REGIONAL SURVEY
ON ABANDONED, LOST OR DISCARDED FISHING GEAR & GHOST NETS IN THE MEDITERRANEAN SEA

A contribution to the implementation
of the UNEP/MAP Regional Plan on Marine litter management
in the Mediterranean

UNEP

MAP

40 Years
TOGETHER
FOR A SUSTAINABLE
MEDITERRANEAN

COVER PHOTO

© Thomais Vlachogianni/MIO-ECSDE

LEGAL NOTICE

The designations employed and the presentation of the material in this document do not imply the expression of any opinion whatsoever on the part of UNEP/MAP or the EU concerning the legal status of any State, Territory, city or area, or of its authorities, or concerning the delimitation of their frontiers or boundaries.

COPYRIGHT

For bibliographic purposes this volume may be cited as: Regional survey on abandoned, lost or discarded fishing gear & ghost nets in the Mediterranean Sea - A contribution to the implementation of the UNEP/MAP Regional Plan on marine litter management in the Mediterranean, UNEP/MAP, Athens, 2015.

UNEP/MAP
48, Vassileos Konstantinou Ave.
11635 Athens
Greece
www.unepmap.org

REGIONAL SURVEY

ON ABANDONED, LOST OR DISCARDED FISHING GEAR & GHOST NETS IN THE MEDITERRANEAN SEA

ACKNOLEDGEMENTS

This publication was prepared by the UNEP/MAP MED POL Programme through the EcAp-MED project co-funded by the EU and the Mediterranean Trust Fund of the UNEP/MAP Barcelona Convention. The chief editors were Tatjana Hema (UNEP/MAP MEDPOL), Anastasia Roniotes and Thomais Vlachogianni (MIO-ECSDE). The regional survey was coordinated by MAP Partner MIO-ECSDE with contributions from Marieta Mima (ECAT), Riad Naser Bendaoud (AEB), Mosor Prvan (Sunce), Essam Nada (AOYE), Asaf Ariel (EcoOcean), Iffat Edriss (OBBA), Mohamed Ftouhi (CMED), Houssine Nibani (AGIR), Mahmoud Ibrahim Alsheikh Eld, Suheir Raies (SCSEP), Wahid Jenhani (Association de l'Environnement de Kelibia), Şeyda Dağdeviren (TURMEPA), Vaggelis Kalampokis and Maria Riga (MIO-ECSDE).

UNEP-MAP (www.unepmap.org) is the first regional seas programme involving 21 countries bordering the Mediterranean Sea, as well as the European Union. Through UNEP/MAP, the Contracting Parties to the Barcelona Convention and its Protocols are determined to meet the challenges of protecting the marine and coastal environment while boosting regional and national efforts to achieve sustainable development.

The EcAp-MED project on the "Implementation of the Ecosystem Approach in the Mediterranean by the Contracting Parties in the context of the Barcelona Convention for the Protection of the Marine Environment and the Coastal region of the Mediterranean and its Protocols"(EcAp MED project 2012-2015) aims to support UNEP/MAP to implement EcAp in synergy with the implementation of the EU's Marine Strategy Framework Directive.

The Mediterranean Information Office for Environment, Culture and Sustainable Development (MIO-ECSDE | www.mio-ecsde.org) is a MAP Partner, a Federation of 130 Non-Governmental Organizations (NGOs) working in the fields of Environment and Development in the Euro-Mediterranean area.

Final page layout and cover page were prepared by Pavlina Alexandropoulou

TABLE OF CONTENTS

© Steve Spring/Marine Photobank

PREFACE

Despite the uncertainties and knowledge gaps on marine litter, either related to amounts, their fate in the marine environment, or their impacts, it is widely accepted that both the levels of marine litter and the rate of input into the oceans are rising over time.

Abandoned, lost or otherwise discarded fishing gear (ALDFG) is a significant and very persistent type of marine litter with numerous harmful effects for the marine and coastal environment and human livelihoods and well-being[1].

1 (Brown & Macfadyen, 2007; Faeta et al, 2009; Good et al, 2010; Arthur et al, 2014)

Given that relevant information is lacking, fragmented and inconsistent in the Mediterranean, a survey-based regional assessment was conducted on abandoned, lost or discarded fishing gear and ghost nets, relying on information collected mainly from fishermen, with the aim to provide insight on the situation in eleven targeted countries[2].

This assessment, the results of which are presented in this publication, is a direct contribution to the implementation of the Regional Plan on Marine litter Management in the Mediterranean adopted by the 18th meeting of the Contracting Parties to the Barcelona Convention in December 2013 (Istanbul, Turkey) in the framework of Article 15 of the LBS Protocol, and the Ecosystem Approach (EcAp) Implementation Roadmap.

The next step would be to build on the conclusions so as to eventually reduce the impact of abandoned, lost or discarded fishing gear and ghost nets on the marine environment.

It was the Strategic Framework on Marine Litter Management, adopted by the 17th meeting of the Contracting Parties to the Barcelona Convention in 2012 (Paris, France) that had identified major gaps with regards to abandoned, lost or otherwise discarded fishing gear in the Mediterranean.

2 Albania, Algeria, Croatia, Egypt, Israel, Lebanon, Morocco (Atlantic and Mediterranean side), Palestine (Gaza), Syria, Tunisia and Turkey.

