MAREA: Mediterranean hAlieutic Resources Evaluation and Advice

SPECIFIC CONTRACT N° 8 "Identification and characterization of the small-scale driftnets fisheries in Mediterranean (DRIFTMED)"

DRIFTMED

FINAL REPORT

Partners involved:

CIBM

COISPA

CNR-IAMC

HCMR

CONISMA

Starting date of the Contract: March 04th, 2013.

Duration: 8 months.

Final report

April 14th, 2014

SUMMARY

LIST OF TABLES

LIST OF FIGURES

List of Acronyms

CFP	Common Fisheries Policy
DCF	Data Collection Framework
DCR	Data Collection Regulation
EC	European Commission
EU	European Union
FAD	Fishing Aggregating Device
FAO	Food and Agriculture Organisation of the United Nations
GFCM	General Fisheries Commission for the Mediterranean
GND	Driftnets
GNS	Set gillnets (anchored)
GRP	Gross Profit
GSA	Geographical Sub Area
GT	Gross Tonnage
GTR	Trammel nets
GVA	Gross Value Added
ICCAT	International Commission for the Conservation of Atlantic Tunas
ICES	International Council for the Exploration of the Sea
IUU	Illegal, Unregulated and Unreported (Fishing)
KW	Kilo Watt
LFD	Length Frequency Distribution
LLD	Drifting longlines
LLS	Set longlines
LOA	Length overall
MCDA	Multi Criteria Decision Analysis
MCS	Minimum Conservation Size
NGO	Non Governamental Organisation
NM	Nautical Mile
PS	Purse Seine
SB-SV	Beach and boat seine
SSD	Small Scale Driftnets
SSF	Small Scale Fisheries
STECF	Scientific, Technical and Economic Committee for Fisheries
SWOT	Strengths, Weaknesses, Opportunities and Threats
UN	United Nations
UNGA	United Nations General Assembly
WWF	World Wide Fund for Nature

ACKNOWLEDGEMENTS

We sincerely wish to thank all the fishermen and fishermen associations that provided their full availability and assistance during the field activities of DRIFTMED performed by means of interviews, logbooks and embarks. Without this collaboration, the collection of detailed information on the activity of the small scale driftnet fisheries would have been impossible.

We also thank Bojan Marceta, of the FRIS (Fisheries Research Institute of Slovenia) of Ljubiana, Slovenia, for the open collaboration in providing data on the small scale driftnets in Slovenia.

We are grateful to Gianni Pavan, Michela Podestà and Elisabetta Bernuzzi of the University of Pavia (Italy) for their support in the consultation of the Italian data bank on marine mammals stranding.

We acknowledge the following persons for the availability in providing, at various levels, information of driftnets in different Mediterranean countries:
- Enrico Arneri, FAO AdriaMed Project;
- Constantina Karlou-Riga, FAO EastMed Project;
- Juan Antonio Camiňas, FAO Copemed II Project;
- Mimoza Cobani, Fishery Policies Directorate, Ministry of Environment, Forestry and Water Administration (Albania);
- Zdravko Ikica, Institute of Marine Biology (Kotor, Montenegro);
- Samir Majdalani, Head, Department of Fisheries & Wildlife, Ministry of Agriculture (Beirut, Lebanon);
- Stefano Lelli, (CANA project), CNRS – Lebanon;
- Nedo Vrgoc, Sanja Matic-Skoko, Vjekoslav Ticina, Institute of Oceanography and Fisheries (Split, Croatia);
- Erdinç Güneş, Directorate General of Fisheries and Aquaculture (Ankara, Turkey);
- Zafer Tosunoğlu, Ege University, (Izmir, Turkey);
- Othman Jarboui, Institute National des Sciences et Technologies de la Mer (INSTM, Pourt La Goulette, Tunisia);
- Abdalnasser Madi, EastMed Focal point (Gaza, Palestine);
- Francesc Maynou, Laura Recasens, Institut de Ciencies del Mar - CSIC (Barcelona, Spain);
- Beatriz Guijarro, Luis Gil de Sola, Instituto Espaňol de Oceanografia - IEO (Spain);
- Marie Louise Pace and Roberta Mifsud, Department of Fisheries and Aquaculture (Malta).

EXECUTIVE SUMMARY

Small driftnets of limited length and relatively small mesh size to catch small/medium sized species have been used for generations by many artisanal fleets along the Mediterranean coasts, without major environmental concerns. Problems started in the late 70s-80s when the use of driftnets with larger meshes and much greater overall size targeting mainly swordfish and tunas rapidly expanded outside any preventive control. These type of nets led to large incidences of unwanted catch and created a great environmental concern.
In the early 90s, following the United Nations Resolutions, EU developed a strict legislation on driftnets. Since June 1992 the keeping on board or using of driftnets whose individual or total size is more than 2.5 km is prohibited in EU waters (EEC, 1992). Subsequently EU prohibited all driftnets, no matter their size, when intended for the capture of a group of pelagic species including inter alia tunas, swordfish, billfish and sharks (e.g. the species included in the Annex VIII of EC regulation n. 1239/98). In practice, the current legal driftnets in the Mediterranean are those existing from ancient times.
Despite their historical presence, the knowledge on these fisheries is at present very scarce and scattered.

In this context, the MAREA Specific Contract n.8 ("Identification and characterization of the small-scale driftnets fisheries in Mediterranean" acronym DRIFTMED) was carried out, with the main objective to identify and characterize, both for the past and the present, the small scale driftnet fisheries (SSD fisheries, e.g. those using nets < 2.5 km in length and not targeting species in the Annex VIII) in the Mediterranean.
Other specific objectives were:
- Provide technical information on the driftnet gear (mesh size, twine thickness, rigging ratio, etc.).
- Identify and describe SSD fisheries currently used by countries other than EU Member States in Mediterranean Sea.
- Identify and describe alternative fishing methods to catch the same species or group of species exploited by the small scale driftnets.
- Provide information on the economic parameters pertaining to each EU Mediterranean small scale driftnet fishery
- Provide an overview of the international/EU/national provisions regulating the use of driftnets fisheries in Mediterranean Sea.

DRIFTMED had also the objective of providing update outcomes to the Commission service and of guaranteeing the coordination and interaction with the Specific Contract n.5 (SC5) MARE/2011/01 *"Study in support of the review of the EU regime on the small-scale driftnet fisheries"*. DRIFTMED and SC5 were in continuous contact, sharing data and information. DRIFTMED was structured into four inter-correlated Workpackages and included three main activities:
- the review of all the existing available information;
- the collection of new data regarding the technical characteristics of the gears, as well as the CPUE and catch composition;
- the analysis of the gathered data to identify and characterize the currently active SSD fisheries, in terms of fishing capacity/activity, composition of the catches, socio-economic relevance.

The Contract was signed on March 4th 2013; its duration was 8 months.

All the information coming from literature references related to small scale driftnets in the Mediterranean EU countries was gathered and critically reviewed.
Data for the vessels associated to the fishing type "GND" (Driftnets) were extracted from the EU Mediterranean Countries, taking into account the information stored in the website of the EU Fleet Register (http://ec.europa.eu/fisheries/fleet/index.cfm).

An overview of all the provisions issued in these years affecting the driftnet fisheries in the Mediterranean was made. This work considered all the driftnet fisheries *sensu latu*, not only the SSD fisheries.
All the relevant information was gathered and summarized, with particular attention to possible catch reporting obligations, verifying if some compulsory fishing authorization regime is in place.

The investigations performed confirmed that, despite their historical presence along the EU Mediterranean coastal zones, the knowledge on the small scale driftnet fisheries is still scarce and scattered at spatio temporal level. Most of the past information mentioned the presence and described the technical characteristic of some small scale driftnet fishing gears, without providing data on the effective number of vessels, landings and catch composition.
At the same time, the data from the DCF (EC Reg. n. 199/2008, fishing system GND), which is in force from several years in EU Mediterranean waters, did not allow to draw a detailed picture of the characteristics of the small scale driftnets. As a matter of fact, the monitoring according to DCF is at present limited to spot areas, due to the very scattered distribution of these fisheries, their amount of catches and the catch value. Thus this data source is not sufficient to exhaustively describe this fishing segment. Indeed, as concerns the Italian waters, only in the GSA 19 and occasionally in the GSA 10 the GND (the fishing system specialized for the catch of small pelagic species) has been selected by the ranking system as a métier to be monitored.
From the data collected in the past, it emerged that most of the small scale driftnet fisheries in Mediterranean were located in Italy, where several typologies of SSD fisheries were present in the past years using:
- driftnets with small mesh sizes (from 20 to 40 mm) targeting mainly anchovy and sardine;
- driftnets with higher sizes mostly targeting saddled seabream, greater amberjack, mackerels, Atlantic bonito and bullet tuna.

All these fisheries, grouped with the term "ferrettara", came from historical traditions, or, in other cases, they resulted from the gear substitution followed to the enforcement of the EU Provisions forbidding the large scale driftnets and the Italian Provisions prohibiting driftnets with meshes higher than 100mm. Finally, in other cases, there are new fisheries, as the "ferrettara" for bluefish, recently developed on the basis of the increased availability of this resource and the local market appreciation of this species.

According to the investigations carried out in this study, at present the vessels involved in the Small Scale Driftnet fisheries in EU Mediterranean waters are operative only in Italy and Slovenia; in the other EU Countries, no vessels associated to the SSD fisheries were identified in the period investigated by DRIFTMED. In some countries, as Spain and France, the SSD fisheries were present in the past years, but they were progressively abandoned in the subsequent periods.
In any case, the SSD is potentially usable in all the EU Mediterranean Countries, except in Greece, where this gear is prohibited according to a national provision.
As concerns the not EU Countries, the available knowledge on the presence of the SSD gears is still more scarce. It resulted, however, that in some countries (Morocco, Tunisia, Turkey), these gears are currently forbidden, even though their use were widespread in the past (e.g. Turkey).

The investigations at field were carried from the end of March to mid October 2013, in 25 different harbors and mooring places of Italy and Slovenia: 96 interviews, 254 logbooks and 55 embarks were performed.
Detailed information about SSD fisheries as concerns fishing capacity and activity, gear technical characteristics, species composition of the catch (by catch in particular, with attention to the possible presence of sensitive/endangered and non authorized species) was collected.
Data collection was realised according to a common protocol. All the information extracted from the analysis of the existing knowledge, as well as the new data, were stored in a common Database, using a standardised platform.

In spite of the 480 vessels which at present potentially can use small driftnets in the EU Mediterranean waters (467 of them in Italy), according to the last data of the EU Fleet Register, the number of the vessels currently using these gears is notably lower.

During the investigations at field, 100 vessels, almost all in Italy (only 1 in Slovenia), involved in nine small scale driftnet fisheries, were identified. This number can be likely slightly higher (we estimate of 20-30 units, as a maximum), due to the vessels not active or not identified in the monitored period, because located in very small and isolated mooring places.

The following nine fisheries were identified:

1) "Menaide" for anchovy, *Engraulis encrasicolus*, in Catania area (GSA19): it was performed all year round by 30 vessels.
2) "Menaide" or "menaica" for anchovy, *Engraulis encrasicolus*, in the Cilento area (GSA10): it was seasonal (April-June) and carried out by 19 vessels.
3) "Occhiatara" for saddlled sea bream, *Oblada melanura*, in Ligurian Sea (GSA9): 5 vessels were involved in this fishery, from may to June.
4) "Sgomberara" or "sgombetara" for mackerels (*Trachurus* spp. and *Scomber* spp.) and bogue, in northern Sicily (GSA10): this fishery involved 30 vessels all year round but for a limited number of fishing days.
5) "Menaide" for anchovy, *Engraulis encrasicholus*, in S. Agata di Militello (GSA10): it was performed by 7 vessels from June to August.
6) "Ricciolara" for greater amberjack, *Seriola dumerili*, in S. Agata di Militello (GSA10): 3 vessels were identified, from August to October.
7) "Ferrettara" for blue fish, *Pomatomus saltatrix*, in Gulf of Naples (GSA10): it was carried out by two vessels, from June to October.
Other two fisheries were identified, even though less important in terms of number of involved vessels and economic aspects:
8) "Menaide" for sardine, *Sardina pilchardus*, in northern Adriatic (GSA17): only one vessel in Slovenia, from April to May.
9) "Menaide" or "tratta" for anchovy, *Engraulis encrasicolus,* and sardine, *Sardina pilchardus*, in Selinunte (GSA16): it was performed by five vessels in May-September.

The order of magnitude of these fisheries, in terms of fishing capacity/activity (number of vessels and fishing days), volume of landings and economic parameters is definitely small, if compared with that of the other artisanal fisheries. They have relevance at local level and in terms of seasonal fishery, thus providing an alternative to other small scale fisheries.
The majority of the vessels involved in these fisheries has less than 12 metres length and generally operates close to the home ports. These vessels are dispersed in many artisanal and small fleets, often located in small coastal villages of the south-west of Italy (mainly in Campania and Sicily administrative Regions).
These fisheries are in most cases strictly seasonal, with the exception of the "menaide" of Catania area (GSA19), which is active all year round (145 fishing days per vessel per year). For the other fisheries, the annual activity ranged from 15 days in Ligurian Sea to 70 days in the Gulf of Naples.

All the investigated fisheries are characterised by a high degree of specialisation and a high efficiency of the captures: for most of the fisheries the target species dominated the biomass caught (from 70 to 100%); only in the case of the "sgomberara", in the investigated period, the by-catch accounted, by far, for the majority of the catches.

The technical properties of the nets studied were strictly correlated with characteristics (size, behaviour) of the target species , as well as with the features of the fishing grounds (depth, typology of bottom).
For five (the "menaide" nets) out of the nine fisheries the average length of the nets employed was less than 500 m and for the other fisheries it was always no greater than 2400 m. The mesh sizes of the "menaide" nets were from 20 to 30 mm, those of the other nets ranged from 70 to 90 mm. The net configurations were characterised by high values of hanging ratio, often greater than 0.7.
In general terms, we can conclude that the high hanging ratio, together with the use of small meshes and the T90 configuration of the net make the small scale driftnets highly selective fishing gears.

Moreover the mesh opening used in the small scale driftnets seems to be small enough to make difficult the incidental catch of sensitive species, as marine mammals and reptiles. The same consideration holds for the fishing operations, in general carried out near the coastal area.

Only for one out of the nine fisheries investigated, the biomass caught was dominated by the by-catch fraction; for the majority of the fisheries, the target species were by far predominant in the total catch.
The not authorised species, included in the Annex VIII, were generally not registered in the catch, in particular these species were never recorded in the "menaide" fisheries. In the by-catch of the "occhiatara" the presence of Atlantic bonito and of two species of cephalopods was observed but with minimal values in respect to their percentage contribution; the same was registered for the "ferrettara" for bluefish as regards bullet tuna. Only the catches of "sgomberara" for mackerels and bogue were dominated by the by-catch, mostly constituted in this case by bullet tuna.
The discard was in all cases practically absent, as well as the presence of invertebrates belonging to the local biocenosis, testifying the absence of impact on the bottom.
Formal stock assessments for the target species, as well as for the main species of the by-catch, are not available for the investigated areas. At the same time the information of the biology and the population dynamic for most of these species in the investigated areas is scarce (except for anchovy and sardine).
Therefore, the sustainability for the exploitation of these fisheries was based on simple and basic concepts, as the proportion of the catch smaller than the size at first maturity.
The investigated small driftnets resulted highly selective also at species level. The catch of the target species, for the 5 "menaide" fisheries, the "occhiatara", the "sgomberara" and the "ferrettara" for bluefish, was composed entirely by adult specimens, greater than the size at first maturity. The specimens caught by these fisheries were also higher than the limit imposed by Minimum Conservation Size (from EC reg. n. 1967/2006), if present.
Only the specimens of greater amberjack caught by "ricciolara" were lower than the maturity size reported for this species; in fact this fishery occurs in the recruitment period of the target species, when the specimens are concentrated and close to the coasts.
A great percentage of the specimens of bullet tuna (around 50%) and little tunny (around 80%), the species dominating the catches of the "sgomberara" fishery in the investigated period, was lower than the respective maturity size.
We have also to take into account that, in general, the landings of the target species due to the SSD fisheries are always a minor or negligible (as the case of the "menaide" for sardine in GSA17) fraction of the total landings at GSA or national level. A remarkable exception is the "menaide" fishery of Catania which landing represents about 30 % of the total production of anchovy in the GSA19.

The nine small scale driftnet fisheries identified accounted for a limited social and economic importance at national level, but they have high social, economic and cultural importance at a local level.
The employment related to the investigated SSD fisheries was estimated in approximately 300 fishermen. These fisheries generate more employment in comparison of the other small scale fisheries, especially the "menaide" ones, where (principally the Catania "menaide" fishery) the number of fishermen employed is high (up to six per vessel). Moreover, in some areas (e.g. Cilento and Catania) the SSD fisheries generate employment also in associated activities, related to the processing and the commercialization of the product.
In general, the economic value of the product landed by the SSD fisheries is higher than that of the same product landed by other fisheries.
Another common aspect of these fisheries is the low economic cost: the fuel consumption was roughly estimated, less than 30 € per day at sea, for the majority of studied fisheries. The costs related to the purchase and the maintenance of the gear were low as well.
Another important aspect is the territorial and social peculiarity. In many cases (e.g. the "menaide") these fisheries are carried out since many decades, following historical traditions. As regards the "menaide" of Catania and Cilento areas, the fresh product landed and the processed one are object of a brand ("Slow Food" Presidium).

The SWOT analysis to assess the possible replacement of each existing SSD fishery with alternative fishing methods has stressed, in general, the strengths of the SSD fisheries against the following four strategic areas or criteria: technical characteristics of the gears/vessel/fleet; environmental impact; economic performances; social and cultural heritage.
In particular for the “menaide” fishery the Strengths completely outbalanced the Weaknesses, whilst the Threats were not counterbalanced by the Opportunities. Intermediate situations were registered for the other SSD fisheries, though the Threats, in case of replacement with Purse seine (PS); Set gillnet (GNS), Trammel net (GTR), Set longline (LLS), Drifting longline (LLD), Boat seine (SB_SV), were more relevant. In the case of the “sgomberara” and “ricciolara” the Threats appeared to be compensated by the Opportunities, while Strenghts were not outbalanced by the Weaknesses

In conclusion, in spite of their general low incidence in terms of fishing activity and landing at national level, these fisheries provide a relevant contribution in terms of the annual income for the fishermen involved. These fisheries are generally highly selective on the target species, with an overall low impact on the environment.
These aspects provide robust evidences to implement specifically oriented management measures, which could ensure the regulated activity of these fisheries, allowing the diversification of the fishing effort, maintaining old local traditions and sustaining the economy of small coastal villages.

0. INTRODUCTION

The present document is the Final Report of the MAREA Specific Contract n. 8 "Identification and characterization of the small-scale driftnets fisheries in Mediterranean (DRIFTMED)".
The Contract was signed on March 4th 2013; its duration was 8 months.

This report provides a detailed description of the objectives, the methodology and the results obtained by this project.

According to the contractual terms, the DRIFTMED Contract included the following Deliverables:

D1 – First Interim Report.
D2 – Second Interim Report.
D3 - Draft Final Report.
D4 - Structure of the database to store data (existing and new data) on SSD fisheries.
D5 - List of the bibliographic references, also in electronic (Acrobat pdf) format.
D6 - Database filled with the available information (both from EU and non EU countries).
D7 - Review of the legislative provisions regulating SSD fisheries.
D8 - Summary of the main characteristics of possible fishing methods alternative to SSD.
D9 - Database filled with the new data.
D10 - Summary on the distribution and the characteristics of the SSD fisheries in Mediterranean.
D11 - Overview of the technical aspects of the gears used by the SSD fisheries in Mediterranean.
D12 - Overview of the economic aspects related to the SSD fisheries in Mediterranean.
D13 - Comparative evaluations about a possible replacement of the existing small-scale driftnets with alternative fishing methods in Mediterranean.

All the Deliverables are available, as standalone documents, in the web site of MAREA framework (www.mareaproject.net), under the specific folder dedicated to DRIFTMED Contract.

The Deliverables D6 and D9 have been included in the same excel file "DRIFTMED database" (see Chapter 3.3. of the present Report).

1. BACKGROUND

TEAM COMPOSITION

CIBM - Consorzio per il Centro Interuniversitario di Biologia Marina ed Ecologia Applicata "G. Bacci", V.le N. Sauro 4, 57128 Livorno (Italy). Tel.: + 39 0586 807287, Fax: + 39 0586 809149. www.cibm.it

COISPA - Tecnologia & Ricerca S.c.r.l., Via dei Trulli 18/20, 70126 Torre a Mare (Ba) (Italy). Tel.: +39 080 5433596, Fax: +39 080 5433586. www.coispa.it

CNR – Consiglio Nazionale delle Ricerche. www.cnr.it. **ISMAR** - Istituto di Scienze Marine Largo Fiera della Pesca, 60125 Ancona (Italy). Tel +39 071 207881, Fax +39 071 55313. **IAMC** – Istituto per l'Ambiente Marino Costiero, Via Vaccara 61, 91026 Mazara del Vallo (TP) (Italy). Tel.: +39 0924 948966, Fax: +39 0924 906634.

HCMR - Hellenic Centre for Marine Research - Institute of Marine Biological Resources, 46.7 Km Athens, P.O Box 712, (Greece). Tel.: +30 210 9856703, Fax: +30 210 9811713. www.hcmr.gr.

CONISMA - Consorzio Nazionale Interuniversitario per le Scienze del Mare. Via Isonzo 32, 00198 Roma (Italy). Tel.: +39 06 85355476, Fax: +39 06 8543810. www.conisma.it.

PARTICIPANTS	AFFILIATION	
Paolo Sartor	CIBM	Project coordinator
Maria Teresa Spedicato	COISPA	MAREA Coordinator
Alexis Conides	HCMR	Responsible of Task 1.1 and D5
Paolo Carpentieri	CIBM	Responsible of Task 1.2 and D6
Francesco Colloca	CNR-IAMC	Responsible of Task 1.3
Fulvio Garibaldi	CIBM	Responsible of Task 1.4 and D7
Pierluigi Carbonara	COISPA	Responsible of Task 2.1 and D9
Alessandro Lucchetti	CNR-ISMAR	Responsible of Tasks 2.2 and 3.2 and D11
Mario Sbrana	CIBM	Responsible of Task 3.1 and D10
Rosaria Sabatella	CONISMA	Responsible of Task 3.3 and D12
Giuseppe Lembo	COISPA	Responsible of Task 3.4 and D13
Maria Teresa Facchini	COISPA	Responsible of the Database and D4
Luca Lanteri	CIBM	Responsible of D8
Sandro Cerasi	CIBM	
Ilaria Rossetti	CIBM	
Marina Sartini	CIBM	
Claudia Musumeci	CIBM	
Walter Zupa	COISPA	
Loredana Casciaro	COISPA	
Francesco De Carlo	CNR-ISMAR	
Massimo Virgili	CNR-ISMAR	
Fabio Fiorentino	CNR-IAMC	
Marco Toccaceli	CNR-IAMC	
Sergio Vitale	CNR-IAMC	
Teresa Romeo	CNR-IAMC	
Dimitris Klaoudatos	HCMR	
Kostas Kapiris	HCMR	
Panagiotis Kougioufas	HCMR	
Maria Karkani	HCMR	

RATIONALE

Driftnets are one of the most ancient gears used to exploit fishery resources in the world. (Karlsen & Bjarnasson, 1986). In the Mediterranean Sea the use of the small driftnets of limited length with relatively small mesh size to catch different small/medium sized species, mostly living in or migrating through coastal areas, is traditionally widespread, especially in the past and in some regions. These gears have been used for generations by many artisanal small-scale fleets located in several mooring places along the Mediterranean coasts. This small-scale use has never been a cause for major concern.

Problems started in the late 70s-80s when the use of driftnets with much larger meshes and of much greater overall size targeted mainly to large pelagics (like swordfish and tunas) rapidly expanded outside any preventive control. Italy developed one of the most important fleets using driftnets for large pelagics (Ferretti *et al*., 1995). These types of nets led to numerous and large incidences of unwanted catch and created great environmental concern (Di Natale, 1996).

In the early 90s, following the United Nations General Assembly (UNGA) Resolutions (UN 1989; 1991), EU developed a strict legislation on driftnets. Since June 1992 the keeping on board or using of driftnets whose individual or total size is more than 2.5 km is prohibited in EU waters (EEC, 1992).

The implementation of the 2.5 km rule presented many practical problems (mainly due to illegal fisheries) and did not stop the expansion of large-scale pelagic driftnets. Therefore EU prohibited all driftnets, no matter their size, when intended for the capture of a certain group of pelagic species including inter alia tunas, swordfish, billfish and sharks (e.g. the species included in the Annex VIII of EC Reg. 1239/98).

Italy adopted a more strict legislation allowing, from January 1st 2012, only the use of driftnets with overall length equal or less than 2.5 km, with a mesh size no more than 100 mm and to be used only within 3 miles from the coast (Italian Ministry for Agricultural, Food and Forestry Policies, 2011). These technical requirements aimed at reducing the interaction of this driftnet with non-target species and reducing the incidental entanglements by decreasing the mesh opening (usually the driftnets targeting large pelagic species had a mesh opening greater than 350 mm).

In practice, the legal fishing with driftnets in the Mediterranean is that referring to types of fisheries practiced from ancient times. These fisheries were undoubtedly more important in the past, when they were widely distributed and had an important economic and social value for many small-scale fisheries (Sassu *et al.*, 2001; Colloca *et al.,* 2002).

However, it is currently known, especially for Italy (Cannas, 2001) the presence of vessels in some landing sites using small driftnets to exploit, mainly in the coastal areas, species as anchovy (*Engraulis encrasicolus*), sardine (*Sardina pilchardus*), round sardine (*Sardinella aurita*), Atlantic mackerel (*Scomber scomber*) and chub mackerel (*Scomber colia*s), bogue (*Boops boops*), greater amberjack (*Seriola dumerilii*), saddled seabream (*Oblada melanura*). These fleets are located especially in mooring points of small villages of Italy (in particular in central and southern Tyrrhenian Sea and Sicilian Channel, but also in Ligurian Sea, northern Tyrrhenian Sea and northern Adriatic) (Cannas, 2001; Sassu *et al*., 2001; Colloca *et al*., 2002), but their presence is likely also in other EU and non EU countries.

Despite their historical presence along the Mediterranean coastal zones, the knowledge (e.g. specific studies or bibliographic references) on these fisheries is at present very scarce and scattered.

The driftnets have been grouped under the gear coded GND (driftnets), according to the International Standard Statistical Classification of Fishing Gear (ISSCFG, 1980; FAO, 1990).

Since 2002, according to the EC Regulations n. 1543/2000, n. 1639/2001, n. 1581/2004 and n. 199/2008 and to the Commission Decision n. 93/2010, which established the DCR (Data Collection Regulation) and subsequently the DCF (Data Collection of Fisheries) in EU countries, GND is also a fishing segment that can be monitored if selected by the ranking system in certain GSAs as regards fishing capacity, effort, landings, economic data and biological data. Due to the very scattered distribution of these fisheries/mètiers, the level of catches and the catch value, monitoring according to DCF is at present limited to spot areas, not enough to exhaustively describe this fishing segment.

Indeed, as concerns the Italian waters, only in the GSA 19 and occasionally in the GSA, 10 the GND (specialized for the catch of small pelagic species) has been selected as a mètier monitored.
Therefore, a deep investigation on these gears is needed, in order to provide a robust overview on their presence, at the Mediterranean scale, both in the past and at present, with particular attention to the information related to the gear characteristics and the composition of the catch.
Also the economic aspects of Small-Scale Driftnets (SSD hereinafter) fisheries need to be known more in details, because at present is impossible to assess the role played by these fisheries in the socio-economic context.
Finally, it is important to provide an overview of all the regulating provisions issued in the last years and to perform a critical analysis, on the basis of the information collected, if the implementation of the 2.5 km rule, coupled with the mesh size reduction, has solved the problems related to the use of large scale pelagic driftnets. All this information will be important to establish the real sustainability of these fisheries, both from the environmental and economic point of view, and to support any management policy.

PROJECT OBJECTIVES AND ORGANISATION

The overall objective of this Specific Contract is to **identify the fleets using driftnets smaller than 2.5 km and not targeting species in Annex VIII of the EC Reg. n. 894/97 (<u>SSD, Small-Scale Driftnets</u>), at Mediterranean level, and to describe the various fisheries/mètiers and their impact on resources and environment, as well as the economic turnover and the social aspects involved**.
More in detail objectives are:
1) Identify and describe past and currently active EU Mediterranean fisheries using driftnets of length equal or smaller than 2.5 km (small-scale driftnets) to exploit species other than large pelagic migratory species and not included in Annex VIII of Council Regulation (EC) n. 894/97 as amended by Regulation (EC) n. 1239/98.
2) Provide technical information on the driftnets gear (mesh size; twine thickness, rigging ratio, etc.) that are adequate to exploit species other than those listed in the Annex VIII of Regulation (EC) n. 1239/98.
3) Identify and describe the small-scale driftnets fisheries currently used by countries other than EU Member States in the western and central Mediterranean Sea as well as in the Aegean Sea.
4) Identify and describe alternative fishing methods to catch the same species or group of species exploited by the small-scale driftnets. Compare and comment as adequate their fishing power, their likely environmental impact and their adequacy to the type of fishing vessels using small-scale driftnets.
5) Provide information on the economic parameters pertaining to each EU Mediterranean small-scale driftnet fishery including the estimation of the proportion on the annual income and economic profit of an average fishing vessel and/or fleet segments involved.
6) Provide an overview of the international/EU/national provisions regulating the use of driftnets fisheries including, among others, catch reporting obligations and whether a compulsory fishing authorization regime is in place. Identify gaps which hamper full implementation of and compliance with UNGA resolutions and EU legislation.

The DRIFTMED project included three main activities:
- the review of the existing available information from scientific papers, grey literature, reports, etc. and other sources of information (e.g. fishermen, fishermen associations, control bodies, FAO Regional Projects, DCF data, EU and national legislation records, etc.);
- the collection of new data regarding the technical specifications of the gears (mesh size, twine thickness, rigging ratio, etc.) as well as CPUE and catch composition;
- the joint analysis of all the gathered data to provide an overview on the presence of the SSD fisheries in Mediterranean, to characterize the main fisheries/mètiers in terms of fishing capacity/activity and composition of the catches, to review all the existing provision regulating these fisheries, to assess the economic and their social relevance and, finally, to produce an evaluation of the feasibility of the use of alternative gears to exploit the same resources.

The project was organised in four different Work Packages:
WP0 = project management and coordination.
WP1 = collection and critical review of the existing information on SSD fisheries in Mediterranean.
WP2 = collection of new data on SSD fisheries.
WP3 = data analysis, socio-economic assessment and synthesis.

The details of the project organisation, including the minutes of the plenary meetings are provided in the **Annex I** of the present Report.

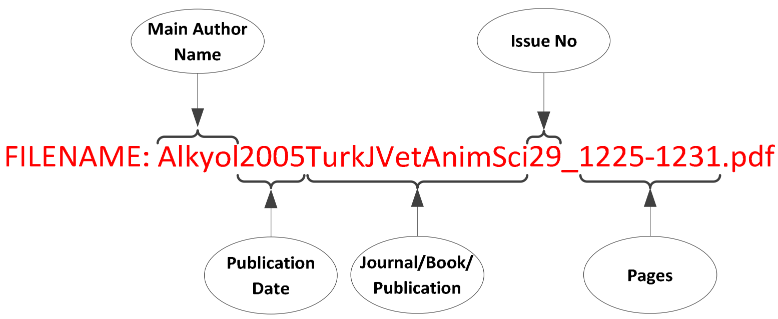
2 - COLLECTION AND CRITICAL REVIEW OF THE EXISTING INFORMATION ON SSD FISHERIES IN MEDITERRANEAN (WORKPACKAGE 1)

The Workpackage 1 consisted in the following Tasks:
Task 1.1 – Collection of the available information on SSD fisheries in EU Mediterranean fisheries.
Task 1.2 – Critical review of the available information on SSD fisheries in EU Mediterranean fisheries.
Task 1.3 - Collection and review of the available information on SSD fisheries other than EU Mediterranean countries.
Task 1.4 - Overview of the international/EU/national provisions regulating the driftnets fisheries in Mediterranean

The following paragraphs describe the methodology and the results obtained for each Task.

2.1 - COLLECTION OF THE AVAILABLE INFORMATION ON SSD FISHERIES IN EU MEDITERRANEAN WATERS (TASK 1.1)

The main objective of Task 1.1 was to gather literature references from various sources related to Small-scale Driftnets (SSD) in the Mediterranean. The detailed results of this task are provided in the **Deliverable 5** ("List of the bibliographic references, also in electronic PDF - Portable document format"), annexed to this Report.
The bibliographic research started just after the beginning of the Contract, following different approaches, in order to collect all the relevant material for this study: scientific papers, reports from research projects, technical reports, official statistics from national and private (as fishermen associations) bodies, other kind of grey literature. All the bibliographic references were digitalized, generating files in PDF (Portable Document Format) version. The files were renamed in accordance to a code related to their contents, which enables the reader to locate the relevant file during the elaboration of the report, as follows:



The sources of the literature have been the following:

Elsevier publisher	research/scientific papers
Wiley/Blackwell publisher	research/scientific papers
Springer publisher	research/scientific papers
Regional organisations (COPEMED, GFCM etc.)	reports
NGO (WWF, Oceana, PEW, MAREVIVO etc.)	reports, leaflets
FAO (green series)	guidelines, reports
FAO Regional projects (ADRIAMED, EASTMED, COPEMED etc.)	papers, presentations, reports
RTD project reports	reports

Conference papers/abstracts	papers
Textbooks	books
Other sources (random Internet searches)	various types of documents

Keyword searches for 'driftnet', 'drift-net' and 'drift net' produced the following results from the main publishers using their search function:

Term / Publisher	'driftnet'	'drift-net'	'drift net'
Springer	81	550	550
Elsevier	418	715	715
Wiley/Blackwell	169	694	694
TOTALS	**668**	**1959**	**1959**

A large number of papers have been also collected from the other sources (they may concern grey literature). All the papers collected, were examined regarding:

1. Related geographic area (only the papers for the Mediterranean were selected)
2. The existence of technical information on the gears in the text - mainly the materials and methods sections - (only the papers with technical information were selected)

Based on the above two selection criteria, a final number of **68 documents (plus 1 identification sheet on gear codes)** were finally selected and archived.

All the documents were digitised in PDF format and were uploaded in the web site of MAREA project (www.mareaproject.net, in the folder dedicated to the DRIFTMED project). Fig. 2.1.1 illustrates the GFCM zones for the papers collected. It is evident from the results that there is a scarcity of papers dealing with driftnets in the Mediterranean and even scarcer are the documents that include information on the technical characteristics of the gears. Regarding the geographic location of the documents collected, most refer to the EU member states in the Mediterranean and most papers deal with problems related to the illegal use of driftnets (Fig. 2.1.1).

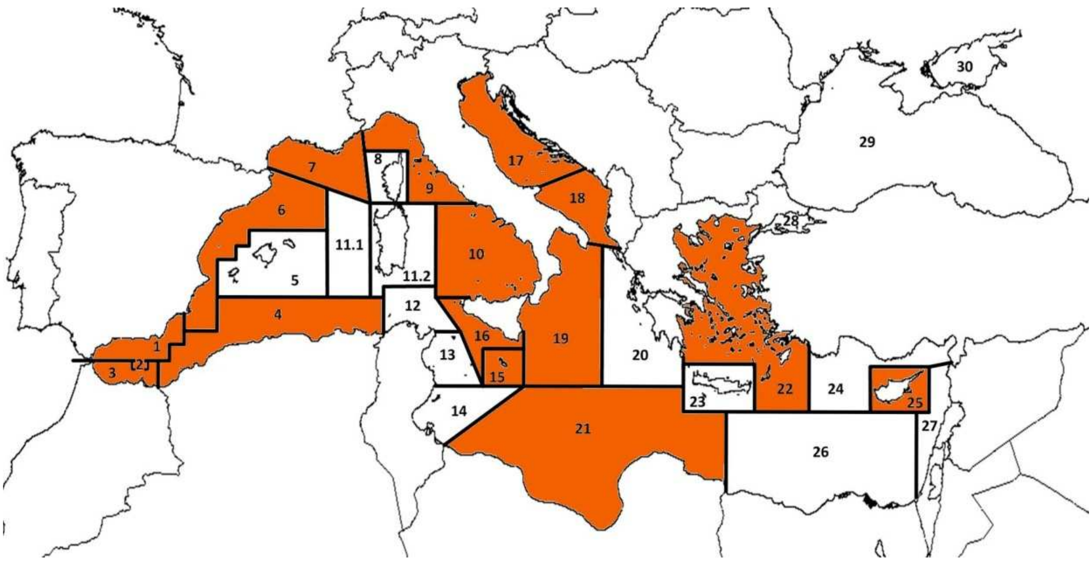


Figure 2.1.1 - FAO GFCM Geographic zones from which driftnet information have been collected.

The age of classification of the collected references is illustrated in Fig. 2.1.2. The results show that the main publications on Mediterranean driftnets (including gear specifications) started since 1980. The highest number of publications occurred in the period 2005-2006 resulting in 8 publications (24.2%).

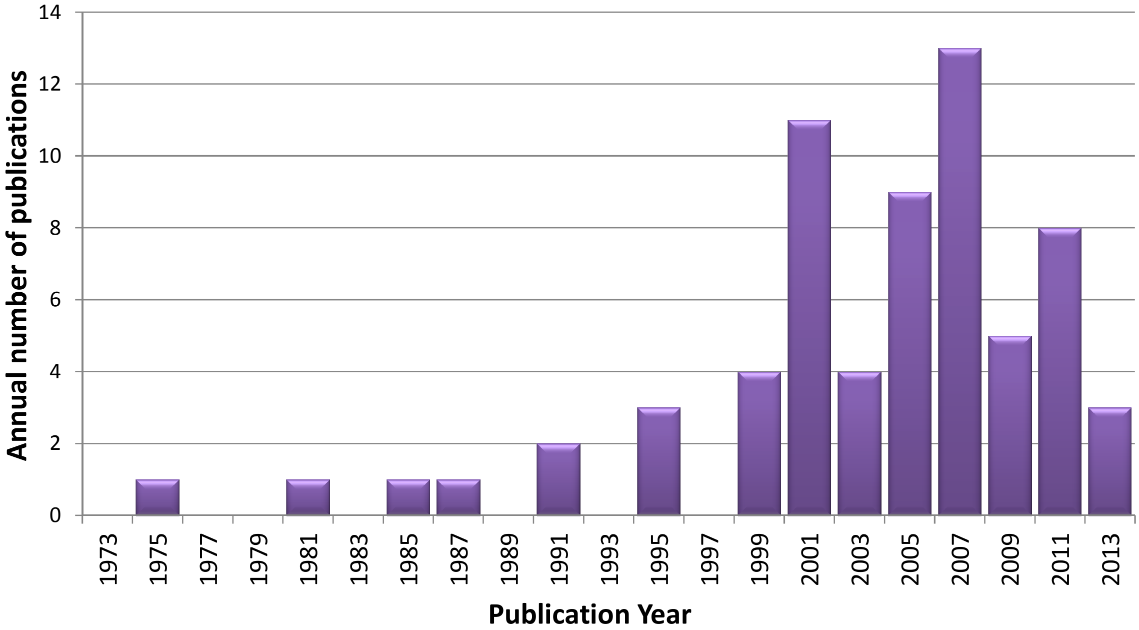


Figure 2.1.2 - Classification of collected references based on the publication year.

The geographic coverage of the collected references is summarized in the following table (Tab. 2.1.1).

Table 2.1.1 - Geographical repartition of the collected bibliographic references.

GEOGRAPHICAL AREA	NUMBER
Adriatic Sea	2
Aegean Sea	5
Alboran Sea (SW Med)	2
Tyrrhenian Sea	1
Central & Western Mediterranean Sea	1
Central Mediterranean Sea	3
Western Mediterranean Sea	5
Mediterranean Sea	29
All Europe	6
World	4
Not reported	11

The distribution to the countries referred in the selected references is summarized in Tab. 2.1.2. Most papers cover Italian and Turkish waters. In addition there are a few papers from France, Morocco and Spain.

Table 2.1.2 - Country repartition of the collected bibliographic references.

COUNTRY	NUMBER
Albania	1
Algeria	1
Cyprus	1
France	2
Italy	12
Libya	2
Malta	1
Morocco	5
Spain	6
Turkey	8
South European countries	1
Mediterranean countries	8
European union member states	4
All countries	6
Not reported	11

Finally, in terms of species in the collected references, the distribution is reported in Tab. 2.1.3. Most papers focus on the small-scale fishery species usually caught using SSD, though there are several papers dealing with the effects of the SSD on endangered (sea birds, mammals, turtles) and protected/managed species (tunas and swordfish).

Table 2.1.3 - Species repartition of the collected bibliographic references.

SPECIES	NUMBER
Anchovy	1
Sardine	1
Swordfish	4
Bluefin Tuna	1
Yellowfin tuna	3
All tunas/bonitos/tuna-likes	1
Small-scale fishery species	27
Large Pelagics (both tuna and swordfish)	2
Mammals	2
Marine turtles	2
All species	10
Not reported	15

The list of the digitized references is provided in the **Deliverable 5**.

A specific database, based on the Filemaker 12.0 for Windows™ platform, was created to store, classify and manage these references. Its characteristics and functioning are reported in the **Deliverable 5**.

2.2 – CRITICAL REVIEW OF THE AVAILABLE INFORMATION ON SSD FISHERIES IN EU MEDITERRANEAN WATERS (TASK 1.2)

LITERATURE REVIEW

The main objective of this Task was to analyze the information coming from the existing literature, collected from various sources, related to small-scale driftnets in the Mediterranean EU countries.

The investigations confirmed that, despite their historical presence along the EU Mediterranean coastal zones, the knowledge on the small-scale driftnet fisheries is still scarce and scattered. The only available studies or reports are available at very small spatio/temporal scale and are not very detailed. However, some aspects (e.g. species caught, net dimension) of this kind of fishery are mentioned in scientific and technical papers dealing with artisanal fishery, as well as some information were also available, even though highly dispersed, from grey literature.

As concerns Mediterranean Sea, driftnets fisheries have been subjected to particular attention from the legislative point of view, mostly because the problems caused by the driftnets used for large pelagic species. Before the entry in force of the EU Reg. 894 of April 29th1997 and EU Reg. 1239/98, the large size of meshes employed (targeting large pelagic species), together with the length (often tens of kilometres) and the drop (often more than 20 m) of the nets have implied the unwanted catch and death of sensitive and endangered species, such as cetaceans (as common dolphin, *Delphinus delphis*, striped dolphin, *Stenella coeruleoalba*, bottlenose dolphin, *Tursiops truncatus*, pilot whale, *Globicephala melas*, and sperm whale, *Physeter macrocephalus*) pelagic sharks and turtles, as well as catches of other large pelagic species. For this reason, the bulk of the bibliographic references produced on driftnets regards mainly the by-catch of marine mammals, turtles and sharks (Di Natale, 1990 and 2006; Di Natale & Nortarbartolo di Sciara, 1994; Placenti & Malvarosa, 2000; Bearzi, 2002; Tudela, 2004; Greenpeace, 2006a, 2006b; EJF, 2007; Oceana, 2005, 2007, 2008a, 2008b).

Thereafter, there is a quite large bibliography on the description, inventory and selectivity of fishing gears in the Mediterranean (Ferretti *et al*., 1994 and 2002; Guillou & Crespi, 1999; Stewart, 2001; Garcia-Rodriguez *et al*., 2006). In these studies, same information is also present for small driftnets: what is generally reported it is a roughly description of the gears, sometimes is detailed the area and the name of the species caught, but rarely are indicated or reported the quantitative.

A very few papers, scientific works and/or manuals deal with the small-scale driftnets species not included in Annex VIII of EC Reg. 1239/98 (Silvani *et al*., 1999; Granzotto *et al*., 2001; Sassu *et al*., 2001; Colloca *et al*., 2002 and 2004).

The objective of this Chapter is to provide an overview, based on the available data, of the artisanal fisheries in some areas (mainly along the Italian coasts, and few citations for France, Malta and Spain coasts), where a description of small-scale driftnet was reported.

For what concerns the Italian waters, Scaccini (1974) in the FAO GFCM Geographical Sub Area (GSA) 17 (North Adriatic Sea), cited the use of a particular type of driftnet, namely "menaide", targeting sardine. The same author reported also that in 1931, in the Venice lagoon, around 30 vessels were using this kind of gear: at that time the driftnet "menaide" was defined as innovative and profitable.

Always in the GSA 17, and principally in the Venice Lagoon, Granzotto *et al*. (2001) reported a description of the main fishing activities. These Authors reported that the "menaide" net was used in the area from June to September targeting mainly sardine.

The presence of "menaide" is mentioned also in the Gulf of Trieste (GSA 17) where the catch discriminating action of this kind of gear was reported (AA.VV., 1985): "*Apart from seiners or paired trawlers, which can aim at the aforesaid species by selection of the proper time and place but cannot catch discriminating between sardines and anchovies, a simple gear is know in the Adriatic which is strictly speaking 'species selective': the small drifters menaide which can only catch sardine*".

The same description of the "menaide" fishery, targeting sardine, *Sardina pilchardus*, and anchovy, *Engraulis encrasicolus*, was provided by a survey carried out in 2008 in the Gulf of Trieste. In this latter work the activity of a common "menaide" or "menaida" driftnet is described: anchovies are caught during the night, from April to July; fishermen come out at dusk usually when the sea is calm. Fishing is selective and captures only the anchovies of a certain size that are processed immediately: the anchovies caught by "menaide" driftnet are distinguished from the anchovies caught with other gears (e.g. purse seine) for meat clearer that tends to pink. Authors stated that while it is a fishing technique tiring and not very productive, it provides anchovies that have absolutely superior organoleptic qualities.

Ferretti *et al*. (1995) reported a detailed description, with technical characteristics and list of the species caught, by the different kind of driftnets (small driftnets and the driftnets targeting large pelagic species) used along all Italian coasts:

- driftnets with small mesh size (from 20 to 40 mm) targeting mainly sardine and anchovies;
- driftnets with medium mesh size (from 50 to 130 mm) targeting *O. melanura*, *Lithognathus mormyrus, S. scomber, Mugil* spp., *Auxis rochei* and small *S. dumerili*;
- driftnets with biggest mesh size (from 160 to 200 mm) targeting *Thunnus thynnus*, *T. alalunga, Euthynnus alletteratus* and *Sarda sarda*.

Ferretti *et al*. (2002) also classified and described the different gears used along the Italian coasts, but with a description limited to the target species. In this report is clearly evident that the driftnets used till 2002, on the basis of the Ministeriale Decree of 26/7/95, belong to two different categories: driftnet (targeting large pelagic species which include "spadare" and "alalungare") and "ferrettara". In the "ferrettara" system (always including nets not anchored with mesh size less than 180 mm and that could be possible to use also after 1/1/2002), Ferretti *et al.* (2002) mentioned driftnets gears which name came from the target species: the "alacciara" (for *S. aurita*), the "bogara" (for *B. boops*), the "sgomberara" (for *S. scomber*), the "occhiatara" (for *O. melanura*) and the "ferrettara" (for *Belone belone, S. colias* and *S. scomber*, and *S. dumerilii*). To the ferrettara system belong also "menaide" for small pelagic species (anchovies and sardines).

These fisheries/mètiers are grouped under the gear coded GND (driftnets) according to the International Standard Statistical Classification of Fishing Gear (ISSCFG, 1980; FAO, 1990).

Another analysis on the different gears operating in Italy has been carried out by Sassu *et al*. in 2001. In this study all the distribution systems according to the main fishing activity (e.g. which is the most used in the course of 1999 in terms of days per year) are reported. It is evident the importance at the local level of driftnets for large pelagic species, mainly used in GSA 10 and 16 (South Tyrrhenian and Sicilian channel), but also it is mentioned the other kind of driftnets namely "ferrettara": during the 1999, 432 fishing vessels used small driftnets, for 116 vessels (for a total of 899 GT) "ferrettara" driftnet was noticed as the principal gear (0.7% of total Italian fleet).

Sassu *et al*. (2001) and Cannas (2001) reported also a description of the "ferrettara" driftnet: it is characterized by smaller nets (the maximum length is 2 km) and a mesh not exceeding 150 mm opening, which varies as a function of the target species (Ministerial Decree of October 14th 1998). In 1999 it was relatively common in Sicily and the Tyrrhenian Sea (GSA 16 and GSA 10 respectively). In the report it is mentioned as from January 1st 2002, "ferrettara" may be used only within the 3 miles from the coast (and with less than 100 mm mesh opening) catching amberjack, mackerel, bogue, salema, sardines and anchovies. With the entry into force of the future restrictions, vessels employing driftnets and/or ferrettara can still make use of other fishing gears provided under license by limiting the economic damage from the mandatory conversion. Therefore, the data of the study showed that 99% of vessels operating with "ferrettara" utilised also other gears: on 432 vessels operating with driftnets, only 4 utilised this gear as unique fishing system.

The "ferrettara" driftnet was more commonly used in spring and summer, with anchovies and sardines as the main target species. According to Sassu *et al.* (2001), the importance of this gear derived almost exclusively from the Sicilian coasts (GSA 19), in which is still in use the so-called "menaide" for the capture of small pelagic species.

Tab. 2.2.1 summarises the number of vessels operating with the "ferrettara" along the 7 Italian GSAs following the outputs of Sassu *et al*. (2001):

Table 2.2.1 - Number of vessels operating with "ferrettara" in the Italian GSAs (from Sassu *et al*., 2001).

GSA 9	GSA 10	GSA 11	GSA 16	GSA 17	GSA 18	GSA 19	Italy
17	98	4	285	2	7	19	432

Colloca *et al.* (2002, 2004) gave a detailed description of a local area (Cilento) situated in the south of Italy (GSA 10) in which driftnets for anchovy are still used in late spring. The Authors reported that the presence of a type of driftnet named “menaica” targeting mainly anchovies. Before the Second World War it was one of the most commonly used fishing methods in southern Italy and Sicily. Nowadays, Cilento is one of the last areas still using this mètier (e.g. 9 active fishing vessels are cited by the two papers).
These driftnets are employed at night without the aid of light or echo-sounder to attract and detect fishing schools. Fishing boats remain tied to the nets, once they are set at sea. During the fishing season, every night several sets are made according to the catches. There is no net hauler or other gear handling equipment on the boat. Net dimensions range between 150 and 350 m in length, between 10 and 20 m in height, with a stretched mesh of 2.5-2.6 cm. Nets are hung stretched to the maximum with a hanging ratio of 0.8. Several floaters are tied on to the headline with smaller ropes 1.5-2 m long which give a buoyancy of 20 Kg. Their purpose is to maintain the balance of the gear and keep it operative during consecutive catches, even if they are of large quantities. The commercial value of anchovy caught by “menaica” is very much higher than the one usually found on the national market. Authors also reported that anchovy caught with driftnet are particularly well adapted for salting, either because of their size which is usually bigger than those fished by purse seine, or because the heads of the fish are removed on board. In this way the fish have already bled and their flesh is of a better quality when they are salted.
Battaglia *et al.* (2010) investigated the evolution of the driftnet fishery “ferrettara” and the socio economic aspects in the Aeolian Islands (GSA 10), in relation to the changes occurred following the Italian law (Ministerial Decree n. 281 October 14th 1998). In the area, small-scale driftnets are in use by fishermen that replaced the large scale driftnet, targeting large pelagic species, with the "ferrettara" net, targeting pelagic fishes. The “ferrettara” driftnet is described as a gill net 1500–2500 m long, kept vertical by floats on the head-rope and weights on the ground-rope, drifting with the current, near the surface, and targeting pelagic fishes. Boats usually are 9.30–15.80 m long with 40.6–227.3 kW of engine power. This gear is preferred during warm seasons. In the area, since the “spadara” driftnet ban pursuant to EC Reg. 1239/98, this fishery has undergone changes that are still in progress and that are leading to a greater polyvalence and seasonality of fishing activities for all boats. Therefore, a part of fishermen, despite the economic subsidies received to stop or convert their activity, has preferred to continue fishing using other gear. They invested their capitals in the construction of new vessels and they reconstitute a driftnet fleet fishing by “ferrettara”.
Moreover, Baino and Silvestri (1987) provided a description of the technical characteristics and the catch efficiency of a small driftnet used in northern Tyrrhenian Sea (GSA9), targeted to grey mullets. It was reported that this net was employed seasonally, from April to October; the net length was 700m, the drop 14 m, the mesh size 80 mm. The target species *(Mugil cephalus, Chelon labrosus, Liza aurata*) accounted for 94.2% of the total catch, by-catch was mostly represented by saddled seabream, *O. melanura*. Also the catches of Atlantic bonito were reported, but this species accounted only for 0.3% of the total catches. This net was also reported as highly selective, catching only adult specimens of grey mullet.
De Leiva *et al*., (1998) reported the situation of driftnets in the Maltese waters (GSA 15). In this report, Maltese driftnets are described as small pelagic nets (GND) used mostly from November to February when saddled seabream (*O. melanura*) and small tunnids (Scombridae) are known to congregate. The size of the meshes varies according to the target species. *O. melanura* is the smaller of the targeted species. This document mentioned that approximately 50 small vessels are licensed to use this gear.
Urbistondo (2001) provided a description of two types of small driftnets present along the Spanish Mediterranean coasts: “bonitera” and “melvera”, both targeting mainly large pelagic species such as *A. rochei* and *S. sarda*. The Authors also reported that 11 vessels used “bonitera” to catch *S. dumerili*. Always

in Spain, Garcıa-Rodrıguez *et al*. (2006) carrying out an analysis of the small-scale fisheries in the Alicante Gulf (GSA 6), mentioned driftnets together with other gears (e.g. hand lines and Moorish pound nets). Those gears were seasonally used for catching *S. dumerili, Coryphaena hippurus, Loligo vulgaris* and different Scombridae species, representing 3.4% of the total landing.

De La Serna *et al*. (2000), in the framework of the FAO Copemed project, confirmed the presence of the two driftnet gears, "bonitera" or "melvera" mainly targeted to bonito and frigate tuna. In the report is mentioned that the average catches for the last years reached 300 tons for bonito and 600 tons for frigate tuna. Those gears in some cases consist of a boltrope of cork and lead which respectively snare the net. One form is composed of a series of rags tied together totalling a maximum length of up to 1.5 miles. This is vertically plunged along the coast in order to intercept the passage of these highly migratory species. The mesh had a minimum size of 10 cm. The most significant fishing period is in the autumn for the frigate tuna and in the winter and spring for the bonito.

The catalogue of fishing gears of Cortés and Manrubia (2003) mentioned the presence of small driftnets named "sardinal" and "volaera" targeting sardine and flying fishes in Andalucía, without providing information of their use. The Tab. 2.2.2 summarizes all the information collected.

Silvani *et* al. (1999) investigated the by-catch of the Spanish driftnet fishery targeting *Xiphias gladius* and operating on the Mediterranean side of the Gibraltar Straits (GSA 2 and 3). They provided a description of the driftnet fishery investigated during the period covered by the study. The fleet operating in the area was composed of 27 vessels, whose lengths ranged from about 10 to 25 m and crews were composed of 5-8 persons. The gear consisted in a driftnet of 40 cm mesh size and 32-40 m high. A single piece of net measured 72 m long and each boat set about 40-70 of these pieces, depending on the size of the boat. Thus, nets deployed by this fleet in the Mediterranean ranged from 2.9 to 5 km long (mean/standard deviation 4.01±0.50 in 1993, 3.64±0.41 in 1994). Nets were set at sunset and hauled around midnight. Boats returned to harbour at 05.00-07.00 am each day.

The inventory provided by Guillou & Crespi (1999) of the artisanal fisheries in the Gulf of Lions (GSA 7) reported, among the gears used in the area, a typology of driftnet (filet maillant dérivant) named "thonnaille". This gear, depending on the mesh size, targeted *T. thynnus, X. gladius, C. hippurus,* and *Brama brama*. The relative abundance of the vessels using driftnets "thonnaille" is reported to be around 3%. The use of "thonnailles" (without distinction of catch) seemed concentrated mainly from February to December.

The knowledge on the environmental impact of the small-scale driftnets is very scarce and in literature there are not specific papers on the by-catch caused by this type of gears. Older works report the capture of cetaceans, sharks, birds and turtles by the driftnets used in the past to catch large pelagic species or by other drifting gears like long-lines (Tudela, 2004; EC COM (2012) 665 final). There are no references to the nets fishing for species not listed in the Annex VII of Council Regulation (EC) n. 894/97.

Council Regulation (EC) n. 812/2004, laying down measures concerning incidental fishing of cetaceans, does not provide for a specific monitoring program for SSD in the Mediterranean to be implemented by each Member State. The communications 368/2009 and 578/2011 from the Commission to the European Parliament and the Council on the implementation of certain provisions of Council Regulation (EC) n. 812/2004 confirms the lack of information about the by-catch of these organisms in the Mediterranean. Although it is claimed that there are scientific evidences in other areas from at-sea monitoring schemes or from post-mortem analysis of stranded animals of existing conflicts between cetacean and fisheries, currently they can not be related with the use of SSD.

Table 2.2.2 - Summary of the historical information collected concerning Small-Scale Driftnets in EU Mediterranean waters.

Target species	GFCM Subarea	Fishing period	By catch info	Net measures	References	Reference period
Sardina pilchardus	GSA 17		NA		Scaccini, 1974	years before 1974
Sardina pilchardus	GSA 17	June-September	NA		Granzotto et al., 2001	years before 2001
Sardina pilchardus	GSA 17	Arpila-August	NA		Granzotto et al., 2001	years before 2001
Sardina pilchardus	GSA 17		NA		AA.VV., 1985	1974-1982
Sardina pilchardus	GSA 17	May-Septmber	NA		AA.VV., 2008	2008
Engraulis encrasicolus	GSA 17	April-July	NA		AA.VV., 2008	2008
Scomber spp.	GSA 17		NA	50 m length; 5 m height	AA.VV., 2008	2008
Sardina pilchardus	GSA 17		NA		Bombace et al., 1993	1975-1991
Engraulis encrasicolus	GSA 17		NA		Bombace et al., 1993	1975-1991
Sarda sarda	GSA 9	May-Septmber	NA	less than 2 km length and less than 100 mm opening	Cannas at al., 2001; Sassu et al., 2001	2000-2001
Sardina pilchardus	GSA 10 and GSA 16	May-June	NA	less than 2 km length and less than 100 mm opening	Cannas at al., 2001; Sassu et al., 2001	2000-2001
Engraulis encrasicolus	GSA 10 and GSA 16	May-June	NA	less than 2 km length and less than 100 mm opening	Cannas at al., 2001; Sassu et al., 2001	2000-2001
Auxis rochei	GSA 10 and GSA 16	May-June	NA	less than 2 km length and less than 100 mm opening	Cannas at al., 2001; Sassu et al., 2001	2000-2001
Coryphaena hyppurus	GSA 10 and GSA 16	May-June	NA	less than 2 km length and less than 100 mm opening	Cannas at al., 2001; Sassu et al., 2001	2000-2001
Oblada melanura	GSA 19	June-July	NA	less than 2 km length and less than 100 mm opening	Cannas at al., 2001; Sassu et al., 2001	2000-2001
Sarda sarda	GSA 19	June-July	NA	less than 2 km length and less than 100 mm opening	Cannas at al., 2001; Sassu et al., 2001	2000-2001
Salpa salpa	GSA 19	June-July	NA	less than 2 km length and less than 100 mm opening	Cannas at al., 2001; Sassu et al., 2001	2000-2001
Seriola dumerilli	Italian GSAs	spring and summer	NA	less than 2 km length and less than 100 mm opening	Cannas at al., 2001; Sassu et al., 2001	2000-2001
Boops boops	Italian GSAs	spring and summer	NA	less than 2 km length and less than 100 mm opening	Cannas at al., 2001; Sassu et al., 2001	2000-2001
Trachurus spp.	Italian GSAs	spring and summer	NA	less than 2 km length and less than 100 mm opening	Cannas at al., 2001; Sassu et al., 2001	2000-2001
Engraulis encrasicolus	GSA 10	late spring	NA	150/350 m length; 10/20 m height; 25/26 mm mesh size	Colloca et al., 2002 and 2004	1994-2001
Oblada melanura	GSA 10	April-August	NA	1500/2500 m length; < 180 mm mesh size	Battaglia et al., 2010	1994-2003
Boops boops	GSA 10	April-August	NA	1500/2500 m length; < 180 mm mesh size	Battaglia et al., 2010	1994-2003
Oblada melanura	GSA 15	November-February	NA		De Leiva et al., 1998	1997-1998
Scombridae	GSA 15	November-February	NA		De Leiva et al., 1998	1997-1998
Seriola dumerilli	GSA 6	November-January	NA		Urbistondo, 2001	1987-2001
Sarda sarda	GSA 6	April-December	NA		Urbistondo, 2001	1987-2001
Sarda sarda	GSA 1	all year	NA		Urbistondo, 2001	1987-2001
Sarda sarda	GSA 6	October-April	NA		Urbistondo, 2001	1987-2001
Auxis rochei	GSA 1	June-October	NA		Urbistondo, 2001	1987-2001
Auxis rochei	GSA 3	all year	NA		Urbistondo, 2001	1987-2001
Seriola dumerilli	GSA 6		NA		Garcia-Rodriguez et al., 2006	1994-2003
Scombridae	GSA 6		NA		Garcia-Rodriguez et al., 2006	1994-2003
Engraulis encrasicolus	GSA 19	spring and summer	NA	150/350 m length; 10/20 m height; 25/26 mesh size	Sanfilippo et al., 2011	2011
Engraulis encrasicolus	GSA 10	spring and summer	NA	506 m length; 25,32 m height	Ferretti et al., 1995	years before 1995
Sardina pilchardus	GSA 18	winter	NA	48/126 m length; 7,87/19,58 m height; 30/32 mm mesh size	Ferretti et al., 1995	years before 1995
Sardina pilchardus	GSA 10	winter	NA	297.5 length; 22,40 m height; 32 mm mesh size	Ferretti et al., 1995	years before 1995
Sardinella aurita	GSA 10	winter and spring	NA	400/500 m length; 15/18.5 m height; 30/37 mm mesh size	Ferretti et al., 1995	years before 1995
Boops boops	GSA 10	autumn	NA	400 m length; 18.5 m height; 37 mm mesh size	Ferretti et al., 1995	years before 1995
Scomberesox saurus	GSA 10	spring	NA	120 m length; 20 m height; 40 mm mesh size	Ferretti et al., 1995	years before 1995
Oblada melanura	GSA 18	spring and autumn	NA	45/90 m length; 8.4/15 m height; 56/60 mm mesh size	Ferretti et al., 1995	years before 1995
Oblada melanura	GSA 18	autumn	NA	300 m length; 12/18 m height; 60 mm mesh size	Ferretti et al., 1995	years before 1995
Oblada melanura	GSA 18	autumn and winter	NA	75 m length; 6/15 m height; 60 mm mesh size	Ferretti et al., 1995	years before 1995
Boops boops	GSA 19	autumn	NA	400 m length; 29 m height; 58 mm mesh size	Ferretti et al., 1995	years before 1995
Scomber spp.	GSA 19		NA	2500 m length; 18 m height; 60 mm mesh size	Ferretti et al., 1995	years before 1995
Scomber spp.	GSA 18		NA	120 m length; 6 m height; 60 mm mesh size	Ferretti et al., 1995	years before 1995
Mugil sp.	GSA 18	summer and autumn	NA	66.7 m length; 5.6/7.6 m height; 56/64 mm mesh size	Ferretti et al., 1995	years before 1995
Scomber spp.	GSA 9		NA	48.75 m length; 6.5 m height; 65 mm mesh size	Ferretti et al., 1995	years before 1995
Oblada melanura	GSA 9	spring and autumn	NA	635 m length; 17.5 m height; 70 mm mesh size	Ferretti et al., 1995	years before 1995
Auxis rochei	GSA 10	summer	NA	250 m length; 19 m height; 70 mm mesh size	Ferretti et al., 1995	years before 1995
Seriola dumerilli	GSA 10	autumn	NA	1050 m length; 32.4 m height; 80/84 mm mesh size	Ferretti et al., 1995	years before 1995
Auxis rochei	GSA 18	spring and autumn	NA	300 m length; 13.2/16.6 m height; 88 mm mesh size	Ferretti et al., 1995	years before 1995
Scomber spp.	GSA 10	April-August	NA	105 m length; 17.6 m height; 88 mm mesh size	Ferretti et al., 1995	years before 1995
Auxis rochei	GSA 10	April-November	NA	2000 m length; 18 m height; 90 mm mesh size	Ferretti et al., 1995	years before 1995
Auxis rochei	GSA 10	April-August	NA	600/2700 m length; 21.9/21.2 m height; 106 mm mesh size	Ferretti et al., 1995	years before 1995
Sarda sarda	GSA 10	September-October	NA	264/720 m length; 13.2/21.2 m height; 106/132 mm mesh size	Ferretti et al., 1995	years before 1995
Sarda sarda	GSA 19	March-June/September-October	NA	750 m length; 18/24 m height; 120/160 mm mesh size	Ferretti et al., 1995	years before 1995
Sarda sarda	GSA 9	March-June/September-October	NA	4800 m length; 25.2 m height; 125 mm mesh size	Ferretti et al., 1995	years before 1995
Sarda sarda	GSA 18	spring and autumn	NA	220 m length; 15.84 m height; 160 mm mesh size	Ferretti et al., 1995	years before 1995
Cheilopogon heterurus	GSA 1 and GSA 6	May-September	NA	900/1400 m length; 40 mm mesh size	Cortés and Manrubia, 2003	years before 2003
Dactylopterus volitans	GSA 1 and GSA 6	May-September	NA	900/1400 m length; 40 mm mesh size	Cortés and Manrubia, 2003	years before 2004
Sardina pilchardus	GSA 1 and GSA 6	April-September	NA	30/40 mm mesh size	Cortés and Manrubia, 2003	years before 2005
Chelon labrosus	GSA 9	April-October	NA	700 m length; 14 m height; 8 cm mesh size	Baino and Silvestri, 1987	1982-1986
Liza aurata	GSA 9	April-October	NA	700 m length; 14 m height; 8 cm mesh size	Baino and Silvestri, 1987	1982-1986

To better understand the possible impact of driftnets on cetaceans, the Italian "Stranding Databank" has been analysed. Stranding data of marine mammals from Italian coasts are being regularly collected on a national basis since 1986 by the Centro Studi Cetacei. The Italian Stranding Data Bank of marine mammals and the Italian Monitoring Network have been created from the input of the Italian Ministry of the Environment with the collaboration of the University of Pavia, the Natural History Museum of Milan and the University of Padova that also runs the Marine Mammals Tissue Bank and a Cetacean Emergency Response Team. The network managed the monitoring of Italian coasts and the study of the stranded and by-catch animals. In recent years other organizations began to be concerned with stranding and created their own local stranding network. Several Institutions, Associations, Research Centres, NGOs joined this initiative. Among them we can mention, ACCOBAMS, PELAGOS, several Italian Ministries, Port Authorities, the Pelagos Sanctuary and the Italian Military Marine. The whole system is now managed by these institutions in cooperation with the Ministry of Health with its network of Experimental institutes of zooprophylaxis.

Thanks to the availability of the University of Pavia the "Stranding Databank" (http://www.unipv.it/cibra/spiaggiamenti.html; http://www.unipv.it/cibra) was consulted.

At present this database contains 4324 records of sightings of marine mammals (a total of 4441 specimens was recorded). In the majority of cases the records refer to strandings of a sinlge specimen. The analysis of the database allowed selecting 630 records mentioning incidental catches due to fishing gears: 580 out of

the 630 records did not mention the typology of the fishing gear and of the remaining 50 records, 44 are referred to set nets, 3 to longlines, 2 to purse seines for tunas and one to trawl nets.
As concerns the 44 records of incidental catches due to set nets, 29 are referred to generic "pelagic driftnets" (without more specifications), 7 to trammel nets and the remaining 8 don't have more details.
As regards the sightings of incidental catches due to pelagic driftnets, Tab. 2.2.3 resumes the species composition of those 29 records: the spermwhale, *P. macrocephalus* is the most frequently recorded species, followed by *S. coeruleolaba* and *Ziphius cavirostris*.

Table 2.2.3 – Species composition of the records of incidental catches due to generic "pelagic driftnets" along Italian coasts (source http://www.unipv.it/cibra/spiaggiamenti.html; http://www.unipv.it/cibra).

Species	n° of records
Balaenoptera physalus	1
Globicephala melas	1
Grampus griseus	2
Physeter macrocephalus	17
Stenella coeruleoalba	4
Ziphius cavirostris	4
Total	29

Following the discussions made during the second DRIFTMED plenary meeting, an investigation was made to further clarify about a record of incidental catches of seabirds appeared in the Report of the Working Group on Seabird Ecology (WGSE), March 10^{th}-14^{th} 2008, p. 67. This document reported the incidental catch of up to 500 Yelkouan shearwaters in Greece due to a single driftnet. The report also appeared in the paper Zydelis *et al*. (2013), as a reference to ICES report. This incident also appeared in the Journal of the Greek Ornithological Society (n. 50, Oct-Nov 2012, p. 22-23) but no net type was reported.
During DRIFTMED project we managed to find and contact directly the person who is responsible for the actual report, Mrs. Adamantopoulou Stella from The Hellenic Society for the Study and Protection of the Monk Seal. Mrs Adamantopolou informed us that likely this record was not related to driftnets but to trawling or purse-seining. Therefore this information seems rather contradictory and it is impossible to associate a specific gear to this catch.

EU FLEET REGISTER DATA

The EU Fleet Register is an open access database where all the fishing vessels flying the flag of a Member State are registered in accordance with Community legislation.
Data for the vessels associated to the fishing type "GND" (Driftnets) have been extracted for the EU Mediterranean Countries, taking into account the information stored in the website of the EU Fleet Register (http://ec.europa.eu/fisheries/fleet/index.cfm).
The criteria adopted for the extraction of data were the following:
- the search was carried out country by country (Spain, France, Italy, Malta, Slovenia, Greece, and Cyprus);
- the fishing type "GND" vas selected as "MAIN" gear and "SECOND" gear;

As concerns France and Spain, the vessels belonging to non Mediterranean ports were deleted from the selected data
Data collected from the "MAIN" gear selection were added to those coming from "SECOND" gear selection.
A few cases, concerning the data of the Italian vessels, of duplications of records were detected (e.g. the same vessel was found two times in the database, being associated to GND both as primary and secondary

gear). Double records for the same vessels were eliminated from the extracted data set, to avoid double counting.

- three data sets were extracted, referring to three temporal windows, using the option "LAST EVENT ONLY" and "ACTIVE AS A DATE". Three dates were selected: Dec 31st 2002, Dec 31st 2007 and Dec 31st 2012. This allowed investigating some temporal trend in the fleets stored in the EU Fleet Register.

The analyses of these data give an idea only of the potentiality of the use of small-scale driftnets, not of the real use of these gears. Almost all fishing vessels have a license for more than one gear; therefore GND can be one of the gears potentially used, alternating with other fishing types. GND could be also registered by third, fourth or *nth* gear. In this case, the information is not detected by the EU Fleet register data.
On the basis of this analysis, the total number of active vessels, updated to December 31st 2012, which are allowed (according to their fishing licenses and the attribution as "main" and "second" gear) to use driftnets in the EU Mediterranean countries is 480 (Fig. 2.2.1). The bulk of the fleet is concentrated in Italy (467 vessels, around 97%), whereas France (8 vessels), Slovenia (4) and Greece (1) exhibit the rest of the fleet. As concerns Greece, all driftnets are currently forbidden: the investigations made within DRIFTMED revealed that the EU Fleet Register record is likely an erroneous entry.
The predominance of Italy for the GND fleet is evident also when Gross Tonnage (GT) and engine power (kW) are taken into account (Fig. 2.2.2).

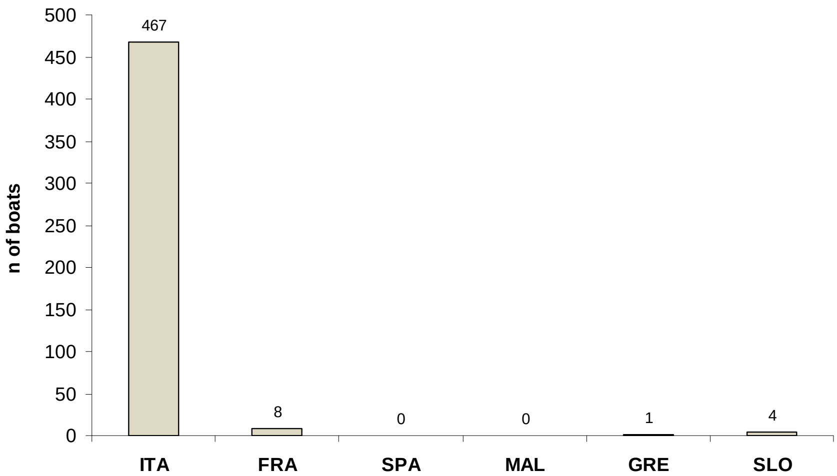


Figure 2.2.1 - Number of vessels associated with the GND fishing type in the Mediterranean EU waters updated to December 31st 2012 (data from EU Fleet Register).

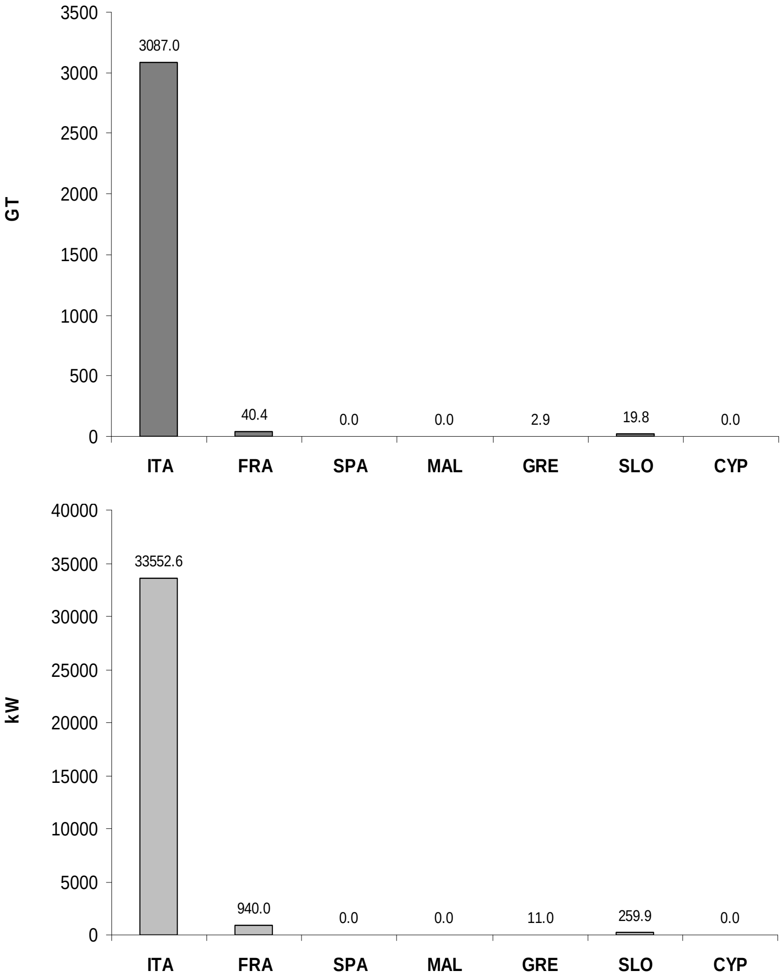
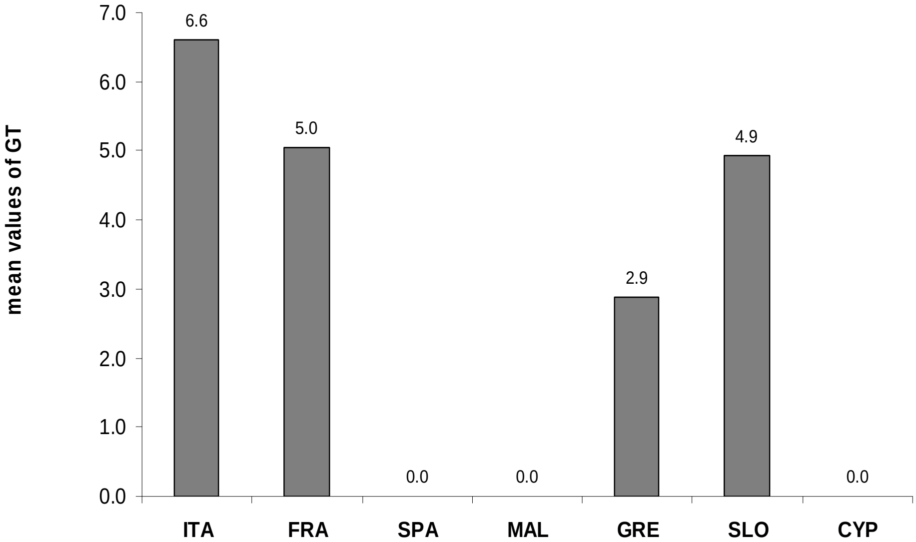


Figure 2.2.2 - Gross tonnage (above) and engine power (below) of the vessels associated to GND gear in EU Mediterranean countries (data from EU Fleet Register, updated to December 31st 2012).

In the countries reporting vessels using GND, the mean size of these vessels is small: the average gross tonnage ranges between 2.9 GT (Greece) to 6.6 (France) (Fig. 2.2.3). A similar pattern is shown by the average kW values: they are comprised between 11.0 (Greece) and 117.5 (France).



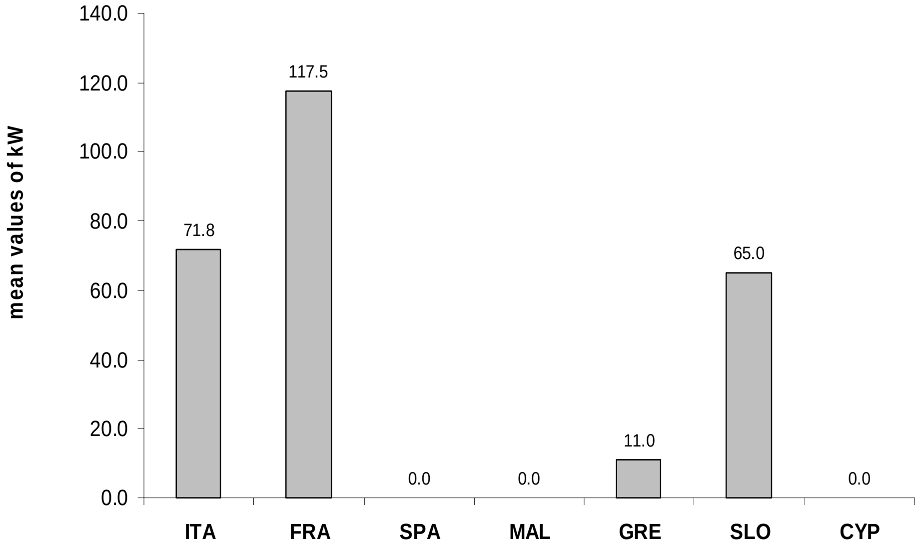


Figure 2.2.3 - Average values of Gross Tonnage (above) and engine power (below) of the vessels associated to GND gear in EU Mediterranean countries (data from EU Fleet Register, updated to December 31st 2012).

As concerns the temporal evolution of the GND fleet, Fig. 2.2.4 shows that in this short time period (2002-2012) the distribution of the vessels among the Mediterranean countries remained the same; for Italy it is noticeable a progressive decrease of the number of vessels, from 569 to 467.

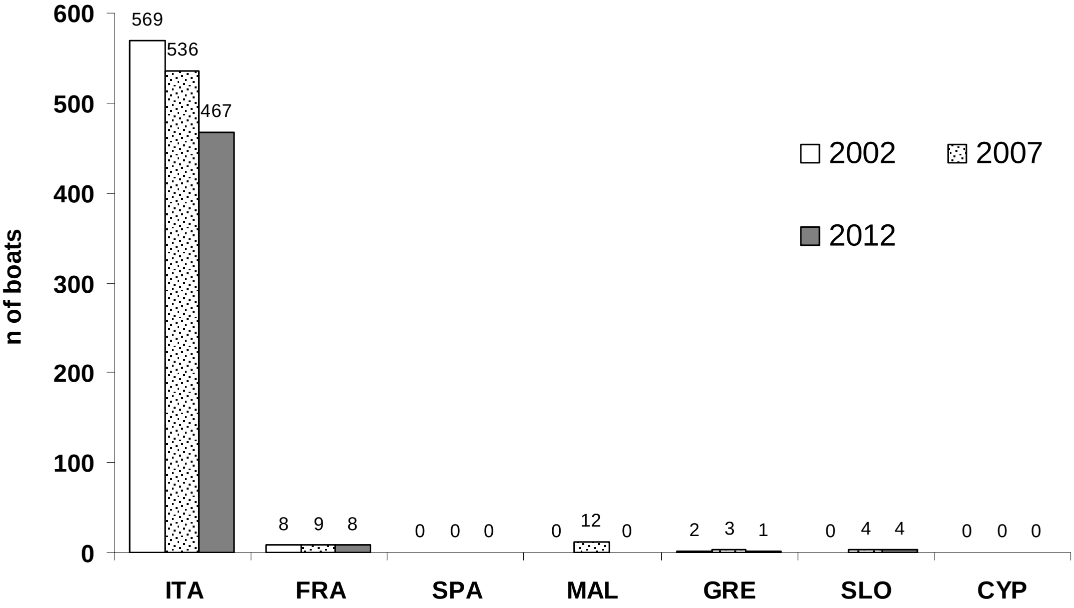


Figure 2.2.4 - Number of vessels associated with the GND fishing type in the Mediterranean EU waters updated to December 31st 2012 (data from EU Fleet Register).

Tab. 2.2.4 shows the main characteristics of the current GND fleets, according to each GSA and country. It is evident that the GND vessels are mostly distributed in the south-western part of Italy, mainly GSA10 and GSA19 (southern Tyrrhenian Sea, eastern Sicily and western Ionian Sea), with 264 and 99 vessels, respectively. It is also evident the dispersion of this fleet in a great number of harbours (141), as reported in the next paragraph. The numbers of Tab. 2.2.4 concerning the size of the vessels, even rather heterogeneous, highlight that this fleet is composed by small-scale vessels.

Table 2.2.4 - Main characteristics of the vessels associated with the GND fishing type (both as main and second gear) in the Mediterranean EU waters updated to December 31st 2012 (data from EU Fleet Register).

GSA	Country	Harbors	n. vessels	GT			LOA (m)			kW		
				tot	mean	SD	tot	mean	SD	tot	mean	SD
7	France	8	8	40.4	5.0	5.4	73.3	9.2	2.8	940.0	117.5	62.7
9	Italy	16	47	370.0	7.9	6.5	515.8	11.0	3.3	4533.1	96.4	60.5
10	Italy	51	264	1282.0	4.9	6.6	2340.5	8.9	3.1	14728.5	55.8	56.6
11	Italy	5	13	137.0	10.5	15.0	141.0	10.8	4.5	1580.0	121.5	78.7
16	Italy	7	16	153.0	9.6	19.4	145.2	9.1	4.9	1195.9	74.7	137.4
17	Italy	12	17	74.0	4.4	6.3	135.4	8.0	2.7	1483.6	87.3	57.3
	Slovenia	2	4	19.8	4.9	4.8	35.3	8.8	4.1	259.9	65.0	41.6
18	Italy	5	11	37.0	3.4	3.3	88.1	8.0	2.5	701.7	63.8	80.6
19	Italy	23	99	1034.0	10.4	13.7	1114.8	11.3	3.8	9330.0	94.2	93.6
22	Greece	1	1	2.9	2.9	-	8.3	8.3	-	11.0	11.0	-

The following tables (Tabs. 2.2.5 - 2.2.14) summarize the information on the current GND fleets according to each Country, GSA and Administrative harbour.

Table 2.2.5 - Main characteristics of the vessels associated with the GND fishing type (both as main and second gear) in the GSA9, according to Administrative Regions and harbours (data from EU Fleet Register, updated to December 31st 2012).

GSA	Region	Harbors		GT		kW		LOA	
			Vessels	Mean	SD	Mean	SD	Mean	SD
GSA9	LIGURIA	ALASSIO	1	1.0	-	59.0	-	8.5	-
		CHIAVARI	2	3.5	0.7	72.8	9.5	9.7	1.1
		GENOVA	2	1	0.0	10.0	6.4	4.9	0.4
		IMPERIA	13	7.2	3.8	97.6	62.7	11.2	2.3
		LOANO	1	1	-	32.3	-	6.6	-
		SAN REMO	4	4	0.0	99.4	18.5	9.8	0.9
		SESTRI LEVANTE	1	1	-	25.0	-	6.4	-
		VENTIMIGLIA	1	5	-	60.0	-	11.0	-
	TOSCANA	FOLLONICA	1	3.0	-	41.0	-	8.5	-
		MARINA DI CARRARA	1	1.0	-	17.5	-	4.5	-
		PORTOFERRAIO	2	4.0	1.4	66.8	24.4	9.7	1.6
	LAZIO	CIVITAVECCHIA	1	17.0	-	142.0	-	15.0	-
		FORMIA	3	15.7	11.0	151.0	51.4	13.2	2.7
		PONZA	12	13.8	5.1	143.7	44.1	14.2	1.9
		ROMA	1	1.0	-	-	-	7.7	-
		TORVAIANICA	1	1.0	-	14.0	-	5.3	-

Table 2.2.6 - Main characteristics of the vessels associated with the GND fishing type (both as main and second gear) in the GSA10, according to Administrative Regions and harbours (data from EU Fleet Register, updated to December 31st 2012).

GSA	Region	Harbors		GT		kW		LOA	
			Vessels	Mean	SD	Mean	SD	Mean	SD
GSA 10	CAMPANIA	ACCIAROLI	8	3.5	3.2	58.8	53.3	8.0	2.7
		AMALFI	4	1.5	0.6	22.1	29.9	6.1	2.0
		BAIA	2	4.0	4.2	42.5	60.1	8.2	5.2
		CASTELLAMMARE DI STABI/	1	5.0	-	66.0	-	9.9	-
		CETARA	2	3.5	3.5	26.8	19.2	8.3	2.7
		FORIO D'ISCHIA	4	1.3	0.5	23.9	5.2	7.1	0.5
		GAETA	2	11.0	1.4	88.3	12.5	11.2	1.1
		ISCHIA	27	3.5	2.3	53.2	34.4	9.0	1.6
		MAIORI	2	4.0	2.8	37.1	25.5	8.9	1.5
		MARINA DI CAMEROTA	5	8.6	11.3	82.2	76.0	10.4	3.5
		MARINA DI PISCIOTTA	1	1.0	-	17.6	-	7.0	-
		MASSALUBRENSE	9	1.4	0.7	18.1	11.7	6.7	1.4
		META DI SORRENTO	1	1.0	-	0.0	-	4.7	-
		MONDRAGONE	1	1.0	-	7.4	-	6.1	-
		PALINURO	3	3.0	3.5	39.2	67.8	6.2	3.4
		PIANO DI SORRENTO	5	2.0	0.7	23.2	18.6	7.4	1.0
		PORTICI	1	31.0	-	316.0	-	19.4	-
		POSITANO	2	3.5	0.7	50.0	4.2	9.1	0.6
		POZZUOLI	5	2.6	0.9	50.2	26.5	8.4	1.2
		PROCIDA	1	1.0	-	11.2	-	6.9	-
		SALERNO	15	5.5	7.3	74.2	54.4	9.0	3.1
		SANTA MARIA DI CASTELLA	9	2.8	2.5	33.6	30.4	7.8	2.0
		SAPRI	2	1.0	0.0	44.5	51.5	7.3	0.2
		SCARIO	3	2.3	1.5	24.5	16.2	7.4	1.5
		SORRENTO	8	6.1	6.5	90.9	58.8	10.1	2.6
		TORRE ANNUNZIATA	15	1.9	0.6	24.2	11.0	7.6	1.4
		TORRE DEL GRECO	2	3.0	0.0	30.9	6.2	8.0	0.5
		VICO EQUENSE	9	1.4	1.0	12.6	17.9	5.8	1.7
		VIETRI SUL MARE	2	2.0	0.0	29.0	17.0	9.6	3.4
	CALABRIA	BAGNARA	13	9.9	10.1	104.7	85.2	11.4	4.2
		CETRARO	2	3.0	2.8	23.5	33.2	8.9	2.5
		DIAMANTE	2	3.0	2.8	76.4	87.2	8.0	2.4
		PALMI	3	2.3	2.3	29.5	25.6	7.9	3.0
		PIZZO	1	1.0	-	0.0	-	4.2	-
		SCILLA	5	4.0	2.5	52.6	20.6	9.5	2.1
		TROPEA	3	1.7	1.2	15.8	9.1	6.5	1.4
		VIBO VALENTIA	6	2.3	1.2	22.6	17.2	7.8	1.8
	SICILY	BALESTRATE	2	1.0	0.0	15.1	3.6	7.0	0.7
		CEFALU'	13	7.8	4.8	76.5	36.3	11.5	2.8
		ISOLA DELLE FEMMINE	6	4.0	4.8	44.8	58.8	8.5	2.7
		LIPARI	16	9.8	7.0	117.9	71.9	11.6	3.0
		MILAZZO	4	17.8	21.8	113.0	94.6	11.9	6.6
		MONDELLO	3	3.3	2.1	48.0	26.8	9.7	2.5
		PALERMO	1	1.0	-	4.4	-	5.0	-
		PATTI MARINA	3	8.3	11.0	84.8	62.8	10.5	4.2
		PORTICELLO	9	8.0	12.1	59.7	81.1	9.2	4.7
		SALINA	2	7.0	2.8	83.8	6.0	10.9	0.7
		SANT'AGATA DI MILITELLO	7	9.1	8.6	96.1	64.8	11.2	3.3
		SANTO STEFANO DI CAMA!	2	1.5	0.7	15.3	15.9	6.5	1.9
		TERMINI IMERESE	7	2.1	1.2	27.0	21.3	7.4	1.8
		TORRE DI FARO	3	1.3	0.6	14.1	3.9	7.0	1.0

Table 2.2.7 - Main characteristics of the vessels associated with the GND fishing type (both as main and second gear) in the GSA11, according to Administrative Regions and harbours (data from EU Fleet Register, updated to December 31st 2012).

GSA	Region	Harbors		GT		kW		LOA	
			Vessels	Mean	SD	Mean	SD	Mean	SD
GSA 11	SARDINIA	BOSA	2	4.0	0.0	161.7	0.0	9.7	0.0
		CAGLIARI	3	27.7	26.0	171.7	112.2	15.1	6.6
		CALA GONONE	1	1.0	-	9.1	-	4.6	-
		ORISTANO	1	3.0	-	88.2	-	9.6	-
		SANT'ANTIOCO	6	7.0	5.9	107.4	68.5	10.4	3.6

Table 2.2.8 - Main characteristics of the vessels associated with the GND fishing type (both as main and second gear) in the GSA16, according to Administrative Regions and harbours (data from EU Fleet Register, updated to December 31st 2012).

GSA	Region	Harbors		GT		kW		LOA	
			Vessels	Mean	SD	Mean	SD	Mean	SD
GSA 16	SICILY	AVOLA	5	2.0	2.2	17.4	31.6	7.6	2.1
		LAMPEDUSA	1	6.0	-	121.3	-	11.0	-
		MARETTIMO	1	1.0	-	13.2	-	5.7	-
		MARSALA	3	20.7	34.1	186.6	297.4	10.6	8.6
		MAZARA DEL VALLO	3	5.0	6.9	58.8	76.5	8.7	3.6
		SCIACCA	1	57.0	-	220.0	-	19.8	-
		SCOGLITTI	2	1.0	0.0	9.2	13.0	6.5	1.2

Table 2.2.9 - Main characteristics of the vessels associated with the GND fishing type (both as main and second gear) in the GSA17 (Italian side), according to Administrative Regions and harbours (data from EU Fleet Register, updated to December 31st 2012).

GSA	Region	Harbors		GT		kW		LOA	
			Vessels	Mean	SD	Mean	SD	Mean	SD
GSA 17	FRIULI	MARANO LAGUNARE	2	1.0	0.0	59.3	15.2	6.7	0.2
	VENETO	PORTO LEVANTE	1	6.0	-	125.0	-	10.1	-
		PORTO TOLLE	1	2.0	-	147.0	-	7.9	-
		SCARDOVARI	2	9.0	8.5	144.4	3.7	9.6	3.0
		VENEZIA	1	1.0	-	42.0	-	7.6	-
	EMILIA	PORTO GARIBALDI	2	7.5	4.9	147.0	0.0	10.2	2.5
		RAVENNA	1	1.0	-	150.0	-	6.3	-
		RICCIONE	2	1.0	0.0	15.8	1.6	6.0	0.0
	MARCHE	FANO	1	23.0	-	147.0	-	15.0	-
		NUMANA	1	1.0	-	18.4	-	6.1	-
		PORTO SAN GIORGIO	1	1.0	-	14.7	-	6.6	-
	ABRUZZO	PESCARA	2	1.0	0.0	53.3	2.5	5.4	0.0

Table 2.2.10 - Main characteristics of the vessels associated with the GND fishing type (both as main and second gear) in the GSA18, according to Administrative Regions and harbours (data from EU Fleet Register, updated to December 31st 2012).

GSA	Region	Harbors		GT		kW		LOA	
			Vessels	Mean	SD	Mean	SD	Mean	SD
GSA 18	APULIA	BARLETTA	4	6.3	3.3	68.5	48.0	10.4	2.0
		BRINDISI	3	1.0	0.0	28.1	9.5	6.3	0.1
		MONOPOLI	1	6.0	-	283.2	-	10.0	-
		OTRANTO	2	1.0	0.0	23.9	7.8	6.0	0.0
		TRANI	1	1.0	-	12.5	-	5.4	-

Table 2.2.11 - Main characteristics of the vessels associated with the GND fishing type (both as main and second gear) in the GSA19, according to Administrative Regions and harbours (data from EU Fleet Register, updated to December 31st 2012).

GSA	Region	Harbors		GT		kW		LOA	
			Vessels	Mean	SD	Mean	SD	Mean	SD
GSA 19	SICILY	ACI CASTELLO	5	4.4	1.5	101.7	47.8	9.9	1.7
		AUGUSTA	3	3.7	2.9	38.8	40.1	9.8	1.7
		CATANIA	20	5.4	2.3	56.8	28.5	10.7	1.3
		GIARDINI	5	12.0	7.9	103.6	71.6	11.6	3.0
		MESSINA	4	6.8	4.2	80.5	57.9	10.3	3.1
		OGNINA	5	6.4	2.1	59.8	32.9	11.8	0.9
		PORTOPALO DI C. PASSERO	3	9.3	7.8	101.5	42.6	11.7	2.7
		POZZILLO	1	23.0	-	150.0	-	15.0	-
		RIPOSTO	9	10.1	11.3	104.5	104.0	10.3	4.5
		SANTA MARIA LA SCALA	10	33.6	27.8	246.1	181.9	16.1	4.3
		SIRACUSA	4	17.5	21.6	125.2	89.5	13.0	6.4
	CALABRIA	BIANCO	1	1.0	-	0.0	-	5.1	-
		BOVA MARINA	1	1.0	-	0.0	-	4.0	-
		CIRO' MARINA	4	5.0	2.8	81.9	53.9	11.2	1.2
		CROTONE	1	2.0	-	26.5	-	7.2	-
		MELITO DI PORTO SALVO	2	7.5	7.8	71.9	34.1	10.4	4.6
		REGGIO CALABRIA	2	1.0	0.0	6.8	9.6	5.7	0.3
		SOVERATO	1	1.0	-	0.0	-	4.4	-
	APULIA	CASTRO	1	1.0	-	18.0	-	5.8	-
		GALLIPOLI	4	3.8	3.4	34.9	42.9	8.5	4.0
		MARUGGIO	1	20.0	-	147.0	-	15.0	-
		TORRE CESAREA	11	13.5	7.3	112.5	23.1	13.6	2.0
		TRICASE	1	1.0	-	18.3	-	5.8	-

Table 2.2.12 - Main characteristics of the vessels associated with the GND fishing type (both as main and second gear) in GSA7 (data from EU Fleet Register, updated to December 31st 2012).

GSA	Region	Harbors		GT		kW		LOA	
			Vessels	Mean	SD	Mean	SD	Mean	SD
GSA 7		AJACCIO	1	16.6	-	110.0	-	14.0	-
		MARSEILLE	1	4.4	-	184.0	-	10.2	-
		MARTIGUES	1	1.9	-	73.0	-	6.4	-
		PORT VENDRES	1	4.4	-	147.0	-	9.0	-
		SÉTE	2	1.0	0.5	52.5	74.2	7.1	1.9
		TOULON	2	5.6	5.3	160.5	50.2	9.7	3.1

Table 2.2.13 - Main characteristics of the vessels associated with the GND fishing type (both as main and second gear) in the GSA17 (Slovenian side) (data from EU Fleet Register, updated to December 31st 2012).

GSA	Region	Harbors		GT		kW		LOA	
			Vessels	Mean	SD	Mean	SD	Mean	SD
GSA 17		IZOLA	1	4.6	-	66.2	-	9.7	-
		KOPER	3	5.1	5.8	64.6	50.9	8.5	5.0

Table 2.2.14 - Main characteristics of the vessels associated with the GND fishing type (both as main and second gear) in the GSA22 (data from EU Fleet Register, updated to December 31st 2012).

GSA	Region	Harbors		GT		kW		LOA	
			Vessels	Mean	SD	Mean	SD	Mean	SD
GSA 22		KAMENA BOURLA	1	2.88	-	11.03	-	8.3	-

DATA CALL FOR GND DCF DATA

One of the objectives of Task 1.2 was the collection and review of the DCF data concerning the GND segment, in order to extract all the useful information for this task. These data sets were used to characterise the Small-scale Driftnet fisheries in the European Mediterranean countries as regards the main gear (GND fisheries) and possible secondary gears (all the others e.g. GNS, GTR, etc.), by this way getting the relevant information to accomplish the Tasks 1.1, 1.2 (collecting existing information), 2.1 (identify the main sites for new data collection) and 3.4 of the DRIFTMED project (assessment of the use of fishing methods alternative to SSD to exploit the same resources). Data coming from Data Call were also used for the Deliverable 8 (Summary of the main characteristics of possible fishing methods alternative to SSD).
These data has been requested to the focal points of each EU Mediterranean Country, by means of an official Data Call, issued by DG MARE. On March 19th 2013 a request for data call for GND segment was sent by the MAREA scientific coordinator (Maria Teresa Spedicato, COISPA) to DGMARE.
The specifications of the mètier for the data requested are the follows:

• Driftnet [GND] Small pelagic fish GND_SPF_0_0_0
• Driftnet [GND] Demersal fish GND_DEF_0_0_0
• Trammel net [GTR] Demersal species GTR_DES_>=16_0_0
• Set gillnet [GNS] Small and large pelagic fish GNS_SLP_>=16_0_0
• Set gillnet [GNS] Demersal species GNS_DEF_>=16_0_0
• Purse seine [PS] Small pelagic fish PS_SPF_>=14_0_0
• Drifting longlines [LLD] Large pelagic fish LLD_LPF_0_0_0
• Set longlines [LLS] Demersal fish LLS_DEF_0_0_0

• Pots and Traps [FPO] Demersal species FPO_DES_0_0_0
• Fyke nets [FYK] Demersal species FYK_DES_0_0_0

The complete time series of the following data sets for the Mediterranean have been requested:
• Fisheries landings and discards at age data
• Fisheries landings at length data
• Fisheries discards at length data
• Fisheries effort data

The last week of June 2013, the DCF data were received from EU DGMARE offices.
As concerns GND fishing type, this database contained information only for the Slovenian sector of GSA17 and for GSA19 (Catania area), documenting driftnet fisheries for sardine in the first case and for anchovy in the second. This information follows the protocols of data collection and is consequent to the ranking system selection.

SUMMARY OF THE MAIN CHARACTERISTICS OF POSSIBLE FISHING METHODS ALTERNATIVE TO SSD

The critical review of Workpackage 1 was also carried out on the existing information of fishing methods other than SSD but exploiting the same resources.
On the basis of the target/by catch species of the Small Scale Driftnets (SSD) fisheries identified during the present study, seven fishing gears potentially alternative to driftnet (GND) in exploiting the same resources were identified (Tab. 2.2.15).
Data used come from DCF (Data Collection Framework, EU regulation 199/2008), obtained through the Data Call launched during DRIFTMED project at the beginning of March 2013; data refers to the period 2003-2011. In addition, data for fishing season 2012 (IREPA, 2012) were used.
Data were analysed in order to provide an overview of the main aspects of fishing effort, landings, seasonality and socio-economic parameters of these fisheries and to compare them with the related characteristics of the SSD fisheries identified in this project. This information was utilised for the analysis of Task 3.4 "Assessment of the use of fishing methods alternative to SSD to exploit the same resources".
The results of this analysis are also showed in the **Deliverable 8** "Summary of the main characteristics of possible fishing methods alternative to SSD".

Table 2.2.15 - Aggregation of Fishing Activity at various levels (FT_LVL) for Mediterranean and Black Sea regions (Appendix IV of the 2008/949/EC).

Level 1	**Level 2**	**Level 3**	**Level 4**	**Level 5**
Activity	**Gear classes**	**Gear groups**	**Gear type**	**Target assemblage**
Fishing Activity	**Hooks and Lines**	Longlines	Drifting longlines [LLD]	Large pelagic fish (LPF)
			Set longlines [LLS]	Demersal fish (DEF)
	Nets	Nets	Trammel net [GTR]	Demersal species (DEMSP)
			Set gillnet [GNS]	Small and large pelagic fish (SLPF)
				Demersal species (DEMSP)
			Driftnet [GND]	Small pelagic fish (SPF)
	Seines	Surrounding nets	Purse seine [PS]	Small pelagic fish (SPF)
				Large pelagic fish (LPF)
			Beach and boat seine [SB] [SV]	Demersal species (DEMSP)

Information on the annual fishing effort in terms of GT-days at sea and nominal effort (kW-days at sea) in five different Mediterranean countries (Italy, Slovenia, Malta, France, Greece), coming from DCF, is reported in Tab. 2.2.16. The fishing effort for the 2012 fishing season (only for Italy) is reported in Tab. 2.2.17 and includes also statistics concerning the boat seine (SB-SV), not available in DCF data.
According to the DCF data, information on GND fisheries are available for Italy and Slovenia only (Tab. 2.2.16), reporting the metier called "menaide" (GND_SPF, driftnet for small pelagic fish) targeting mainly anchovy. This is the result of the ranking system which selected the fishing segments for the data collection.
The following results and elaborations are based only on the Italian fleet, that is decisely more relevant compared to the Slovenian one.
The average fishing effort, expressed as GT effort (GT*days at sea) and the nominal effort (kW*days at sea), exerted by the single gear types were calculated throughout the period 2004-2012.

Fishing effort

In Italy, the fishing effort exerted by the GND fleets in the last nine years represents a very small percentage (near 1%) of the total national fishing effort, both in terms of GT and nominal effort (Fig. 2.2.5); only the effort of SB-SV fisheries is lower than GND (near 0.5%). The national fishing effort is mainly performed by four gears: GTR, GNS, LLD and PS (Fig. 2.2.6).

Table 2.2.16 – Total Annual fishing effort by gear types reported in five countries by DCF data (2003- 2011). GT= GT*days at sea; kW=kW*days at sea. Legend for the metiers as in Tab. 2.2.15.

	YEAR	GND		PS		LLD		LLS		GNS		GTR	
		GT	kW	GT	kW	GT	kW	GT	kW	GT	kW	GT	kW
ITALY	2003	-	-	-	-	-	-	-	-	-	-	-	-
	2004	70,750	1,113,415	1,727,928	11,424,237	2,979,554	13,996,502	623,251	11,263,939	1,080,555	15,719,723	1,706,616	22,525,893
	2005	43,446	356,359	1,072,769	7,652,927	1,652,790	10,096,189	382,764	5,895,675	1,167,660	18,325,266	1,382,995	19,569,557
	2006	97,991	1,225,247	1,143,578	7,174,124	1,278,665	7,926,542	459,903	5,776,171	949,066	14,311,563	1,463,073	20,088,883
	2007	66,099	720,288	1,252,852	7,573,222	1,646,015	9,747,327	418,989	5,064,731	828,477	12,043,902	1,235,585	16,517,514
	2008	56,876	736,022	1,138,180	6,646,098	1,336,911	8,718,495	359,871	4,434,235	691,159	10,623,126	1,003,994	14,289,333
	2009	43,517	696,830	1,038,760	6,197,632	1,072,163	7,508,432	302,226	3,880,156	820,371	12,738,819	1,111,802	15,607,161
	2010	43,337	737,686	809,478	4,803,131	1,385,327	9,504,995	317,048	4,398,903	809,869	11,991,892	1,114,141	16,095,956
	2011	32,442	579,980	849,338	4,818,979	1,051,151	7,227,050	350,814	4,397,324	858,834	13,863,206	1,184,211	16,458,635
	Mean	**56,807**	**770,728**	**1,129,110**	**7,036,294**	**1,550,322**	**9,340,692**	**401,858**	**5,638,892**	**900,749**	**13,702,187**	**1,275,302**	**17,644,117**
SLOVENIA	2003	-	-	-	-	-	-	-	-	-	-	-	-
	2004	-	-	-	-	-	-	-	-	-	-	-	-
	2005	1,338	28,906	14,479	140,936	-	-	95	1,670	37,218	542,314	36,557	655,610
	2006	200	2,090	17,441	170,593	-	-	395	5,537	37,537	501,493	35,371	636,565
	2007	162	1,727	14,230	167,796	-	-	28	175	40,914	561,257	73,766	1,420,701
	2008	280	3,538	12,347	137,800	-	-	16	81	61,525	1,104,997	97,443	1,895,691
	2009	79	2,731	22,338	230,722	-	-	72	851	64,574	1,198,877	129,870	2,312,745
	2010	28	450	21,261	211,540	-	-	53	442	79,136	1,570,878	120,635	2,214,051
	2011	103	2,711	19,367	192,829	-	-	29	322	64,677	1,217,191	-	3,067,681
	Mean	**313**	**6,022**	**17,352**	**178,888**	**-**	**-**	**98**	**1,297**	**55,083**	**956,715**	**82,274**	**1,743,292**
MALTA	2003	-	-	-	-	-	-	-	-	-	-	-	-
	2004	-	-	-	-	-	-	-	-	-	-	-	-
	2005	-	-	3,326	23,420	80,434	513,349	15,317	106,819	149	1,251	870	6,524
	2006	-	-	2,178	14,347	42,055	408,206	46,527	969,422	12,916	272,362	44,303	1,124,750
	2007	-	-	2,686	17,817	49,946	418,156	47,622	929,314	7,698	268,184	34,859	881,678
	2008	-	-	5,844	40,315	44,277	602,188	47,920	977,640	400	6,563	20,205	484,857
	2009	-	-	4,786	30,183	64,262	510,501	16,401	235,992	6,064	204,781	38,006	936,314
	2010	-	-	3,176	20,468	47,520	307,704	22,044	400,308	4,492	140,239	18,912	485,034
	2011	-	-	3,963	30,108	66,127	499,412	15,710	264,809	3,300	67,478	19,399	468,145
	Mean	**-**	**-**	**3,708**	**25,237**	**56,374**	**465,645**	**30,220**	**554,901**	**5,003**	**137,265**	**25,222**	**626,757**
FRANCE	2003	-	-	-	-	-	-	41,399	919,296	203,166	3,742,723	146,240	2,381,824
	2004	-	-	-	-	-	-	30,095	662,464	236,831	4,090,583	150,874	2,734,374
	2005	-	-	-	-	-	-	32,006	634,850	253,118	5,023,886	176,039	3,335,217
	2006	-	-	-	-	-	-	38,437	1,014,367	175,631	4,888,034	251,669	5,657,420
	2007	-	-	-	-	-	-	32,262	795,610	253,252	5,202,383	251,974	4,661,238
	2008	-	-	-	-	-	-	29,565	806,093	220,500	4,202,991	192,206	3,519,840
	2009	-	-	-	-	-	-	-	-	-	-	-	-
	2010	-	-	-	-	-	-	-	-	-	-	-	-
	2011	-	-	-	-	-	389	23,148	572,072	170,527	4,197,978	36,882	697,775
	Mean	**-**	**-**	**-**	**-**	**-**	**389**	**32,416**	**772,107**	**216,146**	**4,478,368**	**172,269**	**3,283,955**
GREECE	2003	-	-	2,103,553	10,114,735	-	-	341,114	2,013,877	-	-	11,905,618	101,847,029
	2004	-	-	2,111,136	10,015,045	-	-	621,271	5,675,556	-	-	11,009,661	96,181,312
	2005	-	-	2,525,731	10,403,838	-	-	629,936	3,139,396	-	-	10,889,803	95,556,107
	2006	-	-	2,297,621	9,618,985	-	-	861,630	5,150,517	-	-	10,080,496	86,241,910
	2007	-	-	-	-	-	-	-	-	-	-	-	-
	2008	-	-	2,085,582	8,848,802	-	-	1,641,004	11,401,461	-	-	7,573,352	68,748,594
	2009	-	-	-	-	-	-	-	-	-	-	-	-
	2010	-	-	-	-	-	-	-	-	-	-	-	-
	2011	-	-	-	-	-	-	-	-	-	-	-	-
	Mean	**-**	**-**	**2,224,725**	**9,800,281**	**-**	**-**	**818,991**	**5,476,161**	**-**	**-**	**10,291,786**	**89,714,990**

Table 2.2.17 – Total fishing effort by gear reported in Italy in 2012 (IREPA). GT= GT*days at sea; kW=kW*days at sea. Legend for the metiers as in Tab. 2.2.15.

