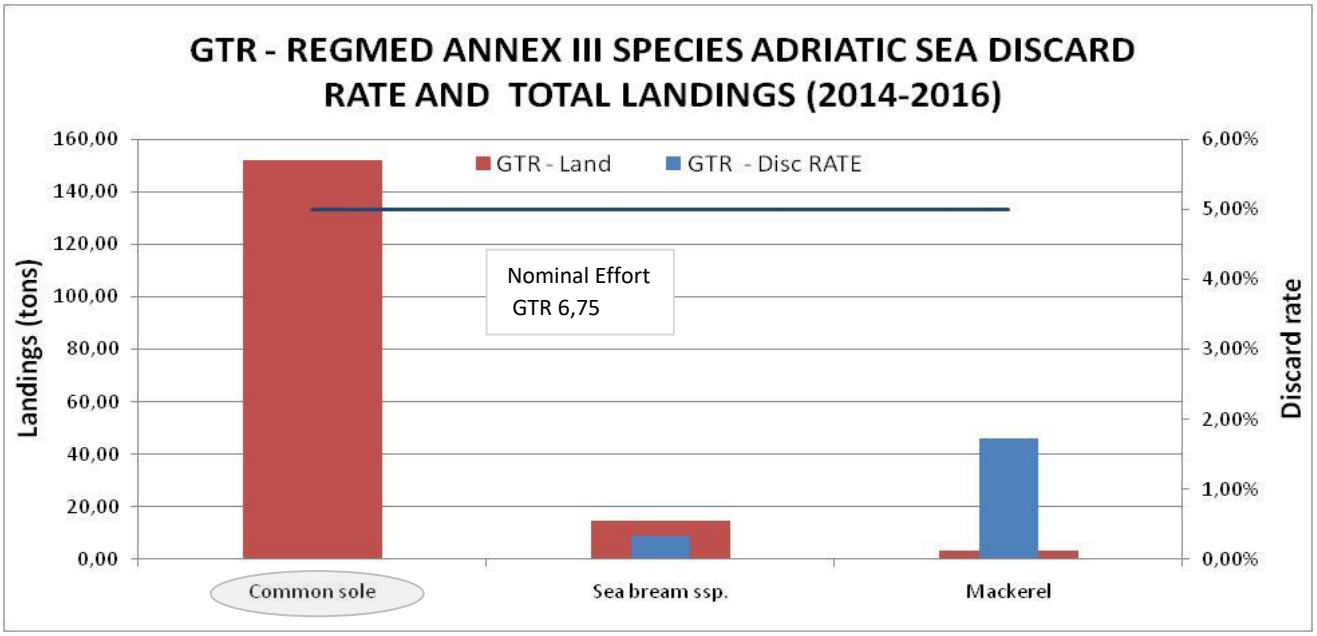
As the Western Mediterranean area, species landed by Purse Seiners (PS) are all already covered by the delegated act.



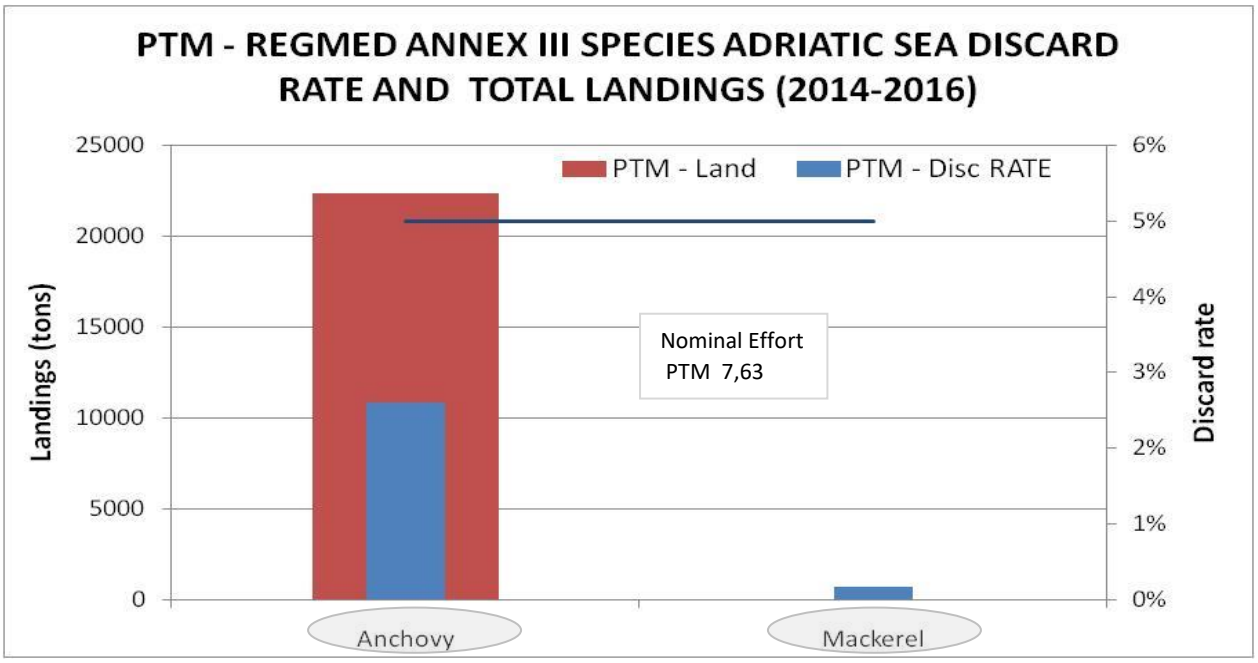


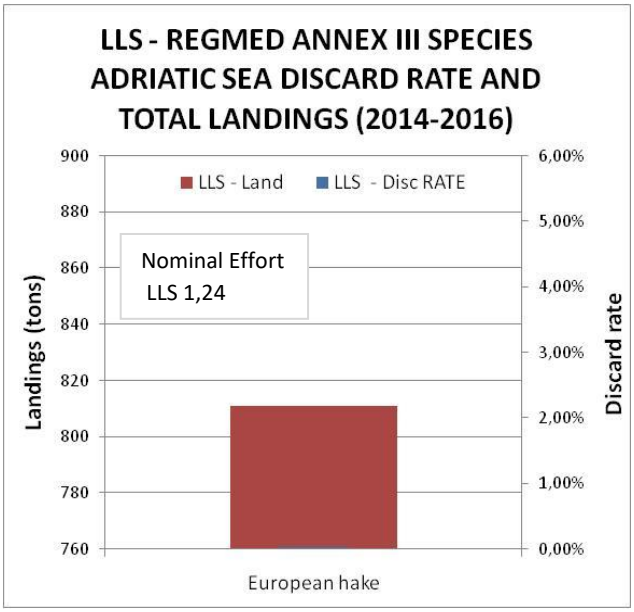
Gill nets (GNS) discard rate raises over 5% for anchovies and sardines, while the associated landings are respectively 0,02 tons and 0,38 tons/year. Discard rate of trammel nets (GTR) never exceeds 5%.

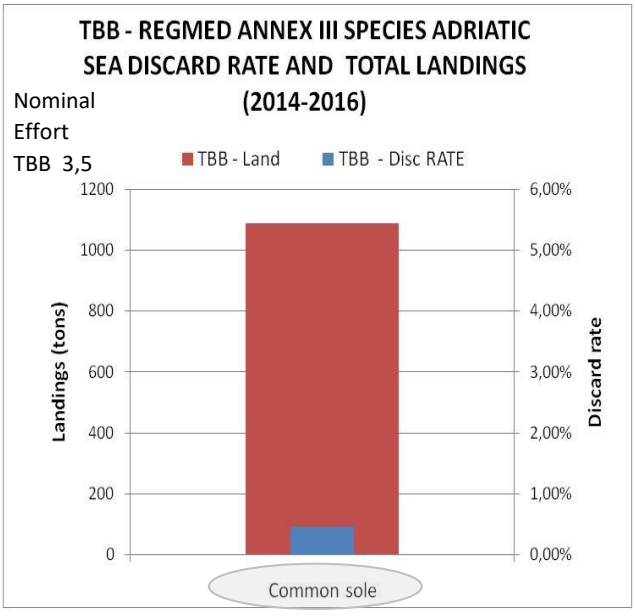




The processing of data obtained by the collection framework points out that the discard rate of Pelagic Pair Trawls (PTM), Set Longlines (LLS) and Beam Trawls (TBB) doesn't raise over 3%.

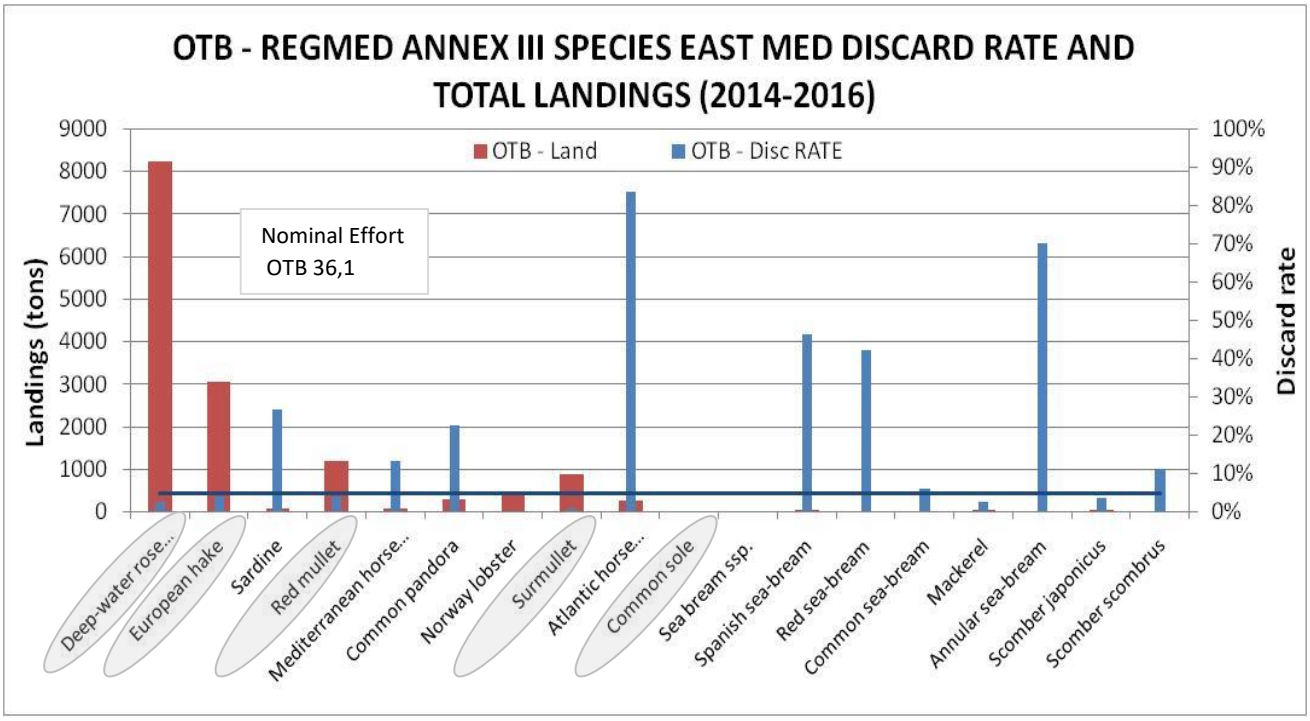


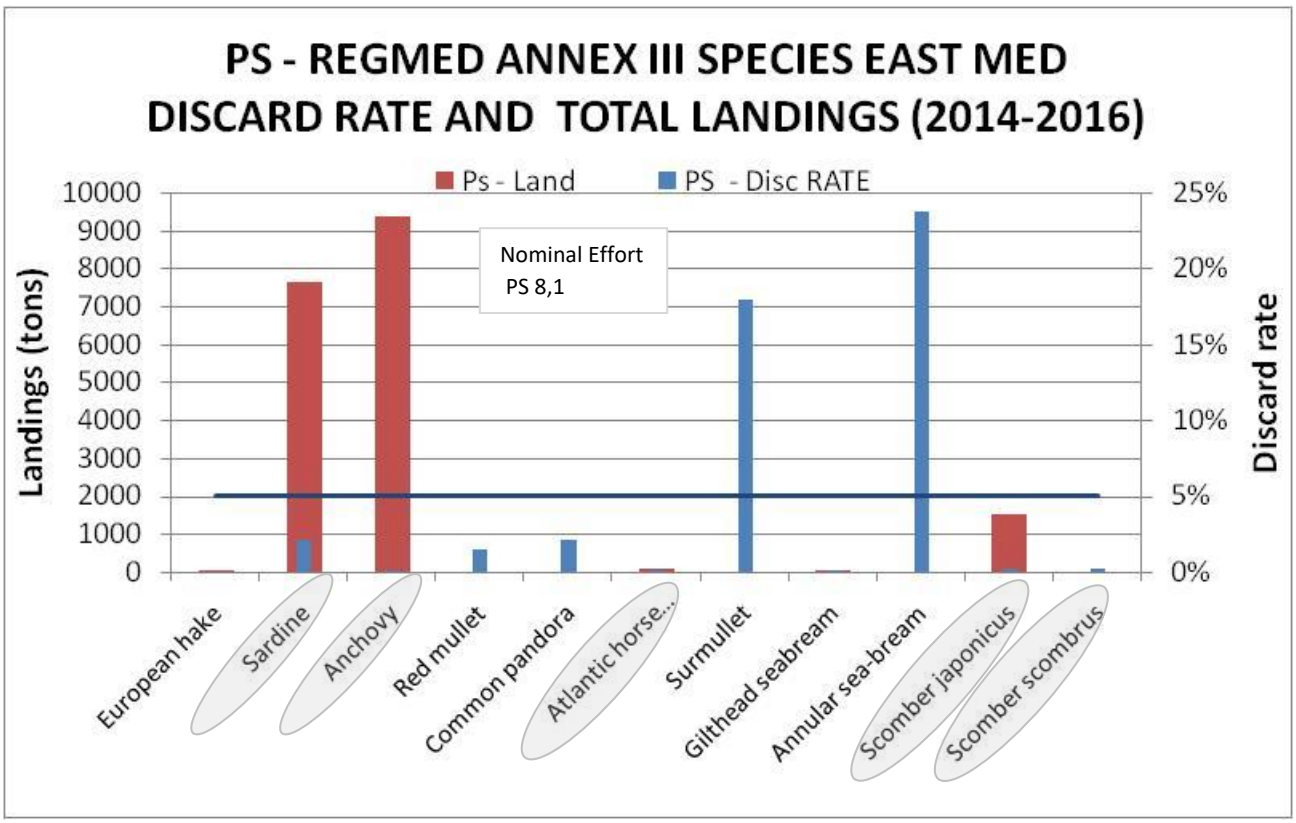




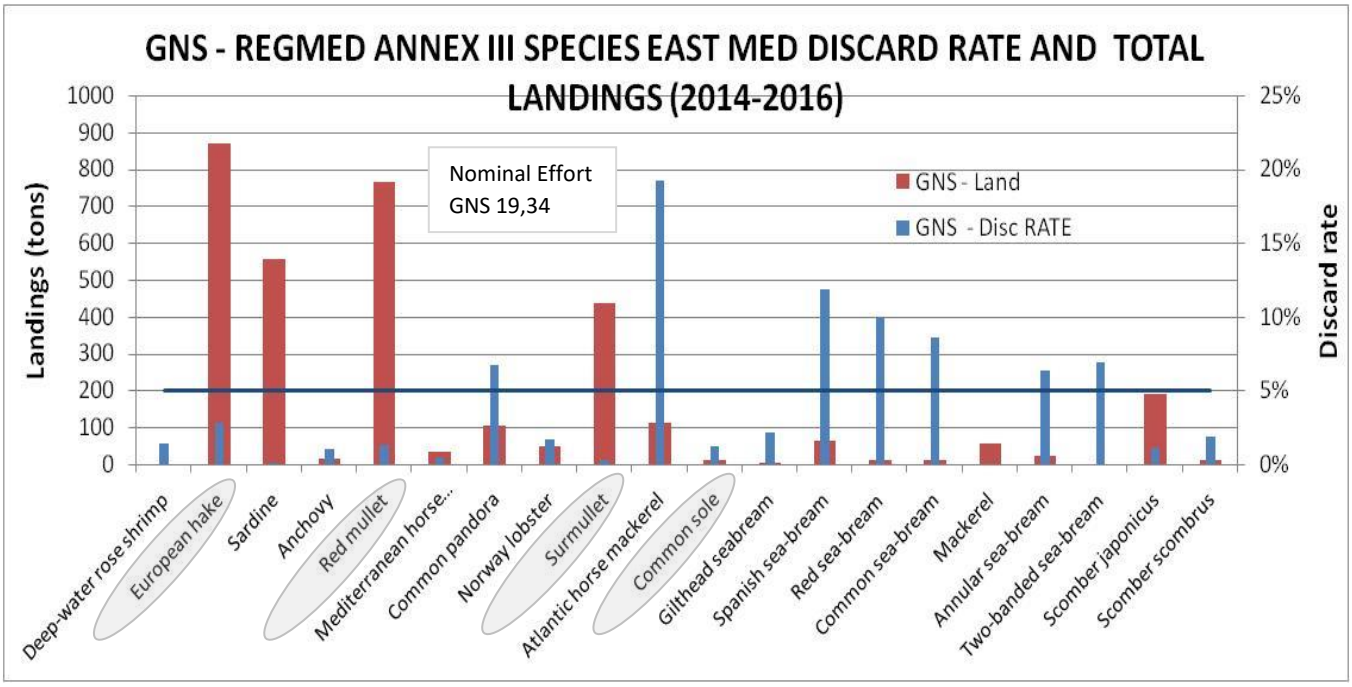
CENTRAL EASTERN MEDITERRANEAN

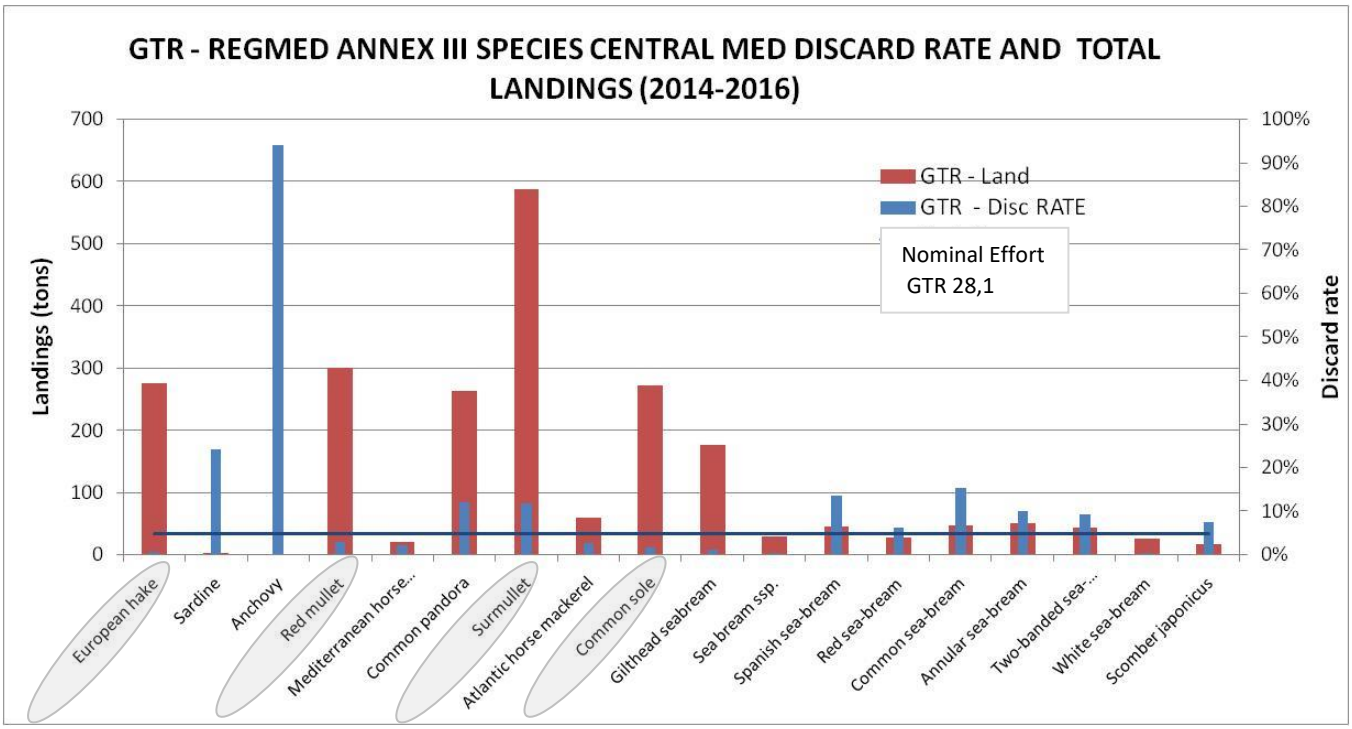
In the Central Eastern Mediterranean area, the species interested by the greatest landings quantities of Bottom Otter Trawl (OTB) and Purse Seiners (PS) are already covered by a delegated act until 2019 and the associated discard rate is below the 5%. While the discard rates over 5% are associated to landed quantities lower than 45 tons/year.





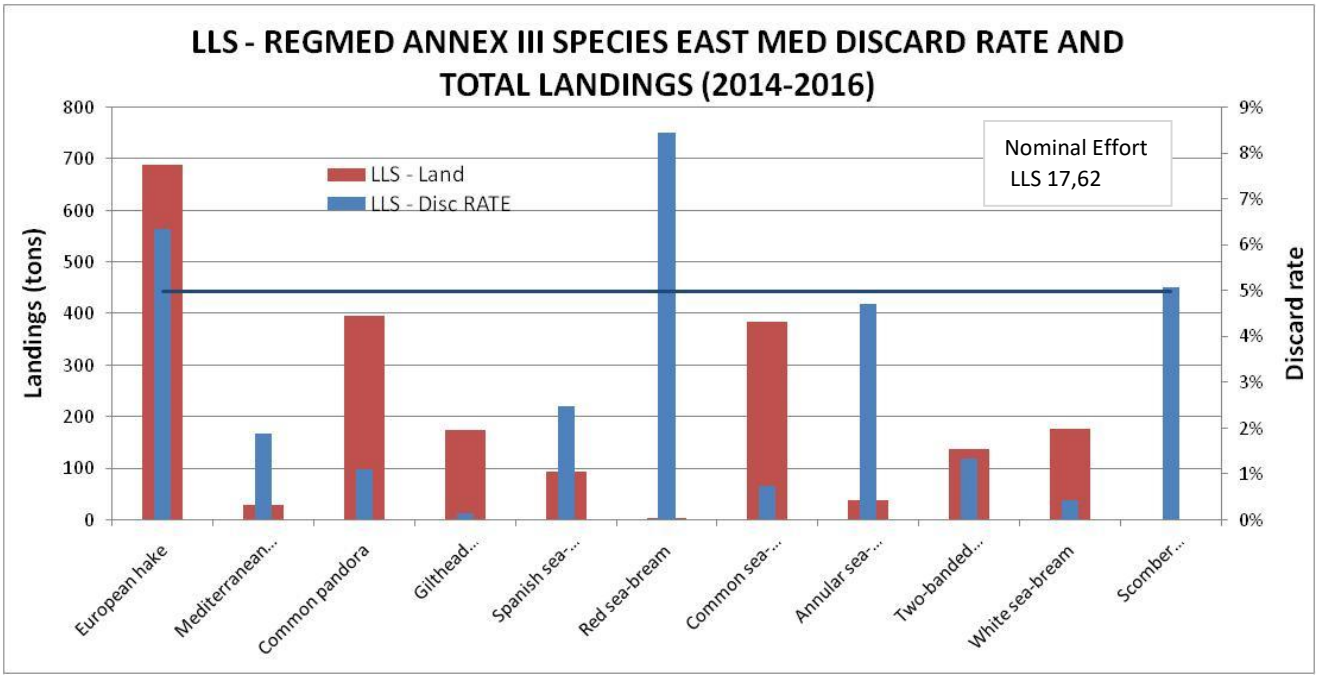
Despite to the great variety of species landed by gill (GNS) and trammel (GTR) nets, when discard rate exceeds 5% landings doesn't raise over 100 tons/year.