GEAR	GT	kW
GND	34.604	613.332
GNS	786.882	12.489.888
GTR	1.057.373	15.199.209
LLD	1.100.476	7.892.003
LLS	331.415	4.133.442
PS	897.736	4.866.628
SB-SV	***22.070***	***247.075***

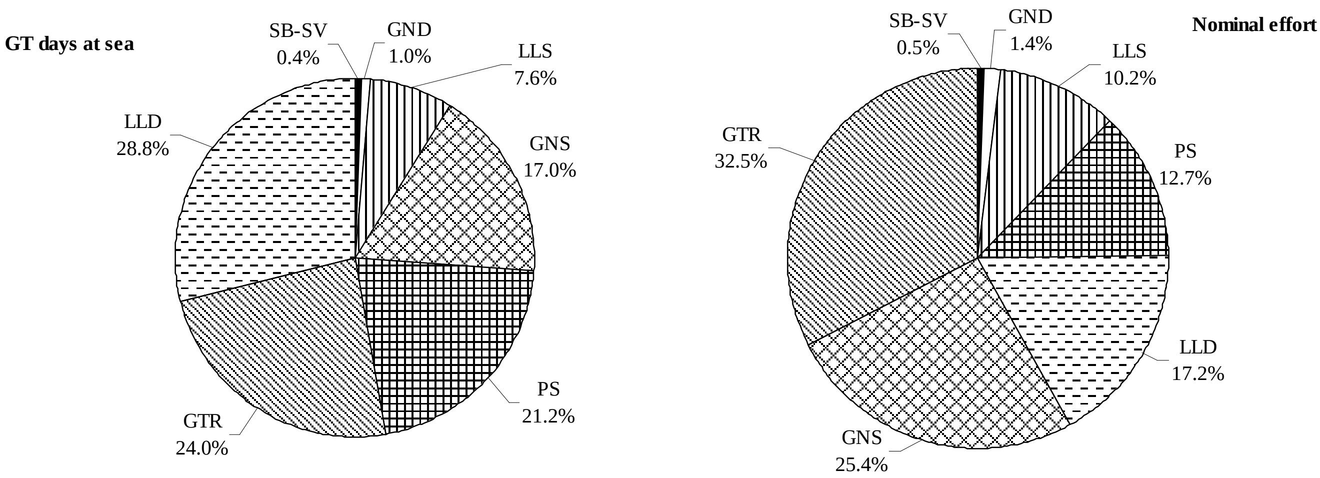


Figure 2.2.5 – Percentages of the fishing effort (averaged over 2004-12) of the seven gear types. Legend for the metiers as in Tab. 2.2.15.

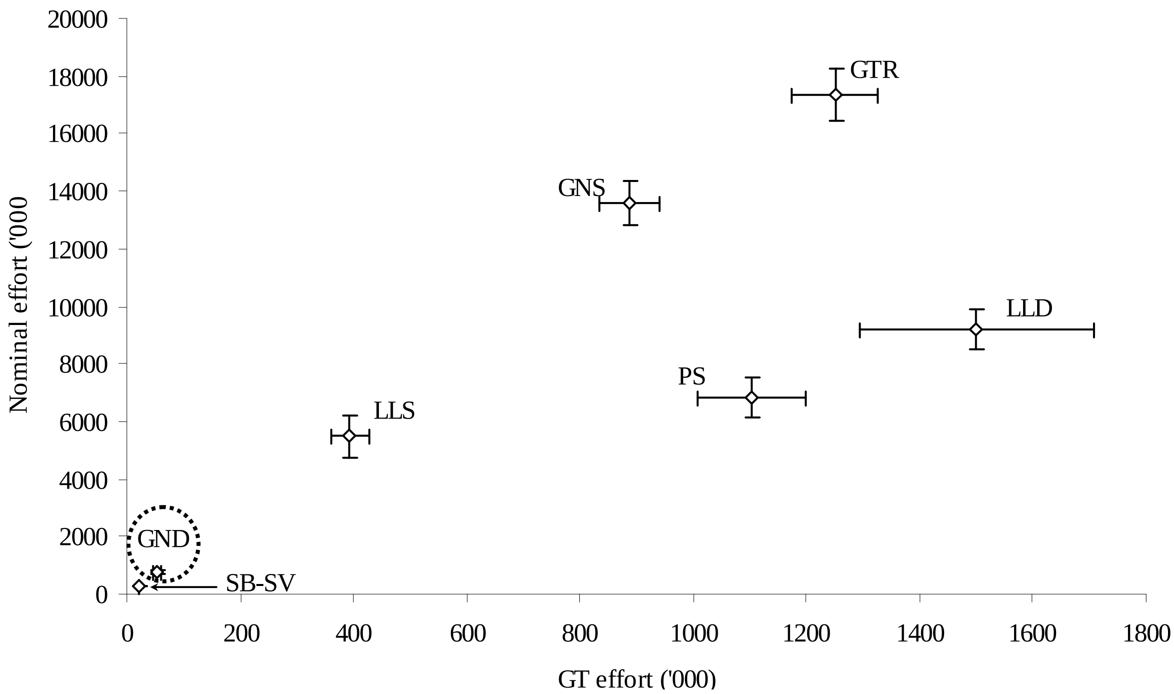


Figure 2.2.6 – GT/nominal effort relationships (averaged over 2004-12) of the gear types considered in Italy (bars indicate Standard Error). Legend for the metiers as in Tab. 2.2.15.

The fishing effort (GT vs Nominal effort) of each of the seven gear types in each GSA is shown in Fig. 2.2.7 and 2.2.8. GND is mainly present in GSA 10 and 19 and, to a lesser extent, in GSA 9 and 17 (Fig. 2.2.7).
The boat seine fisheries (SB-SV), referred to a single fishing season (2012), are mainly present in GSA 9, 10, 19 and to a lesser extent in GSA 11 (Fig. 2.2.7). GTR and GNS are often the main gears used by the "small-scale artisanal fishery". However, in some areas, the main effort is also performed by other kind of fisheries such as the PS in GSA 10, the LLS in GSA 18 and the LLD in GSA 19 (Fig. 2.2.8).

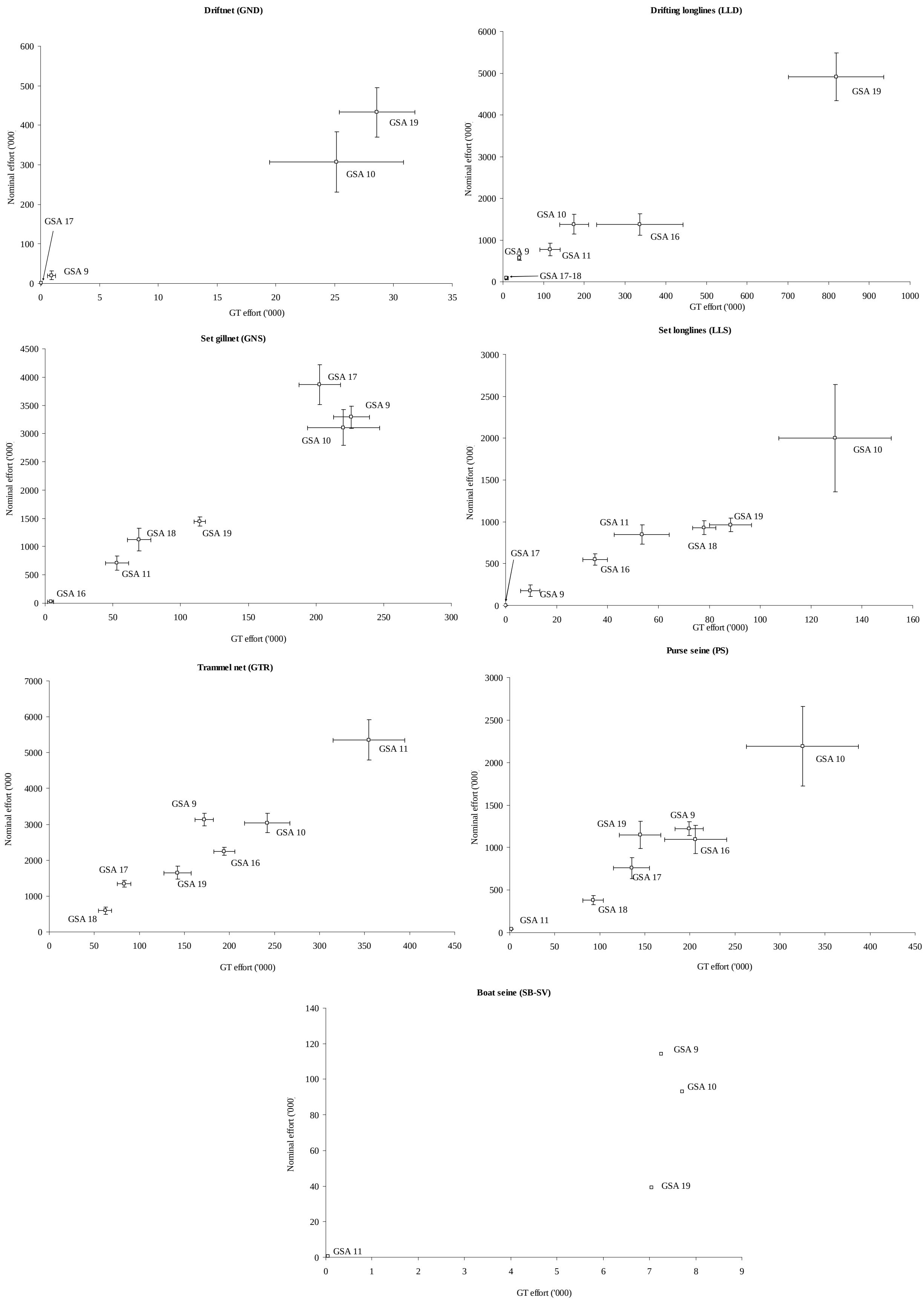


Figure 2.2.7 – GT/nominal effort relationships (averaged over 2004-2012) of the seven gear types considered (bars indicate Standard Error). Legend for the metiers as in Tab. 2.2.15.

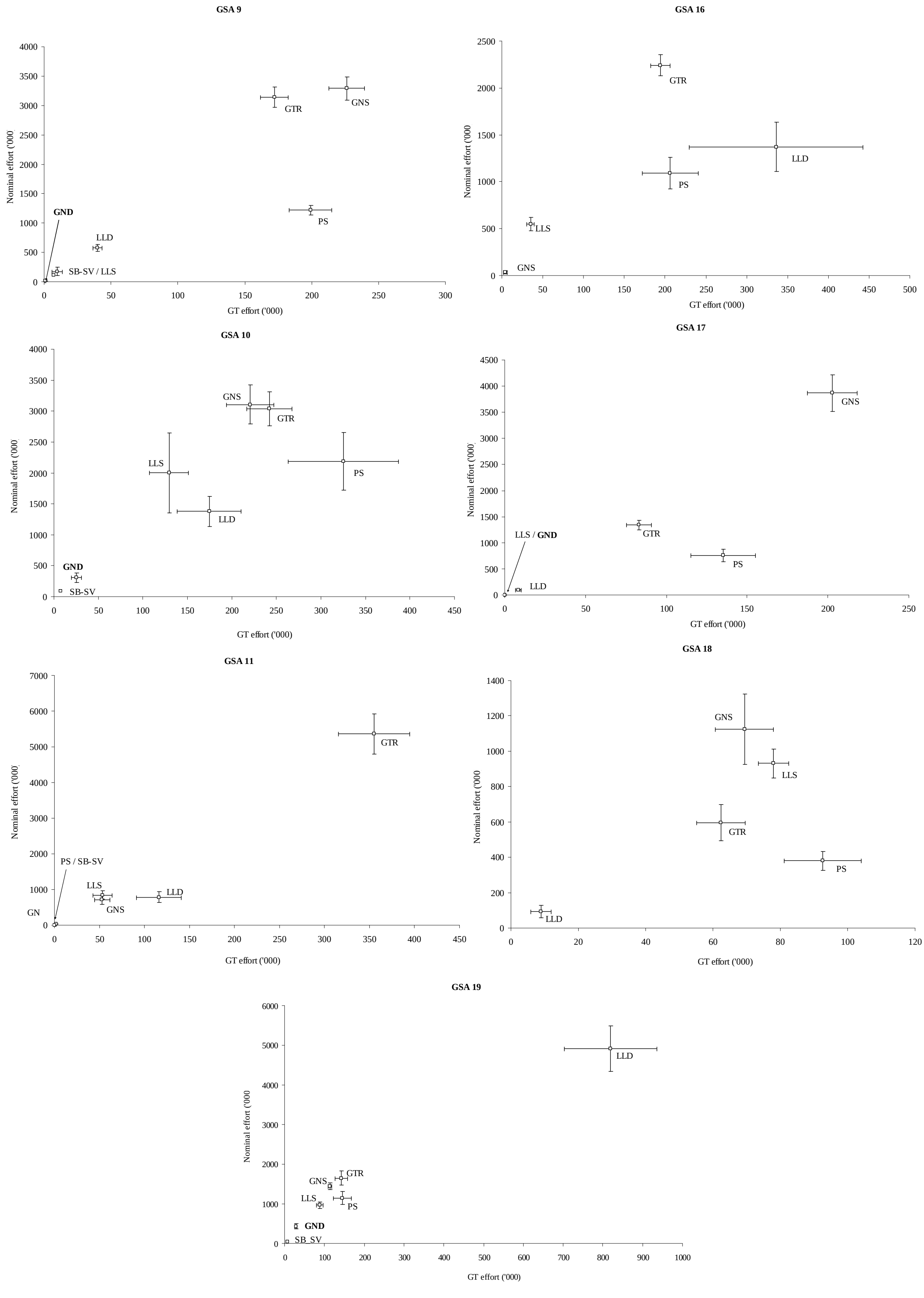


Figure 2.2.8 – GT/nominal effort relationships (averaged over 2004-2012) of the seven gear types by GSA (bars indicate Standard Error). Legend for the metiers as in Tab. 2.2.15.

The next analysis has been performed at a different aggregation level of fishing activity considering the single metiers (Targeting assemblage - Level 5, see Tab. 2.2.15).
As previously mentioned, the available DCF data for GND refer to only one metier (GND_SPF), namely the "menaide" driftnet, targeting anchovy and sardine; among the other gears, only the purse seine (PS_SPF) has the same target species (Fig. 2.2.9).

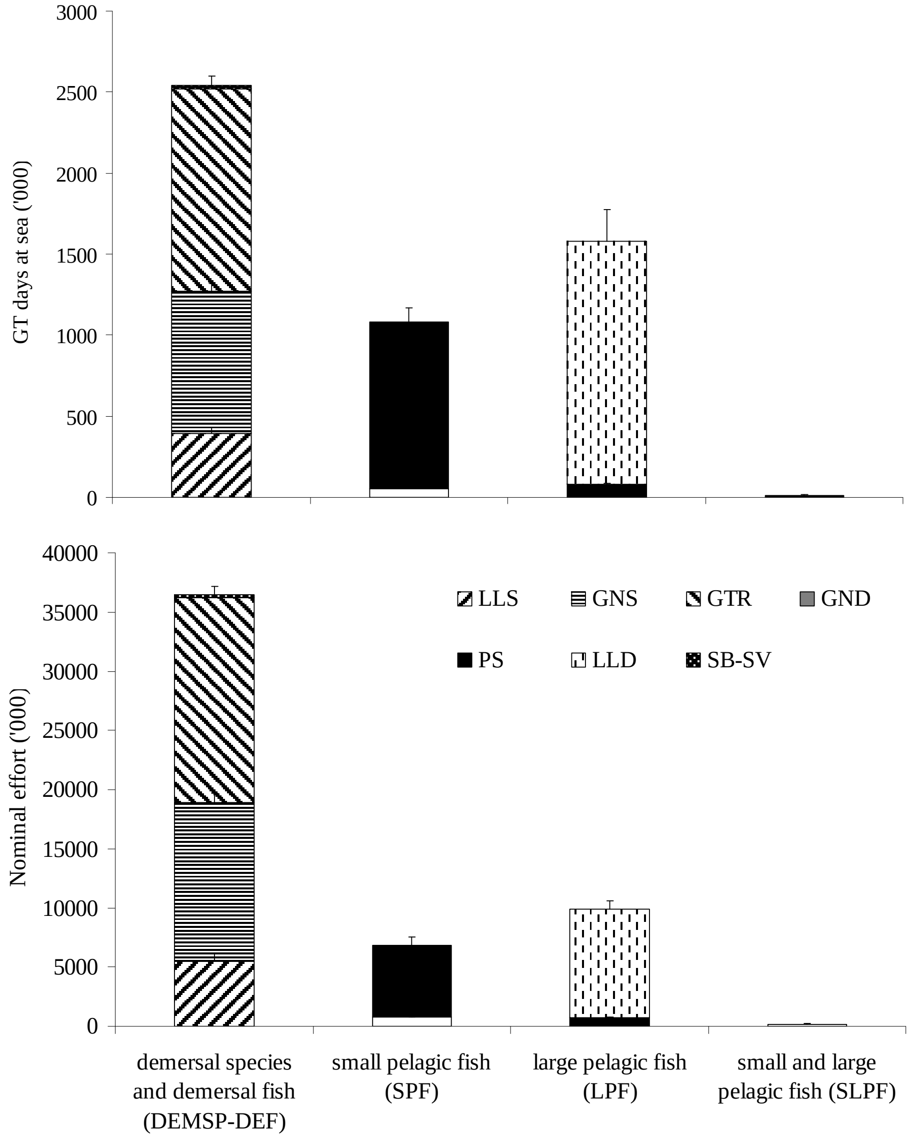


Figure 2.2.9 - Fishing effort (averaged over 2004-12) of the nine different metiers considered (bars indicate Standard Error).

A substantial difference between GND_SPF and PS_SPF has been detected in terms of boat length (LOA) in fact, the majority of the effort (GT and kW) is carried out by vessels measuring more than 12m by the PS_SPF and between 6 and 12m by the GND_SPF (Fig. 2.2.10, 2.2.11).
In the PS_LPF and the LLD_LPF the maximum effort is produced by boats ranging between 12 and 24 m LOA, as for the PS_SPF (Fig. 2.2.10, 2.2.11).
In the GNS_SLPF and in the 4 "demersal species" metiers (GTR_DEMSP, LLS_DEF, GNS_DEMSP, SB-SV_DEMSP), the highest values of effort were achieved by vessels ranging between 6 and 12m LOA (Fig. 2.2.10, 2.2.11) as for GND_SPF.

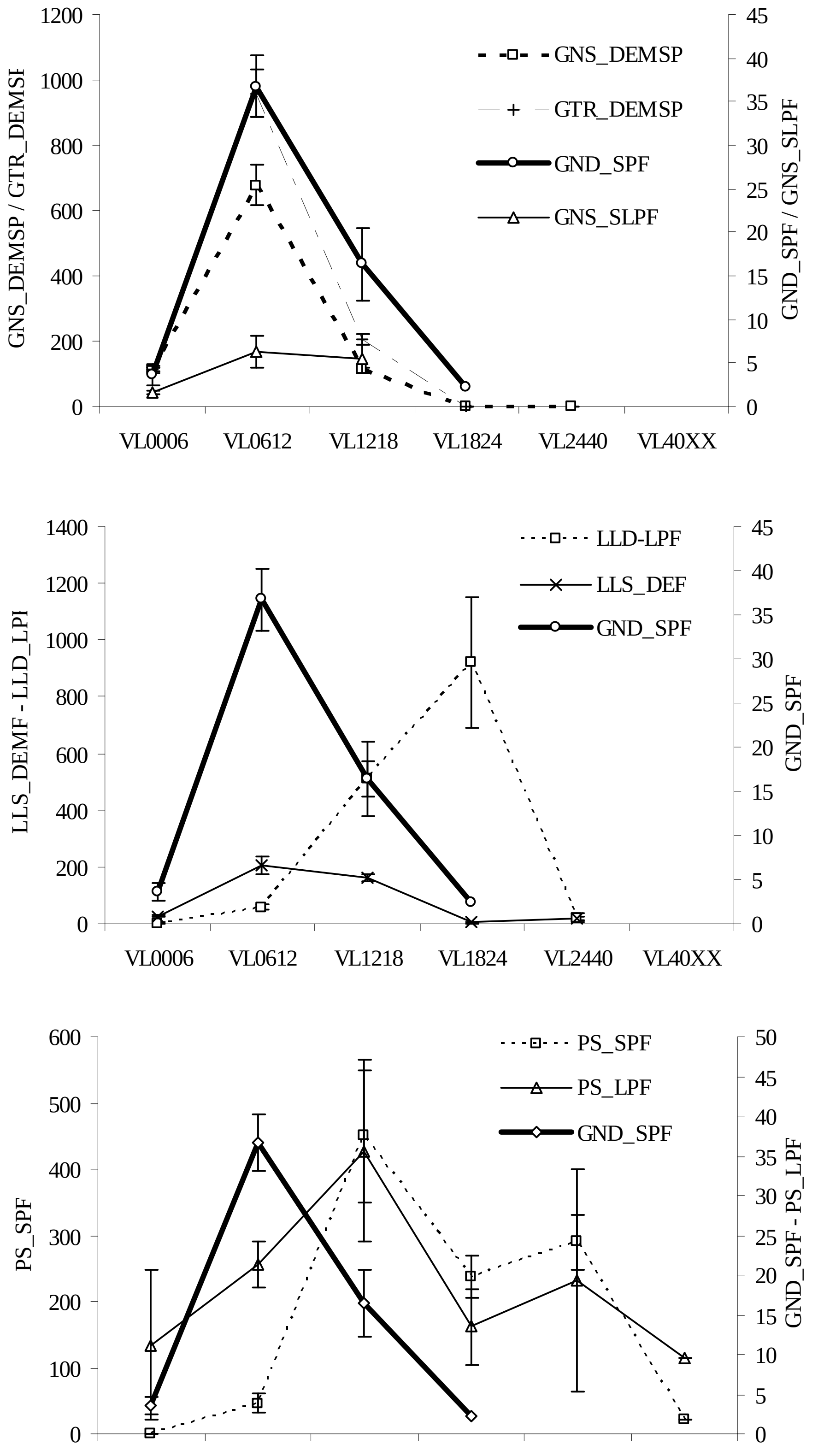


Figure 2.2.10 – GT effort (averaged over 2004-2012) of the fishing types (metiers) by vessel length (bars indicate Standard Error). Legend for the metiers as in Tab. 2.2.15.

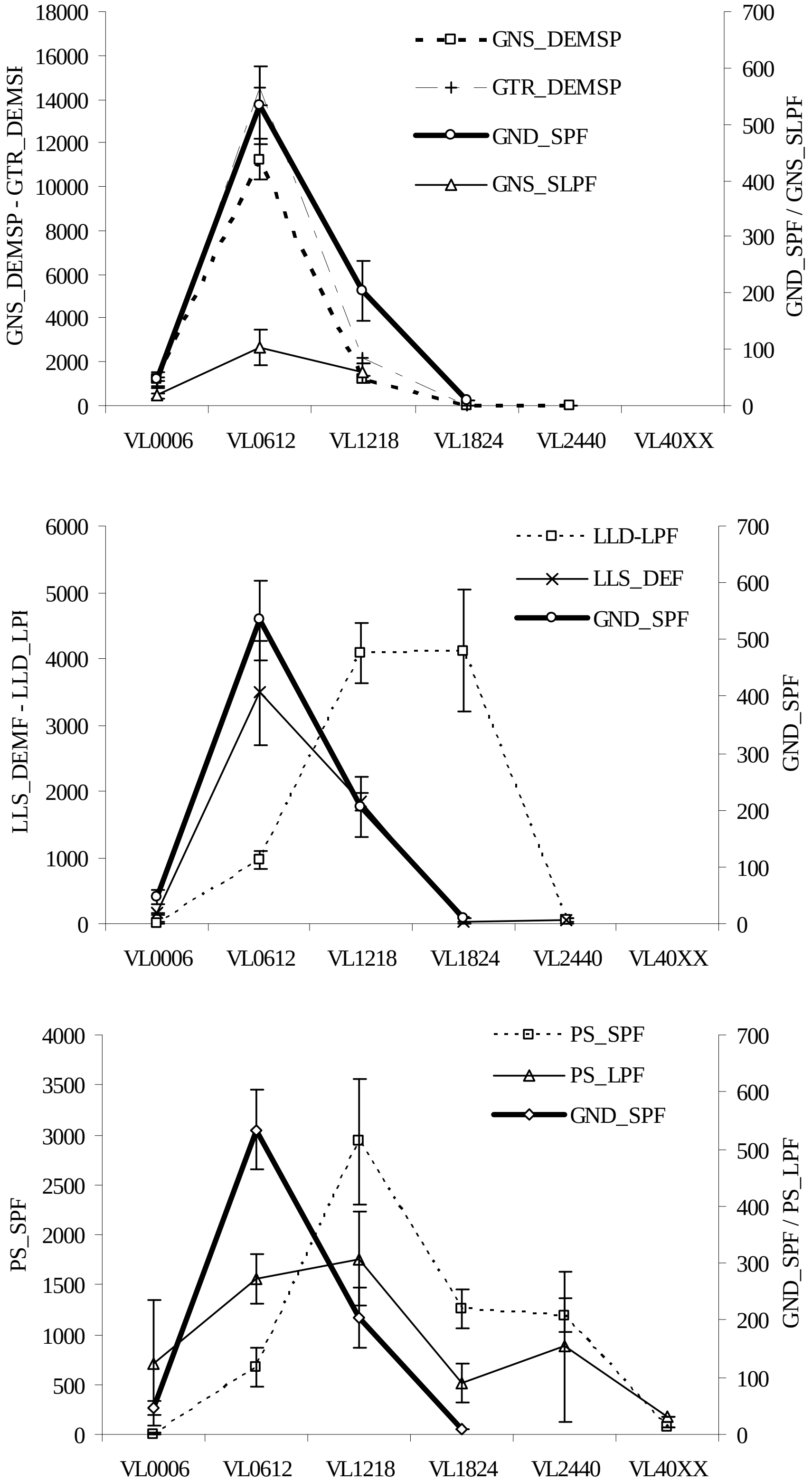


Figure 2.2.11 - Nominal fishing effort (averaged over 2004-2012) of the fishing types (metiers) by vessel length (bars indicate Standard Error). Legend for the metiers as in Tab. 2.2.15.

Landings

Landings data of nine metiers were used, focusing only on the target/by-catch species of the the small scale driftnets fisheries recorded during the DRIFTMED study (Tab. 2.2.18). Landings data derived from DCF (2004-2011) and from IREPA (2012), are presented separately.

Table 2.2.18 – Target/by catch species of the SSD fisheries recorded in DRIFTMED study.

CODE	Species	Common name
AMB	*Seriola dumerili*	Greater amberjack
ANE	*Engraulis encrasicolus*	European anchovy
BOG	*Boops boops*	Bogue
BON	*Sarda sarda*	Atlantic bonito
FRZ	*Auxis thazard, A. rochei*	Frigate and bullet tunas
HMM	*Trachurus mediterraneus*	Mediterranean horse mackerel
HOM	*Trachurus trachurus*	Atlantic horse mackerel
MAC	*Scomber scombrus*	Atlantic mackerel
MAS	*Scomber japonicus* (cfr. S. *colias*)	Chub mackerel
MAZ	*Scomber spp*	Scomber mackerels nei
PIL	*Sardina pilchardus*	European pilchard (Sardine)
SBS	*Oblada melanura*	Saddled seabream

Italian landings of the GND_SPF, available from DCF, are scattered, depending on the sorting of the métier made by the ranking system and concern only GSA 10 (2011) and GSA 19 (2006, 2007, 2008, 2011) (Fig. 2.2.12; Tab. 2.2.19).
The only solid time series of landings of anchovy and sardine regards PS_SPF (period 2005–2011) in the GSA 9, 10, 16, 17, 18, 19 (Tab. 2.2.20). The annual landings highlight an increase for anchovy, with a peak in 2006, after which the values seem to have a slightly negative tendency. For sardine, some variability is evident, with a peak in 2009 of about 10,000 tons (Fig. 2.2.12). PS_SPF landings of anchovies and sardines were available only for GSA 17 in 2005 while in 2009 no data for GSA 18 were found.

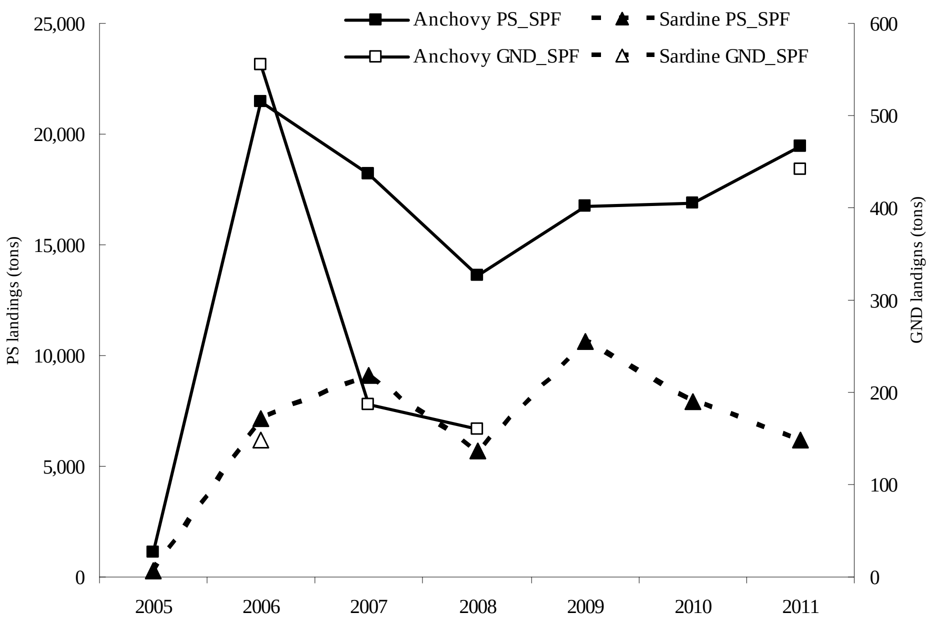


Figure 2.2.12 - Annual landings (tons) of anchovy and sardine in the GND_SPF and PS_SPF (DCF, 2004-11). Legend for the metiers as in Tab. 2.2.15.

As concerns some target species of the SSD, as the saddled sea bream, *Oblada melanura*, the greater amberjack, *Seriola dumerili* and the Atlantic bonito, *Sarda sarda*, no data were found in the DCF database.
The available data of other by-catch species of small-scale driftnets (bogue, mackerels), concern GTR and GNS and derive quite exclusively by GSA 9 (Tab. 2.2.19).

Table 2.2.19 – Total landings (tons) of six potential target/by-catch species by fishing types and GSA (DCF data). Legend for the metiers as in Tab. 2.2.15, for the species as in Tab. 2.2.18.

Metier	GSA	Year	Species					
			ANE	*PIL*	*BOG*	*HMM*	*HOM*	*MAZ*
GND_SPF	10	2011	41.9	-	-	-	-	-
	19	2006	554.4	147.6	-	-	-	-
		2007	186.0	-	-	-	-	-
		2008	160.3	-	-	-	-	-
		2011	399.6	-	-	-	-	-
PS_SPF	9	2006	3630.4	4344.2	-	-	-	-
		2007	2192.8	5111.9	-	-	-	-
		2008	1239.9	2288.1	-	-	-	-
		2009	2378.6	5673.9	-	-	-	-
		2010	2893.2	4475.7	-	-	-	-
		2011	4355.1	2543.4	-	-	-	-
	10	2007	3864.3	1435.4	-	-	-	-
		2008	3542.9	1126.5	-	-	-	-
		2009	5377.5	3028.0	-	-	-	-
		2010	6092.3	2407.6	-	-	-	-
		2011	7147.2	1502.3	-	-	-	-
	16	2006	3109.2	1543.1	-	-	-	-
		2007	2021.8	1559.3	-	-	-	-
		2008	2538.7	1621.9	-	-	-	-
		2009	4387.8	1300.8	-	-	-	-
		2010	3094.6	584.3	-	-	-	-
		2011	3073.1	1457.1	-	-	-	-
	17	2005	1093.0	285.0	-	-	-	-
		2006	8338.3	-	-	-	-	-
		2007	5625.7	411.8	-	-	-	-
		2008	3280.5	279.4	-	-	-	-
		2009	4062.4	313.3	-	-	-	-
		2010	2362.0	313.0	-	-	-	-
		2011	2459.8	486.8	-	-	-	-
	18	2006	4680.1	80.6	-	-	-	-
		2007	3868.0	87.6	-	-	-	-
		2008	2622.9	-	-	-	-	-
		2009	-	-	-	-	-	-
		2010	1845.2	-	-	-	-	-
		2011	1881.0	57.7	-	-	-	-
	19	2006	1729.3	1184.1	-	-	-	-
		2007	644.8	467.8	-	-	-	-
		2008	399.7	370.3	-	-	-	-
		2009	549.8	286.3	-	-	-	-
		2010	575.9	120.8	-	-	-	-
		2011	531.4	103.9	-	-	-	-
GNS_DEMSP	9	2008	-	-	-	-	49.9	-
		2009	-	-	-	-	51.8	-
		2010	-	-	-	4.0	36.2	42.4
		2011	-	-	-	-	25.0	-
	10	2010	-	-	45.7	-	-	-
GTR DEMSP	9	2010	-	-	-	-	16.0	-
	10	2010	-	-	28.8	-	-	-

Landings data provided by IREPA concern 11 potential target/by catch species of the SSD (Tab. 2.2.20; Fig. 2.2.13, 2.2.14). In the 2012 fishing season the landings of anchovies were about 380 tons from GND-SPF and 15,600 tons from PS_SPF (Tab. 2.2.20).

Table 2.2.20 – Total landings (tons) of 11 potential target/by-catch species by fishing types and GSA (IREPA, 2012). Legend for the metiers as in Tab. 2.2.15 for the species as in Tab. 2.2.18.

Metièr	GSA	Species										
		ANE	*PIL*	*AMB*	*BOG*	*BON*	*FRZ*	*HMM*	*HOM*	*MAC*	*MAS*	*SBS*
GND SPF	10	83.2	-	-	-	6.7	1.4	-	-	6.6	-	0.6
	19	297.1	34.2	-	-	1.2	-	-	-	1.7	-	-
GNS_DEMSP	9	0.1	-	0.5	8.1	6.9	12.0	7.5	27.8	4.5	17.4	9.1
	10	0.7	-	17.2	31.2	9.1	0.0	2.6	42.6	2.2	4.8	25.2
	11	-	-	1.4	18.9	0.7	-	8.6	12.8	-	-	1.6
	16	-	-	-	0.2	-	-	-	0.5	-	-	0.3
	17	-	-	-	0.6	0.1	0.2	-	49.7	53.4	-	-
	18	-	-	-	-	-	-	-	2.3	2.0	-	-
	19	-	-	3.6	455.4	14.9	2.4	15.2	16.8	22.2	-	1.0
GNS_SLPF	9	-	-	-	0.3	0.7	8.8	3.6	6.5	1.5	4.1	1.6
	10	-	-	0.9	1.7	4.5	2.8	9.4	3.2	1.5	-	-
	11	-	-	-	-	-	-	5.8	-	-	-	-
	17	-	-	-	-	-	-	-	0.6	1.4	-	-
	19	-	-	1.1	0.6	41.0	0.7	14.7	7.5	10.6	-	0.0
GTR_DEMSP	9	-	0.4	0.8	6.2	24.2	1.2	17.8	10.4	0.2	15.3	9.5
	10	-	-	37.4	18.6	51.9	0.1	0.5	135.6	5.4	-	6.7
	11	-	-	0.7	7.4	0.5	-	8.0	4.7	2.4	-	1.6
	16	-	-	0.2	17.6	-	-	0.1	5.1	0.0	-	0.1
	17	-	-	-	0.2	-	-	0.0	1.6	-	-	-
	18	-	-	-	17.7	-	-	-	-	-	-	18.9
	19	-	-	0.5	13.8	11.4	-	-	-	-	-	-
LLD_LPF	9	-	-	56.1	-	0.7	0.1	-	-	-	-	-
	10	-	-	7.3	-	54.9	10.5	-	3.3	11.6	-	-
	19	-	-	-	-	201.8	31.9	-	-	2.3	-	-
LLS-DEF	9	-	-	0.1	0.2	1.3	-	2.3	0.3	-	-	-
	10	-	-	0.2	-	21.8	-	0.7	17.3	-	-	9.6
	11	-	-	-	0.2	-	-	-	-	-	-	0.2
	16	-	-	-	0.3	-	-	-	-	-	-	1.2
	18	-	-	-	-	2.3	-	-	-	0.7	4.1	-
	19	-	-	1.1	-	73.1	-	-	5.0	-	1.1	19.1
PS_LPF	9	6.2	-	0.1	-	12.0	-	-	-	-	-	-
	10	1.8	2.6	59.2	1.6	88.2	-	-	1.5	-	-	0.7
	16	0.1	1.7	44.8	0.1	5.5	0.3	-	-	0.4	-	0.7
	19	19.7	20.9	9.9	1.1	310.9	0.9	4.2	0.7	-	-	-
PS_SPF	9	4778.8	1704.3	35.0	4.3	4.2	1.2	13.0	66.2	36.8	15.3	4.0
	10	5820.4	545.4	8.0	141.5	13.9	-	-	330.2	42.7	0.6	5.5
	16	1503.8	1022.1	6.3	30.7	0.2	-	-	24.9	91.8	-	4.6
	17	1604.0	232.4	-	5.4	7.3	0.3	-	16.2	3.3	33.8	-
	18	1400.5	30.7	-	2.5	2.7	-	-	11.2	2.0	126.7	-
	19	497.4	221.1	-	84.0	16.3	-	14.6	114.6	145.0	-	-
SB-SV DEMSP	10	-	-	0.7	40.6	-	-	-	2.0	1.4	0.5	7.2
	11	1.7	-	-	-	-	-	-	-	-	-	-
	19	-	0.4	3.3	-	51.5	-	-	-	-	-	-

As concerns the other metiers, the main catches concern the following species (Fig. 2.2.13, 2.2.14):

1) Atlantic bonito (*S. sarda*) - purse seine (PS_SLPF), set gillnet (GNS_SLPF), longlines (LPF / DEF) and boat seine (SB-SV_DEMSP) ;
2) greater amberjack (*S. dumerili*) - purse seine (PS_LPF) and longlineS (LLD_LPF);
3) chub and Atlantic mackerel (*S. scombrus*, *S. colias*) – set gillnets (SLPF - DEF), longlines (LPF – DEF) and purse seine (SPF);
4) saddled seabream (*O. melanura*) - trammel net (GTR-DEMSP), set gillnets (GNS_DEMSP), longlines (LLS_DEF) and boat seine (SB-SV_DEMSP);
5) bogue (*B. boops*) - trammel net (GTR_DEMSP), set gillnets (GNS_DEMSP) and boat seine (SB-SV_DEMSP);
6) horse mackerels *(T. trachurus, T. mediterraneus)* – usually caught in all metiers, mainly by the set gillnets (SLPF / DEMSP).

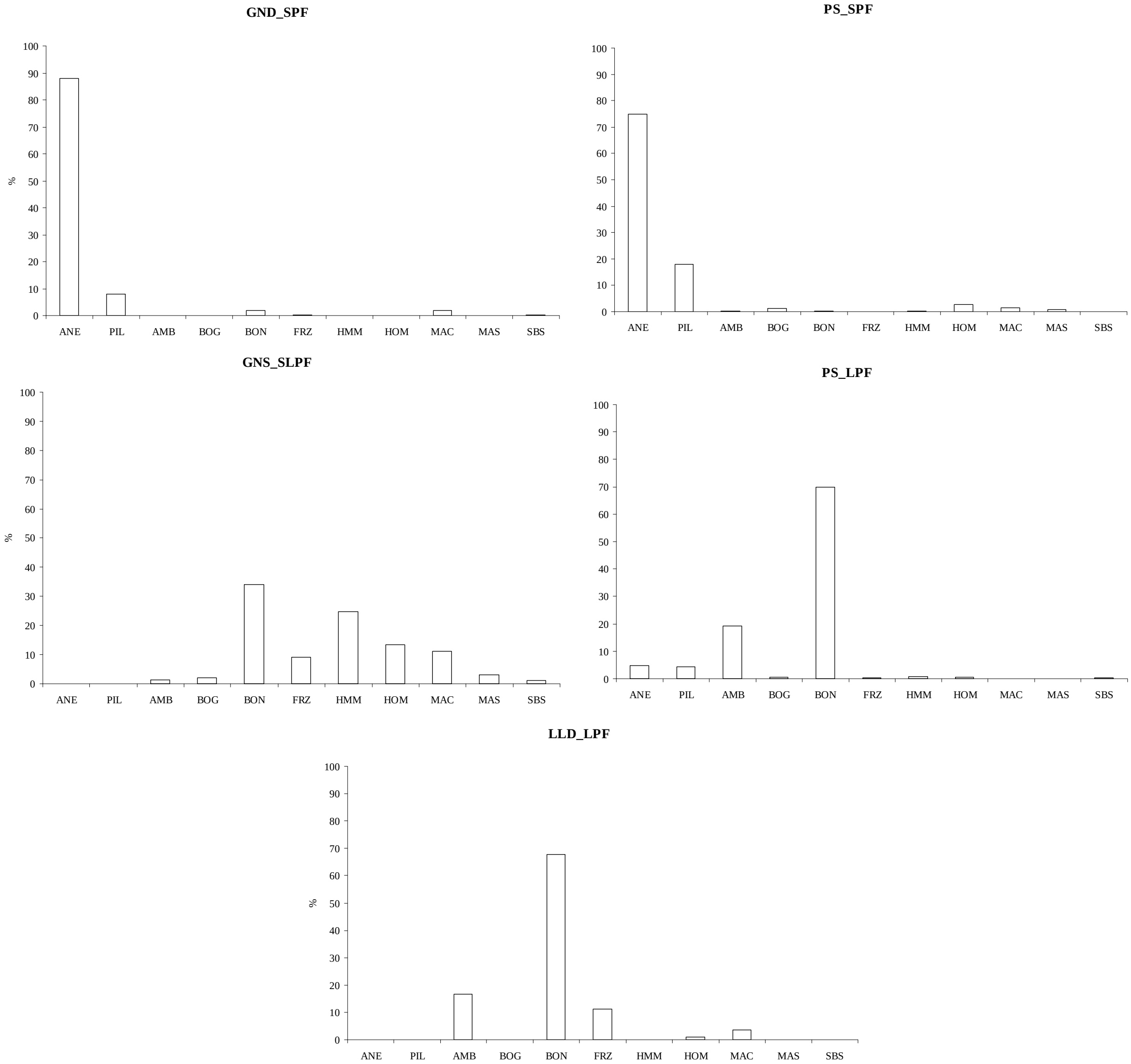


Figure 2.2.13 – Total landings (%) of the 11 potential target /by-catch species by the five metiers targeting “pelagic fishes”. Legend for the metiers as in Tab. 2.2.15, for the species as in Tab. 2.2.18.

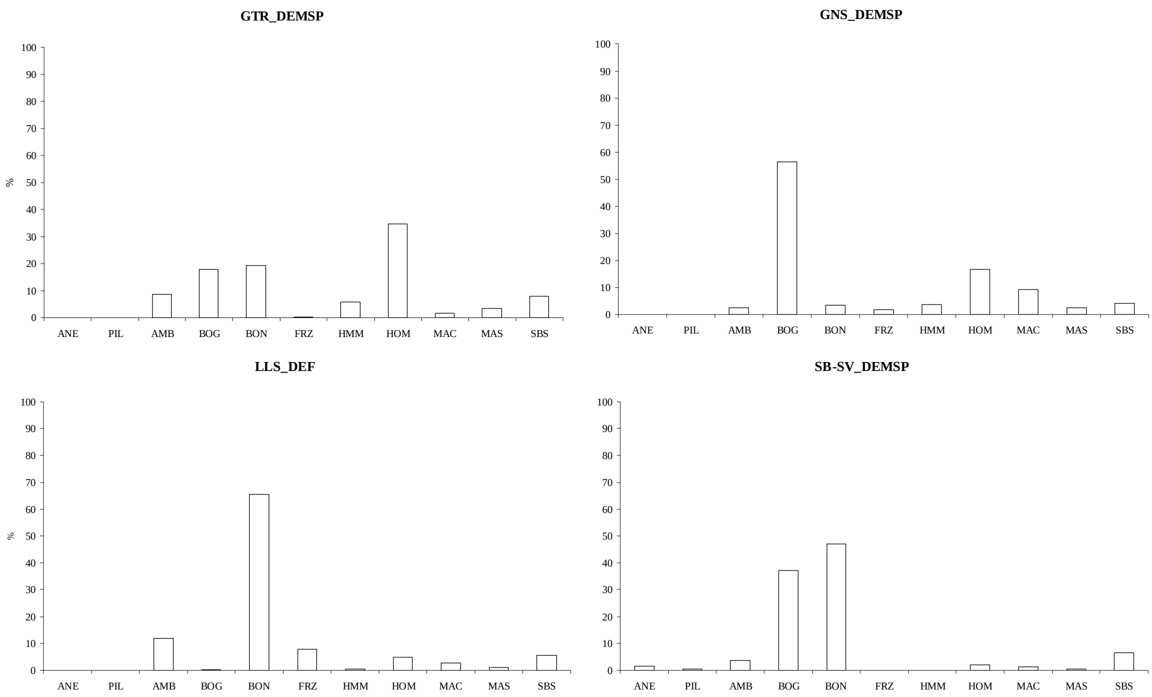


Figure 2.2.14 – Total landings (%) of the 11 potential target/ by catch species by the four metiers targeting "demersal species". Legend for the metiers as in Tab. 2.2.15, for the species as in Tab. 2.2.18.

.

Considering the landings by month (IREPA 2012), we can have an idea of the seasonality of the target species (Fig. 2.2.15, 2.2.16 left column); the landings also varied depending on the metier used (Fig. 2.2.15, 2.2.16, right column).

Regarding anchovy, the main catches of the GND_SPF, occurred between May and July, with a peak in June (Fig. 2.2.15-right column). Among the other species, the main catches concern:

- the European sardine (*S. pilchardus*), steadily caught throughout the year;
- the saddled sea bream (*O. melanura*), between May and June;
- the Atlantic bonito (*S. sarda*), the bullet tuna (*A. rochei*) and the Atlantic mackerel (*S. scombrus*) in the summer with a peak in August.

The highest landings for almost all the species occur in the period between late spring and summer (Fig. 2.2.16). This effect is due to the huge quantities caught by the purse seine fisheries (SPF/LPF) which concentrates the highest effort during this two seasons between April and September; this is true not only for anchovies (maximum value in June) and sardines (August), but also for Atlantic and chub mackerel (*S. scombrus* and *S. colias*) and the greater amberjack (*S. dumerili*).

The maximum catches of Atlantic bonito (*S. sarda*) have been reached in the autumn with a peak in autumn (October-November) in the PS_ LPF, LLD_LPF, LLS_-DEF and SB –SV_DEMSP (Fig. 2.2.16).

As concern the bullet tuna (*A. rochei*) and the greater amberjack (*S. dumerili*), the spring season between April and May, shows the highest catches obtained mainly by the longlines (LLD_LPF) (Fig. 2.2.16).

For the saddled seabream (*O. melanura*) highest catches have been reported in spring, in particular for the GTR_DEMSP (March and May) while during summer the most of the catches refer to the GNS_DEF and the LLS_DEF reaching a peak in September for the latter (Fig. 2.2.16).

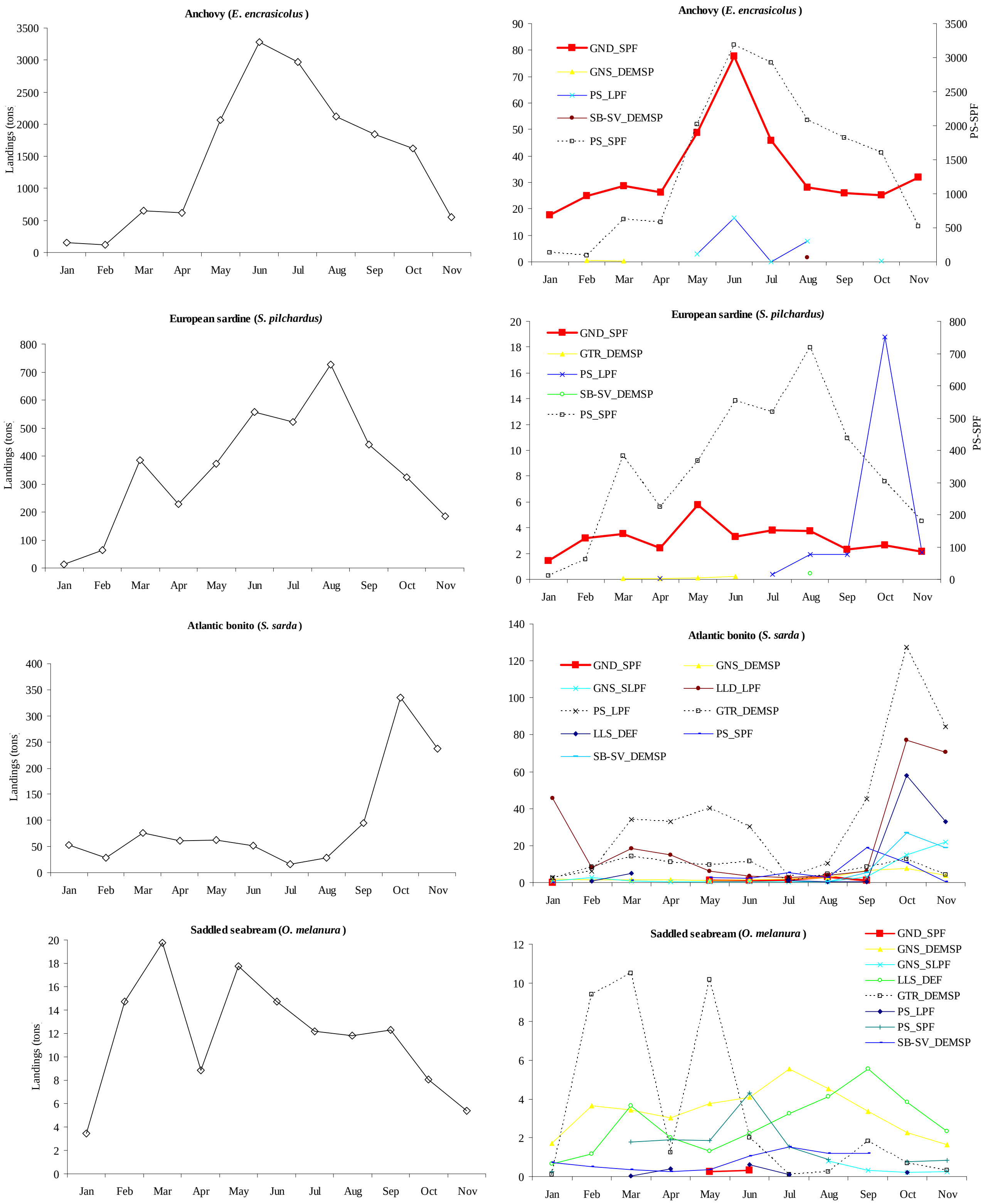


Figure 2.2.15 – Total landings (tons) of the target species of the small scale driftnets.
On the left column: by species; on the right column: by metier.
Legend for the metiers as in Tab. 2.2.15.

.

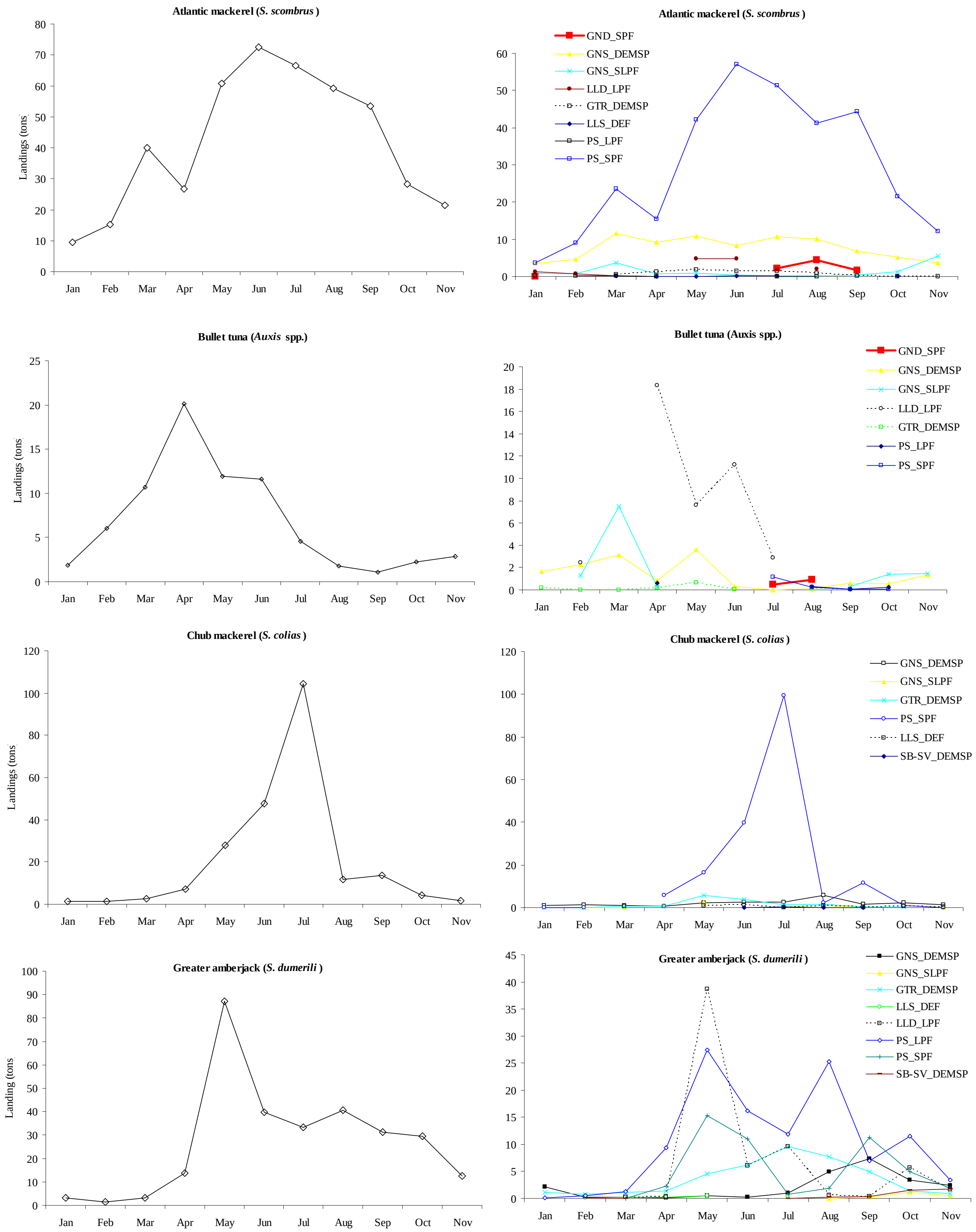


Figure 2.2.16 – Total landings (tons) of the target species of the small scale driftnets.
Left column: by species; right column: by metier.
Legend for the metiers as in Tab. 2.2.15.

Among the by-catch species (Fig. 2.2.17) the highest values of landing regard:
- the bogue (*B. boops*), mainly caught in spring (March) by the GNS_DEF and in summer by the PS_SPF;
- the Atlantic horse mackerel (*T. trachurus*), mainly caught by the PS_SPF in the summer season;
- the Mediterranean horse mackerel (*T. mediterraneus*), caught from spring (April) to autumn (November) mainly by set gillnets (DEF / SLP) and by purse seine (PS_SPF).

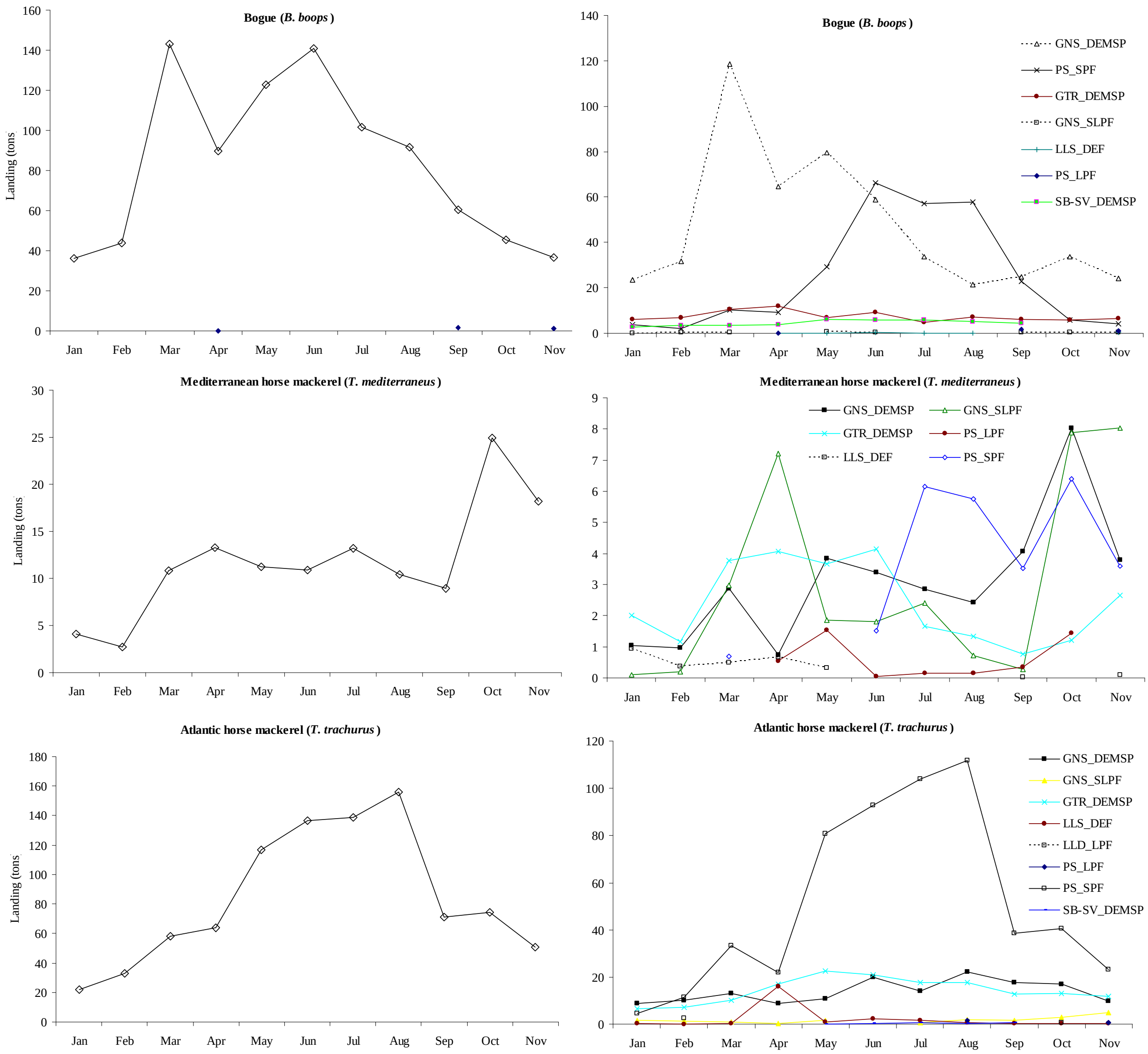


Figure 2.2.17 – Total landings (tons) of three by-catch species of the small scale driftnets.
Left column: by species; right column: by metier.
Legend for the metiers as in Tab. 2.2.15.

Socio-economic parameters

The socio-economic parameters, available from the statistics produced by IREPA for the fishing season 2011 (IREPA 2012), are reported in Tab. 2.2.21.

Data are grouped into seven fleet segments: bottom trawl, mid-water pair, purse seine, dredge, longlines, passive polyvalent, small scale fishery. In particular the gear types (GTR, GNS, GND, LLD, LLS, SB-SV) reported until now, are aggregated into three different categories:

1) The small-scale fishery segment is composed by vessels with a total length (LOA) less than 12m, typically using passive gears like set nets, long-lines, pots and traps. They are mostly managed on a family and artisanal basis.
2) Passive polyvalent includes vessels greater than 12 meters (LOA) fishing with passive gears like fixed nets, long-lines, pots and other artisanal fishing methods. None of them is predominant and therefore these vessels are considered "polyvalent".
3) Longlines includes vessels using this fishing method (LLD) as predominant.

Only the purse seine fishery (PS) is clearly separated from the other fleet segments.
Therefore, on the basis of these findings, a comparison between the socio-economic data of the different fishing gear types is currently not possible.

Table 2.2.21 - Socio-economic key indicators by fleet segment in Italy in 2011 (IREPA, 2012).

	Bottom trawl	**Mid-water pair**	**Purse seine**	**Dredge**	**Small scale fishery**	**Passive polyvalent**	**Longlines**
Landings in volume (tons)	71,951.00	34,218.00	32,335.00	21,790.00	36,620.00	8,143.00	5,267.00
Landings in value (mln Euro)	519.99	40.05	68.70	62.62	296.45	63.43	39.09
Landings prices (Euro/kg)	7.23	1.17	2.12	2.87	8.10	7.79	7.42
Yearly landing in volume by vessel (tons)	28.20	286.30	131.50	30.80	4.20	14.90	27.60
Landing volume by day at sea (kg)	192.30	2,049.50	1,260.50	364.00	31.10	113.70	224.30
Yearly landing in value by vessel (000 Euro)	203.60	335.10	279.39	88.43	33.64	115.69	205.09
Landing in value by day at sea (Euro)	1,389.45	2,399.06	2,677.89	1,045.91	251.88	885.86	1,665.06
Energy costs by vessel (000Euro)	75.95	111.26	47.29	15.05	6.26	-	35.23
Crew (total number)	8,431.00	678.00	1,813.00	1,480.00	14,008.00	1,589.00	726.00
Income (000 Euro)	203.60	324.81	282.37	88.43	33.64	-	205.09
Intermediate costs (000 Euro)	115.96	183.17	103.29	24.76	12.65	-	94.46
Gross value added (000 Euro)	87.64	141.64	179.07	63.67	20.99	-	110.63
Labour cost (000 Euro)	45.12	80.61	95.16	28.64	9.48	-	56.20
Gross profit (000 Euro)	42.64	61.02	83.92	35.02	11.51	-	54.44

2.3 - COLLECTION AND REVIEW OF THE AVAILABLE INFORMATION ON SSD FISHERIES OTHER THAN EU MEDITERRANEAN COUNTRIES (TASK 1.3)

The objective of this task was to collect the information about SSD fisheries in non EU countries available from different sources: grey literature (e.g. project reports), research papers, documents and any source of data available at the GFCM and the FAO Regional Projects. In addition local experts have been contacted to directly gather supplementary information.
The FAO regional projects, namely ADRIAMED (Adriatic Sea), MEDSUSMED (Strait of Sicily), EASTMED (Eastern Mediterranean basin), COPEMED (S-W Mediterranean), ARTFIMED (artisanal fisheries) have been enforced in the Mediterranean in the last 20 years with several objectives linked to the sustainable management of shared fisheries resources. Their project coordinators have been officially contacted in April and July 2013 by the responsible of Task 1.3 to ask their cooperation for the collection of relevant information on driftnet fisheries in the geographical areas covered by their projects. The support received from these projects was however generally poor, and this was pointed out during the Coordination Meeting of Bari (July 2013) by the Task coordinator.
The data extraction and review of the information carried out within task 1.3 has however allowed producing a general overview of the knowledge available on the past and current status of driftnets fisheries in non EU Mediterranean waters. In general the information available resulted scanty either on a spatial or temporal scale and rarely quantitative data (e.g. CPUE, by-catch, etc.) were available. Driftnets are currently prohibited in several countries (e.g. Tunisia, Croatia, Turkey) where they were largely used in the past to target several species of small and medium pelagic fish (e.g. sardine, anchovy, round sardinella, mackerels, horse mackerels, bonito). In some other countries (e.g. Palestine and Libya) they are still widely used by the artisanal fleet. Any information about the current use and legal status of driftnet fisheries was found for Egypt, Syria, Israel, Algeria, and Libya. Such information seems also lacking in the COPEMED and EASTMED projects, which have an important component of their activities devoted to artisanal fisheries in these countries.
The following sections summarize the information gathered on SSD fisheries in non EU Mediterranean countries.

LIBYA
Past status
In Libya a drift gillnet ("*Sayeb ayam*") was reported to be used between October and March to target *Euthynnus alletteratus* (Lamboeuf, 2001; Tab. 2.3.1).

Table 2.3.1 - Technical features of drifting gillnets used in Libya (from Lamboeuf, 2001).

Sayeb Ayam سايب عائم Drifting Gillnets GND 07.2.0
- Mesh 50mm - Length 100 fathoms - Height 150/200 meshes - Rope Ø 6-7mm - Float 90 mm one every 150 cm - Lead 180g every 180 cm
Flouka 800 Ftm = 8 pieces Mator 2000 Ftm = 20 pieces
Rzam *Ethynus alletteratus*
10-50 Ftm
Pelagic
October - March
Set at sunset, hauled three hours after

Present status
We did not find any scientific papers or other documents on SSD fisheries in Libya. No information available from COPEMED II project.

TUNISIA

Past status
According to FAO-COPEMED Project (De La Serna *et al.,* 2000), drifting gillnets ("mernine") were commonly used in some Tunisian sectors, especially during the concentration of small tuna, such as the little tuna (*Euthynnus alletteratus)* the bullet tuna (*A. rochei*), and the Atlantic bonito (*S. sarda*). It was a seasonal fishery. The nets were set up in the direction of the wind and they not usually exceed 1000 m in length. They were generally set up at night and retrieved early in the morning.

Present status
The use of driftnets is currently prohibited.

ALGERIA

Past status
In Algeria driftnets were mainly used in the ports of El Tarf, Alger and Tipaza to target different medium-sized fish species, such as juveniles of *S. dumerilii*, *S. sarda*, etc. (Sahi and Bouaicha, 2003).

Present status
No information available.

MOROCCO

Past status
At the end of '90s small-scale driftnets were mostly used in Tétouane, Chefchaouen, Nador (Damiano, 1999) where about 30% of the fleet was involved in this fishery. According to an inventory of the Mediterranean artisanal fisheries carried out in 1999 (INHR, 1999), there was a wide use of driftnets to target the Atlantic bonito (about 25% of the boats) mainly in autumn (September-December).
Recently, Robles (2010) described the use of drift gillnets in the Alboran Sea where a fleet of about 150 boats was involved in a fishery for medium pelagic species, such as Atlantic bonito, bullet tuna (*A.rochei*) and little tunny (*E. alletteratus*). The estimated annual catch of these species (the period is not specified) was 553 tons also coming from purse seiners. An important amount of by-catch of *Caretta caretta* was also reported.

Present status
The import, fabrication, detention, selling and use at sea of driftnets is prohibited by the law 19-07 of 16th July 2010.

TURKEY

Past status
According to the information received from local fisheries experts, driftnets were prohibited for the first time on March 5th 1998 in Turkey. However, taking into consideration the EC Reg. n. 894/97 directive, with modification on August 16th 2005, it was allowed using driftnet in 2.5 km length only for one year. This application was repeated on September 1st 2006 in compliance with EU related directive.
In 2006, drift-netting in Turkey was officially prohibited.
However, the majority of fishermen made some modifications in their nets adding weights and buoys on both sides of the nets in order to by-pass the conventional definition for driftnets as found in Notification 2/1 regulating commercial fishing (Akyol & Ceyhan, 2011). The Turkish fisheries authorities have given a limited permission for traditional pelagic driftnet fishery in Turkish seas until the July 2011. Finally, this fleet stopped its activity in July 2011 in order to comply with UN and EU binding resolutions (Akyol & Ceyhan, 2012). The regulation prohibited also to keep driftnets on board or in the fishing ports.
A common use of driftnets to target *Scomber* was reported for the Istanbul and Western Black Sea regions. Sardine driftnets were also reported to be used in Izmir region between May and September.
The technical characteristics and regulations (both national and international) of driftnets used in Turkish waters are summarized by Aykol *et al.* (2008). In the Gulf of Izmir are described 12 types of driftnets. Four

of them are used by big vessels to target medium and large pelagics and the others by small-scale vessels. The length of driftnets ranged from 400 m to 6900 m. An inventory of the main features of the most used driftnets in the Gulf of Izmir can be found in Akyol & Ceyhan (2007). They described 7 types of driftnets, five gill nets and two trammel nets (Tab. 2.3.2).

Table 2.3.2 - Inventory of drifting gillnets in the Gulf of Izmir (from Akyol & Ceyhan, 2007).

Net type	N. of boats	Max n. of nets	Net length	Net length by boat	Total net length estimated for the fleet
Mackerel	20	7	133	931	18620
Bonito	10	7	133	931	9310
Sardine	65	6	133	798	51870
Round sardinella	40	5	100	500	20000
Horse mackerel	20	6	133	780	15600
Salema	20	4	100	400	8000
Shrimps	35	10	100	1000	35000
Total	210	45	832	5340	158400

<u>Driftnet for mackerel (*Scomber scombrus*) (Fig. 2.3.1).</u>
Each net was 133 m long and 200 meshes height. Three net panels were mounted as reported in Fig. 2.3.1. Mesh size was 52-56 mm (stretched). The hanging ratio (E) was 0.66 on the floating line and 0.69 on the lead line. The nets were used in summer at the sunset and sunrise over 30-40 m depth. The fishing time was about 1 hour. The main by-catch was horse mackerel, *Trachurus spp*. (Akyol & Ceyhan, 2007).

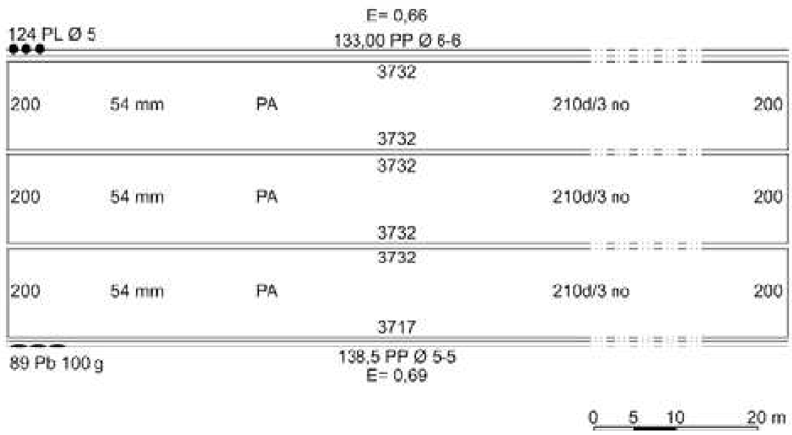


Figure 2.3.1 - Driftnets for mackerel (from Akyol & Ceyhan, 2007).

<u>Driftnets for Atlantic bonito (*Sarda sarda*) (Fig. 2.3.2).</u>
Driftnets targeting Atlantic bonito were made up by three panels of nets, each of 133 m length and 100 and 200 meshes from the float line to the lead line, corresponding to about 40 m height. The hanging ratio (E) was 0.66 on the floating line and 0.69 on the lead line (Fig. 2.3.2). These nets were used during sunset from September to January, by a fleet of 10 boats from Guzelbahce. The soaking time was about 1 hour.

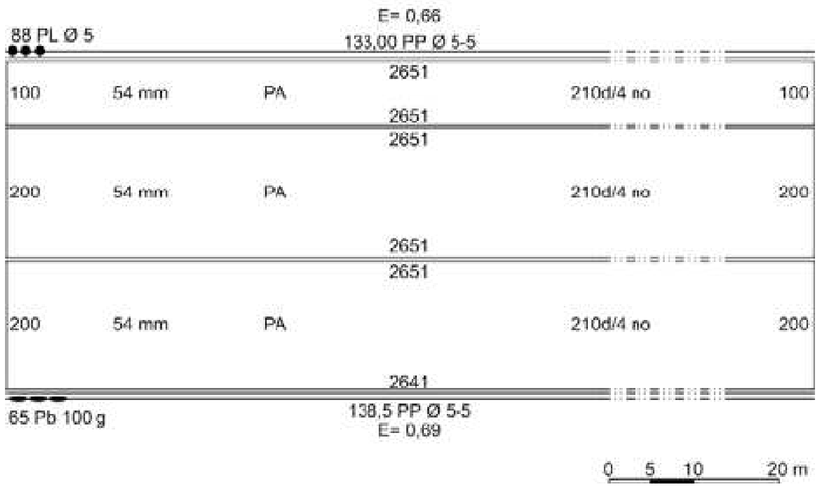


Figure 2.3.2 - Driftnets for bonito (from Akyol & Ceyhan, 2007).

Driftnets for sardine (*Sardina pilchardus*) (Fig.2.3.3).

Sardine and also anchovies were exploited with nets of 130 m length and 520 meshes height (about 13 m). The mesh size was of 25.5 mm (stretched). The hanging ratio was 0.66 both on the floating and lead lines (Fig. 2.3.3). They were used from April to August in all the Izmir Gulf after the sunset.

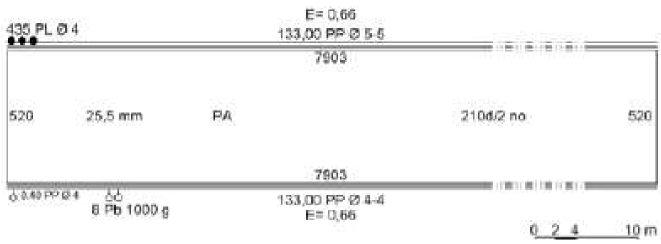


Figure 2.3.3 - Driftnets for sardine (from Akyol & Ceyhan, 2007).

Driftnets for round sardinella (*Sardinella aurita*) (Fig. 2.3.4).

Gillnet driftnets for round sardinella were used throughout the year, usually in shallow coastal waters less than 20 m starting from the sunset preferably in night without moon. A total of 4-5 panels of net of 90-100 m each were fastened together. The mesh size used was 44 mm stretched.

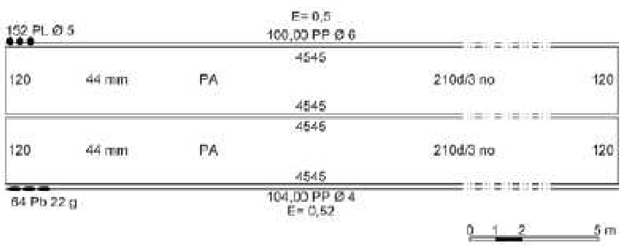


Figure 2.3.4 - Driftnets for round sardinella (from Akyol & Ceyhan, 2007).

Driftnets for mackerels (*Trachurus* spp.) (Fig. 2.3.5).

Drift gillnets for horse mackerel employed a 56 mm stretched mesh size. They were composed by 5 panels of nets of 130 m length and of 120 meshes each, fastened together to achieve a height of about 20 m. Up to 6 of these nets were used together. The fishing period was June-July.

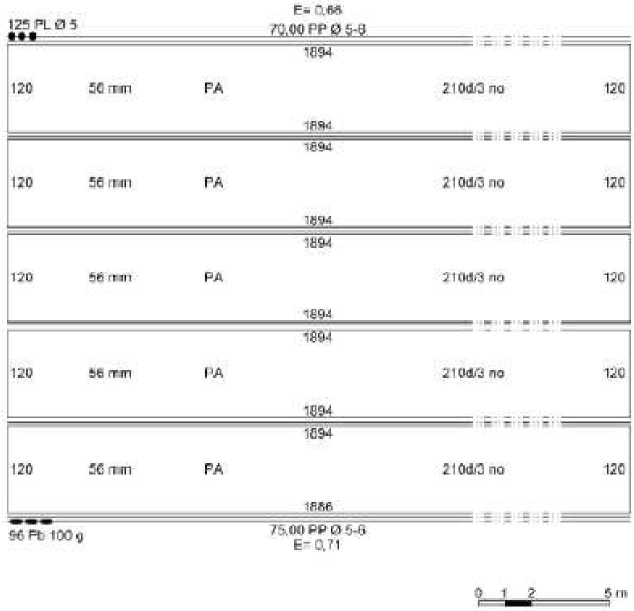


Figure 2.3.5 - Driftnets for horse mackerel (from Akyol & Ceyhan, 2007).

<u>Drift trammel nets for salema (*Sarpa salpa*) (Fig. 2.3.6).</u>

Salema was targeted using drifting trammel nets, assembled with a hanging ratio around 0.5. They were employed by a fleet of about 20 vessels from May to July during sunset and sunrise in coastal waters up to 15-20 m depth. The catch was composed by a large variety of species including grey mullets, seabreams, mackerels, and also octopus and squid (*L. vulgaris*).

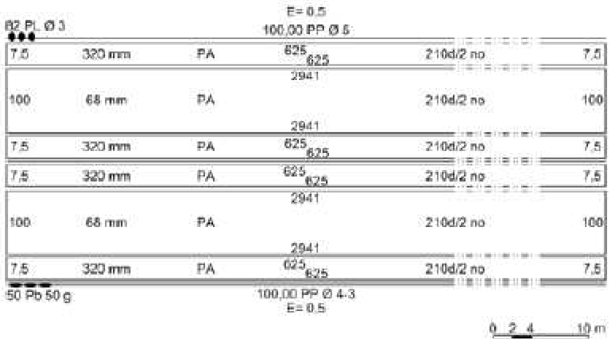


Figure 2.3.6 - Driftnets for salema (from Akyol & Ceyhan, 2007).

<u>Drift trammel nets for shrimps (Fig. 2.3.7).</u>

These small mesh (40 mm inner panel) trammel nets were used during the months of May and June at sunset. The soak time was 1-2 hours. By-catch could be composed by many different small-sized coastal species, such as red mullet, horse mackerel, sardines, etc. The average catch was 7-10 kg per day.

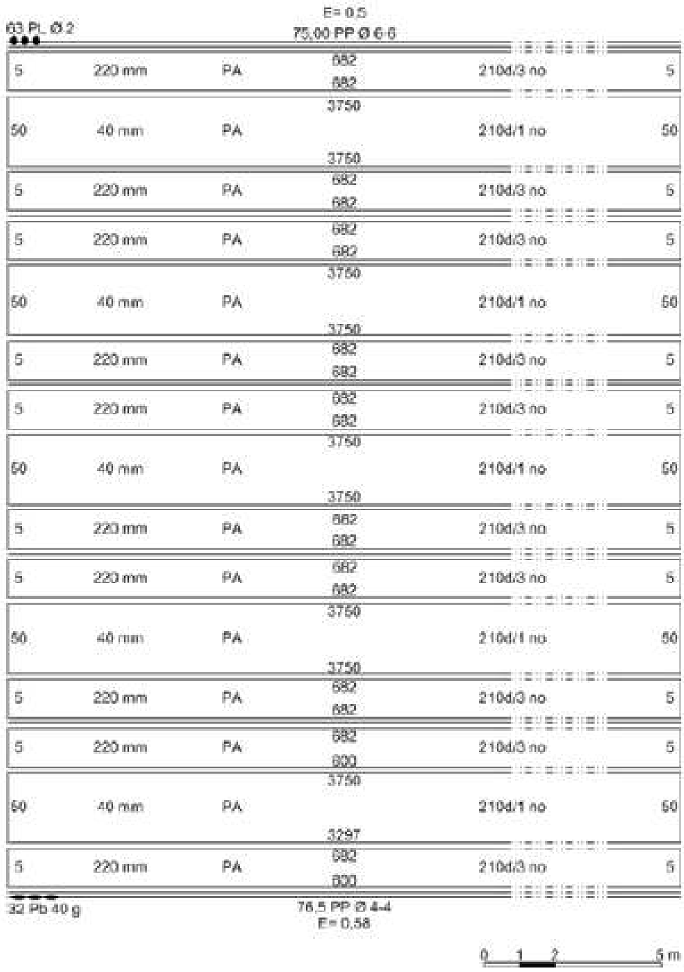


Figure 2.3.7 - Driftnets for shrimps (from Akyol & Ceyhan, 2007).

Present status
The use of driftnets is prohibited since 2011.

PALESTINE
Present status
According to information gathered from the national focal point of the EastMed project, in Palestine a specific driftnet for small pelagics ("*Maltash*") is used in spring and autumn. Another driftnet with a larger mesh ("*Zeada*") is used to catch different medium pelagic species all along the year. The following table explains the characteristics of these two nets (Tab. 2.3.3).

Table 2.3.3 - Characteristics of the "Maltash" and "Zeada" driftnets.

Item	Drift net (1): **Maltash**	Drift net (2): **Zeada**
• Presence of vessels using small drift nets	Gaza Sea (SE Mediterranean)	Gaza Sea (SE Mediterranean)
• Main ports	Gaza-Dair elbalah-Khanyounis-Rafah	Gaza-Dair elbalah-Khanyounis- Rafah

Table 2.3.3 - Characteristics of the “Maltash” and “Zeada” driftnets (continued).

• Vessels involved and their characteristics	A. the Small boat (Hasaka) Length from 5-7 m, fibreglass hull using outboard engine B. Small boat (Hasaka) Length from 3-4 m, fibreglass hull using paddles	A. the Small boat (Hasaka) Length from 5-7 m, fibreglass hull using outboard engine B. Small boat (Hasaka) Length from 3-4 m, fibreglass hull using paddles
• Fishing gears	- The net contains of 10 pieces, every one 100 m X 12 m - The net is put in depth in around 15-20 m Arabic name of this net is “Maltash”	– The net contains of 10 pieces, every one 100 m X 12 m – The net is put in depth in around 15-20 m Arabic name of this net is “Zeada”
• Target species	*Sardinella aurita,* *Sardinella maderensis,* *Sardina pilchardus* *Sphyraena chrysotaenia* *Spicara maena,* *Spicara smaris*	*Sarda sarda,* *Seriola dumerili,* *Euthynnus alletteratus,* *Argyrosomus regius,* *Epinephelus marginatus,* *Mugil cephalus*
• By-catch	-------	Marine turtles
• Fishing Seasons	March-June September - November	All the year
• Gear characteristics	Every net piece - 100 m X 12 m - Mesh size 14- 15 mm - the floating rope: thickness 4-5 mm with 250 small floats. - Bottom rope: thickness 4-5 mm with 7 kg leads (one Kg leads = 30 lead pieces).	Every net piece - 100 m X 12 m - Mesh size 42 mm - the floating rope: thickness 4-5 mm with 150 small floats - Bottom rope: thickness 4-5 mm with 10 kg leads (one Kg leads = 30 pieces).
• Grey literature and papers	No	no

LEBANON

Past status

No information available.

Present status

According with information collected from local experts involved in international projects on small-scale fisheries (CANA project), driftnets do not seem to be currently used by the artisanal fleet. This was also confirmed by the Department of Fisheries & Wildlife (Ministry of Agriculture) and National focal point for FAO EastMed project.

EGYPT

No information available from literature, GFCM and the EastMed project.

SYRIA

No information available from literature, GFCM and the EastMed project.

ISRAEL

No information available.

ALBANIA

Past status

No information available.

Present status

According to the available information from local experts and the FAO ADRIAMED regional project, driftnets are not used by artisanal vessels.
(http://www.faoadriamed.org/pdf/publications/td15/NR_ALB.pdf).

MONTENEGRO
Past status
No information available.
Present status
According to fisheries scientists of the Institute of Marine Biology of Kotor, there are currently 30 licensed boats using driftnets in Montenegro, all classified as "gill nets for bonito (*S. sarda*)" ("polandara"). According to the "Rulebook on construction–technical basis, mesh size, method of use and purpose of certain net types and other means for commercial fishing" (Official Gazette of Montenegro, 8/2011), the minimum stretched mesh size of "gillnet for bonito" is 80 mm. Gillnet for bonito in Montenegro is limited to a height of 22 m and length of up to 400 m. Most drift nets are licensed in the municipality of Herceg Novi (13), split between ports of Herceg Novi (8) and Zelenika (5). Budva has 11 licensed driftnets, Kotor 5, Tivat 4, and Bar 2. Mesh side length ranges from 40 mm to 100 mm, with the majority (42.9% or 15 drift nets) having a mesh side length of 45 mm (90 mm stretched mesh size).
The vessel length ranges from 3.93 to 11 m, with an average 6.3 m. Engine power is between 2.75 to 192 kW, with an average of 30.27 kW, while the gross register tonnage ranges from 0.51 to 9.36 GRT, with an average of 2.14 GRT. Catch composition of gillnets for bonito in Montenegro is currently unknown.

CROATIA (information received before Croatia's accession to the EU).
Past status
A driftnet called "vojga" was used in the past for catching small pelagics but nowadays this net is fully replaced by "srdelara" purse seine for small pelagics (sardine and anchovy).

2.4 - OVERVIEW OF THE INTERNATIONAL/EU/NATIONAL PROVISIONS REGULATING THE DRIFTNETS FISHERIES IN MEDITERRANEAN (TASK 1.4)

A global overview of all the provisions issued in these years affecting the driftnet fisheries in the Mediterranean was made. This work considered all the driftnet fisheries *sensu latu*, not only the SSD fisheries.
All the relevant information was gathered and summarized, with particular attention to possible catch reporting obligations, verifying if some compulsory fishing authorization regime is in place. Furthermore, the critical overview was focused on the identification of gaps in the legislative framework which might hamper the full implementation of and compliance with the UNGA resolutions and the EU legislation.
This results are also presented in the **Deliverable 7:** "Review of the legislative provisions regulating SSD fisheries"; this Deliverable provides also the complete list of all the provisions cited in this paragraph.

As stated in the rationale of the project, driftnets were used since ancient times in the Mediterranean Sea as the only way to exploit different small/medium sized species, mostly living in or migrating through coastal areas. These small scale gears have been used for generations by small artisanal local fleets and was never been a cause for major concern.
Problems started in the late 70s-80s: the development of hydraulic hauls and new materials for the construction of nets, coupled with the possibility to build new larger boats brought fishermen to completely change the original concept of these nets: they were transformed from small scale driftnets (SSDs, with small mesh size and moderate in length) to large mesh size nets, with a much greater overall length and height, mainly addressed to exploit large pelagic fish, as swordfish and tunas. At the end of the '80 the intensive use of large scale, pelagic drift nets increased to such an extent that a great matter of

concern was expressed not only for the high number of by-catch species, mainly made by protected and vulnerable species, such as sea turtles and marine mammals, but also for the target species, notably swordfish, because of the high rate of catches.

In this scenario, the United Nations General Assembly (UNGA) on 22nd December 1989 adopted the first resolution referred to driftnets (UNGA Resolution n. 44/225).

In this resolution it was affirmed that "….moratoria should be imposed on all large-scale pelagic driftnet fishing by 30th June 1992".

The implementation of this resolution was not very successful, so that the following year (1990) the UN felt the need to reaffirm the concepts expressed in the previous year, adopting the UNGA Resolution n. 45/197), slightly shifting the terms of the moratoria, which was postponed to 31st December 1992, introducing the need of a 50% reduction of the large scale pelagic driftnet fishing effort by 30th June 1992.

These two resolutions were followed by a third (UNGA Resolution n. 46/215) in the 1991, reaffirming the same concepts, and recommending to all member states to "ensure that a global moratorium on all large-scale pelagic drift-net fishing is fully implemented on the high seas of the world's oceans and seas, including enclosed seas and semi-enclosed seas, by 31st December 1992."

At local level, in the Mediterranean Sea the unwanted catches of vulnerable and protected species raised to very high levels in those areas where high concentrations of marine mammals and sea turtles were present coupled to a high fishing effort, such as the southern Tyrrhenian Sea and the Ligurian Sea. The high number of killed or injured animals belonging to many species, mainly striped dolphins, pilot whale and sperm whales among others, drove many Research Institutes and NGO to curb the proliferation of driftnets.

Thus, the Italian Ministry of Marine Merchant, at that time in charge for Fisheries management, issued the Ministry Decree (DM) of July 20th 1989, introducing the prohibition of releasing new fishing licenses for drift nets as well as the prohibition of the fishing activity during the month of October to fish for swordfish and albacore. This was followed by the DM of October 25th 1989 issuing the prohibition to fish swordfish and albacore with driftnets in the period November 1st 1989 to March 31st 1990.

Before that, in Italy, the Sardinian Regional government prohibited the use of drift nets in the water surrounding the Sardinia Island with the regional law 13th May 1988, n. 10.

The Italian Ministry decided to downsize the driftnet fleet issuing the DM of 30th March 1990 about some technical measures concerning the driftnets for swordfish, the so called "spadara" nets, such as:

- minimum mesh size 320 mm;
- maximum net height 35 m;
- maximum length 5 Nautical Miles (NM);
- minimum distance from the coastline 900 m (shifted to 3 NM on summer).

The same decree announced the creation in the Ligurian Sea of a an area where such fishing activity should be prohibited, on the basis of the opinions of three scientific institutes, using the only available legal instrument, Article n. 98 of the Fisheries Act 1965, for the establishment of "zones of biological protection".

This area was then established with the DM. July 18th 1990; some other decrees followed: Ministerial Decree of May 22nd 1991, Ministerial Decree of June 19th 1991 and Ministerial Decree of August 12 1992, in order to better define the outline of the area (Fig. 2.4.1), which is called for the first time "Sanctuary" for protection of Cetaceans.

These and other decrees also introduced temporal and/or seasonal bans, some new technical changes to the gear, such as minimum mesh size of 350 mm, maximum height 30 m, maximum length 2500m and the authorization to fish within the Sanctuary area only for boats registered in Ligurian ports, allowing research on the fishing activities by onboard observers .

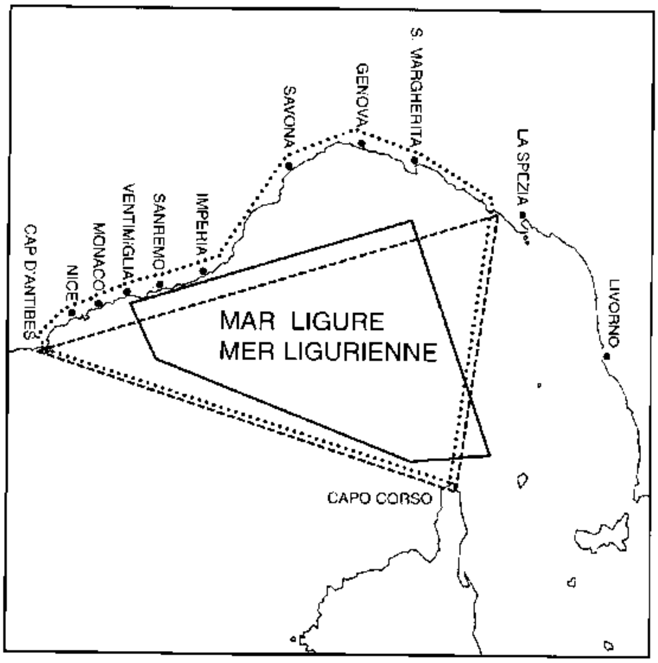


Figure 2.4.1 - The "Sanctuary" limits following different Decrees
July 18th 1990; --------- June 19th 1991; ……. August 12th 1992.

At the same time, also Spain decided to regulate the activities of drift nets, with the Decree of October 22 1990, in which all drift nets were banned except those used to fishing bullet tuna, *Auxis rochei*, and Atlantic bonito, *Sarda sarda.* A with maximum mesh size of 150mm and maximum length of 1500m were allowed, starting from March 31st 1991.

The EU regulation n. 345/92 of the January 27th 1992 was issued, stating that (Art. 9a) "…no vessels may keep on board, or use for fishing, one or more driftnets whose individual or total length is more than 2,5 km and other measures by June 1st 1992". One year later, at the beginning of 1993, Greece also banned driftnets from all Greek territorial waters.

As already stated, Italy countries was the most active among the European countries in the legislation on driftnets (we counted more than 20 different decrees on this issue), also considering the great number of Italian vessels using this gear.

In 1995, with the Ministerial Decree of 26th July 1995, the Italian Ministry distinguished the large-mesh driftnets to catch swordfish and albacore from the small scale driftnets, which were called for the first time "ferrettare", introducing as technical measure, the maximum length of 2000m and the maximum mesh size of 180mm.

Finally the EU issued the Council Regulation (EC) n. 894/97 of April 29th 1997 (amended by the Reg. n. 1239/98 and the Reg. n. 809/2007 with a new definition of driftnet), introducing measures on fishing operations, the maximum number of fishing boats per Member State and, in particular, the list of the Prohibited species (Annex VIII). In summary the most important measures were:

- Art 11.2. "No vessel may keep on board, or use for fishing, one or more drift nets whose individual or total length is more than 2.5 kilometers"
- Art 11a. "From 1st January 2002, no vessel may keep on board, or use for fishing, one or more drift-nets intended for the capture of species listed in Annex VIII.
- From 1st January 2002, it is prohibited to land the species listed in Annex VIII. Hereafter the Annex VIII species list:

— Albacore: *Thunnus alalunga*
— Bluefin tuna: *Thunnus thynnus*
— Bigeye tuna: *Thunnus obesus*
— Skipjack: *Katsuwonus pelamis*
— Atlantic Bonito: *Sarda Sarda*
— Yellowfin tuna: *Thunnus albacares*
— Blackfin tuna: *Thunnus atlanticus*
— Little tuna: *Euthynnus* spp.
— Southern bluefin tuna: *Thunnus maccoyii*
— Frigate tuna: *Auxis* spp.
— Oceanic sea breams: *Brama rayi*
— Marlins: *Tetrapturus* spp.; *Makaira* spp.
— Sailfishes: *Istiophorus* spp.
— Swordfishes: *Xiphias gladius*
— Sauries: *Scomberesox* spp.; *Cololabis* spp.
— Dolphinfishes: *Coryphæna* spp.
— Sharks: *Hexanchus griseus; Cetorhinus maximus; Alopiidae; Carcharhinidae; Sphymidae; Isuridae; Lamnidae*
— Cephalopods: all species

In the same time it was issued the EC Council decision n. 97/292 of April 28th 1997, on a specific measure to encourage Italian fishermen to diversify out certain fishing activities, taking into account that fishing for large pelagic species with drift nets of 2.5 km or less in length was not profitable. This decision was taken as "part of the plan drawn up by the Italian Government to reorganize and diversify out of drift net fishing for large pelagic fish, as notified to the Commission on July 25th 1996, a specific measure is established to grant aid ……in the form of compensation for suspending this activity." In the Annex the different reconversion premium for fishermen were also defined.
Following this decision, the Italian Ministry issued the DM of May 23rd 1997, the National plan for reorganize and diversify Italian drift net fleet, followed by the circular of June 26th 1997, containing some clarifications, which put the maximum limit for the submission of the application for conversion by March 31st 1999. There were subsequently some circulars and decrees, always linked to the conversion plan, targeted to calibrate step by step the plan itself. Finally, the term to apply the reconversion plan was postponed to November 15th 1999 by the Ministerial Decree of May 3rd 1999. The plan for the reconversion of large mesh drift nets included, among others, an allowance of cessation of fishing activities and a "*bonus"* for conversion to carry out any other activity other than fishing driftnet or to other economic sector (Article 6, paragraph 1). For those who have not joined the plan, it was permitted fishing with drift nets until December 31st 2001 provided the conditions introduced by Regulation (EC) n. 1239/98.
In the meantime, some measures were adopted by Italian Government encouraging the dismission of large mesh pelagic driftnets, giving new licenses for the so called "ferrettara", as partial compensation. Of course, to avoid falling back into the problem and given the possibility that "ferrettara" nets were then illegally used to catch species listed in the Annex VIII or replaced by true "spadara" nets, the Italian Ministry felt the need to modify the technical measures regarding SSDs.
As stated with the old DM of July 26th 1995, the "ferrettara" was allowed to have a maximum length of 2000m and mesh size with up to 180mm. The new DM of October 14th 1998 contained a plan for the progressive reduction of the mesh and some other technical characteristics of the gear, with the prohibition of catching different species, following EU directives, in particular the Annex VIII of the Regulation 894/97.
In summary this new decree stated the following measures:
By December 31st 2001,

- maximum distance from the coast 6 nm NM;
- maximum length 2000 m;
- maximum size 150 mm;
- permitted species: Atlantic bonito, dolphin fish, bullet tuna, amberjack, saddled seabream, mackerels, salema, bogue, sauries, round sardinella, sardine, anchovy.

Starting from 1st January 2002

- maximum distance from the coast 3 NM;
- maximum length 2000 m;
- maximum mesh size 100 mm;

- permitted species: amberjack, saddled seabream, mackerels, salema, bogue, sauries, round sardinella, sardine, anchovy.

With these technical measures it was prevented that any drift net could be used to catch large pelagic fish, also facilitating control activity in the ports.
In the same years, there was the case of the French “thonaille”: in 2003, permits were issued by French Government for tuna fishing with drift net, by the decree (Arrêté) of August 1st 2003, introducing a special license for the "thonaille", with the following characteristics:
- mesh sizes: minimum 200 mm - maximum 240 mm;
- length of the net: 1 NM for each crew member up to a maximum of 5 NM.

This decree was modified in 2004 by the new “Arrêté” of 8th July 2004 that, taking into account of the large number of dolphins, mainly juveniles, caught as by-catch, introduced a temporal closure from August 15th to September 15th inside the Pelagos Cetacean Sanctuary.
These decrees were in contrast with the EU Regulations and in France also public awareness strongly opposed to the use of this gear, so that there was the Decision of the French Conseil d'Etat July 6th 2005 against these two decrees, but this was overcome by the New “Arrête” 28th July 2005, slightly modifying the first decree of 1 August 2003.
Four years later the Judgment of the European Court (Third Chamber) of 5th March 2009 condemned France and that was the end of fishing with the thonaille.
Applying the decision of the Court, the French Government issued the decree of 28th August 2009, containing the following technical measures for the use of drift nets by French vessel operating in the Mediterranean Sea (FAO area 37):
- Maximum length 2500 m
- Maximum mesh size 80 mm

As regards Italy, on January 1st 2002 the decree on “ferrettara” of 14th October 1998 was enforced.
On 19 April 2005, a decree allowing the use of driftnets so called “ferrettara” up to a distance of 10 NM from the coast of the smaller islands around Italy, with 5000m of maximum length was issued. This decree, however, was immediately stopped by the decree of July 1st 2005.
The following year it was issued the DM May 24th 2006 which allowed fishing with “ferrettara” nets with the following measures:
- Maximum distance of 10 NM from the coastline
- Maximum length of the net 2500 m,
- Maximum mesh size 180 mm.

This regulation led to an increase in illegal fishing, since it made more difficult, if not impossible, to carry out controls, especially on the species caught and landed, as with a mesh of 180mm many of the large species were often captured.
This situation led to the infraction procedure against Italy implemented by the EU for lacking in the controls, as stated by the judgment of the European Court, section 7 to October 2009 (“*Lack of effective control systems to ensure compliance with this prohibition”)*.
Given the difficulty in implementing controls despite the strong efforts made by Italian authorities, the Italian Ministry issued the decree of July 1st 2011, which forbade the presence on board at the same time of both driftnet and long line. Against this decree, there was a sentence of the TAR (Regional Administrative Court) on September 1st, which suspended the DM, until February 2012.
In anticipation of this judgment, the Ministry issued the final decree, DM of September 21st 2011, which established the following technical measures for driftnets, starting from January 1st 2012:
- maximum distance from the coast 3 NM:
- maximum length 2,500 m;
- maximum mesh size 100 mm;
- forbidden to catch the species of the Annex VIII bringing the situation back to 2002, within the regulations established by the European community.

Over the years, some International Organizations issued resolutions or Recommendations about driftnet.
In 1997 - GFCM Resolution n. 97/1 concerning the use of large-scale pelagic driftnets in the GFCM area of 16 October 1997, stating that “No vessel flying the flag of a Contracting Party of GFCM may keep on board, or use for fishing, one or more driftnets whose individual or total length is more than 2.5 kilometers….;” followed by 2003 ICCAT recommendation n. 03/04 – Mediterranean swordfish – in which Contracting Parties, Cooperating non-Contracting Parties, Entities or Fishing Entities shall prohibit the use of driftnets for fisheries of large pelagics in the Mediterranean.
After these, GFCM issued the Recommendation n. 2005/3 adopting ICCAT recommendation 03-04.
Since 2008 as stated by the Art. n. 216/2 of the “Consolidated version of the Treaty on the functioning of the European Union” all agreements concluded by EU with International Organizations) “*are binding upon the institutions of the Union and on its Member States*”. This led to a great importance of all recommendations issued by ICCAT or GFCM, immediately applicable to the entire Mediterranean Basin. From this point of view the latest Recommendations adopted by GFCM (Recs n. 35/2011 and n. 36/2012 acquire even greater strength. These recommendations are primarily aimed to mitigating by-catch of sea birds (n. 35/2011/3), sea turtles (n. 35/2011/4), cetaceans (36/2012/2) and on conservation of Mediterranean monk seal (n. 35/2011/5) and elasmobranch species (36/2012/3).
In summary, the current situation about driftnet fishing, with regard to the different Member Countries of the European Community, is as follows:
- Council Regulation (EC) n. 894/97 of 29th April 1997 (amended by n. 1239/98 and 809/2007 with a new definition of driftnet) introducing Measures on fishing operations and number of fishing boats per Member State and the Prohibited species (Annex VIII) since 1st January 2002. In summary the most important measures were:
Art 11.2. “No vessel may keep on board, or use for fishing, one or more drift nets whose individual or total length is more than 2,5 kilometers” and
Art 11a“From 1st January 2002, no vessel may keep on board, or use for fishing, one or more drift-nets intended for the capture of species listed in Annex VIII.
2. From 1st January 2002, it is prohibited to land species listed in Annex VIII which have been caught in drift-nets.

Italy – At present the decree of 21st September 2011 is enforced. A new decree issued on 26th January 2012 with the aim to standardize the fishing gear denominations with the international nomenclature, as transposition of the Commission Implementing Regulation n. 404/2011(44) of for the implementation of Council Regulation (EC) n. 1224/2009 establishing a Community control system for ensuring compliance with the rules of the Common Fisheries Policy, substituted the name “ferrettara” with “Small drift net” (GND).

France – There is a specific regulation at country level for driftnets: the decree of 23rd July 2011 established the following technical measures for drift nets:

- Maximum length 2500m
- Maximum mesh size 50 mm
- Maximum distance from the coast 2 NM
- Maximum length of the boat 10m.

Greece – Driftnet ban, as stated by the Decree n. 40/1993

Spain – As far as we know, the decree of October 22nd1990 is still enforced, which should allow the capture of Atlantic bonitos and bullet tunas, which are species of Annex VIII; this decree should be decayed and overcome by European legislation.

Croatia – A driftnet called "vojga" was used in the past for catching small pelagics but nowadays this net is fully replaced by "srdelara" - purse seine for small pelagics (sardine and anchovy).

According to information from local experts, the new Marine Fisheries Act, actually no longer includes drift nets. Particularly, nets are defined as passive single (gill nets) and triple (trammel nets) nets that stand in a water column. Based on this definition drifting nets are no longer permitted.

For the non-EU countries in the Mediterranean basin we have collected the following information:

Morocco – The "Dahir" reporting the law n. 1-73-255 of 23rd November 1973 about marine fishery regulations is the reference point for all the fishery legislation in Morocco; it only reports a brief description and definition of drift nets, without technical measures or limitations. Starting from the end of the '90 the Moroccan driftnet fleet has greatly expanded, generating a great matter of concern about by-catch of protected and vulnerable species, but also about the health of the stocks of targeted species. In the framework of some Fisheries Partnership Agreement between the European Community and the Kingdom of Morocco started after 2002, one of the terms was the total ban of driftnet fishery by Morocco.
Only recently, with the "Dahir" n. 1-10-122 reporting the law 19-07 of 16th July 2010 this happened; at the moment in Morocco the importation, fabrication, detention, selling and use at sea of driftnets is forbidden.

Tunisia - The "arrêté" of September 28th 1995 on the Regulation of fishery is the basic text of application of the law n. 94-13, 31 January 1994. It prohibited (article n. 15) the use of driftnets longer than 2500 m. No other more recent laws were found about driftnet.

Libya - A drift gillnet ("*Sayeb ayam*") was reported to be used between October and March to target mainly *Euthynnus alletteratus* with a mesh size of 50 mm. No other information was available about law status.

Lebanon - According with information collected from Department of Fisheries & Wildlife (Ministry of Agriculture) and local experts involved in international projects on small-scale fisheries (CANA project), driftnets do not seem to be currently used by the artisanal fleet.
Palestine - According to information gathered from the national focal point of the EASTMED project, in Palestine a specific driftnet for small pelagics ("*Maltash*") is used in spring and autumn. Another driftnet with a larger mesh ("*Zeada*") is used to catch different medium pelagic species all along the year. No other information was available about law status.

Turkey – Driftnets were prohibited for the first-time in 5th March 1998, but later, taking into consideration of EU 894/97 directive, on 16th August 2005 it was allowed using driftnet with a maximum length of 2500 m only for one year. This application was repealed on 1st September 2006, in compliance with EU related directive. Finally, since 2011 it is completely prohibited the use and detention of all kind of driftnets.

Montenegro - The basic text about fishery regulation in Montenegro is Decree on Promulgating the Law on Marine Fisheries and Mariculture (50), published on Official Gazette of Montenegro n. 56/09 of 14 August 2009, completed by the "Rulebook on construction and technical basis, mesh size, method of use and purpose of some types of net and other tools for commercial and sport-recreational fishing, taking of shellfish, corals, sponges and marine vegetation", published in the Official Gazette of the Republic of Montenegro 10/2004 and 9/2006. This regulation was updated by the "Rulebook on construction–technical basis, mesh size, method of use and purpose of certain net types and other means for commercial fishing" (52) published on Official Gazette of the Republic of Montenegro 8/2011) which is the most recent text about some different kind of GND used. The minimum stretched mesh size for entangling nets for the catches of "Atlantic bonito (*Sarda sarda*), Bullet tuna (*Auxis rochei*), Little tunny (*Euthunnus alletteratus*) and greater amberjack (*Seriola dumerilli*) is 34 mm and length of up to 800 m.