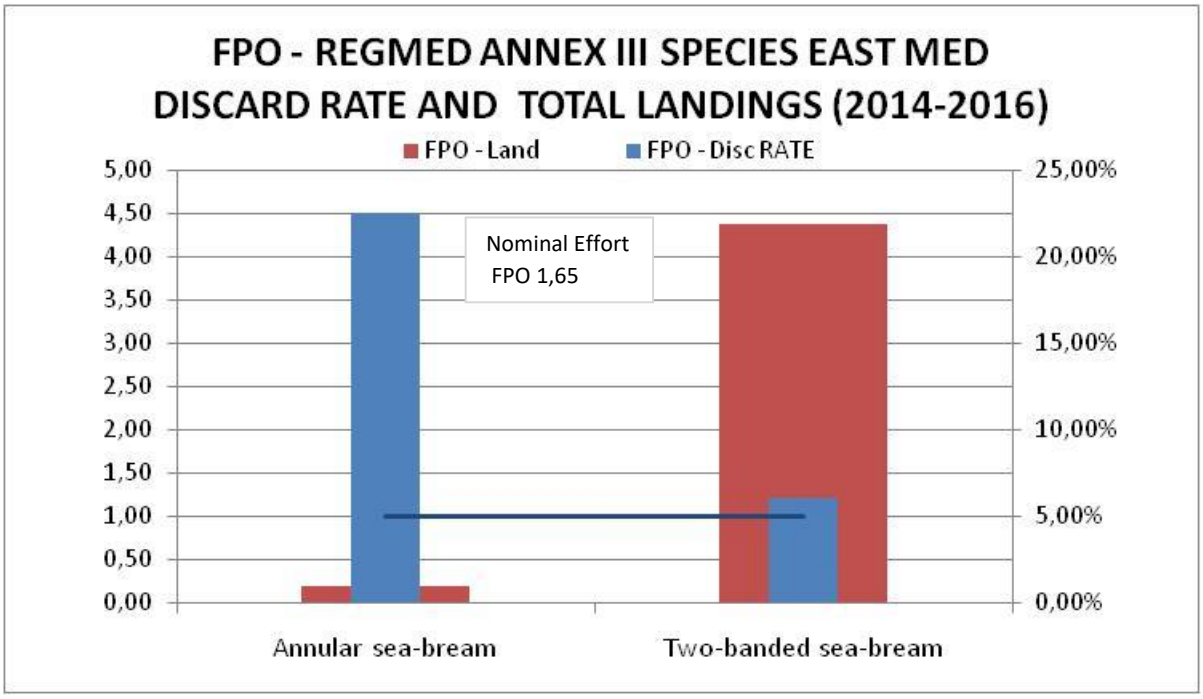




The species caught by Set Longlines (LLS) that exceed 5% of discard rate are: European Hake, Red Sea- bream and *Scomber japonicus*. Nevertheless, only landings of European Hake raise over 40 tons/year, reaching about 690 tons/year.

Even if the discard rate exceeds 5% of both species caught by pots (FPO), corresponding quantities landed don't reach 5 tons/year.





5. Scientific bases supporting the proposed plans per stock (species/gear/area/period)

On the basis of the graphs above, at least two species have been chosen for each macro-area and gear complying with the following criteria:

- species that are not already exempted, and which are associated with the highest percentages of discards and landings over 100 tonnes/year:

WEST MED	
TRAWLER	
Anchovy	*Engraulis encrasicolus*
Spanish sea bream	*Pagellus acarne*
Common pandora	*Pagellus erythrinus*
Atlantic Horse mackerel	*Trachurus trachurus*
ADRIATIC	
TRAWLER	
Deep water rose shrimp	*Parapenaeus longirostris*
Atlantic Horse mackerel	*Trachurus trachurus*
Common pandora	*Pagellus erythrinus*
CENTRAL-EAST MED	
TRAWLER	
Atlantic Horse mackerel	*Trachurus trachurus*
Common pandora	*Pagellus erythrinus*
GILLNET	
Atlantic Horse mackerel	*Trachurus trachurus*
TRAMMEL NET	
Common pandora	*Pagellus erythrinus*
LONGLINES	
Hake	*Merluccius merluccius*

- species for which it was possible to find relevant scientific studies for the identification of nursery/spawning areas and periods, the list of which and the available information are documented on the following pages

The scientific bases thus identified, in support of the management plans to reduce catches of undersized specimens, thus making it possible not to reach the *de minimis* exemption thresholds granted, for each macro-area, species and gear, are: Report STECF-17-15 " Mediterranean Stock Assessments 2017 part I"[9], Colloca et al (2015) "The Seascape of Demersal Fish Nursery Areas in the North Mediterranean Sea, a First Step Towards the Implementation of Spatial Planning for

[9] Scientific, Technical and Economic Committee for Fisheries (STECF) – Mediterranean Stock Assessments 2017 part I (STECF-17-15). Publications Office of the European Union, Luxembourg, 2017

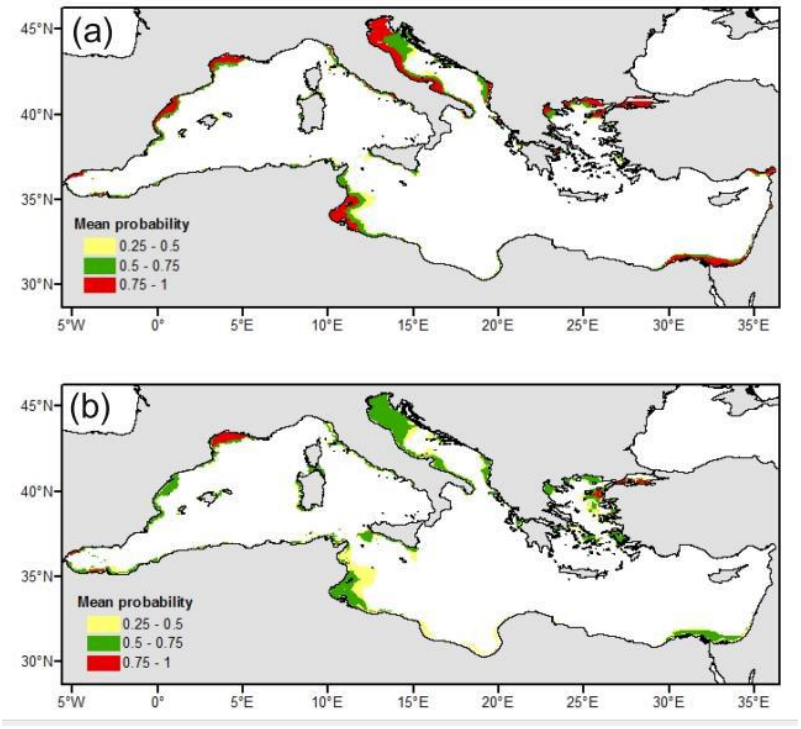
Trawl Fisheries"[10], CALL MARE 2014/27 "Study on the evaluation of specific management scenarios for the preparation of multiannual management plans in the Mediterranean and the Black Sea"[11] and the MEDISEH project "Mediterranean Sensitive Habitats"[12].
The results of the aforementioned studies are thus reported in single data sheets for each species, so as to include the corresponding methodological indications for each one, even if this means that some are repeated, together with evidence of the most sensitive periods for the nursery areas.

WEST MED – TRAWLER:

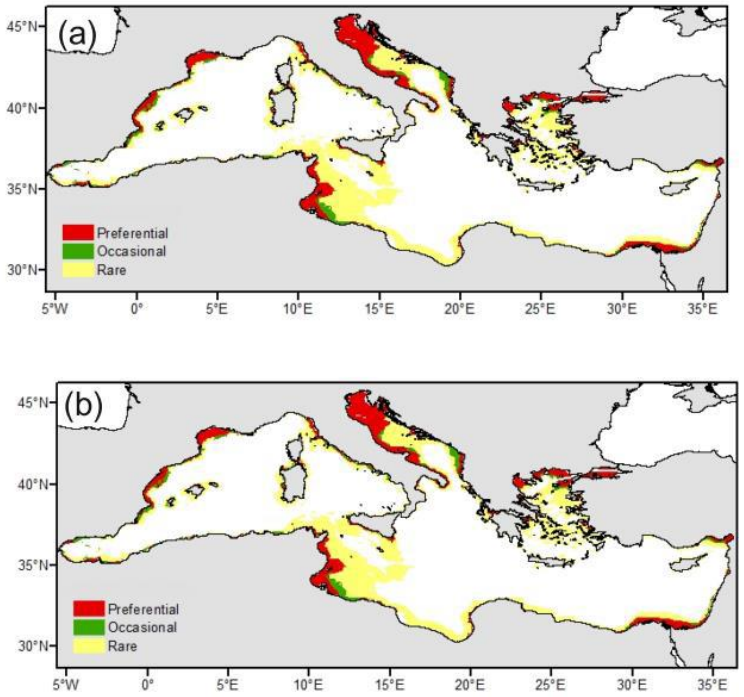
Anchovy

STECF-17-15 "Mediterranean Stock Assessments 2017 part I". *Detailed information about juveniles and spawning ground in the Mediterranean basin has been done through project MEDISEH. (Giannoulaki et al 2013). The main objective of this work was identification of the juvenile and spawning grounds of certain small pelagic fish species within the Mediterranean basin. Ichthyoplankton surveys data were used for the identification and the modelling of spawning grounds of Engraulis encrasicolus. Data from different acoustic surveys performed in the Mediterranean were used for the identification and the modelling of nursery grounds of Engraulis encrasicolus. A persistence map was defined to describe preferential (high mean, low std), occasional (high mean, high std) and rare (low mean, low std) juvenile and spawning grounds.*
In the western Mediterranean, suitable spawning areas were located in the Gulf of Lions and off the Catalan coast, the Alboran Sea and to a lesser extent the Italian coasts of the Ligurian and Tyrrhenian Seas" (Maps 2 and 3 – June and July).

[10] Colloca F, Garofalo G, Bitetto I, Facchini MT, Grati F, Martiradonna A, et al. (2015) The Seascape of Demersal Fish Nursery Areas in theNorth Mediterranean Sea, a First Step Towards the Implementation of Spatial Planning for Trawl Fisheries. PLoS ONE 10(3): e0119590. doi:10.1371/ journal. pone.0119590
[11] Spedicato MT et al., 2016, SERVICE CONTRACT NUMBER - EASME/EMFF/2014/1.3.2.7/SI2.703 193 CALL MARE/2014/27
[12] Giannoulaki et al, 2013. MAREA PROJECT MEDISEH (Mediterranean Sensitive Habitats) Specific Contract No 2 (SI2.600741)

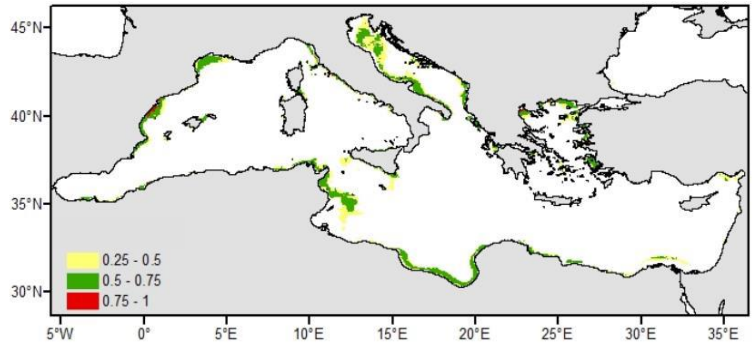


Map 2 Mean probability maps of *Engraulis encrasicolus* spawning (egg) habitat in the Mediterranean Sea for the period 2003-2008. (A). June (B) July (STECF 17-15)

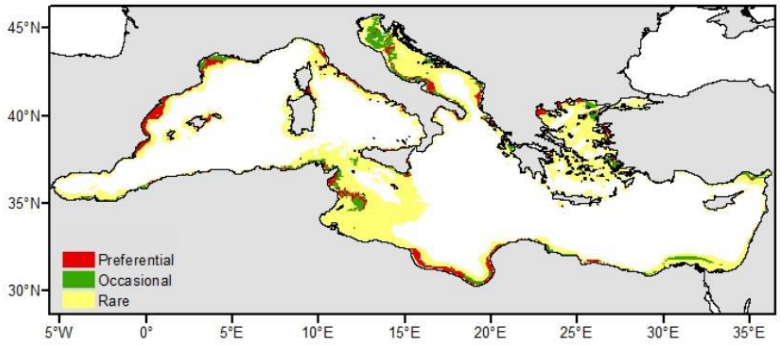


Map 3 Persistent habitat maps of *Engraulis encrasicolus* spawning (egg) habitat in the Mediterranean Sea for the period 2003-2008. (A). June (B) July (STECF 17-15)

In the Western Mediterranean suitable nursery areas were identified in association with the outflow of the Rhone river in the Gulf of Lions and the Ebro river southwards in the Spanish waters (Maps 4 and 5 –late autumn).