Albania - According to the available information from local experts and the FAO ADRIAMED regional project, driftnets are not used by artisanal vessels.

No other definite information on the regulations of Egypt, Algeria, Israel, Syria, The search for this information is still in progress, in the framework of Tasks 1.1 and 1.3 of this Contract.

General considerations

The main target of most of the legislations implemented so far on driftnets fisheries has always been limiting, if not completely banning, the use of large scale pelagic drift nets for catching highly migratory species, such as swordfish and tunas. This was due to concerns rising for the high level of unwanted catches of protected and/or vulnerable species and otherwise for the high catch rate of target species. Regarding the SSDs, these are not always been seen as a problem both for the environment and for the exploited resources. As a matter of fact, if we consider the first UNGA resolution(1) of 1989, it was clearly expressed that “the present resolution does not address the question of small-scale driftnet fishing traditionally conducted in coastal waters, especially by developing countries, which provides an important contribution to their subsistence and economic development.”

Up to date, the EU regulation sets a limit only to the length of the driftnet, but does not express limitations regarding possible other measures such as mesh size, distance from the coast line or other technical characteristics of nets.

The implementation of the 2.5 km rule presented many practical problems (mainly due to illegal fisheries) and did not stop the expansion of large-scale pelagic driftnets. Therefore EU prohibited all driftnets, no matter their size, when intended for the capture of a certain group of pelagic species including inter alia tunas, swordfish, billfish and sharks (e.g. the species included in the Annex VIII of EC regulation n. 1239/98).

If we look deep into the national legislation, when some regulations about SSD exist, there are many differences, also among EU countries, mainly regarding legal mesh size.

Although in the past Italy and France faced many problems with illegal (Italy) or legalized (France) driftnet fishing, up to date both the Italian and French regulation are stricter than the EU one. As a matter of fact, only the use of driftnets with overall length equal or less than 2.5 km, with a mesh size no more than 100 mm for Italy and 50 mm for France (but in this case it could be expressed) not as stretched mesh) and to be used only within 3 miles (2 miles for France) from the coast.

These technical requirements aimed at reducing the interaction of this driftnet with non-target species and reducing the incidental entanglements by decreasing the mesh opening (usually the driftnets targeting large pelagic species had a mesh opening greater than 350 mm).

In the meantime for Greece there are no problems as it has completely banned the use of driftnets and in Spain, the decree of 1990 allowed the use of drift nets in coastal waters to catch Atlantic bonitos and bullet tunas, but this decree should be decayed and overcome by European legislation since the species are included in Annex VIII.

Also some non-EU countries adopted national regulations on driftnets, following international resolutions/recommendations (GFCM, ICCAT, UN), but there are still many in which this kind of gears are commonly used without application of technical measures.

Other concerns regard possible illegal activity with large mesh driftnets in Mediterranean, considering that there remain some gray areas in national regulations and control activities at a basin scale.

In practice, at present, the legal fishing with driftnets in the Mediterranean is that referring to traditional, artisanal types of fisheries practiced from ancient times, carried out by small boats using small mesh size drift nets. These fisheries were undoubtedly more important in the past, when they were widely distributed and had an important economic and social value for many small scale fisheries.

3. COLLECTION OF NEW DATA ON SSD FISHERIES (WORKPACKAGE 2)

The Workpackage 2 of DRIFTMED was targeted to collect new data about SSD fisheries as concerns fishing capacity and activity, gear technical characteristics, species composition of the catch, as well as the main economic parameters. WP2 was planned out on fleets of EU Mediterranean countries, with a particular effort in Italian waters, because the SSD fisheries are mostly present in this country. WP2 comprises the following two tasks:
Task 2.1 - Interviews, log books and embarks/observations at landing sites and on board.
Task 2.2 - Measurements of technical parameters of nets.

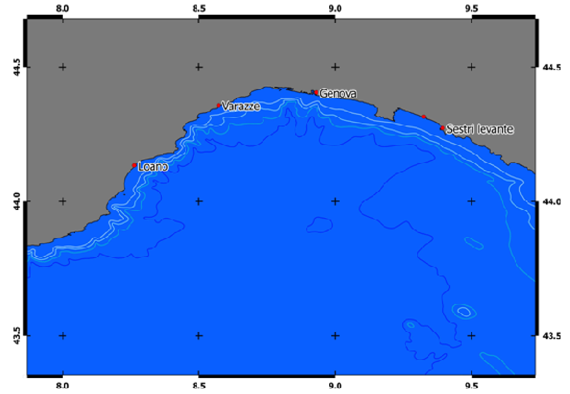
3.1 - INTERVIEWS, LOGBOOKS AND EMBARKS/OBSERVATIONS AT LANDING SITES AND ON BOARD (TASK 2.1)

This task has been planned to collect data through direct contacts with fishermen and other stakeholders, such as representative of fishermen associations and cooperatives, as well as of fishing markets or auctions. Data were collected by means of three different approaches:

- questionnaires/interviews: targeted to gather information at single vessel level of group of vessels for a wide period (e.g. year);
- logbooks: targeted to gather information at single fishing trip level;
- embarks: targeted to collect information by observations on board.

The first step was to establish the sampling plan for the data collection on field, starting to the results of the analysis of EU fleet register. The most appropriate fleets/sites were selected for carrying out the collection of new data on SSD fisheries and/or check the presence of active SSD fisheries were selected.

- Ligurian and Tyrrhenian coasts (GFCM GSAs 9 and 10) (Fig. 3.1.1).
In Liguria interviews, logbooks and embarks were realised to follow the SSD fishery so called “occhiatara”.
Interviews were carried out in Ponza Island, to verify the current use of driftnets used in the past years.
The same activity was realised in the Ischia Island and in Salerno.
In Torre Annunziata (Gulf of Naples), interviews, logbooks and embarks were realised to follow the few vessels of the small driftnet fishery targeting the bluefish (*Pomatomus saltatrix*).
In several ports of Cilento the local SSD fishery targeting anchovy was followed by interviews, logbooks and embarks.



	Interview	logbook	Embark
Ligurian coast	x	x	x

	Interview	logbook	Embark
Ponza	x		
Ischia	x		
Torre Annunziata	x	x	x
Salerno	x		
Cilento Area	x	x	x

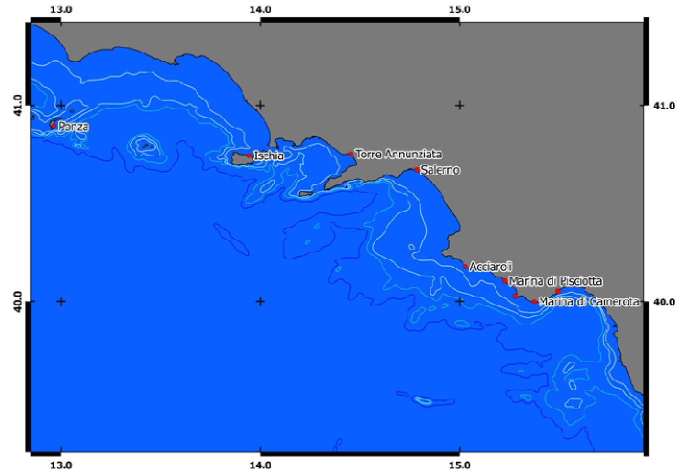


Figure 3.1.1 – Sampling sites and sampling plan in the Italian GSA9 (above) and GSA10 (below).

- Coast of Sicily (GFCM GSAs 10, 16 and 19) (Fig. 3.1.2).

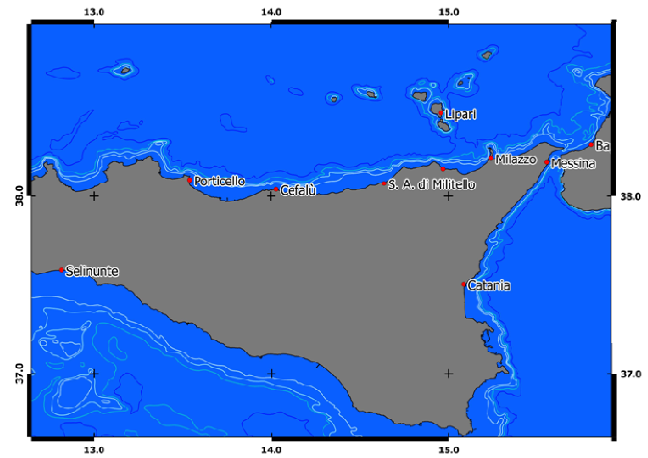
Along the Sicilian coasts many fishing ports where SSD fisheries are in use were identified.

The SSD fishery using "menaide" net present in the Catania area was monitored by means of interviews, logbooks and embarks.

The vessels moored in Sant'Agata di Militello belonging to the fisheries targeting anchovy, mackerels, bogues and amberjacks (in different periods of the year) were monitored by means of interviews, logbooks and embarks. The same was performed in Milazzo area and Porticello for the fishery targeting mackerels.

Interviews were realised in the harbours of Messina, Cefalù and Lipari.

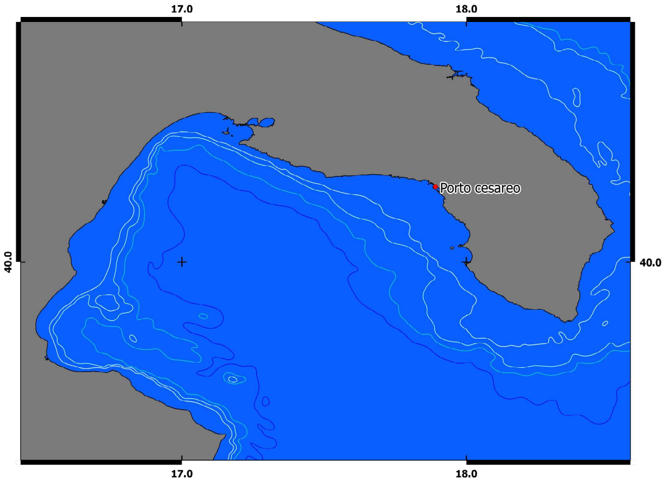
Also in the port of Selinunte some information was collected by interviews, directed to the fishermen using small-scale driftnets targeting sardine in a limited period of the year.



	Interview	logbook	Embark
Milazzo area	X	x	x
S. Agata di Militello	x	x	x
Cefalù	x		
Porticello	x	x	x
Catania area	x	x	x
Lipari	x		
Messina area	x		
Selinunte	x		

Figure 3.1.2 – Sampling sites and sampling plan along the Sicilian coast (GSAs 10, 16 and 19).

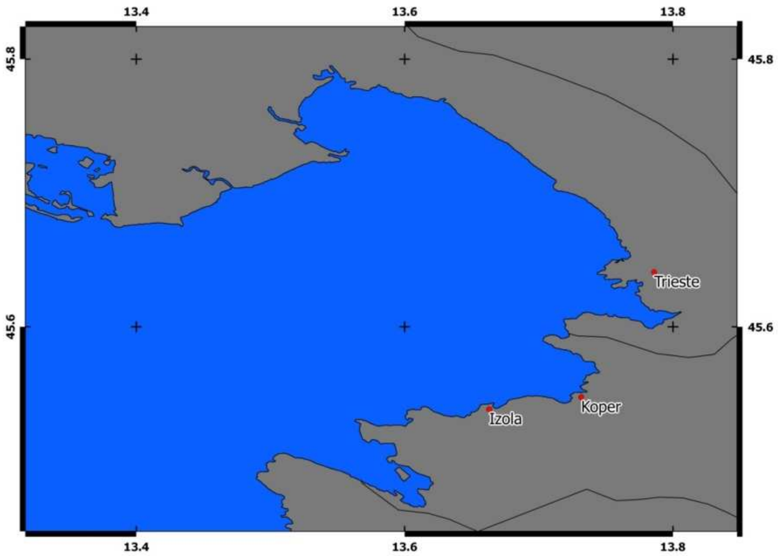
- Coast of Ionian Apulia (GFCM GSA 19) (Fig. 3.1.3)
Interviews were realised in Porto Cesareo to detect the current presence of small-scale driftnet fisheries.



	Interview	logbook	Embark
Porto Cesareo	x		

Figure 3.1.3 – Sampling sites and sampling plan along the Ionian Apulia region (GSA19).

- Northern Adriatic (Fig. 3.1.4)
Interviews were carried out in the ports of Koper and Izola, Slovenia, to fishermen using small-scale driftnets targeting sardine in a limited period of the year.



	Inteview	Logbooks	Embark
Koper	x		
Izola	X		

Figure 3.1.4 – Sampling sites and sampling plan along the northern Adriatic (GSA17.)
The collection of new data performed with interviews was carried out on the highest possible number of vessels/fleets, in order to provide the more exhaustive picture of the active SSD fisheries. On the other

hand, due to the limitations of time, resources available and given the dispersion of the sampling sites, the data collection by means of logbooks and embarks was performed on a selected number of vessels/fleets.
The choice of the vessels/fleets was made primarily trying to cover all the fisheries identified. Moreover, the selection of the vessels/crews for the logbooks and embarks was done following several criteria, according to previous positive experiences of collaboration with scientists, to the availability to collaborate and to the representativeness of the vessels in the context of the local fleets.
Fig. 3.1.5 shows the number of vessels involved in the collection of new data; in total 12 vessels were used for the embarks, 37 for the logbooks.
The active SSD fisheries were monitored by means of 96 interviews, 254 logbooks and 55 embarks, in the period from April to mid of October 2013 (Tab. 3.1.1).

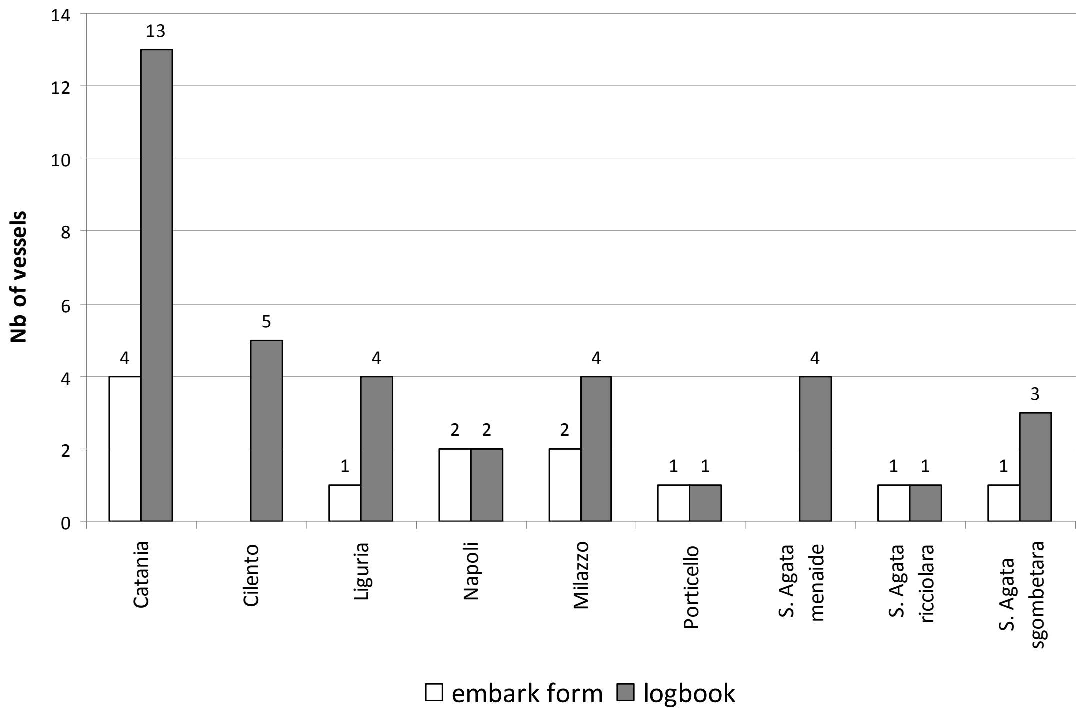


Figure 3.1.5 – Number of vessels involved in the collection of data by means of embarks and logbooks.

Sampling site	N° Interviews	N° Logbooks	N° embarks / observations at landing site
Arenzano	1		
Bordighera	2		
Chiavari	2		
Genova Darsena	1		
Genova Nervi	4		
Imperia	13	10	
Loano	4	5	
Sanremo	4	39	8
Vernazza	1		
Marina di Pisciotta	4	8	
Marina di Camerota	2	5	2
Palinuro	13	3	
Torre Faro	1		
Ganzirri	2		
Milazzo	1		
Porto Rosa	11	20	19
Spadafora	1	10	1
Capo d'orlando	1		
Porticello	1	39	6
Catania	15	51	12
Ognina	4	3	
S. Agata di Militello	6	46	3
Torre Annunziata	2	15	4
Total	**96**	**254**	**55**

Table 3.1.1 – Details on data collection (by interviews, logbooks and embarks) along the Italian coast.

The collection of new data was made according to a common protocol defined the first month of the project. Three standardised forms for data collection were created, in order to gather information on fishing capacity, fishing activity, technical specification of the gears, composition of the catch (target species and by-catch, with particular attention to the presence of sensitive/endangered and non-authorized species), as well as on socio-economic aspects of these fisheries.
According to the suggestions received from DGMARE after the delivery of the 1st interim report and given the experience of the first month of sampling activity, the forms were reviewed in some parts.

Examples of the three forms are provided in the **Annex II** of this report.

3.2 - MEASUREMENTS OF THE TECHNICAL PARAMETERS OF NETS (TASK 2.2)

RATIONALE

At present the knowledge, from a technological point of view, of the Mediterranean Small-scale Driftnets (SSD) is scarce and scattered in various sources of information. In consideration of this, Task 2.2 of DRIFTMED Contract (Measurement of technical parameters of nets) has been specifically designed to obtain more detailed information about the technical properties of the different SSD in use in EU Mediterranean area.

The Council Regulation (EC) n. 809/2007 of June 28th 2007, defined the driftnet as "*any gillnet held on the sea surface or at a certain distance below it by floating devices, drifting with the current, either independently or with the boat to which it may be attached. It may be equipped with devices aiming to stabilize the net or to limit its drift*". Therefore a driftnet is simply defined as gillnet (one single netting panel) drifting freely with the current. However <u>this is a generic definition that makes unfeasible to clearly discern gillnet from a driftnet, simply on the basis of technical properties</u>.
Driftnets have been largely used in the past for the catch of a wide range of species from large (albacore, *Thunnus alalunga*; bluefin tuna, *T. thynnus*; swordfish, *X. gladius,* etc.) to small (anchovy, *E. encrasicolus*; sardine, *S. pilchardus* etc.) pelagic species.
In consideration of the target species, the two groups of driftnets (targeting large or small pelagic species) largely differ in their technical properties. The following technical features can be identified when illegal driftnets targeting large pelagic species are analysed: large mesh opening (usually more than 340 mm), thick material, high net drop (usually more than 20 m), huge net volume when stored (Fig. 3.2.1).
In the Mediterranean EU countries, the main concern with driftnets was historically recognized in Italy, even if in the last few years the battle against illegal nets produced good results.
In this country the use of driftnet has been regulated since 1998 with the Ministry Decree n. 281 of 14th October, that defined the technical requirements for the use of the small driftnet, the so-called "ferrettara", the use of which was allowed only for the catch of small pelagics and some sparids (e.g. *B. boops*, *O. melanura*, *E. encrasicolus*, *S. pilchardus,* etc.). This decree was followed by others modifying the technical requirements of the "ferrettara" net. Finally, the Italian Ministry Decree of September 21th 2011, from January 1st 2012, only allowed the use of "ferrettara" nets with overall length equal or less than 2.5 km, having a mesh size no more than 100 mm and to be used only within 3 miles from the coast.
At present, in the EU waters only fishing with small sized driftnets with a total length equal or smaller than 2.5 km is allowed to catch species other than those included in the Annex VIII of EC Reg. n. 1239/98.
The preliminary investigation highlighted the presence of small-scale driftnets in Italy and Slovenia; therefore the direct measurements carried out in the DRIFTMED project involved driftnets presently in use in these two countries.
The data collected in the Task 2.2 have been used to integrate the information collected in the WP1.

Figure 3.2.1 - Details of an illegal driftnet.

The main objectives of Task 2.2 were the following:

- To collect new data on technical aspects of small-scale driftnets.
- To fill the gaps on the present knowledge.
- To identify technical properties of small-scale driftnets by gear type and fishery.
- To define possible parameters to discern small-scale driftnets from fixed nets (gillnet).

METHODOLOGICAL APPROACH

Technical parameters

The technical parameters of driftnets were collected directly at deck harbour or where the nets were stored by applying the methodological approach adopted in the recently finished MAREA Specific Project n. 3 ARCHIMEDES, which had the objectives of the estimation of technical parameters of set nets in Mediterranean (Lucchetti*,* 2012). The new data were collected by means of direct measurements on the nets taken by scientific operators, at landing points, directly on board of the vessels or in the warehouses, depending on where the net to be measured was found. In few cases it was possible to collect technical information on the nets only through direct interviews with fishermen and net makers.
In more details the following measurements were done:

- **Mesh opening**: the longest distance between two opposite knots or joints in the same mesh when fully extended; the mesh opening was determined according with the rules for the determination of the mesh size enclosed in the Commission Regulation (EC) n. 517/2008 of June 10th 2008. The mesh gauge for the measurement of the mesh opening is an electrically driven instrument that applies a pre-set longitudinal force of 10 N to the mesh to be measured (Fig. 3.2.2). Once this force is reached, the exact opening of the gauge is measured automatically.

Figure 3.2.2 - Measurement of the mesh opening (left) of a “menaide" driftnet in the Catania fishing Harbour.

- **Mesh length**: the distance between the centres of two opposite knots or joints in the same mesh when fully extended in the N-direction (measured stretching the net and measuring ten meshes in a row; Fig. 3.2.3);

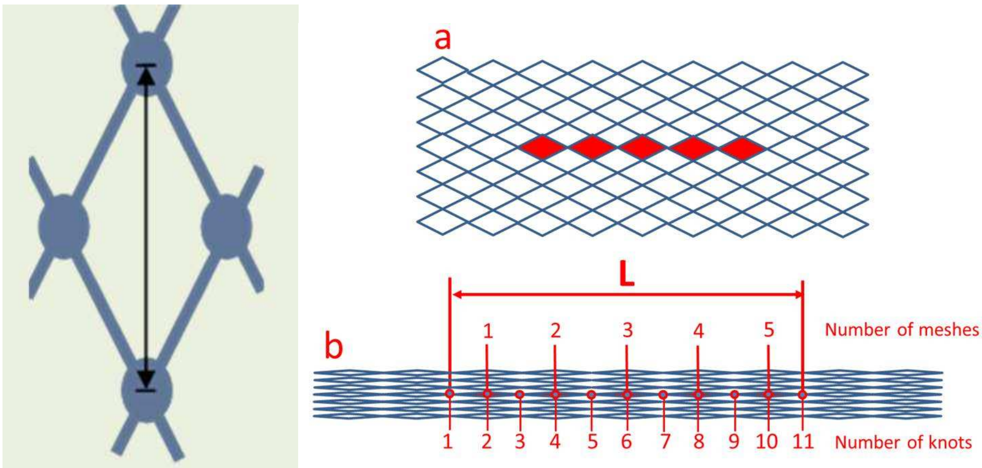


Figure 3.2.3 - Mesh length (left): principle applied for the direct measurement (right).

- **Net rigging**: it defines how the net is mounted on the headrope and leadrope (Fig. 3.2.4). Basically two main net rigging can be present: Diamond and T90 configuration (Fig. 3.2.5).

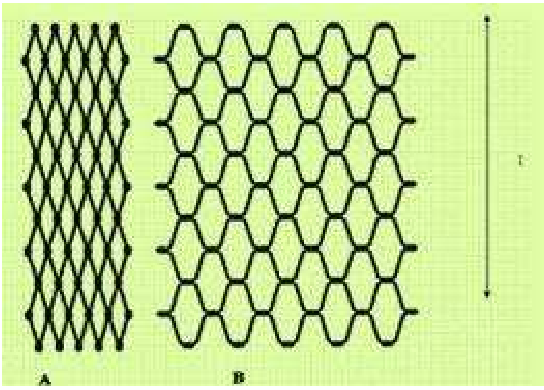


Figure 3.2.4 - Different net riggings observed in the driftnets measured: A) diamond rigging; B) T90 rigging.

- **Hanging ratio at the headrope and leadrope**: the hanging ratio *(E)* is commonly defined as: *E = L/Lo* = Length of rope on which a net panel is mounted *(L)* / Length of stretched netting hung on the rope (*Lo*) (Fig. 3.2.5).

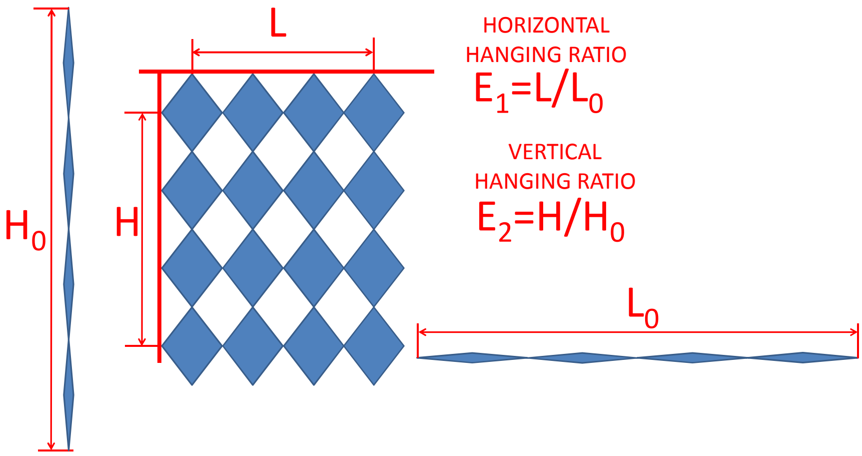


Figure 3.2.5 - Principle adopted for the measurement of the horizontal hanging ratio.

- **Headrope and leadrope diameter and material**

- **Float's dimension and shape** (Fig. 3.2.6).

Figure 3.2.6 - Measurement of float's dimensions.

- **Distance between floats**: (Fig. 3.2.7) it is the mean distance between two floats. It can be reported as number of floats per meter of headrope.

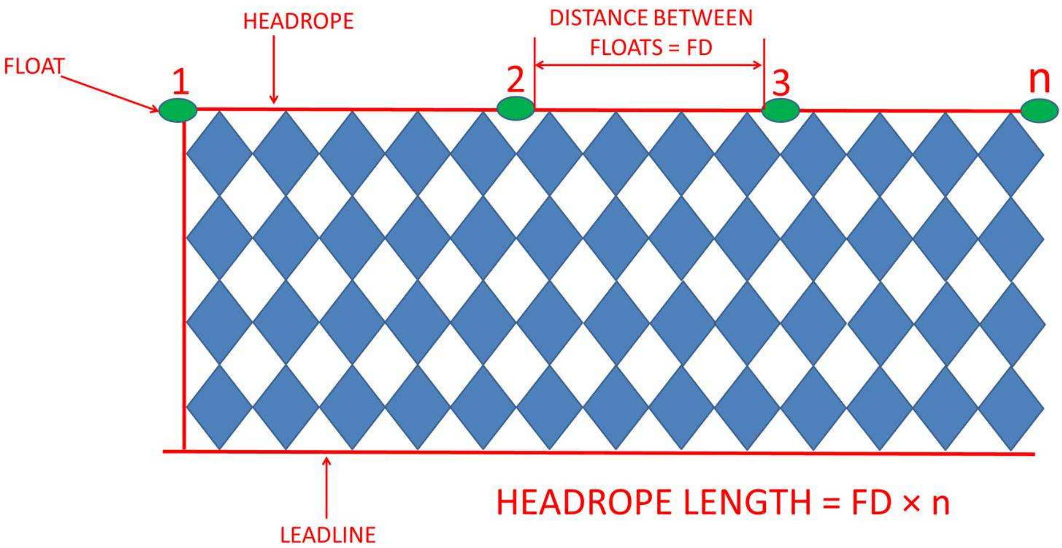


Figure 3.2.7 - Principle adopted for the measurement of the distance between floats.

- **Weight of the leadrope**: it is the mean weight of leadrope. It can be expressed as grams per meter of leadrope.

- **Vertical number of meshes** (Fig. 3.2.8): it is the number of meshes measured in a line from the leadrope to the headrope.

- **Fictitious net drop** (Fig. 3.2.8): it is defined as the sum of the length of the meshes (including knots) when wet and stretched perpendicular to the float line (EC Reg. 1967/06). The fully extended net drop (fictitious drop) was calculated by multiplying the mesh length for the number of meshes from the floatline to the leadline.

-

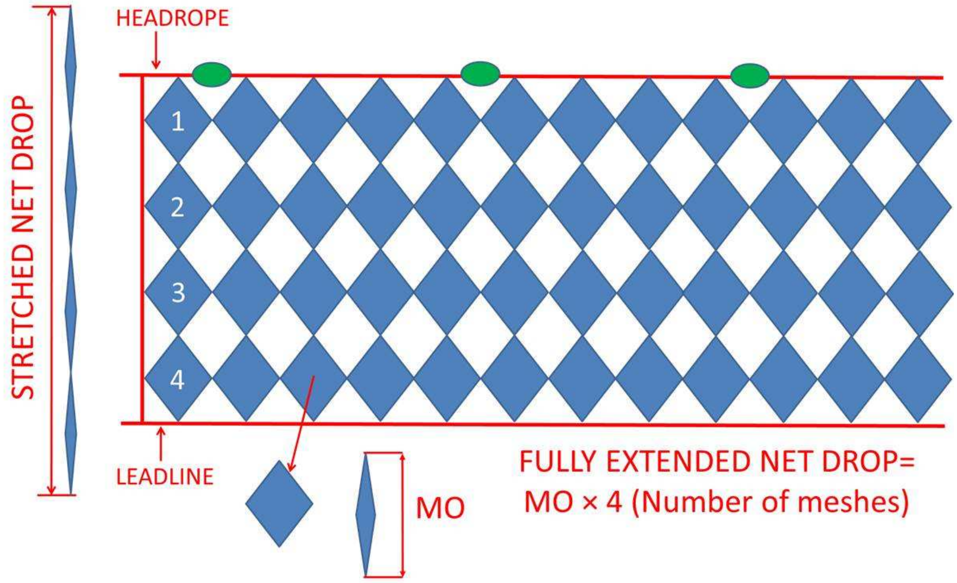


Figure 3.2.8 - Principle adopted for the measurement of the fictitious net drop.

- **Real net drop during fishing**: the fully extended net drop or fictitious drop is a useful (it is enclosed in the EC Reg. n. 1967/2006) but theoretic parameter. The net drop is never completely stretched.
- Therefore the real net drop during fishing operations is usually quite different from the fully extended net drop. **The only way to measure the real net drop with high precision is by using sensors mounted on the leadrope.** However a possible way to estimate the real net drop is by calculating the vertical hanging ratio starting from the horizontal hanging ratio. From theoretical point of view, the shape of a mesh is determined by the process of hanging it onto the rope frame. Similarly, a netting panel has different shapes depending on the two hanging ratios (Fig. 3.2.9).
- E_1 - primary hanging ratio (or longitudinal hanging ratio) and E_2 - secondary hanging ratio (or vertical hanging ratio). Different shapes of the netting are achieved by varying the primary and the secondary hanging ratio (Fig. 3.2.9).

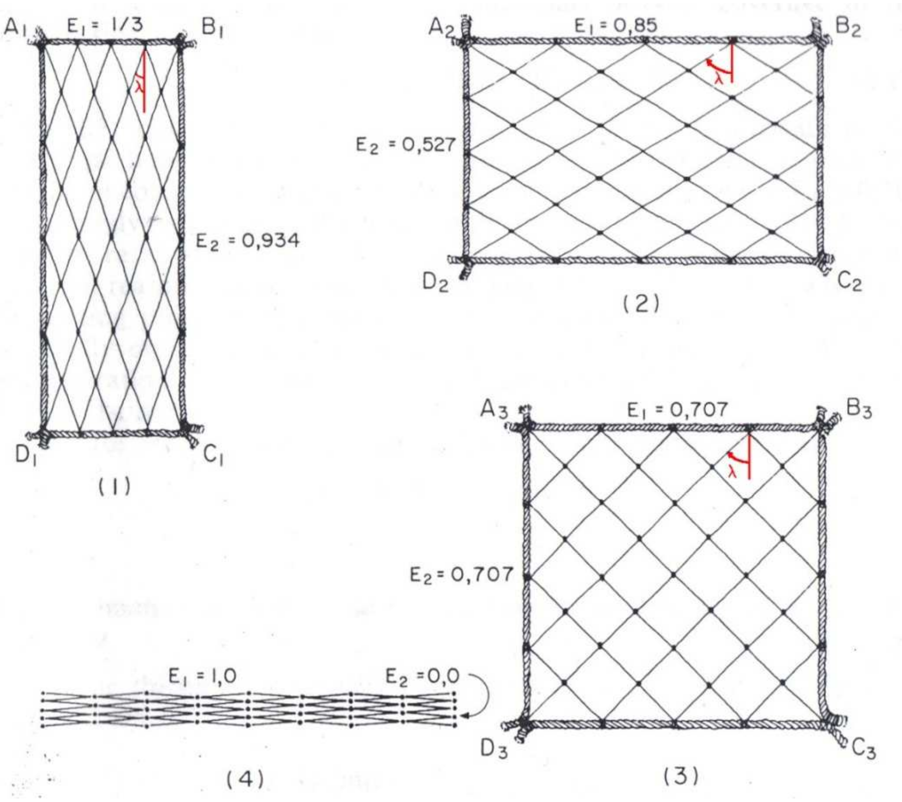


Figure 3.2.9 - Hanging ratios in hung netting (courtesy of Fridman, 1986).

The primary or horizontal hanging ratio is defined as:

$$E_1 = \frac{L}{Lo}$$

where L is the hung length of the netting or the mounted length of the main mounting rope and L_o is the length of the same netting when fully extended.
The secondary hanging is defined as:

$$E_2 = \frac{H}{Ho}$$

where H is the hung height of the netting or the mounted height of the main mounting rope and H_o is the height of the same netting when fully extended.
As shown in Fig. 3.2.9, L (that is the distance between A_1 and B_1, A_2 and B_2, A_3 and B_3) changes while L_0 (fully extended netting) remains constant. L_0 can be measured as the distance A_1C_1, A_2C_2, A_3C_3, which is constant.
From Fig. 3.2.9 it is possible to observe that E_1 and E_2 are correlated: an increase in E_1 (by stretching the netting on the rope in the horizontal direction) will imply a decrease of E_2.
The height of the netting panel (real net drop) H (A_1D_1, A_2D_2, A_3D_3) is therefore geometrically defined by the primary hanging ratio.
The hanging ratios which determine the shape of the netting panel also determine the shape of the individual meshes, which are open to similar proportions as the panel in hung length and in height (Fig. 3.2.10):

$$\frac{mesh\ width}{mesh\ height} = \frac{m_w}{m_h} = \frac{A_nB_n}{B_nC_n} = \frac{L}{H}$$

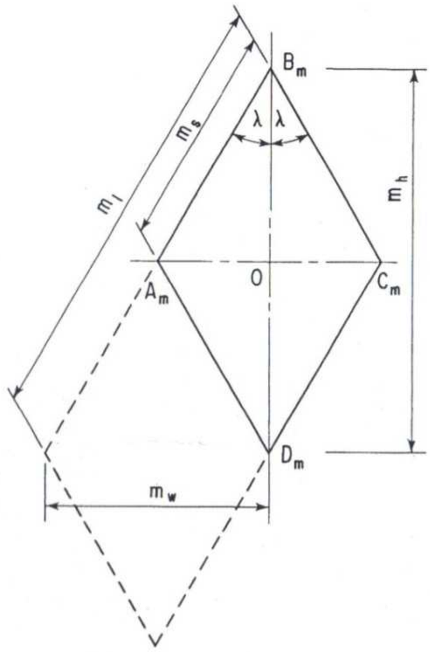


Figure 3.2.10 - Mesh proportion.

The previous formula establishes the mesh half angle λ (Fig. 3.2.10). The relation between the hanging ratios and the angle λ can be expressed as shown in Fig. 3.2.9 and 3.2.10 by:

$$E_1 = \frac{L}{L_0} = \frac{A_nB_n}{A_nC_n} = \sin\lambda = \frac{A_m0}{A_mB_m} = \frac{A_m0}{m_s} = \frac{m_w}{m_l}$$

$$E_2 = \frac{H}{H_0} = \frac{A_nD_n}{A_nC_n} = \cos\lambda = \frac{B_m0}{A_mB_m} = \frac{B_m0}{m_s} = \frac{m_h}{m_l}$$

Where m_s is the mesh side, m_w is the hung mesh width, m_h is the hung mesh height and m_l is the extended mesh length. Therefore the mathematical relationship between the two hanging ratio is:

$$\sin^2\lambda + \cos^2\lambda = 1 = E1^2 + E2^2$$

<u>However it should be noticed that this formula is true only for "flat" netting on a theoretical situation. Therefore the real net height during fishing operation could be defined as the hung height or mounted length of the side hanging line, that is *H*, with a certain margin of error</u>.

This is mainly because the weight of leads of the groundrope obviously could influence the real net drop, but there was not any other option to guess the real net drop.
If M is the number of meshes along the length of a panel of netting, *N* is the number of meshes along its height, m_s, is the length of the mesh side (between adjacent knot centres), and m_l, is the extended mesh length (between the centres of opposite knots in the same mesh).

$$L_0 = m_l \times M;$$

$$H_0 = m_l \times N;$$

Therefore the real net drop (*H*) can be calculated as:

$$H = H_0 \times \sqrt{1 - E1^2}$$

In any case it should be taken into consideration that this is a geometric and theoretic measure that could not fully reflect the real situation.

- **Net length** (from interviews);
- **Net volume** (when possible);
- **Additional information**: depth setting, soaking time, etc. (from interviews).
- **Twine thickness, material and colour:** a sample of net twine was taken when possible. The designation of the thickness of a netting yarn commonly refers to either the mass (weight) per unit length or the length per unit mass of a single yarn. The first is a direct system indicating the so-called "linear density" or the "titre"; the second method is an indirect system. The International Organization for Standardization (ISO) proposed to introduce worldwide an universal direct system based on metric units, which should be applicable to all kinds and types of yarns and replace all the various other traditional numbering systems.
The system recommended by ISO is called the **Tex system** (abbreviation Tt). The system is decimal and employs metric units. **The basic unit is the "tex"** The linear density in "tex" expresses the mass in grams of one kilometer of yarn. The higher is the tex value, the heavier is the yarn.
The tex values mentioned so far refer to the single yarn only. The final product, the netting yarn, may be designated by the **resultant linear density, indicated by the symbol R**, to be put before the numerical value. This **Rtex means the mass in gram per 1 kilometer of the final product**, either as nominal value or as actual value if it derives from the actual determination of the mass per unit length of the specimen (e.g. R 75 tex).

However the International **Titre expressed in Denier (abbreviation Td)** is the unit that is still widely used. The basic unit "Denier" of this direct system indicates the **weight in grams per 9000 meter of a filament or single yarn**. The conversion formula is:

$$1\ tex = 0.111 \cdot Td$$

Netmakers and fishermen still use the single yarn number of 210 den. Therefore the use of term like "210 x 2" indicates a twine made of two yarns having a titre 210 and twisted together.
However the use of titre for the designation of thickness of a yarn is not useful for management purpose; for instance the EC Regulation n. 1967/2006 fixed to 0.5 mm the maximum monofilament or twine diameter of gillnet. Therefore in DRIFTMED there was the need to convert the titre from denier to mm. First of all it was necessary to convert the titre from denier to Rtex.
The conversion formula is:

$$R\ tex = 0.132 \cdot Td\ (titre\ in\ denier)$$

Klust (1983) provided a series of experimental values to covert in mm the twine diameter expressed in Rtex. By using such experimental data it was possible to calculate the following model (Fig. 3.2.11):

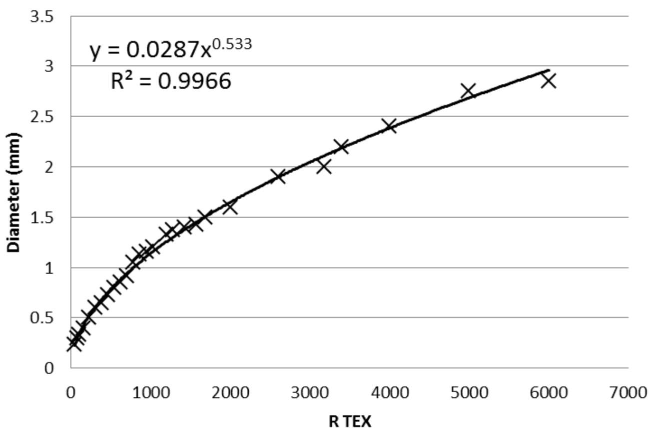


Figure 3.2.11 - Exponential model showing the relationship between Rtex and twine diameter.

Therefore in the DRIFTMED project we considered the following reference table to convert in diameter (mm) the twine thickness expressed in denier (Tab. 3.2.1).

Table 3.2.1 - Conversion table of twine thickness expressed in denier. Td: titre in denier; Tex: linear density in Tex system ($\mathbf{1\ tex} = \frac{\mathbf{1\ g}}{\mathbf{1000\ m}}$); Rtex: resultant linear density (mass in gramme per 1 kilometre of the final product).

Td	Number of yarns	Tex [g/1000 m]	Rtex [g/1000 m]	Estimated diameter [mm]
210	2	46.62	55.44	0.24
210	3	69.93	83.16	0.30
210	4	93.24	110.88	0.35
210	5	116.55	138.60	0.40
210	6	139.86	166.32	0.44
210	7	163.17	194.04	0.48
210	8	186.48	221.76	0.51
210	9	209.79	249.48	0.54
210	10	233.10	277.20	0.58
210	11	256.41	304.92	0.61
210	12	279.72	332.64	0.63
210	15	349.65	415.80	0.71
210	18	419.58	498.96	0.79
210	21	489.51	582.12	0.85
210	24	559.44	665.28	0.92

SMALL-SCALE DRIFTNETS DIRECT MEASUREMENTS

Measurements of nets were carried out in the presence of the fishermen; simultaneously to the direct measurements, fishermen were interviewed in order to collect more information on the net characteristics, as well as on fishing practices and target species.
The existing relationships between the Institutes involved in DRIFTMED and the fishermen/fishermen associations in each area and the experience of the scientists were essential to successfully approach the fishermen and to collect reliable data. In some cases it was also useful to contact the fishermen associations to approach the fishermen, avoiding their possible reluctance in providing information.
Measurements of nets started at mid April 2013 and ended at the end of September 2013. Direct measurements of nets were carried out in 15 fishing harbours belonging to 4 different GSAs (9, 10, 17 and 19), were the SSD fisheries were identified at the beginning of DRIFTMED study (Fig. 3.2.12; Tab. 3.2.2).
In the investigated period it was possible to identify the following main types of driftnets according to the various fisheries identified:

"Menaide"; main target species: *E. encrasicolus* and *S. pilchardus*; these nets were measured in GSA9, GSA10, GSA17 and GSA19.
"Occhiatara"; target species: *O. melanura;* these nets were measured in GSA9.
“Sgomberara”; target species: *Trachurus* spp. *Scomber* spp. and *B. boops* ; the nets were measured in GSA10.
“Ferrettara” for bluefish; target species: *P. saltatrix*; the nets were measured in GSA10.
“Ricciolara”; target species: *S.a dumerili*; the nets were measured in GSA10.

In addition to these nets, measurements were made also on other typologies of small driftnets, even though these nets were not associated to active fisheries in the investigated period:

“Bisantonara”/”palamitara”; target species: *S. sarda, A. rochei, Trachinotus ovatus, E. alletteratus.* The nets were measured in GSA9 and GSA10.
“Bogara”; target species: *B. boops*; the nets were measured GSA10.
“Alacciara”; target species: *S. aurita, B. boops*; the nets were measured GSA10.

Figure 3.2.12 - Location of the fishing harbours were the measurements of the nets have been carried out.

Table 3.2.2 - Fishing harbours were the technical properties of the nets have been collected (* data obtained from interviews).

GFCM-GSA	Area	Harbour
9	*Ligurian and North Tyrrhenian Sea*	Bordighera
9	*Ligurian and North Tyrrhenian Sea*	Sanremo
9	*Ligurian and North Tyrrhenian Sea*	Loano
9	*Ligurian and North Tyrrhenian Sea*	Nervi
9	*Ligurian and North Tyrrhenian Sea*	Chiavari
17	*Northern Adriatic Sea*	Izola
17	*Northern Adriatic Sea*	Koper
19	*Western Ionian sea*	Catania
19	*Western Ionian sea*	Ognina
10	*Southern Tyrrhenian Sea*	Marina di Pisciotta
10	*Southern Tyrrhenian Sea*	Palinuro
10	*Southern Tyrrhenian Sea*	Marina di Camerota
10	*Southern Tyrrhenian Sea*	Porticello
10	*Southern Tyrrhenian Sea*	Sant'Agata di Militello
10	*Southern Tyrrhenian Sea*	Porto Rosa
19	*Western Ionian sea*	Torre Faro*
19	*Western Ionian sea*	Ganzirri*
10	*Southern Tyrrhenian Sea*	Milazzo*
10	*Southern Tyrrhenian Sea*	Spadafora*
10	*Southern Tyrrhenian Sea*	Capo D'Orlando*

3.3 - THE COMMON DATABASE TO STORE THE DATA COLLECTED FROM WP1 AND WP2

All the collected information, as well as the new data, was stored in a common database, using a standardised platform. The structure of the database to store data (existing and new data) on SSD fleets was discussed and defined by all the partners during the kick off meeting. It was refined according to the project needs and finally it was provided in the **Deliverable 4** of this Specific Contract.

The database (DB) is implemented in Microsoft Access 2010 and organised into separate sections, according to the items described in Task 1.2. The DB is structured to allow integrating data collected from WP1 with those collected from WP2.

All the information collected by WP1 and WP2 has been imported in the final DRIFTMED database from the excel work files compiled during the field observations, and structured according to the forms for the data collection (see Annex II).

The data have been registered by the partners by means of predefined lists of values in the drop down menus preventing mistyping or synonymy. Then the data have been transferred to the Access database by the importing function that includes checks on the types of data for each field in each table. Once in the database, the data have been queried, checked and compared with the original sheets. Also visual checks have been made and implausible values corrected according to the original data and the expert knowledge.

In addition to the row data the database contains also queries providing aggregated views of the data. These queries are recalled in external Microsoft Excel files directly linked to the Access database for the preparation of specific tables and graphs. As these structured files are directly connected to the database, they can be used to have an overview on the main characteristics describing the monitored fisheries, as the composition of catches, the structure of the measured samples. These structured files also give the opportunity to work always on updated data (e.g. creating graphs, calculating indicators, etc.) without retrieving at each operation specific data sets from the database. The worksheets include standard tables and graphs resuming the information ready to be inserted in the report. (Fig. 3.3.1).

Figure 3.3.1 - Standard graphs on data directly queried from the Access database.

In addition, a graphical user interface was realized in order to provide a tool to support the storage and the management of the collected data in a more user friendly manner. Further to the standard views, visualization and update of the database can be done scrolling row-by-row the tables or selecting the records by means of the filters. Fig. 3.3.1 shows an example of the graphical interface of the trip form.
The partner COISPA was the responsible for the construction of the database and its management during all the life of the project.

The Database filled with the data collected by DRIFMED is also the **Deliverable 6** ("Database filled with the available information (both from EU and non EU countries)") and the **Deliverable 9** ("Database filled with the new data"). The Excel file with the Databae was uploaded in the the web site of MAREA framework (www.mareaproject.net), under the specific folder dedicated to DRIFTMED Contract.
The Database is at disposal of DGMARE services after the project will be over.

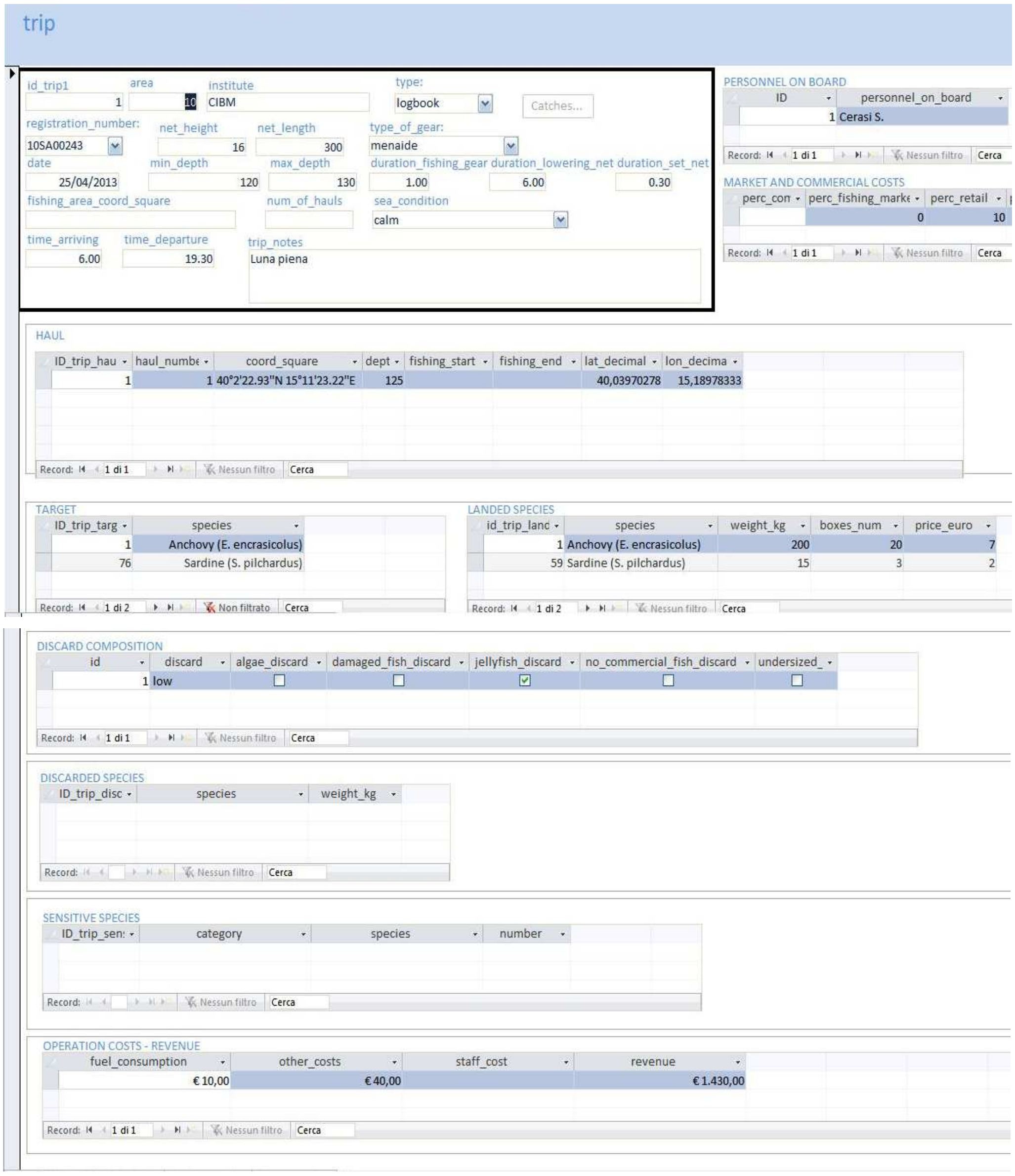


Figure 3.3.2 - Detail of the TRIP form for the insertion or visualization of the information related to a trip in the sampling period (main information, personnel on board, haul information, landed and discarded species, sensitive species and economic data).

3.4 - DIFFICULTIES ENCOUNTERED

No serious difficulties in the activities planned by the Contract have been encountered.

WP1
Task 1.2. The information contained in the DCF data received following the Data Call of DRIFTMED Contract was only partially useful to the purposes of this project. These data were collected only for those fishery segments selected by the ranking system; because the importance of the GND fishing type is low in terms of total production, production value and fishing effort, data from GND are often not collected under DCF context.
The same critical lack of information occurs for many species which plays an important role in the GND fisheries, as the saddled seabream and the greater amberjack.

Task 1.3. Some difficulties have been encountered in the search for information on SSD fisheries for not EU countries, especially in the first months of the DRIFTMED Contract. There was generally a scarce level of reply to our requests of providing information. In the last months some improvements occurred, manly after the recall communication made by DGMARE to the FAO Regional projects.

WP2
Task 2.1 and 2.2. The high dispersion of the small-scale driftnet fleets in many small mooring points made difficult to intercept all the active vessels and to exhaustively monitor the fishing activities.
It was expected to fully start the field activities at mid April 2013, after setting up the sampling protocols and defining all the aspects concerning the contacts with fishermen and the authorizations for the embark of scientific personnel. Unfortunately, due to the bad weather conditions occurred in Italy, the activity of the artisanal fleets involved in the SSD fisheries was reduced in this period; therefore, also the field works of DRIFTMED suffered some delays.
Some fisheries selected for monitoring are strictly seasonal, concentrated in the last summer-autumn period; therefore the data collection for these vessels started only in the last phase of the project (for example the “ricciolara” fishery).
In general, no particular problems were encountered in approaching fishermen for data collection. A good level of collaboration and also interest was always found. It must be however emphasized that the experience of the partners involved in this Contract, as well as the partner’s knowledge of many artisanal fisheries, revealed important to successfully achieve the data collection.

3.5 - CHANGES TO THE ORIGINAL WORKPLAN

No particular changes to the original working plan have been made.

4. DATA ANALYSIS, SOCIO-ECONOMIC ASSESSMENT AND SYNTHESIS (WORKPACKAGE 3)

The Workpackage of DRIFTMED 3 was planned to integrate and analyze all the collected information, coming from both the review of the existing knowledge (WP1) and from the new data gathered by WP2.
This WP consisted in four Tasks:
Task 3.1 - Identification and overall characterization of the SSD fisheries in Mediterranean.
Task 3.2 - Technical characteristics of the gears used by the SSD fisheries.
Task 3.3 - Overview of the economic parameters pertaining to each EU Mediterranean SSD fishery
Task 3.4 - Assessment of the use of fishing methods alternative to SSD to exploit the same resources.

The following chapters provide the results obtained in the identification of the small scale driftnet fisheries and a detailed description of their main characterisitcs. These results are also included in the following Deliverables:
Deliverable 10, "Summary on the distribution and the characteristics of the SSD fisheries in Mediterranean".
Deliverable 11, "Overview of the technical aspects of the gears used by the SSD fisheries in Mediterranean".
Deliverable 12, "Overview of the economic aspects related to the SSD fisheries in Mediterranean".
Deliverable 13, "Comparative evaluations about a possible replacement of the existing small-scale driftnets with alternative fishing methods in Mediterranean".

4.1 - IDENTIFICATION OF THE SMALL-SCALE DRIFTNET FISHERIES

The identification of the small-scale driftnet fisheries in Mediterranean waters was done taking into account the existing information (collected in WP1), integrated and updated with the new information (collected in WP2).
Data of the EU Fleet Register showed that in EU Mediterranean waters the vessels using small-scale driftnets are essentially distributed in Italy; these vessels are mostly located in southwest of Italy, especially in GSA10 and GSA19. This fleet is highly dispersed in a great number of small harbours.
The information provided by the EU Fleet register doesn't allow providing a picture of the actual number of vessels really operating with small-scale driftnets. Therefore the surveys performed in the framework of DRIFTMED were fundamental to identify the vessels really involved in fisheries related to SSD.
This paragraph provides an identification of the SSD fisheries at Country/GSA/Administrative Region level, according to the new information collected.

ITALY
GSA9
According to the EU Fleet register, 47 vessels with GND are present in GSA9. The DRIFTMED investigations revealed that the active vessels using SSD in 2013 are only a few units located in some harbours of Liguria. These vessels used driftnets ("occhiatara") in a restricted period of the year, to exploit saddled seabream (*O. melanura*). They were monitored by means of interviews, logbooks and embarks.
Most of fishermen interviewed in different places of GSA9, although still holding the license for SSD, did not use any more this gears since, at least, 3-5 years. It was estimated that at least 20-25 small-scale vessels used SSD in the past years, mostly to exploit Atlantic bonito (*S. sarda*), bullet tuna (*A. rochei*), little tunny (*E. alletteratus*), greater amberjack (*S. dumerili*), and dolphin fish *(C. hippurus*), but also anchovies and sardines

(especially in Liguria and in Ponza island). Unfortunately, information on this fishery for the past years was not found.
During the field investigations carried out in Liguria, it was possible to collect technical data to some nets, as the “palamitara” for Atlantic bonito and the “bisantonara” for bullet tuna. The fishermen interviewed reported that the current use of these nets is negligible; in the period investigated by DRIFTMED the use of these nets was not detected.
Moreover it was noticed the presence, in the area of Livorno, of one vessel using a small driftnet for grey mullets (Mugilidae) and garfish (*Belone* sp.). The use of this gear was reported for the past year, while in the current year it was still not used. It was noticed that this gear was used for a maximum of 10 days per year; the net used is about 500 m long. No information is available on mesh size. By-catch was reported as very scarce. This type of driftnet was also described by Baino and Silvestri (1987).

GSA10
Data from the EU fleet register report the GSA10 (southern Tyrrhenian Sea) as the area with the highest presence of vessels associated to GND fishing type (264 vessels). The information collected within DRIFTMED confirmed the importance of this area, even though the number of vessels currently using small-scale driftnets was much lower.
<u>Campania</u>: an important SSD fishery is located in the Cilento area. About 20 vessels were identified and monitored during the present study; they used driftnets with small meshes to exploit anchovy (*E. encrasicolus*), with a gear called “menaide" or "menaica” in the period mid spring – mid summer.
In the Gulf of Naples a little but specialised fishery was identified and monitored with DRIFTMED. It targets the bluefish, *P. saltatrix*, with "ferrettara" small driftnet.
Other vessels (4-6) using small driftnets could be likely present in the Gulf of Naples and Sorrento peninsula, but the investigations performed did not meet these vessels in the monitored period.
<u>Calabria</u>: also in Calabria, along the Tyrrhenian coast, some vessels can potentially use small driftnets, but they did not resulted active in the investigated period.
<u>Sicily</u>: in this area three SSD fisheries were identified and monitored by interviews, logbooks and embarks during the present study:
- the “sgomberara or sgombetara” fishery, involving vessels of several small harbors in the northern Sicily. It targets different species of mackerels, e.g. the horse and Mediterranean mackerel (*Trachurus trachurus* and *T. mediterraneus*), the chub and the common mackerel (*Scomber colias* and *S. scombrus*) and the bogue, *Boops boops*.
- the "ricciolara" fishery, a seasonal activity targeting the greater amberjack, *S. dumerili,* carried out by some vessels of S. Agata di Militello, northern Sicily.
- the "menaide" fishery for anchovy, *E. encrasicolus,* practiced by some vessels in north-eastern Sicily.

During the field activities it was possible to collect technical data to some nets, as the “palamitara” (mainly for Atlantic bonito) and the “alacciara (for round sardinella, *Sardinella aurita*). As in GSA9 the fishermen interviewed reported that the current use of these nets is negligible and in the period investigated by DRIFTMED the use of these nets was not detected.

GSA11
On the basis of the information collected, in GSA11 no vessels are associated with SSD fisheries. In addition, the Law of May 13th 1988 of the Sardinia Administrative Region prohibited the use of driftnets in the waters surrounding Sardinia Island.

GSA16
The EU Fleet Register data show that in GSA16 a low number (16) of vessels can potentially use small driftnets. The investigations carried out with DRIFTMED revealed the presence of a small fishery (5 vessels) of the Selinunte fleet using on seasonal basis "menaide" or "tratta" nets for anchovy, *E. encrasicolus* and sardine, *S. pilchardus*. Some data for this fishery were collected by means of interviews.

GSA17

From the interviews performed in Slovenia, the presence of two vessels in the Gulf of Trieste (northern Adriatic), using sporadically (10 days/year as a maximum) small driftnets "menaide" for sardine was noticed. The typology of the fishery is the same of that performed in Slovenia, described below.
No data were collected for these two vessels.

GSA18

Data from EU Fleet register report only 11 vessels associated to GND in the GSA 18. The investigations carried out did not reveal the presence of active vessels associated to SSD in this area.

GSA 19

GSA 19 is the second area in order of importance involved in SSD fisheries, being 99 the vessels associated to GND fishing type stored in the Fleet Register. The DRIFTMED investigations performed in this area confirmed this picture, even though the number of vessels effectively using SSD was notably lower.
The area of Catania, eastern Sicily, is the most relevant in terms of SSD fisheries. A fleet of 28 vessels was identified in the monitored period, as involved in the "menaide" fishery, targeting anchovy (*E. encrasicolus*), all year round. This fishery has been investigated during DRIFTMED.
In other areas of GSA19, as Messina and Ionian Apulia, there is likely the presence of some other vessels using SSD, but in the investigated period no active vessels were detected.

FRANCE

According to EU Fleet Register data, in the French Mediterranean there are only 8 vessels (moored in several ports of GSA7) that can potentially use small driftnets.
On the base of the contacts with fishermen and fishermen representatives, it seems that during the period investigated by DRIFTMED (2013), however, no vessels used small-scale driftnets.

SPAIN

The search for information and the contacts with Spanish colleagues (from IEO and ICM-CSIC) did not reveal the presence of vessels using small-scale driftnets, confirming the absence of data in the Fleet Register.

MALTA

The search for information and the contacts with the Maltese Ministry confirmed the absence of SSD vessels in this country.

CROATIA

The information collected and the contacts with the colleagues of the IOF Institute of Split did not reveal the presence of vessels using driftnets.

GREECE

The information collected did not reveal the presence of vessels using driftnets.

SLOVENIA

A few vessels are traditionally performing a seasonal (spring-summer) fishing activity with "menaide" for sardine, *Sardina pilchardus*. In 2013 only one vessel resulted active for this fishery. Data were collected, thanks to the availability of the Fishery Research Institute of Ljubiana; direct measurements of nets were also realised.

CYPRUS

The information collected and the contacts with the colleagues of the DFMR Institute did not reveal the presence of vessels using driftnets.

In summary, the investigation conducted with DRIFTMED allowed to identify the following 9 active SSD fisheries in EU Mediterranean waters:

1) “Menaide” for anchovy, *Engraulis encrasicolus*, in Catania area (GSA19).
2) “Menaide" or "menaica” for anchovy, *Engaulis encrasicolus*, in the Cilento area (GSA10).
3) “Occhiatara” for saddled seabream, *Oblada melanura*, in Ligurian Sea (GSA9).
4) “Sgomberara” or "sgombetara" for mackerels and bogue, in northern Sicily (GSA10).
5) “Menaide” for anchovy, *Engraulis encrasicolus*, in Sant’Agata di Militelllo (GSA10).
6) "Riccciolara" for greater amberjack, *Seriola dumerili*, in Sant’Agata di Militello (GSA10).
7) "Ferrettara" for bluefish, *Pomatomus saltatrix*, in Gulf of Naples (GSA10).
8) "Menaide" for sardine, *Sardina pilchardus*, in northern Adriatic (GSA17).
9) "Menaide" or "tratta" for anchovy, *Engraulis encrasicolus,* and sardine, *S. pilchardus*, in Selinunte (GSA16).

4.2 – CHARACTERISATION OF THE SMALL-SCALE DRIFTNET FISHERIES IDENTIFIED

This paragraph provides detailed information about the nine small scale driftnet fisheries identified as active in the present study (see Chapter 4.1): fishing capacity, activity, technical characteristics of the nets, landing and catch rates, composition of the catches, catches of unauthorized and protected species, size composition of the catches and socio-economic parameters. The fisheries 8 and 9 were characterised less in detail, because the collected information was based mainly on anecdotic reports.
This information comes from the revision of the existing information (if any) and form new data collected through the present study. As concerns the existing information, data from previous studies or data collected by means of European Data Collection are reported.
Since 2002, according to the EC Regulations n. 1543/2000, n. 1639/2001, n. 1581/2004 and n. 199/2008 and to the Commission Decision n. 93/2010, which established the DCR (Data Collection Regulation) and subsequently the DCF (Data Collection of Fisheries) in EU countries, GND (drifting gillnets) is a fishing type that can be monitored if selected by the ranking system in certain GSAs according to the relevance of landing volume, landing value and fishing effort.
Due to the very scattered distribution of these fisheries/métiers, the level of catches and the catch value, the monitoring according to DCF in Mediterranean waters is at present limited to spot areas, not enough to exhaustively describe this fishing system.
Indeed only in the GSA 19, and occasionally in the GSA 10, the GND (only the fisheries specialized for the catch of small pelagic species) has been selected as a métier to be monitored. Therefore, in this Chapter the results of the analysis of the data collected by means of DCR and DCF for GND in the last years are presented for GSA 19 and GSA 10.

GSA 19: "Menaide" for anchovy, *Engraulis encrasicolus*, in Catania area (Fishery 1)

Existing (DCF) information
In the eastern Sicily (GSA19) a fleet using small-scale driftnets is present and mainly concentrated in the Catania area (Catania, Ognina and A7ci Castello ports, mainly). It is a specialized traditional fishery using "menaide" driftnets with anchovy, *E. encrasicolus*, as the effective target species.
Since 2007, under the EU DCF framework, this fishery is monitored also by means of onboard observers, though the monitoring can be irregular, depending on the sorting of the mètier by the ranking system.
The production and fishing effort, available from the statistics produced by IREPA (2007-2012) are instead more regularly monitored.
This fishery is performed all year round. The monthly landings in tons, averaged over 2007-2012, highlighted certain variability and a peak in mid-spring early summer months, reaching a value of about 35 tons (Fig. 4.2.1). The production raised from about 200 tons in 2007-2009 to 450 in 2010, then it gradually decreased to 300 tons in 2012 (Fig. 4.2.2). The GND production of anchovy represented a fraction not negligible of the total anchovy landed in the GSA 19, ranging between 22% in 2007 and 44% in 2010 (Fig. 4.2.3).

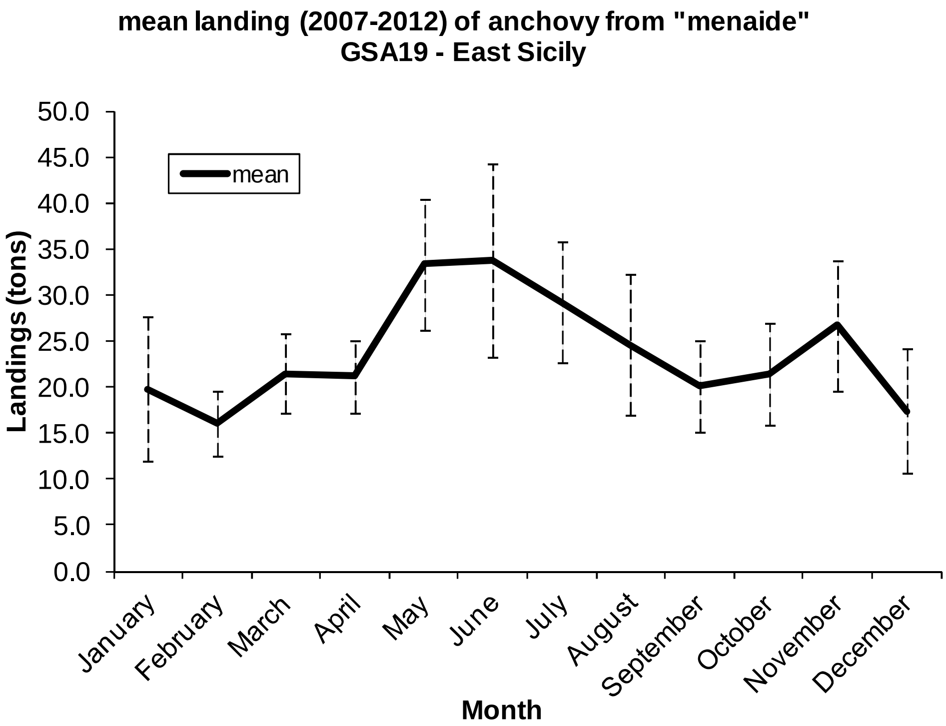


Figure 4.2.1 – Mean monthly landing (averaged over 2007-2012) in tons of anchovy by means of “menaide” in the Catania area (GSA19). The bars represent the standard error.

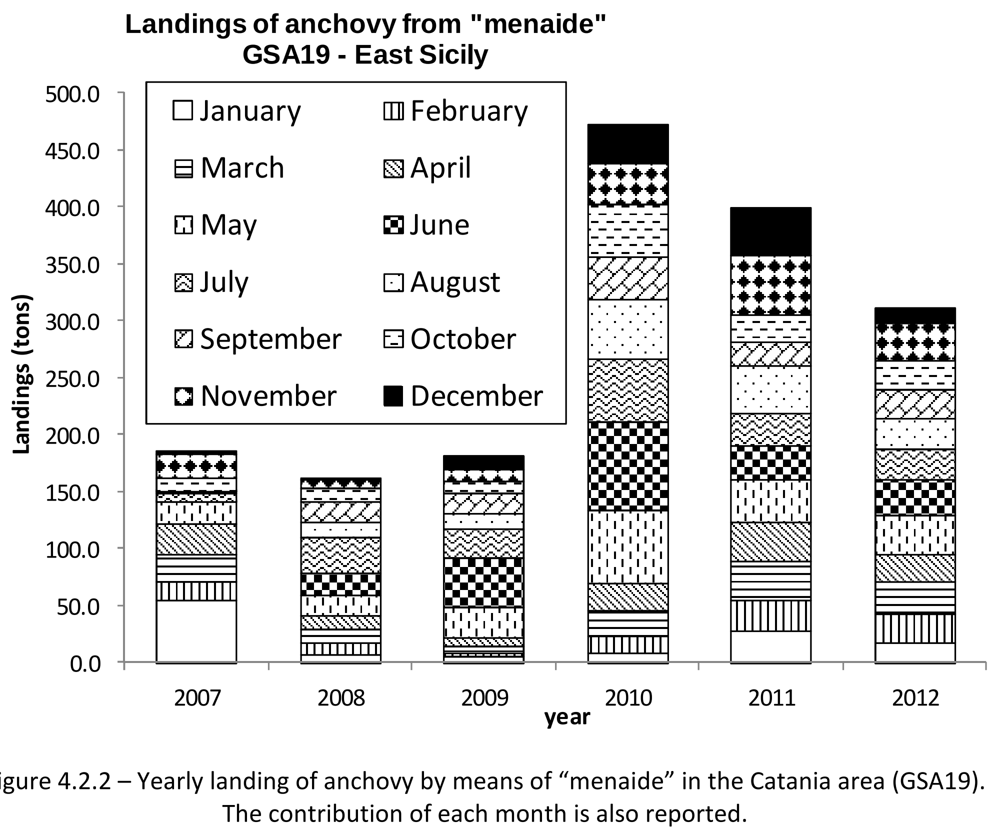


Figure 4.2.2 – Yearly landing of anchovy by means of “menaide” in the Catania area (GSA19). The contribution of each month is also reported.

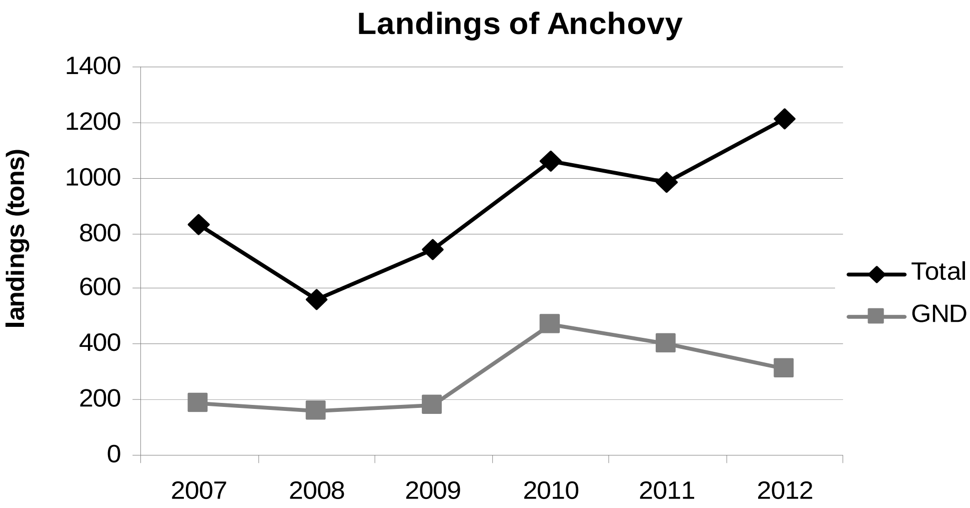


Figure 4.2.3 – Total and GND yearly landing of anchovy in GSA19.

The most important species belonging to the commercial by-catch of this fishery is sardine (*S. pilchardus*); the contribution of this species to the landings is much lower and has a more variable pattern compared to anchovy. The monthly landings of sardine in tons, averaged over 2007-2012, were around 2-3 tons. The total yearly landings decreased from 30-40 tons in 2007-2008 to 10-15 tons in 2009-2011, while in 2012 the production raised to about 40 tons (Fig. 4.2.4). In the case of sardine, however, this variable pattern seems to be due to an opportunistic behaviour of the fishermen that do not land sardine regularly. The yearly landings (Fig. 4.2.5) of sardine show an opposite trend, compared to the anchovy landings. This is driven by the market request and thus often sardine is discarded, due to its low price and also because sardines are landed only when the amount of anchovies is not sufficient to recompense the fishing day.

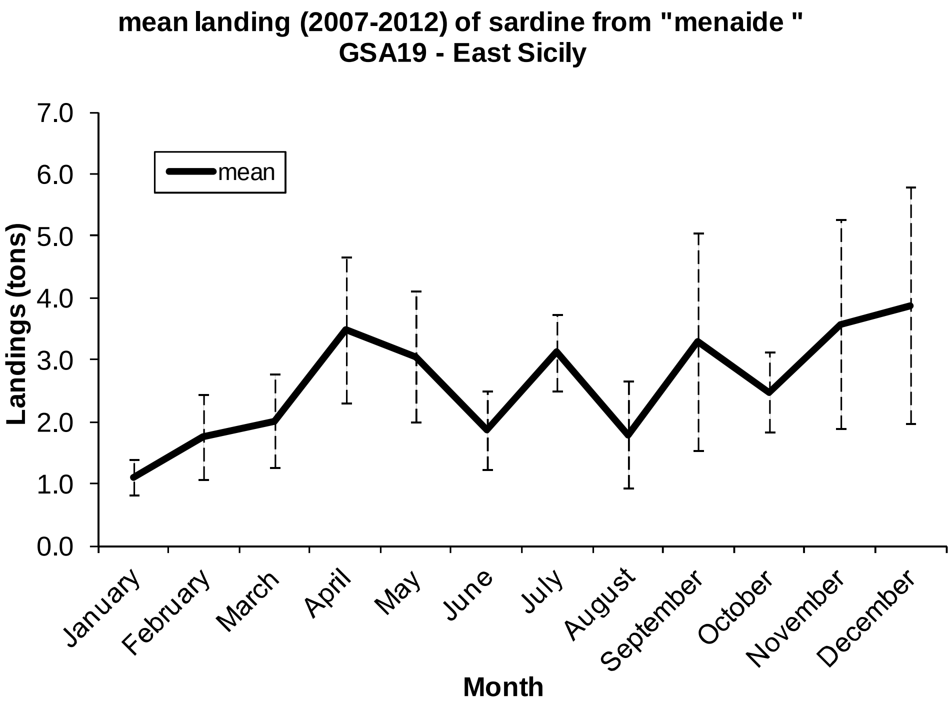


Figure 4.2.4 – Mean monthly landing (averaged over 2007-2012) in tons of sardine by means of “menaide” in the Catania area (GSA19). The bars represent the standard error.

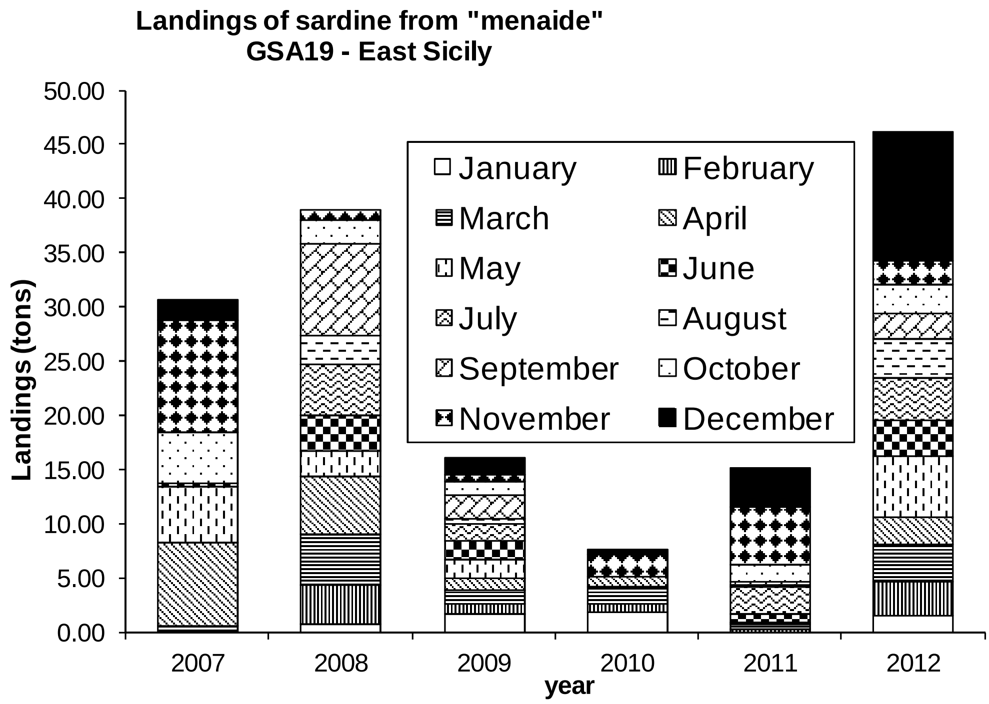


Figure 4.2.5 – Yearly landing of sardine by means of "menaide" in the Catania area (GSA19).
The contribution of each month is also highlighted.

The anchovy represented a percentage from 80% (in 2008) to 98% (in 2010) in the total landings of"menaide" in GSA19 (Fig. 4.2.6).

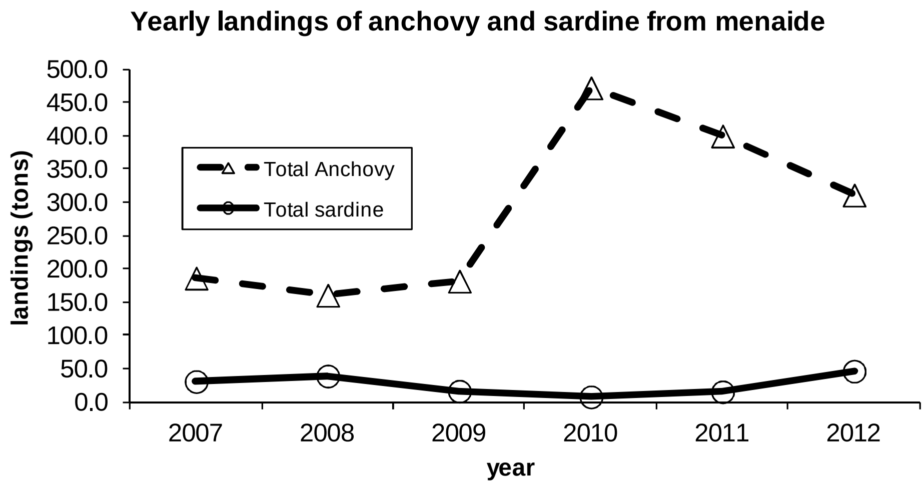


Figure 4.2.6 – Yearly landings of anchovy and sardine from 2007 to 2012 and percentage of anchovy in the total landings by means of "menaide" in the Catania area (GSA19).

As concerns the characteristics of this fleet, 6-12 m was the LOA segment that contributed more to the landings and accounted for a remarkable number of active vessels and fishing days.
Regarding fishing activity, the mean monthly number of vessels using "menaide" was rather variable along the time and the seasons. Peaks are present in spring-early summer and then in October-November. The mean number of vessels operating by month in the years 2007-2012 varied between 24 in September and

45 in May (Fig. 4.2.7). The size of this fleet decreased in the last years, being represented by about 60 vessels in 2007 and by 30 vessels in 2012 (Fig. 4.2.8).

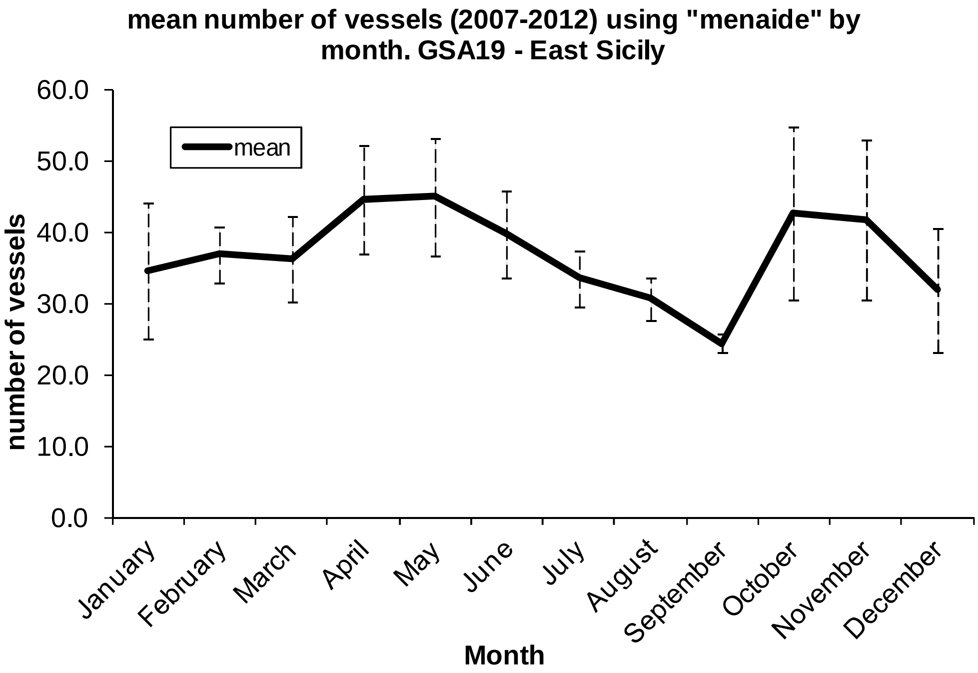


Figure 4.2.7 – Mean number of vessels (averaged over 2007-2012) using "menaide" in the GSA19, Catania area. The bars represent standard errors.

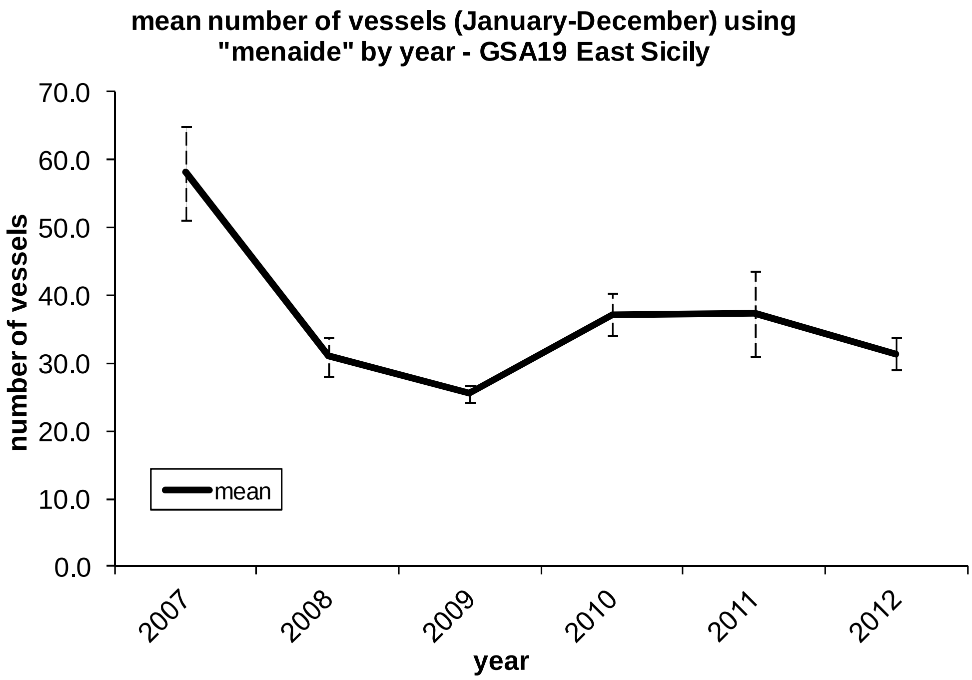


Figure 4.2.8 – Yearly number of vessels (averaged over months) using "menaide" in the GSA19, Catania area. The bars represent standard errors.

The mean monthly number of fishing days (averaged over 2007-2012) shows higher values in May/July and in October/November as well (Fig. 4.2.9), while the overall yearly effort of the fleet, which reflects the

landings trend, shows a decrease from 2007 (about 6000 fishing days) to 2009 (about 3500), followed by a high increase in 2010 (9000 fishing days); then the overall effort decreases again to 7000 fishing days in 2011, while a new slight rising is present in 2012 (about 8000 fishing days) (Fig. 4.2.10).
Moreover the monthly evolution of fishing days (Fig. 4.2.10) doesn't show a clear seasonality, even though the spring-summer months show a higher number of fishing days, due that the actvitiy of this fishery is strongly influenced by the sea conditions.

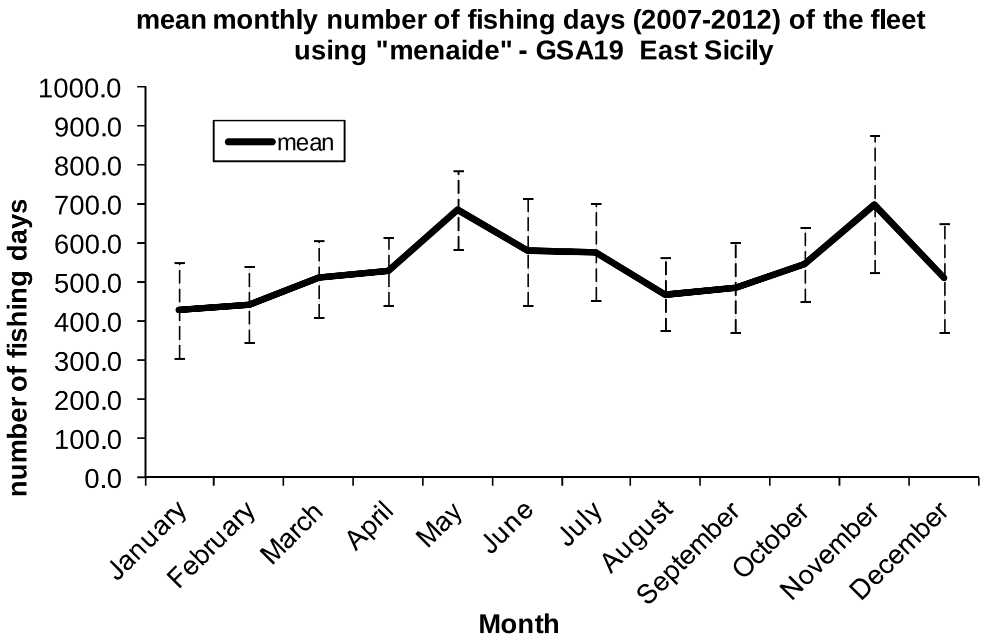


Figure 4.2.9 – Mean monthly number of fishing days (averaged over 2007-2012) of the fleet using "menaide" in the GSA19, Catania area. The bars represent standard errors.

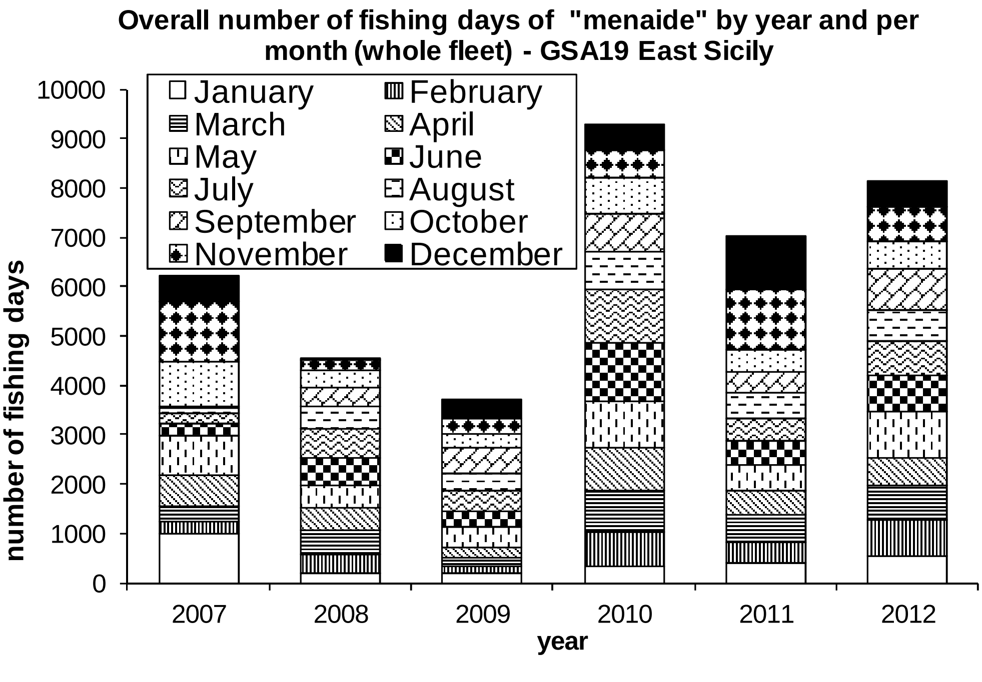


Figure 4.2.10 – Fishing days by year of the fleet using "menaide" in the GSA19, Catania area, highlighting the contribute of each month.

At the same time the mean monthly number of fishing days per vessel was rather variable along the years, ranging between 12 and 16, with a peak of 20 in September (mean values averaged over 2007-2012) (Fig. 4.2.11). The mean number of fishing days per vessel was steadily increasing from 2007 to 2012 (except 2011), moving from 10 to 20 days (Fig. 4.2.12). The yearly CPUEs of anchovy per vessel and per day followed mostly the same pattern, increasing from 31 to about 60 kg, except for the last year (2012) in which a decrease to 38 kg is present (Fig. 4.2.13). The mean monthly CPUEs per vessel and fishing day (averaged over 2007-2012) of anchovy showed higher values during summer months (Fig. 4.2.14).

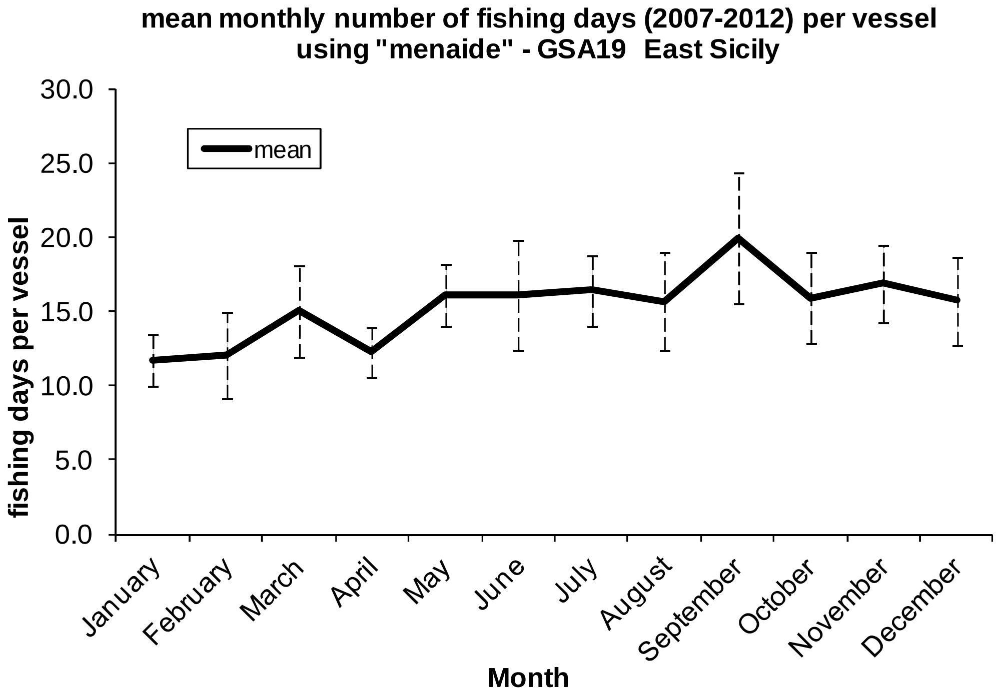


Figure 4.2.11 – Mean monthly number of fishing days per vessel (averaged over 2007-2012) of the fleet using "menaide" in the GSA19, Catania area. The bars represent standard errors.

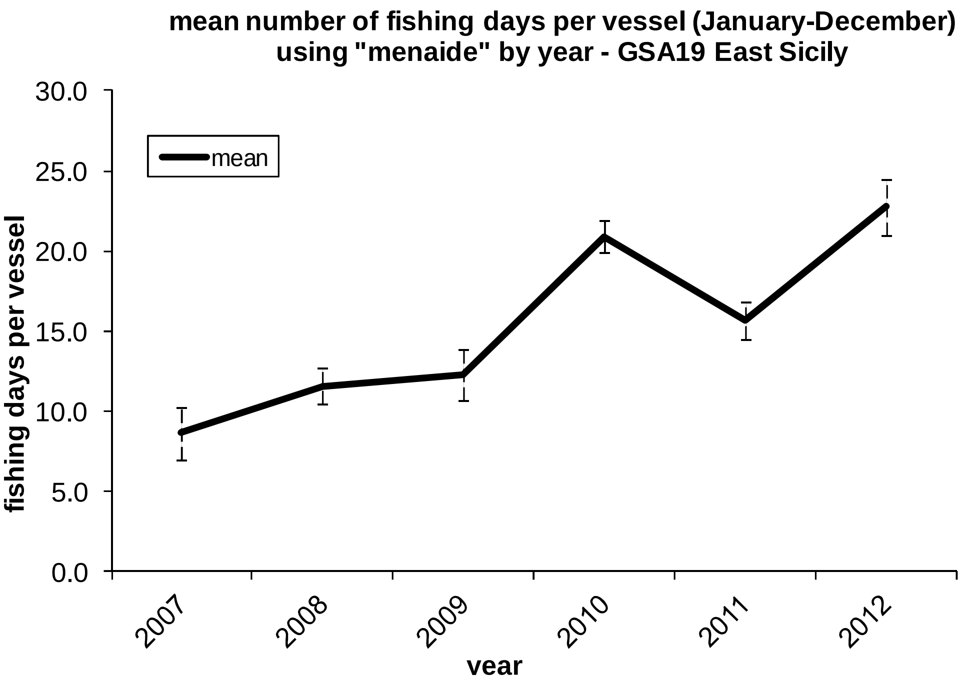


Figure 4.2.12 – Mean number of fishing days by year (averaged over months each year) of the fleet using "menaide" in the GSA19, Catania area. The bars represent standard errors.

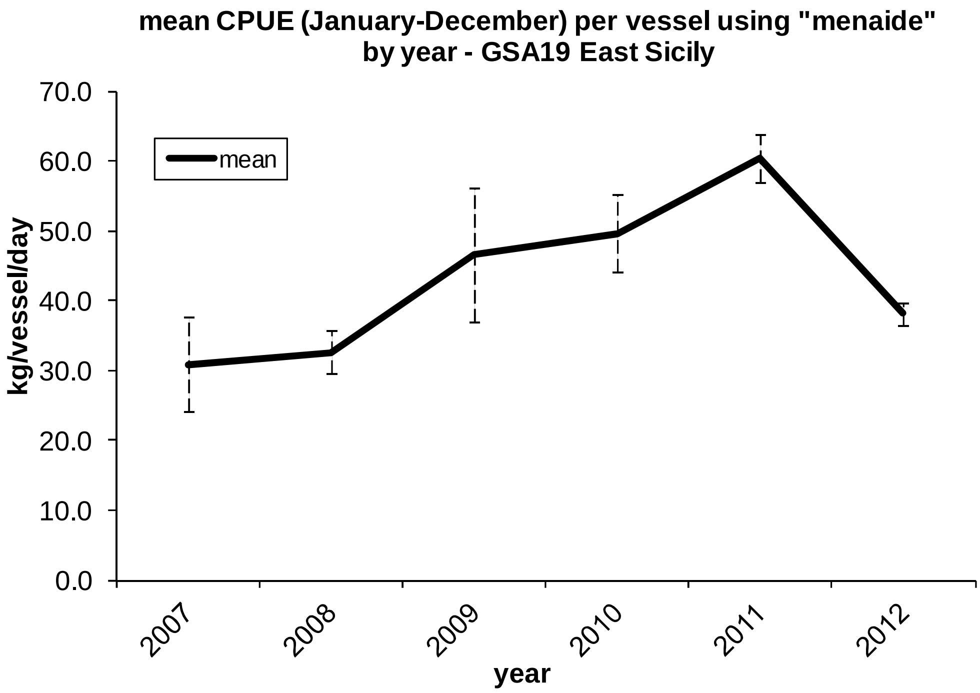


Figure 4.2.13 – Mean CPUE of anchovy per vessel and day of the fleet using "menaide" in the GSA19, Catania area. The bars represent standard errors.

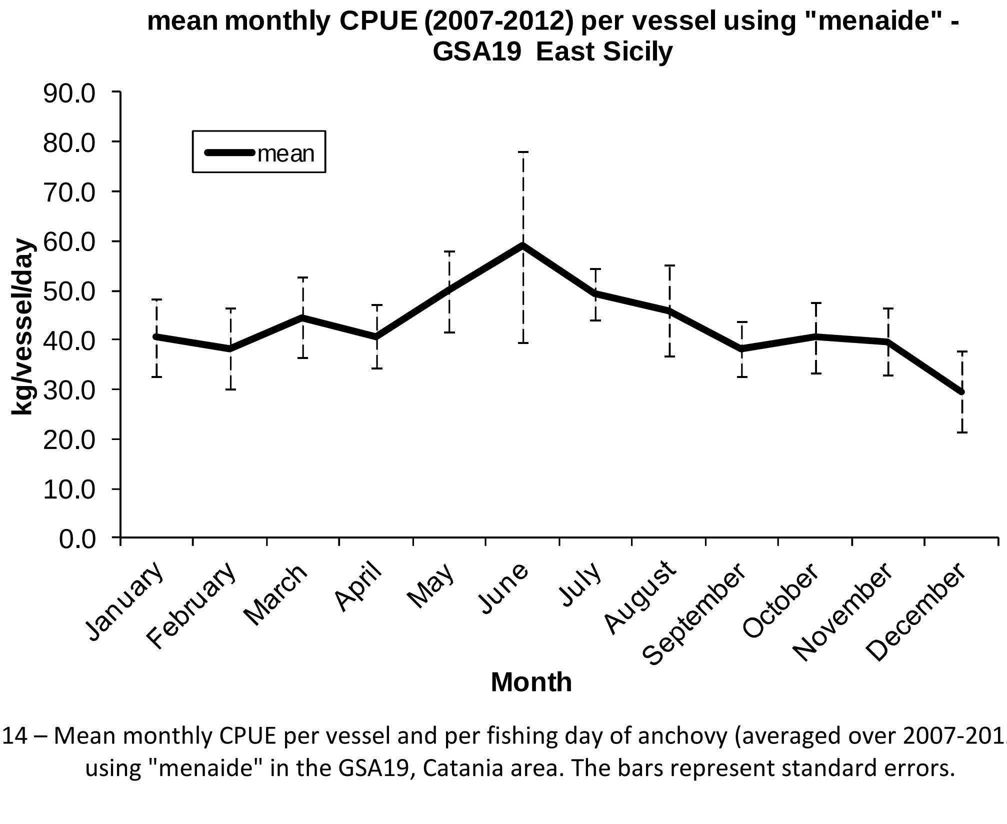


Figure 4.2.14 – Mean monthly CPUE per vessel and per fishing day of anchovy (averaged over 2007-2012) of the fleet using "menaide" in the GSA19, Catania area. The bars represent standard errors.

Following the DCF protocols, observations onboard were carried out in the period 2008-2012 (2008, 2011 and 2012, realised by COISPA) on the "menaide" fishery of Catania. This allowed collecting data on catch composition and fish samples to monitor the size structure of the target species.
The catch was almost exclusively composed by *E. encrasicolus*, which was never discarded, and by *S. pilchardus*, which was often discarded, depending on the size of the specimens and the market demand. No other species were generally caught, with the rare exception of a few specimens of *Scomber* spp.

The length structure of the catch of anchovy highlights the predominance of specimens ranging between 11 and 13.5 cm TL (Total Length) (Figs. 4.2.15, 4.2.16), a size higher than that at first maturity (L_{50}) and the Minimum Conservation Size (MCS). Considering the MCS of 9 cm TL and the L50 of 9.7 cm TL (www.fishbase.org), the length structure of the catch shows a very high percentage (Tab. 4.2.1) of specimens larger of these limits.

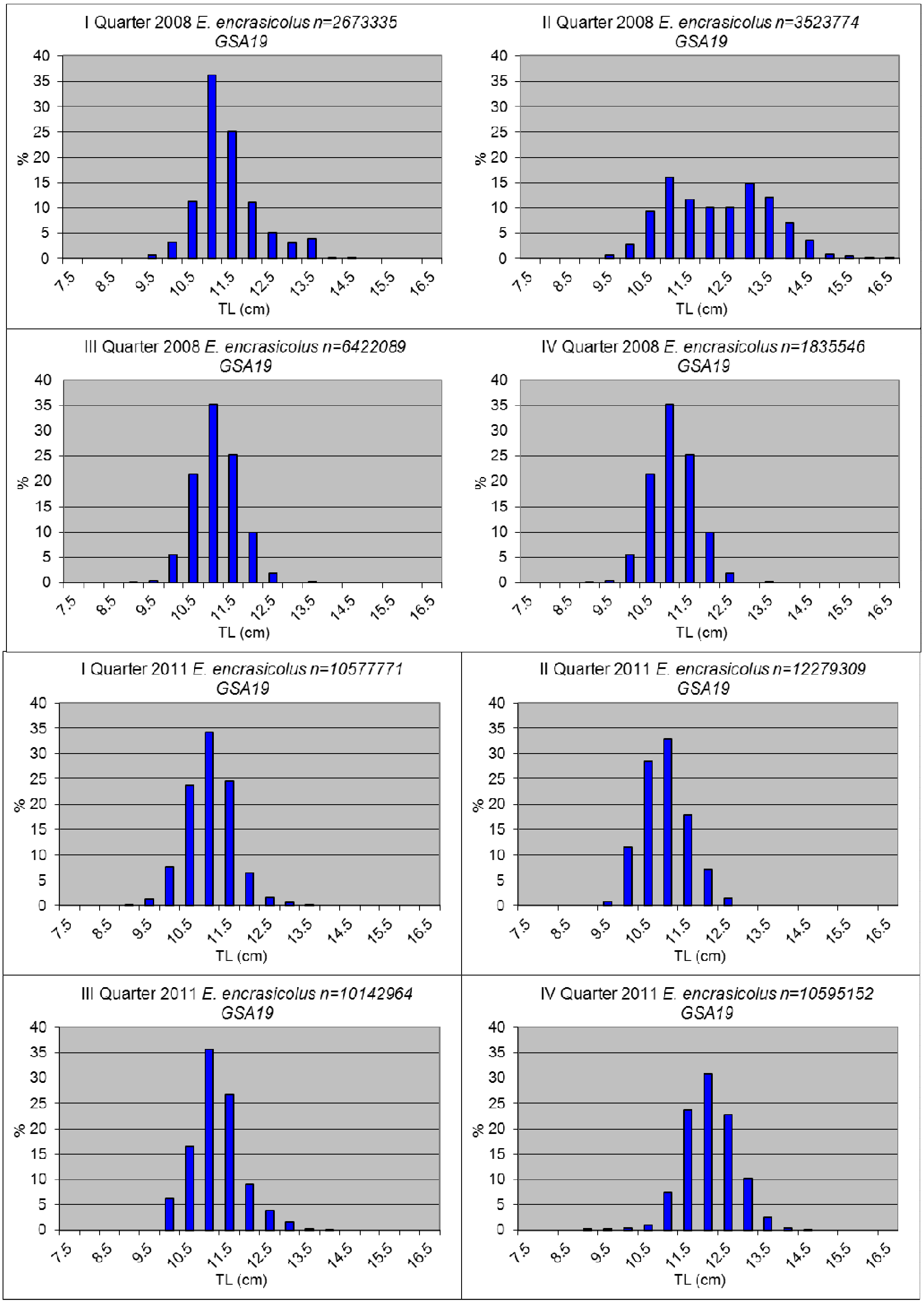


Figure 4.2.15 - Length frequency distributions by quarter (2008, 2011) of anchovy, raised to the production. GSA19, Catania area.

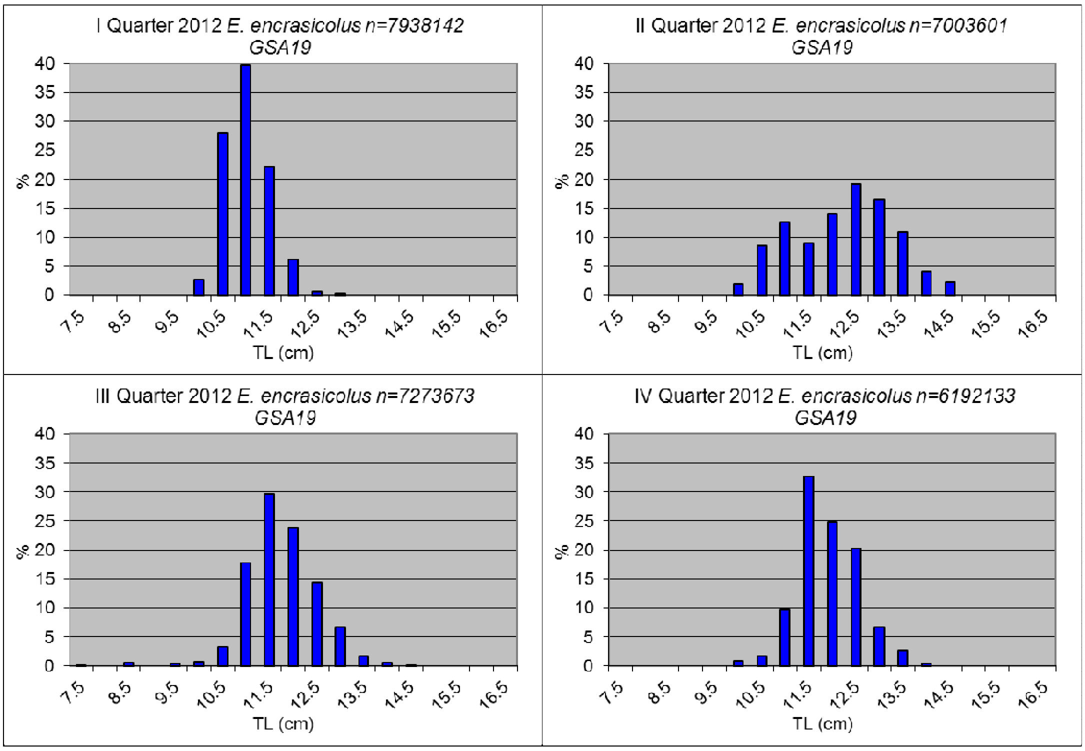


Figure 4.2.16 - Length frequency distributions by quarter (2012) of anchovy, raised to the production. GSA19, Catania area.