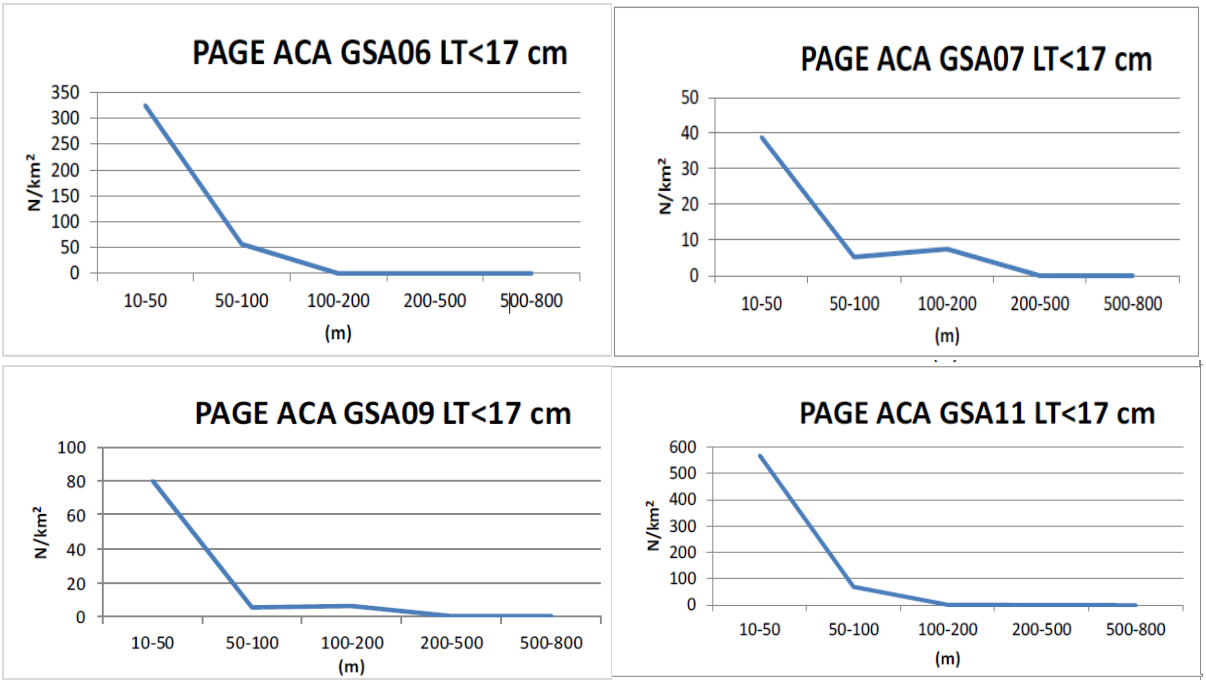
Map 4 Mean probability maps of *Engraulis encrasicolus* nurseries habitat in the Mediterranean Sea for the period 2003-2008 during late autumn (STECF 17-15)



Map 5 Persistent habitat maps of Engraulis encrasicolus nurseries in the Mediterranean Sea for the period 2003-2008 during late autumn (STECF 17-15)

Spanish sea bream

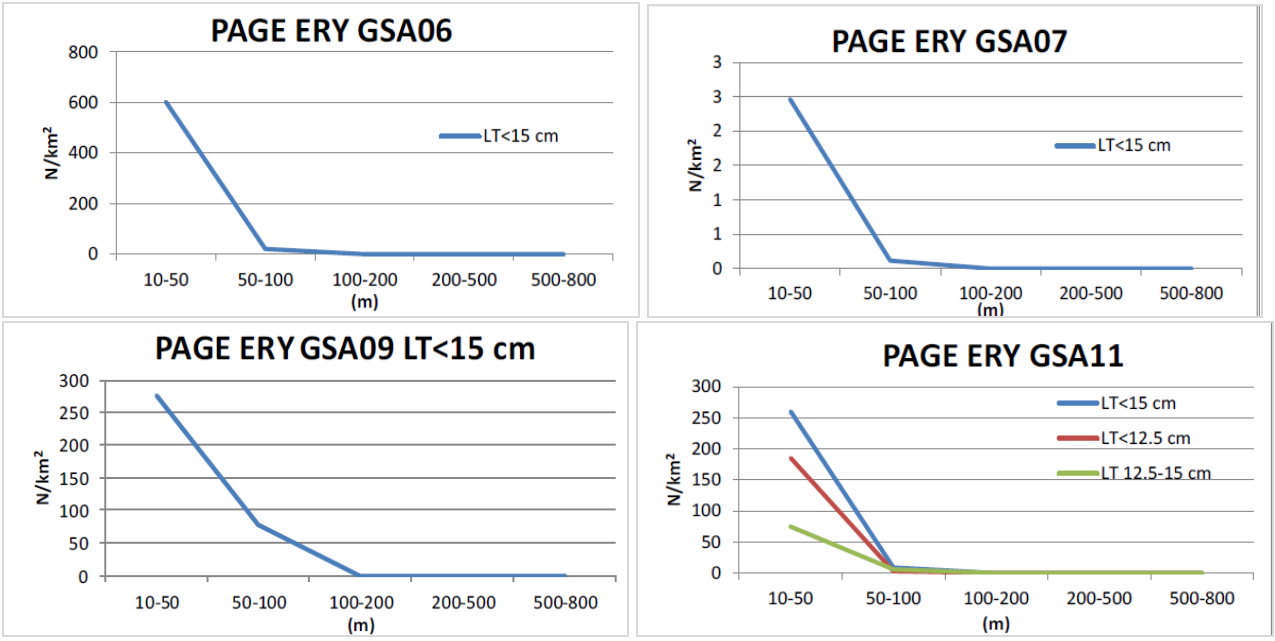
CALL MARE/2014/27 - *MEDITS time-series provided some useful information to estimate local abundance indices of the population fraction below the MLS for those species appearing both in the list of the Annex III of the EU Reg. 1967/2006 and in the MEDITS reference list. This has been achieved by analyzing the distribution of such indices in different MEDITS depth strata and geographical sub-areas. This information can help to give insight on the potential availability of such population fraction to the towed gears and possibly identify depth strata/areas where risk of catching population fractions below the MCRS of some important demersal species is higher. […] There is a fraction of the population that is not under protection of the Reg. 1967/2006. Such fraction could be protected extending the area to be forbidden to trawlers also offshore 50 m and, for example, to 80-100 m depth, at least in some seasons (i.e. late spring-summer), when the young of the year of some key species are still present in more coastal waters.*



Graph 1 Abundance indices by year and depth stratum computed according to the MEDITS protocol (last 5 years used). Minimum Conservation Reference size as well as the thresholds based on recruitment size as used in MEDISEH project were taken into account. GSA6-7-9-11. (CALL MARE 2014/27)

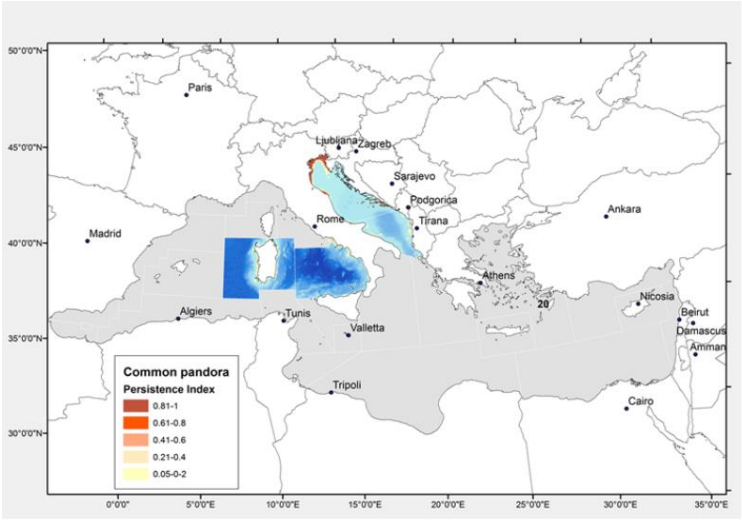
Common Pandora

CALL MARE/2014/27 – As for Spanish Sea bream, *MEDITS time-series provided some useful information to estimate local abundance indices of the population fraction below the MLS for those species appearing both in the list of the Annex III of the EU Reg. 1967/2006 and in the MEDITS reference list. The data analysis provided the same outputs: such fraction could be protected extending the area to be forbidden to trawlers also offshore 50 m and, for example, to 80-100 m depth, at least in some seasons (i.e. late spring-summer), when the young of the year of some key species are still present in more coastal waters.*



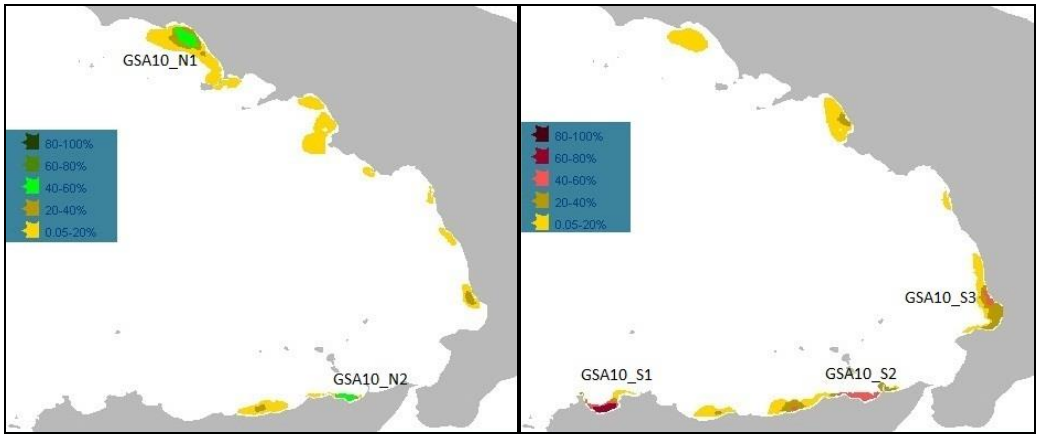
Graph 2 Abundance indices by year and depth stratum computed according to the MEDITS protocol (last 5 years used). Minimum Conservation Reference size as well as the thresholds based on recruitment size as used in MEDISEH project were taken into account. GSA6-7-9-11. (CALL MARE 2014/27)

Colloca et al. 2015 - GSA 10, 11 *In South Tyrrhenian Sea and Sardinia, nursery areas generally appeared to be small and poorly persistent. Dati MEDITS (from 1994 to 2010) in late spring (may – june): there was a mismatch between the MEDITS survey period and the recruitment peak for some species spawning in late spring-summer, such as red mullet and common Pandora, whose nurseries were only identified in the Adriatic Sea. The MEDITS catch of recruits of these two species in the Northern Adriatic Sea was probably due to a delay in the survey period to late July-August that occurred in some years.*



Map 6 Common Pandora nursery areas GSA 10,11 (Colloca et al. 2015)

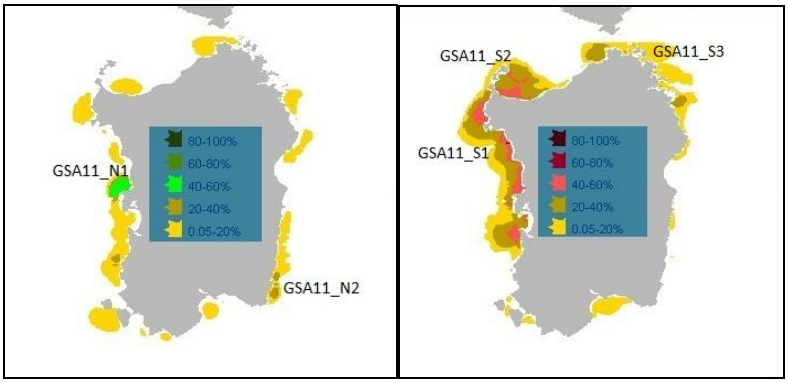
MEDISEH PROJECT provided the revision of the information on the spawning and nursery grounds of demersal and small pelagic fish. Moreover, available past and recent survey data suitable for modeling and the identification of nursery and spawning areas have been retrieved and used in the report. In the GSA 10 nursery areas with higher level of persistence (>40%) were identified in the Gaeta (GSA10_N1) and Patti (GSA10_N2) Gulfs. In the latter, also a spawning aggregation was identified (GSA10_S2) with a level of persistence (>40%) comparable with that of GSA10_S3, localized along the coasts of Capo Suvero. In the Castellammare Gulf (GSA10_S1) the level of persistence was even higher (60-80%).



Map 7 Position of persistent nursery (left) and spawning areas (right) of red Pandora in GSA10 (MEDISEH)

GSA 11 Nursery areas are mainly found in the western and south eastern coasts of Sardinia at depth lower than 100 m. The beds are mainly characterized by the presence of the Biocenosis of *Posidonia* (upper levels) and that of terrigenous mud (lower levels) with macro organisms like

Aphrodite aculeata, Stichopusregalis, Alcyoniumpalmatum. Spawning areas are present around all Sardinian coasts mainly in the western and northern coasts. Few zones with lower level of persistence are found also in the north-eastern coast, at depth lower than 100 m.