Table 4.2.1 – Yearly percentage, by year quarter, of the specimens of anchovy larger than the Minimum Conservation Size (9 cm TL) and Length at first maturity (9.7 cm TL).

	Minimum Conservation Size (9 cm)					Length first maturity (9.7 cm)				
	I Quarter	II Quarter	III Quarter	IV Quarter	Total	I Quarter	II Quarter	III Quarter	IV Quarter	Total
2008	100	100	100	100	100	100	100	100	100	100
2011	100	100	100	100	100	100	100	100	100	100
2012	100	100	99.33	100	99.83	100	100	99.33	100	99.83

The mean size of the specimens caught ranged from 11 to 12 cm TL, depending from the year and the quarter (Fig. 4.2.17).

The length frequency distributions of the specimens caught show a similar temporal pattern, without substantial differences among the quarters; the modal size is stable, between 11.5 and 12.0 cm TL.

The length structure of the catch of the sardine for the year 2012 was dominated by the sizes ranging between 13 and 16 cm TL (Fig. 4.2.18), higher than the size at first maturity and MCS. Considering the L_{50} of 11.8 (Somarakis *et al.*, 2006) and the MCS of 11 cm, the percentages of specimens larger of these two limits are respectively 99.3% and 97.2%. The mean size of catch was 13.8 cm TL.

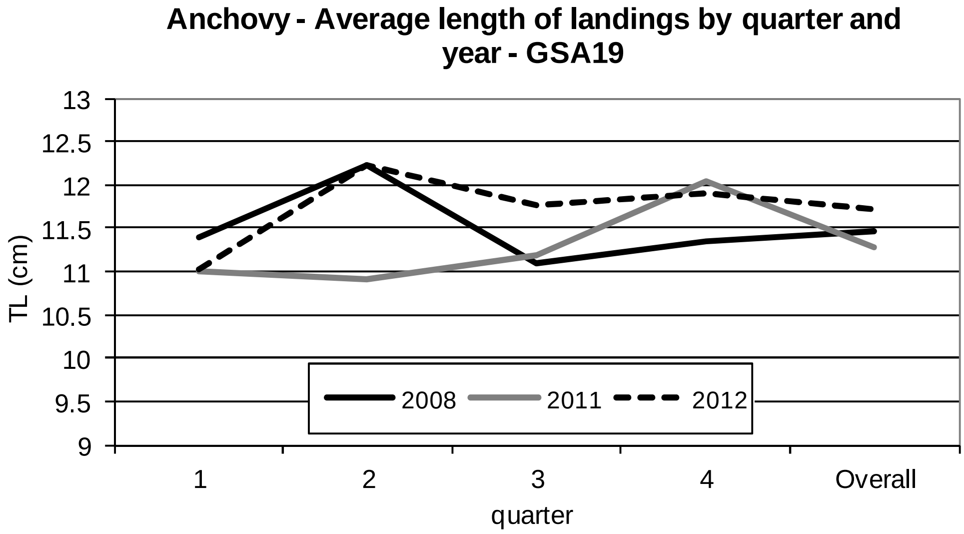


Figure 4.2.17 - Average length of the catch of anchovy caught with "menaide" by quarter and year. GSA19, Catania area.

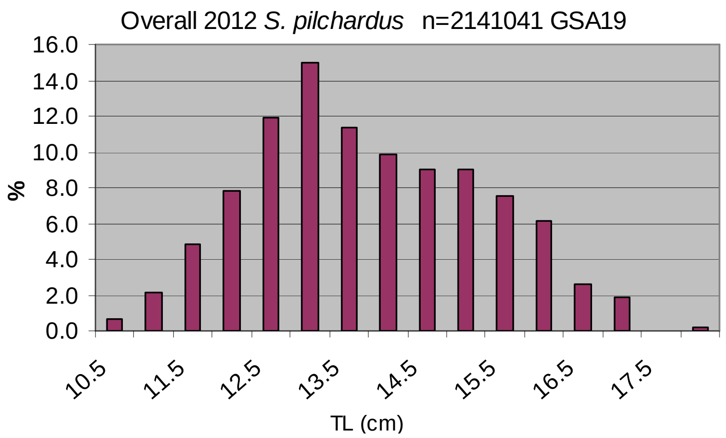


Figure 4.2.18 - Length frequency distribution of sardine raised to the production of 2012. GSA19, Catania area.

As concerns discards, for the "menaide" fishery of Catania area, the importance of this component was negligible. The monitoring of discards indicated that the discard ratio for sardine in 2012 is about 0.9 and the amount of the discard of sardine on the total production of anchovy and sardine in the same year is about 10%.The catch of sensitive/endangered species never was recorded, as well as of species included in the Annex VIII.

New data

The "menaide" fishery of Catania was monitored by means of interviews, logbooks and embarks, from the last week of May to the end of September 2013. 54 logbooks, 19 interviews and 12 embarks were realized (3 logbooks per week and 3 embarks by month).

In the investigated period, this fishery was present in the ports of Catania, Ognina and Aci Castello, with respectively 19, 4 and 5 vessels. The LOA of the boats of Catania is between 7 and 13.1 m (mean 10.56 m), in Ognina between 10.8 and 11.83 m (mean 11.43 m) and in Aci Castello between 8.2 and 12.8 m (mean 9.91 m). Other technical characteristics of the vessels (engine power and gross tonnage) are reported in Fig. 4.2.19. The vessels of Catania and Ognina have similar characteristics, while those of Aci Castello are slightly smaller, but with more powerful engines. This characteristic seems to be linked to the distance of the fishing grounds (Fig.4.2.23) of Aci Castello fleet.

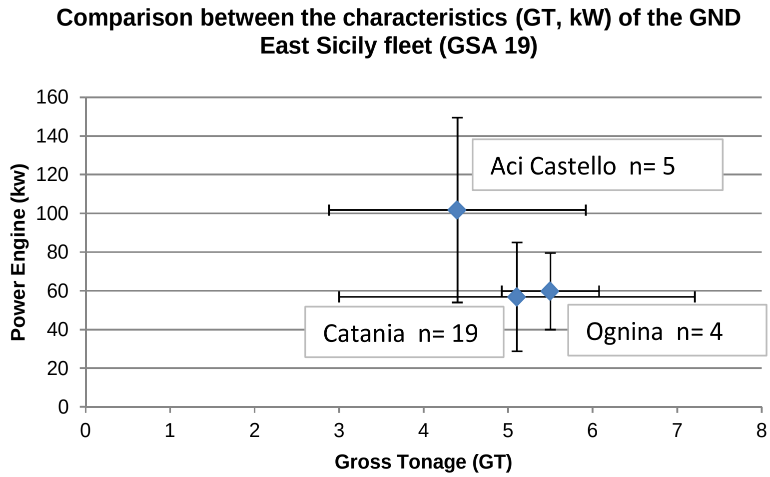


Figure 4.2.19 - Characteristics (GT, kW) of the GND fleets of Ognina, Aci Castello and Catania. Bars indicate the standard deviation.

The fishing activity of the driftnets for anchovies requires good sea conditions. In the investigated period, on average, each boat with "menaide" realised 6 fishing days per week.

In general, the fishing operation started in the last hours of the night with the search of the fishing's shoal through the eco-sounder. The net was deployed at sea close to the shoal in a position depending of the sea current. After about 1 hour and a half, during the sunrise, the net was hauled. Anchovies and sardines were removed from the net during the net recovering; the catch was maintained in little tanks with ice and water before to be landed (Fig. 4.2.20).

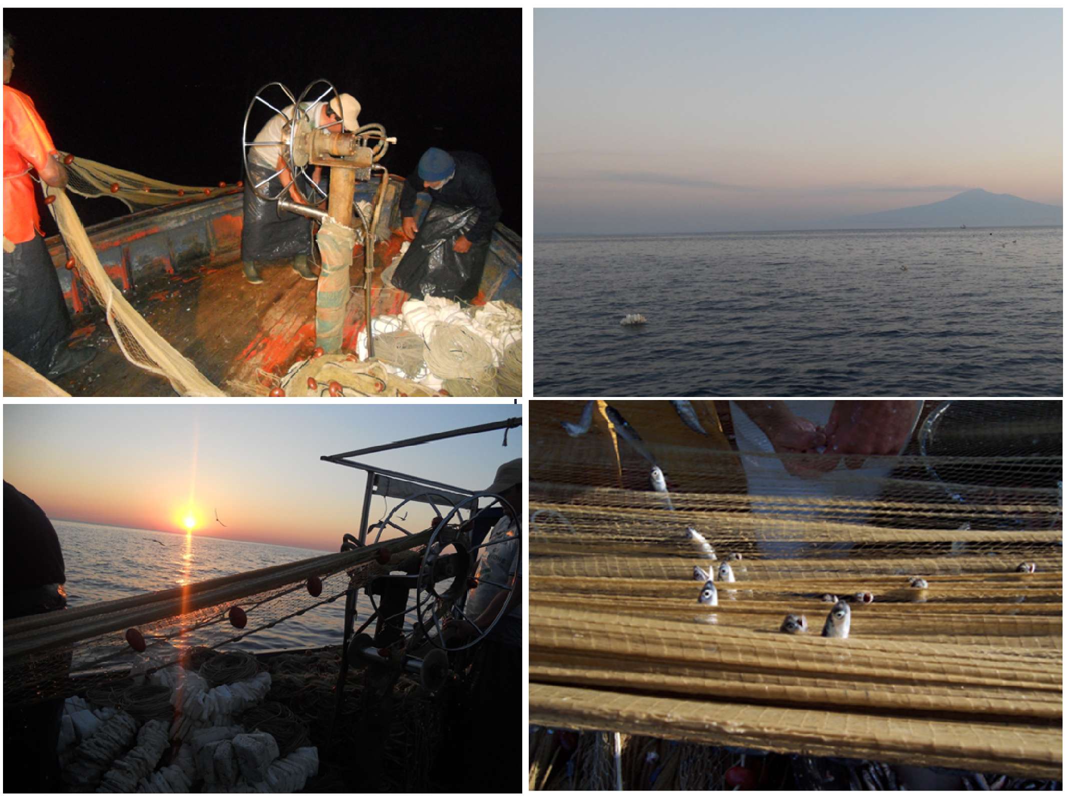


Figure 4.2.20 – Some phases of the "menaide" fishing operations.

The average length of the nets used in Catania area was 280 m, the average drop 25 m, the mean mesh size 20.5 mm. The duration of fishing trip in the sampled period was between 3.5 and 6 hours, while the duration of fishing operation between 1 and 3 hours (Fig. 4.2.21). In some cases more than one haul was carried out. The duration of fishing trip depended by different factors, as the distance of the fishing site, the abundance of the catch, the sea conditions.

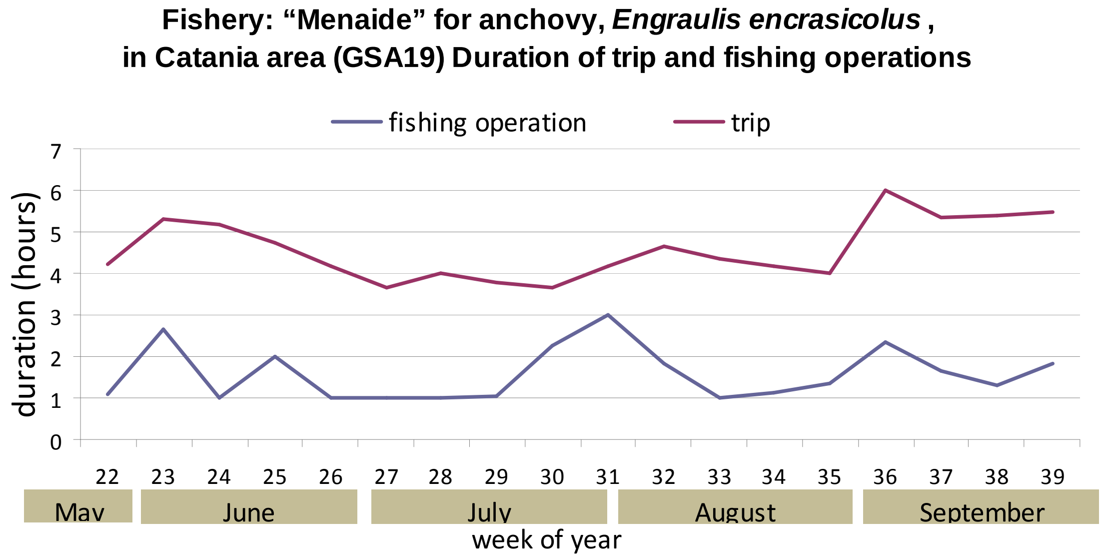


Figure 4.2.21 – Weekly average of trip and fishing operation duration.

The drifting of the net was estimated calculating the distances from the geographical coordinates of the points where the net was deployed (beginning and end) to the points where the net was hauled. Fig. 4.2.22 shows the average by month of the distances covered by the "menaide" net (drift); the value was rather constant, around 400 m in the sampled months, with higher standard deviation in September.

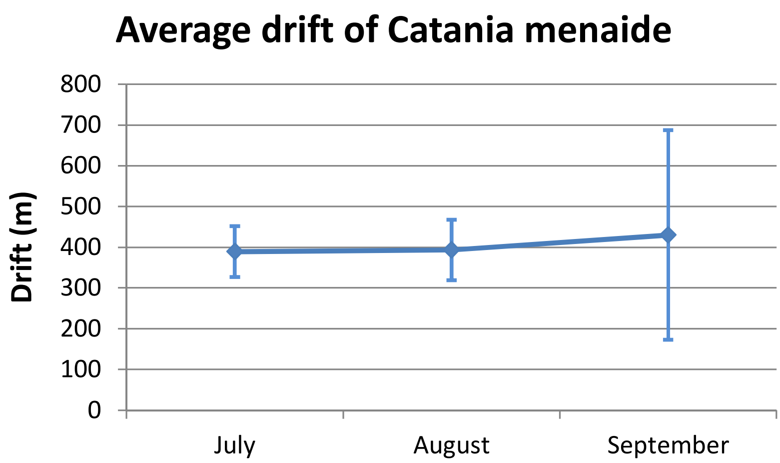


Figure 4.2.22 – Average drift of the "menaide" net measured during the embarks.
Bars indicate the standard deviation.

Fishing grounds were located in an area from Ognina to the north, to Brucoli villages to the south, with depths ranging from 35 to 135 m, characterized by sandy-muddy bottoms. Distances from the coast are included between about 0.6 and 6.6 km, with an average of 4.3 km (Fig. 4.2.23).

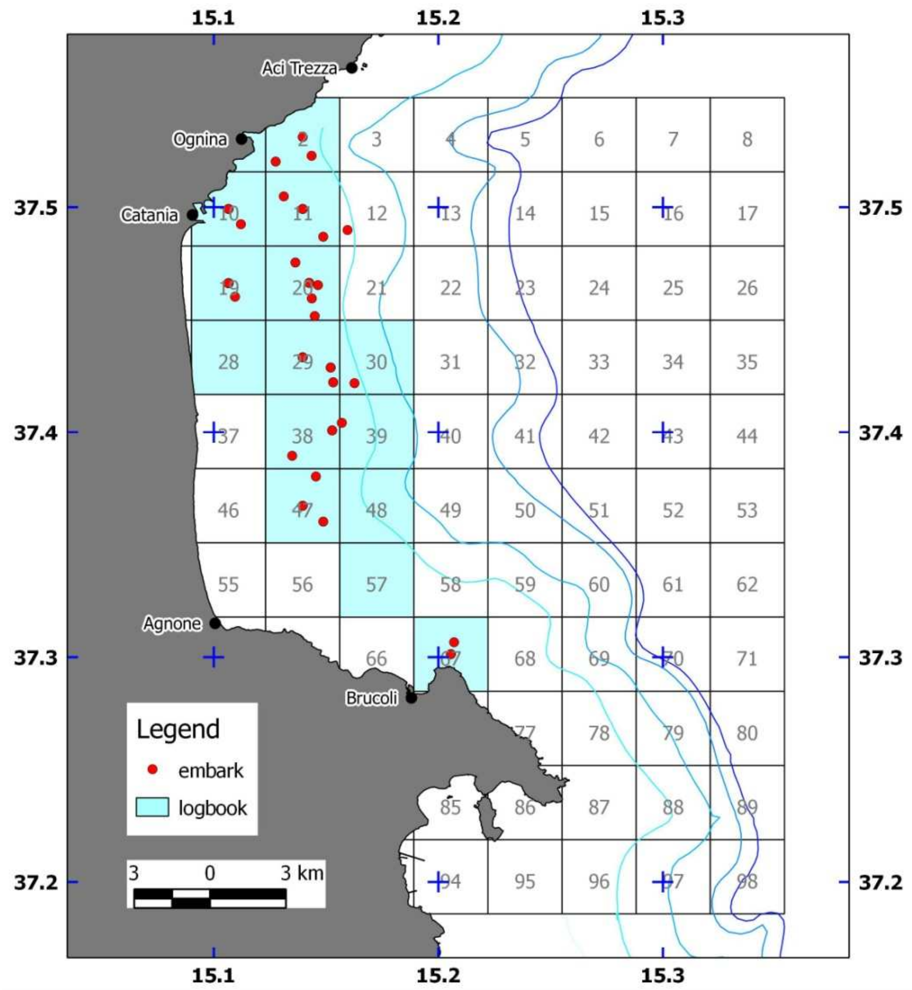


Figure 4.2.23 – Fishing sites of the “menaide” of Catania area.

The crew of the vessels involved in “menaide” fishery ranged between 3 and 6 persons (mean 4).
The selling of the landed product is usually done directly by the fishermen in the port and/or on the typical fish markets of Catania so called “la pescheria”. The price of the anchovies caught from “menaide” was on average 50% higher than that of the anchovies caught with other gears (purse seine, pelagic trawling). As a matter of fact, anchovies captured trough “menaide” (Fig. 4.2.24) are traditionally recognized by the consumers and more appreciated.
The specimens of anchovy caught by "menaide" are extracted from the net by removing the head; this produces a bleeding from the fish, which gives to the product a unique taste. The content in fatty acids (mainly Ώ3 series as docosahexaenoic and eicosapentaenoic) is significantly higher in the anchovies caught by "menaide", than that of the specimens coming from other gears, as the purse seine (Sanfilippo *et al.*, 2011). The high content of fatty acid results in an anthithrombotic and anti-inflammatory effect, lowering LDL cholesterol and helps the adjustment of calcium metabolism (Sanfilippo *et al.,* 2011).
In the recent years the anchovies of Catania caught by “menaide” have obtained a brand for the typicality of the product (“Slow food” Presidium “masculine da maghia", www.fondazioneslowfood.it). In addition, the Sicily Region issued a regulation (www.agrinnovazione.regione.sicilia.it) to obtain and put on the market products with the denomination “Presidio slowfood masculine da maghia” and some cooperatives started marketing the anchovies with this brand.

Figure 4.2.24 – Anchovies caught by “menaide”.

Fig. 4.2.25 reports the catch composition of the "menaide" in the monitored period. The anchovies represented 91% of entire biomass caught; the by-catch is composed only by sardines. The "menaide" fishery is therefore characterised by a high level of specialization for the target species.

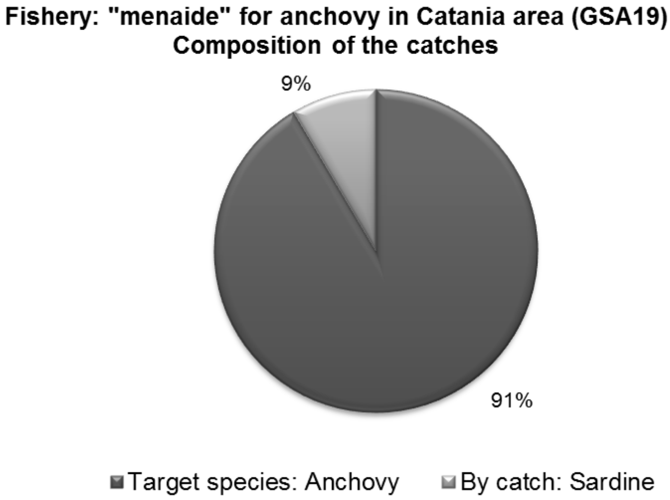


Figure 4.2.25 – Composition of the catch of “menaide” of Catania area, GSA19.

The importance of discards was negligible: they were observed only in May and they were represented only by sardines. In the monitored period, the discard rate of sardine was about 0.7 on the total production of anchovy and sardine. The catches of protected/vulnerable species were never recorded, as well as those of species included in the Annex VIII.
The average monthly CPUEs (kg/100 m^2/fishing hours) of anchovy ranged from 0.38 to 2.49 kg/100m^2 of net/fishing h. The peak was registered in May with a decreasing trend in the other months, with a minimum in September, the last month of sampling (Fig. 4.2.26). The total landings followed the same trend, also because the by-catch represented a small fraction of the total landings (Fig 4.2.25).

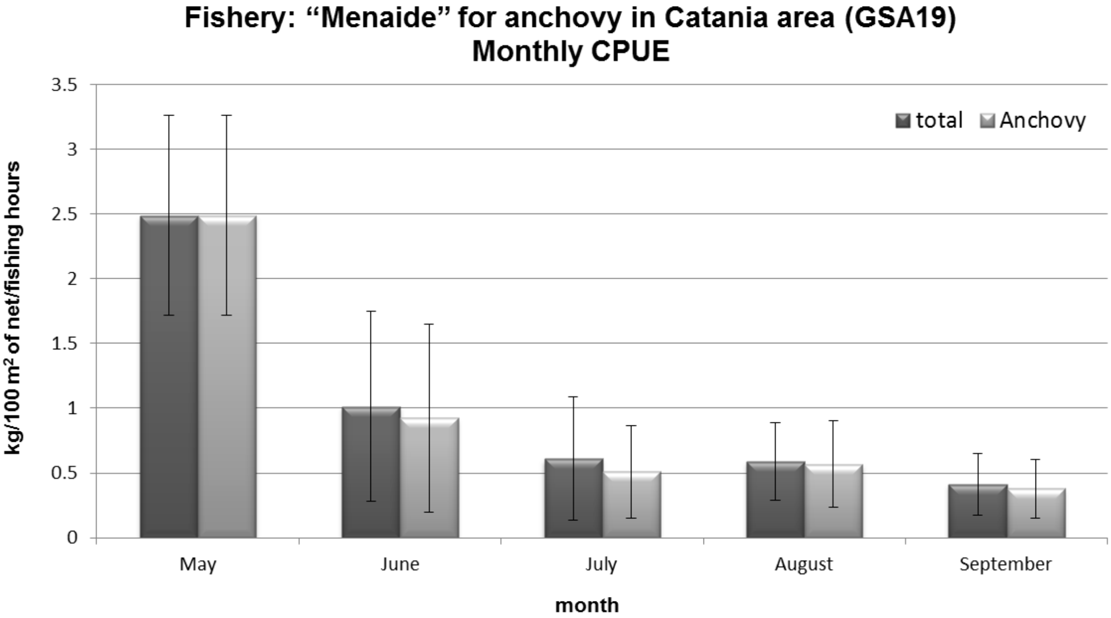


Figure 4.2.26 – "Menaide" for anchovy in Catania area (GSA19). CPUE, expressed as kg/100 m^2 of net/fishing hours (monthly averages; overall monitored period average). Grey columns: target species; dark grey columns: all landings (target+by-catch); bars: the standard deviation.

The average weekly CPUEs (kg/100 m^2/fishing hours) of anchovy ranged from 0.19 in the first week of August and 2.5 in the last week of May. Despite these data are rather fluctuating, it is possible to recognize a general decreasing trend, from late spring to the autumn (Fig. 4.2.27). This trend is in accordance with the observations of the previous years (Fig. 4.2.14). The comparison of CPUE for the target species (anchovy) and total landing (anchovy and sardine) shows the same trend and in many weeks the anchovy represent the sole landed species.

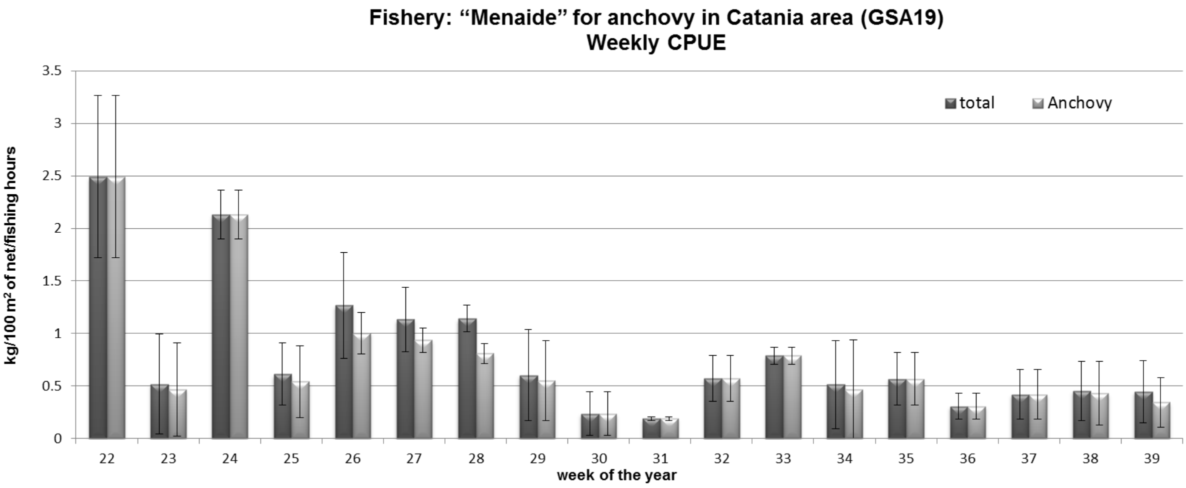


Figure 4.2.27 – "Menaide" for anchovy in Catania area (GSA19). CPUE, expressed as kg/100 m^2 of net/fishing hours (weekly averages; overall monitored period average). Grey columns: target species; dark grey columns: all landings (target+by-catch); bars: the standard deviation.

In the Figs 4.2.28 and 4.2.2.29 the catch rates (kg/fishing day) by month and week are reported, both for anchovies and for all the species landed. From May to the end of September a clear decreasing trend of the total landings is evident: from 130 kg per fishing day in May to 35.7 kg per fishing day in September. The anchovy shows the same trend, from 130 kg per fishing day in May to 32 kg per fishing day in September.

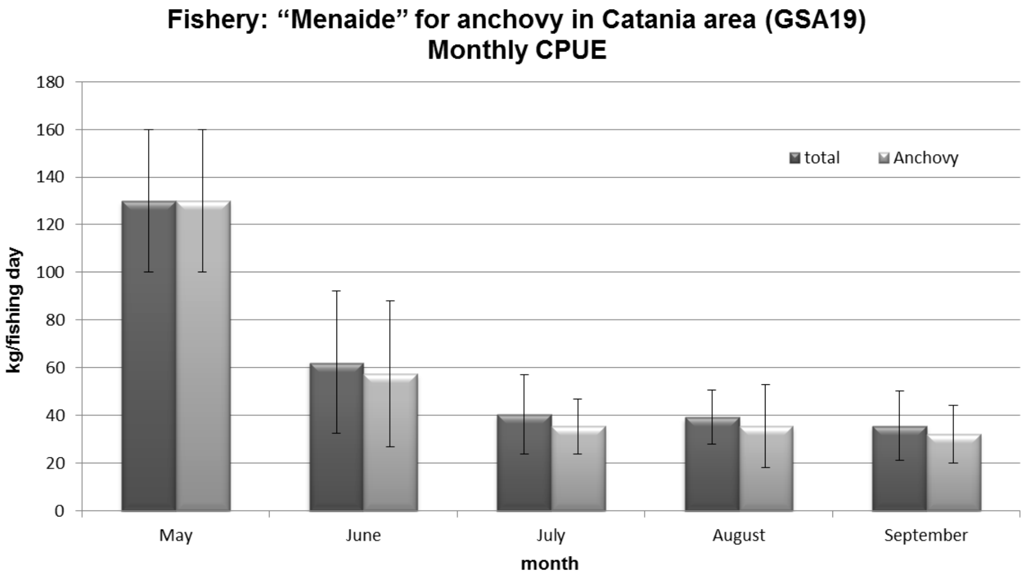


Figure 4.2.28 - "Menaide" for anchovy in Catania area GSA19. Catch rates, expressed as kg/fishing day (monthly averages; overall monitored period average).
Grey columns: target species; dark grey columns: all the species caught; bars: the standard deviation.

Despite these fluctuations, the weekly catch rates show a general decreasing trend, from late spring to autumn, in accordance with the CPUEs data. The catch rate of the target species (anchovy) and the total landing (anchovy and sardine) show the same trend.

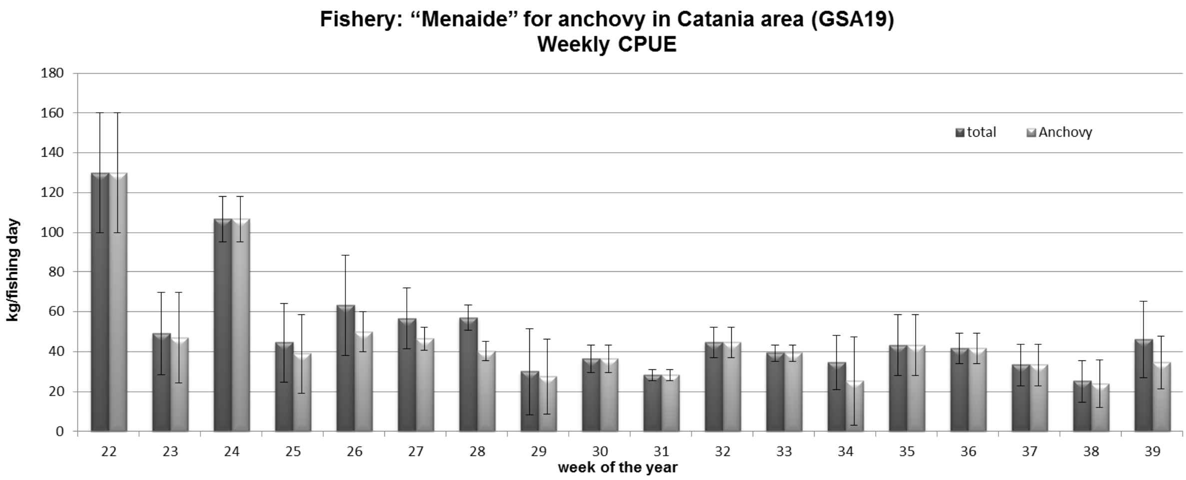


Figure 4.2.29 - "Menaide" for anchovy in Catania area GSA19. Catch rates, expressed as kg/fishing day (weekly averages; overall monitored period average).
Grey columns: target species; dark grey columns: all the species caught; bars: the standard deviation.

The Figs. 4.2.30 and 4.2.31 shows the Length Frequency Distribution (LFD) of the target species, by month and for the entire sampling period (June-September). In June, July and August the capture is represented only by adult specimens. In September some recruits start to appear in the catch, but with a percentage very small, around 2% of entire catch of September. This result could be linked with a selectivity of the net, fishing technique and the characteristics of the fishing grounds.

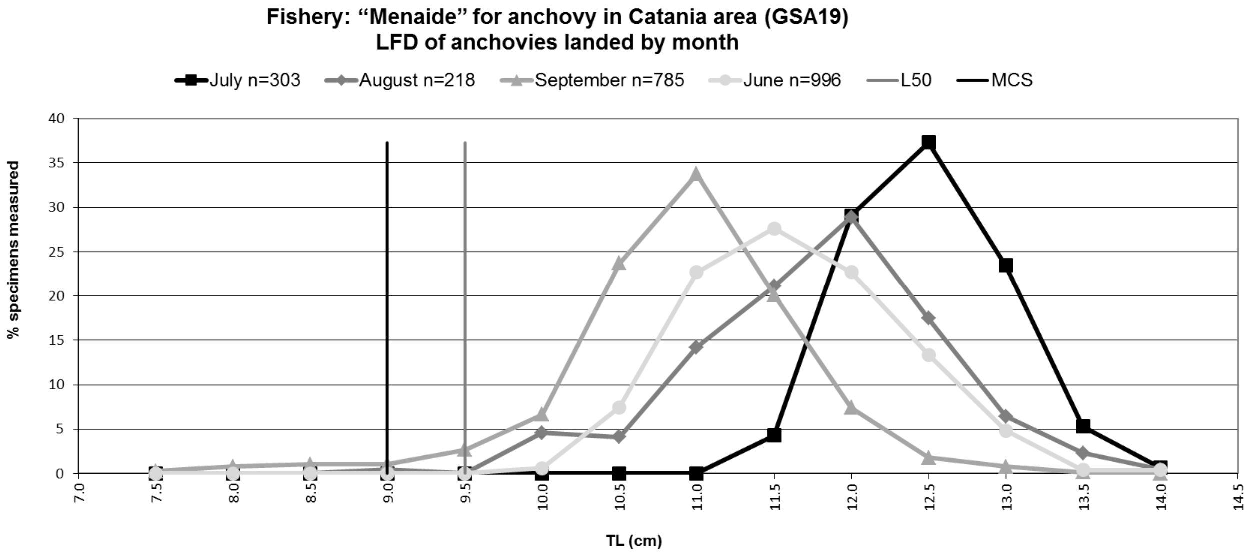


Figure 4.2.30 - "Menaide" for anchovy in GSA19. Monthly Length Frequency Distribution of the specimens of anchovy measured. Black line: Minimum Conservation Size; grey line: size at first maturity.

The LFD for the entire sampling period shows that most of the specimens are concentrated in the size classes between 10.5 to 13 (93.7% of all specimens) and considering the Minimum Conservation Size of 9 cm TL (EC Reg. n. 1967/2006) and the length at first maturity of 9.7 cm TL (www.fishbase.org), the percentage of specimens smaller of these limits are respectively 0.7% and 1.1%. The "menaide" gear therefore catches almost exclusively adult specimens and this data could be a first indication of the sustainable exploitation of this gear; also because, until now, no formalized stock assessments for the anchovy in the western Ionian Sea (GSA19) are available.

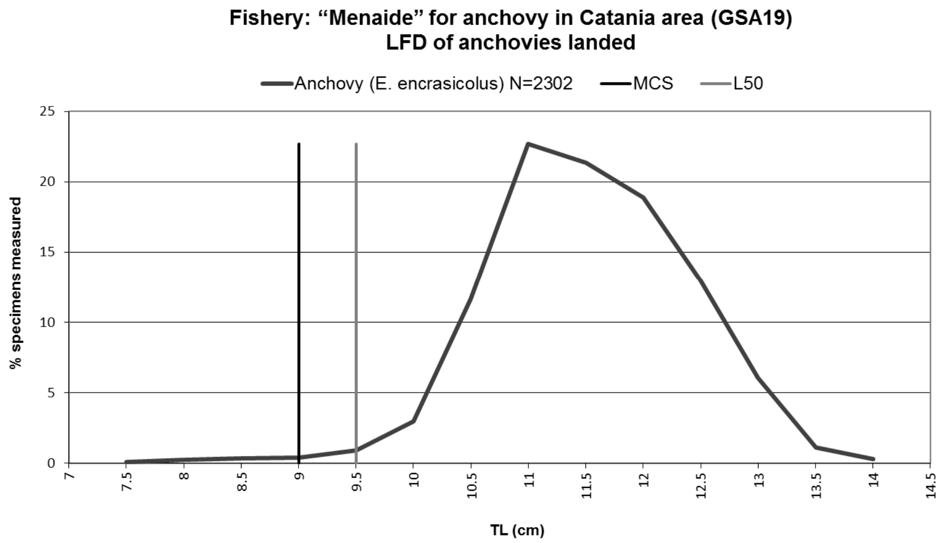


Figure 4.2.31 - "Menaide" for anchovy in GSA19. Length Frequency Distribution of the specimens of anchovy measured in the all monitored period. Black line: Minimum Conservation Size; grey line: size at first maturity.

Regarding the Length Frequencies Distribution (LFD) of the by-catch, the sardine, the results by month and for the entire sampling period (June-September) are reported in the Figs. 4.2.32 and 4.2.33. In June the LFD has a polimodal pattern: one mode at 10-10.5 cm TL and other one at 11.5 cm TL. In the other two months the LFD shows one mode at 11 cm TL.

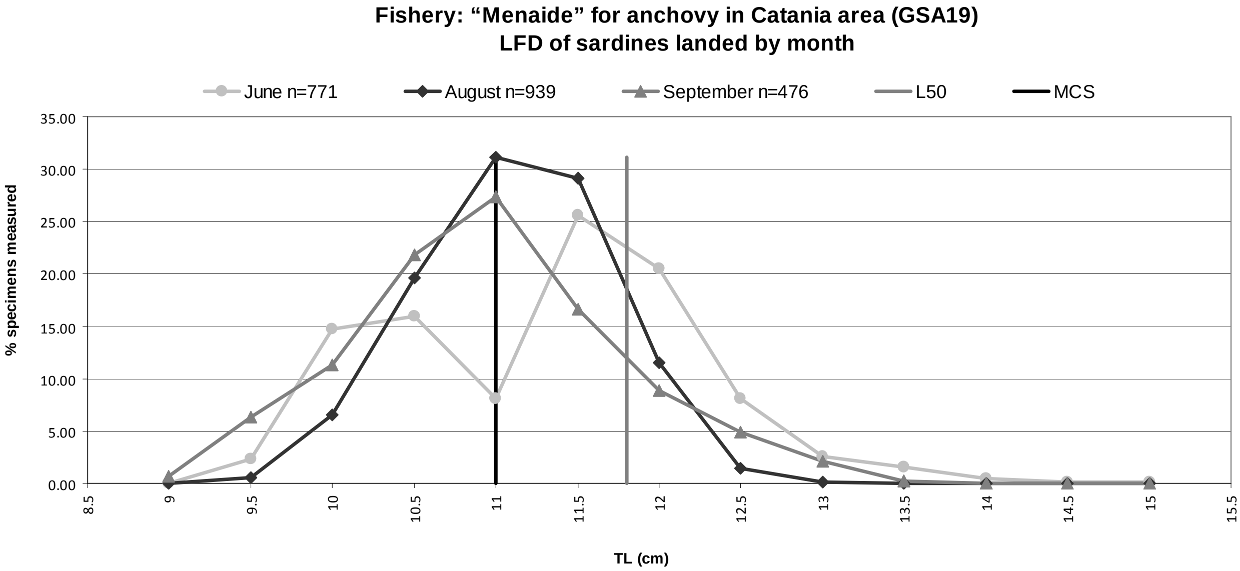


Figure 4.2.32 - "Menaide" for anchovy in Catania area (GSA19).
Monthly Length Frequency Distribution of the specimens of sardine measured.
Black line: Minimum Conservation Size; Grey line: size at first maturity.

The LFD for the entire sampling period shows that most of the specimens are concentrated in the size classes between 10 to 13 cm TL (90% of all specimens) and considering the MCS of 11 cm LT and the size at first maturity of 11.8 cm LT the percentages of the specimens smaller of these limits are respectively 31.6% and 54%. Unlike the anchovy, about half of the "menaide" catch of sardine is under the size at first maturity. This result is influenced by the sampling period that corresponds to the recruitment season (Voulgaridou and Stergiou, 2003). In any case, it is important underline that the fraction of the sardine in the catch is very small.

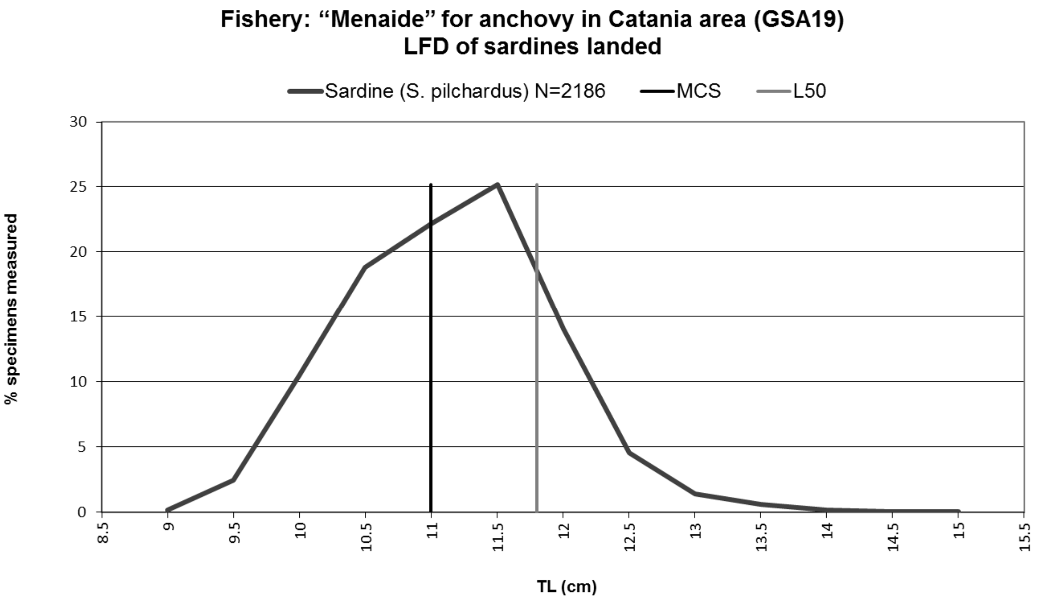


Figure 4.2.33 - "Menaide" for anchovy in Catania area (GSA19).
Length Frequency Distribution of the specimens of sardine measured in the all monitored period.
Black line: Minimum Conservation Size; grey line: size at first maturity.

GSA 10: "Menaide" for anchovy, *Engraulis encrasicolus*, in Cilento area (Fishery 2) and in Sant' Agata di Militello (Fishery 5).

DCF Data

In GSA10 the GND fisheries with "menaide" for anchovy were monitored in the DCF framework in the last years. Data on production and fishing were collected, even though, according to the selection of the ranking system, the monitoring was not regular in the years. Such data were gathered from the statistics produced by IREPA (2007-2012); an overview of this information is presented below.

These fisheries were mainly present in the Cilento area (Campania administrative region) and in the north of Sicily, namely in the port of S. Agata di Militello.

The fishery for small pelagics with GND fishing type in GSA10 is performed almost all year round, even though it is concentrated in spring-summer. The monthly landings in tons, averaged over the period 2007-2012, highlighted a clear peak in mid-spring early summer months, reaching a value of about 35 tons (Fig. 4.2.34).

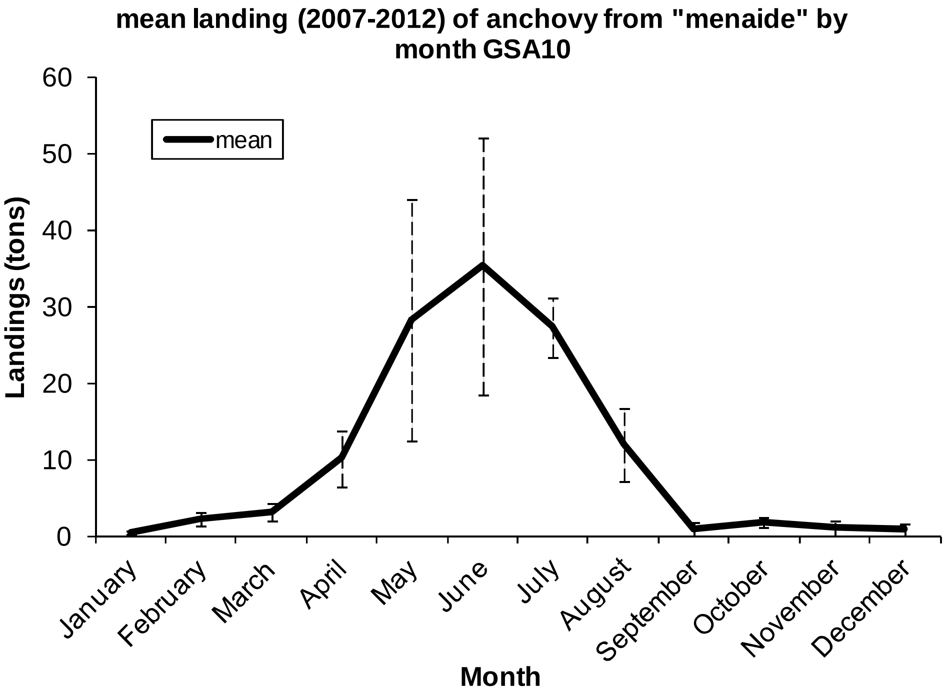


Figure 4.2.34 – Mean monthly landing (averaged over 2007-2012) in tons of anchovy by means of "menaide" in the Central-Southern Tyrrhenian sea (GSA 10). The bars represent the standard error.

The production resulted of about 80 tons in 2007-2008, increased in 2009 and 2010 until about 150 and 300 tons, respectively; then in 2011 decreased to about 40 tons and raised to 80 tons in 2012 (Fig.4.2.35).

The GND production of anchovy represented a small fraction (between the 0.6 and the 4.5%) of the total anchovies landed in GSA 10 (Figs. 4.2.36 and 4.2.37). The most important by-catch species is sardine (*S. pilchardus*), with low contribution to the total landings and a more variable temporal pattern than anchovy. The monthly landings of sardine, averaged over 2007-2012, varied from 0.5 to 3.5 tons (Fig. 4.2.38).

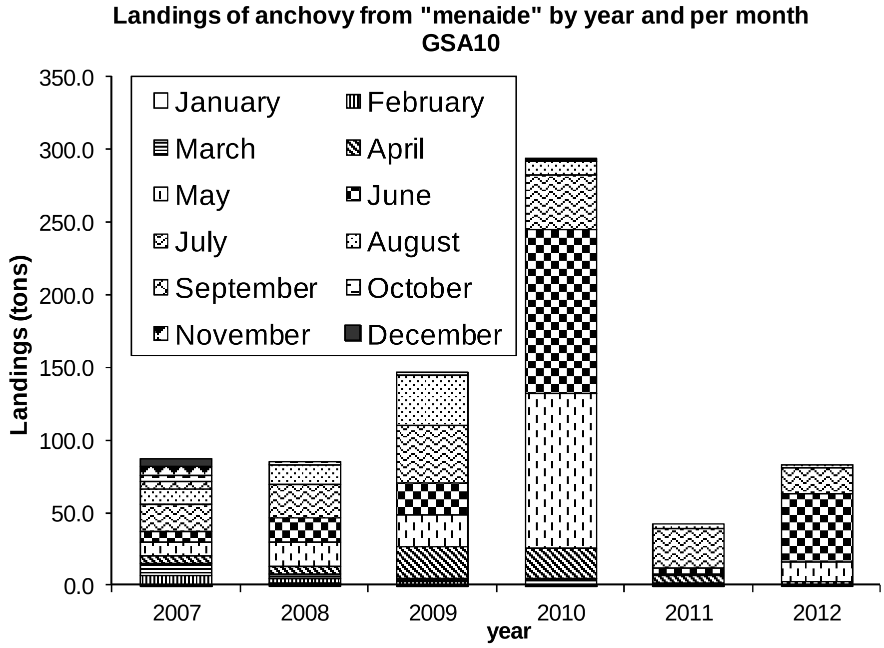


Figure 4.2.35 – Yearly landing of anchovy by means of "menaide" in GSA 10. The contribution of each month is also reported.

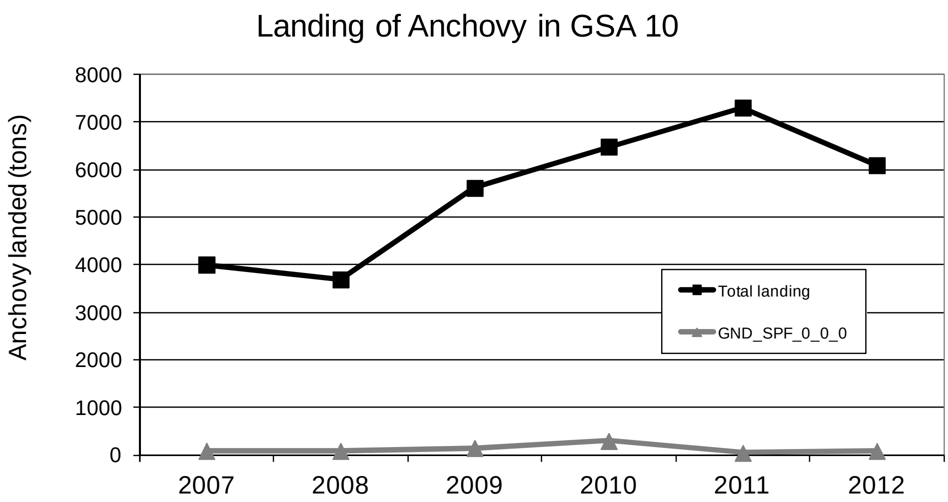


Figure 4.2.36 – Total and GND yearly landings of anchovy in GSA 10.

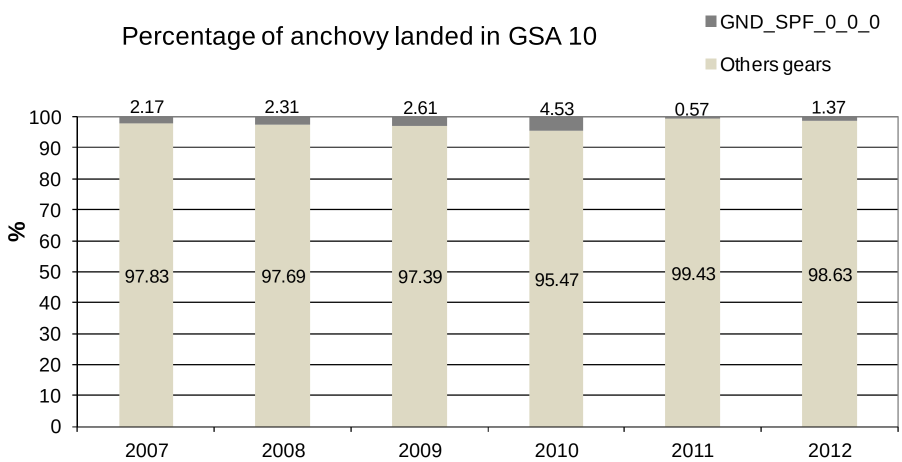


Figure 4.2.37 – Percentage of anchovies caught by "menaide" respect to the total landings of anchovy in GSA 10.

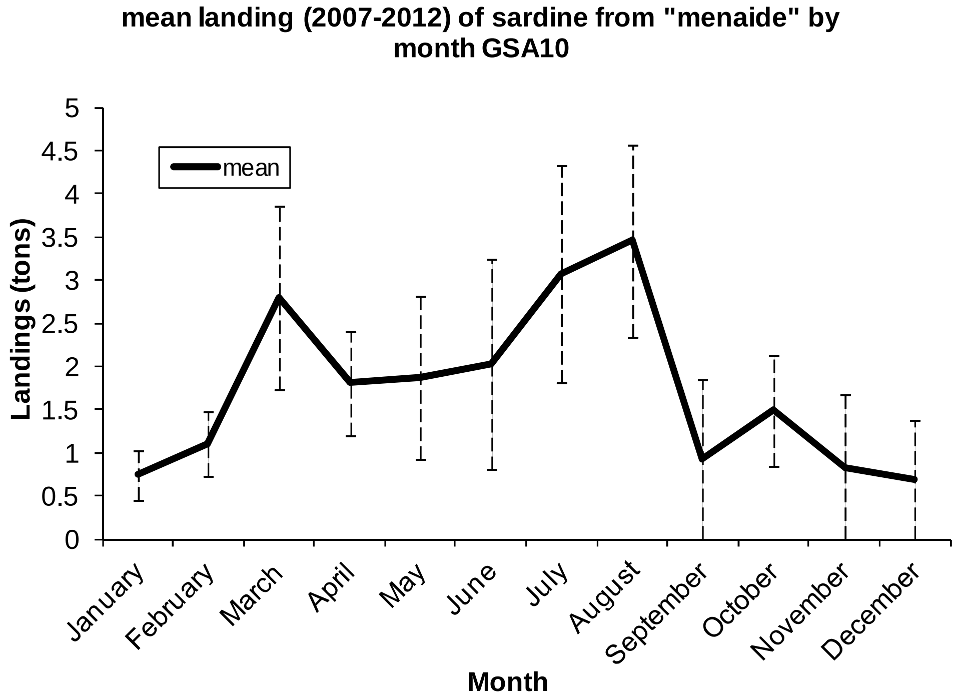


Figure 4.2.38 – Mean monthly landings (averaged over 2007-2012) of sardine by means of "menaide" in GSA 10.
The bars represent the standard error.

The sardine yearly landings decreased from about 60 tons in 2007 to 14-20 tons in 2009-2010; in 2011 the production raised to about 9 tons and disappeared in the 2012 (Fig. 4.2.39). This variable pattern seems to be due to an opportunistic behaviour of the fishermen that did not land sardine regularly. This depended from the market demand; sardine was often discarded, due to its low price and also because this species was landed only when the amount of anchovies were not sufficient to recompense the daily revenue.

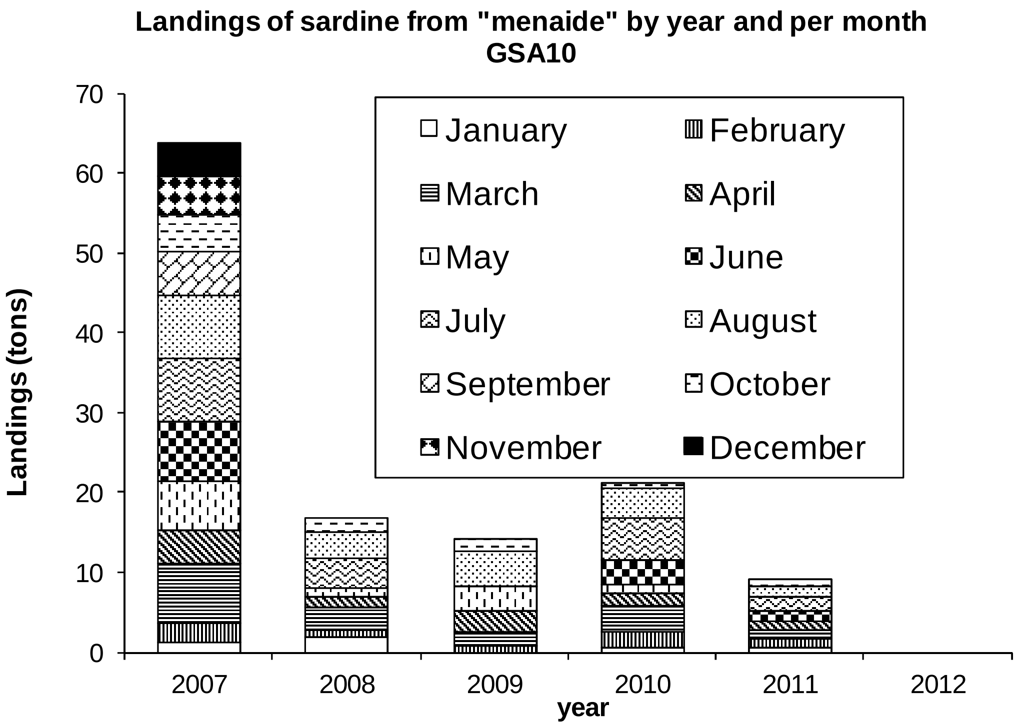


Figure 4.2.39 – Yearly landing of sardine by means of "menaide" in GSA 10.
The contribution of each month is also highlighted.

The contribution of the anchovy ranged from about 60% (in 2007) to 100% (in 2012) of the total landing of GND in the GSA 10 (Fig. 4.2.40).

	2007	2008	2009	2010	2011	2012
% Anchovy on landings	57.6	83.6	91.2	93.3	82.2	100.0

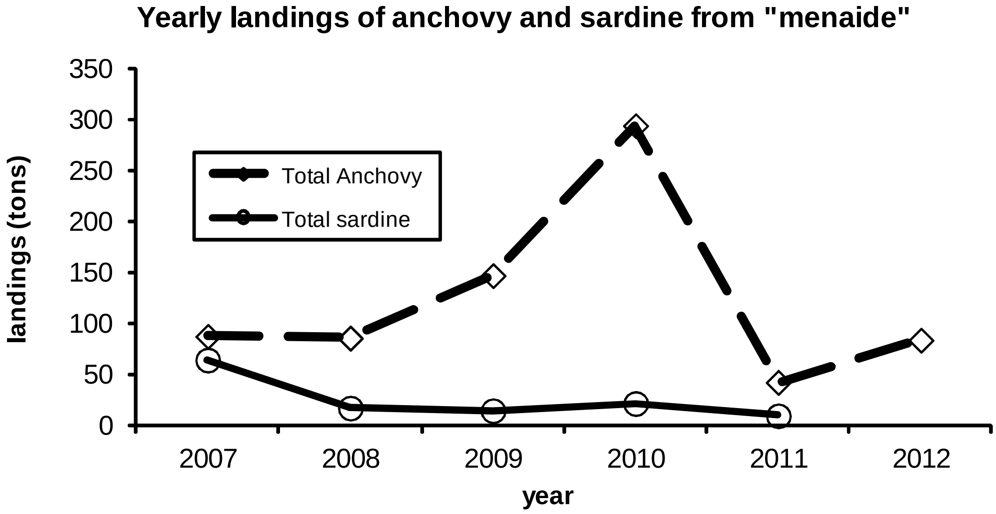


Figure 4.2.40 – Yearly landings of anchovy and sardine from 2007 to 2012 and percentage of anchovy respect to the total landings due to the “menaide” fisheries in the GSA 10.

As concerns the characteristics of the fleet involved in “menaide” fishery, the LOA segment that contributed more to the landings and to the number of active vessels and fishing days was 6-12 m.
Regarding fishing activity, the mean monthly number of vessels potentially using "menaide" was rather constant along the time, with around 60 vessels (Fig. 4.2.41).

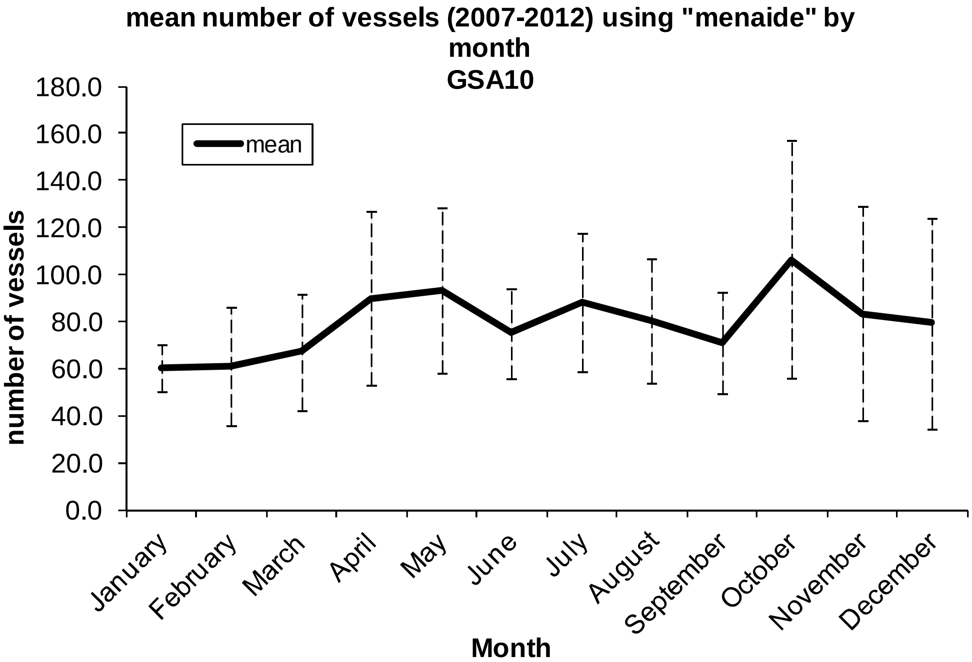


Figure 4.2.41 – Mean number of vessels (averaged over 2007-2012) using "menaide" in the GSA10. The bars represent standard errors.

The mean monthly number of fishing days (averaged over 2007-2012) shows higher values in July (Fig. 4.2.42).

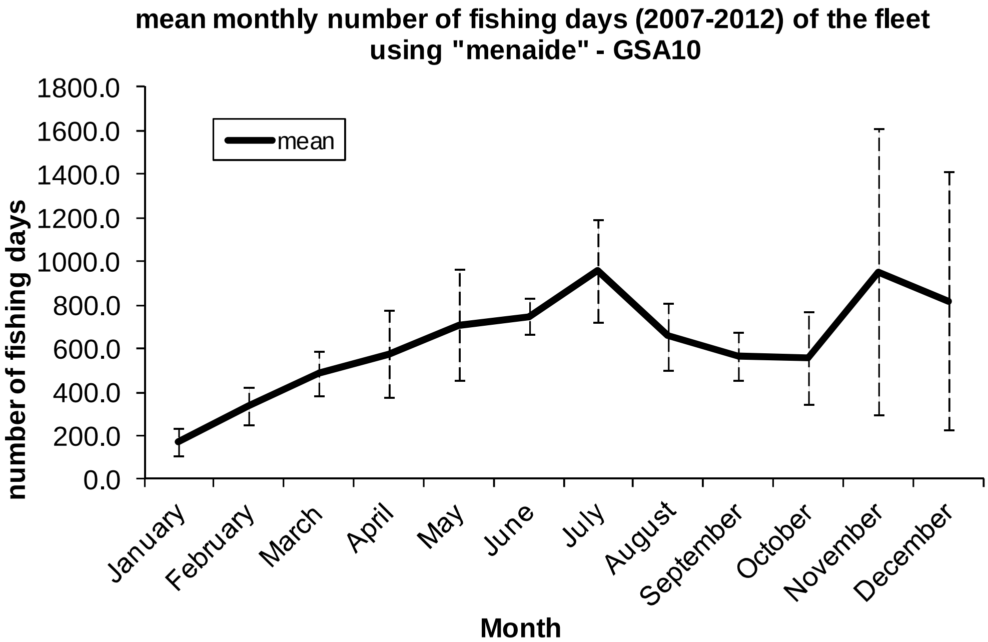


Figure 4.2.42 – Mean monthly number of fishing days (averaged over 2007-2012) of the fleets using "menaide" in the GSA10. The bars represent standard errors.

The overall yearly effort of the fleet showed a decrease from 2007 (about 16000 fishing days) to 2012 (about 1650) (Fig. 4.2.43). In 2012 the fishing activity was concentrated from April to August, with a peak in June.

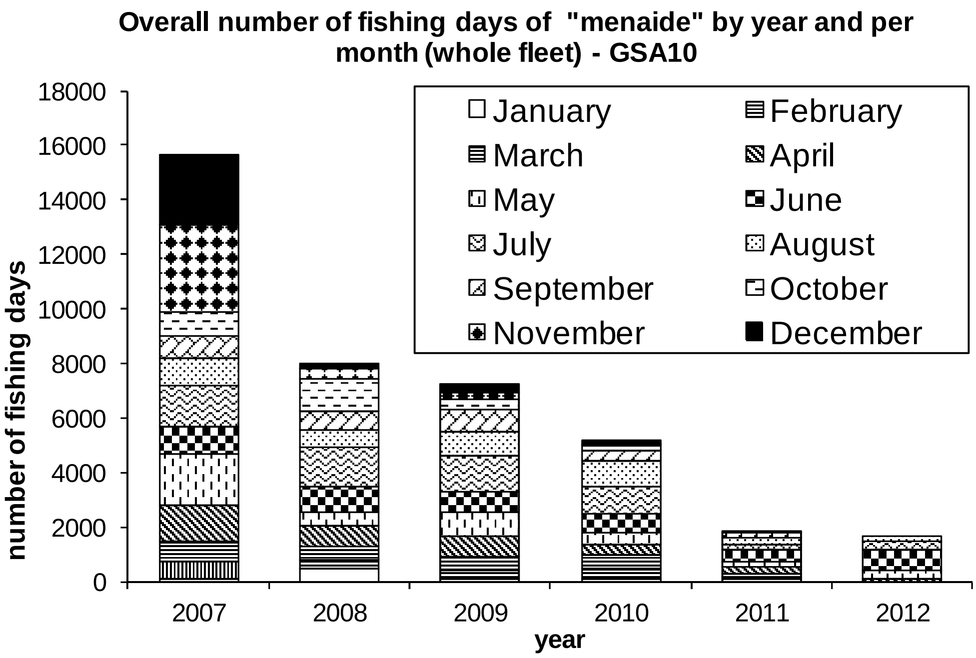


Figure 4.2.43 – Overall fishing days by year of the fleet using "menaide" in GSA10, with the contribute of each month.

The the mean monthly number of fishing days per vessel (averaged over 2007-2012) showed a marked seasonality, ranging from 2 in January to 5 in December, with a peak of 12 in June and July (Fig. 4.2.44).

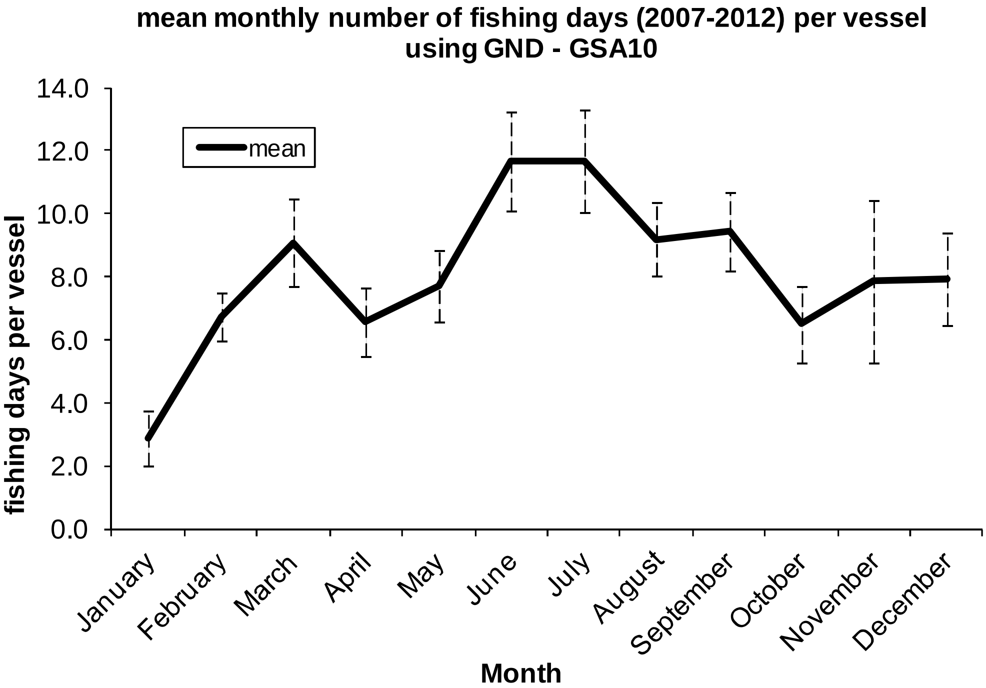


Figure 4.2.44 – Mean monthly number of fishing days per vessel (averaged over 2007-2012) of the fleet using "menaide" in the GSA10. The bars represent standard errors.

The yearly CPUEs of anchovy expressed as kg/vessel/fishing day followed an increasing trend, from about 7 to 17 kg, with a peak in 2010 (about 45 kg) (Fig. 4.2.45). The mean monthly CPUEs of the anchovy landed, expressed as kg per vessel and fishing day (averaged over 2007-2012), showed a strong seasonality with higher values during early summer months (June-July) (Fig. 4.2.46).

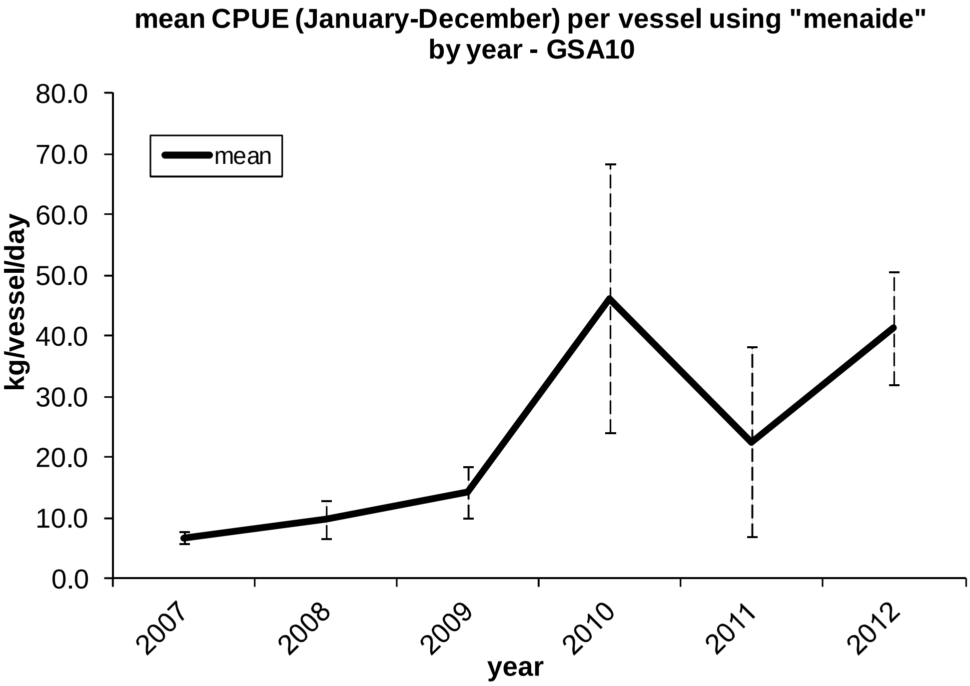


Figure 4.2.45 – Mean yearly CPUE, expressed as kg of anchovy landed per vessel and fishing day, of the fleet using "menaide" in GSA 10. The bars represent standard errors.

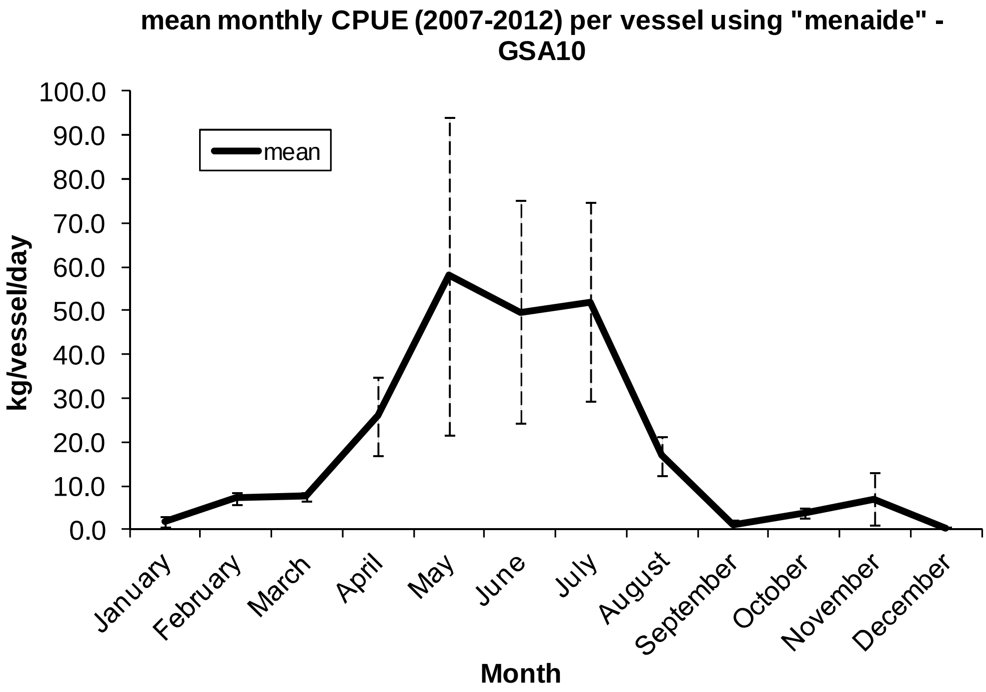


Figure 4.2.46 – Mean monthly CPUE expressed as kg of anchovy landed per vessel and fishing day (averaged over 2007-2012) of the fleet using "menaide" in the GSA10. The bars represent standard errors.

In the year 2011 the “menaide” fishery of Sant’Agata di Militello was monitored by observations onboard, performed by COISPA, according to the sorting of the mètier by the ranking system of DCF and the Pilot Study on discard. The embarks and the observations on landings allowed following 12 fishing days in total. The catch was exclusively composed by *E. encrasicolus*, which was never discarded. The annual length frequency distribution (LFD) structure (Fig.4.2.47) showed a bi-modal pattern: one mode at 10-10.5 cm TL and another one at 13.5 – 14 cm TL. Considering the Minimum Conservation Size (MCS) of 9 cm TL (EC Reg. n. 1967/2006) and the size at first maturity of 9.7 cm TL (www.fishbase.org) for this species, practically all the specimens measured are larger than these limits.

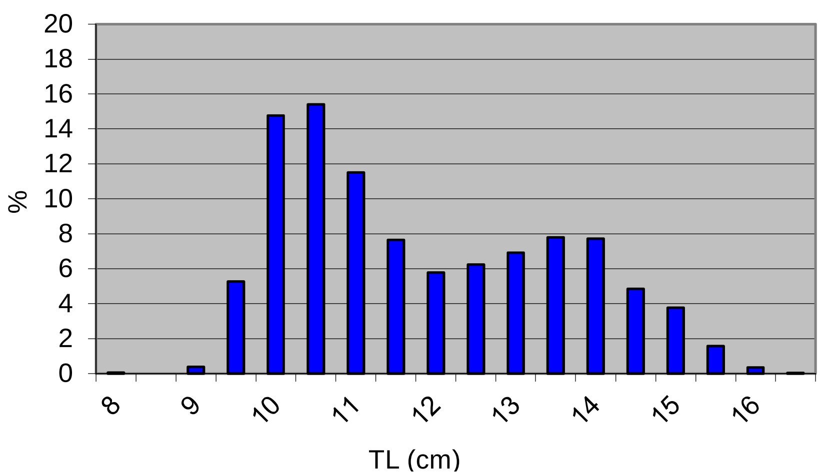


Figure 4.2.47 – Annual length frequency distribution of *E. encrasicolus* caught with "menaide" in Sant’Agata di Militello (GSA10), 2011.

Menaide" for anchovy, *Engraulis encrasicolus*, in the Cilento area (Fishery 2).

Existing information

The artisanal fisheries of Cilento area were investigated in the years 1994-2001 by a specific study realised by Colloca *et al.* (2002), which provided detailed information on the structure of the fleets, the fishing effort and the composition of the catches.

The area of Cilento is located in Campania administrative Region, Salerno Province. It spreads for over than 140 km in the southern Tyrrhenian Sea (GSA10), from the Gulf of Salerno (Punta Licosa) to the North and Policastro (Punta Iscoletti) to the South (Fig. 4.2.48). Several fishing ports and mooring places are present, hosting principally small-scale fleets: the most important are Acciaroli, Marina di Casal Velino, Marina di Pisciotta, Palinuro and Marina di Camerota (Fig. 4.2.49).

The southern coast of Cilento is characterised by a limited extension of the continental shelf: the depth drops very quickly to 50 m and goes down to over 100 m. The northern coast presents a more developed continental shelf; the bottoms are mostly sandy, with the presence of *Posidonia* meadows.

The artisanal fishing fleets were historically present in the Cilento area.

A rapid increase in the number of vessels occurred from the mid 1960s to the end of the '80s, followed by an abrupt decrease from 1990 to 2000 (Colloca *et al*., 2002). In the year 2001 about 150 vessels, associated to the small-scale fisheries, were registered in the ports of Cilento area (Colloca *et al.,* 2002).

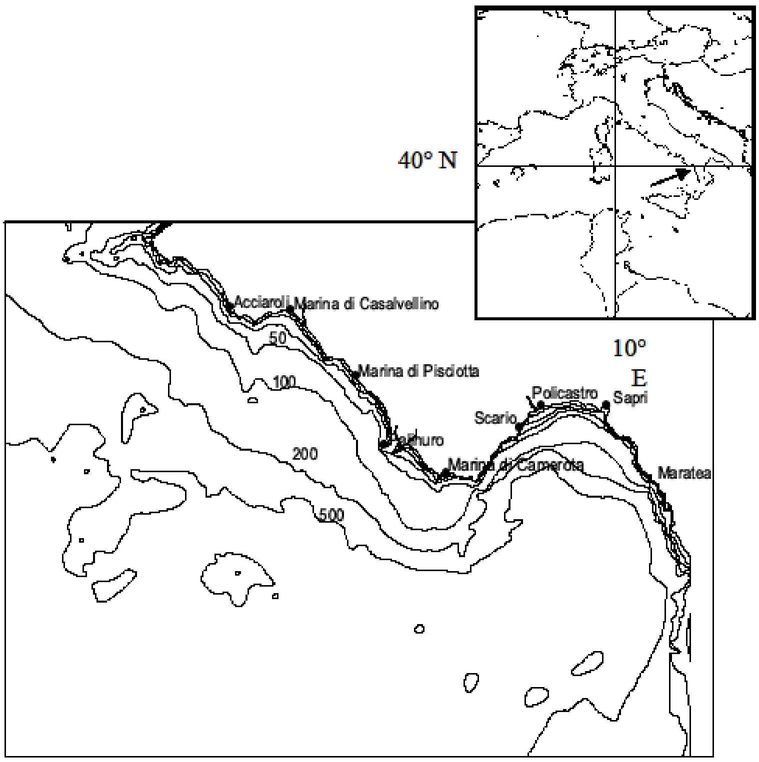


Figure 4.2.48 - Map of Cilento area.

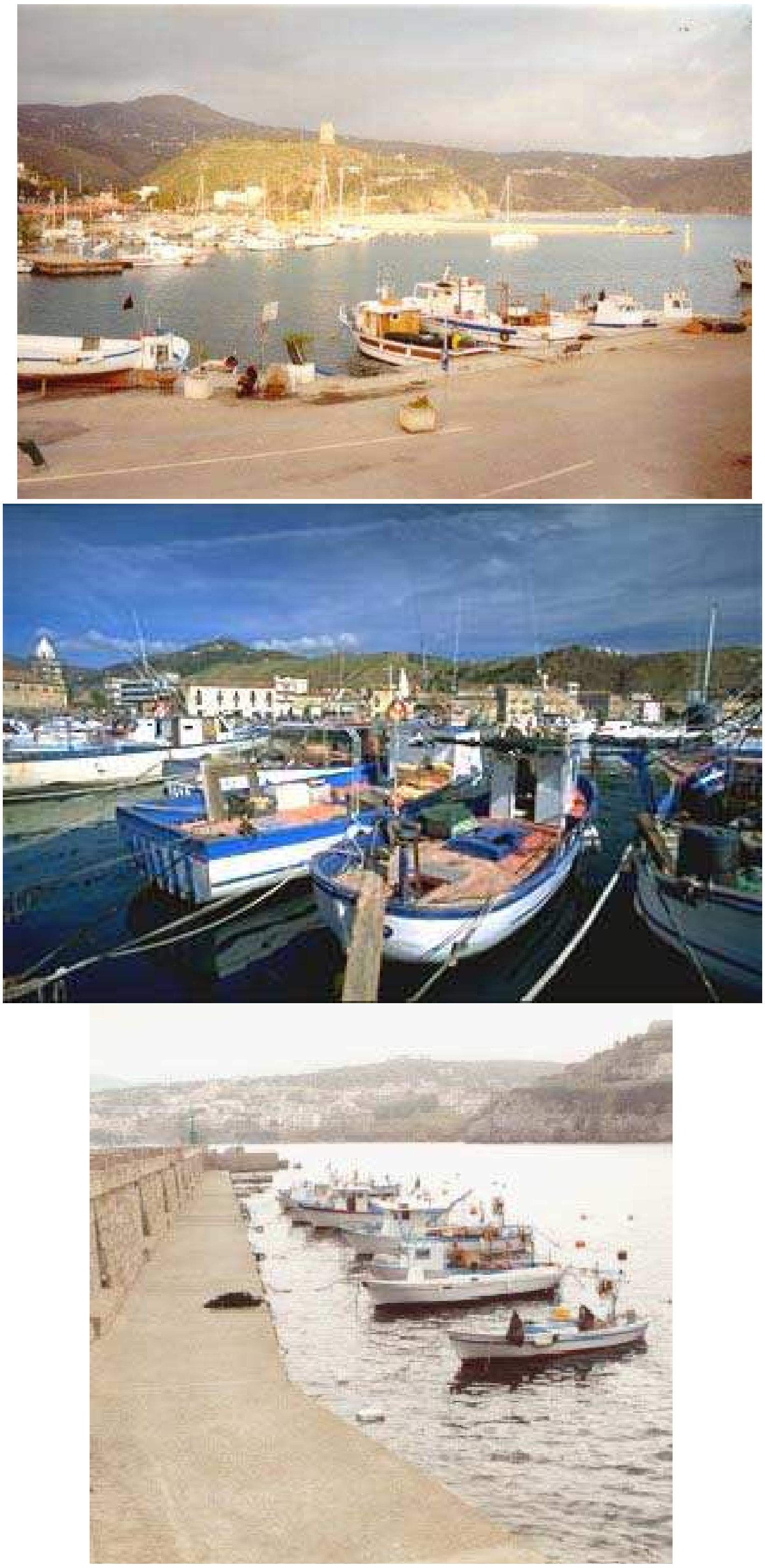


Figure 4.2.49 – Cilento area. The fishing harbours of Marina di Camerota (top), Acciaroli (center) and Palinuro (bottom).

The main activities of the coastal fishery were those with trammel nets, combined gillnets-trammel nets, longlines and gillnets. The first two mainly targeted cuttlefish (*Sepia officinalis*), and, to a lesser extent, red mullets (*Mullus barbatus* and *M. surmuletus*) and lobster (*Palinurus elephas*). Gillnets were generally employed to catch juveniles of greater amberjack (*Seriola dumerilii*) in late summer and red pandora (*Pagellus erythrinus*) in the spring. Longlines were traditionally used to catch dolphin fish (*Coriphaena hippurus*) and swordfish (*Xiphias gladius)* in autumn. Only a few vessels used longlines sporadically for Sparidae (*Diplodus sargus*, *Dentex dentex*, etc.). Offshore artisanal fishery employs mainly gillnets for hake (*Merluccius merluccius*) during the winter and spring. Bottom and floating longlines are used to catch *Lepidopus caudatus* and *Xiphias gladius* respectively in the summer and autumn.
Among these gears, the presence of driftnets targeting anchovy, *E. encrasicolus,* was noticed on late spring, with a specific gear called "menaide" or “menaica”. Colloca *et al.* (2002) reported the presence of 9 vessels performing this activity in the Cilento area. The use of “menaide” gear was reported for a short period of the year (April-June); the vessels involved in this fishery used driftnets of 150-350 m total length, 15-20 m drop and 12-13 mm mesh size. The nets were self-constructed, the fishing practices were made according to ancient traditions (hauling the nets was made by hand).
The catch of anchovy was commercialized fresh or was subjected to a preparation made according to an ancient tradition (Fig. 4.2.50).

Figure 4.2.50 – Salted anchovies from Cilento area.

The preparation of salted anchovies from "menaide" or "menaica" in Cilento has been documented at least since the year 1730, but this system can even be more ancient (Colloca *et al*., 2002).
The commercial value and the organoleptic values of “menaica” anchovies are higher than those of the anchovies usually caught with other systems, like purse seine or pelagic trawl (Sanfilippo *et al.,* 2011). Anchovies from "menaide" are particularly well adapted for salting, either because of their size which is usually bigger than those fished by purse seine, or because the heads of the fish are removed on board.
In the recent years the anchovies of Cilento have obtained a brand for the typicality of the product (“Slow food” Presidium “alici di menaica”, www.alicidimenaica.it; www.slowfood.it).
This cultural and commercial operation, supported by wide publicity, did significantly increase the knowledge and the price of the product with consequent benefits on all the local fisheries. At present, in the Cilento area a small processing factory is working, which buys a substantial part of the anchovies landed in Cilento. The rest of the product is sold at retail.
From June 21st to 23rd 2013 a cultural and gastronomic exhibition was organised in Cilento (Marina di Pisciotta) dedicated to the “alici di menaica”.

New data

The general characteristics of the artisanal fleets of Cilento area monitored in 2013 remained substantially the same of those reported by Colloca *et al. (*2002). The main difference regards the disappearance of the combined nets (trammel nets + gillnets), which are no longer used for reasons related to the current regulation (drop of the nets) and the economic opportunities; another difference concerns the increase of the overall length of the nets.

Tab. 4.2.2 shows the main fisheries/mètiers practiced along the year; there is a clear seasonal alternation of different gears/target species (Tab. 4.2.3). The main gear used is trammel net, mainly for cuttlefish. The small driftnets for anchovy are used only from April to June and involve from 20 to 40% of the active vessels.

The fleet involved in the "menaide" fishery has increased in the last years: Colloca *et al. (*2002) reported the presence of 9 vessels associated in this fishery, while, in the framework of DRIFTMED, a total of 19 vessels was observed using this gear in 2013.

The nineteen vessels using "menaide" were interviewed in the investigated period: they belong to the harbours of Marina di Camerota, Marina di Pisciotta and Palinuro. These vessels have similar technical characteristics: LOA of about 9 m, GT of about 2.8 and engine power of about 50 kW (Tab. 4.2.4).

The fishing season with driftnets for anchovy lasted 3 months (April-June). Fishing trips lasted from sunset to the first hours of the night; fishing time varied from 50 minutes to 2 hours. Nets were hauled by hand.

Table 4.2.2 – Main characteristics of the small-scale fisheries of Cilento area.

GEAR	LOCAL NAME	TARGET SPECIES	PERIOD	AREA
Trammel net	Tramaglio	*S. officinalis*	Feb.-May and Sep.-Oct.	Coastal shelf (5 – 40 m)
Trammel net	Tramaglio	*P. elephas*	Jun.-Aug.	Rocky bottoms (40-100 m)
Monofilament gillnet	Schetta	*M. merluccius*	All the year	Upper and middle slope (120-500 m)
Monofilament gillnet	Palamitara	*Carangidae-Scombridae-Sparidae*	Sep.-Dec.	Rocky bottoms (20-80 m)
Small-scale driftnet	Menaide or Menaica	*E. encrasicolus*	Apr.-Jul.	Offshore neritic waters
Floating longline	Coffa	*X. gladius*	May-Sept.	Offshore neritic waters
Floating longline	Coffa	*T. alalunga*	May-Sept.	Offshore neritic waters
Bottom longline	Coffa	*M. merluccius*	All the year	Upper and middle slope (300-600 m)
Bottom Long0line	Coffa	*L. caudatus*	Oct.–Jan.	Upper and middle slope (150-500 m)
Bottom longline	Coffa	*D. sargus*	Sep.-Oct.	Costal shelf (2-30 m)
Bottom longline	Coffa	*Sparidae-Serranidae*	Sep.-Dec.	Rocky bottoms (30-80 m)

Table 4.2.3 - Seasonal partitioning (percentage) in different fisheries of the small-scale vessels of the Cilento area.

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Gillnets for hake	25	25	25	25	10	10	10	10	10	10	10	10
Longlines for hake	5	5	5	5						5	5	5
Trammel nets for cuttlefish	5	30	70	50	30				40	40	5	10
Trammel nets for lobsters					20	30	60	40				
Longlines for swordfish						20	20	15	15			
Driftnets for anchovy				20	40	40						
Others							10	35	35	45	10	15
Inactive vessels	65	40									70	60

Table 4.2.4 – Technical characteristics of the vessels using small-scale driftnets in 2013 in Cilento area.

		LOA				GT				kW			
Port	n. vessels	Min	Max	Mean	SD	Min	Max	Mean	SD	Min	Max	Mean	SD
Marina di Camerota	2	9	9	9	0	2	4	3	1.41	18	79	48.5	43.13
Marina di Pisciotta	4	8	10	8.75	0.96	1	4	2.75	1.5	18	162	75.5	67.83
Palinuro	13	7	10	8.69	1.03	1	7	2.85	1.82	13	117	40.54	34.42
Total	19	7	10	8.74	0.93	1	7	2.84	1.64	13	162	48.74	43.21

The fishing operation requires good sea and weather conditions. The duration of the fishing trips was on average 6 hours, that of the fishing operations 1.8 hours (4.2.51). From the interviews an average of 20 fishing trips for each vessel in the whole fishing period has been estimated .

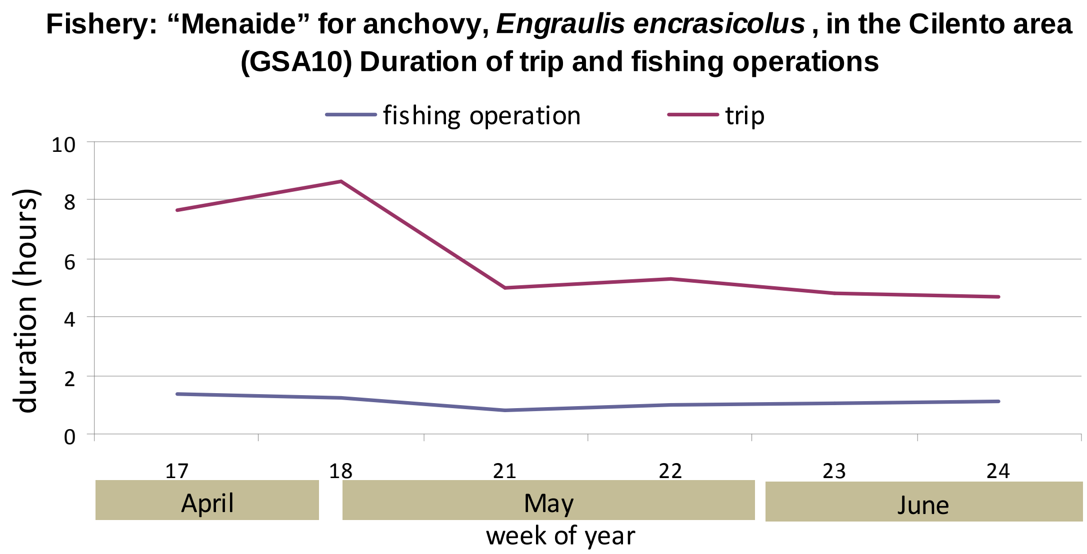


Figure 4.2.51 – Weekly average of trip and fishing operation duration.

The average net length was 425 m, the drop 24 m. The Fig. 4.2.52 and 4.2.53 show some phases of the fishing operation with “menaide. Fishing grounds were located in front of the mooring harbours, characterized by muddy bottoms and ranged from 80 to 150 m depth (Fig. 4.2.54).
As concerns the selling of the product, the fisheries of Marina di Pisciotta and Marina di Camerota deliver the majority of the landings to the transformation industry, while for Palinuro about 50% of the product is sold directly and the other 50% is delivered to restaurants or fish shops.

Figure 4.2.52 - Fishing operations with "menaide” in the Cilento area.

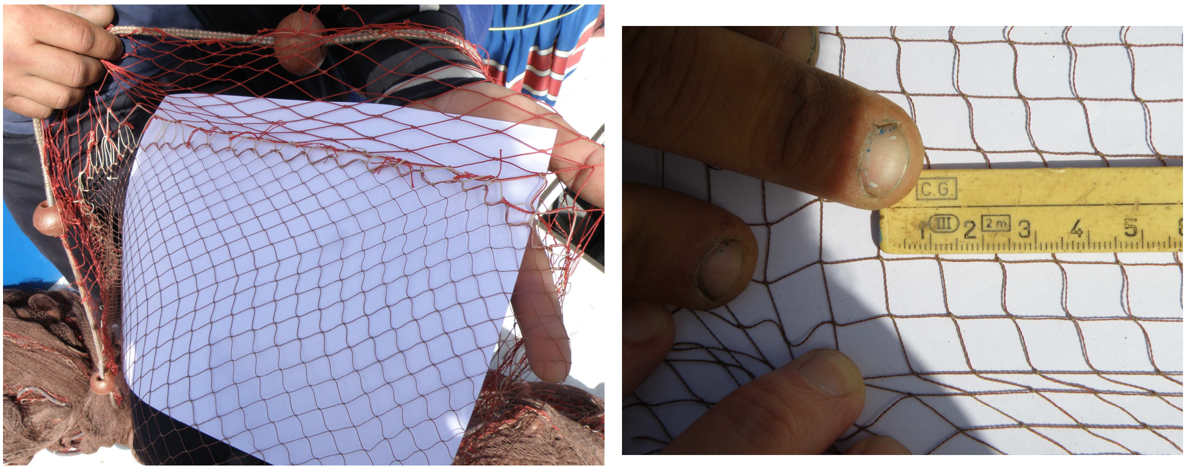


Figure 4.2.53 - Details of the small driftnet "menaide" used in the Cilento area.

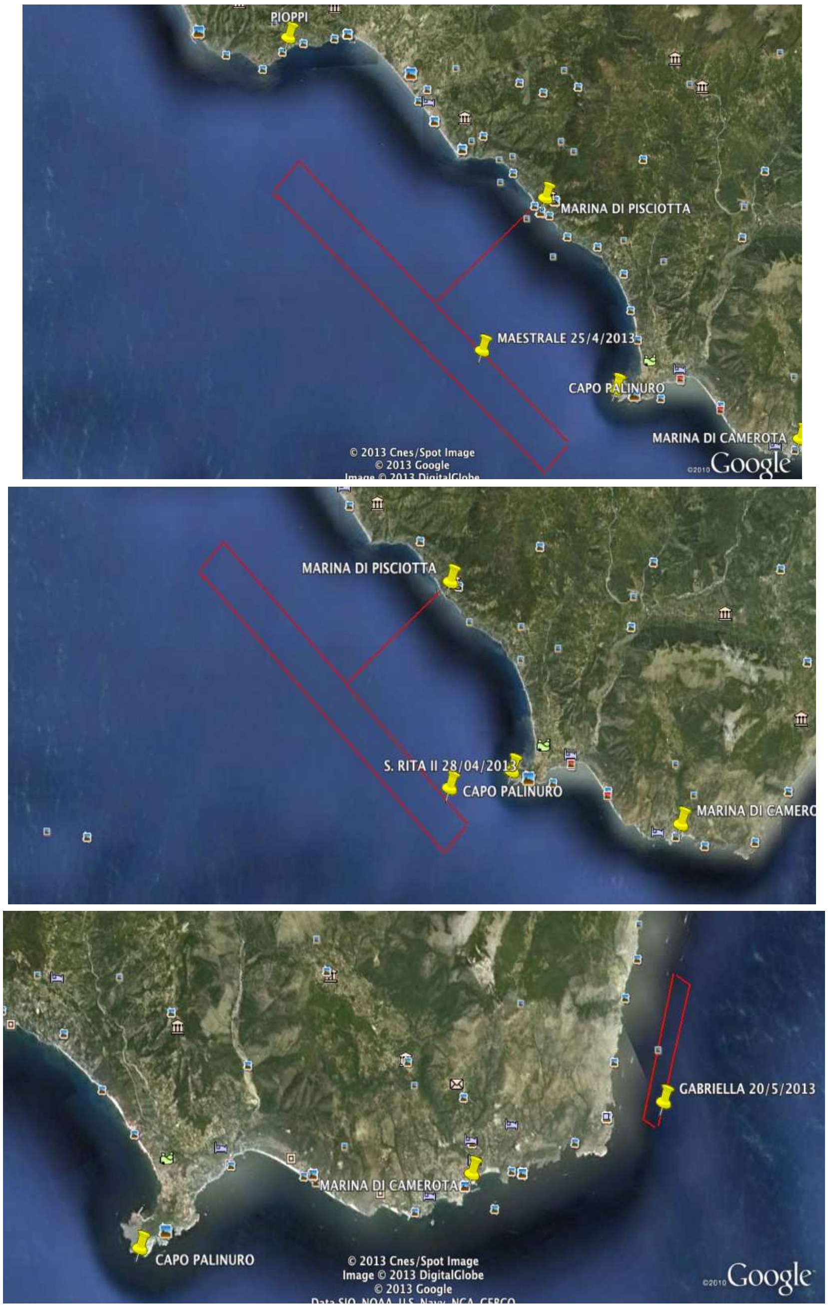


Figure 4.2.54 – Fishing areas of the small-scale driftnets of the Cilento area.

In the investigated period, according to the 19 fishing trips monitored by logbooks, the catches were composed entirely by anchovies and sardines. The total catches per single fishing day were quite variable, from 6 to 65 kg, with an exceptional catch of 215 kg in April 2013; anchovies were always present in the catches and often were more than 50% of the caught biomass (only in three fishing days *E. encrasicolus* accounted for less than 50%). As concerns all the sampled period, the catch of the target species, anchovy, accounted for 76.3% of the total caught biomass. By-catch was entirely made by sardine (Fig. 4.2.55).Anchovies were sold at 7 Euros/kg, while the price of sardines was notably lower, 3 Euros/kg.

By-catch was never registered. Only occasionally, the presence of a few specimens of jellyfish *(Rhizostoma pulmo*) was recorded. Also discards of anchovy and sardine were practically absent.
No specimens of sensitive or protected species, as well as of species included in the Annex VIII were recorded in the catch.

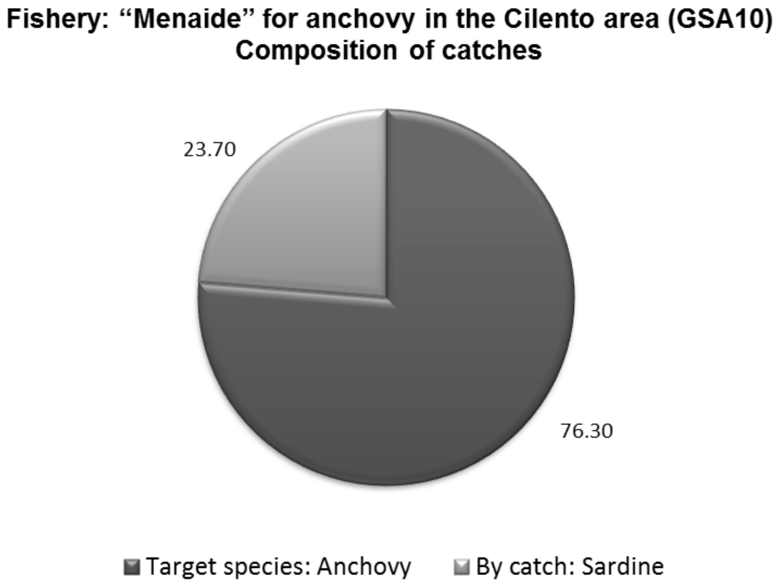
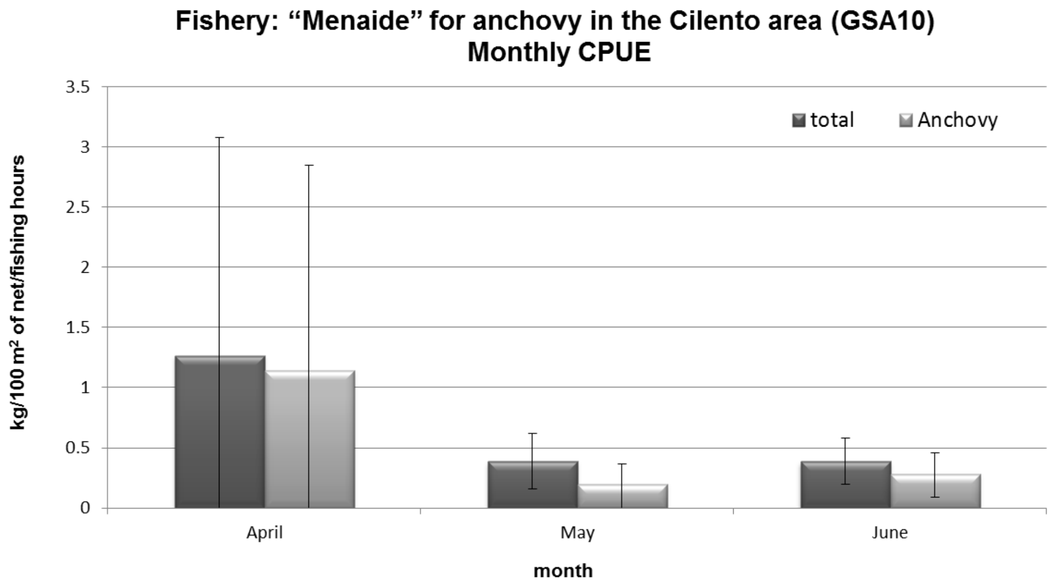


Figure 4.2.55 – Composition of the catch of "menaide" of Cilento area, GSA10.

The average monthly CPUEs of anchovy ranged from 0.2 to 1.1 kg/100m^2 of net/fishing h and from 10.0 to 60.1 kg/fishing day (Figs. 4.2.56 and 4.2.57). The peaks were registered in April, during the first week of sampling, while the values of May and June were similar. The proportion between target species and by-catch remained constant during the whole sampled period.
The size structure of the specimens of *E. encrasicolus* was very similar in the different investigated hauls: the cumulative Length Frequency Distribution shows a modal size at 14.0 cm TL, with minimum and maximum sizes at 13 and 17 cm TL, respectively (Fig. 4.2.58). No specimens lower than the length at first maturity (9.7 cm TL, www.fishbase.org) or the Minimum Conservation Size (9 cm TL, EC Reg. 1967/2006) were present in the catches monitored. This could be a first indication of the sustainability of the exploitation of "menaide", still in absence of a formalized stock assessments for the anchovy in the southern Tyrrhenian Sea (GSA10).



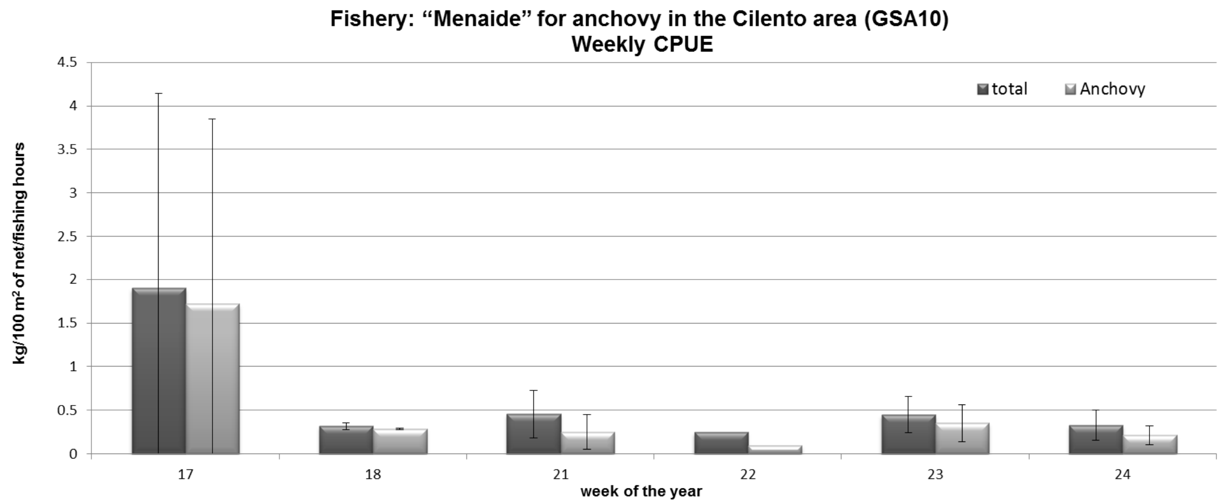
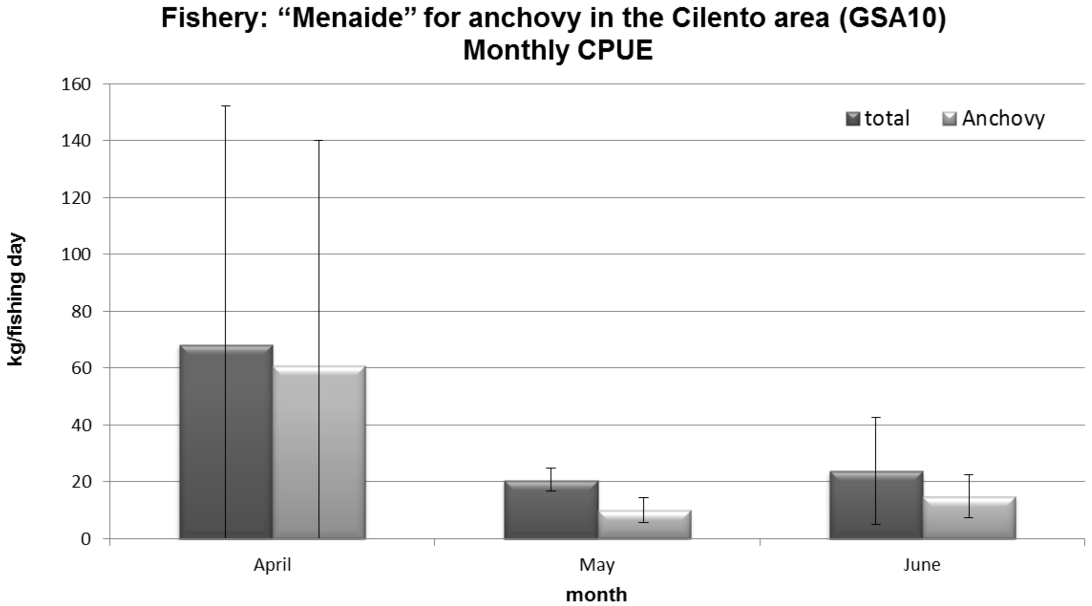


Figure 4.2.56 - "Menaide" for anchovy in Cilento area (GSA10). CPUE, expressed as kg/100m^2 of net/fishing hours (above: monthly averages; below: weekly averages).

Grey columns: target species; dark grey columns: all landings (target+by-catch); bars: the standard deviation.



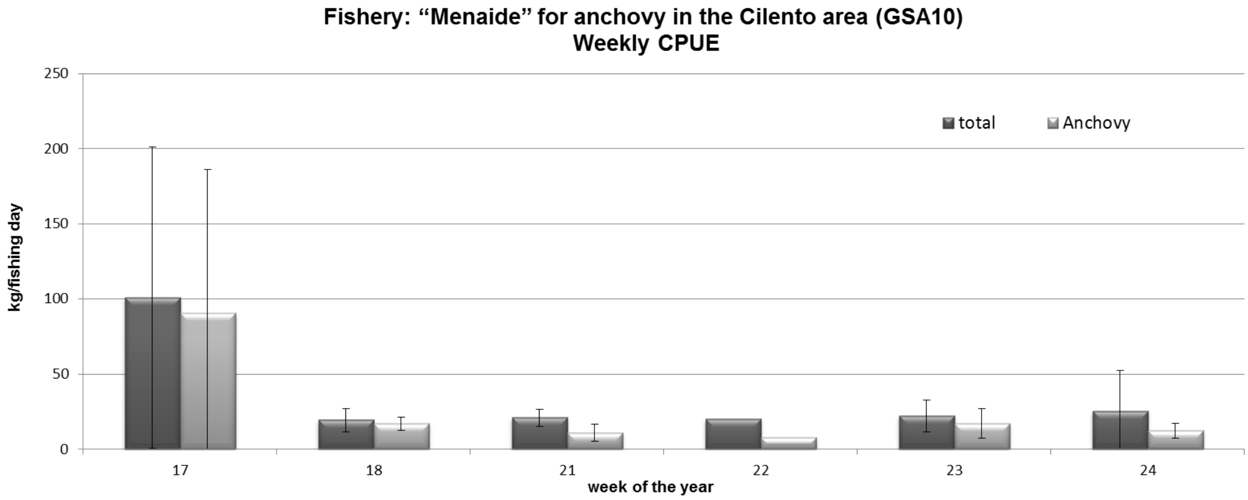


Figure 4.2.57 - "Menaide" for anchovy in Cilento area (GSA10). CPUE, expressed as kg/fishing day.
(above: monthly averages; below: weekly averages).
Grey columns: target species; dark grey columns: all landings (target+by-catch); bars: the standard deviation.