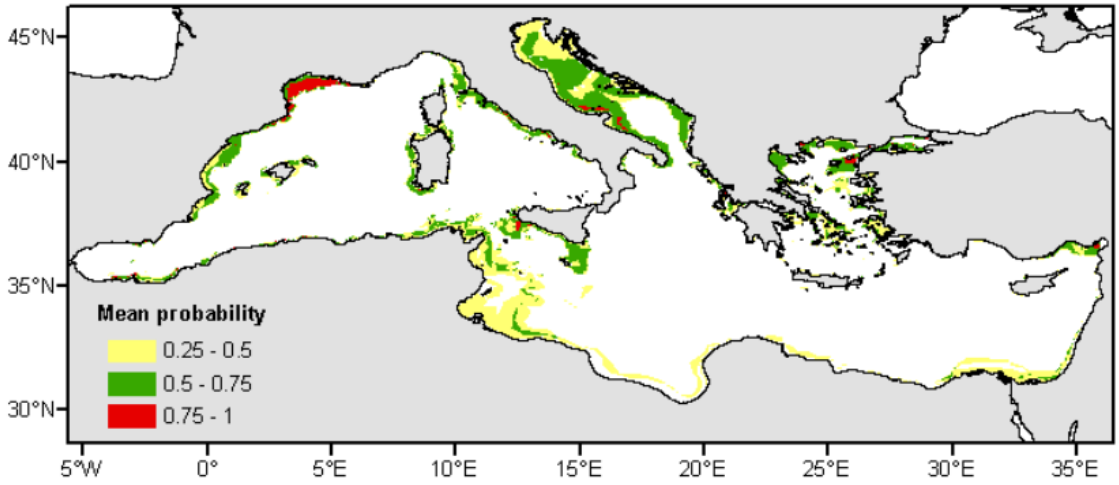


Map 8 Position of persistent nursery (left) and spawning areas (right) of red Pandora in GSA11 (MEDISEH)

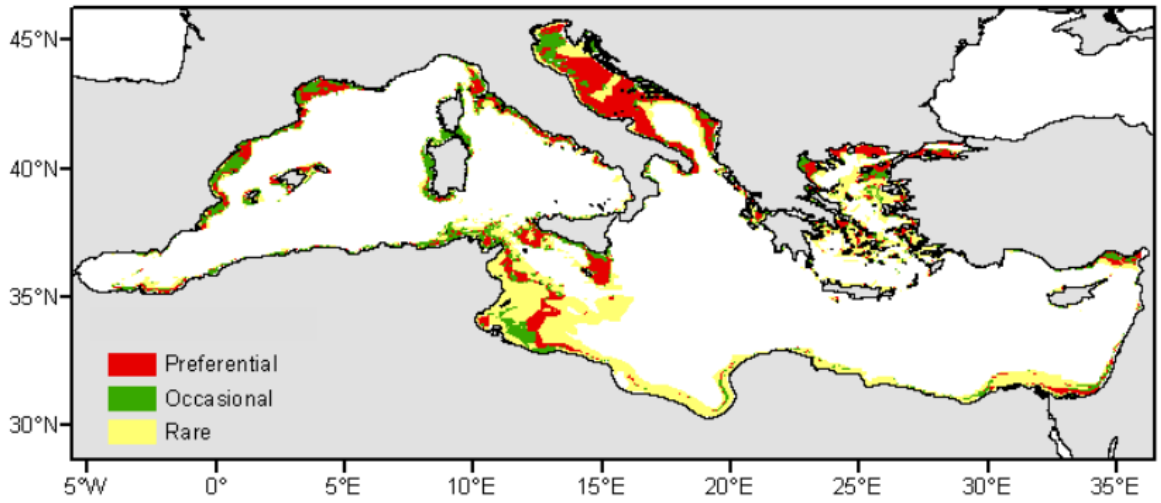
Atlantic horse mackerel

STECF-17-15 "Mediterranean Stock Assessments 2017 part I". Detailed information about juveniles and spawning ground in the Mediterranean basin has been done through project MEDISEH. (Giannoulaki et al 2013). The main objective of this work was identification of the juvenile and spawning grounds of certain small pelagic fish species within the Mediterranean basin. Habitat suitability modelling was applied, that relates abundance information from surveys with environmental variables. MEDITS trawl surveys data were used for the identification and the modelling of nursery grounds of *Trachurus trachurus*. A persistence map was defined to describe preferential (high mean, low std), occasional (high mean, high std) and rare (low mean, low std) juvenile and spawning grounds.

In the western Mediterranean areas suitable for *Trachurus trachurus* nurseries were consistently identified during summer in the northern part of the Catalan Sea, surroundings of the Ebro River Delta and the Baleares plateau, the Gulf of Lions and the coastal waters of Tyrrhenian Sea.



Map 9 Mean probability maps of *Trachurus trachurus* nurseries in the Mediterranean Sea for the period 2000-2010 during summer (STECF-17-15)

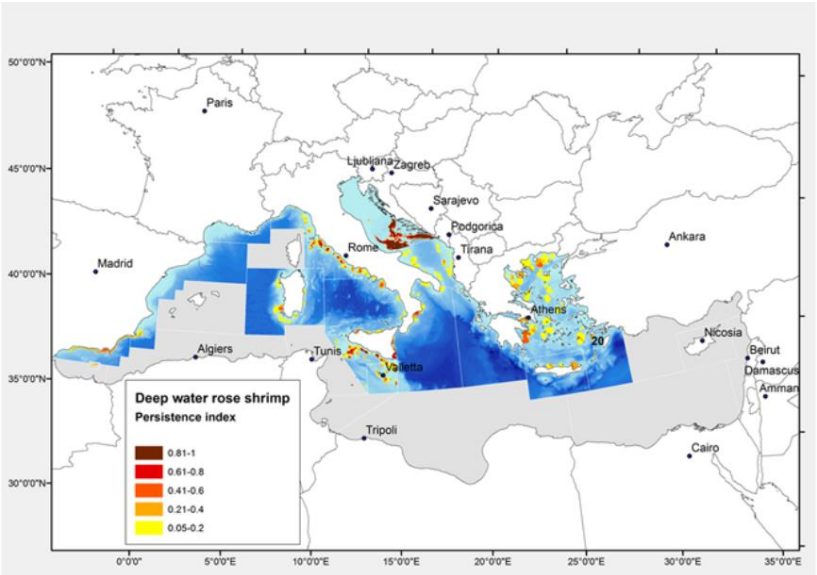


Map 10 Persistent habitat maps of *Trachurus trachurus* nurseries in the Mediterranean Sea for the period 2000-2010 during summer (STECF-17-15)

ADRIATIC – TRAWLER:

Deep water rose shrimp

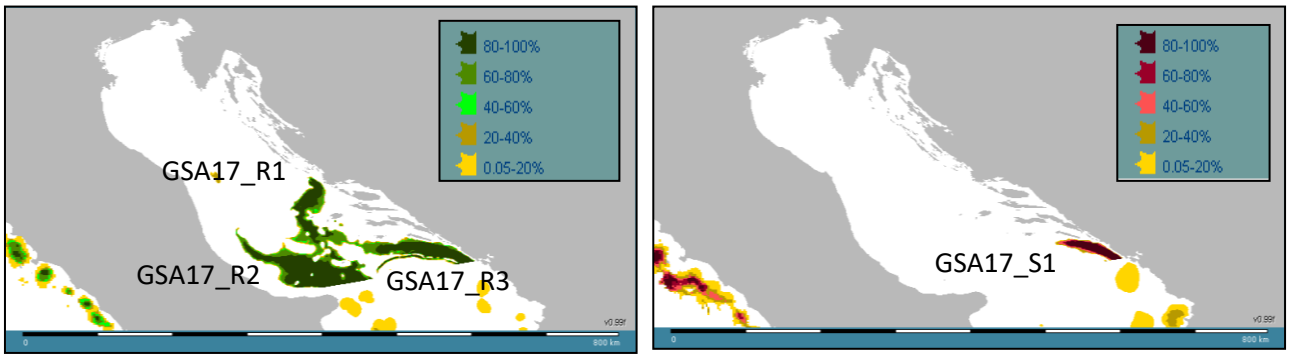
Colloca et al. 2015 – Nursery areas were mostly located on muddy bottoms along the shelf break-upper slope between 100–200 m and even deeper in some areas (whose recruitment occurs on the shelf-break and upper slope below 150 m depth). Three large areas of high persistence (Ii = 0.8–1.0) were identified for the recruits of deep-water rose shrimp in the Northern Adriatic. They extend south east of the Middle Adriatic Pit until the southern limit of GSA 17. MEDITS data (from 1994 to 2010) in late spring (may – june) data from 10 to 800 m depth. This is an important recruitment season for many Mediterranean species whose spawning peak is mostly in spring (see Tsikliras AC, Antonopoulou E, Stergiou KI. Spawning period of Mediterranean marine fishes. Rev Fish Biol Fish. 2010; 20: 499–538) for a review on this subject). Further investigation would therefore be necessary to elucidate the dynamics of recruitment across seasons, in particular for those species with a long spawning period, such as hake or the deep-water rose shrimp.



Map 11 Deep-water rose shrimp Persistence index (Colloca et al. 2015)

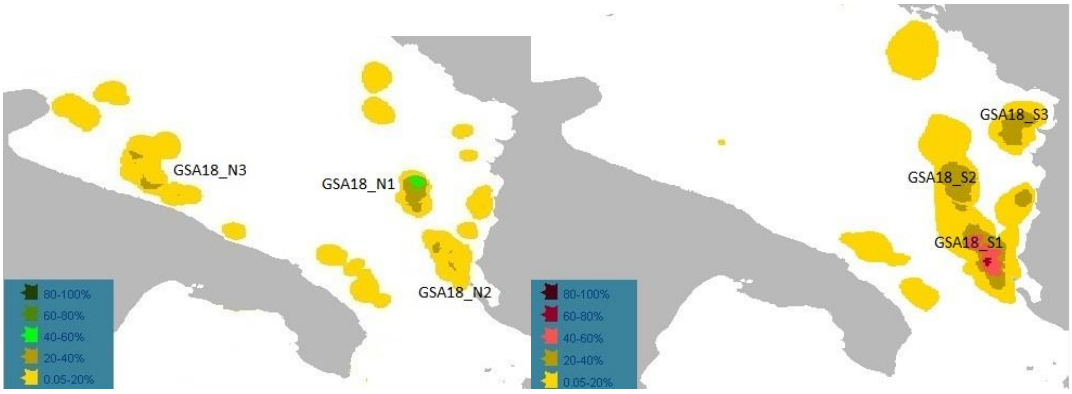
MEDISEH PROJECT provided the revision of the information on the spawning and nursery grounds of demersal and small pelagic fish, this work was completed according to the proposed schedule for the entire Mediterranean Sea. Moreover, available past and recent survey data suitable for modeling and the identification of nursery and spawning areas have been retrieved and used in the report.

The area of persistency identified for the recruits of deep-water rose shrimp in GSA 17 are essentially three. They are comprised between 100 and 400 m. R1 is located easthwards the Pomo/Jabuka Pit, R2 is located from southwards the Pomo/Jabuka Pit area to the limit of GSA17 and R3 extends 85 nm along parallel 45.5 N. R2 and R3 are connected with the nursery areas defined in the GSA18.



Map 12 Position of persistent nursery (left) and spawning areas (right) of deep-sea pink shrimp in GSA 17 (MEDISEH)

Nursery areas, but especially adult aggregations of females are mainly located in the eastern part of the GSA18, along the Albania coast, where a persistent spawning ground is localized (GSA18_S1). Warmer and saltier waters flowing in the eastern side are a favorable environmental condition for the preferential distribution of this species (Abellò et al., 2002).

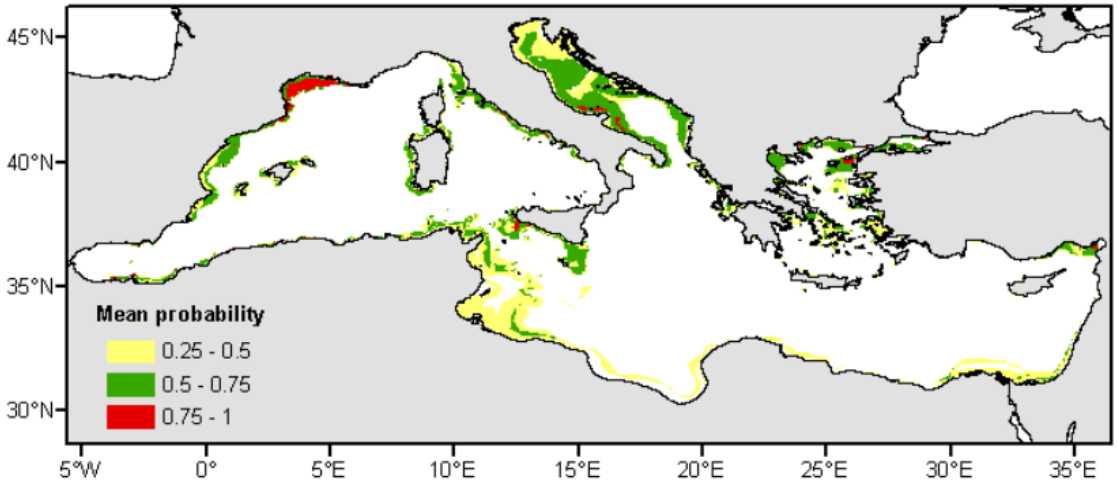


Map 13 Position of persistent nursery (left) and spawning areas (right) of deep-sea pink shrimp in GSA 18 (MEDISEH)

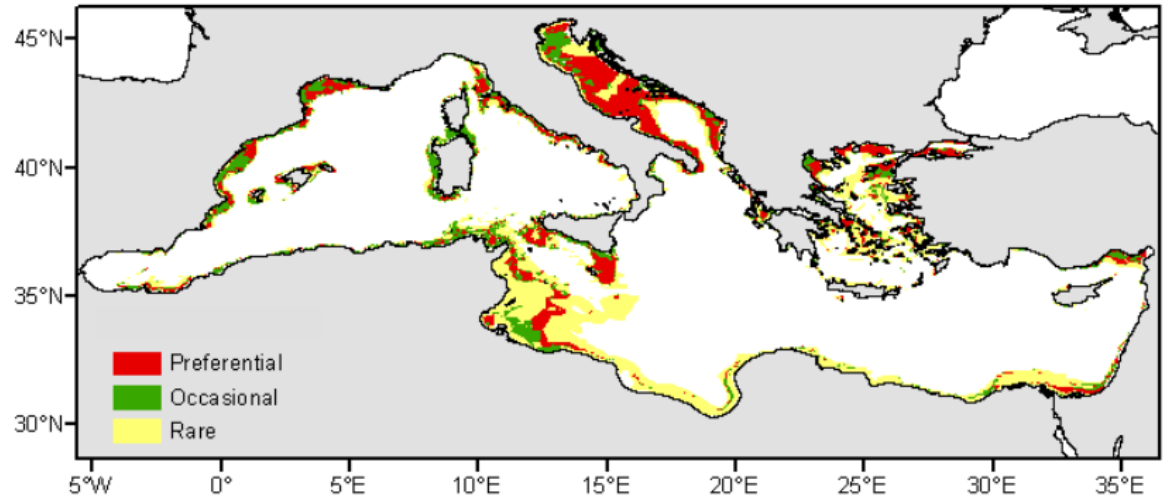
Atlantic horse mackerel

STECF-17-15 “Mediterranean Stock Assessments 2017 part I”. Detailed information about juveniles and spawning ground in the Mediterranean basin has been done through project MEDISEH. (Giannoulaki et al 2013). The main objective of this work was identification of the juvenile and spawning grounds of certain small pelagic fish species within the Mediterranean basin. Habitat suitability modelling was applied, that relates abundance information from surveys with environmental variables. MEDITS trawl surveys data were used for the identification and the

modelling of nursery grounds of *Trachurus trachurus*. A persistence map was defined to describe preferential (high mean, low std), occasional (high mean, high std) and rare (low mean, low std) juvenile and spawning grounds. In the Adriatic Sea, potential nurseries were indicated in the central area of the basin during summer.



Map 14 Mean probability maps of *Trachurus trachurus* nurseries in the Mediterranean Sea for the period 2000-2010 during summer (STECF-17-15)

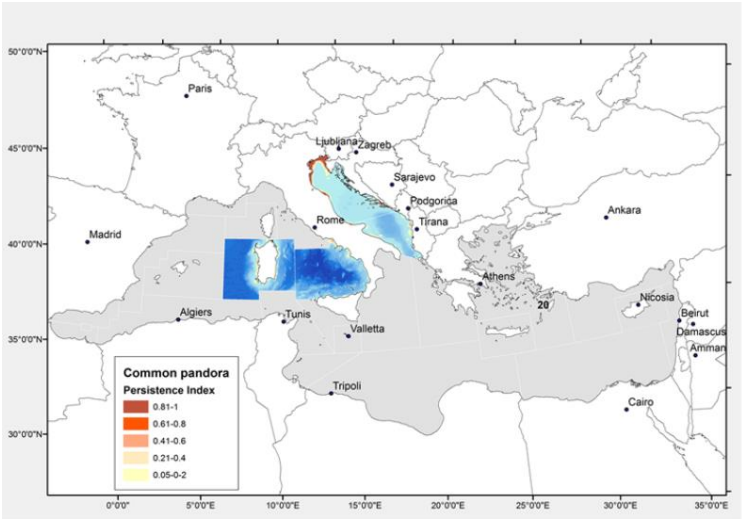


Map 15 Persistent habitat maps of *Trachurus trachurus* nurseries in the Mediterranean Sea for the period 2000-2010 during summer (STECF-17-15)

Common Pandora

Colloca et al. 2015 – Common Pandora Adriatico Nursery areas were only evident in the central/northern Adriatic (GSA 17), with a large nursery spreading from the north-eastern Italian coast to the eastern coast of Istria (Croatia) at a depth of 5–20 m. Another important area was identified along the Southern Croatian coast. In the Southern Adriatic, nursery areas generally appeared to be small and poorly persistent with a few exceptions (e.g. a small patch along the N Albanian coast). MEDITS data (from 1994 to 2010) in late spring (may – june) data from 10 to 800 m depth. This is an important recruitment season for many Mediterranean species whose spawning peak is mostly in spring (see Tsikliras AC, Antonopoulou E, Stergiou KI. Spawning period

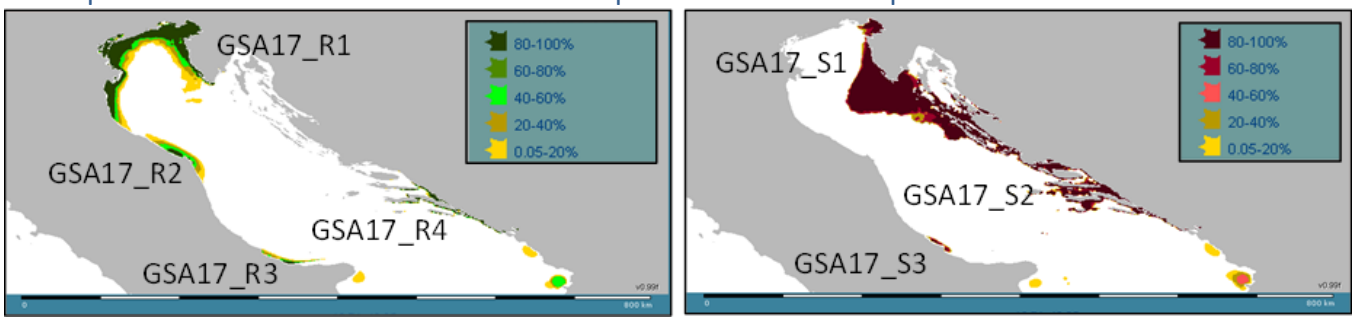
of Mediterranean marine fishes. Rev Fish Biol Fish. 2010; 20: 499–538) for a review on this subject). There was a mismatch between the MEDITS survey period and the recruitment peak for some species spawning in late spring-summer, such as red mullet and common Pandora, whose nurseries were only identified in the Adriatic Sea. The MEDITS catch of recruits of these two species in the Northern Adriatic Sea was probably due to a delay in the survey period to late July-August that occurred in some years.



Map 16 Persistent index of Common Pandora GSA 10-11-17-18 (Colloca, 2015)

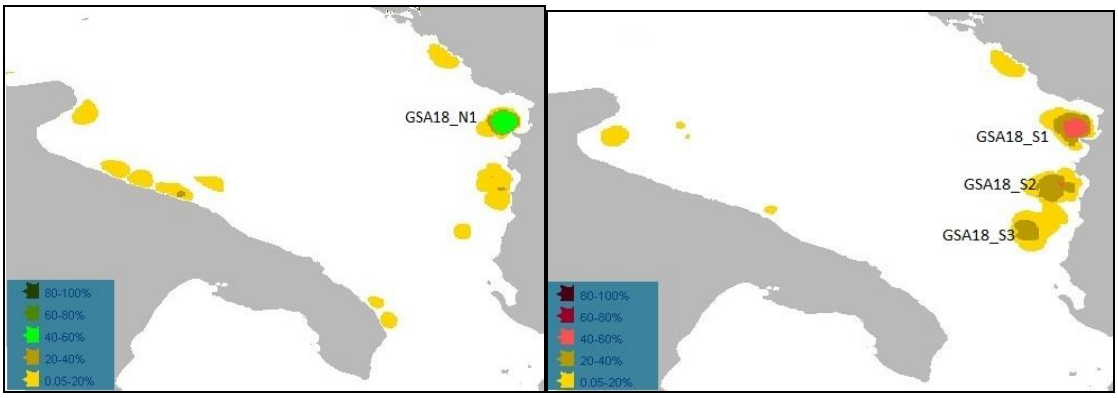
MEDISEH PROJECT - The areas of persistency identified for the recruits of common pandora in GSA 17 are essentially four. R1 is located from Pula (Istria) to Rimini, R2 extends from Fano to the Conero Promontory and R3 is located northwards the Lesina Lagoon. All these three nursery areas extend along the coastline at depths ranging from 5 to 20 m.The edaphic factors do not seem to play a decisive role in the distribution of this species; primarily, the kind and amount of accessible food and hydrography seem to be decisive (Rijavec, 1975; Županović and Rijavec, 1980).

Three persistent areas were identified for the spawners of common pandora in GSA 17



Map 17 Position of persistent nursery (left) and spawning areas (right) of common Pandora in GSA 17 (MEDISEH)

In the GSA18 both nursery areas and spawning aggregation of common pandora were localised in the eastern side along the coast of Albania in the Gulf of Lezhë. A remarkable level of persistence (40-60%) was observed fort the GSA18_N1 and GSA18_S1.

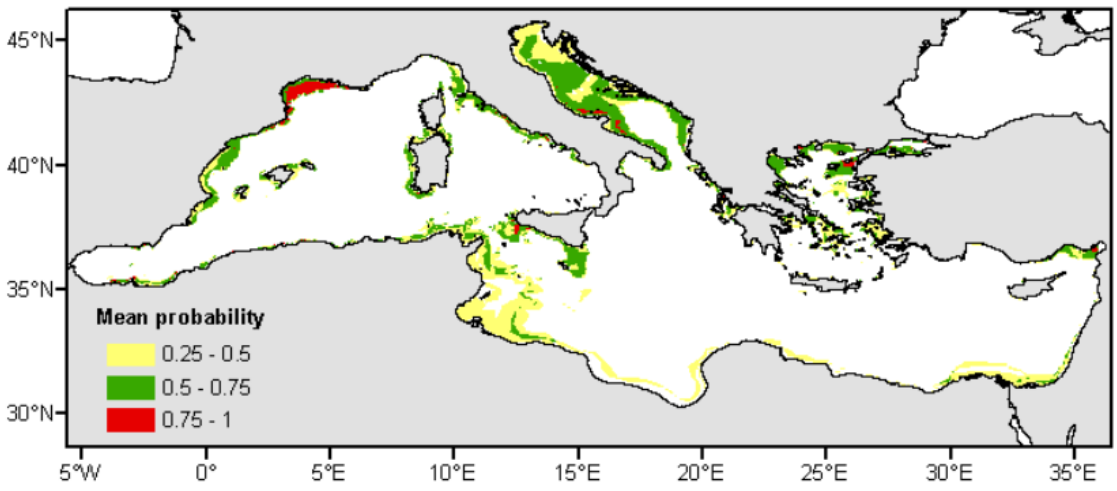


Map 18 Position of persistent nursery (left) and spawning areas (right) of common Pandora in GSA10 (MEDISEH).

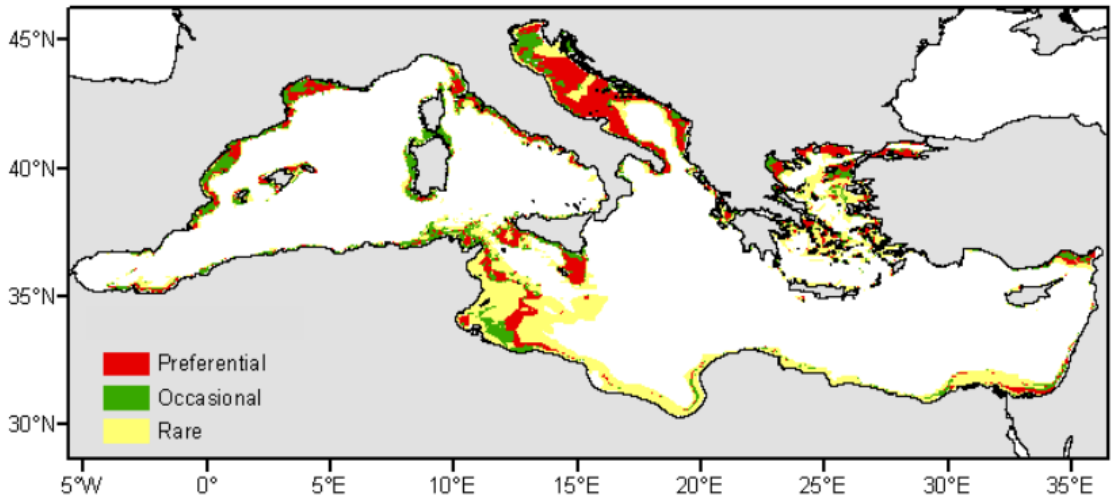
CENTRAL-E MED:

Atlantic horse mackerel (TRAWLER, GILLNET)

STECF-17-15 "Mediterranean Stock Assessments 2017 part I". Detailed information about juveniles and spawning ground in the Mediterranean basin has been done through project MEDISEH. (Giannoulaki et al 2013). The main objective of this work was identification of the juvenile and spawning grounds of certain small pelagic fish species within the Mediterranean basin. Habitat suitability modelling was applied, that relates abundance information from surveys with environmental variables. MEDITS trawl surveys data were used for the identification and the modelling of nursery grounds of *Trachurus trachurus*. A persistence map was defined to describe preferential (high mean, low std), occasional (high mean, high std) and rare (low mean, low std) juvenile and spawning grounds. Potential nurseries were indicated in: the central area of the basin, in the Strait of Sicily (Malta plateau and the north-western part) and in the coastal waters of both the western in the inshore waters of Thracian Sea and also inside closed gulfs like Saronikos, South Evoikos Gulf (Central Aegean) and Patraikos gulf (Ionian Sea) during summer. Further areas were indicated in the western part of Aegean Sea along the Turkish coastal waters.