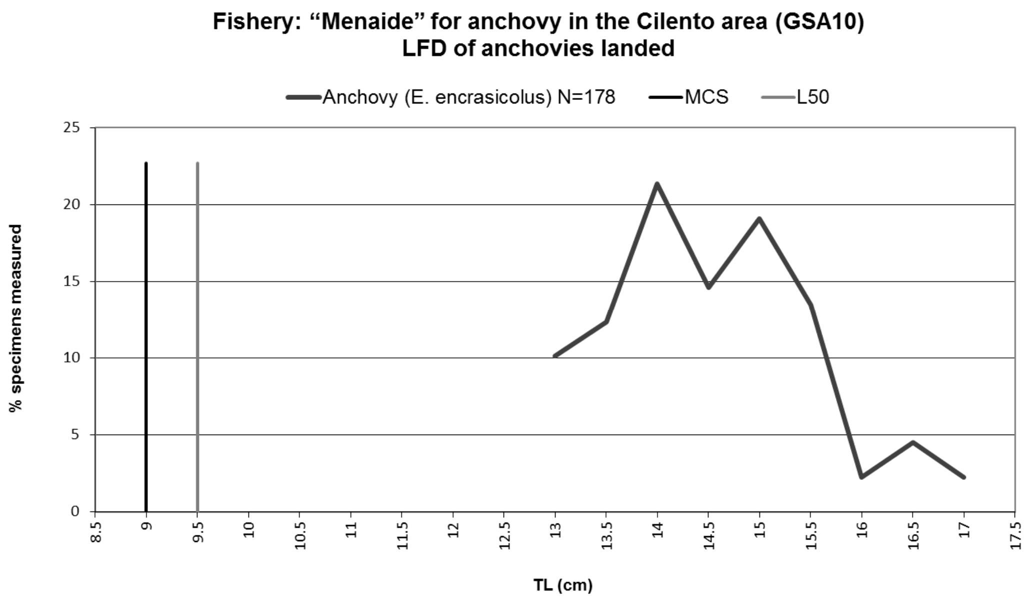


Figure 4.2.58 - "Menaide" for anchovy in Cilento (GSA9). Length Frequency Distribution of the specimens of anchovy measured all the monitored period. Black line: Minimum Conservation Size; grey line: size at first maturity.

Menaide" for anchovy, *Engraulis encrasicolus*, in Sant'Agata di Militello (Fishery 5).

New data

The field activities performed during the present study in Sant'Agata di Militello consisted in 7 interviews and 17 logbooks, realised from the first week of June to the end of July 2013. The fishery followed included 7 vessels and their LOA ranged between 8.7 and 14.3 m (average 10.8 m). Fig. 4.2.59 reports other technical characteristics of the vessels (power engine and gross tonnage).

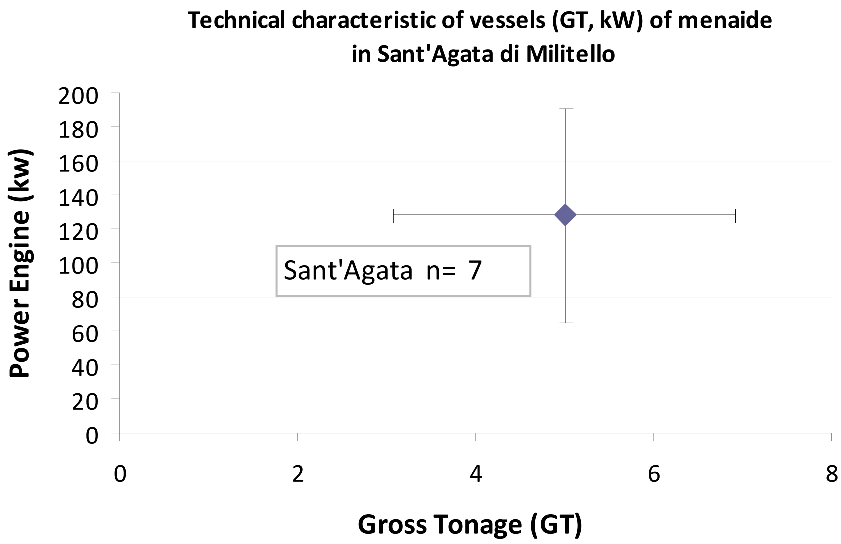


Figure 4.2.59 - Characteristics (kW, GT) of the "menaide" fleets in Sant'Agata di Militello.
Bars indicate the standard deviation.

The fishing season start usually at the ending of April and stops at the beginning of August.

An usual fishing operations start in the last hours of the day with the search of the fishing's shoal through the eco-sounder. The nets (average length 500 m, drop 15 m, mesh size 20 mm), were deployed at the sea close to the shoal in a position depending of the sea current. After about 1 hour and a half during the sunset the nets were hauled. Anchovies and sardines were removed from the net during the net recovering; the catch was maintained in little tanks with ice and water, before to be landed.
The duration of fishing trip in the sampled period was included between 8.5 and 10 hours, while the duration of fishing operation between 1.5 and 2.5 hours in the case is made more of one haul (Fig. 4.2.60).

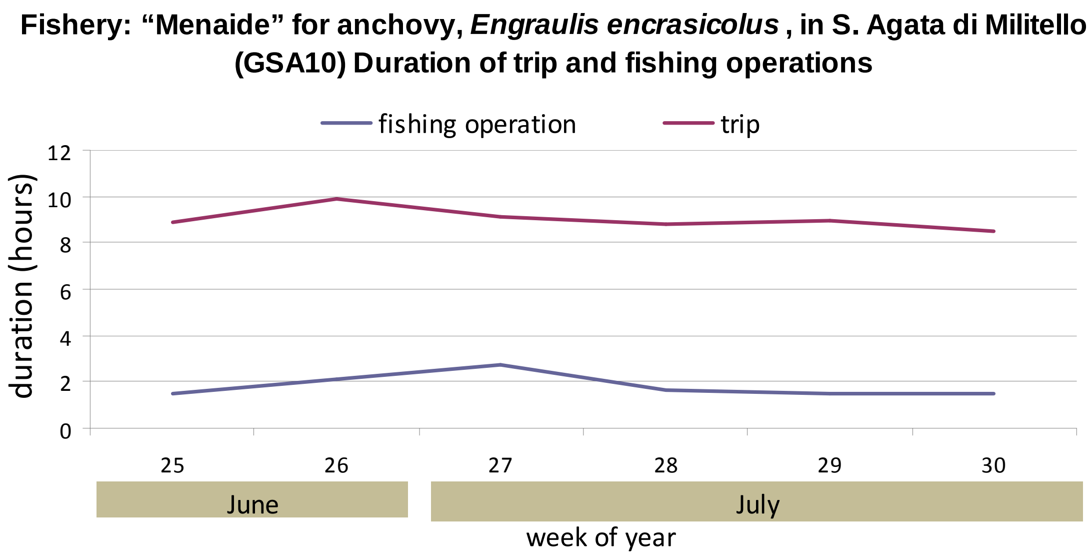


Figure 4.2.60 – Weekly average of fishing trips and fishing operation duration.

The fishing grounds are located in two areas at north-west of the port of Sant'Agata, at depths ranging from 40 to 150 m (mean 80 m) and characterized by sandy-muddy bottoms. The distances from the coast are included between 3.5 and 8.5 km, with an average of 4.5 km (Fig. 4.2.61).

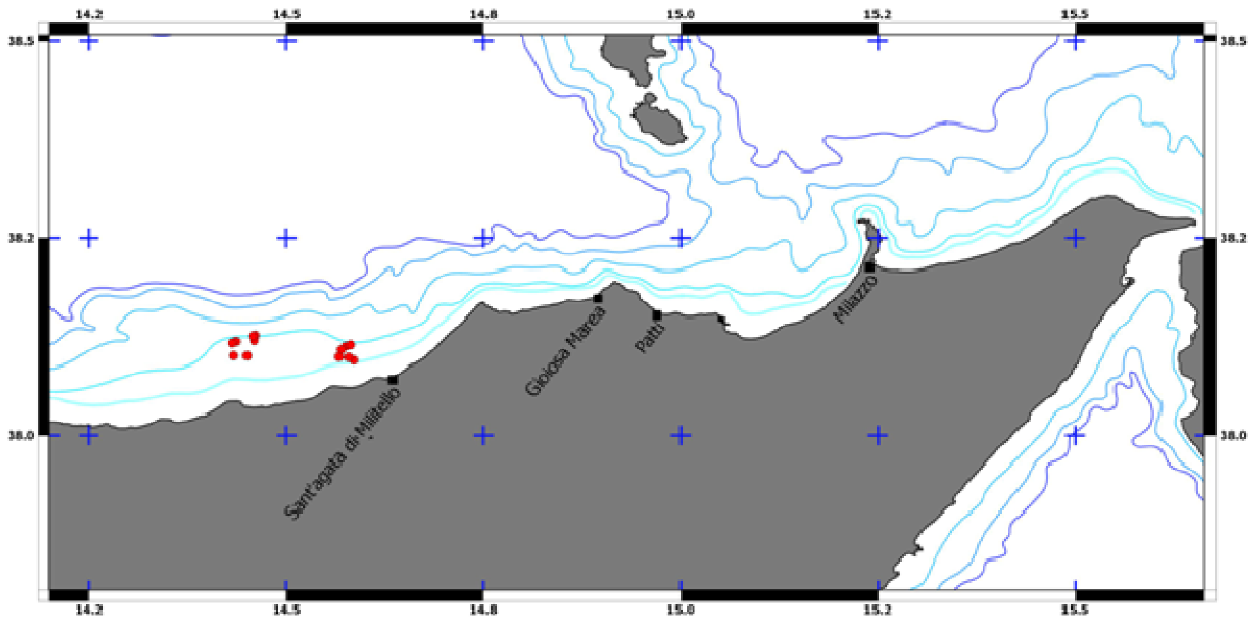


Figure 4.2.61 – Fishing sites of "menaide" in Sant'Agata di Militello fishery (GSA10).

The crew of the vessels involved in the "menaide" fishery ranged between 2 and 3 persons. Usually the catch is sold to wholesalers.
The anchovy was the only species landed and the by-catch was never recorded. Discards were negligible and they were recorded only in the last week of June and the first of July. In the studied period, the discard rate of sardine was 0.65% on the total production of anchovy. During the monitored period (June-July) catches of protected/vulnerable and of species included in the Annex VIII were never recorded.
The average monthly CPUEs (kg/100 m^2/fishing hours) of anchovy ranged from 0.61 to 0.87. The highest value was registered in July (Fig. 4.2.62).

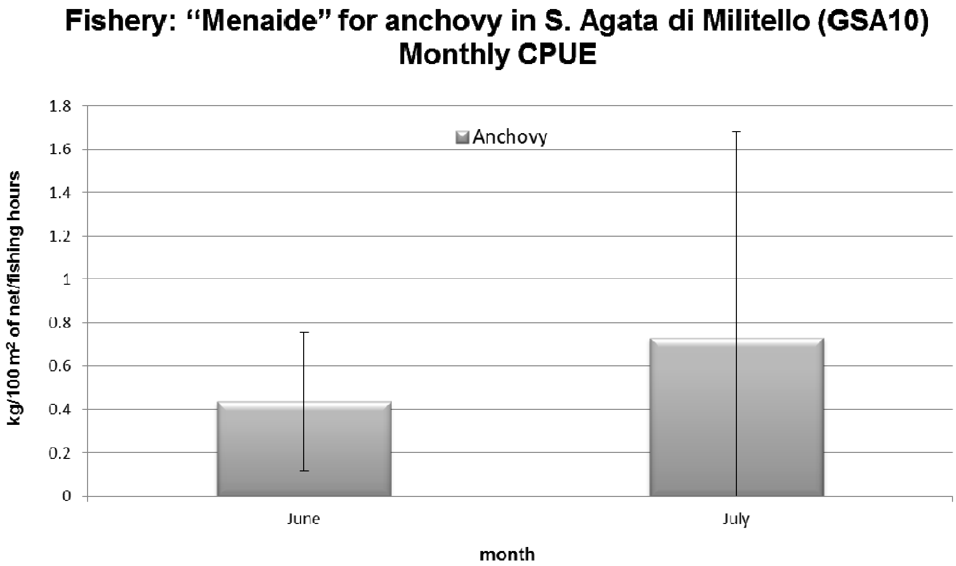


Figure 4.2.62 – "Menaide" for anchovy in Sant'Agata (GSA10). CPUE of anchovy landed expressed as kg/100 m^2 of net/fishing hours (monthly averages). Bars: the standard deviation.

The average weekly CPUEs (kg/100 m^2/fishing hours) of anchovy ranged from 0.13 in the last week of July to 1.46 in the second week of July (Fig. 4.2.63).

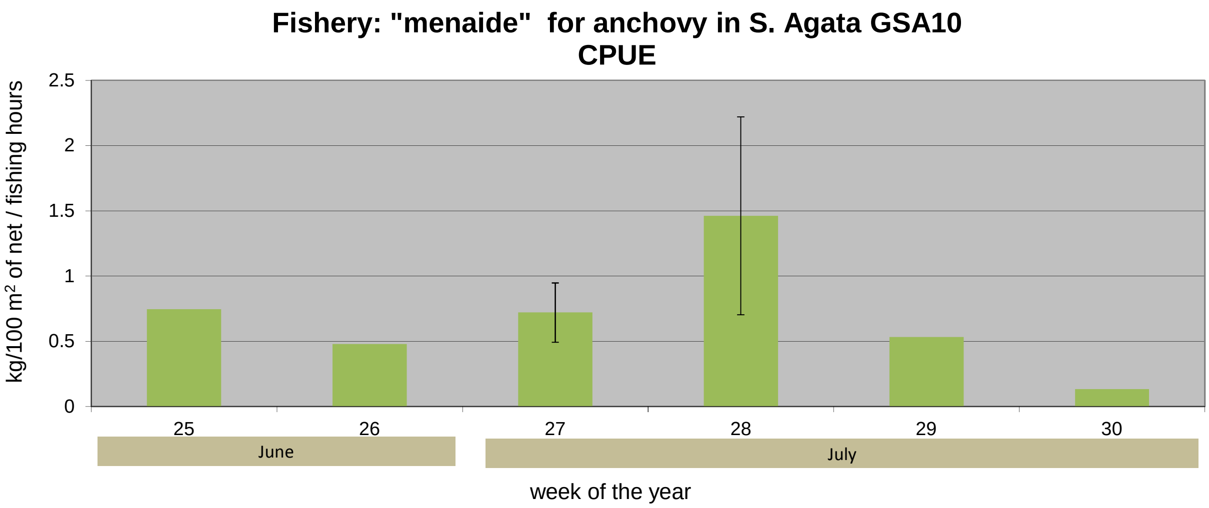


Figure 4.2.63 – "Menaide" for anchovy in Sant'Agata (GSA10). CPUE of anchovy landed, expressed as kg/100 m^2 of net/fishing hours (weekly averages); bars: the standard deviation.

The Figs. 4.2.64 and 4.2.65 report the catch rates (kg/fishing day) by month and week of anchovies. From June to July the CPUE increased from 78 kg per fishing day to 95.5 kg per fishing day. The weekly catch rate shows the same trend, with the highest value in the second week of July (126.67 kg/fishing day) and the lowest in the last week of July (15 kg/fishing day).

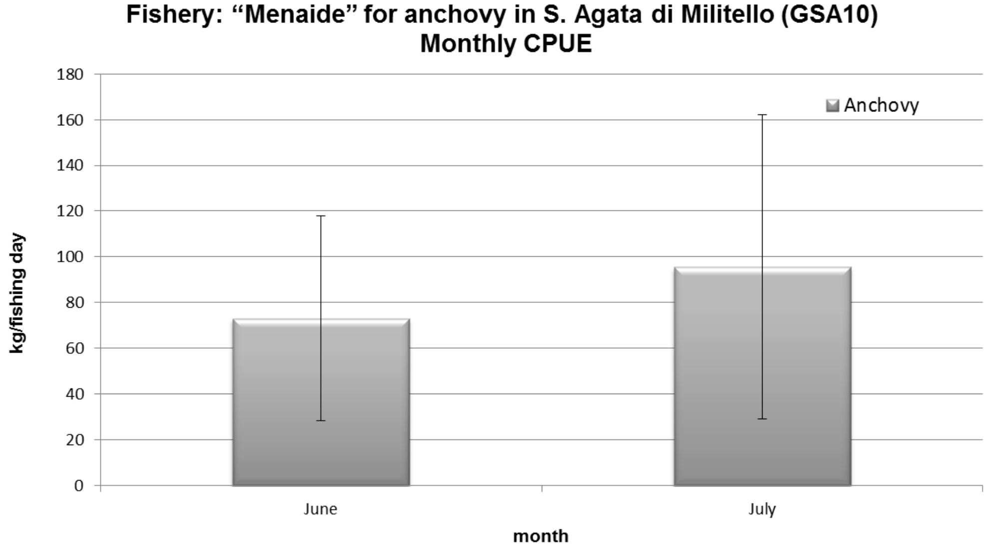


Figure 4.2.64 - "Menaide" for anchovy in Sant’Agata (GSA10). Catch rates of anchovy landed, expressed as kg/fishing day (monthly averages); bars: the standard deviation.

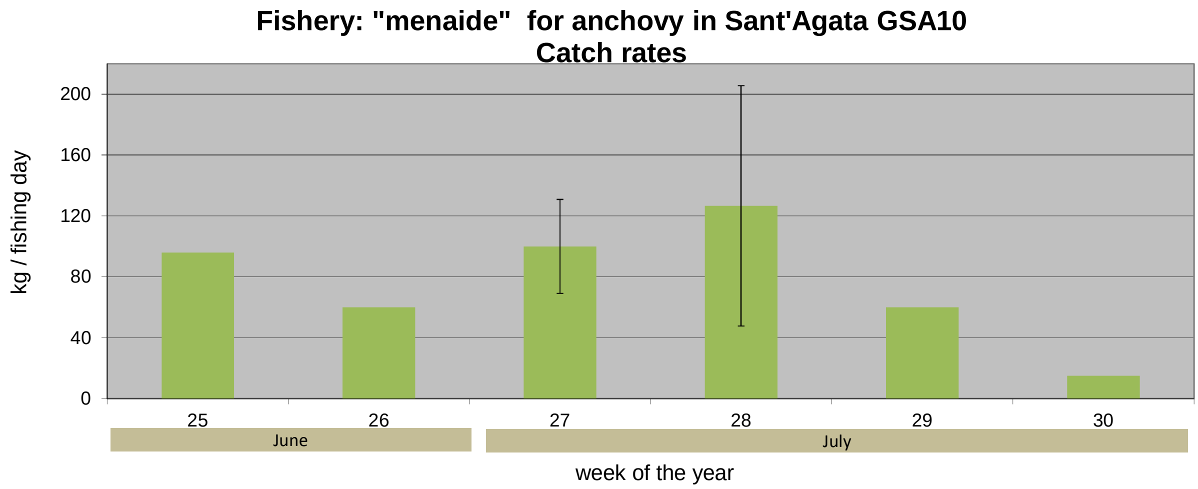


Figure 4.2.65 - "Menaide" for anchovy in Sant’Agata (GSA10). Catch rates of anchovy, expressed as kg/fishing day (weekly averages); bars: the standard deviation.

The highest weekly CPUE values were registered in the middle of fishing season. When the catch of the anchovy is lower than the threshold limit of 20 kg per fishing day, the fisherman abandoned this fishery, because the amount of anchovies caught was considered not sufficient to recompense the fishing day expenses.

GSA 9 "Occhiatara" for saddled seabream, *Oblada melanura*, in Ligurian area (Fishery 3)

Existing information

The information reported in this paragraph derives from the interviews carried out at the beginning of the DRIFTMED project, considering that in the past a structured monitoring of this fishery was never organized in the Ligurian Sea. The following is a brief history of the fishing activity with driftnets in the area.

The use of Small-Scale Driftnets in Ligurian Sea goes back to several decades, when driftnets for anchovies ("menaide"), saddled seabream ("occhiatara"), bullet tuna ("bisantonara") and Atlantic bonito ("palamitara") were commonly used, as traditional coastal activities carried out by small boats. The seasonal distribution was similar to other areas, depending on the availability of resources: "bisantonara" and "palamitara" during spring and autumn, "occhiatara" in late spring/early summer, "menaide" during summer.
In the following years, the largest vessels, which usually were involved in the swordfish longline fishery, started to use large mesh size driftnets to catch for large pelagic fish.
At the end of the '90s, when EC Regulation on driftnets entered in force, large mesh driftnets were completely abandoned, substituted for a short period by the so called "ferrettara" nets, grouping all SSD. Most of these vessels employed a net with 160-180 mm mesh size to exploit Atlantic bonito, albacore and also, even though more rarely, swordfish and bluefin tuna.
After 2002 this kind of activity was abandoned, also as a consequence of the control activity promoted by the local authorities (Coast Guard). At the same time also the use of "menaide" driftnet targeting anchovies was abandoned and only a few vessels continued their fishing activity with "bisantonara" and "palamitara". Finally, practically only the "occhiatara" fishery targeting saddled seabream, *Oblada melanura*, remained in use by a certain number of boats, variable year by year.
The only historical data available on the "occhiatara" net were collected through a fishermen Cooperative and they referred to the last 3 years (2010, 2011, and 2012) and were limited to a small number (5) of boats. These data confirm the seasonality of the "occhiatara" fishery: the fishing season was concentrated in May-June, the yearly landings of *O. melanura* by vessel were highly variable, depending on the fishing activity. The vessels with highest production landed from 1.5 to 3.3 tons of saddled seabream per year.

New data

Considering the low level of knowledge of this fishery, during the first months of the DRIFTMED project all the boats recorded in the Fleet Register as owning the license for GND, plus other vessels licensed with "ferrettara" gear in the Italian Ministry Archives, were investigated, with the aim to verify the number of the active vessels and the characteristics of the fleet and the gears used.
In the past years the fleet using driftnets in Liguria was more numerous; in 2013 the active vessels using GND were only 5 in the Marine District of Imperia. These vessels used small driftnets to catch saddled seabreams, *O. melanura*, as main target species.
According to Fig. 4.2.66, we can notice that the active vessels using SSD for *O. melanura* are medium/small sized boats, if compared with those licensed for GND gear ("ferrettara").

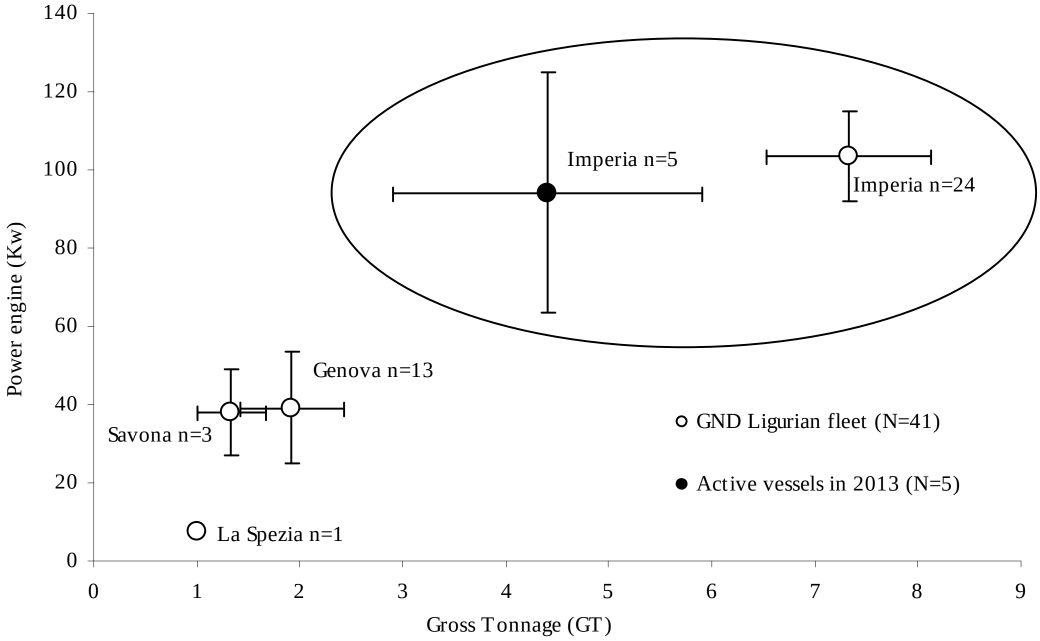


Figure 4.2.66 - Comparison between the characteristics (GT, kW) of the GND Ligurian fleet as a whole (white circle) and the active vessels (blak circle) involved in the "occhiatara" fishery. Bars indicate the standard error.

A total of 32 interviews, 44 logbooks and 18 embarks/observations on landings were realised.
According to the interviews, the “occhiatara” net is used seasonally, in a short period of time, no more than about 40 days, between May and June.
In the investigated period the overall number of fishing days realised with driftnets by the 5 vessels involved was on average 14.5 days/boat, even though a high variability was recorded, from 2 days to 33 days. In fact two of these 5 vessels were active only for a limited number of fishing days. The crew was composed by 1-2 fishermen.
The results reported hereafter derive from the observations carried out on 3 boats, during the entire fishing period (May 9th – June 16th 2013): two of them stationed in the harbour of Sanremo, with fishing ground in Ospedaletti and Bordighera (Fig. 4.2.67), the last one in the harbour of Imperia, with fishing ground Aregai (Fig. 4.2.68).
The fishing ground of Ospedaletti was characterized by the presence of sandy bottom, surrounded by a sea grass bed, and it is considered for this reason a “challenging” fishing ground, where it is necessary to pay great attention to the intensity and direction of sea currents. In fact the sea grass beds were avoided by fishermen, considering the high risk that a net, drifting close to the bottom, could be “entangled” on sea grass plants, with consequent damages to the gear itself.
Bordighera was a more “friendly” fishing ground, characterized by a wide sandy bottom, without sea grass. A similar situation was found for the third fishing area, Aregai, where a stripe of sandy bottom is present close to the coastline, with the presence of a sea grass bed only outside.

Figure 4.2.67 – The main fishing grounds on "occhiatara": Ospedaletti and Bordighera.

Figure 4.2.68 – The main fishing grounds of "occhiatara": Aregai.

The overall number of fishing days realised by the three boats was 57 (average 19.0 days/boat). An overview of the characteristics of the monitoring and the fishing activity is summarized in the Tab 4.2.5. Embarks were carried out during 8 fishing days, covering the 14%, 17.2% and 18.3 % of the total effort, represented respectively by fishing days, net length and net area.

Table 4.2.5 - Summary of the results of the monitoring activity of the "occhiatara" fishery in the Ligurian Sea.

Harbour	**Sanremo**	**Sanremo**	**Imperia**	**Total**
M/P	**1**	**2**	**3**	
Onboard observations	-	8	-	8
Logbooks	12	21	6	39
Landing data	2	4	4	10
Net length (m)	900	1800	900/1200	-
Total catch (kg)	936.30	3,400.93	697.50	5,034.73
Total catch of *Oblada melanura* (kg)	693.00	2384.90	511.20	3589.10
Mean Duration of fishing gear (hh:mm)	04:51	04:30	04:00	04:30
Catch rates (kg/fishing days)	66.88	103.06	69.75	88.30
Oblada melanura (Kg/fishing days)	72.27	49.50	51.12	62.90
CPUE/Total catch (Kg/100m^2/h)	0.10	0.08	0.16	0.10
CPUE *Oblada melanura* (Kg/100m^2/h)	0.08	0.06	0.12	0.07

The "occhiatara" fishing activity was carried out during the night. Nets were deployed in coastal areas on sandy bottoms. The maximum distance from the coastline was between 100 and 600 m, the depth ranged from 12 to 40 m.

The employed net was divided in 3-4 sets, each measuring about 450 m in length, for an overall length of about 1200m - 1800m each night, depending on boat, weather conditions, etc.

The first set was deployed generally after sunset (9:00 - 10:30 pm, local time); the deploying of the entire gear lasted about one hour and half. Depending on the intensity of the current, nets were left at sea up to 4-7 hours (average value 4.5 hours) (until 1:30 – 2:00 am) and then hauled. The hauling operations lasted at least 2 hours, depending on the abundance of catches (Figs. 4.2.69 - 4.2.73).

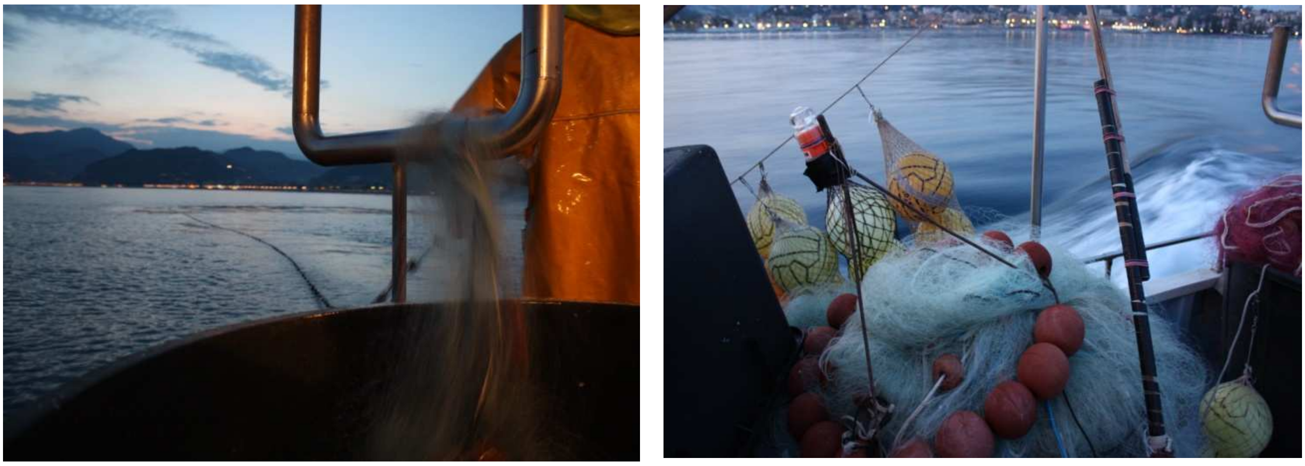


Figure 4.2.69 - An "occhiatara" net deployed at sea.

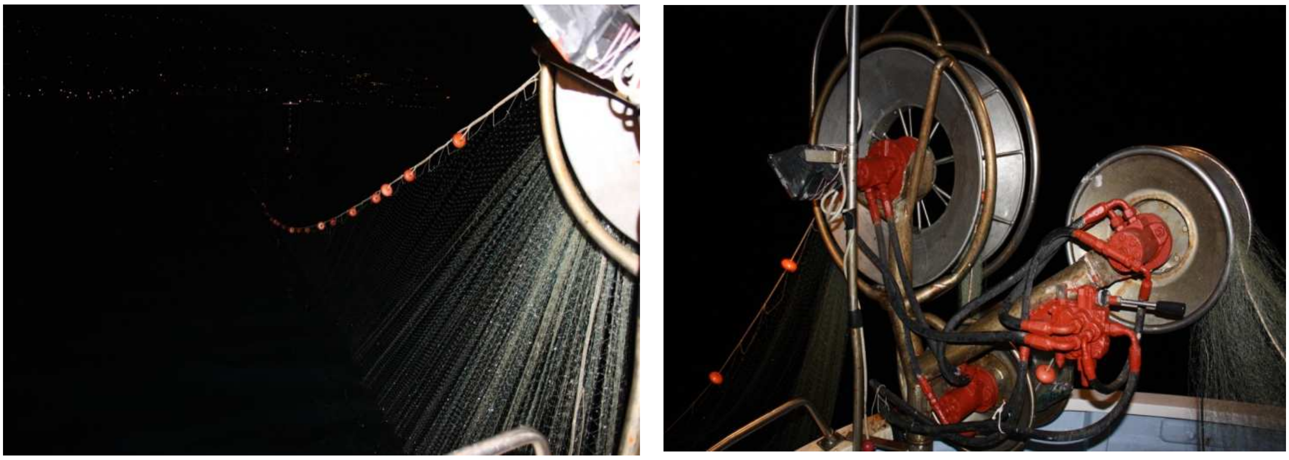


Figure 4.2.70 - Hauling an "occhiatara" net.

Figure 4.2.71 - Specimens of saddled seabream caught by an "occhiatara" net.

Figure 4.2.72 - Species caught by the "occhiatara" net.
In addition to the saddled seabream, also Mugilids, salemas and barracudas are recognizable.

Figure 4.2.73 - Catches of the "occhiatara". Liguria, 2013.

As concerns all the sampled period, the catch of the target species, the saddled seabream, accounted for about 70% of the total biomass caught (Fig. 4.2.74). The by-catch was mainly constituted by the chub mackerel, *Scomber colias* (42 % in weight) and the Mediterranean mackerel, *Trachurus mediterraneus* (34 %) (Figs. 4.2.75 and 4.2.76).
Some species included in the Annex VIII were also found in the by-catch, two cephalopods and one fish:
Todarodes sagittatus (Fig. 4.2.77): it represented less than 1% in weight of the total catches and it was present in each fishing operation with a limited number of individuals. Size range of the specimens measured varied from 18.5 cm to 35.0 cm Dorsal Mantle Length (DML).
Ommastrephes bartrami (Fig. 4.2.78): it was represented by a lonely large (6.6 kg in weight, 60.3 cm DML) spent female as an exceptional prey.
Sarda sarda: also the Atlantic bonito was caught sporadically, representing the 0.4% of the total catch in biomass.

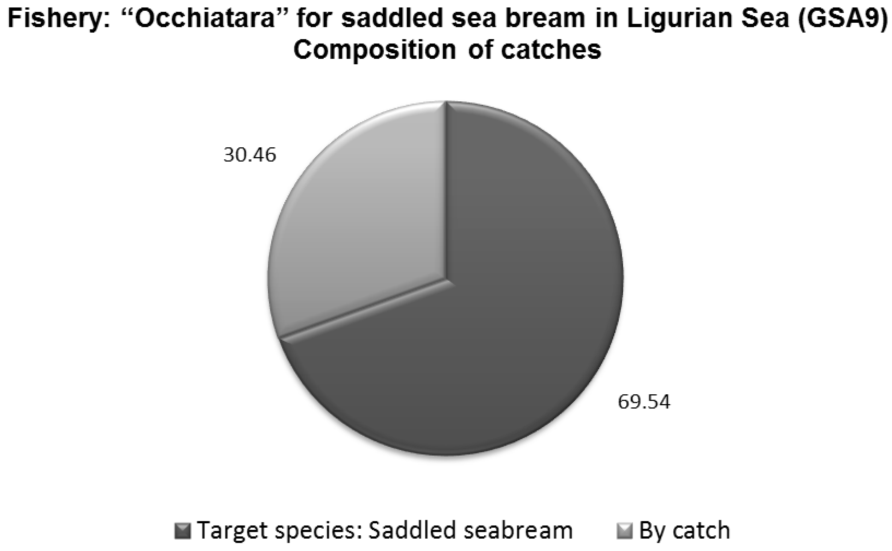


Figure 4.2.74 – Composition of the catch of “occhiatara” of Ligurian Sea, GSA9.

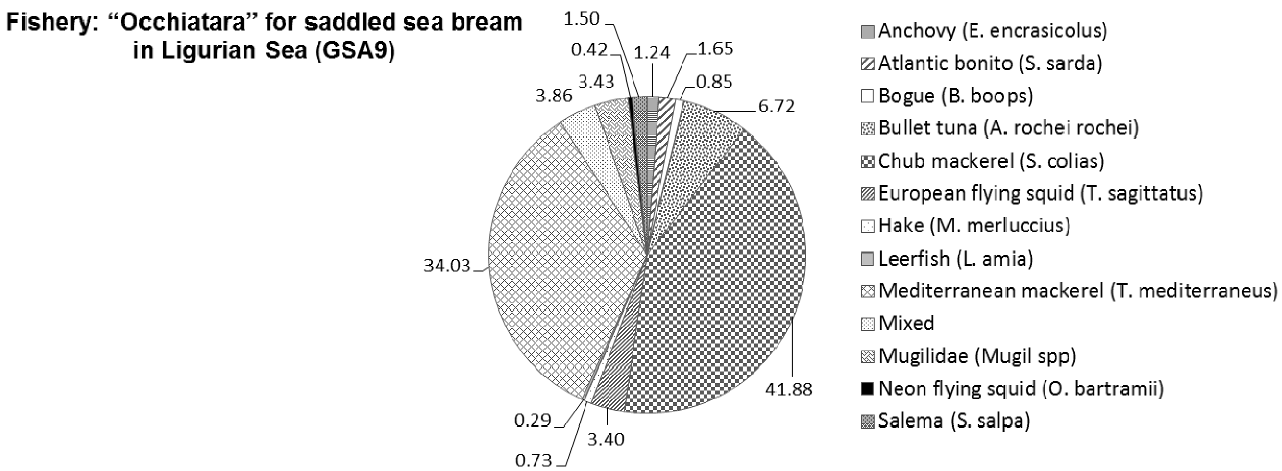


Figure 4.2.75 – Composition of the retained by-catch of “occhiatara” of Ligurian Sea, GSA9.

Figure 4.2.76 – The main by-catch species of "occhiatara" fishery: *S. colias* (left) and *T. mediterraneus* (right).

Figure 4.2.77 – Some specimens of *T. sagittatus* caught by “occhiatara” in the Ligurian Sea.

Figure 4.2.78 – The spent female *O. bartrami* caught by “occhiatara” in the Ligurian Sea.

According to the collected data, discards accounted to the 0.7% of the biomass caught and were constituted mostly by damaged fishes belonging to the commercial species caught (Fig. 4.2.79).
No specimens belonging to sensitive/endangered or protected species were caught.

The onboard observations were particularly important to check the catches of other species of less importance which are often not reported by the fishermen on logbooks and especially to verify the absence of catches of protected or endangered species.

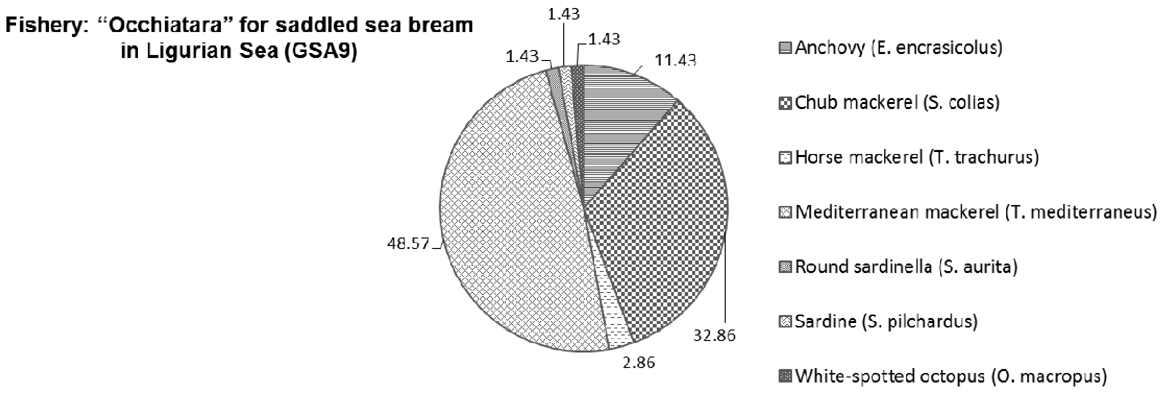
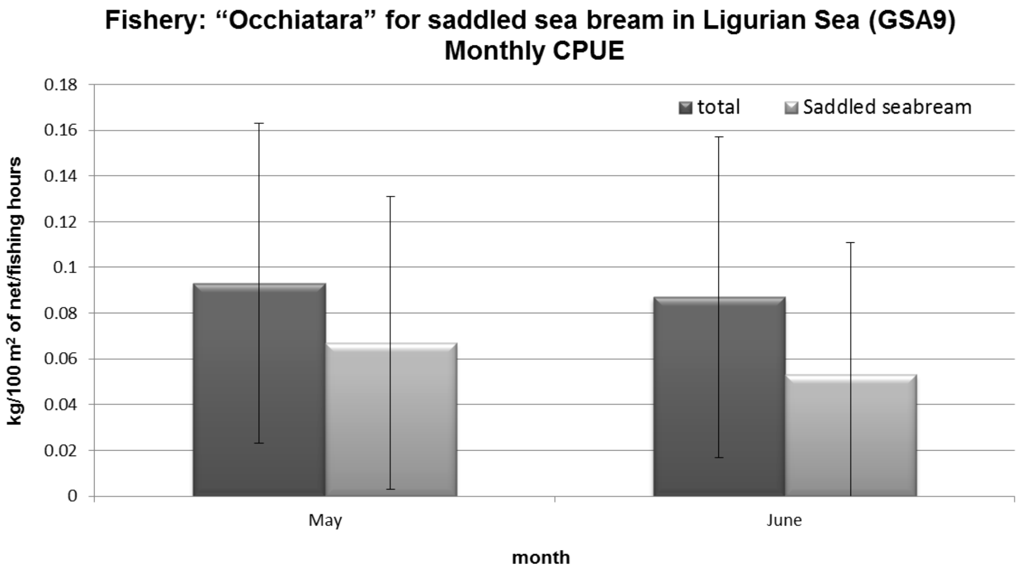


Figure 4.2.79 – Composition of the discarded by-catch of "occhiatara" of Ligurian Sea, GSA9.

The average monthly CPUEs of saddled seabream ranged from 0.05 to 0.06 kg/100m^2 of net/fishing h and to 45 to 60 kg/fishing day (Figs. 4.2.80 and 4.2.81). The values remained stable in the two months sampled, while they showed some fluctuations at weekly level, without however showing evident trends.
Thanks to the data collected onboard, it was possible to study the size composition of *O. melanura.* Moreover, observations about some biological parameters of saddled seabream were carried out, in order to get information about the possible impact of this fishery on the stock.
A sample of 1185 individuals of *O. melanura* was measured. These specimens ranged from 18.5 to 35.5 cm TL, with an average size of 27.04 cm TL (SD of 3.08). The most represented size classes were those from 26.0 to 28.5 cm TL (modal length at 27 cm); two more peaks were clearly visible, centred respectively at 24.0 cm and 31.5 cm TL (Fig. 4.2.82). No Minimum Conservation Size is present for saddled seabream in Mediterranean.
The reproduction in saddled seabream takes place in late spring/early summer (Tortonese, 1975; Cavallaro *et al*., 1984, 1985; Cetinic *et al.*, 2002). During on board sampling activities it was possible to recognize mature specimens by the means of a little pressure on the abdominal area, inducing the emission of gametes. About reproduction, the only available value of size at first maturity it that reported by Cetinic *et al.* (2002) in the Adriatic Sea (17.5 cm TL for females and 16.4 cm TL for males). On the basis of this data, in our sample all the specimens caught were adult, being larger than 18 cm TL, as shown in Fig. 4.2.82. The monthly LFD (Fig. 4.2.83) were similar, without particular differences.
This information can however provides a first indication about the sustainability of the "occhiatara" fishery.
A sub-sample of 234 individuals was sexed, including 125 females and 109 males, representing respectively 53% and 47% of the sample, with a sex-ratio (1.15 - F/M), in favour of females (Fig. 4.2.84).
The size structure of the 343 specimens measured of the Mediterranean mackerel, *T. mediterraneus*, is shown by the Fig. 4.2.85. The specimens ranged from 20 to 50 cm TL, with mode at 29 cm TL. All the specimens measured were higher than both the Minimum Conservation Size (15 cm TL, EC Reg. n.1967/2006) and than the size at first maturity (16 cm TL, Cattaneo Vietti *et al*., 1997) reported for this species.



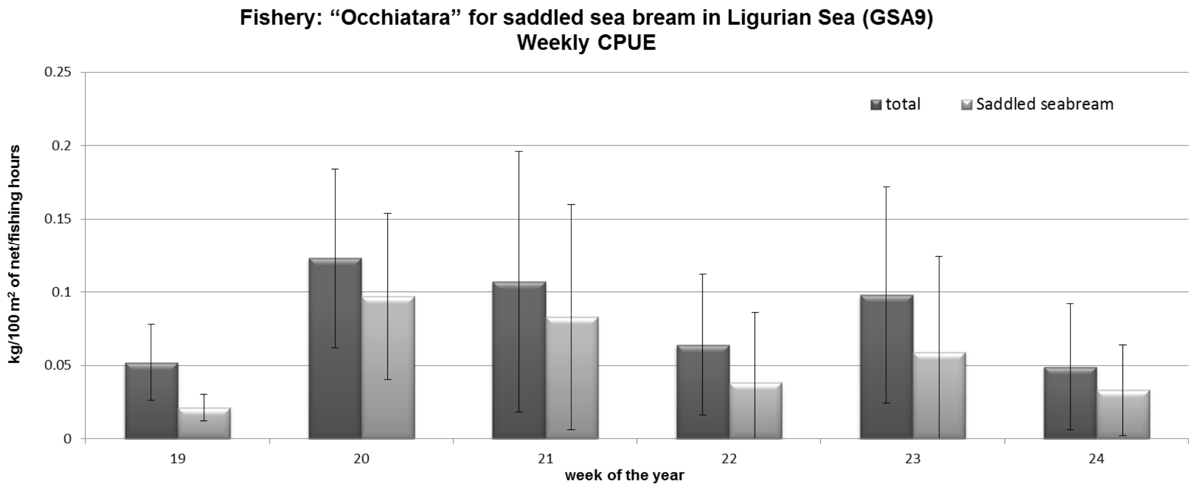
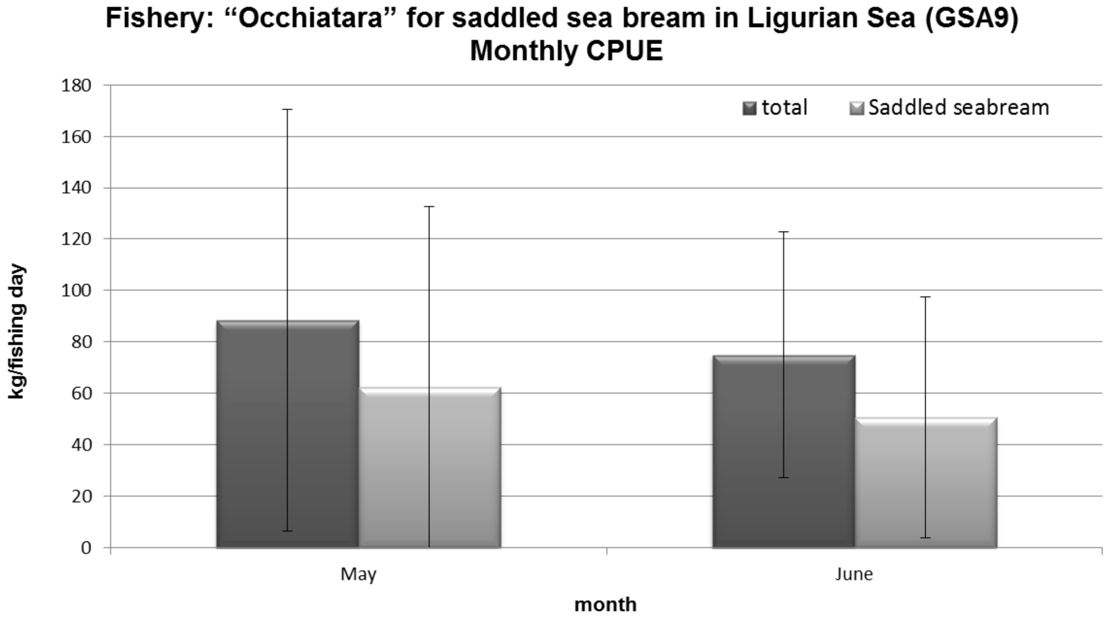


Figure 4.2.80 - "Occhiatara" for saddled seabream in Ligurian sea (GSA9). CPUE, expressed as kg/100m^2 of net/fishing hours above: monthly averages; below: weekly averages). Grey columns: target species; dark grey columns: all landings (target+by-catch); bars: the standard deviation.



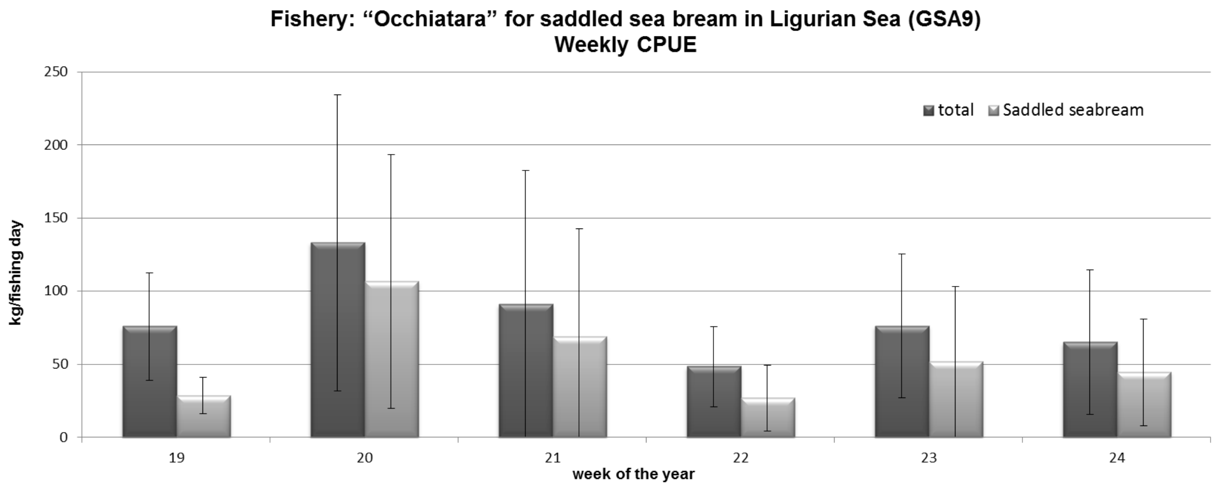


Figure 4.2.81 - "Occhiatara" for saddled seabream in Ligurian Sea (GSA9). CPUE, expressed as kg/fishing day. (above: monthly averages; below: weekly averages).
Grey columns: target species; dark grey columns: all landings (target+by-catch); bars: the standard deviation.

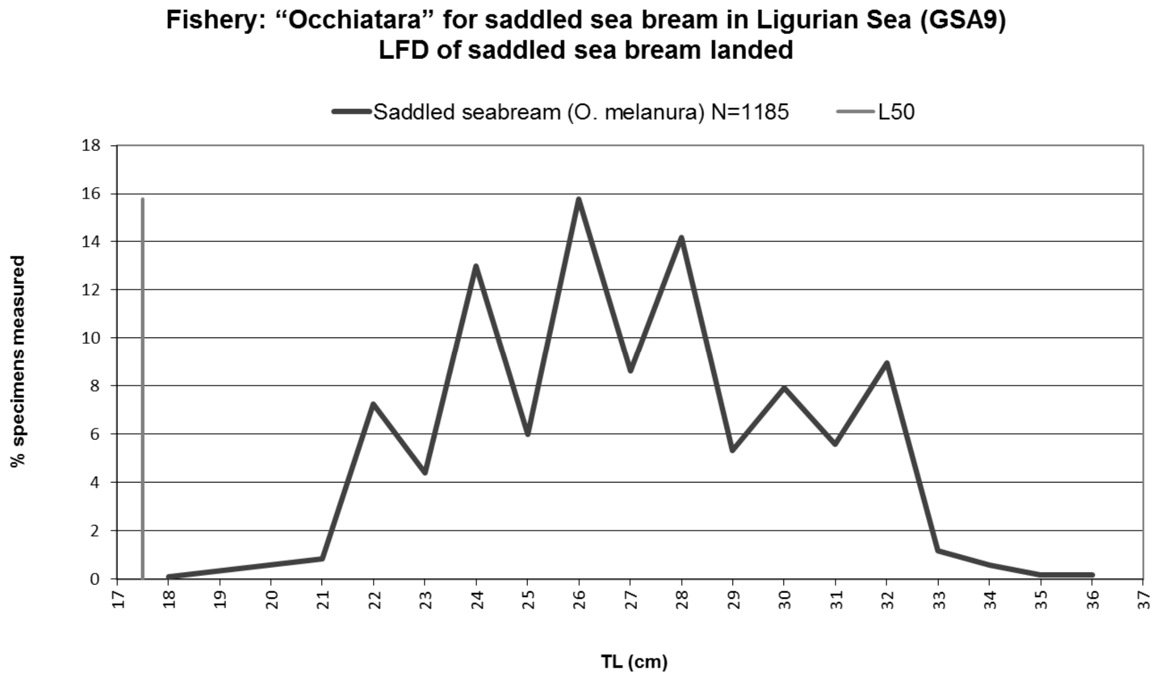


Figure 4.2.82 - "Occhiatara" for saddled seabream in Ligurian Sea (GSA9). Length Frequency Distribution of specimens of saddled seabream measured in the all monitored period. Grey line: size at first maturity.

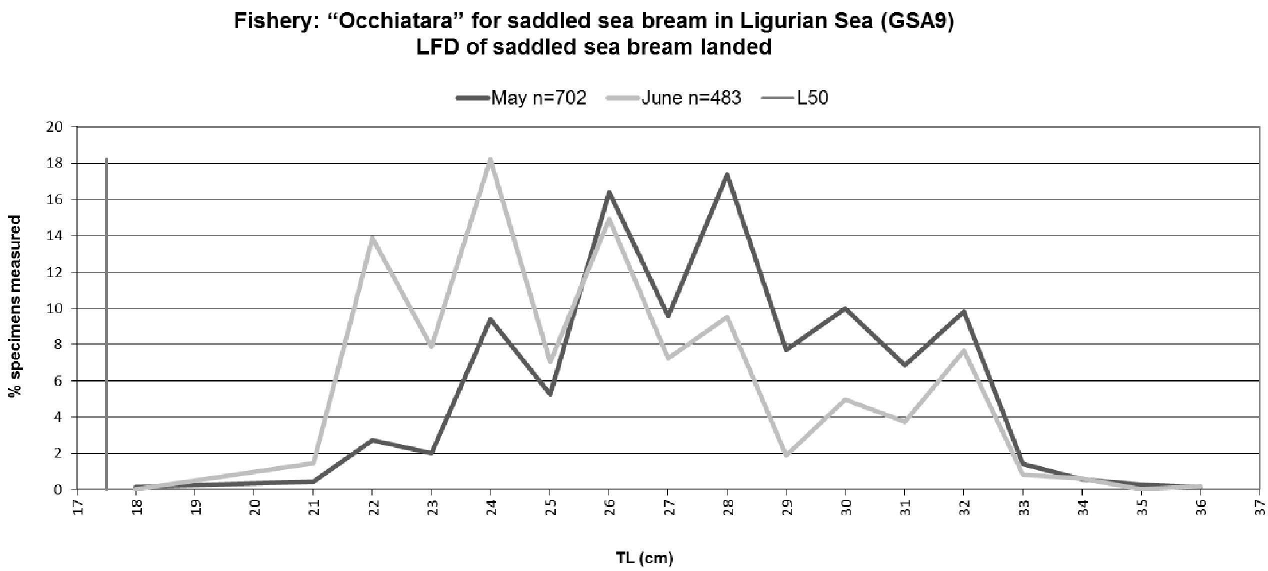


Figure 4.2.83 - "Occhiatara" for saddled seabream in Ligurian Sea (GSA9). Monthly Length Frequency Distribution of the specimens of saddled seabream measured in the all monitored period. Grey vertical line: size at first maturity. Grey line: May 2013; light grey line: June 2013.

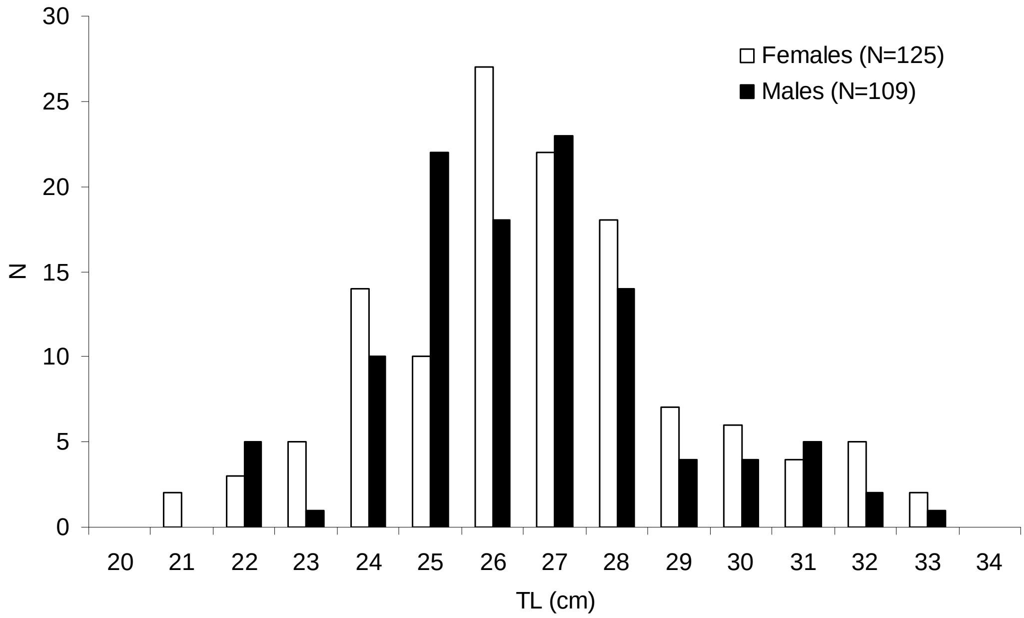


Figure 4.2.84 - "Occhiatara" for saddled seabream in Ligurian Sea (GSA9).
Length Frequency Distribution by sex of *O. melanura*.

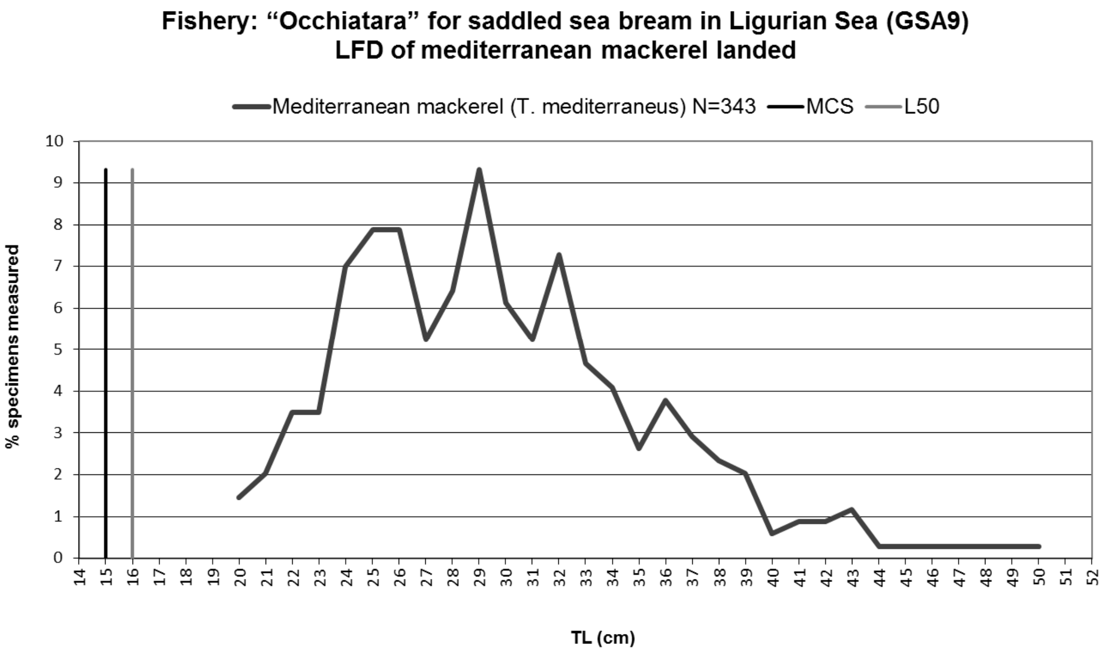


Figure 4.2.85 - "Occhiatara" for saddled seabream in Ligurian Sea (GSA9). Length frequency distribution of the specimens of Mediterranean mackerel, *T. mediterraneus*, in the all monitored period.
Grey line: size at first maturity. Black line: Minimum Conservation Size.

The catches of *O. melanura* are usually divided into three commercial categories of different economic value, according to the size and sorted "by eye" by the fishermen themselves: small (less than 25 cm TL), medium (between about 25 cm and 30 cm TL) and large, more than 30 cm.

Large sized fish were purchased by fish mongers at a price between 10 and 12 Euros/kg, medium size fish between 5 and 8 Euros/kg and the small sized fish at about 2-3 Euros/kg. Sometimes the fishermen sell by themselves large and middle sized saddled seabream directly to the public or restaurants at respectively 20 Euros/kg and 15 Euros/kg. The most important species belonging to the by-catch (*S. colias* and *T. mediterraneus*) were sold at a price lower than 5 Euros/kg.

GSA10: "Sgomberara" or "sgombetara" for mackerels and bogue in northern Sicily (Fishery 4)

New data

The main ports involved in the "sgomberara" fishery are Patti, Milazzo, Porto Rosa and Spadafora (Milazzo area) and Sant'Agata di Militello and Porticello, all located in northern Sicily (GSA10). In these ports a total of 30 vessels engaged in this fishery have been identified during the monitoring period: 17 in Milazzo area, 5 in Sant'Agata and 8 in Porticello. The crew of the vessels involved in "sgomberara" fishing ranged between 2 and 4 persons (3 mean).

The LOA of the boats of Milazzo area was between 6.25 and 13.55 m (mean 9.73 m), in Sant'Agata between 8.7 and 14.3 m (mean 11.01 m) and in Porticello between 5.99 and 13.4 m (mean 10.99 m). The Fig. 4.2.86 shows the other technical characteristics of the vessels (engine power and gross tonnage).

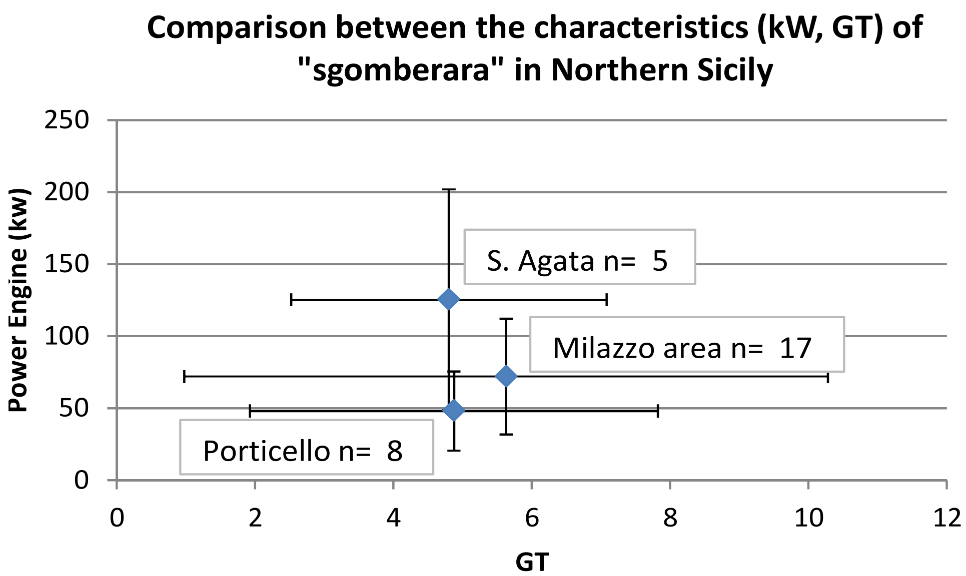


Figure 4.2.86 - Characteristics (GT, kW) of the GND fleets of S. Agata, Milazzo area and Porticello. Bars indicate the standard deviation.

The field activities were carried out by means of interviews, logbooks and embarks, from April to the first days of October 2013: a total of 24 interviews, 26 embarks and 96 logbooks were realised.

As declared by the fishermen involved in this fishery, the target species are constituted by a group of species, the Horse and Mediterranean mackerels, *Trachurus trachurus* and *T. mediterraneus,* the Chub and common mackerels, *Scomber colias* and *S. scombrus* and the bogue, *Boops boops*.

In the investigated period, an average activity of 3-5 fishing days per week per vessel was estimated.

The small driftnets employed in Milazzo area measured between 700 and 1500 m long and 20 and 30 m high; those of Porticello from 1000 to 1500 m long and 30 m high; those of Sant'Agata 1500 m long 25 m high.

Two types of fishing operations were observed: the Sant'Agata and Porticello fleets used to start the fishing trips at sunset with the search of the best fishing site; the net was deployed in a zig-zag direction. After about 4 hours, when the sun was fully lowered, started the recovering of the net (Fig. 4.2.87).

Figure 4.2.87 - Fishing operation with "sgomberara" in Porticello:
Bottom: some specimens caught: *A. rochei, T. mediterraneus*, (bottom left), *S. sarda* (bottom right).

Another modality of fishing operation was recorded for the fleet of Milazzo area: the nets were deployed at sea in the last hours of the night and recovered just after sunrise (Fig. 4.2.88).
In both cases the operability of the "sgomberara" gear required good sea conditions. The catch was removed from the net during the net recovering; the catch was maintained during the fishing operation in tanks with ice and water, before to be landed (Fig. 4.2.89). Usually the fish landed was marketed through wholesalers.

Figure 4.2.88 – Fishing operations with "sgomberara" in Milazzo area. Bottom: some specimens of bullet tuna caught.

Figure 4.2.89 – Fish caught by the "sgomberara" net.

The fishing grounds of the “sgomberara” fishery were generally close to the fishing harbours: they were, on average 130-250 m depth and 11-13.5 km far from the coast (Fig. 4.2.90; Tab. 4.2.6).
The duration of fishing trips monitored during this project was included between 2 and 7.5 hours, while the duration of fishing operations was between 2 and 5.5 hours (Fig. 4.2.91).

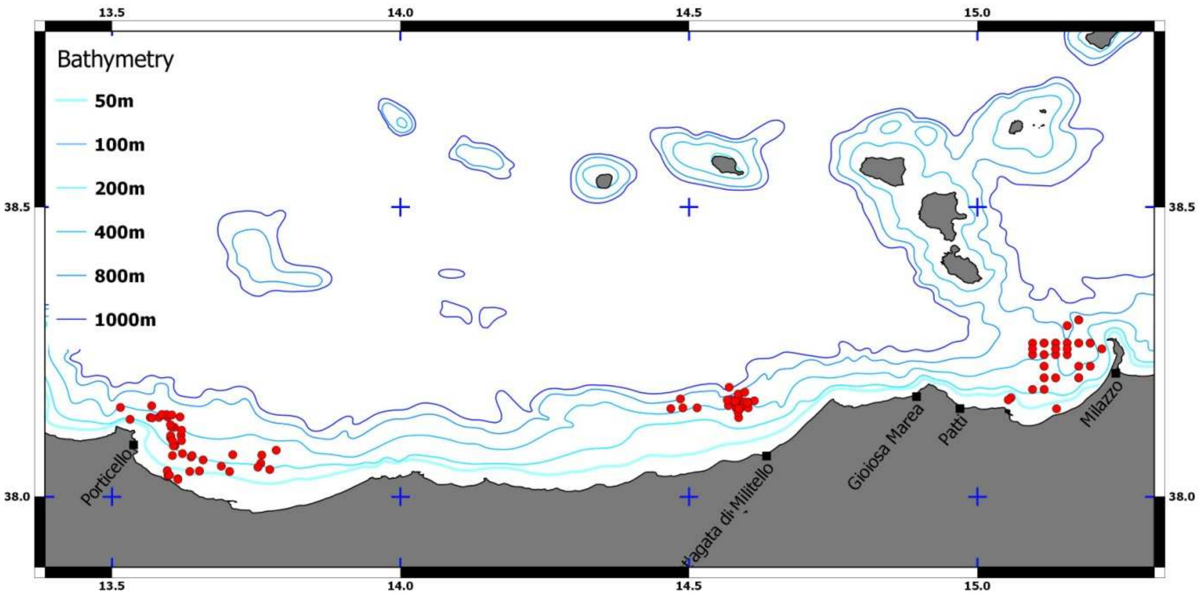


Figure 4.2.90 – Fishing sites of the “sgomberara” fishery in northern Sicily.
Red circles indicates the sites monitored by embarks and logbooks.

Table 4.2.6 - Fishing sites of the “sgomberara” fishery in northern Sicily.

	Distance from the coast (km)			Fishing depth (m)		
Port	**min**	**max**	**mean**	**min**	**max**	**mean**
Porticello	0.9	11.4	6.5	30	600	150
S. Agata di Militello	7.5	13.5	10.5	200	650	130
Milazzo area	1.5	13.1	7.5	40	520	250

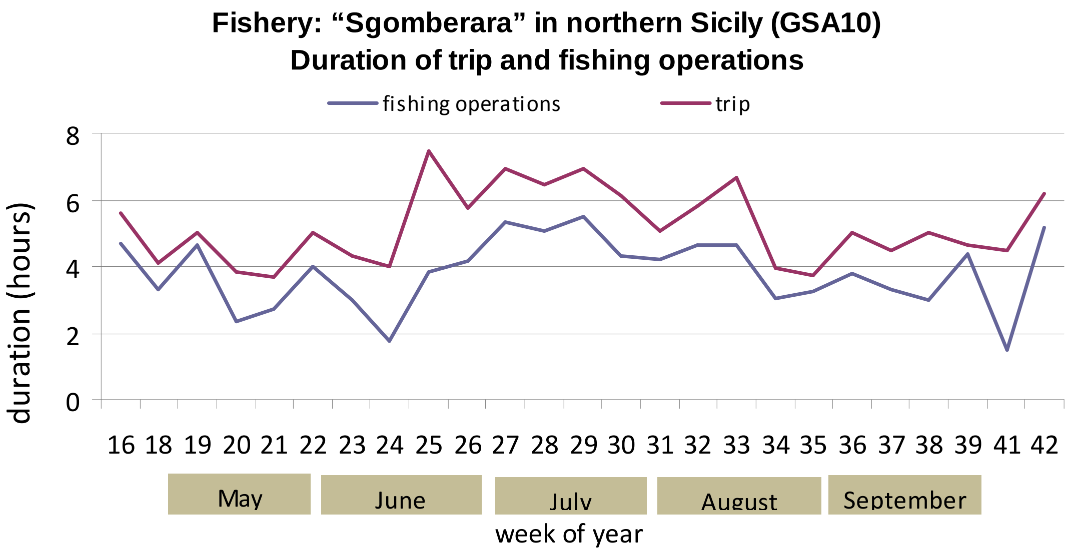


Figure 4.2.91 - Weekly averages of trip and fishing operations duration.

Fig. 4.2.92 shows the catch composition of the “sgomberara” in the monitored period. The target species (*Trachurus* sp., *Scomber* sp. and *B. boops*) were only 1.6% (208 kg) of entire biomass caught (13173.96 kg), *T. trachurus* (104 kg) was the most abundant target species.

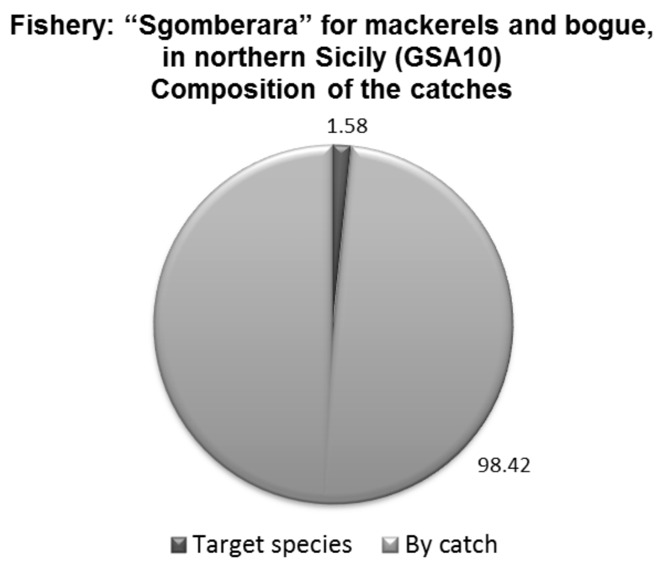


Figure 4.2.92 - “Sgomberara” for mackerels and bogue, northern Sicily (GSA10). Composition of the catches.

The by-catch was composed by 5 species; in terms of biomass the most important was by far the bullet tuna, *A. rochei,* which represented about the 95% of the by-catch (12312 kg), followed by the little tunny, *E. alletteratus* and by the Pompano, *T. ovatus (*Fig. 4.2.93).

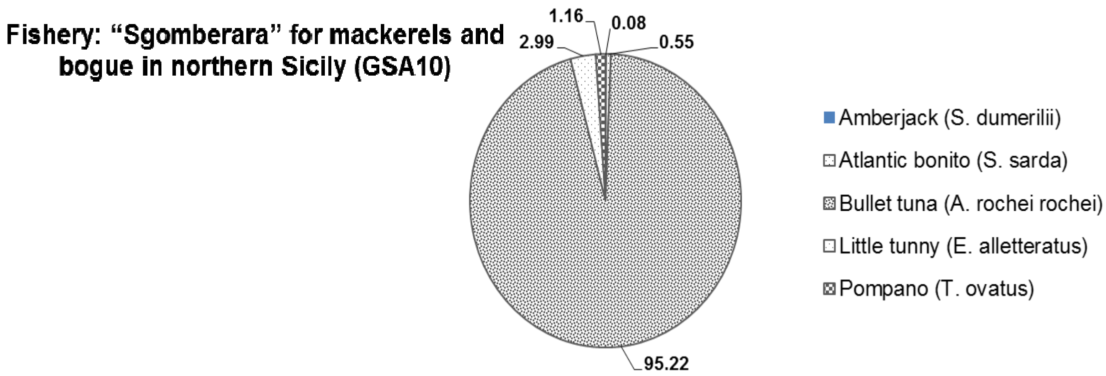


Figure 4.2.93 - "Sgomberara" for mackerels and bogue, northern Sicily (GSA10). Composition of the by-catch.

Catches of protected/vulnerable species were never recorded during the monitored period (from last week of April to the first week of October 2013), as well as discards.

On the other hand, species belonging to the Annex VIII (bullet tuna, little tuna and Atlantic bonito) represented by far the majority of the total catch (about 97%, 12770.16 kg).

The average monthly and weekly CPUEs (kg/100 m^2/fishing hours) of the target species were very low (Figs 4.2.94 - 4.2.97). The high catches of bullet tuna in the monitored period masked the catches of all the other species. Indeed, the market prices reached by the bullet tuna in the monitored period (3 euros per kg, on average), were due to the abundant catches of this species, of medium-low commercial value.

As concerns the total catches, the monthly values ranged from about 0.03 to 0.11 kg/100m^2 of net/fishing day, and from 30 to 180 kg/fishing day. The highest values were registered in June and July. The weekly CPUEs were characterised by the same tend.

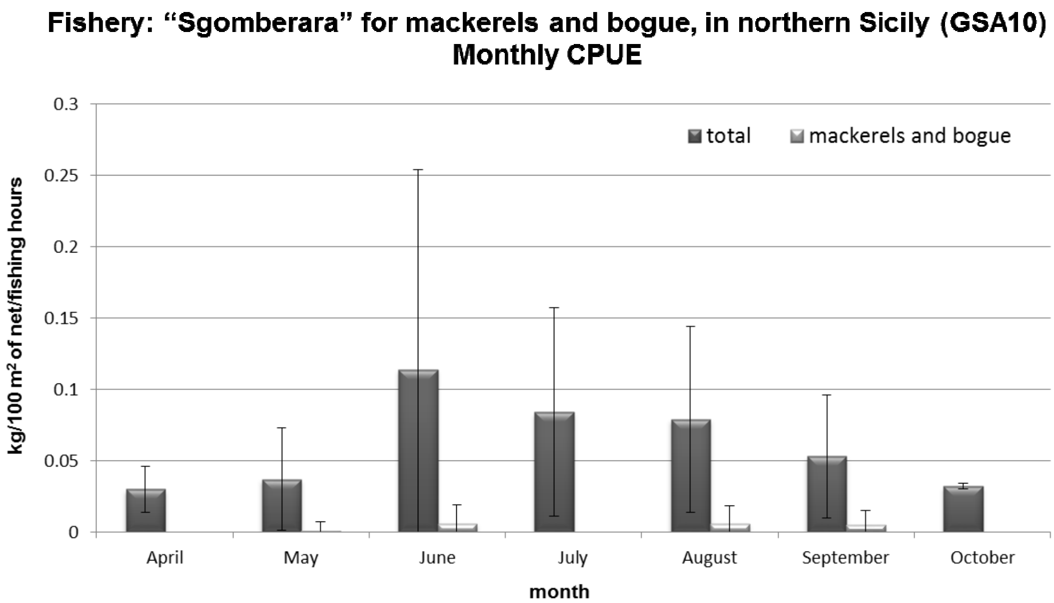


Figure 4.2.94 - "Sgomberara" for mackerels and bogue, in northern Sicily (GSA10). CPUE, expressed as kg/100 m^2 of net/fishing hours (monthly averages; overall monitored period). Grey columns: target species; dark grey columns: all the species caught; bars: the standard deviation.

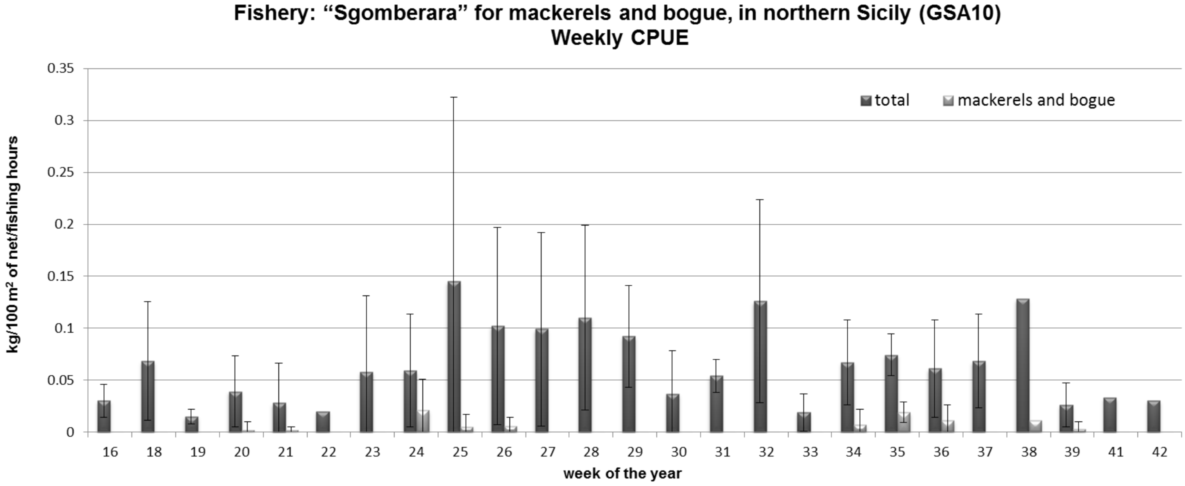


Figure 4.2.95 - "Sgomberara" for mackerels and bogue, in northern Sicily (GSA10). CPUE, expressed as kg/100 m^2 of net/fishing hours (weekly averages; overall monitored period). Grey columns: target species; dark grey columns: all the species caught; bars: the standard deviation.

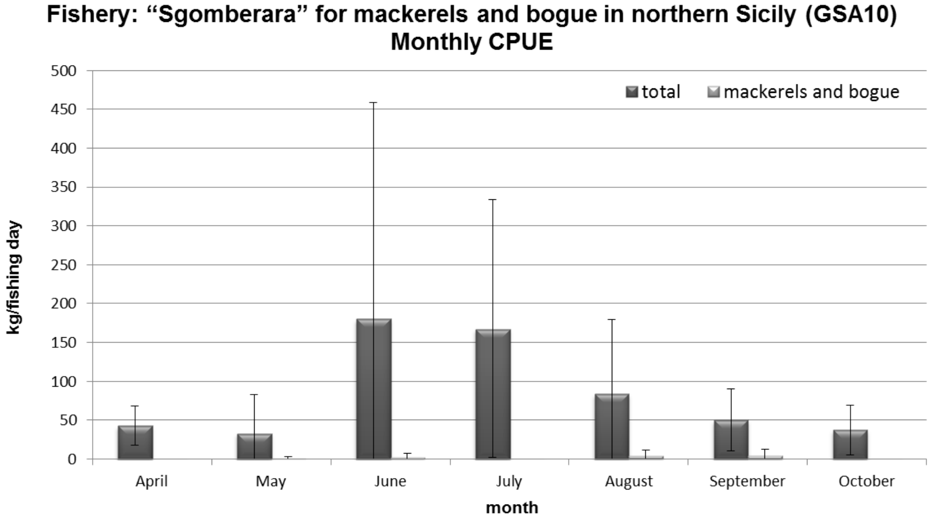


Figure 4.2.96 - "Sgomberara" for mackerels and bogue, in northern Sicily (GSA10). Catch rates, expressed as kg/fishing day (monthly averages; overall monitored period). Grey columns: target species; dark grey columns: all the species caught; bars: the standard deviation.

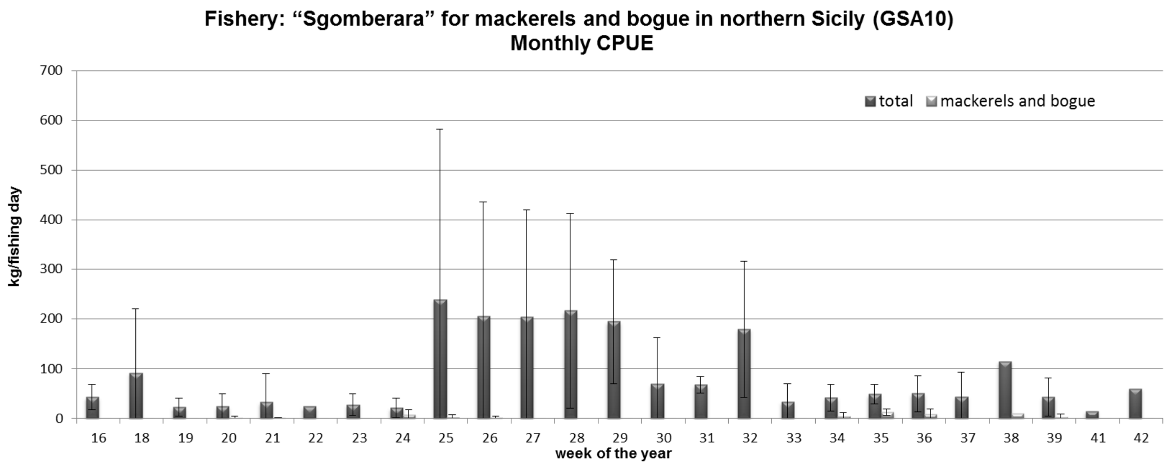


Figure 4.2.97 - "Sgomberara" for mackerels and bogue, in northern Sicily (GSA10). Catch rates, expressed as kg/fishing day (monthly averages; overall monitored period). Grey columns: target species; dark grey columns: all the species caught; bars: the standard deviation.

The Fig. 4.2.98 reports the LFD of *T. trachurus*, the most important target species, of the specimens measured in the whole sampling period. The LFD shows a polimodal pattern with most of the specimens (86%) concentrated in the size classes from 20 to 28 cm TL. Considering the Minimum Conservation Size of 15 cm TL (EC Reg. 1967/2006) and the size at maturity of 18.5 cm TL (Carbonara *et al*., 2012), all the specimens measured are greater than these limits. Therefore, in the period investigated, the "sgomberara" caught exclusively adult specimens. This data can be an indicator of the sustainability of this fishery for the horse mackerel, due that at the present formalized stock assessments for this species in GSA 10 are not available.

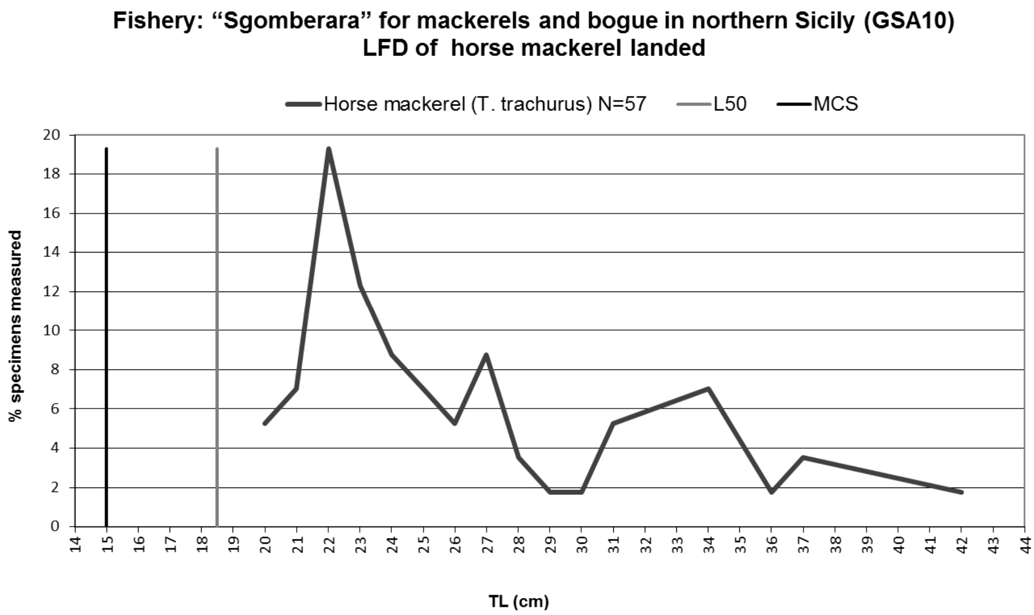


Figure 4.2.98 - "Sgomberara" for mackerels and bogue, in northern Sicily (GSA10). Length frequency distribution of the specimens of horse mackerel measured in the monitored period.
Black line: Minimum Conservation Size; grey line: size at first maturity (from Carbonara *et al*., 2012).

As concern the bullet tuna, the monthly LFDs show a polimodal pattern. In August most of the specimens are concentrated between 31 and 38 cm TL. In September a higher percentage of juveniles (around 28 cm TL) is present and a predominant mode is not evident (Fig. 4.2.99).

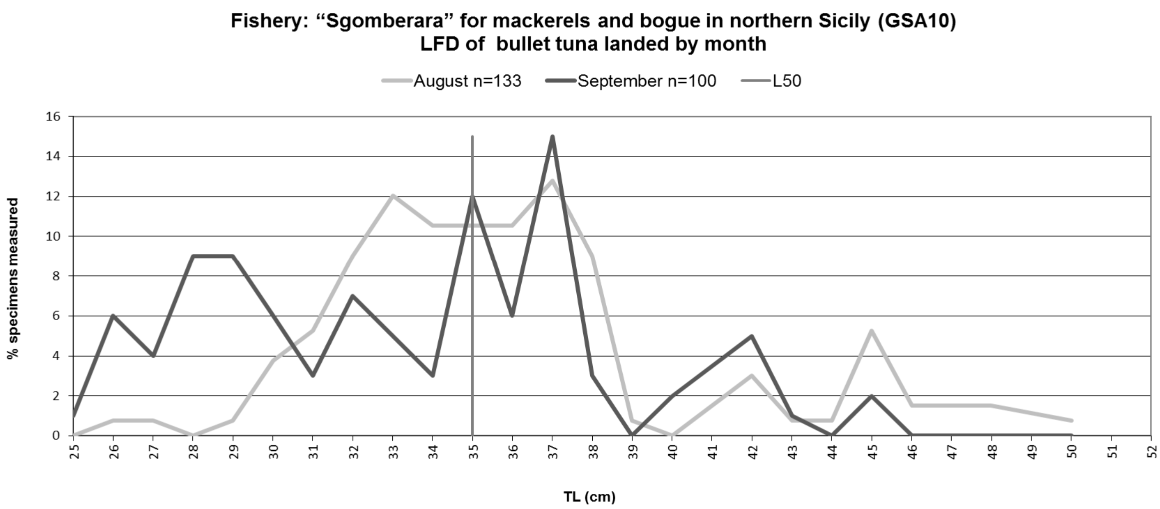


Figure 4.2.99 - "Sgomberara" for mackerels and bogue, in northern Sicily (GSA10). Length frequency distribution of the Bullet tuna specimens measured in the August and September.
Vertical grey line: size at first maturity (from www.fishbase.org).

The LFD for the entire sampling period show that most (73%) of the specimens are concentrated in the size classes included between 30 to 38 cm TL (Fig. 4.2.100). Considering the size at maturity of 35 cm TL (www.fishbase.org) the percentage of specimens smaller of this limit is about the 50%. No Minimum Conservation Size and formal stock assessments are available for this species.

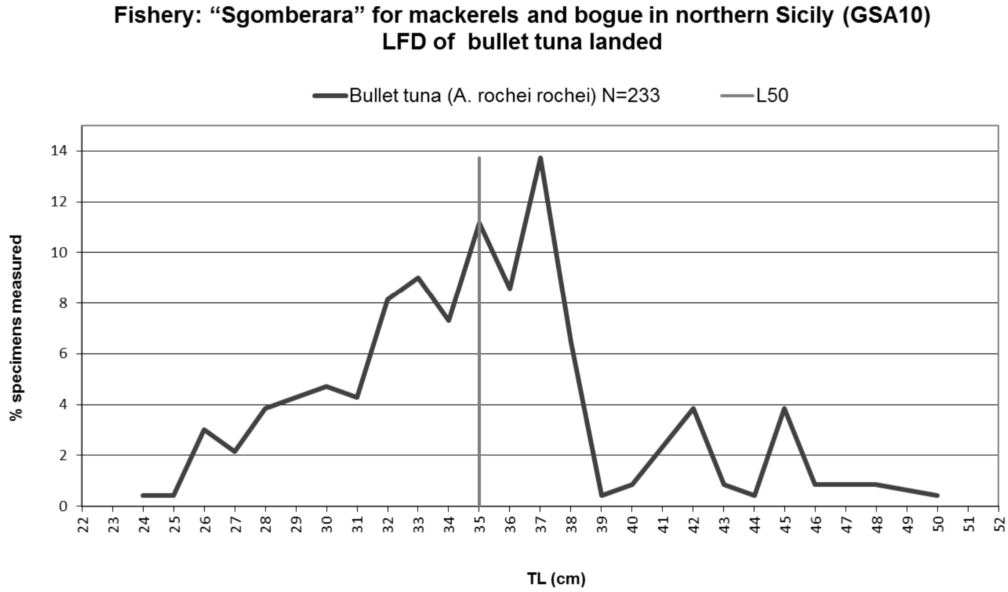


Figure 4.2.100 - "Sgomberara" for mackerels and bogue, in northern Sicily (GSA10). Length frequency distribution of bullet tuna specimens measured in the entire monitored period;
Grey line: size at first maturity (from www.fishbase.org).

The littly tunny, *E. alletteratus*, other by-cactch species was characterized also by a polimodal LFD, with one mode at 36 cm TL and other at 46 cm TL (Fig. 4.2.101). Considering a size a first maturity at 47 cm TL, (Hajjej *et al*., 2010) almost all the specimens caught are smaller of this limits. No Minimum Conservation Size and formal stock assessments are available for this species.

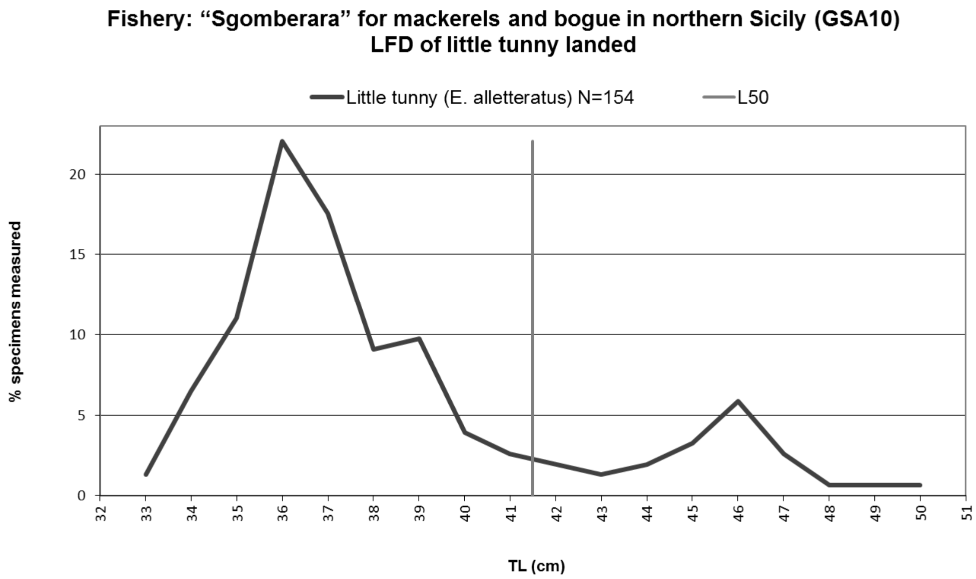


Figure 4.2.101 - "Sgomberara" for mackerels and bogue, in northern Sicily (GSA10). Length frequency distribution of Little tunny specimens measured in the entire monitored period;
Grey line: size at first maturity (from Hajjej *et al.*, 2010).

GSA10: "Ricciolara" for greater amberjack, *Seriola dumerili*, in Sant'Agata di Militello (Fishery 6)

The field activities targeted to the "ricciolara" fishery of Sant'Agata di Militello were carried out by means of interviews, logbooks and embarks, from the last week of August to the end of September. The target species of this fishery is the greater amberjack, *Seriola dumerili;* the fishing season starts usually at end of August and stops at the end of October. Due the timeline the DRIFTMED Contract, the activity of this fishery was followed only partially.
The "ricciolara" fishery was carried out by 3 vessels: their technical characteristics are reported in the Table 4.2.7. The crew fishing ranged between 2 and 3 persons.

Table 4.2.7 - Characteristics (LOA, GT, and kW) of the Sant'Agata di Militello vessels involved in the "ricciolara" fishery.

	LOA (m)	Power Engine (kw)	Gross Tonage (GT)
Vessel 1	11.58	73.55	4
Vessel 2	8.7	73.55	2
Vessel 3	14.3	205.94	8

The fishing site was located close to the port of Sant'Agata di Militello, with depths included between 20 and 30 m with sandy-muddy bottom. The distances from the coast varied from 2.2 to 3.1 km, with an average of 2.8 km (Fig. 4.2.102).

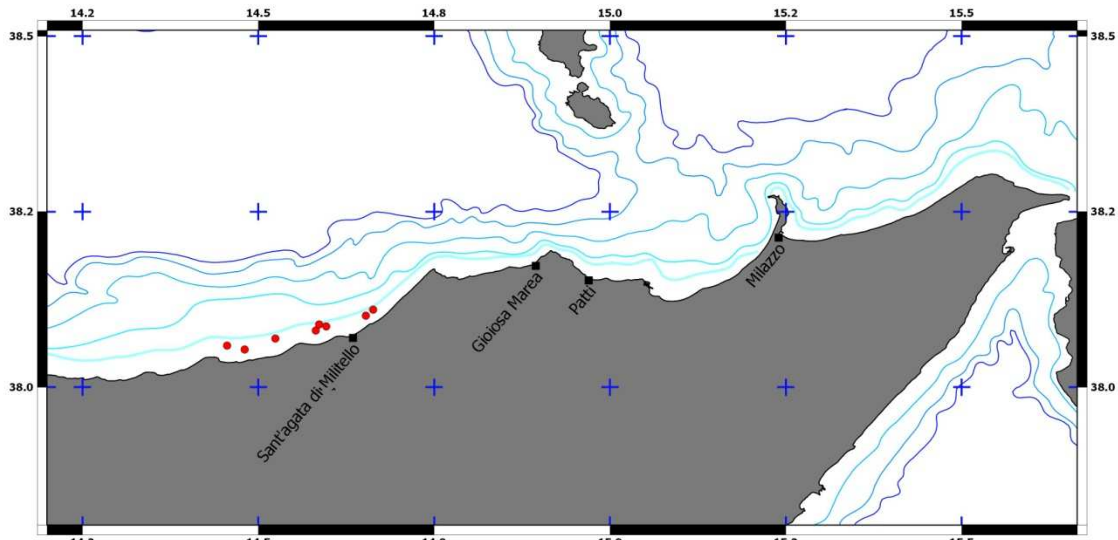


Figure 4.2.102 – The fishing site of the "ricciolara". The red points represent the geographical position of single fishing trips monitored.

In general, the fishing operation started at sun set with the search of the best fishing site. The nets (average length 900 m, average drop 21 m, average mesh size 70 mm) were deployed at the sea in a zig-zag direction, transversally to the coast. After about 4 hours, when the sun was fully lowered, the recovering of the net started. The catch was removed from the net during the net recovering (Fig. 4.2.103).

Due to the low depth (20-30 m) of the fishing site and the drop of the net of 21 m, the lead line could touch the bottom during the fishing operations; for this reason the drift of the net was very limited, about 30 m as a maximum. The characteristics of the bottom (sandy – muddy) avoided damages to the net.

Figure 4.2.103 – Fishing operations of “ricciolara” and catches of greater amberjack (bottom left) and by-catch of *T. mediterraneus* (bottom right).

The duration of the fishing trips in the sampled period varied between 5 and 7 hours, while the duration of the fishing operation between 3 and 5 hours (Fig. 4.2.104).

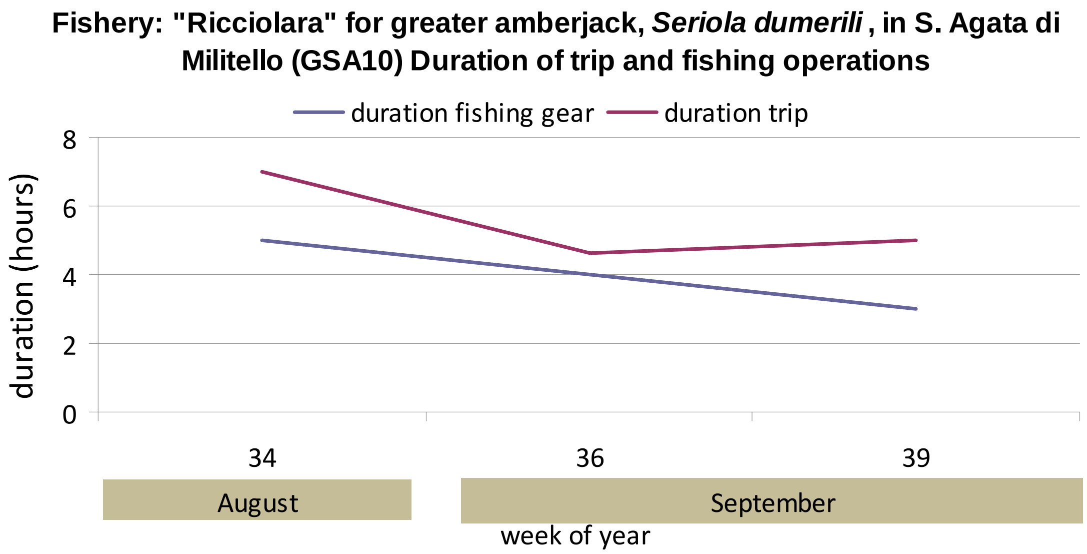


Figure 4.2.104 – Biweekly average durations of trips and fishing operations. "Ricciolara" for greater amberjack, GSA10.

Fig. 4.2.105 reports the catch composition of the "ricciolara" in the monitored period. The target species (*S. dumerili*) was about 58% (37.0 kg) of entire biomass (63.5 kg) monitored, while the by-catch represented about the 42% (70 kg).

Fig. 4.2.106 shows the species composition of the by-catch; 5 species were observed. In terms of biomass the most important was the Mediterranean mackerel (*T. mediterraneus*), representing about the 70% of the by-catch. The common Pandora (*P. erythrinus*) reached about the 19%, the sand steenbras (*L. mormyurus*) about 11%.

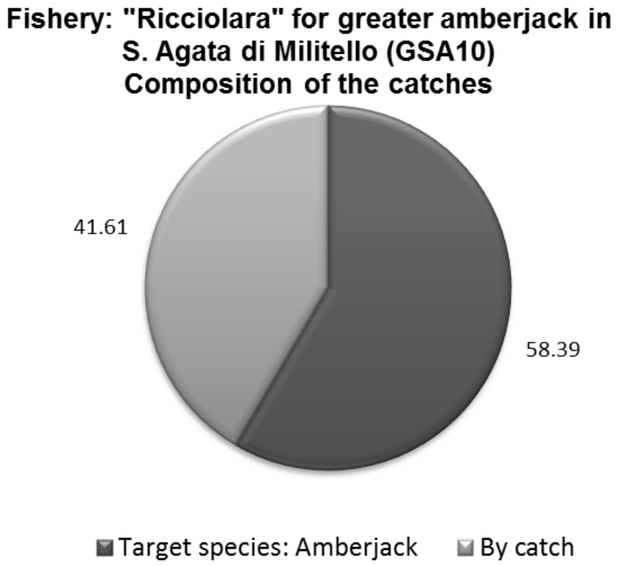


Figure 4.2.105 – Catch composition of the "ricciolara" for greater amberjack in GSA10.

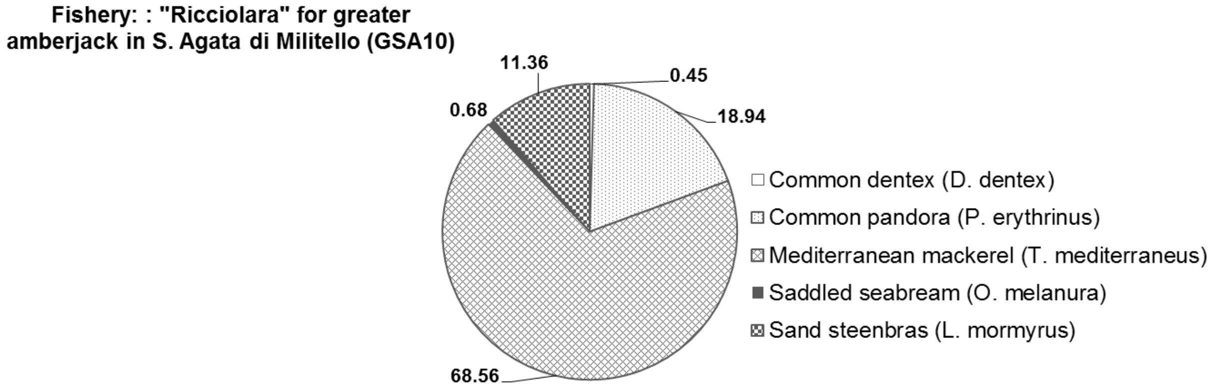


Figure 4.2.106 – By-catch composition of the “ricciolara” for greater amberjack in GSA10.

During the monitored period, catches of protected/vulnerable species were never recorded, as well as those of species included in the Annex VIII; no species were discarded.
The average monthly CPUEs (kg/100 m^2/fishing hours) of amberjack ranged from 0.002 to 0.014 kg/100m^2 of net/fishing h. The higher value was registered in September. By-catch showed an evident decrease from August to September (Fig. 4.2.107).

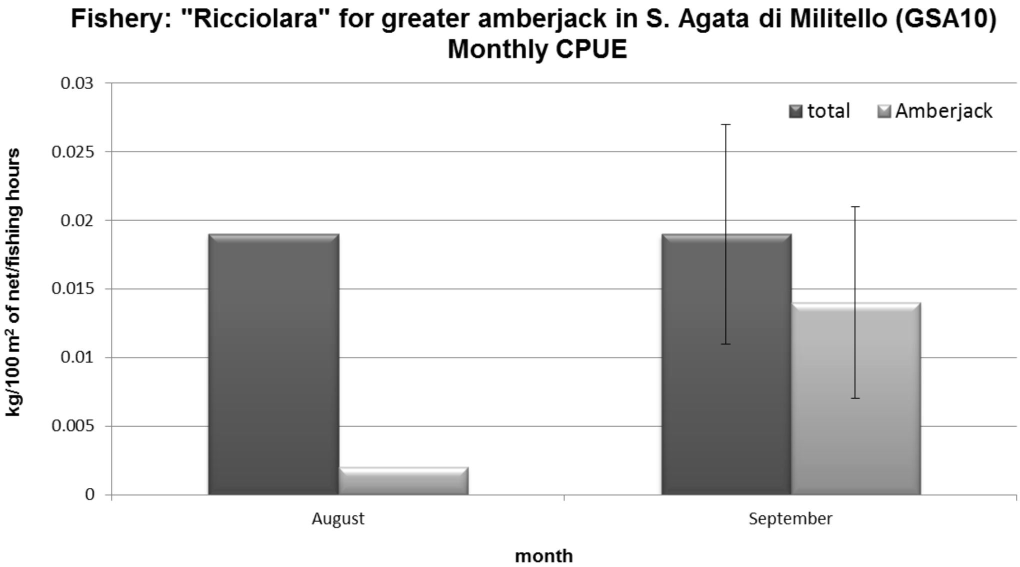


Figure 4.2.107 – Fishery: "ricciolara" for greater amberjack in GSA10. CPUE, expressed as kg/100 m^2 of net/fishing hours (monthly averages; overall monitored period). Grey columns: target species; dark grey columns: all the species landed; bars: the standard deviation.

Fig. 4.2.108 reports the catch rates (kg/fishing day) by month of *S. dumerili* and of all the species landed. It is evident a temporal increase of the amberjack values, from 1.45 to 11.9 kg per fishing day.
Both the CPUEs indicate a clear increase from the end of August to September in the abundance of the stock; this could be done to the higher abundance of the of greater amberjack recruits close to the coast in September-October (D’Anna *et al*., 1999).

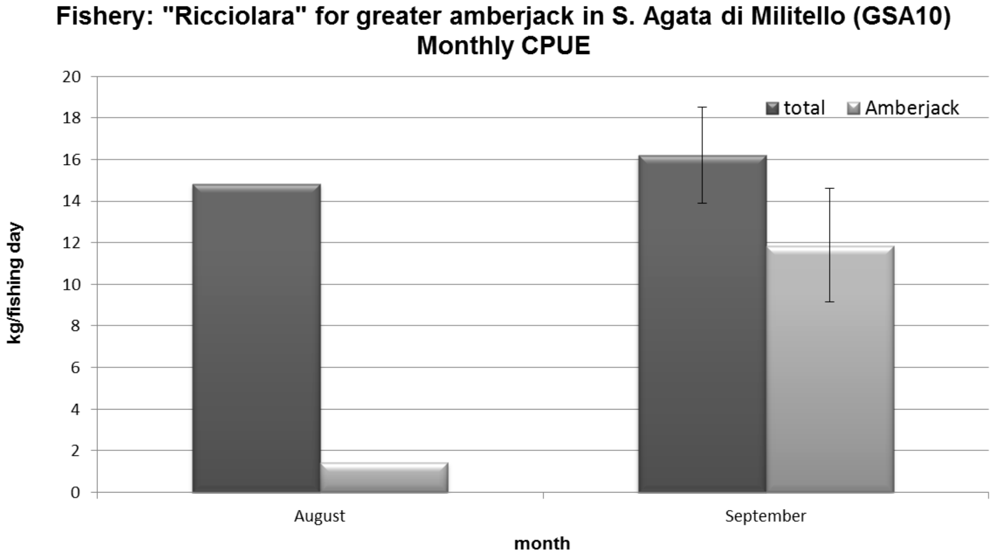


Figure 4.2.108 – "Ricciolara" fishery for greater amberjack in GSA10. Catch rates, expressed as kg/fishing day (monthly averages; overall monitored period).
Grey columns: target species; dark grey columns: all the species landed; bars: the standard deviation.