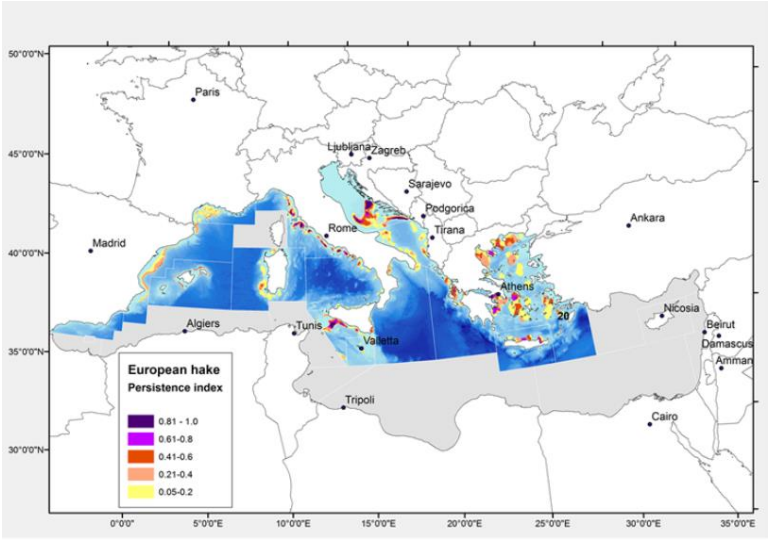
Map 12 Mean probability maps of *Trachurus trachurus* nurseries in the Mediterranean Sea for the period 2000-2010 during summer (STECF-17-15)



Map 13 Persistent habitat maps of *Trachurus trachurus* nurseries in the Mediterranean Sea for the period 2000-2010 during summer (STECF-17-15)

European hake (LONGLINES)

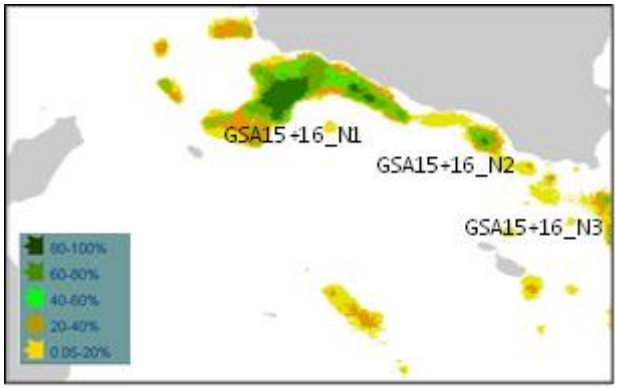
Colloca et al. 2015 –Nursery areas were mostly found between 100 and 250 m depth, with a patchy distribution along the shelf break. MEDITS data (from 1994 to 2010) in late spring (may – june) data from 10 to 800 m depth. This is an important recruitment season for many Mediterranean species whose spawning peak is mostly in spring (see Tsikliras AC, Antonopoulou E, Stergiou KI. Spawning period of Mediterranean marine fishes. Rev Fish Biol Fish. 2010; 20: 499–538) for a review on this subject). Further investigation would therefore be necessary to elucidate the dynamics of recruitment across seasons, in particular for those species with a long spawning period, such as hake or the deep-water rose shrimp.



Map 21 Persistence index European hake (Colloca, 2015)

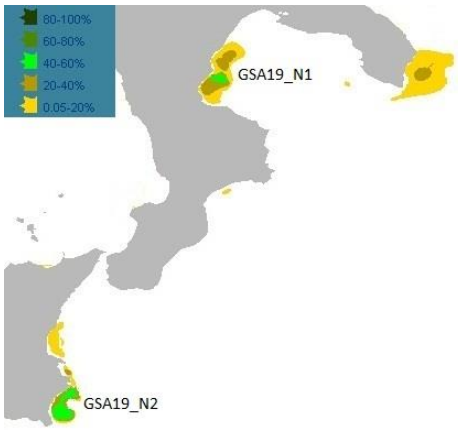
MEDISEH PROJECT provided the revision of the information on the spawning and nursery grounds of demersal and small pelagic fish, this work was completed according to the proposed schedule for the entire Mediterranean Sea. Moreover, available past and recent survey data suitable for modeling and the identification of nursery and spawning areas have been retrieved and used in the report.

GSAs 15-16 The highest densities of hake recruits are concentrated on muddy bottoms between 100 and 300 m, showing that the outer shelf corresponds to the preferential depth range for the recruitment processes. The distribution areas are mainly located to the east of the Adventure Bank, along the central southern coast of Sicily, east of Malta Bank at the border of the GSA 15 and just southeast of Malta. According to persistency analysis the largest nursery in the Strait of Sicily (GSA15+16_N1) is located on the eastern side of the Adventure Bank, between the shelf break and the upper slope, and extends till the south-central coast of Sicily. As regard the nursery identified east of the Malta Bank (GSA15+16_N3), its core actually lies beyond the border of GSA 15 (area not covered in the present project) as reported in a previous study. Persistent nurseries are all located in areas characterized by permanent upwelling and persistent mesoscale structures such as vortices and fronts which sustain processes of enrichment, concentration and retention, thus providing suitable conditions for recruitment.



Map 22 Position of persistent nurseries of hake in GSAs 15-16 (MEDISEH)

In the GSA19 - North-Western Ionian Sea the main nursery areas of *M. merluccius* were generally observed on the shelf grounds distributed between Otranto and Santa Maria di Leuca as well as on the shelf and shelf break-upper slope around the Amendolara Bank and along the coast from Siracusa to CapePassero. The more persistent nursery areas were distributed on the shelf and shelf break-upper slope around the Amendolara Bank and from Siracusa to Cape Passero.

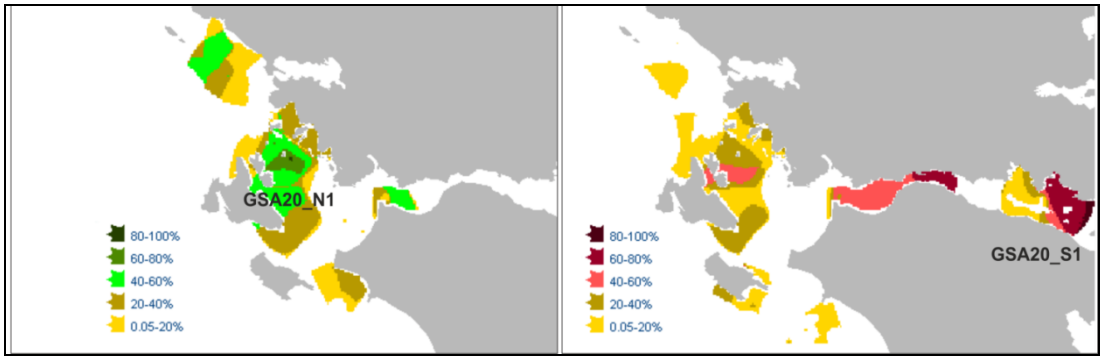


Map 23 Position of persistent nursery areas of hake in GSA19 (MEDISEH)

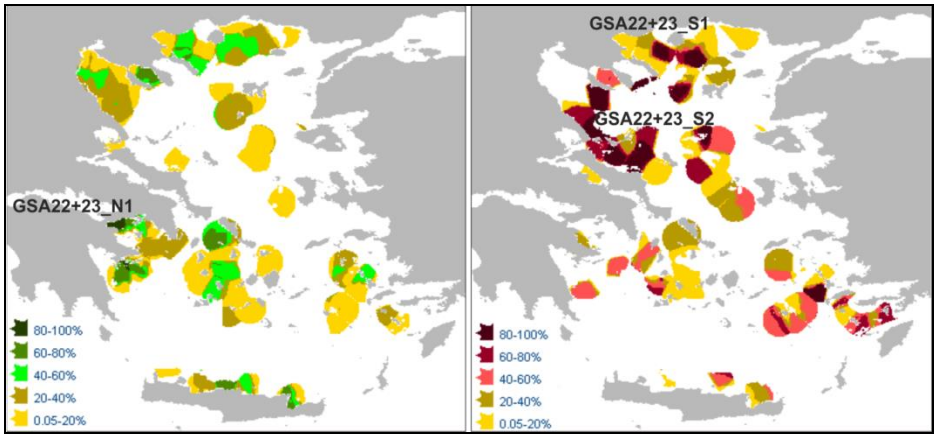
GSAs 20-22-23 Although hake was found throughout the examined depth range (22-800m), MEDISEH's analysis revealed that it is generally more abundant in the 100-450m depth zone. Recruits seem to prefer somehow shallower waters than adults, being more abundant from 100 to 320m and having their major abundance peak around 100m. The density maps revealed that hake

is widely distributed over the examined area, but spawners are relatively more abundant in the northern part of the Aegean Sea and in the Korinthiakos gulf in the Ionian.

Several areas of the Aegean and Ionian seas are characterized as hake nursery grounds. Results, however, have shown that the identified nursery grounds are not all of the same importance and that the Saronikos Gulf is by far the most significant one. It seems that the prevailing abiotic and/or biotic factors in Saronikos Gulf, an area of high fishing activity, favour the hake distribution in the area. Certain fishery closures that are locally applied may be also in favour of hake juvenile survival.



Map 24 Position of persistent nursery (left) and spawning areas (right) of hake in GSA 20 (MEDISEH).



Map 25. Position of persistent nursery (left) and spawning areas (right) of hake in GSA 22_23 (MEDISEH)

The scientific results reported in this paragraph constitute the basis for the definition of management plans aimed at not equaling or exceeding the *de minimis* threshold for each stock. They define nursery and spawning areas and provide indications on the seasons in which the adoption of management measures for the reduction of catches of undersized specimens subject to management plans for the stocks indicated, that the Member States shall propose to the EC. It is also important to bear in mind that the aforementioned studies, publications and projects envisaged research and inclusion of any existing information and data available on the issue. Although they already provide wide-ranging support both in geographical terms and in the time-series included, the management plans that aim to reduce catches of undersized specimens will need to be updated on the basis of the most recent scientific information available, the results of the ongoing projects and the data and studies provided by the Member States.

In summary, the Member States should, as soon as possible, present plans to reduce capture of undersized specimens of the following stocks in the periods and areas listed in the tables according to the macro-areas:

Who	What	Where	When (period)
		WEST MED	
TRAWLER			
Anchovy	Spawning	Gulf of Lions and off the Catalan coast, the Alboran Sea and to a lesser extent the Italian coasts of the Ligurian and Tyrrhenian Seas	June and July
	Nursery	Outflow of the Rhone river in the Gulf of Lions and the Ebro river southwards in the Spanish waters	Late autumn
Spanish sea bream	Population fraction below the MLS	50 - 150 m depth	Late spring-summer
Common pandora	Population fraction below the MLS	50 - 150 m depth	Late spring-summer
	Nursery	GSA 10 - Gaeta and Patti Gulfs	
	Spawning	GSA 10,11	Late spring-summer
	Spawning	GSA 10 - Patti Gulf and Capo Suvero (Castellammare Gulf)	Late spring-summer
	Nursery	GSA 11 - Western and south eastern coasts of Sardinia at depth lower than 100 m	
	Spawning	GSA 11 - Around all Sardinian coasts mainly in the western and northern coasts. Lower level of persistence also in the north-eastern coast, at depth lower than 100 m	Late spring-summer
Atlantic Horse mackerel	Nursery	Northern part of the Catalan Sea, surroundings of the Ebro River Delta and the Baleares plateau, the Gulf of Lions and the coastal waters of Tyrrhenian Sea	Summer

Who	What	Where	When (period)
		ADRIATIC	
TRAWLER			
Deep water rose shrimp	Nursery	Muddy bottoms along the shelf break-upper slope between 100–200 m and even deeper in some areas	Late spring-summer
	Nursery	eastern part of the GSA18, along the Albania coast	Late spring-summer
	Spawning	South east of the Middle Adriatic Pit until the southern limit of GSA 17	Spring
	Spawning	eastern part of the GSA18, along the Albania coast	Spring
	Recruitment	GSA 17 - three areas comprised between 100 and 400 m: easthwards the Pomo/Jabuka Pit, from southwards the Pomo/Jabuka Pit area to the limit of GSA17, extends 85 nm along parallel 45.5 N	
Atlantic Horse mackerel	Nursery areas	Central area of the basin	Summer
Common pandora	Nursery areas	GSA 17 - (central/northern Adriatic) with a large nursery spreading from the north-eastern Italian coast to the eastern coast of Istria (Croatia) at a depth of 5–20 m. along the Southern Croatian coast.	Late spring-summer
	Nursery areas	GSA 17 - along the coastline at depths ranging from 5 to 20 m: Pula (Istria) to Rimini, Fano to the Conero Promontory, northwards the Lesina Lagoon	Late spring-summer
	Nursery and spawning areas	GSA 18 - eastern side along the coast of Albania in the Gulf of Lezhë	Late spring-summer
	Spawning		Late spring-summer

Who	What	Where	When (period)
		CENTRAL-EAST MED	
TRAWLER			
Horse mackerel	Nursery areas	Strait of Sicily (Malta plateau and the north-western part) and in the coastal waters of both the western in the inshore waters of Thracian Sea and also inside closed gulfs like Saronikos, South Evoikos Gulf (Central Aegean) and Patraikos gulf (Ionian Sea). Further areas were indicated in the western part of Aegean Sea along the Turkish coastal waters.	Summer
Common pandora	NO INFO		
GILLNET			
Horse mackerel	Nursery areas	Strait of Sicily (Malta plateau and the north-western part) and in the coastal waters of both the western in the inshore waters of Thracian Sea and also inside closed gulfs like Saronikos, South Evoikos Gulf (Central Aegean) and Patraikos gulf (Ionian Sea). Further areas were indicated in the eastern part of Aegean Sea along the Turkish coastal waters.	Summer
TRAMMEL NET			
Common pandora	NO INFO		
LONGLINES			
Hake	Nursery areas	between 100 and 250 m depth, with a patchy distribution along the shelf break	Late spring
	Spawning	See MAP 21	Spring
	Recruitment	GSA 15-16 - muddy bottoms between 100 and 300 m, east of the Adventure Bank, along the central southern coast of Sicily, east of Malta Bank at the border of the GSA 15 and just southeast of Malta. largest nursery in the Strait of Sicily (GSA15+16_N1) is located on the eastern side of the Adventure Bank, between the shelf break and the upper slope, and extends till the south-central coast of Sicily.	
	Nursery areas	GSA 19 - North-Western Ionian Sea. Shelf grounds distributed between Otranto and Santa Maria di Leuca as well as on the shelf and shelf break-upper slope around the Amendolara Bank and along the coast from Siracusa to CapePassero. The more persistent nursery areas were distributed on the shelf and shelf break-upper slope around the Amendolara Bank and from Siracusa to CapePassero	Late spring
	Recruitment	GSAs 20-22-23 - Recruits seem to prefer somehow shallower waters than adults, being more abundant from 100 to 320m and having their major abundance peak around 100m.	
	Spawning	GSAs 20-22-23 - Hake is widely distributed over the examined area, but spawners are relatively more abundant in the northern part of the Aegean Sea and in the Korinthiakos gulf in the Ionian	Spring
	Nursery areas	GSAs 20-22-23 - Several areas of the Aegean and Ionian seas are characterized as hake nursery, in particular Saronikos Gulf.	Late spring

ANNEX I

It is important to notice that scientific studies are ongoing or planned in Europe (such as MINOUW, DISCARDLESS, GALION etc.) to test new selective devices and new spatio-temporal approaches to avoid residual discards of undersized species, especially under new technical measures context. Those studies could give precious information for trawler fishery.
In the Mediterranean Sea, the French GALION project (*Gestion Alternative de la resource dans le Golfe du LION* - conducted by AMOP, in collaboration with IFREMER, and funded by France Filière Pêche) intends to monitor catches of trawl fishery during the one-year study to identify the composition of catches. The long-term objective is to limit unwanted catches by proposing to avoid fishing activities, according to seasonal distribution of juveniles' concentration. Similar ongoing projects are conducted in other areas, such as MANTIS (*Marine Protected Areas Network Towards Sustainable Fisheries in the Central Mediterranean* - focusing its case studies in particular in the Strait of Sicily and Northern Adriatic) and SAFENETS (*Sustainable Fisheries in a EU-Mediterranean Waters Through Network of MPAs* – focusing on north-western Mediterranean)
The review carried out during DISCATCH project, involving MEDAC as partner, highlighted that discard amount fluctuates among fisheries and areas, usually from <20 % to 70 %, due to a biological, technical, environmental, legal and socio-economic factor. Species specific discards ratios in the Mediterranean are low for target species and usually higher for species that constitute commercial by-catch, but discard ratios of a given species, either target or non-target, are likely to fluctuate within a fishery, across seasons, years and regions. Furthermore, the review and analysis of scientific papers and technical reports in the Mediterranean carried out by DISCATCH project provides more details on this issues: "Understanding reasons for and factors affecting discarding (e.g., Rochet and Trenkel 2005, Feekings et al. 2012) is an important step towards the management of the discards issue and currently, the mitigation of discards is a major concern to conservation bodies and the wider public (Catchpole and Gray 2010). The level of discards changes if the fishery is directed at homogeneous or mixed fishing grounds (Eliasen and Christensen (2012). There are also seasonal and interannual variations in fisheries discards (Moranta et al, 2000; Tsagarakis et al., 2014), some others discard variations are related to the cycles of life of the species (Tsagarakis et al., 2014), depth (Machias et al., 2001; Sánchez et al., 2004; Mallol, 2005) or differences in the composition of the catch and relative biomass of target species (Tsagarakis et al., 2014)".

Therefore, the DISCATCH project results point out that increasing selectivity would decrease partially the problem of discard reduction.

Stakeholder perspective has been evaluated during DISCATCH project through a questionnaire submitted during the first stakeholders' meeting with MEDAC members held in Split (October 2014) on the discards issue and landing obligation provision, and the second and final meeting held in Madrid on June 2015. By considering the whole set of questions and ranking them it has been possible to see that there is not a clear trend of the topics that stakeholders consider as having a paramount importance. However, it has been possible to infer some useful remarks. The costs to shift from the traditional to more selective gears is the most important topic for

stakeholders, who consider any modification of the gear needed to reduce discarding should be funded by the national authorities or by the EU. Stakeholders seem to be not available to pay for more selective gears.

Beyond that, some preliminary outputs of MINOUW[13] project provide other relevant information on cases study about selectivity all around Mediterranean Sea, such as:

- Case study on Bottom trawl crustacean fisheries in Sicily aimed to decrease the current unwanted catches of juveniles and by-catch species by using sorting grid separators and separator panels in crustacean fisheries. Preliminary results highlighted that one of the tested grids was able to reduce unwanted catches, but more data collection is required in order to improve and better understand grids performance at different depths, fishing grounds and seasons.

- Case Studies in the Ligurian and northern Tyrrhenian Sea aimed to evaluate whether lights on nets in shrimp fisheries are efficient in increasing the catch of target species, and, at the same time, in decreasing by-catch and discards. The use of artificial lights on the headline of the trawl net seemed to be effective in reducing the unwanted capture of European Hake under MCRS without loss of commercial fraction. Even in this case, results, although indicating a promising scenario, need to be confirmed by further investigations, both in time and in space.

- Caramote prawn fishery in Tuscany is associated with large amounts of unwanted catches (mainly benthic invertebrates). “Guarding net” device was placed in a trammel net in order to reduce the unwanted catches: experiments showed that the addition of ‘selvedge’ net to traditional trammel nets can reduce by catch significantly, while the economic loss due to the slightly reduced catch of commercial species is offset by decreased sorting time and labour costs.

- Evaluation of circle hooks effects in Mediterranean swordfish fisheries (longlines) on catch rates of target species (both commercial and undersized fractions), of other commercial by-catch species and incidental catches of sensitive species such as sea-turtles and pelagic sharks. Even in this case study, current findings should be considered as preliminary, given the low number of experimental fishing trials. It seems however that circle hooks favour the reduction of undersized swordfish catches without affecting the volume of landings 0 There are no catch rate differences regarding sharks.

Furthermore, an Italian coordinated project[14] allowed computing, through the analysis of the DCF data collected at national level from 2009 to 2014, for each GSA (9-10-11-16-17-18-19) and fishery, estimates of total landing, total discard and discard of specimens below minimum size (MCRS), for the species included in the Annex III of the Reg. 1967/2006. For these species, the size structures of the landed and discarded fractions were studied as well, by fishery and GSA.

[13] MINOUW Project presentations, during the MEDAC meeting held in Palma de Mallorca (11 October 2017) http://en.med-ac.eu/events.php?id=117

[14] Sartor P. 2016, Ministry of Agricultural, Food and Forestry Policies, "Survey on discards of demersal fishery species in Italian seas: preliminary assessments for the implementation of EC provisions on the landing obligation" (Basic Reg. 1380/ 2013, Art. 15)

Among the species that do not “define” the fisheries, the estimated discard of trawl nets for the Norway lobster and the striped red mullet was negligible, generally lower than 5% of the total catch in weight. On the other hand, for other species the percentage of discard was notably higher: this is the case of the Common Pandora (about 40% of the total catch, as an average of all the GSAs), of the mackerels (average values between 40 and 75%, according to the species) and of the anchovy and sardine (percentages even more than 80% of the total catch). However, we have to note that, except the Common Pandora (which is a commercial by catch of the trawl fisheries), the mackerels, the sardine and the anchovy represent an “unwanted” catch for these fisheries and therefore are almost entirely discarded, independently from the size of the specimens caught.

Therefore, discard from the trawl fisheries is caused mainly by the commercial value of the catch and by the presence of specimens under the minimum conservation reference size. These factors can show differences, according to the zone and the period. As a matter of fact, for the species showing a temporal peak of recruitment (e.g. the red mullet), the discard showed marked seasonal differences.

On the other hand, the estimated discard percentage of the common sole, the target of rapido (TBB), was around 1%. The estimate of discard for the by catch species with minimum size gave values in general lower than 5%.

On the other hand, the results of the Italian study point out that taking into account the available data, for most of the species with minimum conservation reference size (e.g. red mullet, striped red mullet, gilt head sea bream, common sole) defining bottom set gillnets fisheries, the estimates of discards provided negligible values; the percentages of discard were around zero or lower than 2% of the total catch in weight.

Only in a few cases higher quantities of discard were estimated: e.g. for the Common Pandora of the trammel net in the GSAs 9, 10 and 18 (10-12% of discard); the red mulled in the gill net of the GSAs 9 and 18 (4 and 5% of discard, respectively), or for the common sole in the gillnets of the GSA 9 (about 8% of discard).

A different situation was observed for the mackerels, especially the horse mackerel, *T. trachurus*. In the GSA 9 this species is a by catch, with scarce or null commercial interest, of the gill net fishery targeting European Hake; the discard percentage of horse mackerel was about 71% of the total catch in weight of this species.

Beyond that, the analysis of the available data on the characteristics of the gears and of their selectivity provided by the Italian study mentioned above showed that, in the current situation (40 mm square or 50 mm diamond cod end meshes), it is very difficult to exclusively catch specimens above the minimum size (MCRS). Therefore, the use of the gears compliant with the current regulation, doesn’t prevent the fishermen to catch specimens to be discarded. At the same time, a considerable increase of the mesh size would imply, in the short period, a reduction in the yields of many commercially important species, with losses in the revenues.

Additional considerations on this topic have been provided by the “Study on the evaluation of specific management scenarios for the preparation of multiannual management plans in the Mediterranean and the Black Sea –CALL MARE/2014/27” (Spedicato M.T. et al., 2014): “There are at least two possible ways to deal with the undesired catch of small-sized individuals. One is to modify gear characteristics so as to allow more small fish to escape (e.g., increase mesh size). In mixed fisheries such as those occurring in the Mediterranean, where the catch is composed by many species and many of them are small-sized even when they are adult, the increase of mesh size aimed at a better exploitation pattern and reduction of discards of undersized individuals of certain species may result in considerable escapement of individuals of other species with consequent important economic losses. Gear modifications other than increasing mesh size can be done (e.g. escapement windows), but effectiveness may be variable and species-specific as it mainly depends on the behavior of each species. The utilization of gears characterized by different selection ability at different depths, different grounds or when targeting different stocks can be effective, but such measures work better when a single species dominates the catch. However, that is not a common case in Mediterranean fisheries, especially in fisheries operating over the continental shelf”.