As concerns the Length Frequencies Distribution (LFD) of the target species, the Fig. 4.2.109 reports the results for whole sampled period. The specimens measured were concentrated in the size classes between 22 and 37 cm TL. No Minimum Conservation Size is present for this species in Mediterranean. Considering the size of first maturity of 80 cm of standard length (Andaloro *et al.,* 1998), this fishery caught only juveniles. Along Sicilian coast, from the end of summer to the early autumn the recruits of amberjack are typically exploited also by means of others gears, as the surrounding nets close to the FAD (floating fish aggregating devices) (D'Anna *et al*., 1999). In September the juveniles of *S. dumerili* move from the FAD to migrate close to the coast; during this migration the "ricciolara" fishery is used to catch this species (Sinopoli *et al*., 2007).

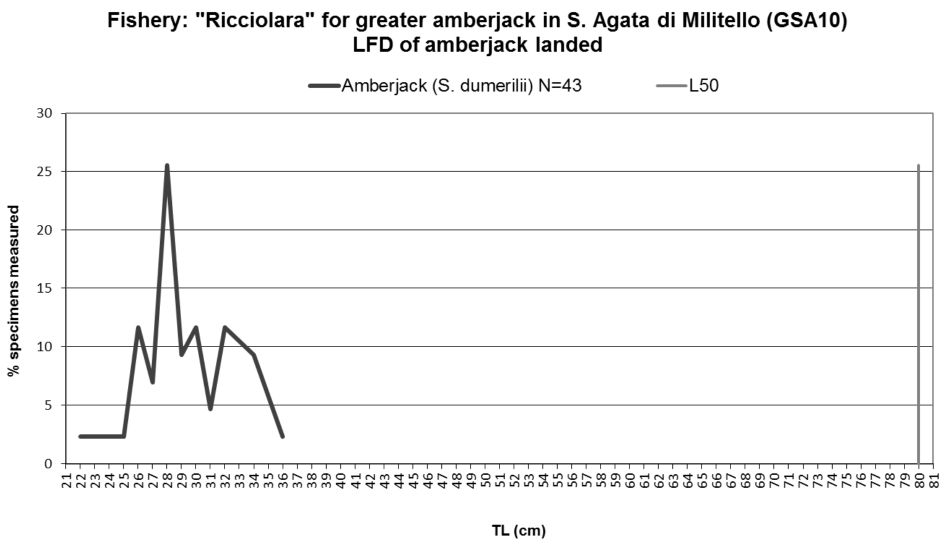


Figure 4.2.109 -"Ricciolara" for saddled seabream in GSA10. Length Frequency Distribution of the specimens of *S. dumerili* for all the monitored period. Grey line: size at first maturity.

Regarding the Length Frequencies Distribution (LFD) of the by-catch, in the Fig.4.2.110 the size structure of the specimens of Mediterranean mackerel is reported. The LFD shows a polimodal pattern and the specimens are concentrated in the length classes between 23 and 27 cm TL. Considering the MCS of 15 cm TL (EC Reg. n. 1967/2006) and the size at maturity of 16 cm TL (Cattaneo Vietti *et al*., 1997), no specimens are smaller of these limits. Therefore, we can conclude that the “ricciolara” fishery exploits only adult specimens of *T. mediterraneus*.

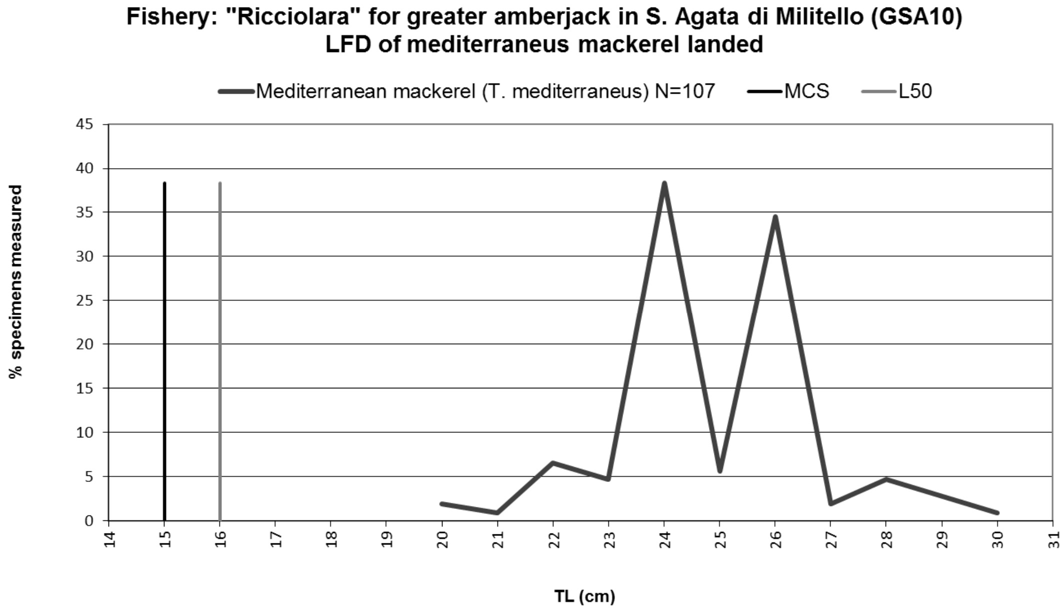


Figure 4.2.110 -"Ricciolara" for greater amberjack in GSA10. Length frequency distribution of the specimens of Mediterranean mackerel, *Trachurus mediterraneus*, measured in the monitored period.
Black line: Minimum Conservation size; grey line: size at first maturity.

GSA 10: “Ferrettara" for bluefish, *Pomatomus saltatrix*, in the Gulf of Naples (Fishery 7)

New data

The field activities in Torre Annunziata were carried out by means of interviews (2), logbooks (15) and embarks (4), from the last week of August to the first half of October 2013. The fishery followed included only 2 vessels of Torre Annunziata fishing port, but it was noticed by the fishermen interviewed that in other close ports, as Castellamare di Stabia and Pozzuoli, some other vessels (4-5 in total) occasionally are involved in this fishery. The technical characteristic of the monitored vessels are reported in the Tab. 4.2.8.
The target species of this fishery is the bluefish, *Pomatomus saltatrix,* the fishing season starts usually at middle of June and stops in middle of October. In the first part of the season, until September, the fishing area is around the mouth of the Volturno River, while in the rest of fishing season in an area close to Torre Annunziata (Fig. 4.2.111).

Table 4.2.8 - Characteristics (LOA, GT, and kW) of the vessels of Torre Annunziata involved in the SSD fishery for bluefish.

	LOA (m)	Power Engine (Kw)	Gross Tonnage
vessel 1	8.45	23	5
vessel 2	9.27	53	3

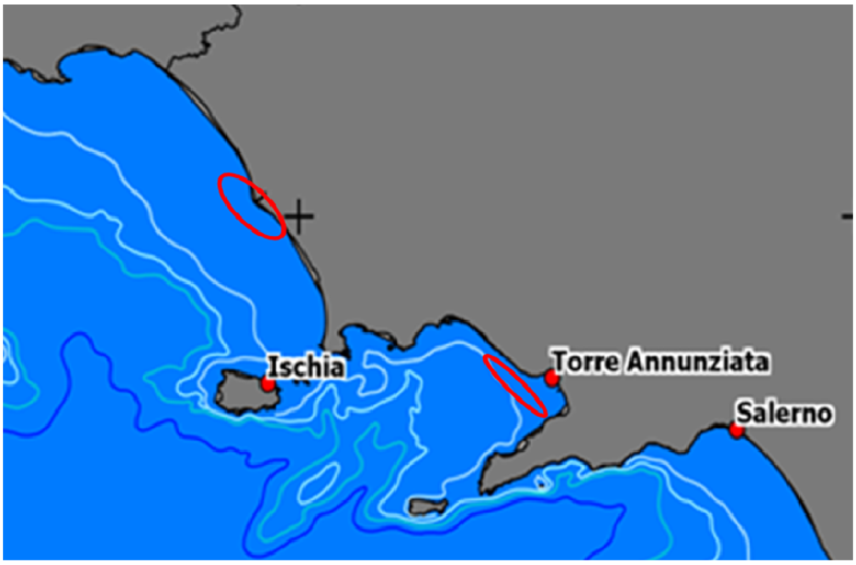


Figure 4.2.111 – The two sites frequented by the "ferrettara" for bluefsh (GSA10), indicated by the red circles.

In general, the fishing operations started at sunset with the search of the best fishing site characterized by low current and higher limpidity of sea water. The net (average length 2000 m and drop 26 m), was deployed at the sea in a zig-zag direction. After about 2 hours, when the sun is fully lowered, the recovering of the net started (Fig. 4.2.112). Bluefish and the other fish caught were removed from the net during the net recovering; the catch is maintained during the fishing operation in tanks with ice and water, before to be landed (Fig. 4.2.113).

Figure 4.2.112 – Fishing operations of “ferratara” for the bluefish, Gulf of Naples (GSA10).

Figure 4.2.113 – Catches of the "ferrettara"; a specimen of bluefish (bottom left) and one of Pompano (bottom right).

The duration of the fishing trips in the sampled period varied between 4 and 6 hours, while the duration of fishing operations between 2 and 3 hours (Fig. 4.2.114). The duration of fishing operations was quite constant, while the duration of fishing trip depended by different factors as the distance of the fishing site and the sea condition. No evident temporal trends were detected during the sampling period.

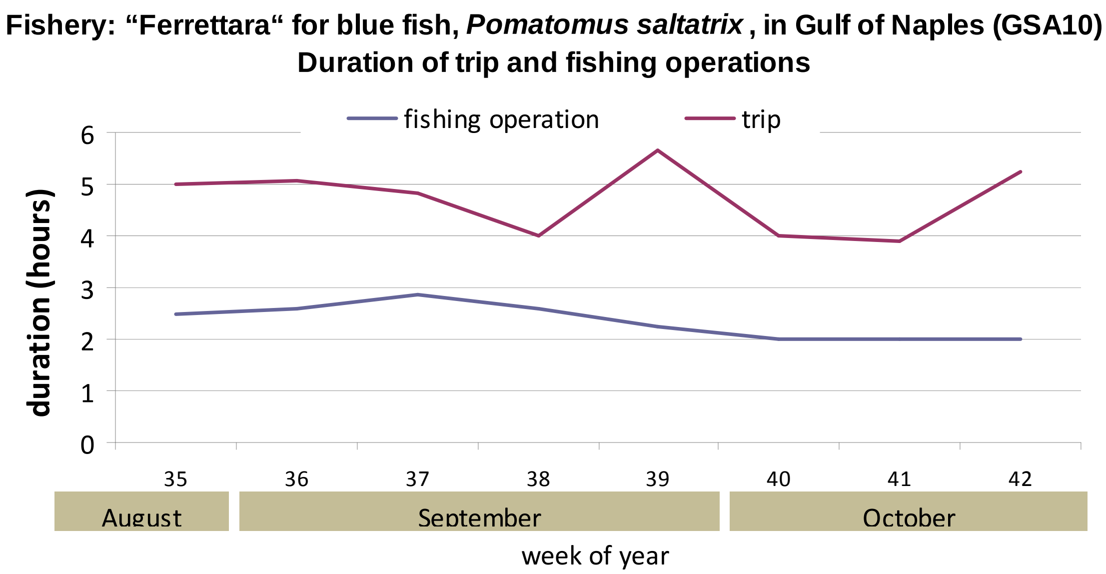


Figure 4.2.114 – "Ferrettara" for bluefish of GSA10- Weekly average duration of trips and fishing operations.

The drift of the net was estimated by averaging the distances among the geographical coordinates from the points where the net was deployed and recovered. For the two fishing sites (mouth of Volturno River and Gulf of Naples) the drift resulted, respectively, about 500 m and 750 m.

This difference is due to the different bottom depths of the two fishing sites. The Volturno fishing ground varied between 10 and 20 m depth; considering the drop of the net of 26 m the lead line touched the bottom during the fishing operation. The depth of the other fishing ground is about 80 m and the net in this case did not touch the bottom. Also the characteristics of the bottom are different in the two fishing sites; sandy – muddy for the first, muddy-rocky for the second.

The crew of the vessel involved in this fishery is composed of two persons. Usually the catch was sold in wholesale fish market. The good price of the bluefish landed and the increasing temporal trend of the abundance of *P. saltatrix* (Voliani *et al.,* 2006) could increase the number of boats involved in this fishery in the next years.

Fig. 4.2.115 reports the catch composition of the "ferrettara" for bluefish in the monitored period. The target species (Fig. 4.2.116) was estimated to be about of 89% (588 kg) of entire biomass caught (658 kg); by-catch represented only the 11% (70 kg). This fishery shows therefore a high level of specialization.

Fig. 4.2.116 reports the composition of the by-catch: in total 8 species were observed. In terms of biomass, the most important is the Pompano (*Trachinotus ovatus*) that represent about the 56% of the by-catch. Mugilidae reached about the 26%. In the by-catch also two species of the Annex VIII were recorded, the Atlantic Bonito (*Sarda sarda*) and the Little tunny (*Euthynnus alletteratus*), but in percentages very small, respectively the 1.8 % (11.6 kg) and 0.09% (0.56 kg) of the entire biomass caught.

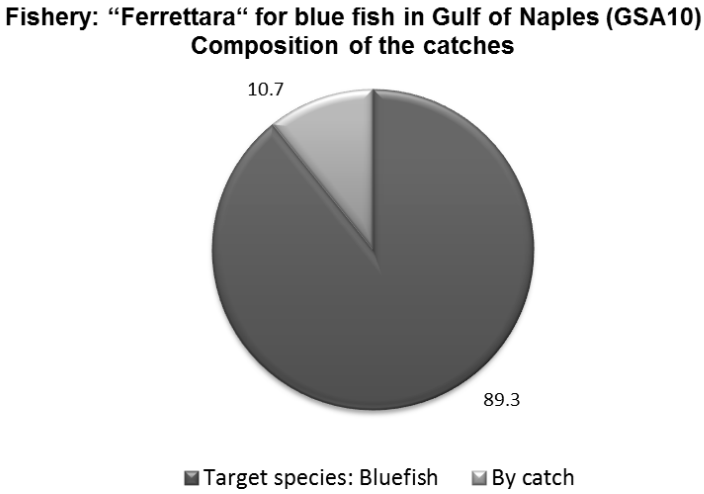


Figure 4.2.115 – Catch composition of the "ferrettara" for bluefish, Gulf of Naples (GSA10).

Figure 4.2.116 – Catch of the "ferrettara" for bluefish, Gulf of Naples (GSA10).

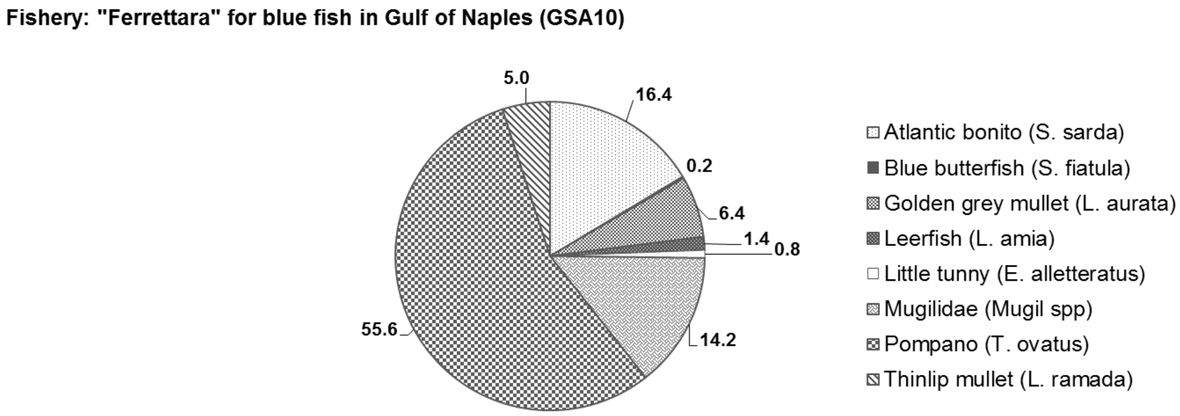


Figure 4.2.117 – By-catch composition of the "ferrettara" for bluefish, Gulf of Naples (GSA10).

Discarding was never observed or reported. During the monitored period (from last week of August to the middle of October) catches of protected/vulnerable species were never recorded.

The average monthly CPUEs (kg/100 m^2/fishing hours) of bluefish ranged from 0.005 to 0.055 kg/100m^2 of net/fishing h. The peak was recorded in August; it was followed by a decreasing trend in the other months with a minimum in October, the last month of sampling (Fig. 4.2.118). The total landing followed the same trend with an increase of the differences with the CPUE of bluefish due to the increase of by-catch in the capture.

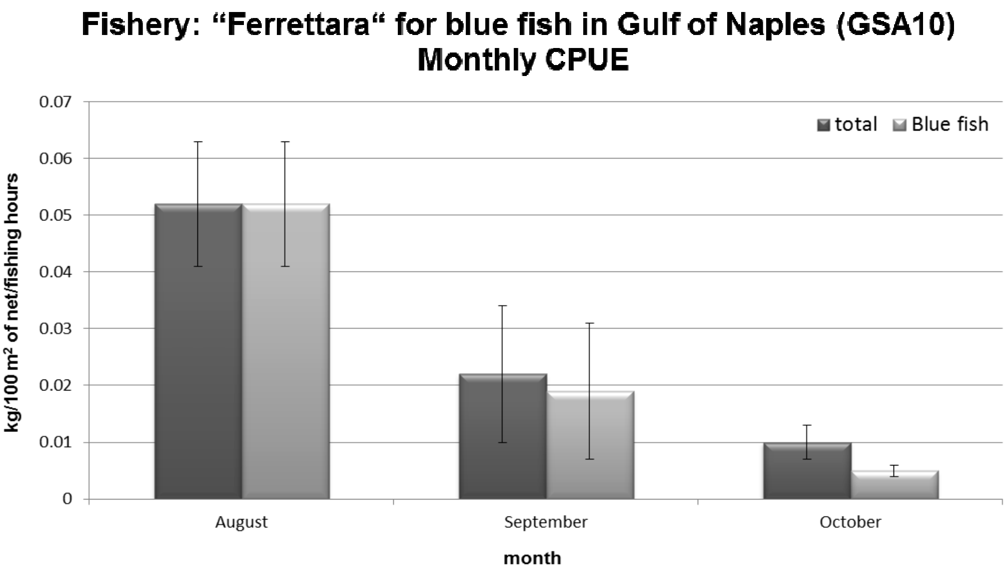


Figure 4.2.118 - "Ferrettara" for bluefish in GSA10. CPUE, expressed as kg/100 m^2 of net/fishing hours (monthly averages; overall monitored period. Grey columns: target species; dark grey columns: all the species caught were landed; bars: the standard deviation.

The biweekly average CPUEs (kg/100 m^2/fishing hours) of bluefish ranged from 0.005 in October to 0.043 in August (Fig. 4.2.119). It was recognized a general decreasing trend from summer to the autumn. The comparison of CPUE of the target species and the total landing shows the same decreasing trend, with an evident increase of the by-catch in the landing in the last period.

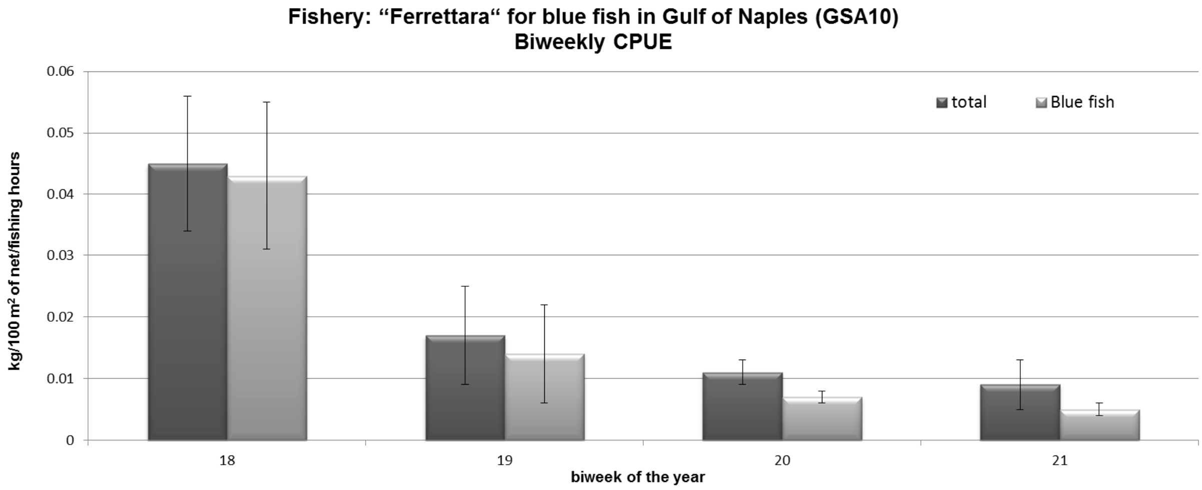


Figure 4.2.119 – "Ferrettara" for bluefish in GSA10. CPUE, expressed as kg/100 m^2 of net/fishing hours (biweekly averages; overall monitored period). Grey columns: target species; dark grey columns: all the species caught were landed; bars: the standard deviation.

In the Figs. 4.2.120 and 4.2.121 the catch rate (kg/fishing day) by month and biweek of *P. saltatrix* and total landings are reported. It is evident a clear decreasing trend of the total landings: from 77 to 12.17 kg per fishing day. The target species shows the same trend from 77 to 6.8 kg per fishing day.

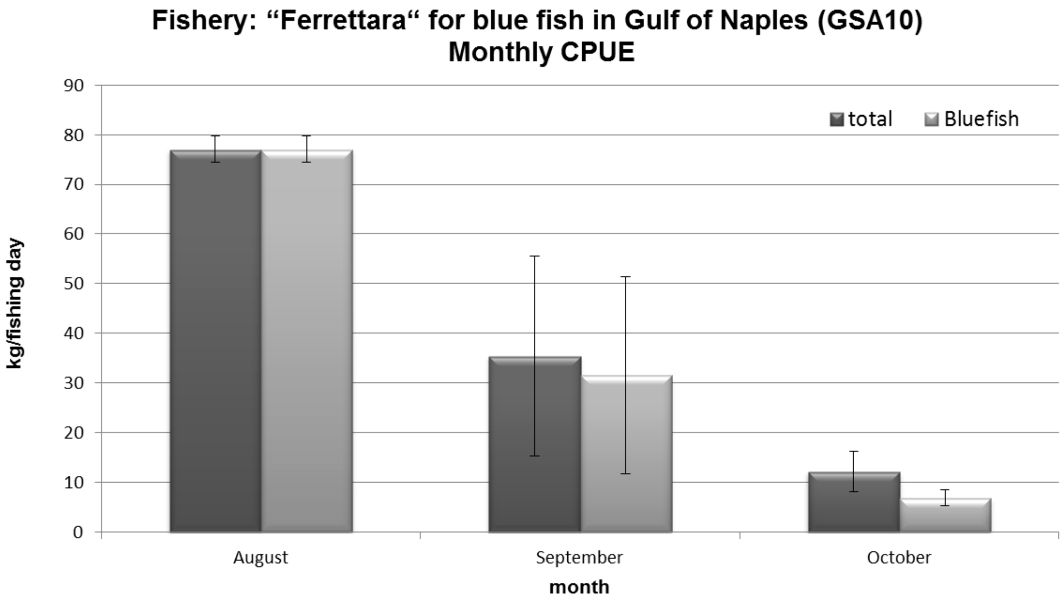


Figure 4.2.120 – "Ferrettara" for bluefish in GSA10. Catch rates, expressed as kg/fishing day (monthly averages; overall monitored period). Grey columns: target species; dark grey columns: all the species caught were landed; bars: the standard deviation.

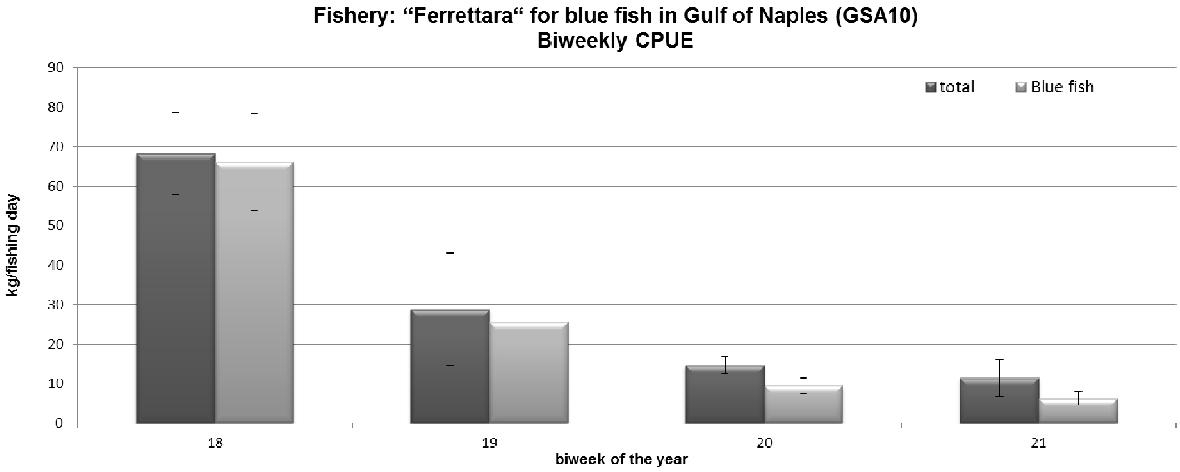


Figure 4.2.121 – "Ferrettara" for bluefish in GSA10. CPUE, expressed as kg/fishing day (biweekly averages). Grey columns: target species; dark grey columns: all the species caught were landed; bars: the standard deviation.

The CPUE values decreased from the end of August to October, because the bulk of the fishing season is in summer. When the yields of the bluefish reach a threshold limit of about 10 kg per fishing day, the fisherman abandon this fishery, and move to more rentable fisheries (e.g. gillnets and/or trammel nets).
As concerns the Length Frequencies Distribution, the Fig. 4.2.122 reports the results for entire sampling period (August-October). Most of the specimens are concentrated in the size classes between 40 and 49 cm TL (about 88% of all specimens). Considering the size of first maturity of 25 cm TL (www.fishbase.org), no specimens were smaller of this limit. So, this fishery, in the sampled period, exploited exclusively adult specimens and this data could represent an indication of the sustainability of this gear. There is no Minimum Conservation Size for this species.
Until now a formalized stock assessment is not available for this species in the Mediterranean Sea. Ungaro *et al*. (2004) and Voliani *et al.* (2006) reported a recent increase in the population abundance of this species in the northern Tyrrhenian Sea and in the southern Adriatic Sea.

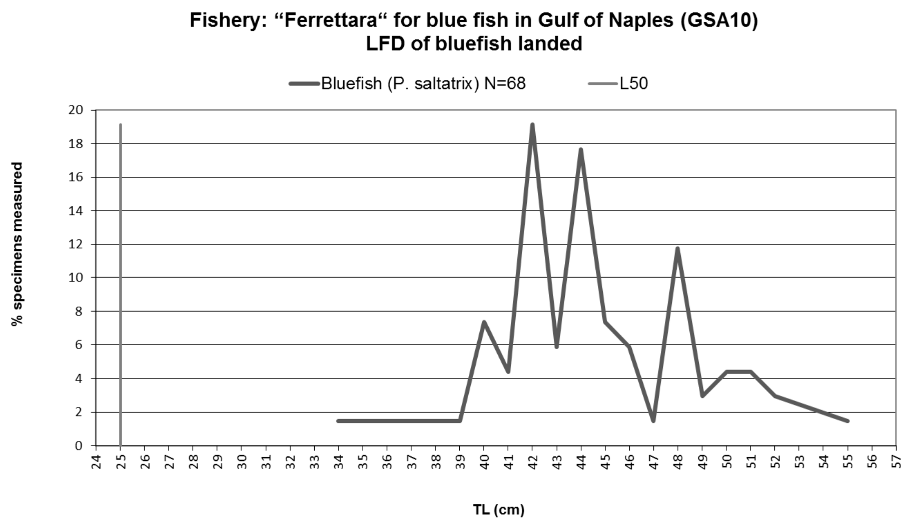


Figure 4.2.122 - "Ferrettara" for bluefish in GSA10. Length frequency distribution of the specimens of *P. saltatrix* measured in the all monitored period. Grey line: size at first maturity (from www.fishbase.org).

GSA 17: "Menaide" for sardine, *Sardina pilchardus*, in northern Adriatic (Fishery 8)

Existing information

In Slovenia a few artisanal vessels are using since several years a “menaide” small driftnet targeting sardine, *S. pilchardus.* This fishery is practised in a restricted period of the year, essentially in April and May

This fleet is monitored since 2005 under the DCF protocols. Thanks to the availability of the colleagues of the Fishery Research Institute of Slovenia, some information from this fishery was gathered, mostly for the period 2005-2012. In addition, during DRIFTMED contract, direct measurements of the small driftnets in use by this fishery nets were made. The number of vessels involved in this fishery was little and highly variable year by year ranged from 1 to 7 in the period 2005-2013 (Tab. 4.2.9).

Tab. 4.2.9 – Number of vessels involved in the “menaide” fishery in Slovenia (GSA17), in the years 2005-2013.

Year	Harbor	Vessels
2005	Koper	6
	Izola	1
2006	Koper	4
2007	Koper	2
	Izola	1
2008	Koper	3
	Izola	1
2009	Koper	2
2010	Koper	1
2011	Koper	1
	Izola	1
2012	Izola	1
2013	Izola	1

This fishery is practised in a restricted period of the year, essentially in April and May, where about 98% of the fishing trips were carried out (period 2005-2012, Fig. 4.2.123).

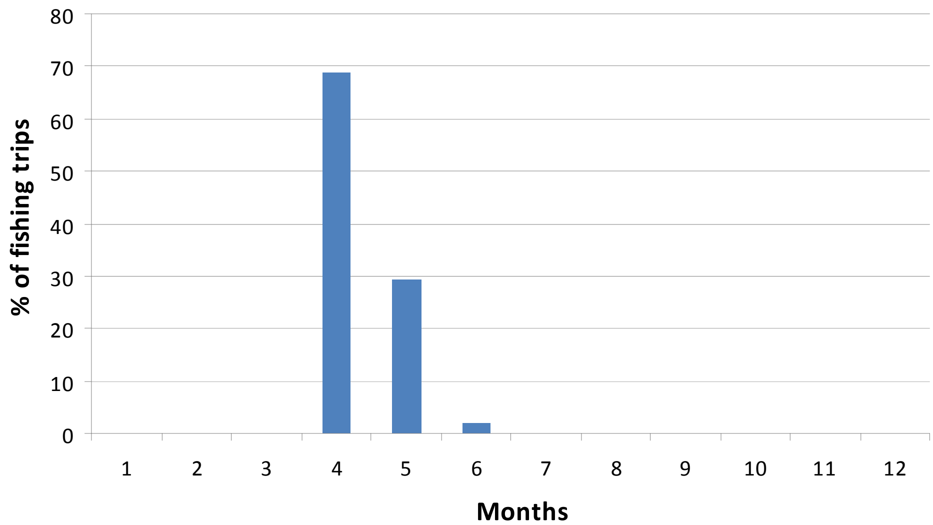


Figure 4.2.123 – “Menaide” fishery in Slovenia (GSA17). Monthly percentage of fishing trips carried out over the period 2005-2012.

The small driftnets used were characterized by an average mesh size of 34.4 mm, average length of 418 m and average drop of 21 m.

The catches are dominated by the sardine that, in the period of highest activity (April-May) accounted for more then 90% of the total biomass caught (Fig. 4.2.124); by-catch is composed by several species, with *Spicara flexuosa* and *Merlangius merlangus* the most represented ones (Fig. 4.2.125).
Discard was not reported, as well as the presence of specimens of sensitive/endangered species or species included in the Annex VIII.

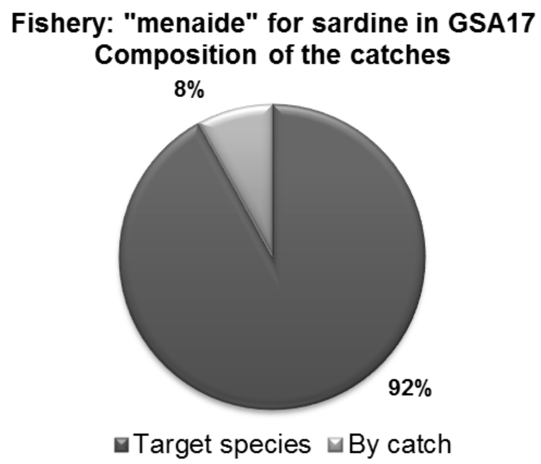


Figure 4.2.124 – Composition of the catch of the “menaide” for sardine, northern Adriatic Sea (GSA 17); period 2005-2012.

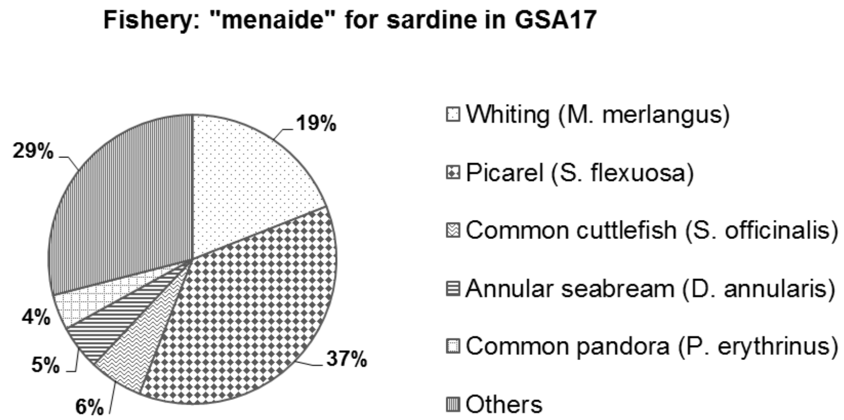


Figure 4.2.125 – By-catch composition of the “menaide” for sardine, northern Adriatic Sea (GSA 17); period 2015-2012.

As concerns the annual landings of sardine, according to the DCF data, the values for the period 2005-2011 ranged from a minimum of 0.3 tons in 2009 to a maximum of 4.1 tons in 2005, without evident temporal trends (Fig 4.2.126). These differences are due to the different activity (fishing days) year by year.
The CPUE (kg/fishing day) are more similar over time: the range from 25.8 kg/fishing day in 2009 to 76.6 kg/fishing day in 2005 (Fig. 4.2.127).

No data on length frequency distribution of sardine were available.
During the interviews realized in Slovenia with the fishermen involved in the "menaide" fishery for sardine, the presence of two more vessels in Trieste (Italy, very close to the Slovenian harbours) performing the same fishery was noticed. It was reported that these additional vessels displayed the same characteristics of the Slovenian ones, in terms of seasonality and gears employed.

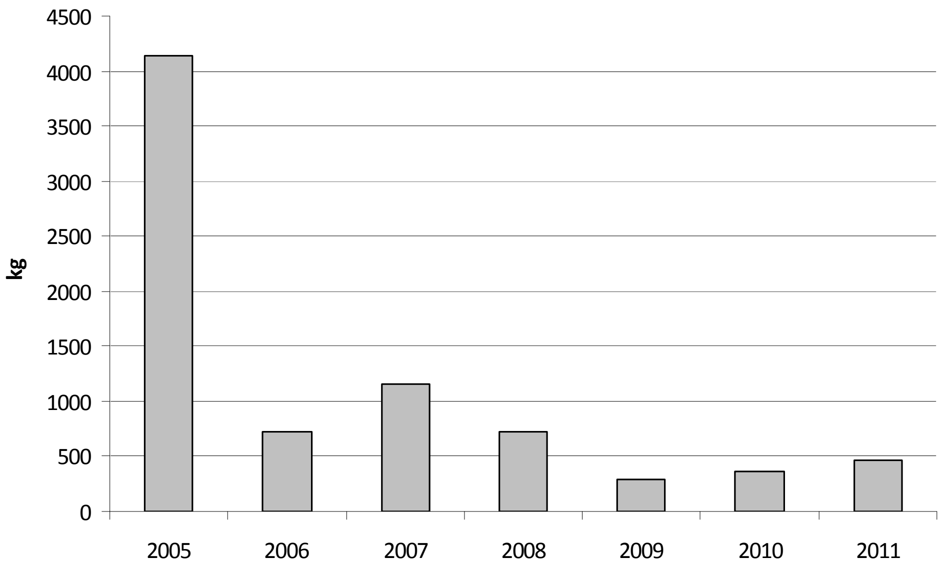


Figure 4.2.126 – Landings (kg) of sardine obtained by the “menaide” fishery for sardine, Northern Adriatic Sea (GSA 17). Source: DCF data.

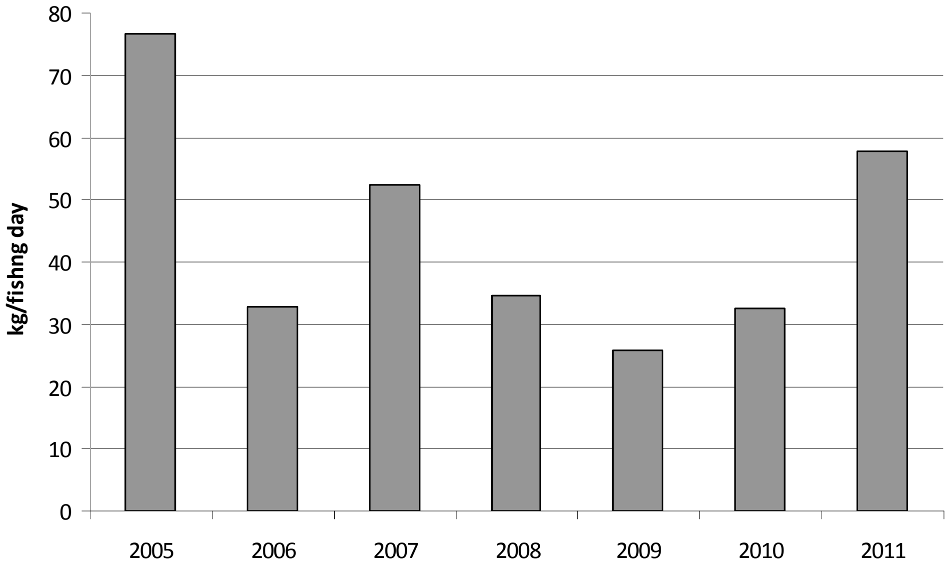


Figure 4.2.127 – CPUE of sardine obtained by the “menaide” fishery for sardine, northern Adriatic Sea (GSA 17). Source: DCF data.

GSA 16:"Menaide" or "tratta" for anchovy, *Engraulis encrasicolus*, and sardine, *Sardina pilchardus*, in Selinunte (Fishery 9)

During the field data collection carried out in Sicily, it was recognised the presence of a little SSD fishery in the south-western coast of Sicily, namely in Selinunte harbour (GSA16). A few (5) vessels were identified as performing the locally called "menaide" or "tratta" fishery targeting anchovy and sardine. This fishery is strictly seasonal, being performed from May to September.

At the end of September 2013, interviews with the 5 crews involved in this fishery were realised, in order to gather some information. The "menaide" or "tratta" fishery have characteristics rather similar to the "menaide" fisheries identified in other areas, as in GSAs 10 and 19.
According to the interviews realised, the average number of fishing days carried out per vessels by the fishery of Selinunte in 2013 was 33. All the 5 vessels are small-scale, with LOA less than 10 m.
The nets employed had an average length of 200 m, and an average drop of 21 m; the average mesh size was 20 mm.
The fishing activity was performed during the night, on a fishing ground close to the harbour of Selinunte, having an average depth of 20 m; the average soaking time was reported of approximately 2 hours.
The interviewed fishermen reported that the catch is almost entirely composed by anchovies and sardines, by catch and discards were noticed as negligible. No catches of specimens of sensitive/protected species were declared, as well as of species included in the Annex VIII.
Unfortunately, it was impossible to collect information on landings, catch rates and size structure of the target species.

4.3 – TECHNICAL CHARACTERISTICS OF THE SMALL-SCALE DRIFTNETS IDENTIFIED

The content of this paragraph is also reported in the **Deliverable 11** ("Overview of the technical aspects of the gears used by the SSD fisheries in Mediterranean ").

.

SMALL DRIFTNETS: NETTING TWINE TYPOLOGY

According to the International Organization for Standardization (ISO), netting is defined as "*a meshed structure of indefinite shape and size, composed of one yarn or of one or more systems of yarns interlaced or joined […]*". The term yarn is a general textile term covering all types and structures of linear textile products. The raw material of the netting of driftnets (as fishing net in general) consists of synthetic fibres. This kind of fibres is represented by man-made fibres which are produced entirely by chemical synthesis and appear uniform, continuous, with high breaking strength and resistant against rotting (Klust, 1983). Among the synthetic fibres, polyamide fibres (PA) are the most common in fishing netting (considering net panel and not headline or leadline which can be in PP or other synthetic fibres). The following netting twines have been identified in the small-scale driftnets measured during DRIFTMED project.

Monofilament

The term of monofilament, in the proper sense, means a twine composed of a single yarn or single filament which is strong enough to function alone as a yarn without having to undergo further processing (Fig. 4.3.1). In practice, this is a term covering coarse filaments with large diameter (e.g. 0.1 mm and more) and stiffness, giving wiry character (Klust, 1983). Transparent PA monofilaments with 0.2 – 0.35 mm twine diameter are commonly used in monofilament driftnets (e.g. "ricciolara", "occhiatara").

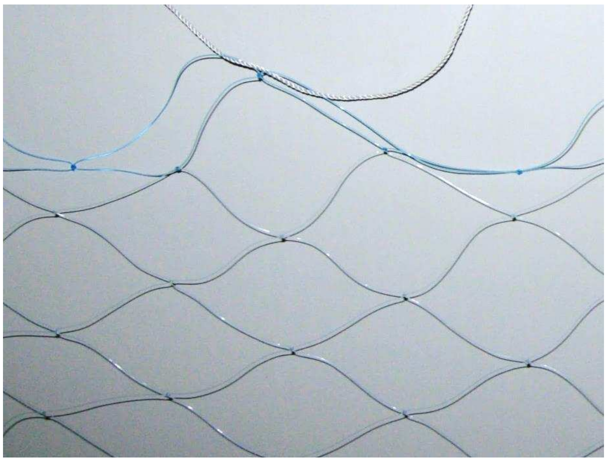


Figure 4.3.1 - Detail of a monofilament twine observed during the direct measurements.

Twisted twine

The twisted twine or spun yarn is the twine composed of two or more yarns twisted together (Fig. 4.3.2). For instance the menaide net is always composed by a twine having a titre of 210 x 2 denier; this means that each twine is composed by two yarns.

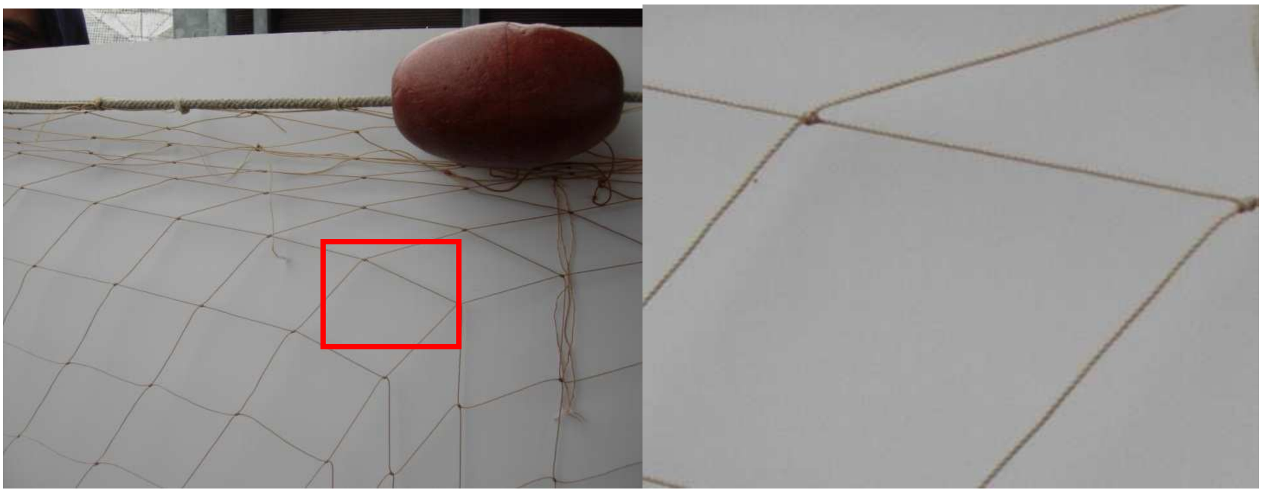


Figure 4.3.2 - Twisted twine or spun yarn used in a "bisantonara" net used in Liguria.

Multimonofilament

The multimonofilament is rarely used both in small-scale driftnet and gillnet. The multimonofilament is a twine composed of two or more monofilament yarns twisted together (Fig. 4.3.3).

Figure 4.3.3 - Detail of multimonofilament used in small-scale driftnets.

BREAKING STRENGTH

The twine thickness (diameter or denier) is considered as an important parameter that strongly influences the entanglement of sensible marine animals, such as turtles and mammals. It is well known that marine mammals are often able to tear out the netting when attempting to feed the fish entrapped. In the case of driftnets, marine mammals, as also for swordfish and other pelagic species, are often entrapped in the netting starting from the tail peduncle. Therefore in these cases the twine breaking strength is a key factor to take in consideration, together with some other technical parameters such as the mesh opening.
Therefore during the DRIFTMED study an investigation on the relationship between twine thickness and breaking strength was undertaken in order to provide an idea of the force needed to break the twine used in small-scale driftnet. In theory, a marine mammals should be able to apply to the nets a certain force to break the netting panel. There is a proportionality between twine thickness and breaking strength; this means that the breaking strength increase with twine thickness.

In the case of twisted netting yarn made of polyamide continuous filaments, experimental test carried out by Klust (1983) enabled us to calculate the following model that makes a relation between Rtex and breaking strength (Fig. 4.3.4).

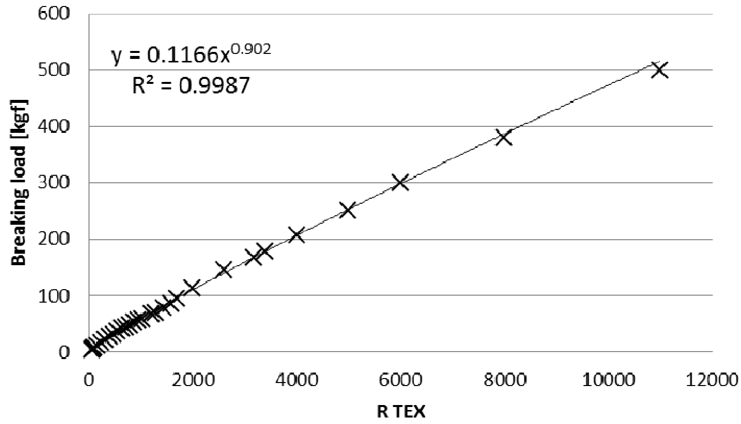


Figure 4.3.4 - Exponential model showing the relation between Rtex and breaking strength in wet conditions for knotted twisted netting yarn made of polyamide continuous filaments.

The model coefficients were finally used to estimate the breaking strength of the polyamide twisted netting yarn commonly used in the small-scale driftnets (Tab. 4.3.1).

Table 4.3.1 - Breaking strength estimated for knotted twisted netting yarn made of polyamide continuous filaments in wet conditions. Td: Titre in denier.

Td	Num twine	Tex [g/1000 m]	R Tex [g/1000 m]	Estimated diameter [mm]	Estimated breaking strength [kgf]
210	2	46.62	55.44	0.24	4.36
210	3	69.93	83.16	0.30	6.29
210	4	93.24	110.88	0.35	8.15
210	5	116.55	138.6	0.40	9.97
210	6	139.86	166.32	0.44	11.75
210	7	163.17	194.04	0.48	13.50
210	8	186.48	221.76	0.51	15.23
210	9	209.79	249.48	0.54	16.94
210	10	233.1	277.2	0.58	18.63
210	11	256.41	304.92	0.61	20.30
210	12	279.72	332.64	0.63	21.95
210	15	349.65	415.8	0.71	26.85
210	18	419.58	498.96	0.79	31.65
210	21	489.51	582.12	0.85	36.37
210	24	559.44	665.28	0.92	41.02

Regarding the monofilament twine, the data obtained from the review of Klust (1983; Tab. 4.3.2) enabled us to calculate the following model that correlates the twine diameter and the breaking strength (Fig. 4.3.5).

Table 4.3.2 - Breaking strength for knotted single polyamide monofilaments in wet conditions (Klust, 1983).

Tex [g/1000 m]	Nominal Diameter [mm]	Breaking strength [kgf]
11	0.10	0.8
16	0.12	1.1
23	0.15	1.5
30	0.18	1.9
44	0.20	2.8
58	0.25	3.5
90	0.30	5.4
120	0.35	7.2
155	0.40	8.8
185	0.45	11.0
240	0.50	13.0
280	0.55	15.0
330	0.60	17.5
480	0.70	25.0
600	0.80	30.0
755	0.9	38.0
920	1	44.0

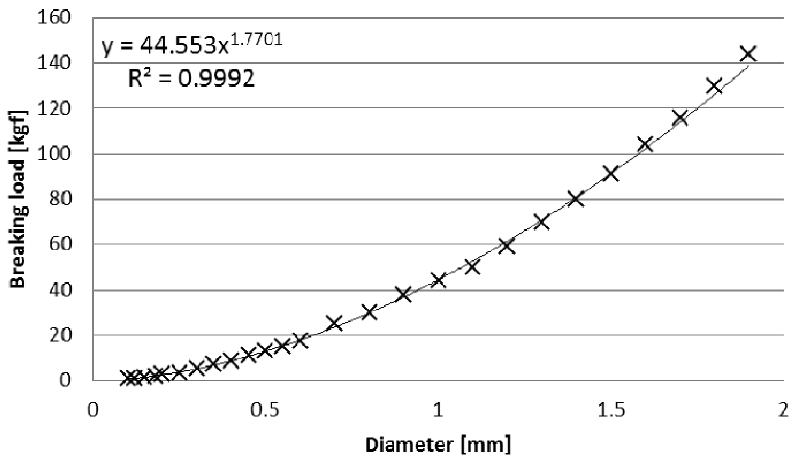


Figure 4.3.5 - Exponential model showing the relation between twine diameter and breaking strength in wet conditions for knotted single polyamide monofilaments.

GEAR PROPERTIES

The main technical gear properties of each type of small-scale driftnet have been summarized in Tab. 4.3.3. Some more detailed information has been reported in Tab 4.3.4.

Table 4.3.3 - Main gear parameters of the small-scale driftnets investigated. Min: minimum recorded value; Max: maximum recorded value; Mean: mean computed value.

	Net ype	Menaide 1	Menaide 2	Occhiatara	Ricciolara 1	Ricciolara 2	Alacciara	Palamitara	Bisantonara	SSD BLUEFISH	Sgomberara	Bogara
	Target species	*Engraulis encrasicolus*	*Sardina pilchardus*	*Oblada melanura*	*Seriola dumerilii*	*Seriola dumerilii*	*Sardinella aurita*	*Sarda sarda*	*Auxis rochei*	*Pomatomus saltatrix*	*Scomber spp, Trachurus spp*	*Boops boops*
Mesh opening [mm]	**Min**	19.0	34.0	70.0	74.0	70.0		88.0	70.0	88.0	70.5	60.0
	Max	29.0	35.0	90.0	110.0	70.0		112.0	100.0	88.0	85.0	60.0
	Mean	**24.7**	**34.3**	**79.4**	**89.0**	**70.0**	**67.0**	**102.0**	**84.9**	**88.0**	**80.2**	**60.0**
Vertical number of meshes	**Min**	800.0	600.0	150.0	70.0	300.0		300.0	400.0	300.0	400.0	300.0
	Max	1200.0	1200.0	500.0	100.0	300.0		400.0	500.0	300.0	500.0	300.0
	Mean	**1028.6**	**750.0**	**243.8**	**80.0**	**300.0**	**500.0**	**365.0**	**475.0**	**300.0**	**433.3**	**300.0**
Fictitous net drop [m]	**Min**	20.8	20.4	11.3	5.8	21.0		30.5	35.0	26.4	28.2	18.0
	Max	26.4	40.8	36.0	7.7	21.0		44.0	44.0	26.4	42.5	18.0
	Mean	**24.2**	**25.5**	**18.2**	**7.0**	**21.0**	**32.0**	**35.9**	**40.0**	**26.4**	**34.9**	**18.0**
Real net drop [m]	**Min**	10.8	9.0	7.4	2.9	-		8.7	8.0	-	-	-
	Max	16.9	23.9	24.2	6.2	-		22.3	16.6	-	-	-
	Mean	**13.9**	**13.8**	**12.9**	**5.0**	**-**	**6.0**	**13.2**	**13.9**	**-**	**-**	**-**
Net length [m]	**Min**	150.0	120.0	375.0	100.0	800.0		300.0	400.0	2400.0	500.0	600.0
	Max	500.0	1050.0	500.0	150.0	1000.0		1600.0	1200.0	2450.0	1500.0	700.0
	Mean	**336.3**	**397.5**	**437.5**	**123.3**	**900.0**	**600.0**	**716.7**	**606.3**	**2425.0**	**921.4**	**633.3**
Hanging ratio (headrope)	**Min**	0.72	0.81	0.62	0.59	-		0.72	0.90	-	-	-
	Max	1.00	0.90	0.83	0.87	-		0.97	1.00	-	-	-
	Mean	**0.84**	**0.85**	**0.70**	**0.68**	**-**	**0.98**	**0.91**	**0.95**	**-**	**-**	**-**
Twine diameter [mm]	**Min**	0.24	0.24	0.25	0.20	0.30		0.25	0.30	0.54	0.30	0.20
	Max	0.24	0.24	0.35	0.58	0.30		0.63	0.44	0.54	0.30	0.20
	Mean	**0.24**	**0.24**	**0.28**	**0.34**	**0.30**	**0.35**	**0.45**	**0.35**	**0.54**	**0.30**	**0.20**
Rigging	**D; T90**	T90	T90	T90; D	T90; D	T90	T90	T90	T90	T90	T90	T90

Table 4.3.4 - Technical properties of the driftnets measured during the DRIFTMED project. HHR: horizontal hanging ratio; VHR: vertical hanging ratio.

Filename	Geographical Sub-Areas	Name	Net length [m]	NETTING PANEL															HEADLINE			LEADLINE	
				Netting twine							Height					Hanging Ratio							
				Material	Type	Color	Titre Denier [den]	N yarn	R TEX	Diameter [mm]	No. Meshes (Vertical)	Fictious [m]	Real Drop [m]	Mesh opening (gauge) [mm]	Mesh lenght [mm]	Rigging	HHR	VHR	Diameter [mm]	No Floats [N/m]	Volume liter	Diameter [mm]	Weight [g/m]
ITA_CHIAVARI_1	GSA09	Palamitara-Ricciolara	300	PA	Monofilament	transparent/azure				0.35	400	40	11.20	105	100	T90	0.96	0.28	6	5.00	0.07-0.17	6	70
ITA_NERVI_1	GSA09	Palamitara-Ricciolara	800	PA	Multifilament	yellow/ochre	210	8	221.76	0.51	300	33	12.13	112	110	T90	0.93	0.37	2	1.00	0.23	2.8	40
ITA_NERVI_1	GSA09	Palamitara-Ricciolara	800	PA	Multifilament	yellow/ochre	210	8	221.76	0.51	400	44	16.17	112	110	T90	0.93	0.37	2	1.00	0.23	2.8	40
ITA_LOANO_1	GSA09	Palamitara	400	PA	Monofilament	transparent/azure			0.00	0.25	390	32	22.26	90	82	T90	0.72	0.70	6	5.00	0.05 - 0.09	6	80
ITA_LOANO_2	GSA09	Palamitara	400	PA	Multifilament	ochre	210	6	166.32	0.44	350	36	8.68	105	102	T90	0.97	0.24	5	0.90	0.28	5	80
ITA_CATANIA_1	GSA19	Palamitara	1600	PA	Multifilament	red	210	12	332.64	0.63	350	30	8.83	88	87	T90	0.96	0.29	5.7	1.38	0.24	8.4	150
ITA_TONNARELLA_1	GSA10	Bisantonara/Palamitara	400	PA	Monofilament	Azure				0.30	500	40	16.05	84	80	T90	0.916	0.40	4	1.11	0.18	5	70
ITA_TONNARELLA_2	GSA10	Bisantonara/Palamitara	400	PA	Monofilament	Light green				0.30	500	40	16.05	97	80	T90	0.916	0.40	4	1.11	0.18	5	70
ITA_TONNARELLA_3	GSA10	Bisantonara/Palamitara	400	PA	Multifilament	Red	210	4	110.88	0.35	500	40	7.96	101	80	T90	0.98	0.20	4	1.11	0.18	5	70
ITA_TONNARELLA_4	GSA10	Bisantonara/Palamitara	400	PA	Multimonofilament	Green/Grey				0.30	500	44	-	106	88	T90	1.00	0.00	4	1.11	0.18	5	70
ITA_PORTICELLO_1	GSA10	Bisantonara/Palamitara	750	PA	Monofilament	White				0.25	500	35	10.71	73	70	T90	0.95	0.31	3	1.11	0.18	5.5	70-80
ITA_PORTICELLO_2	GSA10	Bisantonara/Palamitara	500	PA	Multifilament	Brown	210	4	110.88	0.35	500	43	15.81	86	86	T90	0.93	0.37	3	1.02	0.15	5.5	70-80
ITA_S'AGATA_1	GSA10	Bisantonara/Palamitara	1200	PA	Multifilament	red	210	6	166.32	0.44	400	38	16.64	96	95	T90	0.90	0.44	5	0.90	0.15 - 0.28	5	80
ITA_S'AGATA_2	GSA10	Bisantonara/Palamitara	800	PA	Multifilament	Red	210	6	166.32	0.44	400	40	-	104	100	T90	1.00	0.00	5	0.90	0.15 - 0.28	5	80
ITA_PALINURO_2	GSA10	Ricciolara	120	PA	Multifilament	yellow/ochre	210	10	277.20	0.58	70	6	2.86	83	-	T90	0.87	0.49	5.6	0.72	0.09	5.4	180
ITA_PALINURO_3	GSA10	Ricciolara	150	PA	Monofilament	transparent				0.25	70	8	6.24	110	110	D	0.59	0.81	7	0.55	0.07	8.5	120
ITA_PALINURO_4	GSA10	Ricciolara	100	PA	Monofilament	transparent				0.20	100	7	5.97	74	74	D	0.59	0.81	6.7	1.08	0.08	6.1	80
ITA_NERVI_3	GSA09	Occhiatara	500	PA	Monofilament	transparent/azure				0.25	200	13.3	7.42	70	66.5	T90	0.83	0.56	3	2.00	0.05	5	35
ITA_BORDIGHERA_1	GSA09	Occhiatara	375	PA	Monofilament	transparent/azure				0.25	150	11.3	8.74	77	75	D	0.63	0.78	6 + 4	1.60	0.15	5	100
ITA_BORDIGHERA_1	GSA09	Occhiatara	375	PA	Monofilament	transparent/azure				0.25	200	15.0	11.65	77	75	D	0.63	0.78	6 + 4	1.60	0.15	5	100
ITA_BORDIGHERA_2	GSA09	Occhiatara	375	PA	Monofilament	transparent/azure				0.25	150	12.6	8.50	90	84	T90	0.74	0.67	5 + 4	1.33	0.13	6	100
ITA_BORDIGHERA_2	GSA09	Occhiatara	375	PA	Monofilament	transparent/azure				0.25	200	16.8	11.34	90	84	T90	0.74	0.67	5 + 4	1.33	0.13	6	100
ITA_BORDIGHERA_3	GSA09	Occhiatara	-	PA	Monofilament	transparent/multi color				-	-	-	-	82	76	D	0.66	0.75	6 + 5	1.00	0.37	7	?
ITA_SANREMO_1	GSA09	Occhiatara	450	PA	Monofilament	azure/violet				0.25	500	36.0	24.19	74	72	T90	0.74	0.67	6 + 3	2.00	0.14	6	80
ITA_SANREMO_2	GSA09	Occhiatara	450	PA	Monofilament	white				0.25	200	15.6	12.23	80	78	D	0.62	0.78	5 + 2	1.66	0.13	5	80
ITA_LOANO_3	GSA09	Occhiatara	400	PA	Multifilament	brown/ochre	210	4	110.88	0.35	350	25.2	17.49	75	72	T90	0.72	0.69	4	1.25	0.26	5	80
ITA_NERVI_2	GSA09	Menaide	150	PA	Multifilament	brown/ochre	210	2	55.44	0.24	900	23.85	-	28	26.5	T90	0.87	0.49	10	2.50	0.05	9	264
ITA_CATANIA_4	GSA19	Menaide	300	PA	Multifilament	white	210	2	55.44	0.24	1200	26	-	22	22	T90	1.00	0.00	4.7	3.57	0.07	5.5	700
ITA_CATANIA_6	GSA19	Menaide	300	PA	Multifilament	white	210	2	55.44	0.24	1200	23	10.83	19	19	T90	0.88	0.47	4.1	3.70	0.07	6.1	600
ITA_MARINA DI PISCIOTTA_1	GSA10	Menaide	450	PA	Multifilament	dark red	210	2	55.44	0.24	800	21	10.99	26	26	T90	0.85	0.53	5.2	2.63	0.05	8	150
ITA_MARINA DI PISCIOTTA_1	GSA10	Menaide	450	PA	Multifilament	dark red	210	2	55.44	0.24	1000	26	13.74	26	26	T90	0.85	0.53	5.2	2.63	0.05	8	150
ITA_PALINURO_1	GSA10	Menaide	500	PA	Multifilament	brown	210	2	55.44	0.24	900	25	14.78	29	28	T90	0.81	0.59	5.2	2.63	0.05	8.8	150
ITA_MARINA DI CAMEROTA_1	GSA10	Menaide	300	PA	Multifilament	dark red	210	2	55.44	0.24	900	24	16.86	27	27	T90	0.72	0.69	5	3.33	0.07	8	160
ITA_CATANIA_2	GSA19	Menaide	240	PA	Multifilament	white	210	2	55.44	0.24	1200	24	16.14	20.6	20	T90	0.74	0.67	6.4	3.70	0.07	5.2	600
ITA_CATANIA_5	GSA19	Menaide	300	PA	Multifilament	white	210	2	55.44	0.24	1200	41	23.87	34	34	T90	0.81	0.59	4.7	3.57	0.07	5.5	500
SLO_KOPER_1	GSA17	Menaide	1050	PA	Multifilament	ochre	210	2	55.44	0.24	600	20	9.02	35	34	T90	0.90	0.44	5.2+5.2	2.20	0.05	5.2+5.2	180
SLO_IZOLA_1	GSA17	Menaide	120	PA	Multifilament	ochre	210	2	55.44	0.24	600	20	11.07	34.3	34	T90	0.84	0.54	4.5+4.5	2.08	0.05	4.5+4.5	180
SLO_IZOLA_2	GSA17	Menaide	120	PA	Multifilament	ochre	210	2	55.44	0.24	600	20	11.07	34	34	T90	0.84	0.54	4.8+3.5	2.08	0.05	4.8+3.5	180
ITA_TONNARELLA_5	GSA10	Alacciara	600	PA	Multifilament	Red	210	4	110.88	0.35	500	32	6.04	67	64	T90	0.98	0.19	5	1.78	0.15	4.5	120
Interview	GSA10	Ricciolara	800	PA	Monofilament					0.30	300	21	-	70	70	T90							
Interview	GSA10	Ricciolara	1000	PA	Monofilament					0.30	300	21	-	70	70	T90							
Interview	GSA10	Serratara	2450	PA	Multifilament		210	9	249.48	0.54	300	26	-	88	88	T90				1.14			100
Interview	GSA10	Serratara	2400	PA	Multifilament		210	9	249.48	0.54	300	26	-	88	88	T90				1.14			100
Interview	GSA10	Sgomberara	1000	PA	Multifilament	transparent				0.30	400	28	-		70.5								
Interview	GSA10	Sgomberara	500	PA	Monofilament	transparent				0.30	400	34	-		85								
Interview	GSA10	Sgomberara	1000	PA	Monofilament	transparent				0.30	500	43	-		85								
Interview	GSA19	Bogara	600	PA	Monofilament	RED				0.20	300	18	-		60								
Interview	GSA19	Bogara	700	PA	Monofilament	RED				0.20	300	18	-		60								
Interview	GSA19	Bogara	600	PA	Monofilament	BLUE				0.20	300	18	-		60								

"MENAIDE" NET (Fig. 4.3.6)

TARGET SPECIES:

Anchovy: *Engraulis encrasicolus*

Sardine: *Sardina pilchardus*

This type of small driftnet is commonly used to target small pelagic species. In particular two main net typologies have been identified: "menaide" used to target anchovies (*E. encrasicolus*) and, less commonly, "menaide" to target sardines (*S. pilchardus*). In Slovenia, the "menaide" nets are only used to target sardines. Active "menaide" fisheries were identified in GSA10, 16, 17 and 19. "Menaide" nets are commonly operated by small vessels (GT: 1.3 – 4.9; LOA: 5.2 – 11.5 m; Engine power: 18 – 79 kW; Crew: 1 -2 up to 4). The two types of net are similar as rigging and technical features (Tab. 3), even if the mesh opening used to target the sardine (34.3 mm on average) is greater than the mesh opening commonly used to target anchovy, normally between 19 and 29 mm (24.7 mm on average). Technical properties of the nets are similar independently from the GSA area investigated.

The "menaide" targeting anchovies has a mean fictitious net drop of about 24.5 m (ranging from 20.8 to 26.4 m); while the "menaide" targeting the sardines have a net drop of 26 m (ranging from 20.4 to 40.8 m). The "menaide" nets used in Slovenia have a height of 20-21 m. The mean real net drop of both menaide nets was around 14 m. The twine thickness, always really thin, is practically the same for all nets (titre 210 x 2 denier which can be transformed to a twine diameter of about 0.24 mm). A strength of around 4 kgf can be enough to break this type of twine in wet conditions (Tab. 4.3.1).

The hanging ratio is high in all the nets measured ranging from 0.72 and 1.00.

Technical properties of the "menaide" nets are practically the same in the different fisheries investigated.

The net rigging is always T90. The real net drop during fishing operation calculated for this type of net could be around 14 m.


Figure 4.3.6 - "Menaide" for anchovies (left) and for sardines (right).
A slight difference in the mesh opening can be observed.

"OCCHIATARA" NET (Fig. 4.3.7)

TARGET SPECIES:

Saddled seabream

Oblada melanura

This type of small driftnet is largely and traditionally used in the GSA9 (Northern Tyrrhenian Sea and Ligurian Sea) for the catch of saddled seabream (*O. melanura*) and, to a less extent, for the catch of some other pelagic species (*B. boops, Liza* sp.*, Trachurus* sp.*, Scomber* spp.).
The technical properties of these nets were always similar, independently from fishing harbour and vessel (Tab. 4.3.3).
The mesh opening used to target the saddled seabream ranges from 70 to 90 mm (Tab. 4.3.3.) and the twine diameter was commonly equal to 0.25 mm (monofilament material, 0.28 mm on average). A strength of around 3.5 kgf can be enough to break this type of twine in wet conditions (Tab. 4.3.2).
The fictitious net drop usually ranged from 11.3 to 25.2 m (only one net had a fictitious net drop of 36 m). The real net drop, while the net is fishing, was calculated to range between 7.4 and 24.2 m (12.9 m on average). The hanging ratio was usually comprised between 0.62 and 0.83 (0.70 on average). The length of the nets investigated ranged from 375 to 500 m.
Both T90 and Diamond mesh rigging configuration was found.

Figure 4.3.7 - "Occhiatara" net measured at Bordighera fishing harbour (GSA9).

"RICCIOLARA" NET (Fig. 4.3.8)

TARGET SPECIES:

Greater Amberjack

Seriola dumerili

This type of small driftnet is traditionally used in the GSA10 (Southern Tyrrhenian Sea) for the catch of greater amberjack (*Seriola dumerili*) especially in the late summer early autumn period. "Ricciolara" nets were measured in Cilento area, even though in the investigated period the fishermen did not use this gear, and in northern Sicily. In the two areas the nets showed slight technical differences.

Ricciolara type 1

In Cilento area the fishermen are used to target the greater amberjack with nets that differ in their meshes: mesh opening increases with Greater amberjack dimensions, from late summer (mesh opening 74 mm) to autumn (mesh opening 100 mm or even more; Tabs. 4.3.3 and 4.3.4). The net used to target the greater amberjack in this area is usually made of monofilament with a diameter of 0.20 – 0.25 mm. A twisted twine netting was also used having a titre of 210x10 (twine diameter around 0.58 mm).

The fictitious net drop usually ranges from 6 to 8 m and the net rigging detected was both in diamond and T90 configuration. The real net drop (while fishing) could range (the value is calculated) between 3 and 6 m.

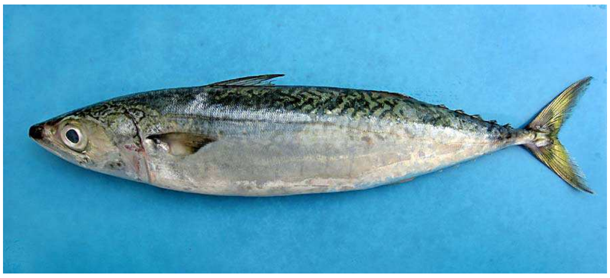
The hanging ratio is about 0.59 and 0.87 (0.68 on average) with the diamond and T90 rigging respectively.
These nets, a part the T90 configuration, were similar to a common gillnet.

Figure 4.3.8 - "Ricciolara" nets measured during DRIFTMED project; the mesh opening increases during the fishing season according to the growth of greater amberjack.

<u>Ricciolara type 2</u>
This type of "Ricciolara" net is commonly used in the North of Sicily from late Summer-Autumn. It was possible to collect information about this type of net only through interviews. The technical properties of this net are reported in Tab. 4.3.3.
The mesh opening used to target the greater amberjack is around 70 mm and the twine diameter is commonly equal to 0.30 mm (polyamide monofilament material), the fictitious net drop is around 21 m. A strength of around 5 kgf can be enough to break this type of twine in wet conditions (Tab. 4.3.2).
The observed mesh rigging is the T90 configuration. About 800-1000 m of net are commonly used.

"SGOMBERARA" OR "SGOMBETARA" NET

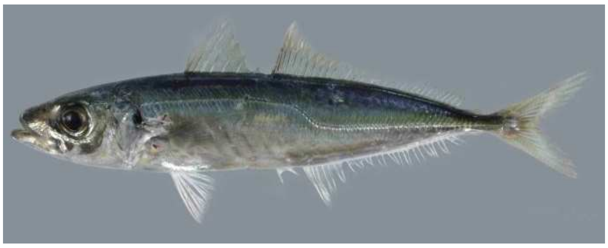
TARGET SPECIES:



Chub mackerel

Scomber colias

Common mackerel
Scomber scombrus



Horse and Mediterranean mackerels

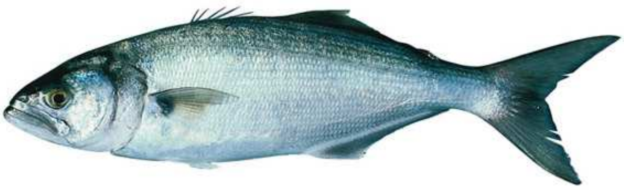
Trachurus spp.

In the northern of Sicily the fishermen are used to target mackerels and, rarely, other pelagic species, with a specific small-scale driftnet.
The main gear properties of this type of net can be briefly summarized as follows (Tab. 4.3.3)

- the mesh opening is usually comprised between 70.5 and 85 mm (80. 2 mm on average);
- the fully extended net height ranges from 28.2 to 42.5 m (34.9 m on average);
- from 500 to 1500 m of net can be set by each vessel in this area;
- the twine is usually a polyamide transparent monofilament with 0.30 mm of diameter; a marine mammals or a turtle entangled in the net should be able to apply a weak strength of about 5 kgf to break the netting twine (Tab. 4.3.2).
- the meshes are rigged in T90 configuration.

"FERRETTARA" FOR BLUEFISH

TARGET SPECIES:



Bluefish

Pomatomus saltatrix

This type of small-scale driftnet was recently introduced in Gulf of Naples, GSA10. Technical data relating to the gear have been collected through interviews.
The main gear properties of this type of net can be briefly summarized as follow (Tab. 4.3.3):

- the mesh opening is around 88 mm;
- 300 meshes are usually rigged from leadrope to headrope for a fictitious net drop of about 26.4 m;
- the net length of the investigated gear was around 2400 m ;
- a polyamide twisted twine is used having a titre equal to 210 x 9 (around 0.5 mm); a strength of around 16 kgf can be enough to break this type of twine in wet conditions (Tab. 4.3.1).
- the meshes are rigged in T90 configuration.

OTHER SMALL-SCALE DRIFTNETS

Other small-scale driftnets have been identified during DRIFTMED project, some of which are widely used in the past years, but, due to the enforcement of controls, their current use is currently reduced. In the investigated period it was not possible to detect active fisheries using these gears.
The technical gear parameters of these nets were collected and presented in Tab. 4.3.3.
It should be noticed that the local name that fishermen assign to certain small driftnets often does not reflects appreciable differences in the technical properties and it is not necessarily linked to the target species.
To this reason the driftnet called "palamitara" does not exclusively indicate as target species the Atlantic bonito ("palamita" in Italian), a species included in the Annex VIII ant therefore not authorised, but often it refers to a net that is locally used to target the Greater amberjack (*Seriola dumerili*) which is authorised.

“ALACCIARA” NET

TARGET SPECIES:

Round sardinella

Sardinella aurita

Technical gear parameters of small-scale driftnet targeting the Round sardinella (*Sardinella aurita*) have been collected. Some other pelagic species can be caught with this net. In fact the main gear properties of this type of net are similar to the net called "sgomberara" (Tab. 4.3.3):

- the mesh opening is around 67 mm;
- 500 meshes are usually rigged from leadrope to headrope for a fictitious net drop of about 32 m;
- the computed real net drop (6 m) seems to be really low if compared with the fictitious net drop; this was mainly because the horizontal hanging ratio, that strongly influence the real net drop, was really high (0.98);
- the net length of the investigated gear was around 600 m;
  a polyamide twisted twine is used having a titre equal to 210 x 4 (around 0.35 mm); a strength of around 8 kgf can be enough to break this type of twine in wet conditions (Tab. 4.3.1). The meshes are rigged in T90 configuration.

“PALAMITARA” NET (Fig. 4.3.9)

TARGET SPECIES:

Atlantic bonito

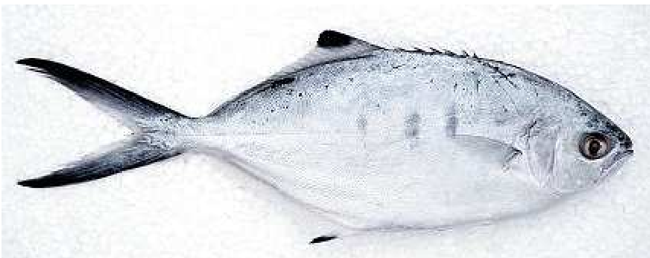
Sarda sarda

Greater amberkack
Seriola dumerili

Little tunny

Euthynnus alletteratus

Bullet tuna
Auxis rochei



Pompano
Trachinotus ovatus

During the investigation some fishermen of GSA9, 10 and 19 declared to use, especially in the past, this type of small-scale driftnet to target the Atlantic bonito (*S. sarda*) and some other

medium sized pelagic species such as the greater amberjack (*S. dumerili*), the little tunny (*E. alletteratus*), the frigate tuna (*A. thazard*), the bullet tuna (*A. rochei*), the pompano (*T. ovatus*).
The main differences between this type of net and the other small-scale driftnets can be identified in the mesh opening and twine diameter, which are usually greater than what it was measured for the other nets (Tab. 4.3.3).
The mesh opening used to target the Atlantic bonito ranges from 88 to 112 mm (102 mm on average, that is slightly over the minimum mesh size established in Italy for this type of nets; Tab. 2); the use of such a meshes also implies the catch of smaller pelagic species such as the Atlantic chub mackerel (*S. colias*). The fictitious net drop usually ranges from 30 to 44 m (35.9 m on average) even if the real net drop seems to be quite low (9-22 m).
A polyamide twisted twine netting is commonly used having a titre comprised between 210x6 and 210x12 (0.2-0.6 mm of diameter, estimated). A marine mammal or a turtle entangled in the net should be able to apply a strength comprised between 11 and 22 kgf to break the netting twine (Tab. 4.3.1).
As observed for the other driftnets the hanging ratio is high and ranges from 0.72 and 0.97 (0.91 on average). The length of the nets investigated ranged from 300 to 1600 m.
Only T90 mesh rigging was observed.

Figure 4.3.9 - Details of the "palamitara" driftnets measured during the project.

“BISANTONARA” NET (Fig. 4.3.10)

TARGET SPECIES:

Bullet tuna
Auxis rochei

This type of small-scale driftnets was reported to be used, especially in the past years, in the GSA10 for the catch of Bullet tuna (*A. rochei*) and for other species such as Atlantic bonito (*S. sarda*), Atlantic chub mackerel (*S. colias*), little tunny (*E. alletteratus*), and the Frigate tuna (*A. thazard*).

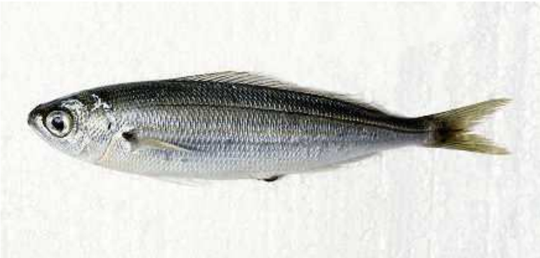
The technical gear properties of this net are similar to the features of the "palamitara" net already described:

- the mesh opening ranges between 70 and 100 mm (84.9 mm on average);
- 400-500 meshes are usually rigged from leadrope to headrope for a fictitious net drop comprised between 35 and 44 m (40 m on average);
- the computed real net drop while fishing (8-16.6 m) seems to be really low if compared with the fictitious net drop; this was caused by the high horizontal hanging ratio (0.95 on average);
- the net length of the investigated gear ranged from 400 to 1200 m;
- both polyamide twisted and monofilament twine is used having a twine diameter of 0.30 – 0.44 mm; a strength of about 4-9 kgf is needed to break the twine .
- also in this case only the T90 mesh configuration was detected.

Figure 4.3.10 - Details of the "bisantonara" nets measured during the project.

“BOGARA” NET

TARGET SPECIES:



Bogue

Boops boops

The small-scale driftnet targeting the bogue (*Boops boops*) was rather infrequent and it was reported in the GSA19 only, even though in the monitored period its use was not noticed. In consideration of the target species, this net seems to be quite similar to the "occhiatara" net targeting the saddled seabream (*O. melanura*).

- the mesh opening is around 60 mm;
- the fictitious net drop is around 18 m;
- the net length of the investigated gear ranges between 600 and 700 m;
- a polyamide monofilament twine is used having a thin diameter of 0.20 mm; the twine netting can be broken with a strength of about 2.8 kgf.
- the meshes are rigged in T90 configuration.

THE SMALL-SCALE DRIFTNET TECHNICAL CHARACTERISITCS: PRESENT AND PAST SITUATION

A literature review was done in order to collect information on the past situation of small-scale driftnets in Italy. This was done to verify any possible main change in gear properties. Two papers have been selected according to their characteristics, since they investigated the same areas and the same small driftnet types (according to target species): Ferretti *et al.,* 1994 and Ferretti and Palladino 1998, (Tab. 4.3.5). However the results of this review should only be considered as a descriptive approach.

No major changes have been detected as concerns the mesh dimension of each small-scale driftnet. The measured mesh length was in line with the value obtained in the past. A slight decrease in the mesh length was detected especially for "palamitara" net; this was mainly due to that fact that fishermen modified their nets to be in compliance with the Italian Ministry Decree of the 21/09/2011, that only allows the use of "ferrettara" nets having a mesh size no more than 100 mm.

The net drop seems to show a general increase compared to the past situation. This was mostly evident for "palamitara", "bisantonara" and "occhiatara".

For most of driftnets the net length seems to remain stable; an evident reduction was only observed for both "palamitara" and "bisantonara".

The twine thickness did not show any evident change while a strong increase was sometimes recorded in the hanging ratio.

Table 4.3.5 - Small-scale driftnet gear parameters measured during DRIFTMED project (DR) and collected from literature (LR). The references of Ferretti *et al*. (1994) and Ferretti and Palladino (1998) have been considered because they investigated the same areas and the same small driftnet types.

Fishing Net	Target species	Colour		Mesh Length [mm]		Net Drop [m]		Net Length [m]		Twine diameter Ø mm or RTEX		Hanging Ratio	
		LR	DR	LR	DR	LR	DR	LR	DR	LR	DR	LR	DR
MENAIDE	*E. enrasicolus*	Brown, ochre	Brown, reddish, ochre, white	22-26	19-28	10-20	21-26	100-500	150-500	R70 tex	R55 tex (*0.24 mm*)	Eh 0.69; El 0.69	Eh 0.72-1 El 0.83-1
MENAIDE	*S. pilchardus*	Reddish, brown	Ochre	28-36	34	6-22	20	460-1000	85-1050	0.20 mm R50-100 tex	R55 tex (*0.24 mm*)	Eh 0.40-0.66 El 0.40-0.66	Eh 0.81-0.90 El 0.88-0.94
OCCHIATARA	*O. melanura*	Reddish, brown, ochre	Transparent, azure	58-90	66-84	9-18	11-36	100-600	375-500	0.20-0.30 mm R100-250 tex	0.25 mm R110 tex (*0.35 mm*)	Eh 0.43-0.83 El 0.43-0.83 El 0.42-0.83 Eh 0.42-1.04	Eh 0.62-0.83 El 0.63-0.83 Eh 0.70; El 0.88
RICCIOLARA	*S. dumerili*	Brown, dark green	Transparent, ochre	50-100	70	20-28	21	1250	800-1000	0.30 mm R100-250 tex	0.20-0.25 mm R277 tex (*0.58 mm*)	Eh 0.63; El 0.63 Eh 0.93; El 0.93	Eh 0.59 El 0.6-0.7 Eh 0.87; El 0.95
ALACCIARA	*S. aurita*	-	Reddish	37-40	64	18	32	500	600	R50-100 tex	R110 tex (*0.35 mm*)	Eh 0.69; El 0.83	Eh 0.98; El 1.07
PALAMITARA	*S. sarda*	Reddish, brown, ochre	Transparent, ochre, red	106-180	82-110	13-25	30-44	1000-6000	300-1600	0.35 mm R250-500 tex	0.25-0.35 mm R166-332 tex (*0.44-0.63 mm*)	Eh 0.83; El 0.83 El 0.57-0.95 Eh 0.57-0.95	Eh 0.72-0.96 El 1 Eh 0.93-0.97 El 0.95-1
BISANTONARA	*A. rochei*	Light brown, red	Red, brown, Light green	70-106	70-100	16-22	35-44	300-2000	400-1200	0.30 mm R100-250 tex	0.30 mm R110-166 tex (*0.35-0.44 mm*)	Eh 0.63-0.83 El 0.63-0.83 El 0.57-0.95 Eh 0.57-1.02	Eh 0.92-0.95 El 0.99-1.16 Eh 0.90-1 El 0.93-1.13

FINAL CONSIDERATIONS

The direct measurements carried out in DRIFTMED allowed to collect useful information to better understand technical features of small driftnets, which can be used to identify different net typologies.

The technical properties of each net type (net rigging, mesh opening, hanging ratio, twine diameter etc.) seem to be correlated with the characteristics of the target species (shape, behaviour) and of the fishing grounds (depth, typology of bottom).

It was possible to identify certain technical parameters which are exclusive of small driftnets and which are rarely or never found in gillnets.

<u>Hanging ratio</u>

The catching method of passive nets is strongly correlated with the gear properties. In the small driftnets, especially in the "menaide" nets, a fish can be caught mainly because gilled or enmeshed in the netting (Fig. 4.3.11). Gilling and enmeshing are two different principles of catching: a fish can be retained by the net mesh through its gills or its maximum girth of the body. The gilling and enmeshing methods of catch are correlated with the mesh opening: these two methods require that meshes stay clearly open to be effective in the fish catching. This usually implies a high hanging ration. The small driftnets measured during DRIFTMED

always showed a high hanging ratio (from 0.70 to 0.98) which was usually higher than that observed for fixed nets (around 0.40 – 0.50; Figs. 4.3.12 and 4.3.13). In the case of fixed gillnets the hanging ratio is low compared to driftnet, increasing the slack of netting panel. This slack makes the gillnets able to catch marine organisms also by entangling them, that is rather unfeasible with driftnets.
When the net is lowered into the water, the weight of the groundrope stretches the net in the vertical direction, making the meshes clearly open. In this way the gilling process is highly efficient. When the net is hauled, the high hanging ratio enables the meshes to tighten the gill of fish, making easy to release the fish from the net (Fig. 11).
In the case of those small driftnets targeting medium sized pelagic species, such as the greater amberjack (*S. dumerili*), or the Atlantic bonito (*S. sarda*), the use of a thick material (twine diameter greater than 0.30 mm or 210 x 6 denier) together with the high hanging ratio, is essential during the hauling process; in this phase the net meshes are completely stretched due to the high hanging ratio, so that the weight of the net is supported by headline but also by the netting twine.

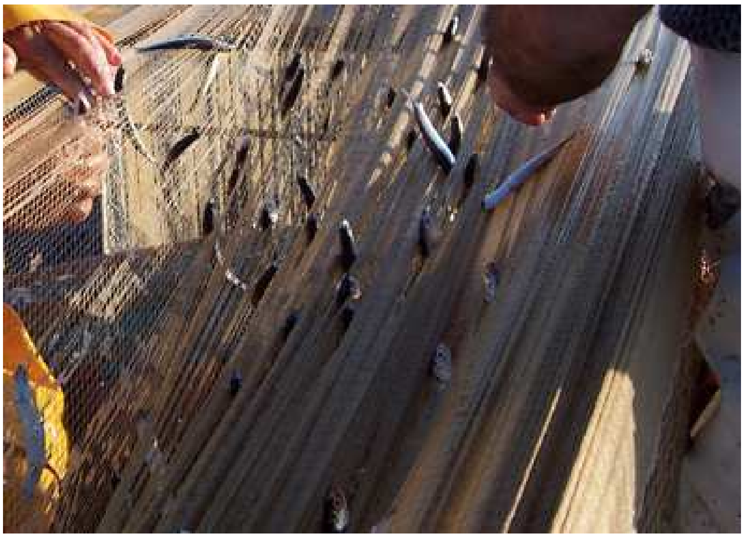


Figure 4.3.11 - Anchovies gilled or enmeshed during the hauling procedures of a "menaide" net.

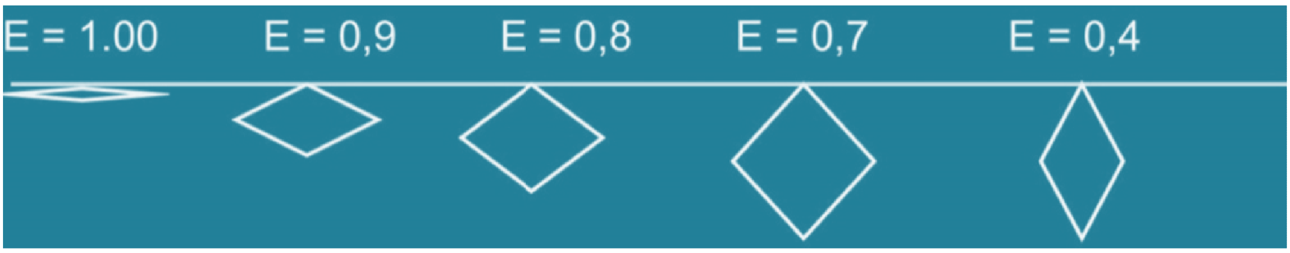


Figure 4.3.12 - Scheme of net meshes rigged with a different hanging ratio.

Figure 4.3.13 - Hanging ratio of a small driftnet (left) and a gillnet (right).

<u>Mesh rigging</u>

As already mentioned, the meshes of a small driftnets need to be clearly open to guarantee an optimal performance of catch. In order to achieve this goal the meshes of most of small driftnets measured in Driftnet were rigged on the headrope (and leadrope) on a T90 configuration (Fig. 4.3.14). A T90 configuration means that a traditional diamond mesh is turned 90° (Fig. 4.3.15). This technical solution is widely applied in the north European countries to improve the selectivity performance of bottom trawl codends. This is mainly because the meshes in the T90 configuration stay more open than in the diamond configuration. Therefore it is possible to conclude that passive nets were the net is rigged on a T90 configuration are more selective compared with passive nets with a traditional netting mounted on a diamond configuration.

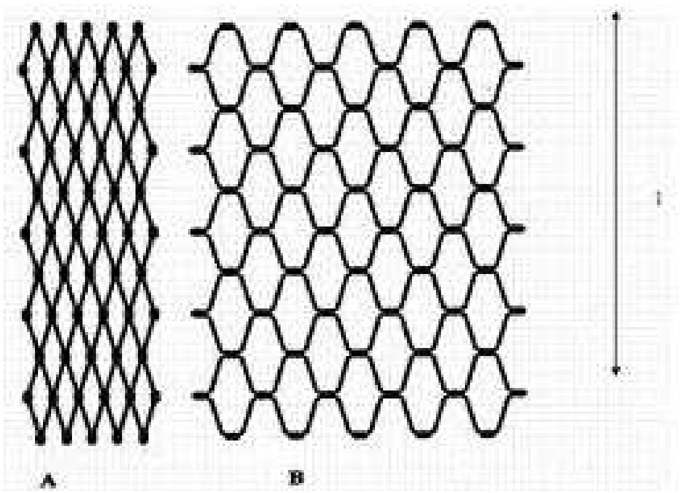


Figure 4.3.14 - Diamond mesh configuration (A); T90 mesh configuration (B).

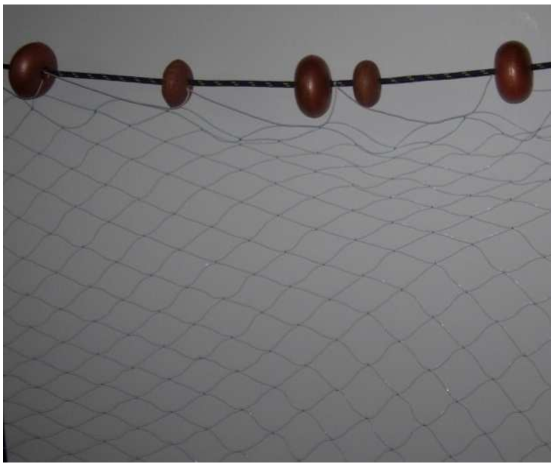
 

Figure 4.3.15 - T90 mesh configuration of the the small driftnets measured in GSA 9.

Mesh opening

The small-scale driftnet meshes measured during the project were in almost all cases below 100 mm mesh opening. This was mainly due to the Italian Ministry Decree of the 21/09/2011 that only allows the use of "ferrettara" nets having a mesh size no more than 100 mm.

It should be considered that in the past the illegal driftnets (e.g. spadara nets for swordfish) accidentally caught endangered species, such as marine mammals, mainly because

- large meshes were used (more than 300 mm mesh opening);
- nets were set on the sea surface on a zig-zag setting.

In these nets the use of large meshes together with the way of setting (zig-zag), made possible to incidentally catch marine mammals, often starting the catching process from the tail peduncle. Therefore the mesh opening used in the small-scale driftnets seem to be small enough to make rather difficult the incidental catch of sensible species.

It was however observed that the mesh opening used in the small driftnets to target anchovies ("menaide") is always greater than the mesh opening used in other fishing gears targeting the same species, such as the purse seine ("Lampara" net) and the pelagic trawling ("volante"). This mainly because the "menaide" nets are used to target large individuals of anchovy. The use of large mesh opening together with the high hanging ratio, makes highly selective this type of net.

Twine thickness

Small-scale driftnets targeting small pelagic species (anchovy and sardine), saddled seabream, bogue and most of the small-scale driftnets targeting the medium sized pelagic species (*Scomber* spp, *S. dumerili*) had a twine diameter ranging from 0.20 to 0.30 mm. For instance 0.20 mm is a netting twine diameter that is commonly possible to observe also in fixed gillnets. All these twines can be broken by applying a strength less than 5-7 kgf (this force concerns one single twine).

In some cases, like the driftnets used to target stronger pelagic species, such as Atlantic bonito and Bullet tuna, are built using a thicker material (up to 210 x 12 denier that is more or less 0.6 mm). Therefore in few cases a breaking strength of about 22 kgf, and more often of about 15-16 kgf, should be applied to break the twine. In this regards the main problems can be observed for twisted netting twine.

Net rigging- technical changes

The small-scale driftnets can be heavy to hoist in consideration of the high net drop and the presence of leads on the groundrope, therefore, particularly during the hauling procedures, the risk of breaking the net should not be underestimated. For this reason, especially in the "menaide" driftnets targeting anchovies, where a thin twine is used, fishermen are used to apply some technical change to the nets:

- Two lateral wings of netting made of large meshes and thick twine are joint to the two ends of net to reinforce the driftnet during the hauling process (Fig. 4.3.16)..
- Two strips of netting made of large meshes and thick twine are joint to the headrope and groundrope to strength the net during hauling (Fig. 4.3.17).
- A double headrope is often used to reduce the risk of breaking the net within the net winch during hauling procedures (Fig. 4.3.18).

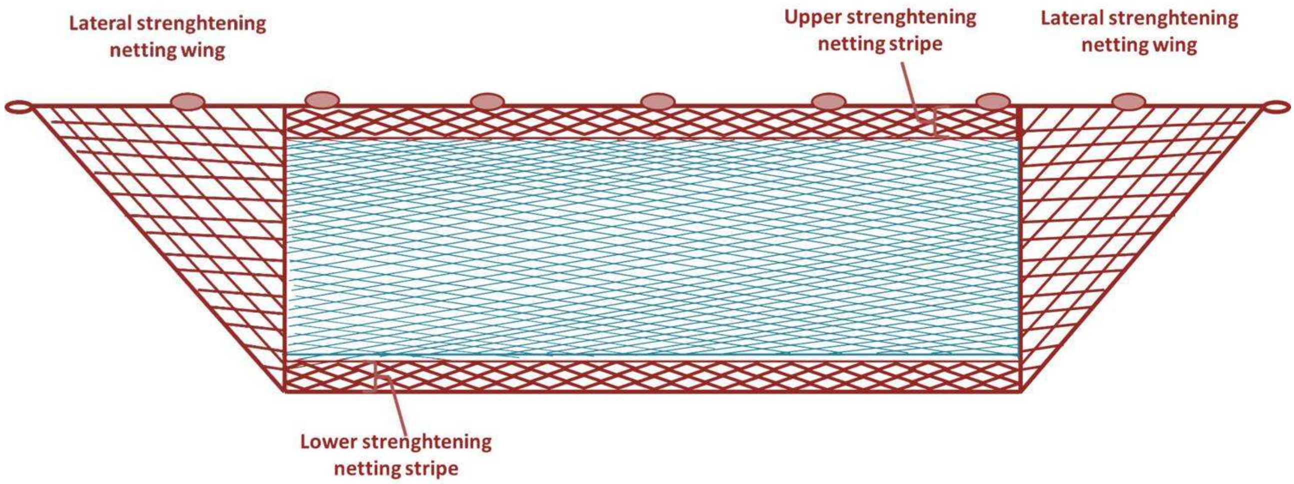


Figure 4.3.16 - Schematic of technical modifications introduced in small driftnets.

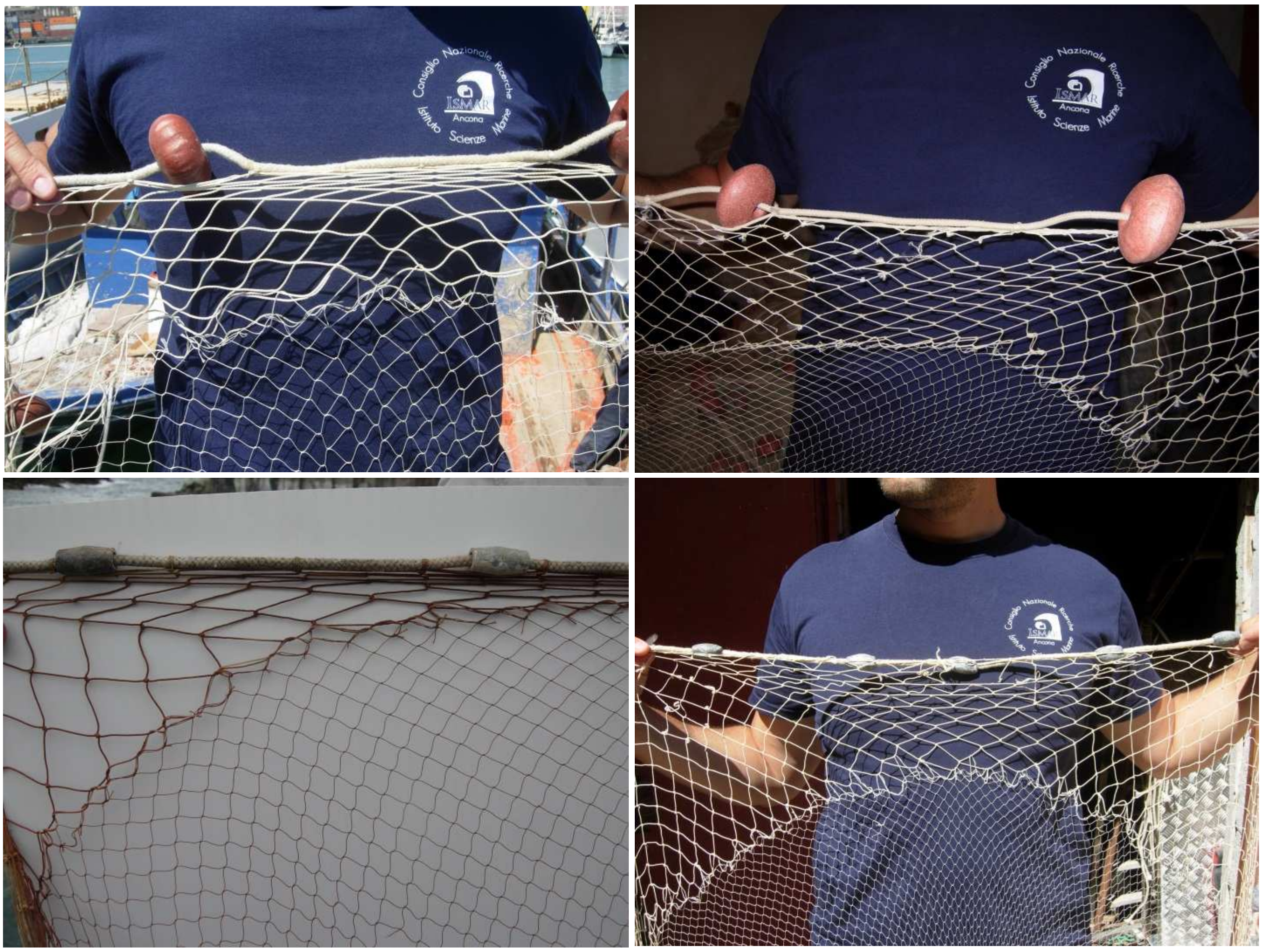


Figure 4.3.17 - Detail of strips of netting made of large meshes and thick twine joint to the headrope.

Figure 4.3.18 - Detail of the double headrope used to reinforce small driftnet.

<u>Net floating</u>

Driftnets can be defined as *"any gillnet held on the sea surface or at a certain distance below it by floating devices, drifting with the current, either independently or with the boat to which it* *may be attached".* Therefore the number of floats in the driftnets is usually greater than that observed for a common gillnet (Fig. 4.3.19).

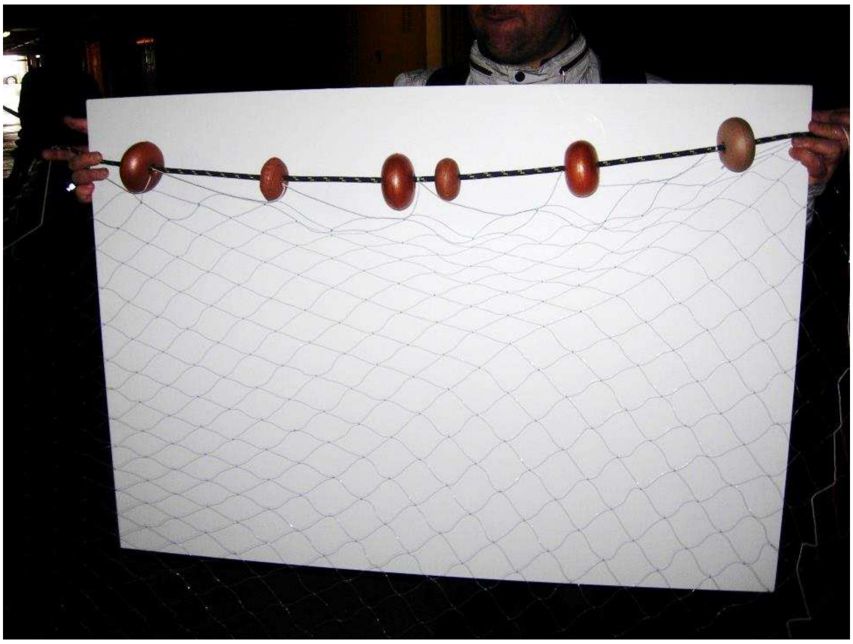


Figure 4.3.19 - Detail of a driftnet headrope.

<u>Parameters to discriminate the small-scale driftnets from the bottom-set gillnets</u>
The Council Regulation (EC) n. 809/2007 of 28 June 2007 defined the driftnets as: "*any gillnet held on the sea surface or at a certain distance below it by floating devices, drifting with the current, either independently or with the boat to which it may be attached. It may be equipped with devices aiming to stabilise the net or to limit its drift*". Therefore a driftnet is simply defined as a gillnet (one single netting panel) drifting freely with the current. However this is a generic definition that makes unfeasible to clearly discern gillnet from a driftnet, simply on the basis of technical properties.
There is not a set of rules that makes possible to clearly identify a driftnet from a gillnet, however the following considerations might be taken into account

- <u>mesh configuration</u>: fixed gillnets are always built by using a traditional diamond configuration, while small driftnet netting is commonly rigged in a t90 configuration;
- <u>hanging ratio</u>: in fixed gillnets the netting panel is commonly rigged to the headrope and leadrope with a low hanging ratio (usually less than 0.5). In small driftnets the netting panel is commonly rigged to the headrope and leadrope with a high hanging ratio (usually more than 0.7).
- <u>twine diameter</u>: in fixed gillnets the twine diameter is commonly less than 0.25 mm or 210 x 3 denier (see Archimedes final report). In small driftnets the twine diameter is more than 0.25 mm or 210 x 3 denier for most of nets. Only "menaide" and "bogara" nets showed a twine diameter of about 0.20-0.24 mm (210 x 2 denier).
- <u>"menaide"</u>: presence of upper and lower netting stripes to strength the net.

4.4 – OVERVIEW OF THE ECONOMIC PARAMETERS PERTAINING TO EACH EU MEDITERRANEAN SSD FISHERY (TASK 3.3)

The content of this paragraph is also reported in the **Deliverable 12** (“Overview of the economic aspects related to the SSD fisheries in Mediterranean”).

The objective of the Task 3.3 of DRIFTMED Project was to provide information on the socio-economic parameters pertaining to each EU Mediterranean small-scale driftnet fishery, including the estimation of the proportion on the annual incomes and the economic profits of an "average" fishing vessel.
The information available before the project on the economic and social parameters of the SSD fisheries in Mediterranean was scarce and insufficient to provide any exhaustive analysis.
For this reason, the economic analysis has been focused on socio-economic data coming from the new data gathered by WP2. Official data (DCF - Data Collection of Fisheries) on small-scale fisheries (SSF) was used as well, to estimate the total annual income of the fishing vessels involved in SSD fisheries.
Information gathered during WP2 with face-to-face interviews with fishermen refers to quantitative and qualitative data; the first ones have been used to have a detailed description of the revenues and the costs and of the estimation of the proportion on the annual income and economic profit; the qualitative data have been be used to evaluate the social aspects of the SSD fisheries in terms of historic and cultural aspects, as well as factors related to the typicality of the product. The information on the socio-economic data gathered through interviews to fishermen associations and cooperatives, interviews to fishermen and logbooks is reported in Tab. 4.4.1.

Methodological approach

The DCF (Council Regulation (EC) No 199/2008) establishes the list of economic variables to be collected for the total fleets and for fleet segments. In order to ensure economic comparability with economic official data, this list has been used to identify the main economic variables; among these: production value per species, labour costs, energy costs, repair and maintenance costs, other operational costs (variable and not variable costs) and employment
In accordance with the data collected, in a first step, a detailed description of the main economic parameters will be presented by each of the fishery identified in the project.
An economic statement (Tab. 4.4.2) has been compiled for each fishery. Gross Value Added (GVA) and Gross Profit (GRP) were calculated in order to assess the economic performance; for economic performance calculations, formulas presented in *“The 2013 Annual Economic Report on the EU Fishing Fleet”* (STECF-13-15) were used. Only economic data related with SSD fishing activity have been considered; fixed costs include repair and maintenance costs of the gear and other fixed costs (repair and maintenance costs of the vessel reduced in proportion of the duration of the SSD fishing activity).
Crew payments (labour costs) are based on the sharing system and include all the crew on board including the skipper-owner, who is also paid according to the amount of capital invested. The “share” varies on the basis of local customs (in general between 35% and 50% of the value of landings).

Table 4.4.1 – Socio-economic data gathered in DRIFTMED project.

	Data	Interviews to fishermen associations/cooperatives	Interviews to fishermen	Logbooks
	Landings			X
	Revenue			X
	Fishing days		X	
Operational costs	*Variables costs*			
	Fuel costs			X
	Other variable costs (fish boxes, ice..)			X
	Fixed costs			
	Cost of maintenance of the gear		X	
	Cost of maintenance of the vessel		X	
	Purchase cost of the gear		X	
Fishermen and labour costs	Number of fishermen per vessel	X	X	
	Age of the fishermen	X	X	
	Type of labour remuneration: crew share, collective labour agreement, mixed	X		
Market and commercial costs	Price by species			X
	Sales channel: seafood market, wholesaler, retail fish market,	X		
	Commercial costs (% on total revenue)		X	

Table 4.4.2 – Example of the algorithm related to the economic statement.

Value of landings	**a**
Energy costs	b
Commercial costs	c
Other variable costs	d
Variable costs	*e=b+c+d*
Maintenance costs of the gear	f
Other fixed costs	g
Fixed costs	*h=f+g*
Total intermediate costs	**i=e+h**
Gross value added (GVA)	**l=a-i**
Labour costs	m
Gross profit (GRP)	**n=l-m**

In almost all the fisheries identified, the small driftnets are used seasonally; in the rest of the year other gears are used, such as gillnets and trammel nets. Total annual value of landings and total annual gross value added of SSD fleet irrespective of the gear used (i.e. from driftnet and all other gears used) were estimated; the income and GVA from SSD activity have been added to income and GVA of the rest of the year in which other gears are used; for this purpose DCF data at level of GSA, fleet segment and LOA have been used.
The social analysis has the objective to provide information on the social parameters pertaining to each EU Mediterranean small scale driftnet fishery; information on the number of fishermen per vessel and per fishery, average age of the crew and labour costs/fishermen are presented.
A description of the market price of landings and sales channel have been conducted in order to evaluate the existence of a competitive advantage of the SSD fish products in terms of:

- factors related to the typicality of the product
- existence of procedures of labelling or eco-labelling
- market demand of SSD fish products

The prices of target species by area have been compared with the price at national level, at GSA and for the overall small scale fishery in the same area.
The SSD fisheries holds a particular importance with regards to the fishing communities in which it is carried out. The seasonal component of these fisheries allows small boats achieving a considerable income during the spring and summer months. Hence, these fisheries are an important source of income integration for many coastal communities, and therefore have a socio-economic and employment relevance.
Finally, a comparison among the selected fisheries is reported. The purpose of this analysis was to highlight the major differences or similarities among the SSD fisheries and to stress the relative weight of each fishery in economic and social terms.

FISHERY 1: "MENAIDE" FOR ANCHOVY, *ENGRAULIS ENCRASICOLUS* IN THE CATANIA AREA (GSA19)

The fishery of "menaide" for anchovy, *Engraulis encrasicolus*, in Catania area (GSA19) is by far the most important SSD fishery in Mediterranean area, both in terms of profitability and social dimension. In the Catania area (GSA19), the fleet using small scale driftnets for small pelagic fish is concentrated in the fishing harbors of Catania, Aci Castello and Ognina.

<u>Income statement</u> (Tab. 4.4.3)
The total annual value of landings of the vessels involved in SSD fishery in the area of Catania was approximately estimated, for the year 2013, in 1.9 million Euros; SSD vessels in this fishery generated a total gross value added of around 1.5 million Euros.
The total variable costs (energy costs, commercial costs and other variable costs such as ice, boxes) roughly amounted to 267 thousand Euros, while fixed costs (mainly, maintenance costs of the gear and of the vessel) were estimated in about 100,000 Euros.
The average income per vessel of SSD fishery approximately corresponded to 67,000 €; in consideration of the low level of the operational costs (in particular of the fuel costs), the incidence of gross value added on the value of landings is very high (about 80%). The fuel costs were estimated in 3,579 Euros per vessel in a year (the SSD fishery is performed all year round), that is equal to about 25.00 € per day.

Table 4.4.3 - Income statement of the SSD fishery, “menaide" for anchovy, Catania area (GSA19).

		Average value per vessel	Value per fishery
Value of landings	**a**	**66,748**	**1,868,940**
Energy costs	b	3,579	100,201
Commercial costs*	c	3,905	109,349
Other variable costs	d	2,039	57,084
Variable costs	*e=b+c+d*	*9,523*	*266,633*
Maintenance costs of the gear	f	1,400	39,200
Other fixed costs	g	2,000	56,000
Fixed costs	*h=f+g*	*3,509*	*95,200*
Total intermediate costs	**i=e+h**	**13,032**	**361,833**
Gross value added	**l=a-i**	**53,716**	**1,507,107**
Labour costs	m	36,678	1,026,977
Gross profit	**n=l-m**	**17,038**	**480,130**

Note: figures refer to the fishing season in which SSD is used
Source: DriftMed project; * estimation on the basis of DCF data

The proportion on the annual income (Tab. 4.4.4) of an "average“ fishing vessel involved in SSD fishery was estimated on a level of 91%. The number of fishing days amounted to 88% of the annual level of activity; this fishery is performed all year round (it represent, on average 145 out of the 164 total fishing days in a year). In terms of the gross value added, the incidence is higher (about 93%) thanks to the low level of the variable costs.

Table 4.4.4 - Estimation of the proportion on the annual days at sea, income and gross value added of an average fishing vessel. “Menaide" for anchovy, Catania area (GSA19).

	Average value per vessel
number of days in SSD fisheries (1)	145
Total annual number of days (2)	164
SSD days/total annual days %	**88%**
Income from SSD fishery (€) (1)	66748
Total annual income (€) (2)	73500
SSD income/total annual income %	**90,81**
GVA from SSD fishery (€) (1)	53716
Total annual GVA (€) (2)	57590
SSD GVA/total annual GVA %	**93%**

Source: (1) Driftmed project
(2) estimation on the basis of DCF data

Social analysis

The crew of the vessels involved in "menaide" fishing in Catania area ranged between 4 and 6 persons (mean 4); the total number of fishermen is 115. The average age is 45 years.
The crews were paid according to the principle of the share system, which is a profit sharing scheme so crew members' earnings in effect relate to the company's performance. The mean wage paid to the fishers is equal to about 9,000 Euros; for each vessel, the labour costs amount to 36,678 Euros in a year.

Table 4.4.5 – Number of fishermen and labour costs,
Menaide" for anchovy, Catania area (GSA19).

	per vessel	per fishery
No. of fishermen per vessel and per fishery	4	115
Labour costs (€)	36,678	1,026,977
Labour costs/fisherman (€)	8,930	
Average age of the crew	45	
Type of remuneration	shared crew	

Source: (1) Driftmed project

In the fishing harbours in which this fishery is present (Catania, Ognina and Aci Castello), the dependence from SSD fishery is quite higher. The total number of small-scale vessels is 72 for 242 GT and 2895 kW; the vessels involved in SSD fishery correspond to the 39% of the total SSF fleet in number and the 44% of the total SSF GT. In terms of income, the vessels that used SSD have an incidence of 55%; the dependence from the SSD fishery is much higher if the number of fishermen is considered (about 90%). The average crew for a small-scale vessel is of about 1.8 persons, while, in consideration of the type of work related with the use of the "menaide", the crew in SSD vessels can also be of 6 persons.

Table 4.4.6 – Level of dependence from small scale driftnets fishery: incidence of small scale driftnet fishery on small scale fishery, "Menaide" for anchovy, Catania area (GSA19).

	SSF vessels (1)	SSD vessels (2)	Inc. %
Number of vessel	72	28	38.9
GT	242	107	44.2
kW	2895	1137	39.3
Income (€) *	3,761,580	2,058,000	54.7
		(1.868.940)	(50%)
Employment	144	115	79.9

Source: (1) estimation on the basis of DCF data
(2) Driftmed project

(*) Income for SSD vessels refers to the annual income of the vessel irrespective of the gear used (i.e. from driftnet and all other gears used); income of the SSD vessels imputable exclusively to the use of the "menaide" is reported in brackets

Market price of landings and sales channel

The SSD fishery in Catania area achieves higher market value for their catches, due to better product quality, shorter marketing channels and high demand in local markets.

The average price at national level of anchovy is 1.77 € per kg, while for the product landed with “menaide” in Catania area the price reaches 10.00 € per kg (Fig.4.4.1).

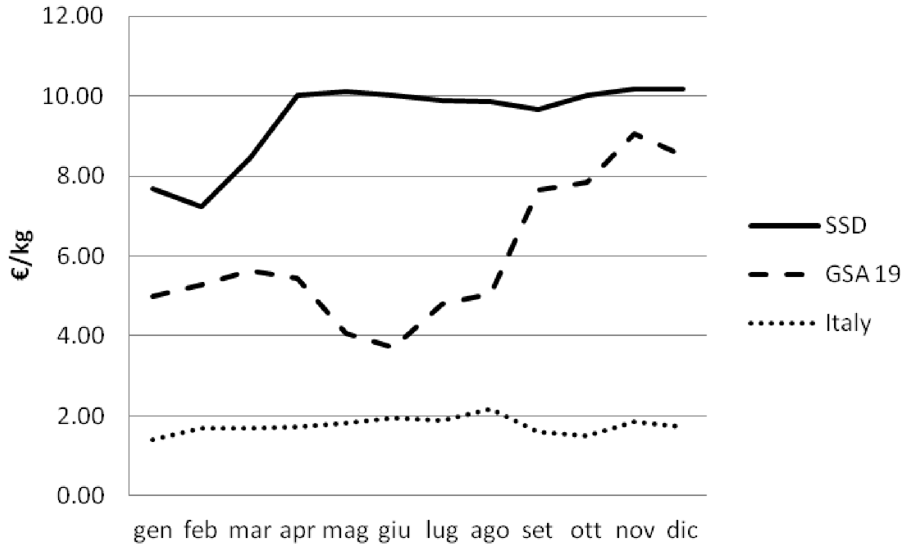


Figure 4.4.1 - Trend of the landing price of anchovy, in GSA 19, in Italy
and of the “Menaide" for anchovy, Catania area (GSA19).
Source: Mpaaf-Irepa (national data and GSA 19 data); data gathered in the present project (SSD fishery).

The fact of adding value to fresh products of good quality and their differentiation on the market may give this fishery a competitive advantage. In the last years, the Italian landing prices in the fishery sector show a constant decline; in fact the unfavourable state of domestic economy and the related general decline in food consumption continues to affect seafood purchase (Irepa, 2012). The trend of anchovy caught by “menaide” in Catania area shows an opposite trend (Fig. 4.4.2).

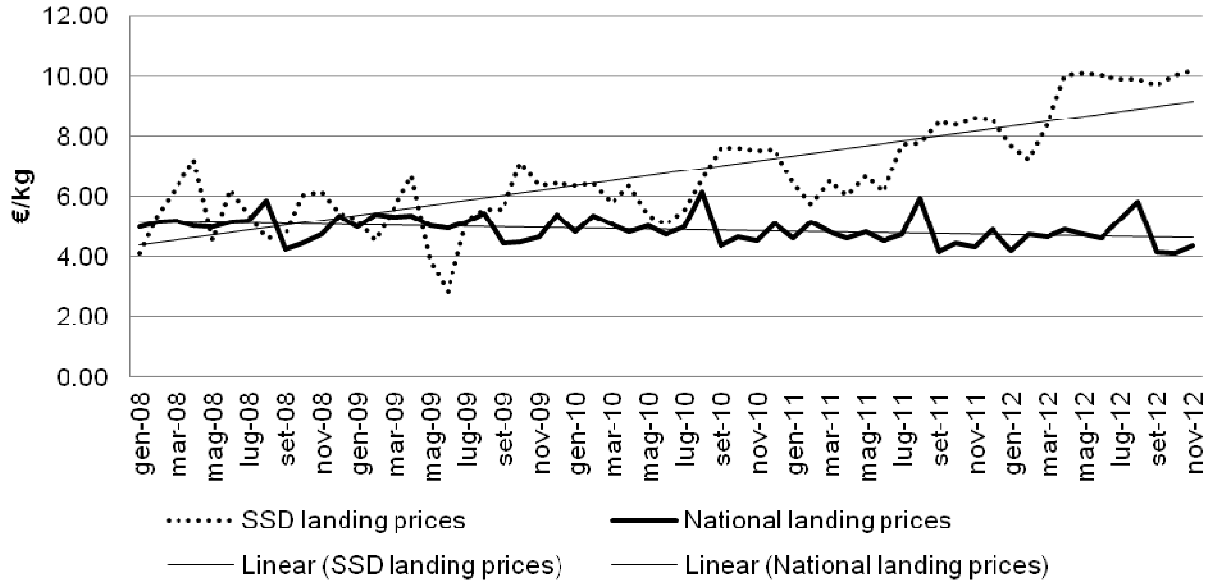


Figure 4.4.2 - Trend in landing price of anchovy in GSA 19 from “menaide”, and Italian landing prices, years 2008-2012. Source: Mpaaf-Irepa.

The product of this fishery is mostly destined for the local sale in retail fish market (such as “A Piscaria” in Catania). No eco-labelling mechanism has been identified. However, in some cases a system of labelling which makes it possible to identify the product on the market is present. The system contributes added value thus securing a better return to fishers

In the recent years the anchovies of Catania caught by menaide have obtained a brand for the typicality of the product: “Slow food” presidium “masculine da magghia". Slow food promotes artisanal fishing and responsible fish consumption, beyond the most popular, and often overfished, species to find local options that allow for a better management of marine resources (Slow food web-site).

The Presidium was created to ensure greater profitability for the fishers and tu sustain the recovery of traditional processing methods. It refers to the salted product (anchovy) caught from April to July (procedural guidelines of the “masculine da maghia”).

A small processing industry in Porto Paolo di Capo Passero (Siracusa) processes the anchovies caught with “menaide” in Catania gulf and sells the product with the denomination “Presidio slowfood masculine da magghia”. The sell price of this product is 70 €/kg and the salted anchovies are sold directly by the processing company (http://www.fondazioneslowfood.it/presidi-italia/dettaglio/3547/masculina-da-magghia).

The Sicily Region issued a regulation (www.agrinnovazione.regione.sicilia.it) to obtain and put on the market products with the denomination “Presidio slowfood masculine da maghia” and some cooperatives of fishermen started the marketing of anchovies with this brand.

As stated by the Presidium coordinator**,** the demand of this kind of products will improve due to the widespread diffusion of national and international campaign to promote "responsible fish consumption” and a rising interest by national and European consumers’ in traditional and ancient fishery “environmentally friendly”. Some ownerships are interested in creating a PO bringing together fishermen involved in “menaide” fisheries with the aim of implementing measures to ensure optimum conditions for the marketing of their products.

The role of SSD fishery in Catania area is rising in terms of employment in consideration of the increased interest in this type of product; in Catania area, 170-180 people are employed directly (fishermen) or in correlated activities such as processing and commercialization (source: Slow food Presidium coordinator).

FISHERY 2: “MENAIDE” OR “MENAICA” FOR ANCHOVY, *ENGRAULIS ENCRASICOLUS* IN THE CILENTO AREA (GSA10)

In the Cilento area (GSA10), the fleet using small scale driftnets for small pelagic fish is mainly concentrated in the fishing villages of Marina di Camerota, Marina di Pisciotta and Palinuro. It is a specialized traditional fishery using "menaide" driftnets to catch anchovy, *E. encrasicolus.*

Income statement (Tab. 4.4.7)

The average income per vessel was estimated in 4,325 € in the fishing season of 2013 (about 20 days), the average total costs of the small-scale vessels was approximately 1,325 €, equally divided between variable costs and fixed costs.

Fixed costs are related to vessel (308 €) and gear maintenance (590 €). The variable costs include mainly fuel and other minor costs related to commercialization and to storage of the fish (ice, boxes for fish, etc.).

The main cost appears to be related to fuel consumption (251 €) which covers more than 25% of total costs for the fishing season. The gross value added amounts to 3,000 € per vessel.

Table 4.4.7 - Income statement of SSD fishery,
"Menaide or menaica" for anchovy, Cilento area (GSA10).

		Average value per vessel	Value per fishery
Value of landings	**a**	**4,325**	**82,175**
Energy costs	b	251	4,773
Commercial costs *	c	42	806
Other variable costs	d	134	2,541
Variable costs	*e=b+c+d*	*427*	*8,120*
Maintenance costs of the gear	f	590	11,210
Other fixed costs	g	308	5,848
Fixed costs	*H=f+g*	*898*	*17,058*
Total intermediate costs	**i=e+h**	**1,325**	**25,178**
Gross value added	**L=a-i**	**3,000**	**56,997**
Labour costs**	m	1,800	34,198
Gross profit	**n=l-m**	**1,200**	**22,799**

Note: figures refer to the fishing season in which SSD is used
Source: DriftMed project; * estimation on the basis of DCF data; ** estimation on the basis of the "crew share" system.

At global level, if all the small scale vessels involved in this fishery are considered, the income related to SSD fishery approximately amount to 82,175 €, while the total intermediate costs are estimated on a level of 25,178 €. The proportion on the annual income (Tab. 4.4.8) of an average fishing vessel involved in this fishery is estimated on a level of 21%. The number of fishing days performed with "menaide" roughly amounts to 13% of the annual level of activity (20 on 149 total fishing days in a year); the income per day when SSD is used is 216 €, much higher than the average income per day (140 €).

Table 4.4.8 - Estimation of the proportion on the annual days at sea, income and gross value added of an average fishing vessel, "Menaide or menaica" for anchovy, Cilento area (GSA10).

	Average value per vessel
number of days in SSD fisheries (1)	20
Total annual number of days (2)	149
SSD days/total annual days %	**13%**
Income from SSD fishery (€) (1)	4325
Total annual income (€) (2)	20195
SSD income/total annual income %	**21%**
GVA from SSD fishery (€) (1)	3000
Total annual GVA (€) (2)	16996
SSD GVA/total annual GVA %	**18%**

Source: (1) Driftmed project
(2) estimation on the basis of DCF data

Social analysis

The number of fishermen employed in small scale driftnet fishery in Cilento area is 57, with an average age of 47 years old. The number of young fishermen entering the fishing sector is constantly decreasing, only 2 fishermen are less than 30 years old.

Most owners are organized in cooperatives whose main aim is to help their members manage their activities (i.e., administration, subsidies, catch statistics, marketing products, etc.).
In the three villages of Cilento in which SSD fishery is more present (Marina di Camerota, Marina di Pisciotta and Palinuro), the number of small scale vessels is 58 for 111 GT and 1,765 kW; the vessels involved in SSD fishery correspond to the 33% of the total SSF fleet in number and the 46% of the total SSF GT. In terms of income, the vessels that used SSD have an incidence of 36% (Tab. 4.4.9).

Table 4.4.9 - Level of dependence from small scale driftnets fishery: incidence of small scale driftnet fishery on small scale fishery "Menaide or menaica" for anchovy, Cilento area (GSA10).

	SSF vessels (1)	SSD vessels (2)	inc. %
	a	b	b/a
Number of vessels	58	19	33%
GT	111	51	46%
kW	1765	880	50%
Income	1,080,273	383,705 (82,175)	36% (8%)
Employment	103	57	55%

Source: (1) estimation on the basis of DCF data
(2) Driftmed project
(*) Income for SSD vessels refers to the annual income of the vessel irrespective of the gear used (i.e. from driftnet and all other gears used); income of the SSD vessels imputable exclusively to the use of the "menaide" is reported in brackets

Market price of landings and sales channel:
The commercial value of anchovy caught by "menaica" is very much higher than the one usually found on the national market. Driftnets for anchovies are particularly well adapted for salting, either because of their size which is usually bigger than those fished by purse seine, or because the heads of the fish are removed on board. In this way the fish have already bled and their flesh is of a better quality when they are salted (Colloca *et al*., 2002).
The average price at national level of anchovy is 1.77 € per kg, while for the product landed with small scale driftnet in Cilento area the price reaches 7.00 € per kg (Fig. 4.4.3).

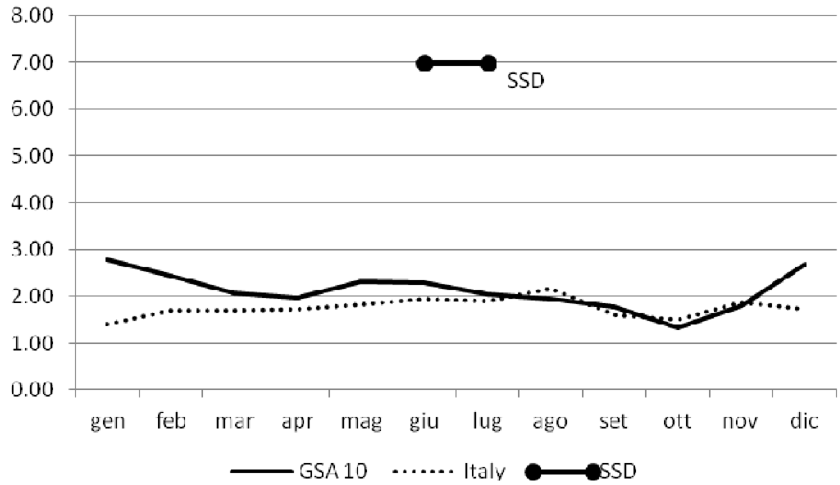


Figure 4.4.3 - Trend in landing price of anchovy, in GSA 10, in Italy and for “menaide” in GSA 10
Source: Mpaaf-Irepa (national data and GSA 10 data); data gathered in the present project (SSD fishery).

Despite the high value of the product, the lack of organisation of the commercial and market network has been one of the most important limitations of the fishing activity. The product landed is generally sold directly from the fishermen at the dock; only in few cases, the product is sold by wholesalers.

In Marina di Pisciotta the product is sold by the fishermen in little jars known as “alici di menaica”. A brand of typicality from the "Slow food" Praesidium ("alici di menaica") has been obtained; the presidium sustains the recovery of traditional processing methods and refers to the fresh product (anchovy) caught from April to July.

Anchovies are put in wooden boxes without refrigerating means and are worked straight away in the first The selling price of this product is 60 €/kg and the salted anchovies are sold directly by a small processing farm located in Marina di Pisciotta. The farm gathers the anchovies landed from April to July by seven vessels; in the future, other vessels involved in this fishery are expected to go in touch with the farm (as stated by the Presidium coordinator). The market demand for this kind of product is steadily increasing; the buyers are both national and European consumers; the product is sold through the web site of the farm and in national and international exhibitions.

FISHERY 3: “OCCHIATARA” FOR SADDLED SEA BREAM, *OBLADA MELANURA,* IN THE LIGURIAN SEA (GSA9)

In 2013, the number of vessels which used small driftnets to exploit the saddled sea bream, *O. melanura,* as target species (“occhiatara”) was 5 (4 in the Marine District of Imperia and one in Savona). This gear is used seasonally, in a short period of time between May and June; in 2013, the number of fishing days realised with driftnets for each vessel was on average 15.

Income statement (Tab. 4.4.10)

The total annual value of landings of the vessels involved in SSD fishery in Ligurian Sea was approximately estimated, for the year 2013, in 40,000 Euros. In the fishing season, the average income per vessel amounts to about 8,000 €. The total variable costs per vessel (energy costs and other variable costs such as ices, boxes) amount to about 3,000 Euros, while fixed costs (mainly, maintenance costs of the gear and of the vessel) are estimated in about 2,200 Euros.

The fuel costs amount to 2,175Euros in the fishing period (an average of 15 days), the 42% of the total intermediate costs.

Table 4.4.10 - Income statement of SSD fishery,
“Occhiatara” for saddlled sea bream, Ligurian Sea (GSA9).

		Average value per vessel	Value per fishery
Value of landings	**a**	**7,961**	**39,803**
Energy costs	b	435	2,175
Commercial costs	c	-	-
Other variable costs	d	150	749
Variable costs	*e=b+c+d*	*585*	*2,924*
Maintenance costs of the gear	f	187	935
Other fixed costs	g	255	1,277
Fixed costs	*h=f+g*	*442*	*2,212*
Total intermediate costs	**i=e+h**	**1,027**	**5,136**
Gross value added	**l=a-i**	**6,933**	**34,667**
Labour cost	m	2,624	13,122
Gross profit	**n=l-m**	**4,309**	**21,544**

Note: figures refer to the fishing season in which SSD is used
Source: DriftMed project

The fishing days carried out with “occhiatara” approximately amount to 12% of the annual level of activity of the vessels that have used this gear in the investigated period. The proportion on the annual income (Tab. 4.4.11) of an average fishing vessel involved in SSD fishery is estimate on a level of 25%; the profitability of the SSD fishing activity is quite high if compared with the profitability of other passive gear (respectively 549 €/vessel/day and 232 €/vessel/day). In terms of the gross value added, the incidence is higher (about 40%) thanks to the low level of variable and fixed costs.

Table 4.4.11 - Estimation of the proportion on the annual days at sea, income and gross value added of an average fishing vessel. “Occhiatara” for saddled seabream, Ligurian Sea (GSA9).

	Average value per vessel
number of days in SSD fisheries (1)	15
Total annual number of days (2)	118
SSD days/total annual days %	**12%**
Income from SSD fishery (€) (1)	7961
Total annual income (€) (2)	32059
SSD income/total annual income %	**25%**
GVA from SSD fishery (€) (1)	6933
Total annual GVA (€) (2)	17497
SSD GVA/total annual GVA %	**40%**

Source: (1) Driftmed project
(2) estimation on the basis of DCF data

Social analysis

The crew of the vessels involved in "occhiatara" fishery in Ligurian sea is composed by two persons; the total number of fishermen is 10. The average age is quite high (51 years old); the level of attractiveness to this fishery for the new generation is very low, although the high profitability in comparison with other fishing activities.

The crews are paid according to the principle of the share system. The mean wage paid to the fishers is equal to about 1,312 Euros in the fishing season; for each vessel, the labour costs amount to 2,625 Euros (Tab. 4.4.12). The level of remuneration is quite high if compared with the minimum wage set out by the labour legislation (the minimum wages is about 1,000 on a monthly base per fishermen).

Table 4.4.12 – Number of fishermen and labour costs, "occhiatara" for saddled seabream, Ligurian Sea (GSA9)

	per vessel	per fishery
No. of fishermen per vessel and per fishery	2	10
Labour costs (€)	2,625	13,123
Labour costs/fisherman (€)	1,312	
Average age of the crew	50,6	
Type of remuneration	shared crew	

Source: (1) Driftmed project

Note: figures refer to the fishing season in which the SSD is used

In the fishing harbors in which this fishery is present (Alassio, Imperia and Savona), the dependence from the "occhiatara" fishery is not high. The number of small scale vessels is 86 for 228 GT and 4,216 kW; the vessels involved in the "occhiatara" fishery in 2013 correspond to the 6% of the total SSF fleet in number and the 10% of the total SSF GT (Tab. 4.4.13). In terms of income, the vessels that used "occhiatara" have an incidence of 7%; the dependence from the "occhiatara" fishery is higher if the number of fishermen is considered (about 10%).

Table 4.4.13 – Level of dependence from small scale driftnets fishery: incidence of small scale driftnet fishery on small scale fishery in Ligurian Sea (GSA9).

	SSF vessels (1)	SSD vessels (2)	Inc. %
Number of vessel	86	5	6%
GT	228	22	10%
kW	4,216	516	12%
Income (€) *	2,379,481	160,293	7%
		(39,803)	(2%)
Employment	103	10	10%

Source: (1) estimation on the basis of DCF data

(2) Driftmed project

(*) Income for SSD vessels refers to the annual income of the vessel irrespective of the gear used (i.e. from driftnet and all other gears used); income of the SSD vessels imputable exclusively to the use of the "occhiatara" is reported in brackets

Market price of landings and sales channel

Catches of *O. melanura* are generally divided into three commercial categories of different economic value, according to the size; in the investigated period the price ranged between 5 and 12 Euro/kg.

The average price of the target species (*Oblada melanura)* of the “occhiatara” net is similar to that recorded for the same species caught by other small scale gears in GSA 9 (13,00 €/kg). The product is destined for local markets and it is well-appreciated by the consumers’ (Fig.4.4.4).

As concerns the other species landed by “occhiatara”, their average price is higher than the one usually found on the national markets; for the chub and Mediterranean mackerels, the “occhiatara” landing price is 5,00 €/kg, twice of the average national price.

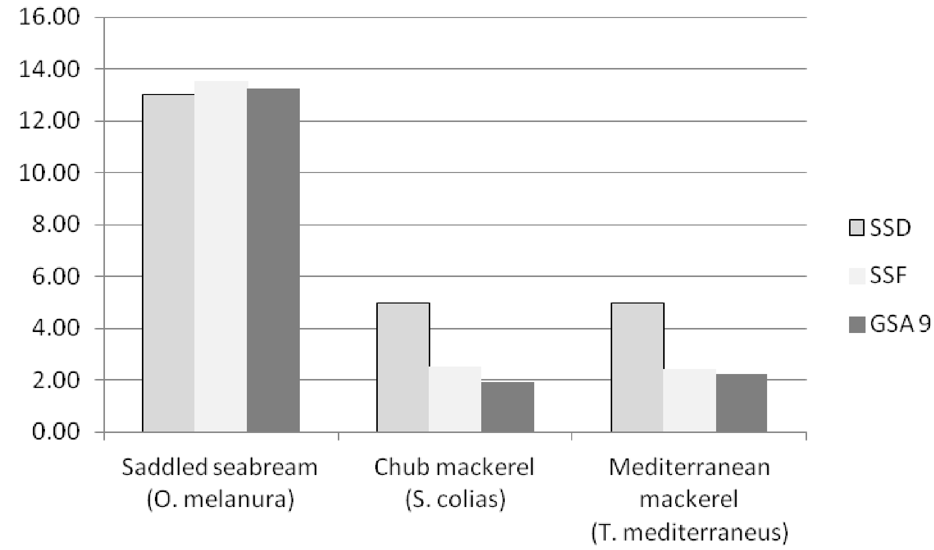


Figure 4.4.4 - Landing prices for species caught with “occhiatara” in GSA 9 (SSD), with small scale fisheries in Italy (SSF) and for all the gears in GSA9. Source: Mpaaf-IREPA for national data and GSA 9 data; present study, for SSD data.

No eco-labelling mechanism has been identified in this fishery.

FISHERY 4: “SGOMBERARA” OR “SGOMBETARA” FOR MACKERELS AND BOGUE, IN NORTHERN SICILY (GSA10)

In northern Sicily, the SSD fishery "sgomberara" involved 30 artisanal vessels, using driftnets for catching mackerels (*Trachurus* spp. and *Scomber* spp.) and bogue (*Boops boops*); this fleet is mainly concentrated in the fishing villages of Milazzo, Sant’Agata di Militello and Porticello. It is a specialized traditional fishery

Income statement (Tab. 4.4.14)

The average income per vessel of the "sgomberara" fishery approximately amounted to 11,302 €; in the fishing season of 2013 (about 60 days/year). The vessels have expended approximately 6,560 €; the main costs appeared to be mostly related to fuel consumption (3,412 €) which covered more than 52% of total costs for the fishing season.

The other variable costs included mainly costs related to commercialization and to storage of the fish. The estimation of fixed costs related to vessel maintenance corresponded to 1,267 €, those related to gear maintenance were estimated in 276 €. The gross value added amounts to 4,742 € per vessel.

In consideration both of the high level of variable costs (in particular of the energy costs) and the number of the crew (3 fishermen on average), the gross profit of the SSD fishery in northern Sicily is very low; the income from landings is just sufficient to cover the operational costs and the wages and salaries of the crew (Tab. 4.4.14).

The average income per vessel of the "sgomberara" fishery approximately amounted to 11,302 €; in the fishing season of 2013 (about 60 days/year). The vessels have expended approximately 6,560 €; the main costs appeared to be mostly related to fuel consumption (3,412 €) which covered more than 52% of total costs for the fishing season.

The other variable costs included mainly costs related to commercialization and to storage of the fish. The estimation of fixed costs related to vessel maintenance corresponded to 1,267 €, those related to gear maintenance were estimated in 276 €. The gross value added amounts to 4,742 € per vessel.

Table 4.4.14 - Income statement of SSD fishery,
"Sgombetara" for mackerels and bogue, northern Sicily (GSA10).

		Average value per vessel	Value per fishery
Value of landings	**a**	**11,302**	**339,056**
Energy costs	b	3,412	102,356
Commercial costs *	c	660	19,800
Other variable costs	d	945	28,343
Variable costs	*e=b+c+d*	*5,017*	*150,499*
Maintenance costs of the gear	f	276	8,290
Other fixed costs	g	1,267	38,010
Fixed costs	*h=f+g*	*1,543*	*46,299*
Total intermediate costs	**i=e+h**	**6,560**	**196,799**
Gross value added	**l=a-i**	**4,742**	**142,257**
Labour cost	m	4,680	140,400
Gross profit	**n=l-m**	**62,00**	**1,857**

Note: figures refer to the fishing season in which SSD is used
Source: DriftMed project; * estimation on the basis of DCF data

At global level, if all the small scale vessels involved in SSD fishery are considered, the income related to SSD fishery amount to 339,056 €, while the total intermediate costs are estimated on a level of 196,799 €.

The proportion on the annual income (Tab. 4.4.15) of an average fishing vessel involved in SSD fishery is estimate on a level of 50%. The income per day when SSD is used is 188 €, lower than the average income of a small scale vessel in northern Sicily (252 €).

Table 4.4.15 - Estimation of the proportion on the annual days at sea, income and gross value added of an average fishing vessel. “Sgombetara” mackerels and bogue, in northern Sicily (GSA10).

	Average value per vessel
number of days in SSD fisheries (1)	60
Total annual number of days (2)	103
SSD days/total annual days %	**58%**
Income from SSD fishery (€) (1)	11302
Total annual income (€) (2)	22151
SSD income/total annual income %	**51%**
GVA from SSD fishery (€) (1)	4,742
Total annual GVA (€) (2)	9,096
SSD GVA/total annual GVA %	**52%**

Source: (1) Driftmed project
(2) estimation on the basis of DCF data

Social analysis

The number of fishermen employed in “sgombetara” fishery in northern Sicily is 90 with an average age of 47 years old (Tab. 4.4.16).

The crews are paid according to the principle of the share system and, as a consequence, the remuneration is function of income and operational costs. The mean wage paid to the fishers is equal to about 1,560 Euros in the fishing season; for each vessel, the labour costs amount to 4,680 Euros. The number of fishermen on board is 3, higher than the average crew of a small scale vessel (in the majority of the case, only 1 person is embarked on a small scale vessel).

Table 4.4.16 – Number of fishermen and labour costs, “Sgombetara” for mackerels and bogue, northern Sicily (GSA10).

	per vessel	per fishery
No. of fishermen per vessel and per fishery	3	90
Labour costs (€)	4,680	140,400
Labour costs/fisherman (€)	1,560	
Average age of the crew	47	
Type of remuneration	shared crew	

Source: (1) Driftmed project
Note: figures refer to the fishing season in which SSD is used

The northern Sicilian fishery is mainly artisanal, involving 980 vessels that represent 70% of the whole fleet (IREPA, 2011). In spite of the development of other fishing activities, the Sicilian small-scale sector is strongly traditional but it has not a subordinate role in economic and social terms.

The availability of different species allows, in many cases, a polyvalent fishing activity to exploit the periodicity of resources depending on season. The seasonal rotation among fishing gears confirms that the polyvalence is an important feature of artisanal fishery, representing the ability of fishermen to adapt them to dynamic environmental conditions and to different presence of resources in order to optimize the yields (Battaglia *et al*., 2010).

In the fishing harbours where this fishery was identified (Milazzo, Portorosa, Sant'Agata di Militello, Patti, Porticello), the small-scale vessels were 382 for 665 GT and 7,606 kW; the vessels involved in the "sgomberara" fishery corresponded to the 8% of the total SSF fleet in number and the 23% of the total SSF GT. The average size of the vessel involved in the "sgomberara" fishery was higher than that of the SSF vessels (5.19 GT for a SSD vessel and 1.74 for a SSF vessel). In terms of income, for the vessels that used "sgomberara", it was estimated an incidence of 7% (Tab. 4.4.17). In consideration of the average crew of 3 persons in a "sgombetara" vessel, the incidence in terms of employment is higher (15%).

Market price of landings and sales channel

The average price of the target species was 6.21 €/kg, while the same species caught with other fishing gears in the same area is sold at 3.40 €/kg.

The high average landing price is due to the high demand of this product on local market and it is related to the quality and the size of the fish caught with SSD. The bullet tuna, *Auxis rochei*, the most important species caught in the period monitored, had a very low unit value (1.31 €/kg), even if according to the size of the specimens caught, the price ranged between 6.00 and 1.00 Euro/kg (Fig. 4.4.5).

Table 4.4.17 - Level of dependence from small scale driftnets fishery:
incidence of small scale driftnet fishery on small scale fishery in northern Sicily (GSA10).

	SSF vessels (1)	SSD vessels (2)	inc. %
	a	b	b/a
Number of vessels	382	30	8
GT	665	156	23
kW	7606	1937	25
Average GT	1.74	5.19	
Income	9,921,097	664,533	7
Employment		(339,056)	(3)
	600	90	15

Source: (1) estimation on the basis of DCF data

(2) Driftmed project

(*) Income for SSD vessels refers to the annual income of the vessel irrespective of the gear used (i.e. from driftnet and all other gears used); income of the SSD vessels imputable exclusively to the use of the "sgombetara" is reported in brackets

Market price of landings and sales channel

The average price of the target species (horse mackerel, *Trachurus trachurus)* is 6.21 €/kg, while the same species caught with other fishing gears in the same area is sold at 3.40 €/kg.

The high average landing price is due to the high demand of this product on local market and it is related to the quality and the size of the fish caught with SSD. The purse seiners and the trawlers caught the same species but they are considered of 2th or 3rd commercial category.

The bullet tuna, *Auxis rochei*, which was the most abundant species caught in the monitored period, has a very low unit value (1.31 €/kg), even if according to the size the price ranged between 6.00 and 1.00 Euro/kg (Fig. 4.4.5).

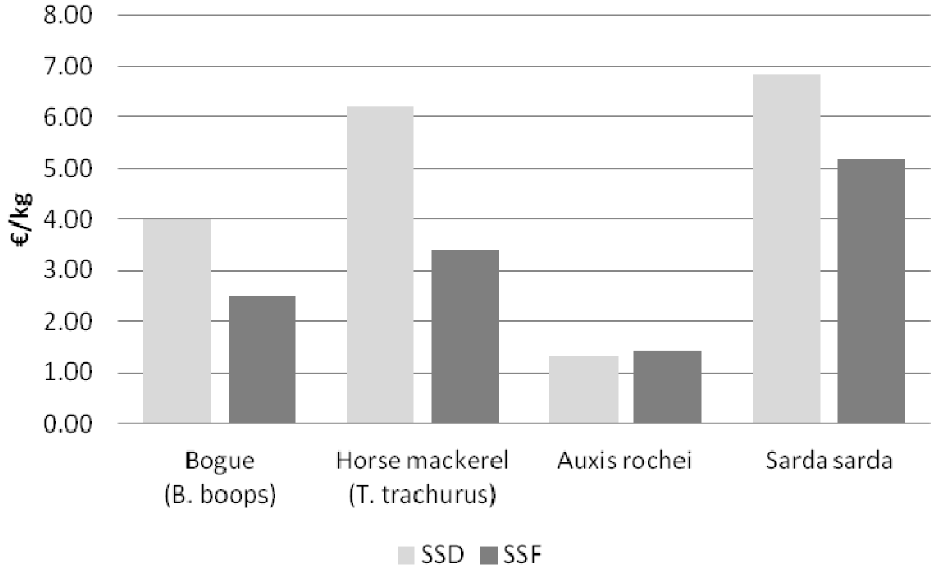


Figure 4.4.5 - Landing prices by main target species for SSF of GSA 10 for "Sgombetara" for mackerels and bogue in northern Sicily (GSA10).
Source: Mpaaf-Irepa (national data and GSA 10 data); data gathered in the present project (SSD fishery).

The sales channel are wholesalers (80% of total production) and retail fish market (20% of total production). The Ninety-two percent of the boats using "sgombetara" are registered in 11 fishing cooperatives, while the others are autonomous. Despite the high level of association, fishermen do not have a common trade agreement and do not adopt a product qualification policy. Moreover, there is no fish market and catches are traded mainly in the wholesale sector and exported to Sicilian and Italian markets (80 % of total production). The remaining part of catches (20%) is traded in fishmonger's shops and restaurants or at landings on wharf directly by fishermen. In the area of Milazzo, thanks also to the help of local cooperatives and municipalities, some fishermen gained enough independence in trading catches directly to consumers, staying on boats in landing places, by adopting food safety rules and in accordance with EU law on the traceability of fishery products (EU Reg. 2065/2001) (Battaglia *et al*., 2010).

FISHERY 5: "MENAIDE" FOR ANCHOVY, *ENGRAULIS ENCRASICOLUS*, IN SANT'AGATA DI MILITELLO (GSA10)

In Sant'Agata di Militello (GSA10), a limited number of vessels (7) are specialized in a traditional fishery using "menaide" driftnets for catching anchovy (*E. encrasicolus*).
Even if the characteristics of the gears, as well the fishing practices and the typology of fishing grounds are similar to those of the "menaide" fishery of Catania, in terms of economic and social aspects, there are significant differences among the two fisheries.

Income statement (Tab. 4.4.18)
The average income per vessel of this fishery approximately amounted to 7,000 € in the fishing season (about 20 days in a year). The main costs appeared to be related to fuel consumption (2,520 €), which covered more than 52% of total costs for the fishing season. The fuel consumption for vessel in a day was approximately equal to 125 €; this high value is due to the distance of the fishing grounds and it is one of the most important difference with the fishery of Catania, for which the average fuel consumption was equal to 25 € in a day. Because of the high cost of fuel, gross profit is very low. It is to be considered that the crew of this fishery is composed by two persons (in some cases only one fishermen) and the ship-owner is one of the fishermen on board; consequently the added value represents the remuneration both of the labour and the capital.
Fixed costs are related to vessel (144 €) and gear maintenance (414 €).
The gross value per vessel added amounts to 3,152 €.

Table 4.4.18 - Income statement of the "menaide" for anchovy in S. Agata di Militelllo (GSA10).

		Average value per vessel	Value per fishery
Value of landings	**a**	**6,997**	**48,979**
Energy costs	b	2,520	17,640
Commercial costs *	c	221	1,546
Other variable costs	d	547	3,827
Variable costs	*e=b+c+d*	*3,288*	*23,013*
Maintenance costs of the gear	f	414	2,898
Other fixed costs	g	144	1007
Fixed costs	*h=f+g*	*558*	*3,905*
Total intermediate costs	**i=e+h**	**3,845**	**26,917**
Gross value added	**l=a-i**	**3,152**	**22,062**
Labour cost	m	2,840	19,880
Gross profit	**n=l-m**	**312**	**2,182**

Note: figures refer to the fishing season in which SSD is used
Source: DriftMed project; * estimation on the basis of DCF data

At global level, if all the small-scale vessels involved in SSD fishery are considered, the income related to SSD fishery amounts to about 50,000 €, while the total intermediate costs are estimated on a level of 33,411 €. The proportion on the annual income (Tab. 4.419) of an "average" fishing vessel involved in this fishery was estimated of 25%; in terms of gross value added, as a consequence of the high level of variable costs, the incidence is lower (21%).

Tab. 4.4.19 - Estimation of the proportion on the annual days at sea, income and gross value added of an average fishing vessel. “Menaide” for anchovy, S. Agata di Militelllo (GSA10).

	Average value per vessel
number of days in SSD fisheries (1)	20
Total annual number of days (2)	102
SSD days/total annual days %	20%
Income from SSD fishery (€) (1)	6,997
Total annual income (€) (2)	27,686
SSD income/total annual income %	25%
GVA from SSD fishery (€) (1)	2,224
Total annual GVA (€) (2)	10,526
SSD GVA/total annual GVA %	21%

Source: (1) Driftmed project
(2) estimation on the basis of DCF data

Social analysis

The number of fishermen employed in the "menaide" fishery in Sant’Agata di Militello was 15 with an average age of 57 years old. The crew share is the method used to pay the fishermen; the mean wage paid to the fishers corresponded approximately to 1,420 Euros in the fishing season (Tab. 4.4.20); for each vessel, the labour costs amounted to 2,840 Euros. The labour costs for the fishery was of 19,880 €, equal to 41% of the total income.

Table 4.4.20 – Number of fishermen and labour costs, “Menaide” for anchovy in S. Agata di Militelllo (GSA10).

	per vessel	per fishery
No. of fishermen per vessel and per fishery	2	15
Labour costs (€)	2,840	19,880
Labour costs/fisherman (€)	1,420	
Average age of the crew	53	
Type of remuneration	shared crew	

Source: (1) Driftmed project
Note: figures refer to the fishing season in which SSD is used

With regard to the level of dependence, 3 of the 7 vessels involved in “menaide” fishery from June to August, use also the “ricciolara” from September to October; for this reason, the analysis of dependence from SSD fishery in the area of Sant’Agata di Militello is being developed jointly by the two fishery and it is reported in the section related to **“**ricciolara” for the greater amberjack, *Seriola dumerili*, in S. Agata di Militello (GSA10)

Market price of landings and sales channel:

The commercial value of anchovy caught by “menaica” is higher than the one usually found on the national market. The average price at national level of anchovy is 1.77 € per kg, while for the product landed with small scale driftnet in Sant’Agata di Militello the price reaches 4.50 € per kg (Fig. 4.4.6).

The landings price is therefore quite high but it is lower of the price of anchovy caught by "menaide" in Catania area (10,00 €/kg) and in Cilento area (7,00 €/kg).
In the area of Sant'Agata di Militello, not all the production is sold directly by the fishermen at the dock or in retail fish market and restaurants; about 30% of the total production is sold to wholsalers who supply the largest fish market of Catania and Palermo.
No eco-labelling mechanism has been identified in the selected fishery.

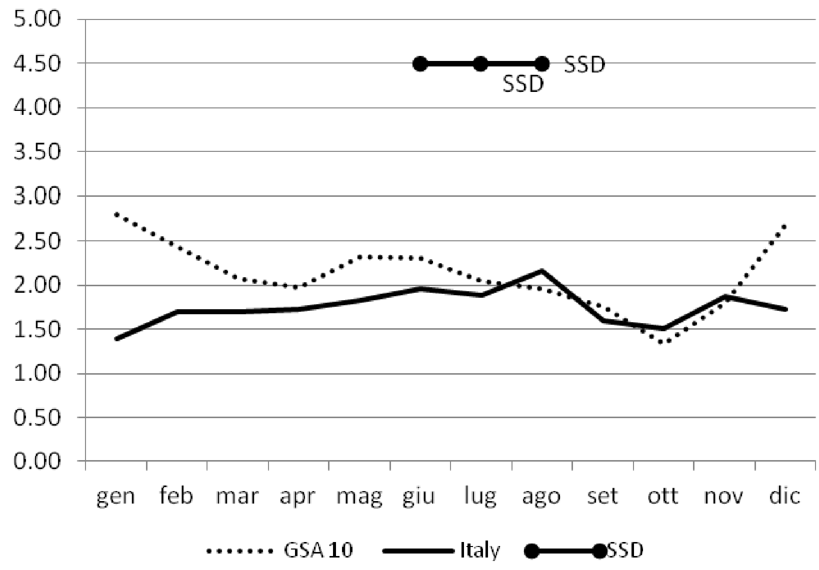


Figure 4.4.6 - Trend in landing price of anchovy, in GSA 10, in Italy and for "Menaide" for anchovy in S. Agata di Militelllo (GSA10).
Source: Mpaaf-Irepa (national data and GSA 10 data); data gathered in the present project (SSD fishery).

FISHERY 6: "RICCIOLARA" FOR THE GREATER AMBERJACK, *SERIOLA DUMERILI,* IN SANT'AGATA DI MILITELLO (GSA10)

In 2013, 3 vessels were identified to exploit the greater amberjack, *Seriola dumerili* as target species ("ricciolara" fishery) in Sant'Agata di Militello. They used small driftnets seasonally, between September and November. In 2013, the number of fishing days realised with driftnets for each vessel was, on average per vessel, 40.

Income statement (Tab. 4.4. 21).
The total annual landings of the vessels involved in the "ricciolara" fishery in GSA 10 was approximately estimated, for the year 2013, in 30,600 Euros. In the fishing season, the average income per vessel amounted to about 10,200 €. The total variable costs (energy costs and other variable costs such as ices, boxes) roughly amounted to 10,915 Euros, while fixed costs (mainly, maintenance costs of the gear and of the vessel) were estimated in about 2,500 Euros. The main costs appeared to be related to the fuel consumption (2,000 € the average value per vessel in the fishing season) which covered more than 45% of total costs. The gross value added barely amounted to 17,170 €.

Table 4.4.21- Income statement of SSD fishery,
"Ricciolara" for the greater amberjack, S. Agata di Militello (GSA10).

		Average value per vessel	Value per fishery
Value of landings	**a**	**10,200**	**30,600**
Energy costs	b	2,000	6,000
Commercial costs*	c	389	1,167
Other variable costs	d	1,249	3,748
Variable costs	*e=b+c+d*	*3,638*	*10,915*
Maintenance costs of the gear	f	250	750
Other fixed costs	g	588	1,765
Fixed costs	*h=f+g*	*838*	*2,515*
Total intermediate costs	**i=e+h**	**4,477**	**13,430**
Gross value added	**l=a-i**	**5,723**	**17,170**
Labour cost	m	4,000	12,000
Gross profit	**n=l-m**	**1,723**	**5,170**

Note: figures refer to the fishing season in which SSD is used
Source: DriftMed project; * estimation on the basis of DCF data

The SSD fishing days amount to 39% of the annual level of activity of the vessels that used "ricciolara" in the investigated period. The proportion on the annual income (Tab. 4.4.22) of an average fishing vessel involved in SSD fishery is estimated of 44%; the profitability of the SSD fishing activity is at the same level of the profitability achieved with other passive gear (255 €/vessel/day).

Table 4.4.22 - Estimation of the proportion on the annual days at sea, income and gross value added of an average fishing vessel. "Ricciolara" for the greater amberjack, S. Agata di Militello (GSA10).

	Average value per vessel
number of days in SSD fisheries (1)	40
Total annual number of days (2)	102
SSD days/total annual days %	**39%**
Income from SSD fishery (€) (1)	10200
Total annual income (€) (2)	23194
SSD income/total annual income %	**44%**
GVA from SSD fishery (€) (1)	5723
Total annual GVA (€) (2)	14423
SSD GVA/total annual GVA %	**40%**

Source: (1) Driftmed project
(2) estimation on the basis of DCF data

Social analysis

The crew of the vessels involved in "Ricciolara" for the greater amberjack, *Seriola dumerili*, in S. Agata di Militello (GSA10) is of two persons on average; the total number of fishermen is 6. The average age is quite high (53 years old).

The crews are paid according to the principle of the share system, so it is variable in function of the income and costs. The mean wage paid to the fishers is equal to about 2,000 Euros in the fishing season; for each vessel, the labour costs amount to 4,000 Euros (Tab. 4.4.23).

Table 4.4.23 – Number of fishermen and labour costs, "Ricciolara" for the greater amberjack, S. Agata di Militello (GSA10).

	per vessel	per fishery
No. of fishermen per vessel and per fishery	2	6
Labour costs (€)	4,000	12,000
Labour costs/fisherman (€)	2,000	
Average age of the crew	53	
Type of remuneration	shared crew	

Source: (1) Driftmed project
Note: figures refer to the fishing season in which SSD is used

In the fishing harbors in which this fishery is present (Sant'Agata di Militello), the number of small scale vessels is 64 for 128 GT and 1,576 kW; the vessels that in Sant'Agata di Militello are involved in "menaide" and "ricciolara" fishery are 7, corresponding to the 11% of the total SSF fleet in number and the 23% of the total SSF GT (Tab. 4.4.24). In terms of income, vessels that used SSD have an incidence of 6%; the dependence from the SSD fishery is the same if the number of fishermen is considered.

Table 4.4.24 – Level of dependence from small scale driftnets fishery: incidence of small scale driftnet fishery on small scale fishery in Sant'Agata di Militello (GSA 10).

	SSF vessels (1)	SSD vessels ("ricciolara and "menaide") (2)	Inc. %
Number of vessel	64	7	11
GT	128	29	23
kW	1576	430	27
Income (€) *	1,374,009	78,319 (38,250)	6 (3)
Employment	101	6	6

Source: (1) estimation on the basis of DCF data
(2) Driftmed project
(*) Income for SSD vessels refers to the annual income of the vessel irrespective of the gear used (i.e. from driftnet and all other gears used); income of the SSD vessels imputable exclusively to the use of the "ricciolara" and "menaide" is reported in brackets

<u>Market price of landings and sales channel</u>

The average price of the greater amberjack, *Seriola dumerili* caught by "ricciolara" is very high (15.00 €/kg). In GSA 10 (lower Tyrrhenian sea), the average price is equal to 12.80/ kg. This specie is well-appreciated in local and national market and it is a target species of the small scale fisheries in general; the high price is due to the high market demand and to the low level of the relatively low quantities landed.

The product is sold to wholesalers.
For the other species landed by "ricciolara", the average price is much higher than that usually found on the national market; for Mediterranean mackerel, the landing price is 10,00 €/kg, while in GSA 10, the average price is 2.00 €/kg; for common Pandora, it was recorded a price of 10.00 €/kg for SSD fishery and 8.00 €/kg for the same specie landed in GSA 10 (Fig. 4.4.7).
No eco-labelling mechanism has been identified in the selected fishery.

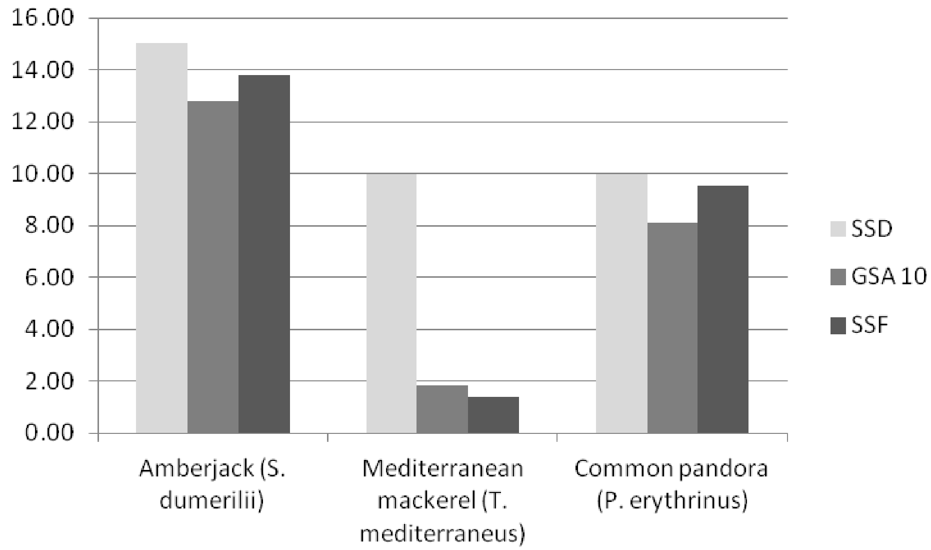


Figure 4.4.7 - Landing prices by main target species for SSF (small scale fishery), for GSA 10 and for "Ricciolara" in S. Agata di Militello (GSA10).
Source: Mpaaf-Irepa (national data and GSA 10 data); data gathered in the present project (SSD fishery).

FISHERY 7: "FERRETTARA" FOR FOR BLUE FISH, *POMATOMUS SALTATRIX*, IN THE GULF OF NAPLES (GSA10)

The "ferrettara" fishery for bluefish, *Pomatomus saltatrix*, in Gulf of Naples was carried out by two vessels of Torre Annunziata, Campania, in 2013. This fishery was practiced on seasonal basis, from June to September; 70 average fishing days were estimated for each vessel.

Income statement (Tab. 4.4.25).
The total annual value of landings of the vessels involved in this fishery was estimated, for the year 2013, in 46,035 Euros; the vessels of this fishery generated a total gross value added of around 35,862 Euros. The total variable costs amounted approximately to 4,294 Euros, the fixed costs to about 10,173 Euros.
The average income per vessel amounted to 23,018 €; in consideration of the low level of the operational costs (in particular of the fuel costs), the incidence of gross value added on the value of landings was very high (about 78%). The fuel costs were approximately 1,575 Euros per vessel in the fishing season, that was equal to a consumption of around 23.00 € per day.

Table 4.4.25 - Income statement of SSD fishery,
"Ferrettara" for the blue fish, Gulf of Naples, GSA10.

		Average value per vessel	Value per fishery
Value of landings	**a**	**23,018**	**46,035**
Energy costs	b	1,575	3,150
Commercial costs*	c	242	485
Other variable costs	d	330	659
Variable costs	*e=b+c+d*	*2,147*	*4,294*
Maintenance costs of the gear	f	2,000	4,000
Other fixed costs	g	940	1,879
Fixed costs	*h=f+g*	*2,940*	*5,879*
Total intermediate costs	**i=e+h**	**5,087**	**10,173**
Gross value added	**l=a-i**	**17,931**	**35,862**
Labour cost	m	10,780	21,560
Gross profit	**n=l-m**	**7,151**	**14,302**

Note: figures refer to the fishing season in which SSD is used
Source: DriftMed project; * estimation on the basis of DCF data

The proportion on the annual income (Tab. 4.4.26) of an average fishing vessel involved in SSD fishery was estimated at a level of 65%. The SSD fishing days amounted to 47% of the annual level of activity. In terms of the gross value added, the incidence is higher (about 71%) thanks to the low level of variable costs.
The profitability of the SSD fishing activity is higher than the profitability of other passive gear (respectively 512 €/vessel/day and 242 €/vessel/day).

Table 4.4.26 - Estimation of the proportion on the annual days at sea, income and gross value added of an average fishing vessel. "Ferrettara" for blue fish, Gulf of Naples, GSA10.

	Average value per vessel
number of days in SSD fisheries (1)	70
Total annual number of days (2)	149
SSD days/total annual days %	**47%**
Income from SSD fishery (€) (1)	23,018
Total annual income (€) (2)	42,114
SSD income/total annual income %	**55%**
GVA from SSD fishery (€) (1)	17,931
Total annual GVA (€) (2)	30,700
SSD GVA/total annual GVA %	**58%**

Source: (1) Driftmed project
(2) estimation on the basis of DCF data

Social analysis

The crew of the vessels involved in "Ferrettara" for blue fish, *Pomatomus saltatrix*, in Gulf of Naples, GSA10 is composed by 4 units. The average age of the fishermen is 45 years.

The crews are paid according to the principle of the share system. The mean wage paid to the fishers is equal to about 5,390 Euros; for each vessel, the labour costs amount to 10,780 Euros in a year per vessel (Tab. 4.4.27).

Table 4.4.27 – Number of fishermen and labour costs, "Ferrettara" for blue fish Gulf of Naples, GSA10.

	per vessel	per fishery
No. of fishermen per vessel and per fishery	2	4
Labour costs (€)	10,780	21,560
Labour costs/fisherman (€)	5,390	
Average age of the crew	45	
Type of remuneration	shared crew	

Source: (1) Driftmed project

In the local fishing harbor in which this fishery is present (Torre Annunziata), the dependence from SSD fishery is quite low. The number of small scale vessels is 65 for 149 GT and 2,182 kW; the vessels involved in SSD fishery correspond to the 3% of the total SSF fleet in number and the 5% of the total SSF GT. In terms of income, vessels that use SSD have an incidence of 4%; the dependence from the SSD fishery in terms of employment is 4% (Tab. 4.4.28).

Table 4.4.28 – Level of dependence from small scale driftnets fishery: incidence of small scale driftnet fishery on small scale fishery in Gulf of Naples, GSA10.

	SSF vessels Gulf of Naples (1)	SSD vessels Gulf of Naples (2)	Inc. %
Number of vessel	65	2	3%
GT	149	8	5%
kW	2182	94	4%
Income (€) *	2.315.078	84.227	4%
		(46.035)	(2%)
Employment	107	4	4%

Source: (1) estimation on the basis of DCF data
(2) Driftmed project

(*) Income for SSD vessels refers to the annual income of the vessel irrespective of the gear used (i.e. from driftnet and all other gears used); income of the SSD vessels imputable exclusively to the use of the "ferrettara" is reported in brackets

Market price of landings and sales channel

The target species, *Pomatomus saltatrix,* represented around 94% of the total catches; the average price in the Gulf of Naples is around 10.00 €/kg.

The SSD fishery in Gulf of Naples achieves higher market value for their catches, due to better product quality, shorter marketing channels and high demand in local markets.

The product is sold directly in local fishing market.

COMPARISON OF THE SOCIO-ECONOMIC PARAMETERS AMONG THE SSD FISHERIES

A comparison of the results obtained from the selected SSD fisheries was carried out.
The comparative criteria covered technical and socio-economic issues, in order to explore the different dimensions under which the SSD operate. Specifically, effort (fishing activity), value of production, operational costs, productivity, prices and markets were analyzed (Tab. 4.4.29).
The small-scale driftnet fishery is in most cases a seasonal activity; only in the Catania area, the "menaide" is active all around the year (an annual value per vessel of 145 of fishing days). For the other fisheries, the annual activity ranged between a minimum of 15 days in the "occhiatara" of the Ligurian Sea to a maximum of 70 days in the "ferrettara" of the Gulf of Naples. The 89% of the total effort (GT*days at sea) of SSD fishery was ascribed to two fisheries: “menaide” in Catania area (56%) and “sgomberara” in Northern Sicily (34%).
A great variability was evidenced in the total value of landings for the SSD fisheries investigated and this situation can be explained by the sizes of the fishery (number of vessels involved), by the unit value of the target species and by the technical characteristics of the different gears that affect the level of technical efficiency. The “menaide” of the Catania area accounts for about 76% of the total value of landings of all the SSD fisheries studied. Over all fisheries, the average value of landings per vessel was 66,748 Euros for the “menaide” of Catania area, 23,018 Euros for the “ferrettara” of the Gulf of Naples and 11,301 Euros for the “sgombetara” in Northern Sicily. In the other fisheries, the value of landings per vessel is lower than 8,000 Euros.
The employment related to the SSD fisheries investigated was estimated in 297 persons; if all the vessels associated with the GND fishing type (both as main and second gear) in the Mediterranean EU waters are considered (467 vessels), the potential number of fishermen increases to more than one thousand units[1].
In terms of employment, the fishermen involved in the fishery of Catania represented the 39% of the total; in Northern Sicily, in the fisheries “sgombetara”, “ricciolara” and “menaide” the number of fishermen is equal to 37% of the total employment; another important area regarding the level of employment is Cilento, with a percentage of 19% of the total fishermen involved in the "menaide" fishery

[1] The estimation of the total employment for the 467 vessels is based on the average number of fishermen per “strata”, where “strata” are a similar group of vessels in terms of gear, LOA and fishing area.

Table 4.4.29 – Fishing effort, value of landings and employment by SSD fisheries.

	Effort (GT*days at sea)	Value of landings (€)	Employment
“Menaide” for anchovy, *Engraulis encrasicolus*, in Catania area (GSA19)	15,515	1,868,940	115
“Menaide or menaica” for anchovy, *Engraulis encrasicolus*, in the Cilento area (GSA10)	1,080	82,175	57
“Occhiatara” for saddlled sea bream, *Oblada melanura*, in Ligurian Sea (GSA9)	319	39,803	10
“Sgomberara” for horse mackerel, *Trachurus trachurus*, in northern Sicily (GSA10)	9,360	339,056	90
“Menaide” for anchovy, *Engraulis encrasicolus*, in S. Agata di Militelllo (GSA10)	580	48,979	15
"Riccciolara" for greater amberjack, *Seriola dumerili*, in S. Agata di Militello (GSA10)	560	30,600	6
"Ferrettara" for blue fish, *Pomatomus saltatrix*, in Gulf of Naples (GSA10)	560	46,035	4
Total SSD fisheries	27,974	2,455,588	297
Vessels associated with the GND fishing type (both as main and second gear) in the Mediterranean EU waters updated to December 31st 2012 (data from EU Fleet Register).			1,009

The SSD fisheries generate more employment in comparison of the others small scale fisheries (Fig. 4.4.8).

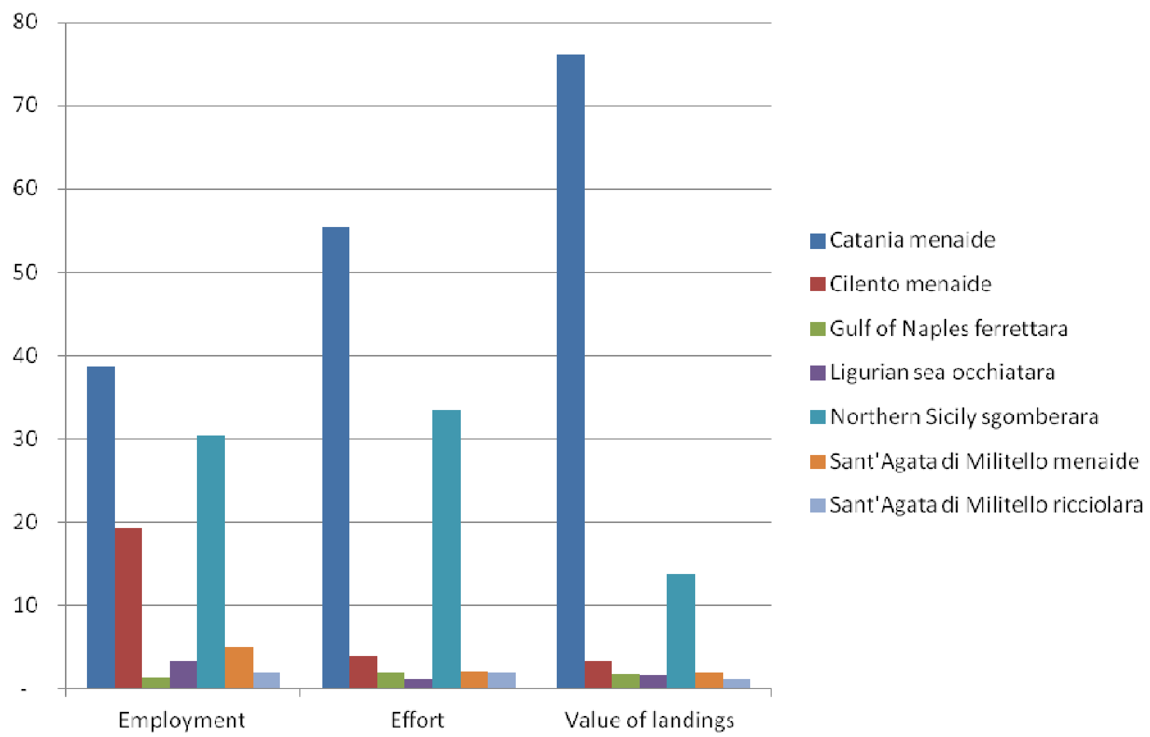


Figure 4.4.8 – Percentage distribution of employment, fishing effort and value of landings by SSD fisheries.

The average number of fishermen per vessel of the SSD fisheries, in fact, is higher than that of the other small scale fisheries; this is particularly evident for the “menaide” fisheries and especially for that of the Catania area, which is carried out all year round. In addition, in some areas (Cilento and Catania), the SSD fishery generates employment in related activity such as the processing and the commercialization.
As concerns the value of landings per days at sea, the average value per vessel for “occhiatara” fishery of the Ligurian sea was estimated in 549 €, the highest value among the fisheries investigated (Tab. 4.4.30). The lowest level of profitability was recorded for “sgomberatara” in Northern Sicily (188 €/per vessel/days at sea). A different level of profitability resulted also for the same gear; this is the case of “menaide” with a profitability equal to 460 €/per vessel/days at sea in Catania area, 216 €/per vessel/days at sea in Cilento area and 350 €/per vessel/days at sea in Sant’Agata di Militello.
Fishing costs, especially fuel cost per unit of production, show an high variability. The fuel consumption is in four fisheries on seven (Catania “menaide”, Cilento “menaide”, Gulf o Naples “ferrettara” and Ligurian sea “occhiatara”) lower than 30,00 € per day at sea. In Northern Sicily the highest fuel costs is linked with the greater distance from the coast of the fishing grounds.
The indicator of GVA on income gives a good indication of the economic performance of the fleets involved in SSD fisheries. The indicator for Catania area is equal to 80% in consideration of the low level of operational costs; in the Northern Sicily, on the contrary, the indicator is lowest, due to the level of fuel costs and to the lesser profitability (Tab. 4.4.30).

Table 4.4.30 – Selected economic indicators by SSD fisheries.

	Revenue per day at sea (€)	Average price (€/kg) of the target species	Fuel cost per days at sea (€)	GVA/income %
“Menaide” for anchovy, Catania area (GSA19)	460.33	9.44	24.68	80.48%
“Menaide or menaica” for anchovy, Cilento area (GSA10)	216.25	7.00	12.56	69.36%
“Occhiatara” for saddlled sea bream, Ligurian Sea (GSA9)	549.01	13.00	30.00	87.10%
“Sgomberara” for mackerels and bogue, northern Sicily (GSA10)	188.36	6.22	56.86	41.96%
“Menaide” for anchovy, S. Agata di Militelllo (GSA10)	349.85	4.50	126.00	45.04%
"Riccciolara" for greater amberjack, S. Agata di Militello (GSA10)	255.00	15.00	50.00	56.11%
"Ferrettara" for blue fish Gulf of Naples (GSA10)	328.82	10.00	22.50	77.90%

The average price of target species for “occhiatara” in Ligurian sea (saddlled sea bream**)** is 13.00 € per kg, compared with 4.50 € per kg for the anchovy caught with menaide in Sant’Agata di Militello.
It was shown in the previous paragraphs that the SSD fisheries achieve generally higher market value for their catches, due to better product quality and shorter marketing channels. The gap between prices at first sale of the same specie caught with other gears can be very high.
These gaps may be explained by both the differences in quality (linked to freshness and organoleptic quality) and size of the products. SSF fish are usually intact, while trawled fish

may be damaged, and there is also the impact of a longer trip duration in the case of the latter (Guyader, 2013).
No eco-labelling mechanism has been identified in the SSD fisheries. However, the marketing of products is in some cases organized according to a system of labelling which makes it possible to identify the product on the market. This is the case of the fishery of “menaide” in Catania area and in Cilento area; two specific certifications to obtain the "Slow food" presidium of typicality of the product ("anchovies from menaide" and “masculine da magghia”) have been obtained; the presidium sustain the recovery of traditional processing methods and were created to ensure greater profitability for the fishers.
This kind of certification has a great impact on the markets; the demand of the “menaide” products had a great improvement in the last years and the trend in landing prices showed an increase.
With the exception of these two fisheries, all the other SSD fisheries are dependent on local and regional markets and only a low quantity of the product is sold at national level.

4.5 - SUMMARY OF THE CHARACTERISTICS OF THE SSD FISHERIES IDENTIFIED

This Paragraph reports a detailed synoptic table (Tab. 4.5.1) resuming the results obtained for the characterization of the Small Scale Driftnet fisheries identified by DRIFTMED project in the EU Mediterranean waters.
This table is also the **Deliverable 10** of the project: "Summary on the distribution and the characteristics of the SSD fisheries in Mediterranean".

Table 4.5.1 - Summary table on the characteristics of the SSD fisheries in mediterranean (Part 1).

Fisheries	**1**	**2**	**3**	**4**	**5**	**6**
General characteristics (1)						
Country	**ITALY**	**ITALY**	**ITALY**	**ITALY**	**ITALY**	**ITALY**
GFCM - GSA where the fishery takes place	19	10	9	10	10	10
Area	Catania	Cilento	Liguria	Northern Sicily	Northern Sicily	Northern Sicily
Local denomination of the fishery	"menaide"	"menaide"	"occhiatara"	"sgomberara"	"menaide"	"ricciolara"
List of the target species	*Engraulis encrasicolus*	*Engraulis encrasicolus*	*Oblada melanura*	*Trachurus trachurus* *T. mediterraneus* *Scomber colias* *S. scombrus* *Boops boops*	*Engraulis encrasicolus*	*Seriola dumerilii*
Main landing port(s)	Catania Ognina Aci Castello	Marina di Camerota Marina di Pisciotta Palinuro	Sanremo Imperia	Portorosa Spadafora S. Agata di Militello Patti Milazzo Porticello	S. Agata di Militello	S. Agata di Militello
Fishing period (*months of occurrence*)	All year	April- June	May-June	All year	June-August	August-October
Annual fishing days (average by boat) (1), (5)	145.0	20.0	14.5	60.0	20.0	40.0
Number and size of						

vessels involved - Total	28	19	5	30	7	3
<10m	6	14	3	19	2	1
10-11m	21	5	1	11	4	1
12-17m	1		1		1	1
>18m						
Sampling details						
N of interviews	19	17	32	24	7	3
N of logbooks	54	19	44	96	17	2
N of embarks	12	0	18	26	0	2
N of nets directly measured	4	4	9	3		5
N of specimens measured	4488	178	1185	314	0	174
Gear configuration (1), (2), (3), (4)						
Mesh sizes (min-max, average)	min-max: 19-22 mm, avg: 20.53 mm	min-max: 26-29 mm, avg: 27 mm	min-max: 70-90 mm, avg: 79.4 mm	min-max: 70.5-85 mm, avg: 80.17 mm	avg: 20 mm	70 mm
Length of the nets employed (min-max, average)	min-max: 240-300 m, avg: 280 m	min-max: 300-500 m, avg: 425 m	min-max: 375-500 m, avg: 412.5 m	min-max: 500-1500 m, avg: 921 m	avg. 500 m	min-max: 800-1000 m, avg: 900 m
Fully extended net drop (min-max, average)	min-max: 23-26 m, avg: 25 m	min-max: 21-26 m, avg: 24 m	min-max: 11-36 m, avg: 18m	min-max: 28-43 m, avg: 35 m	avg: 15 m	21 m
Hanging ratio	min-max: 0.74 - 1, avg: 0.87	min-max: 0.72–0.85, avg: 0.81	min-max: 0.62–0.83, avg: 0.70	NA	NA	NA
Twine thickness	0.24 mm	0.24 mm	min-max: 0.25–0.35 mm, avg: 0.26 mm	0.30 mm	NA	0.30 mm
Do vessels normally	No	No	Yes	No	No	No

carry multiple driftnets on board?						
Do vessels normally set multiple driftnets at the same time?	No	No	Yes	No	No	No
Fishing grounds: distance offshore (min-max, average) **Depth (min-max, average)**	**Distance min-max:** 0.585 km - 6.592 km; avg: 4.337 km **Depth min-max:** 35 - 135 m; avg: 84.0 m	**Distance:** max 3 nautical miles from the coast **Depth min-max:** 80 - 150 m; avg: 120.0 m	**Distance min-max:** 0.050 km – 0.500 km; avg: 0.275 km **Depth min-max:** 12 - 45 m; avg: 23.8 m	**Distance min-max:** 2.633 km – 14.208 km; avg: 9.068 km **Depth min-max:** 30 - 400 m; avg: 194.0 m	**Distance min-max:** 3.568 km – 8.480 km; avg: 4.641 km **Depth min-max:** 40 - 150 m; avg: 70.0 m	**Distance min-max:** 2.252 km – 3.100 km; avg: 2.805 km **Depth min-max:** 18 - 30 m; avg: 26.0 m
Soak time of the nets (min-max, average)	**Soak time min-max:** 1h – 5h; avg: 1h 36’	**Soak time min-max:** 48’ – 1h 30’; avg: 1h 06’	**Soak time min-max:** 3h– 7h; avg: 4h 30’	**Soak time min-max:** 1h 30’ – 6h 30’; avg: 3h 36’	**Soak time min-max:** 1h – 6h; avg: 2h 6’	**Soak time min-max:** 3h – 5h; avg: 4h
Do the vessels of this fishery ever target the same species with a different gear type? if yes please give details	No	No	No	No	No	No
Socio-economic characteristics						
Total number of fishermen involved in this fishery (5)	115	57	10	90	15	6
Average number of fishermen per vessel	4	3	2	3	2	2
	Landings Landings	Landings Landings	Landings Landings	Landings Landings	Landings Landings	Landings Landings

	(kg)	(€)	(kg)	(€)	(kg)	(€)	(kg)	(€)	(kg)	(€)	(kg)	(€)
Total annual landings from this fishery in weight (kg) and € (5)	206131	1868940	14301	82175	6018	39803	214241	339056	12081	48979	2391	30600
Total annual landings of this fleet irrespective of the gear used (i.e. from driftnet and all other gears used) in weight (kg) and value (€) (5)	227152	2058000	47963	383705	17619	160293	258815	664533	32141	195456	7405	69581
Total number of days spent at sea per year by vessel and for all the fleet:	**By vessel**	**All fleet**	**By vessel**	**All fleet**	**By vessel**	**All fleet**	**By vessel**	**All fleet**	**By vessel**	**All fleet**	**By vessel**	**All fleet**
a) when using driftnets	145	4060	20	380	14.5	72.5	60	1800	20	140	50	150
b) irrespectively of the gear used (driftnet and other gears)	164	4592	149	2831	118	591	103	3090	102	714	102	306
Incomes (all fishery)												
Mean price of the targets species	9.44 €		7.00 €		13.00 €		6.22 €		4.50 €		15.00 €	
Average price of the target species caught with other gears	6.00 €		2.00 €				1.58 €		1.77 €		12.80 €	

Fuel costs per day per vessel	24.68 €		12.56 €		30.00€		56.86 €		126.00 €		50.00 €	
Maintenance cost of the gear per vessel	1,400.00 €		590.00 €		187.00 €		276.00 €		414.00 €		250.00 €	
Gear purchase cost per vessel	2,900.00 €		3,600.00 €		1,413.00 €		1,050.00 €		2,140.00 €		800.00 €	
Total annual landings from this fishery/total annual landings of this fleet irrespective of the gear used (5)	**In weight**	**In value**	**In weight**	**In value**	**In weight**	**In value**	**In weight**	**In value**	**In weight**	**In value**	**In weight**	**In value**
	90.7 %	90.8 %	29.8 %	21.4 %	34.2 %	24.8 %	83.0 %	51.0 %	37.6 %	25.1 %	35.0 %	44.0 %
Total number of days spent when using driftnets/total number of days at sea irrespectively of the gear used (5)	88.4 %		13.4 %		12.3 %		58.3 %		19.6 %		39.0 %	
Social and cultural aspects (traditional fishery)	Yes		Yes									
Typicality of the product	Presidium Slow food “Masculine da Magghia”		Presidium Slow food “Alici di Menaica” ”		No		No		No		No	
Other												
Sustainability (1), (3), (4), (6)												
CATCH RATES **<u>a) Total catches</u>** **(irrespective of the**	min 0.1 kg/day -		min 6.0 kg/day -		min 17.5 kg/day - max		min 0.3 kg/day -		min 15.0 kg/day -		min 14.0 kg/day -	

target species) **Kg/fishing days (min-max average)**	max 160.0 kg/day - avg 48.0 kg/day	max 215.0 kg/day - avg 37.0 kg/day	315.2 kg/day - avg 88.3 kg/day	max 1000.0 kg/day - avg 142.0 kg/day	max 250.0 kg/day - avg 86.0 kg/day	max 18.0 kg/day - avg 16.0 kg/day
Kg/100 m^2 net/h of fishing (average value)	0.738 kg/100m^2/h	0.664 kg/100m^2/h	0.101 kg/100m^2/h	0.092 kg/100m^2/h	0.61 kg/100m^2/h	0.019 kg/100m^2/h
b) Only target species **Kg/fishing days (min-max average)**	min 0.1 kg/day - max 160.0 kg/day - avg 44.0 kg/day	min 6.0 kg/day - max 200.0 kg/day - avg 28.0 kg/day	min 8.0 kg/day - max 247.0 kg/day - avg 62.9 kg/day	min 5.0 kg/day - max 20.0 kg/day - avg 11.3 kg/day	min 15.0 kg/day - max 250.0 kg/day - avg 86.0 kg/day	min 1.4 kg/day – max 15.0 kg/day - avg 9.3 kg/day
Kg/100 m^2 net/h of fishing (average value)	0.678 kg/100m^2/h	0.537 kg/100m^2/h	0.072 kg/100m^2/h	0.019 kg/100m^2/h	0.610 kg/100m^2/h	0.011 kg/100m^2/h
LFD of the catch of the target species: average and modal length	Avg: 11.5 cm Modal: 11.0 cm	Avg: 14.3 cm Modal: 14.5 cm	Avg: 27.0 cm Modal: 27.0 cm	Avg: 24.7 cm Modal: 23.0 cm	Avg: NA Modal: NA	Avg: 29.1 cm Modal 27.5 cm
Minimum Conservation Size (from EC Reg. n. 1967/2006)	9 cm	9 cm	NA	15 cm	9 cm	NA
Proportion (in number) of the specimens under the MCS	16/2301 (0.7 %)	(0/178) 0%	NA	(0/50) 0%	NA	NA
Length at first maturity (7)	9.7 cm TL	9.7 cm TL	17.5 cm TL	18.5 cm TL	9.7 cm TL	80 cm SL
Proportion in number of the specimens under the length at first	(25/2301) 1.1 %	(0/178) 0%	(0/1185) 0%	(0/50) 0 %	NA	(43/43) 100.0 %

maturity						
Composition of the catch (% in weight) **Target species** **By catch** **Discard (% in weight respect to the total catch)**	Target 91.5 % by catch 8.5 % Discard 0.4 %	Target 76.3 % By catch 23.7 % Discard 0.0 %	Target 69.5 % By catch 30.5 % Discard 0.7 %	Target 1.6 % By catch 98.4 % Discard 0.0 %	Target 100 % By catch 0 % Discard 0.7 %	Target 58.4 % By catch 41.6 % Discard 0.0 %
Retained by catch (list of the main species, with % in weight, if available)	*S. pilchardus* 100 %	*S. pilchardus* 100 %	*S. sarda* 1.7 % *B. boops* 0.9 % *M. merluccius* 0.7 % *S. colias* 41.9 % *O. bartramii* 0.4 % *T. sagittatus* 3.4% *S. salpa* 1.5 % Mugilidae indet. 3.4 % *T. mediterraneus* 34.0 % *E. encrasicolus* 1.2% *L. amia* 0.3% Others 3.9%	*S. sarda* 0.5 % *A. rochei* 95.2 % *E. alletteratus* 3.0 % *T. ovatus* 1.2 % *S. dumerili* 0.1%	Not present	*D. dentex* 0.5 % *P. erythrinus* 18.9 % *T. mediterraneus* 68.6 % *O. melanura* 0.7 % *L. mormyrus* 11.4 %
Discarded (list of the main species, with % in weight, if available)	*S. pilchardus* 100%	Not present	*T. mediterraneus* 48.6 % *S. colias* 32.9 % *E. encrasicolus* 11.4 % *T. trachurus* 2.9 % *S. pilchardus* 1.4 % *O macropus* 1.4 % *S. aurita* 1.4 %	Not present	*E. encrasicolus* 100 %	Not present

Are unauthorized species (e.g. those listed in the Annex VIII) caught? What aspects of the fishery influence the probability of interactions with unauthorized? Please give details below: **Fishery location** **Time of the year** **Gear configuration: Net length/Mesh size/Depth in water column/Net material** **Other**	No	No	Yes. Cepahalopods (*T. sagittatus, O. bartramii*) 3.9% of total by-catch. *S. sarda* 1.5% of the total by-catch	Yes. The main important aspect are the Fishery location	No	No
Are protected species caught? **Which species are caught?** **What aspects of the fishery/gear characteristics influence the probability of interactions with protected species?** **Please give details**	No	No	No	No	No	No

below: **Fishery location** **Time of the year** **Gear configuration: Net length/Mesh size/Depth in water column/Net material** **Other**						
National legislation	**Fishery 1**	**Fishery 2**	**Fishery 3**	**Fishery 4**	**Fishery 5**	**Fishery 6**
Do additional legislations to the EU provisions at country or local exist?	**Yes (8)**	**Yes (8)**	**Yes (8)**	**Yes (8)**	**Yes (8)**	**Yes (8)**

SOURCE OF INFORMATION:

(1) from interviews with fishermen;
(2) from direct measurements of nets;
(3) from logbooks;
(4) from embarks;
(5) the information from the whole fisheries were obtained raising the information coming from the sampling (logbooks, embarks, interviews) to the total number of the vessels involved in the fishery;
(6) estimates refer to the period sampled in the DRIFTMED contract;
(7) from literature;
(8) The Italian Ministry for Agricultural, Alimentary and Forestry Policies Decree of 21st September 2011("New measures for the ferrettara net");
Italy adopted a more strict legislation allowing, from January 1st 2012, only the use of driftnets with overall length equal or less than 2.5 km, with a mesh size no more than 100 mm and to be used only within 3 miles from the coast.

Table 4.5.1 - Summary table on the characteristics of the SSD fisheries in mediterranean (Part 2).

Fisheries	**7**	**8**	**9**
General characteristics (1)			
Country	**ITALY**	**SLOVENIA-ITALY**	**ITALY**
GFCM - GSA where the fishery takes place	10	17	16
Area	Gulf of Naples	Northern Adriatic	Western Sicily
Local denomination of the fishery	"ferrettara"	"menaide"	"menaide" or "tratta"
List of the target species	*Pomatomus saltatrix*	*Sardina pilchardus*	*Engraulis encrasicolus;* *Sardina pilchardus*
Main landing port(s)	Torre Annunziata	Izola, Koper, Trieste	Selinunte
Fishing period (*months of occurrence*)	June-October	April-May	May-September
Annual fishing days (average by boat) (1), (5)	70	n.a.	33
Number and size of vessels involved - Total	2	1	5
<10m	2		5
10-11m			
12-17m			
>18m			
Sampling details			
N of interviews	2	1	5
N of logbooks	9		
N of embarks	2		
N of nets directly measured	2	3	
N of specimens measured	62		
Gear configuration (1), (2), (3), (4)			
Mesh sizes (min-max, average)	88 mm	min-max: 34-35 mm, avg: 34.4 mm	20 mm
Length of the nets employed (min-max, average)	avg: 2400 m	min-max: 85-1050 m, avg: 418 m	min-max: 200-210 m, avg: 202 m
Fully extended net drop (min-max,	26 m	min-max: 20-21 m, avg: 21 m	min-max: 20-24 m, avg: 21.2 m

average)						
Hanging ratio	-		min-max: 0.84–0.90, avg: 0.86		NA	
Twine thickness	0.54 mm		0.24 mm		0.20 mm	
Do vessels normally carry multiple driftnets on board?	No		No		No	
Do vessels normally set multiple driftnets at the same time?	No		No		No	
Fishing grounds: distance offshore (min- max, average) **Depth (min-max, average)**	**Distance** min-max: 1.353 km – 12.100 km; avg: 3.673 km **Depth** min-max: 15 - 120 m; avg: 40 m				**NA** **Depth** min-max: 18 - 45 m; avg: 31.5 m	
Soak time of the nets (min-max, average)	**Soak time** min-max: 2h – 3h 18'; avg: 2h 36'				**2h**	
Do the vessels of this fishery ever target the same species with a different gear type? if yes please give details	No		No		No	
Socio-economic characteristics						
Total number of fishermen involved in this fishery (5)	4					
Average number of fishermen per vessel	2					
	Landings (kg)	**Landings (€)**	**Landings (€)**	**Landings (kg)**	**Landings (€)**	**Landings (kg)**
Total annual landings from this fishery in weight (kg) and € (5)	4773	46035				
Total annual landings of this fleet irrespective of the gear used (i.e. from driftnet and all other gears used) in weight (kg) and value (€) (5)	10085	84227				

Total number of days spent at sea per year by vessel and for all the fleet: a) when using driftnets b) irrespectively of the gear used (driftnet and other gears)	By vessel	All fleet	By vessel	All fleet	By vessel	All fleet
	70 149	140 298				
Incomes (all fishery) Mean price of the targets species Average price of the target species caught with other gears	9.65 €					
Fuel costs per day per vessel Maintenance cost of the gear per vessel Gear purchase cost per vessel	22.50 € 2,000.00 € 8,000.00 €					
Total annual landings from this fishery/total annual landings of this fleet irrespective of the gear used (5)	In weight	In value	In weight	In value	In weight	In value
	47.0 %	55.0 %				
Total number of days spent when using driftnets/total number of days at sea irrespectively of the gear used (5)	47 %					
Social and cultural aspects (traditional fishery) Typicality of the product Other	No					
Sustainability(1), (3), (4), (6)						
CATCH RATES a) Total catches (irrespective of the target species)	min 12.0 kg/day - max 80.0 kg/day -					

Kg/fishing days (min-max average) **Kg/100 m^2 net/h of fishing (average value)** **<u>b) Only target species</u>** **Kg/fishing days (min-max average)** **Kg/100 m^2 net/h of fishing (average value)** **LFD of the catch of the target species: average and modal length** **Minimum Conservation Size (from EC Reg. n. 1967/2006)** **Proportion (in number) of specimens under the MCS** **Length at first maturity (7)** **Proportion in number of specimens under the length at first maturity**	avg 48.0 kg/day 0.03 kg/100m^2/h min 10.0 kg/day - max 80.0 kg/day - avg 44.7 kg/day 0.028 kg/100m^2/h Avg: 44.3 cm Modal: 44.0 cm NA NA 25.0 cm (0/51) 0.0 %		
Composition of the catch (% in weight) **Target species** **By catch** **Discard (% in weight respect to the total catch)**	Target 89 % By catch 11 % Discard 0 %	Target 95 % By catch 5 % Discard 0 %	
Retained by catch (list of the main species, with % in weight, if available)	*S. sarda* 1.8 % *S. fiatola* 0.2 % *E. alletteratus* 1.7 % *T. ovatus* 55.6 % *L. amia* 16.4 % *L. ramada* 5.0 % *L. aurata* 5.2%	*S. flexuosa* 85% *M. merlangus* 5% Other species 10%	

	Mugilidae 14.1 %		
Discarded (list of the main species, with % in weight, if available)	Not present	Not present	
Are unauthorized species (e.g. those listed in the Annex VIII) caught? What aspects of the fishery influence the probability of interactions with unauthorized? Please give details below: **Fishery location** **Time of the year** **Gear configuration: Net length/Mesh size/Depth in water column/Net material** **Other**	Yes, only in September. The main important aspect are the Fishery location and time of year		
Are protected species caught? **Which species are caught?** **What aspects of the fishery/gear characteristics influence the probability of interactions with protected species?** **Please give details below:** **Fishery location** **Time of the year** **Gear configuration: Net length/Mesh size/Depth in water column/Net material** **Other**	No	No	
National legislation			

Do additional legislations to the EU provisions at country or local exist?	**Yes (8)**	**Yes (8)**	**Yes (8)**

SOURCE OF INFORMATION:

(1) from interviews with fishermen;
(2) from direct measurements of nets;
(3) from logbooks;
(4) from embarks;
(5) the information from the whole fisheries were obtained raising the information coming from the sampling (logbooks, embarks, interviews) to the total number of the vessels involved in the fishery;
(6) estimates refer to the period sampled in the DRIFTMED contract;
(7) from literature;
(8) The Italian Ministry for Agricultural, Alimentary and Forestry Policies Decree of 21st September 2011("New measures for the ferrettara net");
Italy adopted a more strict legislation allowing, from January 1st 2012, only the use of driftnets with overall length equal or less than 2.5 km, with a mesh size no more than 100 mm and to be used only within 3 miles from the coast.

References for Minimum Conservation Size and Size at first maturity of the target species of the small scale driftnets fisheries identified.

Species	Minimum Conservation Size (Reg. 1967/2006) (cm, TL)	Size at 1st maturity (cm ,TL*)	Area	Source
Engraulis encrasicolus	9	9.7	All distribution range	www.fishbase.org
Sardina pilchardus	11	12.4	Sicilian Channel	Gancitano *et al..* 2010
Oblada melanura		17.5	Eastern Adriatic	Cetinic *et al*., 2002
Pomatomus saltatrix		25	All distribution range	www.fishbase.org
Seriola dumerili		80 **	Sicily	Andaloro *et al., 1998*
Trachurus trachurus	15	18.5	Central Mediterranean	Carbonara *et al*., 2012

* Total Length

** Standard Length

4.6 - ASSESSMENT OF THE USE OF FISHING METHODS ALTERNATIVE TO SSD TO EXPLOIT THE SAME RESOURCES (TASK 3.4)

The objective of the Task 3.4 of DRIFTMED was to carry out a comparative evaluation among the current SSD fisheries and alternative fishing methods in Mediterranean, accounting for the technological, economic, social and environmental impacting profiles. Taking into account all the information collected in the previous Workpackages, an analysis about the advantages/disadvantages of a possible replacement of each existing SSD fishery with alternative fishing methods was performed. On the basis of the results achieved by Task 1.2, the main features of possible alternative fishing methods were compared with those of the existing SSD fisheries.
The results of this Paragraph are also reported in the **Deliverable 13** ("Comparative evaluations about a possible replacement of the existing small-scale driftnets with alternative fishing methods in Mediterranean").
The selection of the potentially alternative fishing systems was done on the basis of the affinity of the candidate substitute fishing systems in terms of technical characteristics of the vessel (dimension, technological equipment), operational and technical features of the potentially associated gears, pool of the target species. The potential impact of the candidate alternative systems in terms of fishery sustainability and stock status was one of the key factors taken into account. Thus, fishing systems based on towed gears were excluded by the evaluation.
The objective of the current evaluation was also to bring in evidence lights and shadows of the specific characteristics of the SSD fisheries identified in this study when compared with other fisheries accounting for technical, economic, social and environmental criteria.
This evaluation has been based on the results of the Tasks 3.1, 3.2 and 3.3 and on the outcomes of WP2.

The method applied

The approach followed is the SWOT (Strength, Weakness, Opportunity, Threats) Analysis. This kind of analysis has been selected among other possible techniques, as MCDA (Multi Criteria Decision Analysis), because much information was expected to be available in qualitative than in a quantitative form and also since the comparative evaluations, about a possible replacement of the existing small scale driftnets with alternative fishing methods in Mediterranean, would have required to account for environmental, social as well as economic dimensions. In addition, the use of MCDA would have implied a more complex evaluation structure, as for example the stakeholder consultation, which was difficult to accomplish in the project timeframe.
SWOT analysis is a structured analysis tool that is widely used in strategy formulation, taking into account internal (strengths and weaknesses) and external (opportunities and threats) factors. The external factors may include macroeconomic matters, technological change, legislation, and socio-cultural changes, as well as changes in the marketplace or in competitive positions. The SWOT model has prompted several variations on the theme. Although originally designed for planning, this tool is also used in evaluation processes to ensure that the implemented strategy is appropriate to the situation described in the analysis. SWOT analysis may be used in any decision-making situation when a desired objective has been defined. In

our case study the final goal is the fishery sustainability, accounting for environmental, economic and social considerations.

The SWOT analysis can be thus used to identify options that maximise the potential of strengths and opportunities, while minimising the impact of weaknesses and threats. Further, this tool can assist to determine where change is possible, as an inventory of strengths and weaknesses in the SSD fishery system can reveal priorities as well as possibilities. In the context of the current study, the wide-ranging nature of the SWOT analysis provides a significant advantage over other forms of analysis as it allows environmental, social and economic dimensions to be included and considered simultaneously in the analysis.

In our context the SWOT analysis has followed more the "converting" approach that is to apply conversion strategies to convert weaknesses or threats into strengths or opportunities.

Advantages/disadvantages of a possible replacement of each existing SSD fishery with alternative fishing methods have been thus evaluated by mean of a SWOT analysis supported by the identification of four strategic areas:

1. *Technical characteristics of the gears/vessel/fleet;*
2. *Environmental impact;*
3. *Economic performances;*
4. *Social and cultural heritage.*

For each strategic area, which is contrasted against the Strength, Weakness, Opportunity, Threats, a set of indicators has been identified, which served to assist the SWOT analysis in a more structured manner. The association between indicators and thematic areas is below reported.

A Technical characteristics of the gears/vessel/fleet

1. Number of vessels;
2. Engine power;
3. Gross tonnage;
4. Overall length;
5. Purse seine: deck machinery (presence of powerblock, purse line winch), net length (headrope length), net height;
6. Set gillnet and trammel net: net length (headrope length), net height;
7. Set longline: type (bottom or drifting longline), deck machinery (main line winch), number of hooks;
8. Boat seine: deck machinery (presence of rope winch), net dimensions (headrope length);
9. Fishing trips;
10. Geographical distribution;
11. Associated gears;
12. Seasonality.

B Environmental impact

1. Fish species;
2. Catch composition;
3. Catch rates;
4. Discard rates;
5. Fishing sustainability;
6. Sensitive/endangered species.

C Economic performances

1. Revenue per day;
2. Revenue per effort;
3. Average price (€/kg);
4. Gross Added Value/Revenue;
5. Fuel cost per vessel (000 €);
6. Fuel cost per day (000 €);
7. Cost of maintenance/vessel;
8. Operational costs/revenue;
9. Labour cost/fisherman;
10. Labour cost/vessel.

From 1 to 3 : economic indicators available by métier on the basis of DCF data.
From 4 to 10: economic indicators available by fishing segments (small scale fishing, purse seiners and longlines)

D Social and cultural heritage

1. Typicality of the product;
2. Procedure of labelling or eco-labelling;
3. Relationships with territories and local communities;
4. Social characteristics of the crew;
5. Training, education and skill

The analysis has taken into consideration the following alternative fishing gears/methods:

1. *Purse seine (PS);*
2. *Set gillnet (GNS);*
3. *Trammel net (GTR);*
4. *Set longlines (LLS);*
5. *Drifting longlines (LLD);*
6. *Boat seine (SB_SV).*

The substitutability of the above fishing gears/methods was analysed taking into account the Strategic areas outlined above. In the SWOT analysis the alternative fishing gears/methods were representing the Opportunities and Threats, thus they played as external factors impacting, positively or negatively, the system under investigation.

The SWOT Analysis was performed following a usual step process as below outlined:
first step:

– characterization of the context and collation of the indicators necessary to drive the analysis according to the four identified strategic areas (results from WP1, WP2 and WP3);

second step:

– identification of the possible alternatives potentially enabling the replacement of the existing small scale driftnets with alternative fishing methods (results from Deliverable 8);

third step:

– analysis of the external factors and identification of opportunities and threats in relation to the potential alternatives (results from Deliverable 8);

fourth step:

- identification of the factors that are under the control of the mangers and that can facilitate or impede the fisheries as currently performed (results from Deliverable 7);

fifth step:

- classifying/selecting possible actions that can maximise the potential of the strengths and opportunities, while minimising the impact of weaknesses and threats in order to improve the sustainability;

sixth step:

- evaluate the relevance of the given planned strategy (possible SSD gear replacement).

For the purposes of this analysis, strengths were considered as the positive internal factors of the fishery under control by the system itself and by the managers, while weaknesses were considered as the negative internal elements in the fishery which are controlled by the system itself and by the managers. Opportunities and threats were in relation to a possible implementation of policy which might affect the gear replacement. As such, opportunities represent the external positive possibilities that can contribute to the effectiveness of the management strategy in place regarding the gear substitutability, taking advantage of existing strengths and weaknesses in the context. Threats are difficulties, impediments, or external limitations which can prevent or impede the effectiveness of the gear substitutability. The effects of both Opportunities and Threats are often beyond the influence of the manager because are depending by several operational, economic and environmental factors.
The interpretation key for evaluating the indicators used in the SWOT analysis is outlined in the following two tables (Tab. 4.6.1, 4.6.2).

The results of the SWOT analysis are summarised in the tables below (Tabs 4.6.3 - 4.6.7 and further discussed in the following sections, highlighting whether the objective is attainable, given the SWOT results.

The SWOT analysis has been also supported by a simple and easy to interpret representation (Fig. 4.6.8), according to a traffic light approach. The “degree of strengths and weaknesses” and the “Impact of opportunities and threats” have been weighted according to the number of indicators showing a positive/green, or neutral/yellow, or negative/red response.

Table 4.6.1 - Interpretation keys for evaluating the indicators used in the SWOT analysis (strengths and weaknesses).

STRATEGIC AREA	INDICATORS	STRENGTHS AND WEAKNESSES EVALUATION
Technical characteristics of the gears / vessel / fleet	1. Presence of several landing sites.	It is considered a strength when landing sites are located in the same places where the fisherman communities are established.
	2. Fishing grounds close to the landing sites.	Less miles away from the fishing grounds involves the utilisation of less time and fuel. It is, therefore, considered a strength.
	3. Low average soaking time of the nets.	Less than an average soak time of 2 hours is considered a strength, because involve the utilisation of less time and is supposed to have less impact.
	4. Average LOA.	Vessels smaller than 11m are cheaper, both as initial and maintenance costs. Therefore, this characteristic is considered a strength.
	5. Average length of the nets employed.	Less than an average net length of 500m is considered a strength, because it involves the utilisation of less operation time and it is supposed to have less impact.
	6. Ratio SSD fleet/SSF fleet.	On average, the ratio SSD fleet/SSF fleet (where the SSF fleet is intended at local level) is very low (3-11%). Just for the menaide such ratio reaches values higher than 35%, showing a significant importance in terms of numbers. It is, therefore, considered a strength.
Environmental impact	1. Catch with size below the MCS (Minimum Conservation Size).	A very low level of catch with size below the MCS results in a reduced impact of discard. It is, therefore, considered a strength.
	2. Catch with size below the length at first maturity.	A very low level of catch with size below the length at first maturity results in a reduced impact on the reproductive potential. It is, therefore, considered a strength.
	3. Selective fishery (one target species is the bulk of the catch).	The smaller is the number of target species in the catch, the easier it is considered the fishery management. Selective fishery is,

		therefore, considered a strength.
	4. Presence of discard.	A reduced impact of discard is considered a strength.
	5. Presence of protected species.	Absence of protected species in the catch is considered a strength.
	6. Total by catch.	A reduced impact in terms of by catch is considered a strength.
	7. By catch of species listed in the Annex VIII.	Absence of by catch of species listed in the Annex VIII in the catch is considered a strength.
Economic performances	1. Ratio SSD days at sea/annual level of activity (annual days).	Values of the ratio SSD days at sea/annual level of activity showing a significant importance (higher than 50%) are considered a strength, because the economic performance is assumed to be highly dependent from the SSD activity.
	2. Level of the fuel costs.	A low level of the fuel costs, generally related to the closeness of the fishing grounds to the landing sites, has a positive impact on the budget of the company. It is, therefore, considered a strength.
	3. Level of the maintenance gear cost.	Cheaper maintenance cost has a positive impact on the budget. It is, therefore, considered a strength.
	4. Labour cost.	Higher incidence of the labour costs (higher number of crew required) reduce the profit. It is, therefore, considered a weakness.
	5. Market price of the catch landed, in comparison with other gears.	Higher market price of the landed catch, in comparison with other gears, is considered a strength.
	6. High demand in local market.	High demand in local market ensures that all the production is marketed with premium prices. It is, therefore, considered a strength.
	7. Ratio SSD GVA / value of the landing.	GVA measures the contribution of the production to the economy. Therefore, when its value is very high in comparison to

		the value of landing it is considered a strength.
	8. Ratio SSD GVA / total annual GVA.	Ratio SSD GVA/total annual GVA gives a measure of the dependence of GVA from the SSD fishery. Higher is this ratio, higher is the strength.
Social and cultural heritage	1. Level of SSD employment in comparison with SSF.	From the social point of view, the higher level of employment is considered a strength in evaluating the importance of the SSD in comparison to other fleets.
	2. Average age of the crew.	A lower average age of the crew is considered an indicator of stability and, therefore, a strength for the SSD.
	3. Well-known brand.	A well-known brand is an asset for the market and, therefore, considered a strength for the SSD
	4. Difficulty in passing to new generations skills and experience.	The lower attractiveness for the young generations makes difficult the transfer of experiences and makes weaker the SSD fishery.
	5. Old and traditional fishery system.	Old and traditional fishery systems are considered a heritage (strength) to be passed down through the generations.
	6. Low capital intensity.	Low capital intensity allows easily to get and renew the production means. It is, therefore, considered a strength for the SSD fleet.
	7. Small-scale fisheries integrated with the territory and the local coastal communities.	The higher level of integration is considered an asset for social cohesion, which works in synergy with the economic performance of the SSD fleet. Thus is considered a strength.

Table 4.6.2 -Interpretation keys for evaluating the indicators used in the SWOT analysis (opportunities and threats).

STRATEGIC AREA	INDICATORS	OPPORTUNITIES AND THREATS EVALUATION
Technical characteristics of the gears / vessel / fleet	1. Modernisation of the fishing vessels, equipment and gears.	Subsidies for the modernisation of the fishing vessels, equipment and gears are considered an opportunity in case of gear replacement.
	2. Fishing trip duration.	Greater or lesser duration of the trip is, respectively, considered a threat or an opportunity.
	3. Potential losing of associated gears in the fishing licence.	Less number of gears authorized is considered a threat for the economic performance of the fishing vessel.
Environmental impact	1. Selectivity of the fishery system.	A more selective fishery is considered an opportunity.
	2. Increasing the fishing pressure	Greater effort and/or lesser selectivity on demersal or pelagic stock or on coastal species is considered a threat.
	3. Conflicts due to the increasing of catches of species listed in Annex XIII.	Increasing catches of species listed in Annex XIII is considered a threat.
Economic performances	1. Catch diversification.	A wider list of marketable species is considered an economic opportunity.
	2. Operation costs to reach the fishing grounds.	Each increasing cost is considered a threat.
	3. Price of the catches landed.	Higher or lower price of the catches landed is, respectively, considered an opportunity or a threat.
	4. GVA.	Higher or lower GVA is, respectively, considered an opportunity or a threat.
	5. Profitability.	Higher level of yielding or gain in the fishing activity makes the profitability an opportunity.
	6. Energy cost.	Each increasing cost is considered a threat.
	7. Level of remuneration of the labour.	Conditions in which a higher level of yielding in the fishing activity allows to

		better remunerate the labour are considered an opportunity.
Social and cultural heritage	1. Number of employees.	A fishing system which allows for a greater employment is considered an opportunity.
	2. Niche position in the market.	Losing a niche position in the market is considered a threat.
	3. Specific local traditions.	Losing the local traditions is considered a threat.
	4. Potential increase of conflicts within SSF for competing fishing space and market.	Overlapping of fishing grounds, fishing operations and market assets, among different fishery systems, is considered a threat.
	5. Capability for operating with different fishing gears and equipment.	A greater need for training to acquire the skill for operating with different fishing gears and equipment is considered a threat.

Table 4.6.3 - Results of the SWOT analysis. Fishery 1: "menaide" for anchovy in the Catania area (GSA 19).
Legend for the metiers: PS = Purse Seine; GNS = Set Gillnet; GTR = Trammel Nets; LLS = Set Longlines; LLD = Drifting Longlines; SB_SV = Boat Seines; GND = Driftnets.
SSD = Small Scale Driftnets. SSF = Small Scale Fisheries.

STRATEGIC AREA	STRENGTHS	WEAKNESSES	OPPORTUNITIES	THREATS
Technical characteristics of the gears/vessel/fleet	• Presence of several landing sites. • Fishing grounds close to the landing sites. • Low average soak time of the nets. • Average LOA = 10. • Average length of the nets employed < 500m. • SSD fleet is 38.9% of the SSF fleet.	• None	• Possible modernisation of the fishing vessels, equipment and gears (for all the candidate substitute fishing systems).	• Increase the fishing trip duration (for all the candidate substitute fishing systems). • Potential losing of associated gears in the fishing licence (for all the candidate substitute fishing systems).
Environmental impact	• Less than 1% of catch with size below the MCS (Minimum Conservation Size). • Average length of the catch higher than length at first maturity. • Selective fishery (one target species is the bulk of the catch). • Less than 1% of discard. • By catch 8.5% (Sardine) • No catch of species listed in the Annex VIII. • No catch of protected species.	• None	• None	• Less selective fishing (for all the candidate substitute gears/fishing systems). • Increase the fishing pressure on demersal stocks (in case of replacement with GNS, GTR or LLS). • Increasing the fishing effort of boat seine. Boat seine might impact on coastal species. • Replacement with LLD_LPF and PS_LPF might create conflicts for BFT and SWO catches.
Economic performances	• Very high number of days at sea in respect to the annual level of activity (SSD days/annual days = 88%) • Lower level of the fuel costs, due to the very close fishing grounds. • High demand in local market. • Very high market price of the anchovy landed, in comparison	• Higher labour costs.	• Potential catch diversification.	• Increasing operation costs to reach the fishing grounds. • Lower price of the catch (in case of the replacement with purse seine). • Lowering the value of GVA (in case of replacement with other SSF systems). • Decrease the profitability.

	with other gears. • Higher value of GVA in relation to the value of the landing (about 80%). • High value of GVA in relation to the total annual GVA (93%)			
Social and cultural heritage	• Higher level of employment (4 fisherman/vessel) in comparison with small scale fishery (1,8 fisherman/vessel). • Lower average age of the crew. • Fishery system very old and traditional. • Small scale fishery integrated with the territory and the local coastal communities. • Well-known brand (Slow Food Presidium). • Small-scale fisheries at low capital intensity.	• None	• None	• Substitution with SSF(GNS, GTR or LLS) will decrease the number of employers. • Losing a niche position in the market. • Losing the specific local traditions. • Potential increase of conflicts within SSF for competing fishing space and market. • Needing to acquire the capability for operating different fishing gears and equipment (in particular in case of PS replacement).

Table 4.6.4 - Results of the SWOT analysis. Fishery 3: “occhiatara” for saddled seabream in Ligurian Sea (GSA 9).
Legend for the metiers: PS = Purse Seine; GNS = Set Gillnet; GTR = Trammel Nets; LLS = Set Longlines; LLD = Drifting Longlines; SB_SV = Boat Seines; GND = Driftnets.
SSD = Small Scale Driftnets. SSF = Small Scale Fisheries.

STRATEGIC AREA	STRENGTHS	WEAKNESSES	OPPORTUNITIES	THREATS
Technical characteristics of the gears/vessel/fleet	• Fishing grounds close to the landing sites. • Average LOA < 10. • Average length of the nets employed < 500m	• SSD fleet is 6% of the SSF fleet.	• Possible modernisation of the fishing vessels, equipment and gears (for all the candidate substitute fishing systems).	• Potential losing of associated gears in the fishing licence (for all the candidate substitute fishing systems). • Increase the fishing trip duration (for all the candidate substitute fishing systems).
Environmental impact	• Average length of the catch higher than length at first maturity. • Less than 1% of discard. • No catch of protected species.	• Total by catch 28.7%. • By catch of species listed in the Annex VIII (*S. sarda* 1,5%, *O. bartramii* 0,5 %, *T. sagittatus* 3,5% of the total by catch).	• None	• Increase the fishing pressure on demersal stocks (in case of replacement with GNS, GTR or LLS). • Increase the fishing pressure on small pelagics (in case of replacement with purse seine). • Increasing the fishing effort of boat seine (already higher in this GSA compared to the other GSAs). Boat seine might impact on coastal species. • Replacement with LLD_LPF and PS_LPF might create conflicts for BFT and SWO catches.
Economic performances	• Lower level of the fuel costs, due to the very close fishing grounds. • Higher market price of the by catch landed, in comparison with other gears. • Higher value of GVA in relation to the value of the landing (about 87%).	• Very low number of days at sea in respect to the annual level of activity (SSD days/annual days = 12%). • Low value of GVA in relation to the total annual GVA (40%)	• None	• Increasing operation costs to reach the fishing grounds. • Decrease the profitability from about 549 €/vessel/day of SSD to about 232 €/vessel/day of the other passive gears (in case of replacement with GNS, GTR, LLS). • Lowering the value of GVA (in case of replacement with other

				SSF systems). • Decrease the level of remuneration that is quite high (mean wage paid to the fishers) compared with the minimum wage set out by the labour legislation. • Decrease fish price (especially in case of replacement with purse seine).
Social and cultural heritage	• Old and traditional fishery system. • Small-scale fisheries integrated with the territory and the local coastal communities. • Small scale fishery at low capital intensity.	• High average age of the fishermen. • Difficulty in passing to new generations skills and experience.	• None	• Losing the specific local traditions. • Losing a niche position in the market. • Needing to acquire the capability for operating different fishing gears and equipment (in particular in case of PS replacement).

Table 4.6.5 - Results of the SWOT analysis. Fishery 4:"sgomberara" for mackerels and bogue in Northern Sicily (GSA 10).
Legend for the metiers: PS = Purse Seine; GNS = Set Gillnet; GTR = Trammel Nets; LLS = Set Longlines; LLD = Drifting Longlines; SB_SV = Boat Seines; GND = Driftnets. SSD = Small Scale Driftnets. SSF = Small Scale Fisheries.

STRATEGIC AREA	STRENGTHS	WEAKNESSES	OPPORTUNITIES	THREATS
Technical characteristics of the gears/vessel/fleet	• Average LOA < 10. • Presence of several landing sites.	• SSD fleet is 8% of the SSF fleet (in absolute terms, the number of vessels is 30).	• Possible modernisation of the fishing vessels, equipment and gears (for all the candidate substitute fishing systems).	• Potential losing of associated gears in the fishing licence (for all the candidate substitute fishing systems).
Environmental impact	• No observed catch with size below the MCS (Minimum Conservation Size • Average length of the catch higher than length at first maturity. • No observed discard. • No catch of protected species.	• By catch 99%. • Catch of species listed in the Annex VIII (*S. sarda 0.4 %, A. rochei 96.1 %, E. alletteratus 1.4 %*).	• Reduce the by catch.	• Increase the fishing pressure on demersal stocks (in case of replacement with GNS, GTR or LLS). • Increase the fishing pressure on small pelagics (in case of replacement with PS). • Increasing the fishing effort of boat seine. Boat seine might impact on coastal species. • Replacement with LLD_LPF and PS_LPF might create conflicts for BFT and SWO catches.
Economic performances	• High demand in local market. • Higher market price of the catch landed, in comparison with other gears. • High number of days at sea in respect to the annual level of activity (SSD days/annual days = 58%) • High value of GVA in relation to the total annual GVA (52%)	• Low value of GVA in relation to the value of the landing (about 42%). • High Level of the fuel costs.	• Increase the profitability from about 188 €/vessel/day of SSD to about 252 €/vessel/day of the other passive gears (in case of replacement with GNS, GTR, LLS).	• Decrease fish price (especially in case of replacement with purse seine).
Social and cultural	• Lower average age of the crew. • Higher level of employment (3	• None	• None	• Substitution with SSF(GNS, GTR or LLS) will decrease the number of

heritage	fisherman/vessel) in comparison with small scale fishery (1.8 fisherman/vessel). • Small-scale fisheries integrated with the territory. • Small scale fishery at low capital intensity.			employers. • Losing the specific local traditions. • Potential increase of conflicts within SSF for competing fishing space and market. • Needing to acquire the capability for operating different fishing gears and equipment (in particular in case of PS replacement).

Table 4.6.6 - Results of the SWOT analysis. Fishery 6: “ricciolara” for greater amberjack in Sant'Agata di Militello (GSA 10).
Legend for the metiers: PS = Purse Seine; GNS = Set Gillnet; GTR = Trammel Nets; LLS = Set Longlines; LLD = Drifting Longlines; SB_SV = Boat Seines; GND = Driftnets. SSD = Small Scale Driftnets. SSF = Small Scale Fisheries.

STRATEGIC AREA	STRENGTHS	WEAKNESSES	OPPORTUNITIES	THREATS
Technical characteristics of the gears/vessel/fleet	• Average LOA 10÷11.	• Fishing grounds not close to the landing sites. • SSD fleet is 11% of the SSF fleet (SSD fleet percentage includes both Ricciolara and Menaide).	• Possible modernisation of the fishing vessels, equipment and gears (for all the candidate substitute fishing systems).	• Potential losing of associated gears in the fishing licence (for all the candidate substitute fishing systems). • Increase the fishing trip duration (for all the candidate substitute fishing systems).
Environmental impact	• No catch of species listed in the Annex VIII. • No observed discard. • No catch of protected species.	• Total by catch 41.6%. • Average length of the catch lower than length at first maturity.	• None	• Increase the fishing pressure on demersal stocks (in case of replacement with GNS, GTR or LLS). • Increase the fishing pressure on small pelagics (in case of replacement with PS). • Increasing the fishing effort of boat seine. Boat seine might impact on coastal species. • Replacement with LLD_LPF and PS_LPF might create conflicts for BFT and SWO catches.
Economic performances	• High demand in local market. • Higher market price of the catch landed (both target and by catch), in comparison with other gears. • Value of GVA in relation to the value of the landing ÷ 56% (border line between strengths and weaknesses).	• Low number of days at sea in respect to the annual level of activity (SSD days/annual days = 39%) • Low value of GVA in relation to the total annual GVA (40%). • Higher level of the fuel costs.	• None	• Decrease fish price (especially in case of replacement with purse seine).
Social and cultural	• Old and traditional fishery system.	• High average age of the fishermen.		• Losing the specific local traditions. • Losing a niche position in the

heritage	• Small-scale fisheries integrated with the territory. • Small scale fishery at low capital intensity.	• Difficulty in passing to new generations skills and experience.		market. • Needing to acquire the capability for operating different fishing gears and equipment (in particular in case of PS replacement).

Table 4.6.7 - Results of the SWOT analysis. Fishery 7: "ferrettara" for blue fishe in the Gulf of Naples (GSA 10).
Legend for the metiers: PS = Purse Seine; GNS = Set Gillnet; GTR = Trammel Nets; LLS = Set Longlines; LLD = Drifting Longlines; SB_SV = Boat Seines; GND = Driftnets.
SSD = Small Scale Driftnets. SSF = Small Scale Fisheries.

STRATEGIC AREA	STRENGTHS	WEAKNESSES	OPPORTUNITIES	THREATS
Technical characteristics of the gears/vessel/fleet	• Average LOA < 10. • Fishing grounds close to the landing sites.	• SSD fleet is 3% of the SSF fleet.	• Possible modernisation of the fishing vessels, equipment and gears (for all the candidate substitute fishing systems).	• Potential losing of associated gears in the fishing licence (for all the candidate substitute fishing systems). • Increase the fishing trip duration (for all the candidate substitute fishing systems).
Environmental impact	• Average length of the catch higher than length at first maturity. • By catch 5.8%. • Selective fishery (one target species is the bulk of the catch). • No observed discard. • No catch of protected species.	• By catch of species listed in the Annex VIII (*S. sarda* 7.9%, *E. alletteratus* 1.7 % of the total by catch).	• None	• Less selective fishing (for all the candidate substitute gears/fishing systems). • Increase the fishing pressure on demersal stocks (in case of replacement with GNS, GTR or LLS) • Increase the fishing pressure on small pelagics (in case of replacement with purse seine). • Increasing the fishing effort of boat seine. Boat seine might impact on coastal species. • Replacement with LLD_LPF and PS_LPF might create conflicts for BFT and SWO catches.
Economic performances	• Lower level of the fuel costs. • High demand in local market. • Higher market price of the catch landed, in comparison with other gears. • Higher value of GVA in relation to the value of the landing (about 78%).	• Higher maintenance gear cost per year per vessel. • Low number of days at sea in respect to the annual level of activity (SSD days/annual days = 47%)	• Potential catch diversification.	• Increase energy costs (fuel costs). • Reduce the profitability from 512 €/vessel/day of SSD to 242 €/vessel/day of other passive gears (in case of replacement with GNS, GTR, LLS). • Decrease fish price (especially in case of replacement with purse

	• High value of GVA in relation to the total annual GVA (58%)			seine).
Social and cultural heritage	• Lower average age of the crew. • Small-scale fisheries integrated with the territory. • Small scale fishery at low capital intensity	• None	• None	• Losing a niche position in the market. • Needing to acquire the capability for operating different fishing gears and equipment (in particular in case of PS replacement).

Table 4.6.8 - Swot Analysis representation according to a traffic light approach.

DEGREE OF STRENGTHS AND WEAKNESSES	*IMPACT OF OPPORTUNITIES AND THREATS*
Positive	*Positive*
Neutral	*Neutral*
Negative	*Negative*

"MENAIDE" FOR ANCHOVY IN THE CATANIA AREA (GSA 19)	*Degree of strengths and weaknesses*	*Impact of opportunities and threats*
Technical characteristics of the gear/vessel/fleet		
Environmental impact		
Economic performances		
Social and cultural heritage		

"OCCHIATARA" FOR SADDLED SEA BREAM IN LIGURIAN SEA (GSA 9)	*Degree of strengths and weaknesses*	*Impact of opportunities and threats*
Technical characteristics of the gears/vessel/fleet		
Environmental impact		
Economic performances		
Social and cultural heritage		

"FERRETTARA" FOR BLUEFISH IN THE GULF OF NAPLES (GSA 10)	*Degree of strengths and weaknesses*	*Impact of opportunities and threats*
Technical characteristics of the gears/vessel/fleet		
Environmental impact		
Economic performances		
Social and cultural heritage		

Table 4.6.8 - (continuation)

"RICCIOLARA" FOR GREATER AMBERJACK IN S. AGATA DI MILITELLO (GSA 10)	*Degree of strengths and weaknesses*	*Impact of opportunities and threats*
Technical characteristics of the gears/vessel/fleet		
Environmental impact		
Economic performances		
Social and cultural heritage		

"SGOMBERARA" FOR HORSE MACKEREL IN NORTHERN SICILY (GSA 10)	*Degree of strengths and weaknesses*	*Impact of opportunities and threats*
Technical characteristics of the gears/vessel/fleet		
Environmental impact		
Economic performances		
Social and cultural heritage		

Conclusions

The results of the SWOT analysis highlighted the characteristic relationships of the SSD fleets with the local territories and the coastal communities. The socio-economic relevance of the analysed SSD seems irrelevant at national level, but very important at local level.
In general, the SSD fleets evidenced a more or less negative ratio between opportunity and threats of the substitutability. Also emerged a lower environmental impact of the monitored SSD fleets in respect to possible alternative gears. Only in relation to the SSD "sgomberara" for mackerels in Northern Sicily (GSA 10) relevant quantities were recorded of landed species listed in the Annex VIII. However, it should be specified that the monitoring of this SSD fleet was carried out in a short period, probably not sufficiently representative of the fishing season.
In contrast, the SSD "menaide" for anchovy in the Catania area (GSA 19) was the most selective fishery (one target species, with a size well above the MCS, is the bulk of the catch). The SWOT analysis evidenced for this fleet the better economic performance and the higher level of employment. Also emerged, for this traditional fishery system, the higher level of integration with the territory and the local coastal communities. The anchovies landed with this system are very much appreciated in the local market, with premium price four times higher than the national landing prices (well-known brand Slow Food Presidium). This fishery account for about the 30% of the anchovy production in the GSA19. The differences with the SSD "menaide" operating in the Cilento area, in S. Agata di Militello and in the Northern Adriatic Sea are essentially based on a smaller incidence in these territories and lower economic performance.
The SSD fleets of "menaide", "occhiatara" and "ferrettara" for bluefish showed the worst ratio between opportunity and threats of the substitutability and the better ratio between strength and weaknesses.
In contrast, the SSD fleet of "ricciolara", in S. Agata di Militello, showed a broad equivalence between strength and weaknesses. However, it should be mentioned that this fleet also operate, seasonally, with the "menaide".

5. CONCLUSIONS

The overall objective of DRIFTMED (MAREA Specific Contract n°8) was to identify and characterize, both for the past and the present, the small scale driftnet fisheries (SSD fisheries, e.g. those using nets < 2.5 km in length and not targeting species listed in the Annex VIII of the EC Reg. n° 894/97) in the Mediterranean waters, giving particular attention to the EU Countries.
The project was carried both reviewing the available information and collecting new data, with a great effort on the sampling at field for monitoring the SSD fisheries in EU Mediterranean waters.

Historical data

The available knowledge for the SSD fisheries in EU Mediterranean waters, as well as in the other Mediterranean areas, was definitely scarce and, if present, scattered at spatio temporal level. Most of the past information mentioned the presence and described the technical characteristic of some small scale driftnet fishing gears, without providing data on the effective number of vessels, landings and catch composition.
At the same time, the data from the DCF (EC Reg. 199/2008, fishing system GND), which is in force from several years in EU Mediterranean waters, did not allow to draw a detailed picture of the characteristics of the small scale driftnets. As a matter of fact, the monitoring according to DCF is at present limited to spot areas, due to the very scattered distribution of these fisheries, their amount of catches and the catch value. Thus this data source is not sufficient to exhaustively describe this fishing segment. Indeed, as concerns the Italian waters, only in the GSA 19 and occasionally in the GSA 10 the GND (the fishing system specialized for the catch of small pelagic species) has been selected as a métier to be monitored. In general, the approach of the EU Data Collection selects the fisheries according to criteria of relevance (production, production value and effort) and thus phenomena at small scale are not prioritised for data sampling by Member States, due to the low levels of both fishing effort and landings. These systems might however have a significant relevance at small spatial scale, for local community.
From the data collected in the past, it emerged that most of the small scale driftnet fisheries in Mediterranean were located in Italy, where several typologies of SSD fisheries were present in the past years using:
- driftnets with small mesh sizes (from 20 to 40 mm) targeting mainly anchovy and sardine (e.g. the "menaide" fisheries);
- driftnets with higher sizes (but in general not higher than 160 mm) mostly targeting saddled seabream, greater amberjack, mackerels, Atlantic bonito and bullet tuna (e.g. the "occhiatara", "ricciolara", "sgomberara", "palamitara", bisantonara" fisheries).

These fisheries, grouped with the term "ferrettara", came from historical traditions (e.g. the "menaide" or the "occhiatara") or, in other cases, they resulted from the gear substitution followed to the enforcement of the EU Provisions forbidding the large scale driftnets and the Italian Provisions prohibiting driftnets with meshes higher than 100 mm. Finally, in other cases, there are new fisheries, as the "ferrettara" for bluefish, recently developed on the basis of the increased availability of the target species.
A similar situation occurred in other EU Countries. In France and Spain, for example, the SSD fisheries present in the past years were, in this case, progressively abandoned.
As concerns the non EU Countries, the available knowledge is still more scarce. It resulted, however, that in some countries, where SSD fisheries were widespread in the past (as Turkey), these gears are currently forbidden.

In spite of the 480 vessels which at present potentially can use small driftnets in the EU Mediterranean waters (467 of them in Italy), according to the last data of the EU Fleet Register, the number of the vessels currently using these gears is notably lower.

The investigations at field were carried out from the end of March to mid October 2013, in 25 different harbors and mooring places of Italy and Slovenia: 96 interviews, 254 logbooks and 55 embarks were performed. During these investigations, 100 vessels, almost all in Italy (only 1 in Slovenia), involved in nine small scale driftnet fisheries, were identified. This number can be likely slightly higher (we estimatedan additional number of 20-30 vessels, as a maximum), due to not active vessels in the monitored period or not identified vessels, because located in very small and isolated mooring places.
A rather high year-by year variability in the number of vessels involved in the SSD fisheries was detected. Generally, the vessels operating in small driftnets fisheries have polyvalent fishing license, using a variety of other gears throughout the year and moving from a fishery to another according to the availability of the target species and the economic profitability of the moment.
The following nine fisheries were identified:

1) “Menaide” for anchovy, *Engraulis encrasicolus*, in Catania area (GSA19).
2) “Menaide" or "menaica” for anchovy, *Engraulis encrasicolus*, in the Cilento area (GSA10).
3) “Occhiatara” for saddlled sea bream, *Oblada melanura*, in Ligurian Sea (GSA9).
4) “Sgomberara” or "sgombetara" for mackerel and bogue, in northern Sicily (GSA10).
5) “Menaide” for anchovy, *Engraulis encrasicholus*, in S. Agata di Militello (GSA10).
6) "Ricciolara" for greater amberjack, *Seriola dumerili*, in S. Agata di Militello (GSA10).
7) "Ferrettara" for blue fish, *Pomatomus saltatrix*, in Gulf of Naples (GSA10).
8) "Menaide" for sardine, *Sardina pilchardus*, in northern Adriatic (GSA17).
9) "Menaide" or "tratta" for anchovy, *Engraulis encrasicolus,* and sardine, *Sardina pilchardus*, in Selinunte (GSA16).

The activity of the fisheries from 1 to 7 was followed by means of interviews, logbooks and embarks; the fisheries, 8 and 9, less important in terms of number of involved vessels and in terms of economic aspects, were studied by interviews.
The direct data collection, especially that ralised by means of logbooks and embarks, allowed to fill important gaps of knowledge on these fisheries and to gather, for the first time, information of catch composition, location of fishing grounds and estimation of economic parameters.

The "size" of the current fisheries

The paragraph 4.5 and the Deliverable 10 provide detailed summary tables showing the main characteristics of the nine SSD fisheries investigated by DRIFTMED project.
The order of magnitude of the identified fisheries, in terms of fishing capacity/activity (number of vessels and fishing days), volume of landings and economic parameters is definitely small, if compared with that of the other artisanal fisheries. They have relevance at local level and in terms of seasonal fishery, thus providing an alternative to other small scale fisheries.
The SSD fisheries are characterised by small-scale vessels, with the majority of vessels less than 12 metres length and generally operating close to the home ports. The vessels associated to the small driftnet fisheries are dispersed in many artisanal and small fleets, often located in small coastal villages of the south-west of Italy (mainly belonging to Campania and Sicily administrative Regions).
These fisheries are in most cases strictly seasonal, with the exception of the “menaide” of Catania area (GSA19), which is active all year round (145 of fishing days per vessel per year). For the other fisheries, the annual activity ranged between a minimum of 15 days in Ligurian Sea to a maximum of 70 days in the Gulf of Naples.

The specialisation/efficiency

All the investigated fisheries are characterised by a high degree of specialisation, because the characteristics of the used gears (see paragraph below) and the fishing practices are specific for each target species. This results in a high efficiency of the captures: for most of the fisheries the target species dominated the biomass caught (from 70 to 100%); only in the case of the “sgomberara”, in the investigated period, the by-catch accounted, by far, for the majority of the catches.

Technical characteristics of the nets

The direct measurements allowed collecting detailed technical data on a series of small scale driftnets. The technical properties of the different nets resulted strictly correlated with the characteristics (size, behaviour) of the target species, as well as with the features of the fishing grounds (depth, typology of bottom).

For 5 (the "menaide" fisheries) out of the nine fisheries the average length of the nets employed was less than 500 m and for the other fisheries it was always no higher than 1800 m.

The mesh sizes of the "menaide" nets ranged from 20 to 30 mm, those of the other nets ranged from 70 to 90 mm. The net configurations were characterised by high values of hanging ratio, often greater than 0.7.

In general terms, we can conclude that the high hanging ratio, together with the use of small meshes and the T90 configuration of the net make the small scale driftnets highly selective fishing gears.

Moreover the mesh opening used in the small scale driftnets seems to be small enough to make difficult the incidental catch of sensitive species, as marine mammals and marine reptiles. The same consideration holds for the fishing operations, in general carried out in the coastal area.

The data collected during the net measurements allowed to gather information to help in distinguishing a small driftnet from to a typical set gillnet. The following aspects should be taken into account:

- Mesh configuration: the set (fixed) gillnets are always built in a traditional diamond configuration of the net, while the small driftnet netting is commonly rigged in a T90 configuration.
- Hanging ratio: in the set gillnets the netting panel is commonly rigged to the headrope and the leadrope with a low hanging ratio (usually less than 0.5); in the small driftnets the netting panel is commonly rigged to the headrope and the leadrope has a higher hanging ratio (usually more than 0.7).
- Twine diameter: in the set gillnets the twine diameter is commonly less than 0.25 mm (or 210 x 3 denier); in the small driftnets the twine diameter is more than 0.25 mm (or 210 x 3 denier for most of nets). Only the "menaide" nets showed a twine diameter of about 0.20-0.24 mm (210 x 2 denier).

Sustainability/environmental impact

None of the 9 driftnet fisheries targeted protected or endangered species.

Only for one out of the nine fisheries investigated the biomass caught was dominated by the by-catch fraction; for the majority of the fisheries, the target species were by far the predominant proportion of the total catch.

The not authorised species, included in the Annex VIII, were generally not recorded in the catch, in particular these species were never observed in the "menaide" fisheries. In the by-catch of the "occhiatara" the presence of Atlantic bonito and of two species of cephalopods was observed but with minimal values in respect to their percentage contribution; the same was recorded for the "ferrettara" for bluefish as regards bullet tuna. Only the catches of "sgomberara" for mackerels were dominated by the by-catch, mostly constituted in this case by bullet tuna.

The discard was in all cases practically absent, as well as the presence of invertebrates belonging to the local biocenosis, testifying the absence of impact on the bottom.

The investigated small driftnets resulted highly selective also at species level. The catch of the target species, as concerns the 5 "menaide" fisheries, the "occhiatara", the "sgomberara" and the "ferrettara" for bluefish, was composed entirely by adult specimens, greater than the size at first maturity., The specimens caught by these fisheries were also higher than the limit imposed by Minimum Conservation Size (from EC reg. 1967/2006), when the species was foreseen in this EU regulation.

Only the specimens of greater amberjack caught by "ricciolara" were lower than the maturity size reported for this species; in fact this fishery occurs in the recruitment period of the target species, when the specimens are concentrated and close to the coasts.

A great percentage of the specimens of bullet tuna (around 50%) and little tunny (around 80%), the species dominating the catches of the "sgomberara" fishery in the investigated period, was lower than the respective maturity size.

It is important to take into account that formal stock assessments for the target species, as well as for the main species of the by-catch, are not available for the investigated areas, excluding sardine in the GSA17, where, however, the catch from "menaide" were indeed negligible compared to the production of the GSA.

At the same time the information of the biology and the population dynamic for most of these species in the investigated areas is scarce (except for anchovy and sardine).
Therefore, the adopted concept of sustainability for the exploitation of these fisheries is based on simple and basic concepts, as the proportion of the catch smaller than the size at first maturity (Froese, 2004). Further analyses would have implied the use of the information from different gears/fisheries targeting or catching the same species in the same areas.
Finally, we have also to take into account that, in general, the landings of the target species due to the SSD fisheries are always a minor or negligible (as the case of the "menaide" for sardine in GSA17) fraction of the total landings at GSA or national level. A remarkable exception is the "menaide" fishery of Catania which landing represents about 30 % of the total production of anchovy in the GSA19.

Social and economic importance

The nine small scale driftnet fisheries identified accounted for a limited social and economic importance at national level, but they have high social, economic and cultural importance at a local level, for small communities depending also from fishery.
The employment related to the investigated SSD fisheries was estimated in approximately 300 persons. These fisheries generate more employment in comparison of the other small scale fisheries. The average number of fishermen per vessel (especially for the "menaide" fisheries and in particuar for that of Catania area) is indeed higher than that of other small scale fisheries, e.g. those using trammel or gillnets.
In addition, in some areas (e.g. Cilento and Catania), the SSD fisheries generate employment also in associated activities, related to the processing and the commercialization of the product.
In general, the value of the product landed by the SSD fisheries is higher than that of the same product landed by other fisheries. As an example, the price/kilo of the anchovies landed by "menaide" is almost the double than of the anchovies landed by purse seine.
Another common aspect of these fisheries are the low economic costs: the fishing costs, mainly related to fuel costs, are generally low if compared with other fisheries. The fuel consumption was roughly estimated, less than 30 € per day at sea, for the majority of fisheries studied. The costs related to the purchase and the maintenance of the gear are low as well.
All these aspects produce economic profitability; the contribution of each one of the investigated SSD fisheries on the annual activity of the involved fleets is considerably higher in terms of incomes and biomass landed than in terms of fishing days.
Another important aspect is the territorial and social peculiarity. In many cases (e.g. the "menaide") these fisheries are carried out since many decades, following historical traditions. In all cases, they represent an important contribution to the economy and the socio-cultural aspects of many small coastal villages.
As regards the "menaide" of Catania and Cilento areas, the fresh product landed and the processed one are object of a brand ("Slow Food" Presidium).
Even though, it is not a formal mark of typicality, the "Slow Food" Presidium is issued following standardised procedures. The main objective of a "Slow Food" Presidium is the protection of biodiversity, territories and knowledge of traditional productions. The name "Slow Food" Presidium, logo graphic and the information associated with are the sole property of Slow Food Italy. To obtain this logo, the Presidium producers must sign a Presidium production protocol and be part in an association. Producers belonging to Presidium accept both the self-monitoring by their own association, and the checks by Slow Food Italy.

Possible fishing methods alternative to SSD to exploit the same target species

The SWOT analysis to assess the possible replacement of each existing SSD fishery with alternative fishing methods has stressed, in general, the strengths of the SSD fisheries against the following four strategic areas or criteria:
1) Technical characteristics of the gears/vessel/fleet;
2) Environmental impact;
3) Economic performances;
4) Social and cultural heritage.
In particular, for "menaide" the Strengths completely outbalanced the Weaknesses, whilst the Threats were not counterbalanced by the Opportunities. Intermediate situations were detected for the other SSD

fisheries, though the Threats, in case of replacement with Purse seine (PS), Set gillnet (GNS);Trammel net (GTR), Set longline (LLS), Drifting longline (LLD), Boat seine (SB_SV), were more relevant. In case of the "sgomberara" and "ricciolara", the Threats appeared to be compensated by the Opportunities, while Strenghts were not outbalanced by the Weaknesses

In conclusion, the small driftnet fisheries identified and investigated by the DRIFTMED Contract showed the typical characteristics of the Mediterranean small scale fisheries: small size vessels, seasonality, high specialisation in the technical features of the gears and in the fishing practices.
In spite of their general low incidence in terms of fishing activity and landing at national level these fisheries provide a relevant contribution in terms of the annual income of the fishermen involved.
Following their high specialization, these fisheries were generally highly selective on the target species, with an overall low impact on the environment.
In spite the overall number of vessels involved in the small scale driftnet fisheries decreased in the last years, the number of vessels belonging to the still active fisheries is remaining constant or even is increasing over time.
These aspects provide rather robust evidences to implement specifically oriented management measures, as Local Management Plans. This could ensure the regulated activity of these fisheries, allowing the diversification of the fishing effort, maintaining old local traditions and sustaining the economy of small coastal villages.

6. REFERENCES

AA.VV., 1985. CNR, Consiglio Nazionale delle Ricerche - Quaderni dell'Istituto di Ricerca Marittima Vol. IV n.1, Ancona.

Akyol, O., Ceyhan, T., 2007. Izmir Korfezi'nde (Ege Denizi) Kullanilan Sürüklenen Pelajik Uzatma Aglarinini Teknik Ozellikleri/Technical characteristics of driftnets, used in Izmir Bay (Aegean Sea). E.U. Journal of Fisheries & Aquatic Sciences, 1-2, 179-183.

Akyol, O., Ceyhan, T., 2011. The Turkish swordfish fishery. Collect. Vol. Sci. Pap. ICCAT, 66(4), 1471-1479

Akyol, O., Ceyhan, T., 2012. Turkish driftnet fishery for albacore, *Thunnus alalunga* (Actinopterygii: Perciformes: Scombridae), and incidental catches in the eastern Mediterranean. Acta Ichthyol. Piscat., 42(2), 131-135.

Akyol, O., Karakulak, F.S., Ceyhan, T., Dede, A., 2008. Türkiye Denizlerinde Kullanian Sürüklenen Pelajik Uzatma Ağlarıve Yasal Düzenlemeler/ Driftnets, used in Turkish Seas and the regulations. E.U. Journal of Fisheries & Aquatic Sciences, 2, 153-157.

Andaloro F., Vivono P., Campagnuolo S., Pipitone C., Potoschi A., Mandich A., Marino G., 1998 — Biologia, distribuzione e valutazione dello stock della ricciola, *Seriola dumerili*,nei mari italiani. Biol. Mar. Mediterr., 5 (3): 270-279.

Baino, R. Silvestri, R., 1987. Efficiency of a driftnet for grey mullets. Rapp. Comm. Int. Mer Medit. 30(5): 237.

Battaglia, P., Romeo, T., Consoli, P., Scotti, G., Andaloro, F., 2010. Characterization of the artisanal fishery and its socio-economic aspects in the central Mediterranean Sea (Aeolian Islands, Italy). Fish. Res., 102, 87-97.

Bearzi, G., 2002. Interactions between cetacean and dolphin in the Mediterranean Sea. In: G. Notarbartolo di Sciara (Ed), Cetaceans of the Mediterranean and Black Seas: state of knowledge and conservation strategies. ACCOBAMS Secretariat Report, Section 9, 1-20.

Cannas, A., 2001. Gli attrezzi da pesca in uso nelle marinerie Italiane - Risultati del programma MAPP (Monitoraggio Attivita Pesca Poilvalente). UNIMAR Publication, 96 pp.

Carbonara P., Casciaro L., Bitetto I., Spedicato M. T., 2012. Reproductive cycle and length at first maturity of *Trachurus trachurus*. Biol .Mar. Mediterr. 19 (1): 204-205.

Cattaneo Vietti, M., Giulianini, P. G., Ferrero, E. A., 1997. Reproductive biology of scad, *Trachurus mediterraneus* (Teleostei, Carangidae), from the Gulf of Trieste. ICES Journal of Marine Science, 54: 267-272.

Cavallaro, G., Cefali, A., Potoschi, A., Sotiriadis, S., 1985. Aspetti di biologia di *Oblada melanura* (L., 1758) (Pisces: Sparidae). Memorie di biologia marina e di Oceanografia, 15: 129-140.

Cavallaro, G., Cefali, A., Sotiriaidis, S., 1984. Accresimento degli stadi giovanili di *Oblada melanura* (L. 1758) (Pisces: Sparidae). Mem. Biol. Mar. Oceanografia 14, 105-114.

Cetinic, P., Soldo, A., Dulcic, J., Pallaoro, A., 2002. Specific method of fishing for Sparidae species in the eastern Adriatic. Fisheries Research 55 (2002) 131–139.

Colloca, F., Crespi, V., Coppola, S., 2002. Evolution of the artisanal fishery in Cilento, Italy - case study. ARTFIMED-COPEMED, 78 pp.

Colloca, F., Crespi, V., Coppola, S., 2004. Structure and evolution of the artisanal fishery in a southern Italian coastal area. Fish. Res., 69, 359-369.

Cortés, F.J, Manrubia, Z.F., 2003. Catálogo De Artes Aparejos Y utensilios de Pesca del Litoral andaluz. Viceconsejería, Servicio De Publicaciones y Divulgación. Junta de Andalucía.

Council Regulation (EC) No 1967/2006 of 21 December 2006, concerning management measures for the sustainable exploitation of fishery resources in the Mediterranean Sea, amending Regulation (EEC) No 2847/93 and repealing Regulation (EC) No 1626/94. Official Journal of the European Union L 409.

Council Regulation (EC) No 809/2007 of 28 June 2007 amending Regulations (EC) No 894/97, (EC) No 812/2004 and (EC) No 2187/2005 as concerns drift nets. Official Journal of the European Union. L 182/1.

D'Anna, G., Badalamenti, F. Riggio, S., 1999. Traditional and experimental floating fish aggregating devices in the Gulf of Castellammare (NW Sicily): Results from catches and visual observations. Scientia Marina, 63(3-4): 209-218.

Damiano, A., 1999. Le cadre d'un appui pour la realisation d'un recensement sur la peche artisanale en Mediterranee Marocaine. INRH-Centre de Nador Report, 1-28.

De la Serna, J.M., Tawil, M., Farrugua, A., Srour, A., Hattour, A., 2000. Research on fishing biology of bluefin tuna (*Thunnus thynnus*) and swordfish (*Xiphias gladius*) in the Mediterranean Sea". Final Report of the Project FAO-COPEMED/ Grandes Pelágicos 2000.

De Leiva, I., Busuttil, C., Darmanin, M., Camilleri, M., 1998. Artisanal fisheries in the Western Mediterranean - Malta Fisheries. FAO-COPEMED, 21 pp.

Di Natale, A., 1990. Marine mammals interactions in Scombridae fishery activities: the Mediterranean case. Collect. Vol. Sci. Pap. ICCAT, 33, 140-142.
Di Natale, A., Nortabartolo di Sciara, G., 1994. A review of passive fishing nets and trap fisheries in the Mediterranean and of cetaceans by-catch. Rap. Int. Whal. Comm., Special Issue 1(5), 189-202.
Di Natale, A., 2006. EFH for large pelagic species in the Mediterranean Sea. In: Anon (2006). Sensitive and Essential Fish Habitats in the Mediterranean Sea. Report of the Mediterranean Subgroup (SGMED 06-01) of the Scientific, technical and economic Comité for fisheries (STECF). Commission of the European Communities, Rome, 6-10 March 2006, 1-48.
EC, 1997-1998. Council Regulation (EC) n° 894/97 of 29 April 1997 laying down certain technical measures for the conservation of fishery resources.
EC, 1998. Council Regulation (EC) n° 1239/98 of 8 June 1998 amending Regulation (EC) n° 894/97 laying down certain technical measures for the conservation of fishery resources.
EC, 2000. Council Regulation (EC) n° 1543/2000 of 29 June 2000 establishing a Community framework for the collection and management of the data needed to conduct the common fisheries policy.
EC, 2001. Commission Regulation (EC) n° 1639/2001 of 25 July 200 establishing the minimum and extended Community programmes for the collection of data in the fisheries sector and laying down detailed rules for the application of Council Regulation (EC) n° 1543/2000.
EC, 2004. Council Regulation (EC) n° 812/2004 of 26 April 2004 laying down measures concerning incidental catches of cetaceans in fisheries and amending Regulation (EC) No 88/98.
EC, 2004. Commission Regulation (EC) n° 1581/2004 of 27 August 2004 amending Regulation (EC) n° 1639/2001 establishing the minimum and extended Community programmes for the collection of data in the fisheries sector and laying down detailed rules for the application of Council Regulation (EC) n° 1543/2000.
EC, 2008. Council Regulation (EC) n° 199/2008 of 25 February 2008 concerning the establishment of a Community framework for the collection, management and use of data in the fisheries sector and support for scientific advice regarding the Common Fisheries Policy.
EC, 2008, Commission Regulation (EC) n° 517/2008 of 10 June 2008 laying down detailed rules for the implementation of Council Regulation (EC) n° 850/98 as regards the determination of the mesh size and assessing the thickness of twine of fishing nets.
EC, 2010. Commission Decision n° 93/2010 of 18 December 2009 adopting a multiannual Community programme for the collection, management and use of data in the fisheries sector for the period 2011-2013.
EC, 2012, Communication from the Commission to the European Parliament and the Council - Action Plan for reducing incidental catches of seabirds in fishing gears. 665 Final, 16 pp.
EEC, 1992, Council Regulation (EEC) n° 345/92 of 27 January 1992 amending for the eleventh time Regulation (EEC) n° 3094/86 laying down certain technical measures for the conservation of fishery resources.
EJF (Environmental Justice Foundation), 2007. Illegal driftnetting in the Mediterranean. Leaflet, 25 pp.
FAO, 1990. Definition and classification of fishing gear categories. FAO Fish. Tech. Pap., 222. Revision 1.
Ferretti, M., Mangano, A., Palladino, S., Tarulli, E., 1994. Le reti derivanti. I quaderni ICRAM n° 13: 124 pp.
Ferretti, M., Mangano, A., Manzueto, L., Palladino, S., Tarulli, E., 1995. Le reti derivanti. Quaderno ICRAM, 13, 1-124.
Ferretti M., Palladino S., 1998. Studi sulle reti derivanti. Biologia Marina Mediterranea, 5(3): 771-779.
Ferretti, M., Tarulli, E., Palladino, S., 2002. Classificazione E Descrizione Degli Attrezzi Da Pesca In Uso Nelle Marinerie Italiane Con Particolare Riferimento Al Loro Impatto Ambientale. ICRAM (Institute Centrale per la Ricerca Scientifica e Technologica Applicata al Mare), Quaderni ICRAM, 3, 128 pp.
Froese R. 2004. Keep it simple: three indicators to deal with overfishing. Fish and FisheriesVolume 5, Issue 1: 86–91. DOI: 10.1111/j.1467-2979.2004.00144.x.
Garcia-Rodriguez, M., Fernandez, A.M., Esteban, A., 2006. Characterisation, analysis and catch rates of the small-scale fisheries of the Alicante Gulf (SE Spain) over a 10 years time series. Fisheries Research, 77, 226-238.
Granzotto, A., Franzoi, Longo, A., Pranovi, F., Torricelli, P., 2001. La pesca nella laguna di Venezia: un percorso di sostenibilità nel recupero delle tradizioni Lo stato dell'arte. Rapporto Sullo Sviluppo Sostenibile, Fondazione Eni Enrico Mattei, 61 pp.
GreenPeace, 2006a. The mismanagement of the bluefin tuna fishery in the Mediterranean. GrenPeace Report, 15th Special meeting of ICCAT, Dubrovnik (Croatia), November 17-26, 2006, 1-15.
GreenPeace, 2006b. Where have all the tuna gone? How tuna ranching and pirate fishing are wiping out bluefin tuna in the Mediterranean Sea. GreenPeace Leaflet, 1-40.
Guillou, A., Crespi, V., 1999. Enquête-cadre concernant la répartition, la composition et l'activité des petits mètiers dans le Golfe du Lion. IFREMER Report, Direction des Ressources Vivantes, Ressources Halieutiques - Sete, R.INT.DRV/RH/RST/99-14, 105 pp.

Guyader, O., Berthou, P., Koutsikopoulos, C., Alban, F., Demanèche, S., Gaspar, M.B., Eschbaum, R., Fahy, E., Tully, O., Reynal, L., Curtil, O., Frangoudes, K., Maynou, F., 2013. Small-scale fisheries in Europe: A comparative analysis based on a selection of case studies. Fish. Res., 140, 1-13.

Hajjej, G., Hattour, A., Allaya H., Jarboui, O., Bouain, A., 2010. Biology of little tunny Euthynnus alletteratus in the Gulf of Gabes, Southern Tunisia (Central Mediterranean Sea) Revista de Biología Marina y Oceanografía 45 (3): 399-406.

Institut National de Reserche Halieutique (INRH), 1999. Situation actuelle de la peche artisanale en Mediterranee Marocaine: Resultats de l'enquete effectuee en Decembre 1998. FAO-COPEMED Report, 1-28.

IREPA, 2010. Osservatorio economico sulle strutture produttive della pesca marittima in Italia 2010. Edizioni Scientifiche Italiane, Napoli.

IREPA, 2011. Osservatorio economico sulle strutture produttive della pesca marittima in Italia 2011. Edizioni Scientifiche Italiane, Napoli.

IREPA, 2012. Osservatorio economico sulle strutture produttive della pesca marittima in Italia 2011. Edizioni Scientifiche Italiane, Napoli.

ISSFG, 1980. International Standard Statistical Classification of Fishing Gears. Leaflet, 4 pp.

Italian Ministry for Agricultural, Alimentary and Forestry Policies – Ministry Decree of 21st September 2011: "New measures for the "ferrettara"". Gazzetta Ufficiale, September 24th 2011.

Italian Ministry for Agriculture Policies (1998) - Ministry Decree of 14 October 1998: "Modalità tecniche dell'attrezzo denominato ferrettara". Gazzetta Ufficiale, December 1st 1988.

Italian Ministry for Food, Agriculture and Forestry Policies (2011) - Decree of 21 September 2011: "Nuove modalita' tecniche per l'utilizzo dell'attrezzo ferrettara". Gazzetta Ufficiale, September 9th 2011.

Karlsen, L., Bjarnasson, B.A., 1986. Small-scale fishing with driftnets. FAO Fish. Tech. Pap., 284, 64 pp.

Klust G, 1983. Fibres ropes for fishing gear. FAO fishing manuals. Fishing News Books Ltd. 200 pp.

Lamboeuf, M., 2001. Artisanal fisheries in Libya: census of fishing vessels and inventory of artisanal fishery mètiers. FAO-COPEMED-MBRC Report, 1-44.

Lucchetti A., 2012. Estimation of maximum net length of trammel nets, gillnets and combined bottom set nets by using the volume or the mass of the net (ARCHIMEDES). Call for tenders n° MARE/2009/05, Specific contract n. 3. European Union. Final technical report, July 2012, 271 pp.

OCEANA, 2005. The use of driftnets: a scandal for Europe, a mockery of the United Nations. Report - Results of Oceana's expedition in its ship, Ranger, to the south of the Tyrrhenian Sea and Sardinia (July-August 2005), 12 pp.

OCEANA, 2007. Italian driftnets: illegal fishing continues. OCEANA report, 48 pp.

OCEANA, 2008a. Adrift! Swordfish and driftnets in the Mediterranean Sea. Oceana-Marviva Mediterranean Sea Project 2008, 115 p.

OCEANA, 2008b. Pescespada e reti derivanti nel Mar Mediterraneo. Oceana-Marviva Progetto Mare Mediterraneo 2008, 16 pp.

Placenti, V., Malvarosa, L., 2000. The driftnet Italian program, ban rationalisation and re-conversion: The Sicilian case. IREPA Report.

Robles, R., 2010. Conservation and sustainable development of the Sea of Alborán / Conservación y desarrollo sostenible del mar de Alborán / Conservation et développement durable de la mer d'Alboran.. International Union for the Conservation of Nature and Natural Resources (IUCN) Report, 1-83.

Sahi, M.A., Bouaicha, M., 2003. La peche artisanale en Algerie. FAO-COPEMED Report, 1-23

Sanfilippo, M., Reale, A., Ziino, M., Romeo, V., Lembo, E., Manganaro, A., 2011. Chemical Composition and Nutritional Value of Engraulis encrasicolus (Linnaeus, 1758) Caught by Driftnet "Menaide" along Sicilian Coast: a Natural Food for Mediterranean Diet. World Journal of Fish and Marine Sciences, 3(1), 44-50.

Sassu, N., Cannas, A., Ferretti, M., 2001. Gli attrezzi da pesca in uso nelle marinerie italiane. Risultati del Programma MAPP (Monitoraggio attività pesca polivalente), UNIMAR, 1-16.

Scaccini, A., 1974. Manuale per i corsi di qualificazione per agenti di polizia giudiziaria per la pesca marittima. Ministerio della Marina Mercantile, 38, 1-125.

Silvani, L., Gazo, M., Aguilar, A., 1999. Spanish driftnet fishing and incidental catches in the western Mediterranean. Biol. Cons., 90, 79-58.

Sinopoli, M., D'Anna, G., Badalamenti, F. Andaloro, F., 2007. FADs influence on settlement and dispersal of the young-of-the-year greater amberjack (*Seriola dumerili*). Marine Biology 150:985-991.

Somarakis S., Tsianis D.E., Machias A., Stergiou K.I., 2006. An overview of biological data related to anchovy and sardine stocks in Greek waters. In: Palomares M.L.D., Stergiou K.I., Pauly D. (eds.), Fishes in Databases and Ecosystems, Fisheries Centre Research Reports 14(4). Fisheries Centre, University of British Columbia, pp. 56-64.

Stewart, A.M., 2001. A review of studies of fishing gear selectivity in the Mediterranean. FAO-COPEMED Report, 1-16.

Tortonese, E., 1975. Osteichthyes (Pesci Ossei), vol. II. Fauna d'Italia, 11th ed. Calderini, Bologna, 636 pp.

Tudela, S., 2004. Ecosystem effects of fishing in the Mediterranean Sea: an analysis of the major threats of fishing gear and practices to biodiversity and marine habitats. GFCM Stud. & Rev., 74, 1-44.

UN (1989) - United Nations Resolution n° 44/225 on large-scale pelagic driftnet fishing and its impacts on the living resources of the world's oceans and seas. General Assembly. A/RES/44/225. 85th plenary meeting. 22 December 1989.

UN (1991) - United Nations Resolution n° 46/215. Large-scale pelagic drift-net fishing and its impact on the living marine resources of the world's oceans and seas. General Assembly. A/RES/46/215. 79th plenary meeting. 20 December 1991.

Ungaro, N., Marano, G., Pastorelli, A.M., De Zio, V., Rositani L., 2004. Nuove informazioni sulla fauna ittica del basso Adriatico. Biol. Mar. Mediterr., 11 (2): 648-651.

Urbistondo, J.A.A., 2001. Inventario de la Pesca Artesanal en España Mediterránea (2000-2001). FAO-COPEMED Report, 45 pp.

Voulgaridou, P., Stergiou, K.J. 2003. Trend in various biological parameters of the European *Sardina pilchardus* (Walbaum, 1792) in the Eastern Mediteranean Sea. Scientia Marina 67(1): 269-29-80.

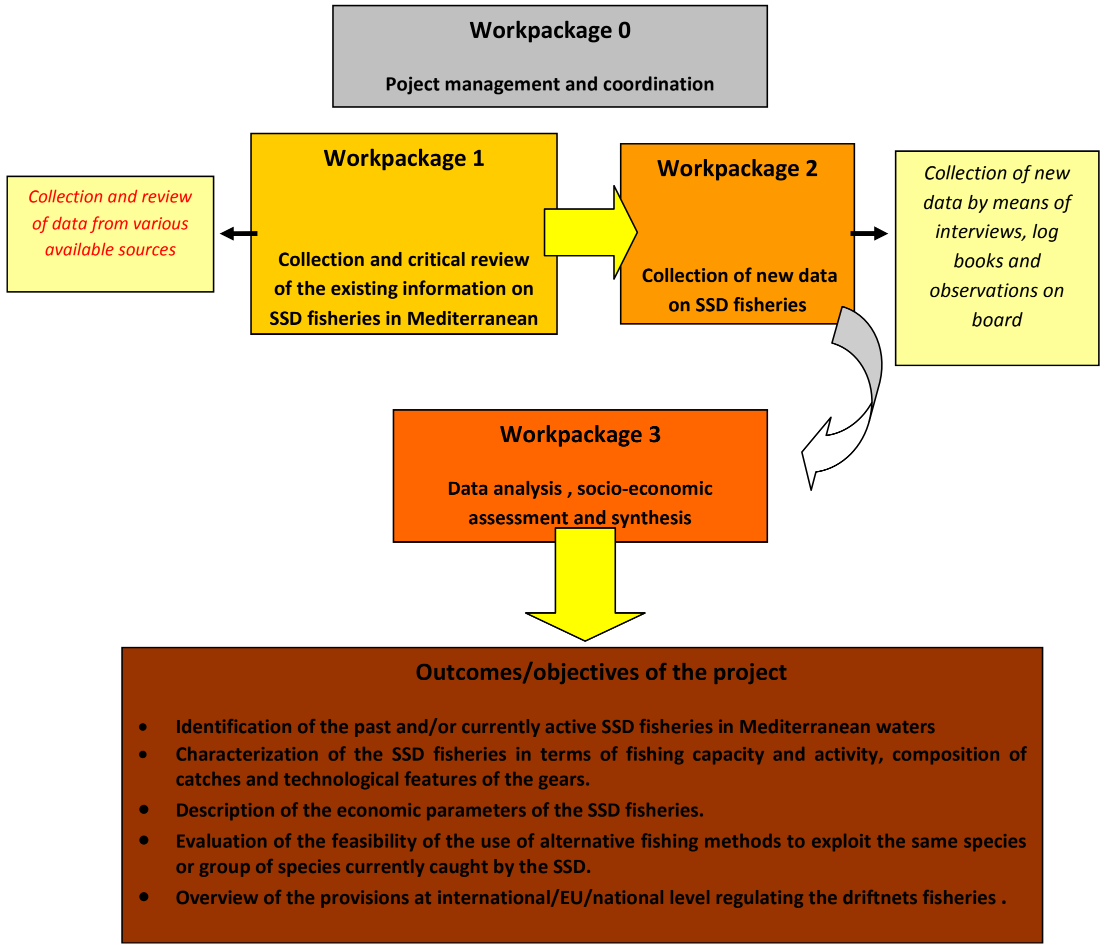
Voliani, A., Trivella, M., Banchetti, R., Cecchi, E., Silvestri, R., 2006. Nota sul progressivo incremento delle presenze di *Pomatomus saltator* (Linnaeus, 1766) lungo le coste toscane. Biol. Mar. Mediterr., 13(1):932-936.

Zydelis, R., Small, C. French, G. 2013. The incidental catch of seabirds in gillnet fisheries: A global review. Biological Conservation 162: 76–88.

ANNEX I – OUTLINE OF THE PROJECT AND MEETINGS

DRIFTMED project was structured in four different Work Packages:

WP0 = project management and coordination.
WP1 = collection and critical review of the existing information on SSD fisheries in Mediterranean.
WP2 = collection of new data on SSD fisheries.
WP3 = data analysis, socio-economic assessment and synthesis.



The Contract was signed on March 4th 2013; its duration is 8 months. The following tables show the timing of the project and the list of the Deliverables.

Timing of the different WPs and their components (Gantt chart).
Deliverables (D) and Coordination meetings (M) have been reported in the chart.

Timing and Work Break Structure of Project									
		Months							
WP / Task	WP and Task Description	1	2	3	4	5	6	7	8
WP0: Project management and coordination									
	Progress of the project								
	Project coordintation meetings	M1			M2			M3	
	Interim reports		D1			D2			
	Draft final report								D3
WP1: Collection and critical review of the existing information on SSD fisheries in Mediterranean									
Task 1.1 Collection of the available information on SSD fisheries in EU Mediterranean fisheries		D4		D5					
Task 1.2 Critical review of the available information on SSD fisheries in EU Mediterranean fisheries					D6	D8			
Task 1.3 Review of the available information on SSD fisheries other than EU Mediterranean countries				D5	D6				
Task 1.4 Overview of the international/EU/national provisions regulating the driftnets fisheries			D7						
WP2: Collection of new data on SSD fisheries									
Task 2.1 Interviews, log books and embarks/observations on board								D9	
Task 2.2 Measurement of technical parameters of nets								D9	
WP3: Analysis of the collected data, economic assessment and synthesis									
Task 3.1 Identification and overall characterization of the SSD fisheries in Mediterranean									D10
Task 3.2 Technical characteristics of the gears used by the SSD fisheries									D11
Task 3.3 Overview of the economic parameters pertaining to each EU Mediterranean SSD fishery									D12
Task 3.4 Assessment of the use of fishing methods alternative to SSD to exploit the same resources									D13

List of deliverables.

WP	Deliverable	Responsible	Delivery date (month)
WP0	D1 – First Interim Report.	P. Sartor (CIBM)	2
WP0	D2 – Second Interim Report.	P. Sartor (CIBM)	5
WP0	D3 - Draft Final Report.	P. Sartor (CIBM)	8
WP1	D4 - Structure of the database to store data (existing and new data) on SSD fisheries.	M. T. Facchini (COISPA)	1
WP1	D5 - List of the bibliographic references, also in electronic (Acrobat pdf) format.	A. Conides (HCMR)	3
WP1	D6 - Database filled with the available information (both from EU and non EU countries).	P. Carpentieri (CIBM)	4
WP1	D7 - Review of the legislative provisions regulating SSD fisheries.	F. Garibaldi (CIBM)	2
WP1	D8 - Summary of the main characteristics of possible fishing methods alternative to SSD.	L. Lanteri (CIBM)	5
WP2	D9 - Database filled with the new data.	P. Carbonara (COISPA)	7
WP3	D10 - Summary on the distribution and the characteristics of the SSD fisheries in Mediterranean.	M. Sbrana (CIBM)	8
WP3	D11 - Overview of the technical aspects of the gears used by the SSD fisheries in Mediterranean.	A. Lucchetti (CNR-IAMC)	8
WP3	D12 - Overview of the economic aspects related to the SSD fisheries in Mediterranean.	R. Sabatella (IREPA)	8
WP3	D13 - Comparative evaluations about a possible replacement of the existing small scale driftnets with alternative fishing methods in Mediterranean.	G. Lembo (COISPA)	8

Reporting:

The draft of the 1st interim Report was sent on May 8th 2013.

- A report of preliminary results (e.g. identified driftnet fisheries, some characteristics, first appreciation of likely environmental impact, etc.) was transmitted to the EC services on July 2nd 2013.
- The draft of the 2nd interim report was sent on August 1st 2013 and an updated version of this document (with an integration of results) on August 7th 2013
- Following the needs of the DGMARE services to have more updated outcomes from DRIFTMED by early October at a latest, due that next October 23rd 2013 the Impact Assessment has been presented by DGMARE, an Executive Summary of the outcomes of DRIFTMED was transmitted to the EC services on October 7th 2013; this document included a detailed synoptic table resuming the results obtained and elaborated to that date.
- The draft Final report was sent on November 5th 2013.

All this timing had the double objective of providing update outcomes to the Commission service and of guaranteeing the coordination and interaction with the Specific Contract n. 5 (SC5) MARE/2011/01 *"Study in support of the review of the EU regime on the small-scale driftnet fisheries"*.
DRIFTMED and SC5 were in continuous contact, sharing data and information.

Meetings:
Three plenary meetings were held during DRIFTMED project:

<u>Kick-off meeting</u>
The Driftmed kick-off meeting was held on February 28th - March 1st, 2013 at CONISMA premises (ROMA).
The kick-off meeting was primarily focused to properly set up the activities of the project.
In addition to the bureaucratic and administrative matters, the working protocols were defined in detail, and the duties among partners for the future activities (in particular for WP1 and WP2) were refined.
The kick-off meeting was also dedicated to establish the contents of the first Interim Report, to be delivered at the end of month 2.

<u>Second coordination meeting</u>
The second coordination meeting was held on July 11th – 12th, 2013, in Polignano a Mare (Bari, Italy).
The meeting was focused to present and discuss the progress of the activities of the Contract, as well as to prepare the second interim Report.
An important part of the meeting was dedicated to the coordination activities between DRIFTMED and the Specific Contract n. 5 of MARE/2011/01 ("Study in support of the review of the EU regime on the small-scale driftnet fisheries”). Two participants of SC5 participated to the meeting. Common discussions were made to properly respecting the contractual deadlines and deliverables of the two Contracts and, in particular, on what information and how shall be exchanged between DRIFTMED and the SC5.

<u>Third coordination meeting</u>
Third coordination meeting (Pisa, September 26th – 27th, 2013) was mainly focused to present and discuss the progress of the activities of the Contract and to define the structure of the draft final Report.
Common discussions were made on the collected data, to define the more appropriate analyses and presentation of results.
An important part of the meeting was dedicated to define the structure and the contents of the Executive Summary and Summary table, to be delivered at the beginning of October 2013, according to the agreements with the MARE Srvices.

Below the minutes of the three meeting are reported.

KICK OFF MEETING

February 28th - March 1st, 2013
CONISMA, ROMA (ITALY)

LIST OF PARTICIPANTS

Name	Affiliation	Country
Maria Teresa Spedicato	COISPA	Bari, Italy
Franco Biagi	EU DGMARE	-
Alexis J. Conides	HCMR	Athens, Greece
Dimitris Klaoudatos	HCMR	Athens, Greece
Maria Teresa Facchini	COISPA	Bari, Italy
Giuseppe Lembo	COISPA	Bari, Italy
Pierluigi Carbonara	COISPA	Bari, Italy
Alessandro Lucchetti	CNR- IAMC	Ancona, Italy
Rosaria Sabatella	IREPA	Salerno, Italy
Fulvio Garibaldi	CIBM	Livorno, Italy
Mario Sbrana	CIBM	Livorno, Italy
Paolo Carpentieri	CIBM	Livorno, Italy
Paolo Sartor	CIBM	Livorno, Italy

The meeting was chaired by the coordinator of the project, Paolo Sartor.
The meeting was attended by 12 participants belonging to the partners of the project.
A representative of DG MARE, Franco Biagi, also attended to the meeting. Due to his impossibility to reach Rome, a video-conference was organized in order to guarantee the participation of Dr Biagi to the meeting.

Overview of DRIFTMED Project

Paolo Sartor started the meeting by summarizing the purpose and the main activities of the project DRIFTMED.
"The objective of the project is the identification and characterization, for the past and at present, estimation, of the fisheries using small size driftnets with total length equal or smaller than 2.5, allowed to catch species except those in the Annex VIII of EC reg. n. 1239/98".

The workpackages and the tasks of the project were recalled:
WP0 = project management and coordination.
WP1 = collection and critical review of the existing information on SSD fisheries in Mediterranean.
WP2 = collection of new data on SSD fisheries.
WP3 = data analysis, socio-economic assessment and synthesis

Paolo Sartor	CIBM, COISPA	WP0
Alexis Conides	HCMR	Task 1.1
Paolo Carpentieri	CIBM	Task 1.2
Francesco Colloca	CNR-IAMC	Task 1.3
Fulvio Garibaldi	CIBM	Task 1.4
Pierluigi Carbonara	COISPA	Task 2.1

Alessandro Lucchetti	CNR-IAMC	Task 2.2
Mario Sbrana	CIBM	Task 3.1
Alessandro Lucchetti	CNR-IAMC	Task 3.2
Rosaria Sabatella	IREPA	Task 3.3
Giuseppe Lembo	COISPA	Task 3.4

The starting date of the project was fixed on February 28th 2013; the ending date will be October 28th 2013. The working plan is very tight; therefore it is recommended to strictly follow the timing of the project.
Sartor recalled that the field activities (workpackage 2) have to start in month 2. It is therefore important in the first month of the project to define the sampling sites (ports/vessels), the sampling plan and to set up all the material of support for data collection. At the end of month 2 (end of April 2013) the production of the first Interim Report (Deliverable 2) is expected.

The expectations of DG Mare

Franco Biagi (EU DGMARE) recalled the participants about the expectations of DGMARE in this project; the results will be useful to support the future management strategies on these fisheries. He underlined the importance of the economic data, not only for the information strictly related to fishing activity, but also for the task (3.4) devoted to evaluation on the advantages/disadvantages of the use of alternative gears to exploit the same species.
In a short time duration project like DRIFTMED, the Interim Reports are very important. Biagi stated on the importance of the second Interim Report (to be delivered at the end of June 2013): this report shall to contain a preliminary, but rather, exhaustive overview on the presence (both for the past and the present) of the SSD in Mediterranean and also information coming from new data.
As concerns the first interim report, this document shall contain all the information demonstrating that the project is properly started and all the activities are on track.

A first overview on the presence of SSD fisheries in Mediterranean

A common discussion was held in order to provide a **first overview on the information**, coming from the knowledge of each partner, about the SSD fisheries n Mediterranean.

Fulvio Garibaldi presented his knowledge about Ligurian Sea (GSA9). He noticed about the presence (more in the past) of vessels fishing with driftnet (mostly in spring) the Saddled seabream (*Oblada melanura*); there are already available some information about catches and fishing activity. Some vessels are used to fish greater amberjack in fall. He noticed also the presence of several vessels exploiting Atlantic bonito (*Sarda sarda*) mostly with combined nets (trammel nets + gillnets).
All the partners agreed on the importance to collect information also for this type of fisheries, because these data can be important for the study of alternative gears.

Alessandro Lucchetti presented his knowledge about central and northern Adriatic. It seems that, at least for the present, in Italy the SSD fisheries are not present; there is some information (to be confirmed) on legal driftnets allowed to fish sardine in Croatia. He noticed also for some references on driftnets used in the past in Turkey to exploit *Sarda sarda* (at present driftnets are forbidden in Turkey).

Pierluigi Carbonara noticed about his knowledge on SSD fisheries in the southern part of Italy. He referred about an important fishery present in Sicily (Catania area), traditionally exploiting anchovy with “menaide” net. This fishery is also monitored under the DCF framework. He provided some preliminary information about the characteristics of this fishery. The presence of other SSD fleets has been noticed also for Campania coasts (Cilento area) and more likely for Calabria and other Sicilian areas.

Alexis Conides reported that in Greece a national law at present forbids the use of the driftnets. The presence of SSD fisheries in the past needs to be investigated.

Paolo Sartor informed on the likely presence of vessels using SSD in Lebanon, Crete and Cyprus. He reported the presence for the past of these fisheries in Ponza and Elba Island (central and northern Tyrrhenian Sea); the present situation has to be investigated.
Sartor also informed that fishermen and fishermen association of France (Gulf of Lions and Corsica) will be contacted in order to check on the presence of SSD fisheries. At the same time, additional effort will be made to investigate about the knowledge for the Spanish coasts.

The first interim report

A common discussion was held to define the content of the first Interim Report, a document to deliver at the end of month 2.
The partners agreed to put in the Interim report the following information:

- A very preliminary overview on the knowledge on SSD fisheries n Mediterranean
- The sampling plan of the collection of new data (interviews, logbooks and embarks)
- The final version of the forms for data collection
- The questionnaire for the collection of the information from the non EU Countries
- A first list of the references collected
- The proof that the data call for GND segment has been launched and the FAO Regional Projects has been contacted.

Biagi agreed on this structure, underlining that the purpose of this report is demonstrate that the project in on track and is following the workplan.

Other projects on small scale driftnets

Biagi informed about other studies funded by EU on driftnets which will cover Black Sea and Baltic Sea (Skagerrak and Kattegat area). These studies concern the technical aspects of the nets and the characterization of the catches, in particular the by catch.
It is expected to share and discuss the results of DRIFTMED with those of these projects. Biagi proposed a joint meeting to be held in Brussels at the end of June; the main aspects to be discussed will be those concerning by catch and the environmental impact of the gears.

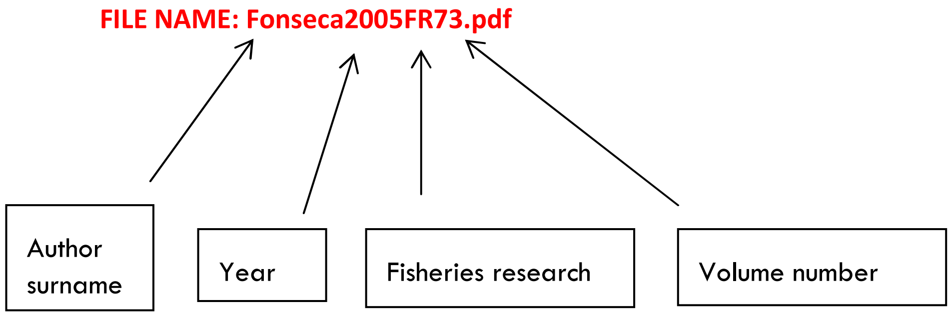
Planning and definition of the activities of DRIFTMED

Maria Teresa Facchini presented a proposal of the structure of the **database** where store both the existing information and the new data. It was already structured, into four main sections: existing information; DCF data; international/national provisions; new data collected during the project.
All the participants discussed on this proposal and suggested modification and integrations.

Rosaria Sabatella informed on the most important **economic parameters** to take into account in the collection of information (both available and new data); the structure of the database and the forms for the collection of new data will be revised accordingly.

As concern the **call of data coming from DCF** (for the segment “GND”), it was discussed the best solution to have access to this information.
In order to gather these data in the shorter time possible and in an useful format for the purposes of the project. It was decided that the best solution will be to ask directly the Commission (DGMARE) for these data: then once, the Commission will have received the Authorizations from the member states, the Commission will engage the JRC to send the data.
It was discussed also the possibility to look the data available at PGMED, even though if this information is structured according to the requirements of the DRIFTMED project.

Alexis Conides exposed his proposal to classify the references coming from the search of all the existing **bibliographic material**, according to the following scheme:



This approach can be applied for both peer reviewed papers and grey literature (technical papers, regional or local paper etc.). This filename will be inserted in the database. This way the file will be immediately identified in the directory of all files listed alphabetically by name.
Conides has already done a search for articles using the web sources; all the partners are invited to put the references (in pdf format, named according to the previous scheme), in particular that referring to grey literature or to national/local extent, in the DRIFTMED folder under the MAREAPROJECT.net web site.
The selected references will be further classified according an ad-hoc platform like ENDNOTE.

The **extraction of the information** from the bibliographic material, coordinated by Paolo Carpentieri, will be done according to a common procedure: the relevant information will be stored in the common database, in the section dedicated to the existing data.

Pierluigi Carbonara presented a proposal of the structure of the forms to be used for the **interviews, logbooks and embarks on board**. As concerns the interviews, two different forms have been proposed, one directed to fishermen association and another to fishermen.
A common discussion was held to include suggestions and modifications in the proposed forms. For example, it was suggested to put the temporal reference of the datum collected from the interviews, to include also economic parameters.
The interviews made to the fishermen should refer to the activity performed on a year base. In the compilation of the logbook the fishermen will be assisted by the personnel of DRIFTMED in charge for this activity. It was suggested to delete the commercial category fro the data of the catch of the single species.
The structure of the database and that of the forms for data collection have to be strictly corresponding in order to collect and store efficiently the data.

A common discussion was held in order to plan the **field activities**.
As concerns interviews (with fishermen and fishermen association), this activity will be realised in the highest possible number of places, where there is likely evidence on SSD fisheries, at least for the past.
Regarding logbooks and embarks, it was decided that to follow a stratified sampling plan collecting data according to factors as metier and month/quarter.
Another aspect will concern the eventual authorisation for the embark of scientific personnel. Also for these aspects, the sampling plan has to be defined as soon as possible.
In any case, the official data coming from the Fleet Register will be the first reference. These data will be integrated with the information available at national or local level.

Paolo Sartor exposed a short presentation prepared by Francesco Colloca, as concerns the **collection of the information on SSD fisheries for the non EU countries**.
A simple questionnaire will be sent to the focal points of the FAO Regional Projects, in order to explore about the presence of the SSD fisheries and to ask for information on the characteristics of these fisheries.

Moreover, searching for information on SSD will be also carried out, looking at other sources, as ACCOBAMS, ONG organisation (Oceana, Greenpeace, and WWF),

Second plenary meeting

It was decided that the second plenary meeting, devoted to discuss on the progress of the project and to prepare the second Interim Report, will be held in Bari: it will last two days, in the week from June 24^{th} to 28^{th} 2013.

Main agreed dead lines for the next future

Middle of March 2013:
- Final drafts of the structure of the database and of the forms for the data collection will be uploaded in the DRIFTMED folder (under the MAREAPROJET. org website) by M.T. Facchini and P. Carbonara; all the partners will revise these documents and, eventually, propose modifications and/or integrations by the end of March, 2013.
- Request to DGMARE for data call for DCF data (GND segment).
- Brief summary prepared by each partner on his present knowledge on the SSD fisheries.

End of March 2013:
- Database (**Deliverable 1**) structure completed; structure of the forms for the data collection completed.
- Definition of the sampling plan for interview, log books and embarks.
- Questionnaire sent to the FAO regional Projects.

First week of April 2013: P. Sartor will send the draft version of the First Interim Report (**Deliverable 2**) for the revision of all the partners.

End of April 2013: First interim report Completed.

End of May 2013: list of the bibliographic references (**Deliverable 3**) completed

End of June 2013: Database filled with the existing information

SECOND COORDINATION MEETING

SECOND MEETING REPORT
July 11th - 12th, 2013
HOTEL COVO DEI SARACENI, POLIGNANO A MARE (BARI), ITALY

LIST OF PARTICIPANTS

Name	Affiliation	Country
Maria Teresa Spedicato	COISPA	Italy
Giuseppe Lembo	COISPA	Italy
Pierluigi Carbonara	COISPA	Italy
Maria Teresa Facchini	COISPA	Italy
Isabella Bitetto	COISPA	Italy
Paolo Sartor	CIBM	Italy
Paolo Carpentieri	CIBM	Italy
Fulvio Garibaldi	CIBM	Italy
Alexis Conides	HCMR	Greece
Dimitris Klaoudatos	HCMR	Greece
Alessandro Lucchetti	CNR- IAMC	Italy
Francesco Colloca	CNR-IAMC	Italy
Rosaria Sabatella		Italy
Chris Mees	MRAAG	United Kingdom
Paolo Accadia		Italy
Franco Biagi	EU DGMARE	

Presentation of the Participants

The local organizer, M. T. Spedicato, opened the meeting and welcomed the participants.
The meeting was attended by 13 participants belonging to the partners of DRIFTMED and by two representatives of the Specific Contract № 5 of MARE/2011/01 "Study in support of the review of the EU regime on the small scale driftnet fisheries" (SC5 hereinafter).
The meeting was also attended by a representative of DG MARE, F. Biagi.
P. Sartor, the coordinator of the DRIFTMED contract, chaired the meeting.
All the participants gave a brief description of their expertise and their role in DRIFTMED and SC5 Contracts.

Overview of MAREA and of DRIFTMED and SC5

The meeting started with a presentation of M. T. Spedicato summarizing the partners, the structure, the main objectives and the functioning of the MAREA framework, including the web site (www.mareaproject.net). The MAREA Specific Contracts, those finished and those currently running, were briefly presented.

P. Sartor gave an overview of the DRIFTMED Specific Contract, recalling the objectives, the working plan and the main deadlines.
The main objective of the project is the identification and characterization, for the past and at present, estimation, of the fisheries using small size driftnets with total length equal or smaller than 2.5, allowed to catch species except those in the Annex VIII of EC reg. 1239/98.

The workpackages and the tasks of the project were recalled:
WP0 = project management and coordination.
WP1 = collection and critical review of the existing information on SSD fisheries in Mediterranean.
WP2 = collection of new data on SSD fisheries.
WP3 = data analysis, socio-economic assessment and synthesis

Starting date of the project March 4th, 2013; ending date shall not exceed November 3rd, 2013.

The project activities are running according to the timetable of the Contract; to date the following deliverable were produced:
- D1 - First Interim Report.
- D4 - Structure of the database to store data (existing and new data) on SSD fisheries.
- D7 - Review of the legislative provisions regulating SSD fisheries.

In addition, the integrative report “Preliminary results about the identification and characterization of the small scale driftnet fisheries in the Mediterranean” was delivered on July 2nd, 2013)
For the near future (end of July 2013) the following documents will be delivered:
- D2 - Second Interim Report.
- D4 - List of the bibliographic references, also in pdf format.
- D6 - Database filled with the available information.
- D8 - Summary of the main characteristics of possible fishing methods, alternative to SSD.

C. Mees presented an overview of the SC5 objectives, deadlines and working plan.
SC5 is focused to support the review of the EU regime on small scale driftnets. The specific objectives are:
Update knowledge and description of currently active driftnet fleets, both within and outside of the EU (where possible), detailing:
-fisheries and métiers
-likelihood of interactions with non-authorized and/or protected species
- economic turnover of active driftnet fleets and social dimensions to better understand the issues at stake
Assess to what degree the existing EU regime on driftnets has met original objectives
Identify policy direction for future driftnet regime in the context of a reformed CFP

The Contract has two main tasks:
Task 1: A Retrospective Evaluation of existing EU regime on driftnet fishing in terms of its relevance, effectiveness, efficiency, coherence, and acceptability
Task 2: A Prospective Evaluation of likely economic, social and environmental impacts as well as the relevance, effectiveness, efficiency, coherence, and acceptability of different policy options for future measures".
As concerns the Mediterranean area, the information needed for the purposes of SC5 will proceed from DRIFTMED outputs, therefore a strict and effective coordination between SC5 and DRIFTMED is necessary.
To this purpose P. Accadia from SC5 is responsible for the exchange of information between the two Contracts.
The first interim report of SC5 shall be delivered next week.
Next plenary meeting of SC5 has been fixed on July 29th in Brussels.

Coordination between DRIFTMED and SC5

P. Accadia showed a detailed presentation of the data needed by SC5 for the Mediterranean area. This information will primarily concern Italy, because the preliminary results of DRIFTMED are revealing that small scale driftnet fisheries are mainly present in this country.
These data will regard three main topics:
- Fishery/Fleet Characteristics
- Socio-economic data

- Sustainability of fisheries

F. Biagi briefly recalled the participants the expectations of DGMARE for these two Contracts; the results will be useful to support the future management strategies on these fisheries. He underlined the importance of the economic data and of the understanding of the risk/occurrence of likely interactions with protected and/or non-authorized species.
Next October 23rd the Impact Assessment shall be presented by DGMARE. Therefore F. Biagi expressed the need of the Commission to have more updated outcomes by the end of September 2013 (early October as a maximum) from DRIFTMED and SC5.
Biagi also recalled the deadline (end of October 2013) for the delivery of the draft Final Report of DRIFTMED.
As concerns the Public Consultation launched from DGMARE (March 27th - June 28th), F. Biagi informed that only 14 contributions have been received (of these, only 3 from NGOs); Commission is currently reflecting on the way forward and an extension of the deadline is likely.

A deepened discussion was developed about the data needed by SC5 from DRIFTMED.
P. Sartor commented that, due to the scarce and scattered information gathered for the Mediterranean area, it will be not possible to provide exhaustive information about trends of fishing capacity and catches at wide geographical scale. Even less historical information is available for the socio-economic data.
F. Biagi recalled the importance to give a wide overview on all the potential sources of information, including also STECF reports, Italian Ministry studies, IREPA reports, etc.

It was agreed that the two projects could and should exchange reports, data collection templates, reporting templates etc. This could include presentations made at the meeting with updated data and other ad-hoc reports requested by MARE. It includes any final reports accepted by the Commission (e.g. Inception reports) and draft reports prior to finalization and acceptance (interim reports). In the case of the latter, care in the use of the data is required and it may need discussion between project leaders and MARE.

DRIFTMED progress of activities

The status of the works, the results achieved, possible problems/deviations from the DRIFTMED workplan were presented according to each Task.

Task 1.1 - Collection of the available information on SSD fisheries in EU Mediterranean fisheries.
A. Conides presented an overview of the work done so far, which is practically completed. - The deliverable D4 (List of the bibliographic references) will be ready at the end of July.

Task 1.2 - Critical review of the available information on SSD fisheries in EU Mediterranean fisheries.
P. Carpentieri showed the results of the analysis of the EU Fleet Register data and the outcome of the review of the existing information, providing a first picture about the existence of small scale driftnet fisheries in Mediterranean. As concerns EU waters, almost all the active vessels are located in Italy, a few vessels are working in Slovenia; for the other countries the first investigations did not reveal the presence of active vessels. Investigation will continue in Malta and France, where there is likely the existence of some vessel.
Data from DCF for the fishing type GND were received recently; the analyses are in progress.

F. Biagi recalled that in addition to the EU fleet register data it would be advisable to look for information on the number of fishing licenses authorized to use GND. He also suggested to check the information coming from NGO associations, Sea Conventions (e.g. ACCOBAMS, Bucharest, etc.) and in particular to check the publications of the Hellenic Society for the Study and Protection of the Monk Seal which report seabirds incidental taking by driftnets in Greece. He also noticed that according to information provided by Slovenia the ‘driftnet’ gear (GND) was entered in 48 commercial fishing licenses.

Task 1.3 - Collection and review of the available information on SSD fisheries other than EU Mediterranean countries.
F. Colloca explained that, so far, little information on small scale driftnets for the Mediterranean has been received from the non EU Countries, in spite of the formal contacts with the FAO Regional Projects and their respective focal points. The investigations will be intensified hereinafter in the Contract. F. Biagi declared the support of the Commission to further contact the FAO Regional Projects.

Task 1.4 - Overview of the international/EU/national provisions regulating the driftnets fisheries in Mediterranean. – The deliverable D7, Review of the legislative provisions regulating SSD fisheries, was completed in the month 2, but Fulvio Garibaldi explained that this document will be integrated with any possible new information (in particular that concerning the non EU Countries). F. Biagi recalled taking into account also the recent GFCM recommendations on cetaceans, sharks, sea turtles, seabirds and monkseal. Those recommendations, pending their transposition in EU law, are binding on the EU and its MS on the basis of article 216(2) of the TFEU.

Task 2.1 - Interviews, log books, observations at landing sites and on board.
P. Carbonara did a detailed presentation of the status of the field activities. They are running in several sites of Italy (and also in Slovenia), affecting artisanal fleets of Liguria, Campania and Sicily Administrative Regions. At present the main monitored fisheries are those for anchovy, sardine and saddled seabream. Data collection for other fisheries, as those for mackerels, amberjack, bogues etc. will be carried out in the following months, because the starting of this fishery is expected for the end of summer.
Carbonara presented also some preliminary results, describing the characteristics (fishing capacity, catch composition, fishing practices) of the small driftnet fisheries for anchovy in Cilento (GSA10) and Catania (GSA 19) area, for sardine in Slovenia (GSA17) and for saddled saebream in Liguria (GSA9).

Task 2.2 – Measurement of technical parameters of nets.
A. Lucchetti presented the status of the so far collected data, showing in detail the main technical characteristics of the nets measured: small driftnets for anchovies (“menaide”), for saddled seabream (“occhiatara”) and for amberjack (“ricciolara”). To the present, 24 different small driftnets were measured. Lucchetti informed that, according to the preliminary results, the measurement of the twine of the nets is very important (it can allow identifying the illegal nets). Also data on the ficticious net drop and net rigging (in the driftnets there is the T90 configuration) are important.

F. Biagi recalled the importance of detecting driftnets fisheries having important by-catches of species other than large pelagic stocks included in the Annex VIII (e.g. the Atlantic bonito; little tuna; cephalopods; etc.). He recalled that GFCM and ICCAT recommendations prohibit the use of driftnets to catch large pelagic species. As concerns the knowledge on the status of the stocks of the species exploited by small driftnets, it will be important to use all the available information, underlining all the possible gaps, also in the DCF protocols. In any case also simple evaluations on the stock status (e.g. on the base of the size composition of the landings compared to the maximum size of the species) are recommended.

R. Sabatella noticed about the most important socio-economic parameters to collect through the field activities. This aspect is very important, because the existing information is very scarce.

M. T. Facchini explained the functioning of the database to store data collected in WP1 and WP2 and provided instruction to properly entry the data. A standardised routine in R language will be also prepared to analyse the data collected.
As concerns the two possible alternatives proposed to finalize the database (Access or My SQL) it was decided that Access platform is the most appropriate for DRIFTMED purposes.
The data entry will start at the beginning of the third week of July.

Task 3.1 - Identification and overall characterization of the SSD fisheries in Mediterranean

P. Sartor presented the methodological approach for the joint analysis of the data collected by WP1 and WP2. It was discussed the most appropriate way to estimate CPUEs, deciding to calculate an index as kg/100 square meters of net/hours of fishing.
Past studies on driftnets will be taken into account, to have information for possible estimations of CPUEs. In any case the R routine to analyse data from the DRIFTMED database will be able to calculate different types of CPUE indices. Anyhow the range of dimensions, both in length and drop, should be reported associated to the different indexes.

Task 3.3 - Overview of the economic parameters pertaining to each EU Mediterranean SSD fishery.
R. Sabatella presented a selection of economic variables to take into account in the synthesis of the information collected from WP1 and WP2. A simplified economic report will be presented for each fishery.

Task 3.4 - Assessment of the use of fishing methods alternative to SSD to exploit the same resources.
G. Lembo presented a proposal of different methods, from a simple SWOT analysis to a traffic light approach. He also proposed several areas of interest to take into account: technical characteristics of the gears; landing and discard (including the environmental impact); economic performances; social and cultural heritage.
A discussion was made to select of the gears to analyse for possible replacement of driftnets fisheries. According to the availability of information (especially socio-economic), the following four gears have been selected: purse seine (PS), set gillnet (GNS), trammel nets (GTR), longlines (LL).
Due that the analyses of Task 3.4 need preparatory information from tasks 3.1, 3.2 and 3.3, it was decided to anticipate the completion of these tasks in order to finalize Task 3.4 in the due time.

The second interim report

A common discussion was held to define the content of the second Interim Report, a document to deliver by the end July 2013.
This report will provide a detailed overview of the activities performed by mid July 2013 and will update (respect to the two Reports presented so far) the results on the identification and characterization of the small scale driftnet fisheries in Mediterranean. The DRIFTMED partners agreed to put in this Report the following information:

1) Description of the activities performed until July 15th 2013, according to each WP and task.

- Detailed description of the work carried out and in progress, with indication of possible problems and proposed solutions.
- Particular attention will be given to the field activities (tasks 2.1 and 2.2).

2) Updating of the overview about the identification and characterization of SSD fisheries in Mediterranean.

Existing information

- Finalize the EU Fleet Register data analysis
- Finalize the critical review of literature data
- Analyze the GND data from data call
- Improve the information for non EU Mediterranean countries
- Characterize the possible fishing methods alternative to SSD

New data

- Increase and improve the information aimed to identify and describe SSD fleets (Italy: Campania, Calabria, Sicily, Apulia; France, Malta).
- Provide results for “menaide” in Cilento area.
- Update the information for “menaide” in Catania area and “occhiatara” in Liguria.
- Provide first data for fisheries different from “menaide” and “occhiatara”.
- Update the information on technical characteristics of the nets.

- Provide fist information on socio-economic aspects.

Deliverables to be annexed to the second Interim report:

- D4. List of the bibliographic references, also in pdf format
- D6. Database filled with the available information.
- D8. Summary of the main characteristics of possible fishing methods alternative to SSD.

Third plenary meeting

It was decided that the third meeting, devoted to discuss on the progress of the project and to prepare the draft Final Report, will be held in Pisa: it will last two days, in the week from September 23rd to 27th 2013.

Main agreed deadlines for the next future

July 22nd
- First step of the data input in the DRIFTMED database.

End of July 2013:
- Second Interim Report (D2)
- Deliverables D4, D6, D8.

End of August – beginning of September 2013: first results of Tasks 3.1, 3.2, 3.3.

End of September – beginning of October 2013: Additional Report on the identification and characterization of small scale fisheries in Mediterranean.

End of October 2012: final Draft Report

THRID PLENARY MEETING

September 26th - 27th, 2013
ABITALIA TOWER PLAZA HOTEL - PISA, ITALY

LIST OF PARTICIPANTS

Name	Affiliation	Country
Maria Teresa Spedicato	COISPA	Italy
Giuseppe Lembo	COISPA	Italy
Pierluigi Carbonara	COISPA	Italy
Maria Teresa Facchini	COISPA	Italy
Paolo Sartor	CIBM	Italy
Mario Sbrana	CIBM	Italy
Paolo Carpentieri	CIBM	Italy
Fulvio Garibaldi	CIBM	Italy
Alexis Conides	HCMR	Greece
Dimitris Klaoudatos	HCMR	Greece
Alessandro Lucchetti	CNR- IAMC	Italy
Luca Lanteri	CIBM	Italy
Rosaria Sabatella	NISEA	Italy
Franco Biagi	EC DGMARE	

Presentation of the Participants

The local organizer, P. Sartor opened the meeting and welcomed the participants.
The meeting was attended by 13 participants belonging to the partners of DRIFTMED and by a representative of EC-DG MARE, Dr F. Biagi.
P. Sartor, the coordinator of the DRIFTMED contract, chaired the meeting.

A review of the EU regime on small scale driftnets fisheries: status of the art, news, deadlines.

The meeting started with a speech of F. Biagi (EC DG MARE), which informed that the public consultation on driftnets was closed on 15 September after about 6 months; 40 respondents have finally contributed.
The questionnaire was structured in different sections:

- presentation of the contributors,
- description the existing driftnet fisheries,
- appraisal of possible persisting problems and
- evaluation of the policy options as indicated in the roadmap.

The replies are under examinations and a report will be prepared and made public on the DGMARE website in the next weeks. Biagi noticed that none of the Regional Advisory Councils have been in a position to provide a collective response, either arguing that the consultations impacted on very few members or that driftnets were irrelevant for them.
The outcomes of the consultation, together with the results of the on-going studies (DRIFTMED-SC8 and MRAG Study -SC5) and the information provided by the national administrations, will constitute the basic elements upon which the European Commission will decide on the way forward on small driftnets.

As already anticipated in previous meetings, Dr Biagi recalled that Commission services shall submit an Impact Assessment (IA) report by 23 October for the examination by the IA Board on 20 November; this means that EC-MARE services must finalize a draft IA in the first ten days of October. As already agreed in previous meetings and talks it is therefore fundamental that, to meet such a tight schedule, the relevant information from DRIFTMED flow swiftly to the study SC-5 which is expected to finalize the retrospective and prospective evaluations by the end of September very early October. The SC-5 has submitted a draft final report on Wednesday 25th September and a more completed draft final report, including also the Mediterranean information, will be submitted very early in October.
In addition to the ongoing flow of information from DRIFTMED to the SC5, it is important that DriftMed provides very early in October the results of the study to EC-MARE services. This will facilitate the production of the Draft IA report and will allow understanding whether the SC5 has properly retained and used the information from the DRIFTMED.
This schedule is without prejudice to the administrative deadline of presenting the draft final report by the end of October as indicated in the contract.

After an articulated discussion, it was agreed to deliver to DGMARE, by **Monday October 7th** at the latest, all the results achieved by DRIFTMED summarized in **detailed synoptic tables**. These tables will be organized following the structure of the table that DRIFTMED and the Specific Contract 5 are using to share the information. The table will be associated by an **executive summary** containing on overview on the objectives, the methodology and a description of the results presented in the table.

DRIFTMED working plan and deadlines for the last phase of the contract

P. Sartor gave an overview of the DRIFTMED Specific Contract, recalling the objectives, the working plan and the main deadlines.
The deadline for the delivery of the Draft Final Report is the end of October; for this date also the remaining deliverables have to be completed.
Sartor informed also that the evaluation of the Second Interim Report was received from DGMARE. This document was considered acceptable and in line with the Contract. The evaluation of the report contained also important suggestions and advices for the preparation of the draft Final report.

The deliverable 8 (Summary of the main characteristics of possible fishing methods alternative to SSD)

L. Lanteri presented a summary of the Deliverable 8, which was annexed in the second Interim Report.
The main characteristics in terms of fishing capacity, fishing activity, landings and economic revenues were presented for possible alternative gears to small driftnets. Data used comes from essentially to DCF, obtained from the specific data call launched in the first months of DRIFTMED.
Lanteri recalled about the difficulty to obtain information for fisheries/metiers at present not monitored by DCF.
During the common discussion it was decided to improve this deliverable trying to **include also information coming from sources different from DCF**. In addition it was recalled the importance to **take into account also the Boat seines**, as possible alternative gear to small scale driftnets.
Biagi suggested finally to **avoid any management or decision making comments** in this Deliverable and to remain in the frame of the objective presentation of the data and related analyses.

DRIFTMED progress of activities: status of the works, difficulties encountered

The status of the works, the results achieved, possible problems/deviations from the DRIFTMED workplan were presented according to each Task.

Task 1.1 - Collection of the available information on SSD fisheries in EU Mediterranean fisheries.
A. Conides presented the overview of the work done so far, which is practically completed. The Literature Database Runtime Manual was presented as well.

Conides reported also the results of a detailed investigation made to clarify the status of the small driftnets in Greece. It resulted that the 3 vessels included in the EU Fleet Register associated to GND fishing system never used driftnets.
Following the discussion done in the previous meeting of Bari, Conides reported also the results of the investigation made to further clarify about a record of incidental catches of seabirds by driftnets as reported by the Hellenic Society for protection of Monk Seal and published in the ICES. The information on the reliability of such record, collected from various sources was rather contradictory, and it was impossible to associate a specific gear to this catch. Conides reported that the scientists at the origin of this record has neglected that was due to driftnets.

Task 1.2 - Critical review of the available information on SSD fisheries in EU Mediterranean fisheries.
P. Carpentieri presented the overview of the work done so far, which is practically completed.
The investigation on the existing information is continued in these last months and Carpentieri presented the progresses of the information collected.
The Italian National Strandings (of marine mammals) Data Bank, created by the University of Pavia, the Natural History Museum of Milan and the University of Padoa was made available to DRIFTMED. This database was then explored with the aim to search about records of incidental catches of cetaceans caused by driftnets.
At present the database contains 4324 records of sightings of marine mammals. In the majority of cases the records refer to strandings. Of the 630 records mentioning incidental catches only 50 reported the typology of the fishing gear; of these 29 are referred to generic “pelagic driftnets”, reporting, as most frequently species recorded, the spermwhale, *Physeter macrocephalus*.

Carpentieri reported also that the official archive of fishing licenses was made available by the Italian Ministry and consulted. All the vessels having a license for small scale driftnets ("ferrettara" gear) were selected from this database, where each fishing type is registered, either it is reported as primary, second, third, fourth or more gear. Therefore, as expected, this database reports a number of vessels (819) larger than that reported by the EU fleet register (508). The picture provided by the EU Fleet register and the Italian Ministry database reflects the theoretical number of vessels that could use the small-scale driftnets.

Finally Carpentieri informed that it was gathered information about the presence in southern Spain of small driftnets targeting in the past years sardine and flying fishes. The use of this gear in the present in under investigation, even though, form the contacts with the Spanish colleagues, these gears do not result active any longer.

Task 1.3 - Collection and review of the available information on SSD fisheries other than EU Mediterranean countries.
Sartor informed that no additional information has been received. So the picture of this task remains the same of that reported in the Second Interim Report.

Task 1.4 - Overview of the international/EU/national provisions regulating the driftnets fisheries in Mediterranean.
Sartor informed that, also for this task, no new information has been collected.
It was discussed to associate all the pdf files collected for Task 1.4 to the literature database developed by Task 1.1.

The DRIFTMED database. Status of data entry, difficulties encountered.
M.T. Facchini provided a detailed description of the structure and the functioning of the Database built to store all the information (existing and new information) collected with DRIFTMED.
The data entry is in progress. Due to the strict deadlines and the need to have data ready for the analysis as soon as possible, it was identified **October 2nd as deadline to finish the input of data**.

The presentation was followed by a discussion, on the procedure of expansion of the sampling data to the whole fisheries.
It is not available. However the landing recorded will be expanded to the single port/fleet, to obtain the production by port/fleet. In any case information of the sampling size (e.g. n° of interviews, logbooks, embarks) will be always provided, to give an idea of the representativeness of the estimates in comparison to the overall fishing days deployed by a fleet.
In some situations (e.g. in the case of GND SPF) the production data are available and they could be used (as for the small driftnets of Catania area).

Task 2.1- Interviews, log books, observations at landing sites and on board.
P. Carbonara did a detailed presentation of the protocols for data collection by means of interviews, logbooks and embarks and described the status of the field activities.

Task 3.1 - Description of the characteristics of the fisheries identified so far.
Sartor started this section providing a general overview. It was confirmed that almost all the active SSD fisheries in EU Mediterranean are located In Italy.
It was confirmed the **absence of active SSD vessels in Greece, Cyprus, Croatia and Malta**.
Some situations are still under investigations (e.g. a possible use driftnets for sardine and flying fishes in Spain and of some driftnets in French Riviera), but, in any case, their order of magnitude is minimal.

Cilento area (Sartor). The data collection and analysis are completed
Campania (Carbonara). A fishery of only 6 vessels targeting on seasonal basis the blue fish (*Pomatomus saltatrix*) was detected and studied.
Catania area (Carbonara). The data collection and analysis are completed. For the data of Catania it was also presented an estimation of the average drift of the nets during the fishing operations.
Northern Sicily (Carbonara). At least three different fisheries were detected (targeting mackerels, greater amberjack, anchovy). The collection of data will be completed next week.
Liguria (Garibaldi). The data collection and analysis are completed.

The presentations were followed by a common discussion on the characteristics of each fishery identified...
It was decided to associate to the LFD histograms of the catch of the target species the size at first maturity of the species and the Minimum Conservation Size (from EC reg. 1967/2006= Mediterranean Regulation). The size at first maturity will be taken from literature.
It was recalled to calculate for each fishery the catch rates (on the basis of the sampling data), expressed as both kg/fishing days and kg/100 square m of net/fishing hours.
It was decided to dedicate a paragraph to present those fisheries/or gears used by restricted number of vessels which presence was detected but, due to their small size or seasonal activity outside the sampling period, no detailed data were collected (e.g. the driftnets for garfish, grey mullets, smooth hounds, dogfish, etc.). In many case the information for these fisheries is rather anecdotal.
As concerns the driftnet fishery targeting sardine in Slovenia (only 4-5 vessels), one or two vessels performing the same fishery were identified for the Italian fleet of Trieste. For this reason it was decided to consider only one fishery, named the SSD for sardine of northern Adriatic.

Task 3.2 –Description of the technical characteristics of the nets in use by the driftnets fisheries identified so far.
A. Lucchetti did a detailed presentation, reporting the results of the measurements of the nets.
So far, detailed data on a total of 36 driftnets targeting different species were collected.
Lucchetti presented the main characteristic of the main typologies of nets and proposed to produce a sort of **book of pictures associated to tables reporting the technical data of the nets** as Deliverable summarising the information collected by Task 3.2.
From the discussion it was suggested to pay particular attention, in the presentation of results of task 3.2, to the differences between the technical aspects of the small driftnets and the set gillnets. Moreover, it

would be useful to indicate, where possible, the vertical hanging ratio and the operational drop with respect to the nominal drop

<u>Task 3.3–Economic parameters pertaining to each EU Mediterranean SSD fishery identified so far</u>
R. Sabatella reported the results of the socio-economic analysis for three fisheries of Cilento, Catania and Milazzo/Patti.
She reported also a comparative analysis of the main socio-economic parameters among the three fisheries.

<u>Task 3.4 - Assessment of the use of fishing methods alternative to SSD to exploit the same resources.</u>
G. Lembo recalled about the information, coming from the results of the form tasks 3.1, 3.2 and 3.3, and in particular from the deliverable 8. This information is propeaedeutic to the analysis planned for the Task 3.4 and shall be available **by Friday 11th October**, at the latest.
During the discussion Biagi recalled about the importance to include in this analysis also information on Boat seines; this is a spurious category, according to the Mediterranean Regulation, which includes both towed seines and surrounding nets without purse line.

The deadline for October 7th: definition of the summary table for data sharing with the Commission

It was agreed that DRIFTMED will deliver to DGMARE, by Monday October 7th at the latest, detailed synoptic tables, resuming the results obtained in the identification of the SSD fisheries in EU Mediterranean waters.
A discussion was made to define the structure of the table in order to give the highest efficacy and clarity to the results presented. The table will contain information on fishing capacity and activity, composition of catches, socio-economic parameters, environmental sustainability for each fishery identified, as well as information of the sampling size.
Most of the information to be stored in the table will be extracted from the DRIFTMED database, according to a standardized procedure.

The draft final report

Finally the discussion moved to define the structure and the content of the Draft Final report (Deliverable 3), which delivery is expected by the end of October. This report will be draft following the structure of the Second Interim report. Paolo Sartor by **October 7th** will send to all the DRIFTMED participants the guidelines for the preparation of the different Chapters of the report, including the Deliverables.

List of deliverables to be Annexed to the Draft Final report.

- **D9 - Database filled with the new data.**
- **D10 - Summary on the distribution and the characteristics of the SSD fisheries in Mediterranean.**
- **D11 - Overview of the technical aspects of the gears used by the SSD fisheries in Mediterranean.**
- **D12 - Overview of the economic aspects related to the SSD fisheries in Mediterranean.**
- **D13 - Comparative evaluations about a possible replacement of the existing small scale driftnets with alternative fishing methods in Mediterranean**.

Main agreed deadlines for the next future

<u>October 2nd:</u> completion of the data input in the database.
<u>October 7th:</u> delivery of the summary table and the executive summary to EU DGMARE.
<u>October 7th:</u> sending to the DRIFTMED partners of the guidelines for the preparation of draft Final Report.
<u>October 11th</u>: completion of the information needed by the Task 3.4.
<u>End of October 2013</u>: completion and submission to EC-MARE of the final Draft Report.

ANNEX II – FORMS FOR THE INTERVIEWS, LOGBOOKS AND EMBARKS

e

<u>- Form for the interviews</u>

The interviews were aimed at obtaining two kinds of data: information on the past and on the current usage of the Small-scale Driftnets (SSD). The questionnaire for the interviews has two levels of aggregation. The first one is related to a group of fishing vessels (e.g. belonging to associations and/or cooperatives), while the second one is referred to the single fishing vessel. The two levels are addressed to collect respectively the past and current information on the SSD fishery.

In the questionnaire addressed to the association and/or cooperatives of fishermen, the relevant data are related to the number of vessels involved in SSD, their characteristics such as LOA, engine power, number of fishermen involved, on board equipment, yearly fishing days, and target species. In addition, relevant socio-economic information, such as the number of employees, trade channel, price, etc., was also collected.

The questionnaire addressed to the fishermen is composed of two parts: one referred to the characteristic of the vessel and another one more specific for the SSD fisheries, with information on the net characteristics and fishing activity. In the first part of the questionnaire the most relevant characteristics of the vessel: LOA, year of construction of the hull, engine power, year of construction of the engine, equipment onboard, general data on yearly fishing activity, per gear and month, referred to the gears authorized in the fishing license are also reported. The first part of the questionnaire also contains questions related to the economic aspects, as the trade channel of fish landed, the costs of maintenance of the vessel, the type of labour remuneration. Moreover, in this part of the questionnaire, some questions related to the social aspects are included. Finally, also questions regarding the perception of the trends in resource abundance and economic performance of the SSD fishery are reported.

The second part of questionnaire is addressed at the collection of data on the net characteristics in terms of the material (nylon, polyester, polypropylene, etc.) of which the different parts of the SSD net is composed, the net dimension (length, height, mesh size, etc.), the rigging of the SSD net (floats material, floats buoyancy, number of leads, weight of the leadline, etc.) and net cost (maintenance and new construction). The second part of the questionnaire includes also the information on the fishing activity with questions on: the duration of the fishing trip, the fishing areas visited during the fishing operations and, above all, on the fishing activity by target species and season (month).

<u>- Form for the logbooks</u>

The logbook form has been designed to obtain information at level of a single fishing trip.

It is composed by 4 sections. The first one reports data on vessel characteristics, fishing activity (time of departure, time of arriving, number of hauls, fishing time, length of net, sea condition, etc.). The second one is aimed at collecting economic data as revenues, operational costs (fuel, staff, commercial, box, ice, etc.) and the trade channel. The third section is related to the collection of information on landings (kg and price/kg)) and discards (kg) data by species. The last section is aimed at reporting more detailed information on discard and possible remarks on the trip (e.g. problems encountered during fishing operations, damages to the gear, etc.).

A special section has been included to record in detail possible catches of sensitive/endangered species (e.g. marine mammals, reptiles, sharks) and the non-authorized species (e.g. the species included in the Annex VIII of the EC Reg. n° 894/97), as well as socio-economic aspects of these fisheries.

<u>Form for the embarks.</u>

The embark form recorded the information regarding a trip with observers on board. In this case the information related to the fishing operations is more detailed. Indeed, data are collected at the level of single haul, with information on geographic coordinates, operative depths, duration of fishing operations (time of start fishing and ending fishing, etc.). The information on the catch is registered at species level, reporting the total amount (kg) of landings, the sampling fraction (kg) taken for the biological data collection and the sample measured in the laboratory (kg and number of specimens measured), the total amount of discards in term of biomass and number of specimens, and the sampling fraction for the collection of biological data related to discards by species.

A special section was prepared to report possible catches of sensitive/endangered species (e.g. marine mammals, reptiles, sharks) and the non-authorized species (e.g. the species included in the Annex VIII of the EC Reg. n. 894/97), as well as on socio-economic aspects of these fisheries.

MAREA

DRIFTMED

Questionnaire

Association and /or Cooperative

N° Interview:	Date:
Place:	Interviewers:
Name Association and/or Cooperative:	

SMALL SCAL DRIFTNETS (SSD) – Information for the past												
Number of vessels:					Mooring port/s:							
Range LFT (m):				Range GTR and/or GT:								
Range Engine power (min. – max) HP and/or Kw:							N° persons embarked (range):					
Persons (number) involved:			Catch rates/landings:					Prize:				
Fish trade (%) Fishing market:			Wholesaler:		Fish shop/Restaurant:					Retail:		
Equipment on board: GPS		Radar		Sonar		Winch net		Other:				
Gear/month	Jan	Feb	Mar	Apr	Ma	Jun	Jul	Aug	Sep	Oct	Nov	De
Target species/months	Jan	Feb	Mar	Apr	Ma	Jun	Jul	Aug	Sep	Oct	Nov	De

MAREA

DRIFTMED
Logbook

Date _______________Name vessel _____________________________ Registration number__________

Fishing port____________________________________ Time of departure (hh:mm)________________

Time of arriving (hh:mm)________ Number of hauls____ Duration of fishing gear (hh:mm)________

Duration for set the net (hh:mm)__________ Duration for lowering net (hh:mm)_________________

Depth range (m)______________Fishing area (Coordinate and/or square)________________________

Length of net (m)_____________ Height net (m)_________________ Sea Condition______________

Target species:__________________________ Revenue______________ Fuel consumption__________

Other cost (ice, box etc.)____________________ Staff cost_______________ Commercial cost________

Fish trade (%): Fishing market______ Wholesaler:______ Fish shop/Restaurant _______Retail_____

Landing species	kg	box	price	Discard species	kg
Anchovy (*E. encrasicolus*)				Anchovy (E. encrasicolus)	
Sardine (*S. pilchardus*)				Sardine (*S. pilchardus*)	
Amberjack (*S. dumerilii*)				Amberjack (*S. dumerilii*)	
Saddled seabream (*O. melanura*)				Saddled seabream (*O. melanura*)	
Atlantic mackerel (*S. scomber*)				Atlantic mackerel (*S. scomber*)	
Chub mackerel (*S. colias*)				Chub mackerel (*S. colias*)	
Bogue (*B. boops*)				Bogue (*B. boops*)	
Mediterranean mackerel (*T. mediterraneus*)				Mediterranean mackerel (*T. mediterraneus*)	
Horse mackerel (*T. trachurus*)				Horse mackerel (*T. trachurus*)	
Salema (*S. salpa*)				Salema (*S. salpa*)	

DISCARD: Absent ☐ Abundant ☐ Very abundant ☐

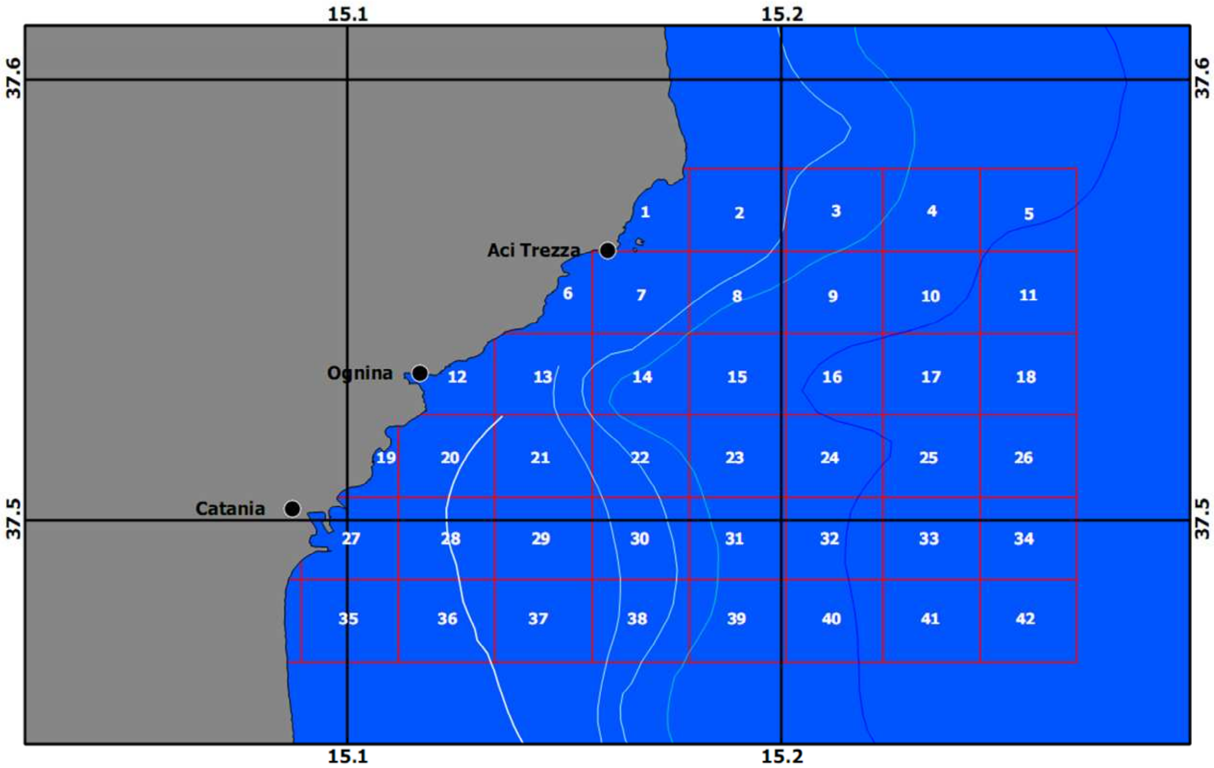
DESCRIPTION: Damaged fish☐ Algae ☐ Jellyfish☐ Undersize fish ☐ No commercial fish☐

Other ______________

Note :(damage to the gear, problems encountered during fishing operations, etc.)

		Species	n° specimens
Presence of sensitive/endangered species:	Marine mammals		
	Reptiles		
	Other		
Presence of non authorized species (Annex VIII of the EC Reg. n° 894/97)			

FISHING AREA



MAREA

DRIFTMED

N°	Date:

EMBARK FORM

GSA	Port	Name vessel	Register Number vessel

Nets length	Nets height	LFT	Mesh size		

Fishing Operation

Date (gg/mm/aa)	**Fishing Area**	**Depth range (m)**	**Total Time Fishing**

N° haul	Coordinates and/or Square	Depth (m)	Fishing start	Fishing end

Catch

Species	Landed		Sampled		Measured	DISCARD	
						Total	Sub-sample
	kg	N° box	kg	N° box	kg	kg	kg
Anchovy (*E. encrasicolus*)							
Sardine (*S. pilchardus*)							
Amberjack (*S. dumerilii*)							
Saddled seabream (*O. melanura*)							
Atlantic mackerel (*S. scomber*)							
Chub mackerel (*S. colia* s)							
Bogue (*B. boops*)							
Mediterranean mackerel (*T. mediterraneus*)							
Horse mackerel (*T. trachurus*)							
Salema (*S. salpa*)							
Amberjack *(S. dumerilii)*							

NOTES

		Species	n° specimens
Presence of sensitive/endangered species:	Marine mammals		
	Reptiles		
	Other		
Presence of non authorized species (Annex VIII of the EC Reg. n° 894/97)			