Now, with the Regional Plan on Marine Litter in place and many Mediterranean countries in the phase of planning national strategies for the viability of their fishing sector, the time is ripe for (a) inclusion and implementation at national level of provisions, measures and incentives that will enable fishing gear being handled in a sustainable manner, (b) creating the enabling environment for holistic outreach programmes undertaken by competent civil society actors that will address the primary causes of marine litter and poorly managed fishing gear. Properly equipped ports, waste management systems and better enforcement are also part of the solution from the side of the authorities.

Apart from running awareness-raising and education activities, civil society actors are also essential in filling in the knowledge gaps that stand in the way of effective decision making. Participatory science and community-based data collection initiatives embedded within or complementing the monitoring programmes soon to be in place by the countries, can provide accurate, coherent and comparable scientific data on marine litter.

Existing evidence is more than sufficient to justify immediate action toward implementing the measures of the Regional Plan on Marine Litter Management.

© Thomais Vlachogianni/MIO-ECSDE

© Thomais Vlachogiann/MIO-ECSDE

INTRODUCTION

Within the framework of an agreement between UNEP/MAP and MAP Partner MIO-ECSDE, the latter undertook the task of conducting a survey-based regional assessment on abandoned, lost or discarded fishing gear (ALDFG) and ghost nets, relying on information collected mainly from fishermen in eleven Mediterranean countries: Albania, Algeria, Croatia, Egypt, Israel, Lebanon, Morocco (Atlantic and Mediterranean side), Palestine (Gaza), Syria, Tunisia and Turkey.

The present report aims to provide insight on the issue of ALDFG in the Mediterranean sea, with regards to their occurrence, amounts, types and trends as these are perceived mainly by fishermen and/or other fisheries related stakeholder groups, such as crew members of vessels (ranging from small to big vessels, professional or pleasure craft, etc.), port authorities, professional divers, etc. Furthermore, the present report aims to take stock of existing measures including regulations, cleanup operations, etc. to mitigate the impacts of ALDFG in the Mediterranean, as well as to assess the fishermen's intentions to engage themselves in 'Fishing for Litter' schemes, as the latter is one of the key measures to address sea-based sources of marine litter outlined in the Regional Plan for Marine Litter Management in the Mediterranean (Article 9, (6); Article 10, (e).

Abandoned, lost or otherwise discarded fishing gear is a significant and very persistent type of marine litter with numerous harmful effects for the marine and coastal environment and human livelihoods and well being (Brown & Macfadyen, 2007; Faeta et al, 2009; Good et al, 2010; Arthur et al, 2014). They pose threats to marine habitats and wildlife (e.g. entanglement and 'ghost' fishing, digestion, etc.), human safety (e.g. divers, boat crews, etc.) and property damage (e.g. damaging propellers). In most cases, the loss of gear is unwanted by the fisherman but in some cases fishing gear is intentionally discarded, mostly to avoid the waste management cycle and related cost or efforts.

The issue of ALDFG has gained global recognition over the years within the overall marine litter problem context and beyond. However, there is lack of comprehensive data. The attempts that have been made worldwide to estimate the amount of ALDFG in given areas are hampered by the inherent difficulties in providing any robust quantification of their level in the world's oceans on an annual basis, or of their overall contribution to marine debris as a whole. At a global level, a rough estimate is that less than 10% of marine litter by volume is ALDFG (Macfadyen et al, 2009) and DFG is the main type of submerged marine debris (NOAA Marine Debris Program, 2015). When it comes to the Mediterranean, despite the scarcity and inconsistency of ALDFG related data, this has been recognized as an issue of major concern and targeted measures to tackle it have been adopted by the Contracting Parties to the Barcelona Convention within the Regional Plan for Marine Litter Management in the Mediterranean (UNEP/MAP IG.21/9).

ALDFG IN THE MEDITERRANEAN SEA

Background

Abandoned, lost or otherwise discarded fishing gear (ALDFG) is a significant and very persistent form of marine litter, recognized as one of the major pollution problems damaging the environmental, economic and cultural values of the marine and coastal environment worldwide (UNEP, 2005). Derelict fishing gear (DFG) is a major component of the marine litter problem worldwide and has been identified as one of the most biologically threatening types of marine litter (Newman et al, 2011; McElwee et al, 2012; Arthur et al, 2014; Kühn et al, 2015).

DFG includes nets, lines, crab and shrimp traps/pots, and other recreational or commercial harvest equipment that has been lost, abandoned or discarded in the marine environment. The use of the term "abandoned, lost or, otherwise discarded fishing gear" implies recognition of both the intentional and unintentional sources of derelict fishing gear, but there are many practical circumstances where those distinctions are blurred (Matthews & Glazer, 2010). The causes of ALDFG are numerous and vary between and within fisheries. Direct causes of ALDFG include operational fishing factors such as weather making it more likely that gear will be left or discarded; illegal, unregulated and unreported fishing; gear retrieval and gear disposal costs; gear conflicts; vandalism and/or theft, while indirect causes include the unavailability of onshore waste disposal facilities, as well as their accessibility and cost of use (Macfadyen et al, 2009).

Although it is impossible to get an accurate global number on the amount of ALDFG in marine environment, a rough estimate is that less than 10% of marine litter by volume is ALDFG (Macfadyen et al, 2009) and DFG is the main type of submerged marine debris (NOAA Marine Debris Program, 2015). The amount of ALDFG continues to increase each year (Macfadyen et al, 2009), but at the root of the issue is the increased use of plastic and nylon fishing gear that when left in the marine environment persists for decades (Matthews & Glazer, 2010). Most modern ALDFG is generally made of synthetic polymers and metal that degrade slowly, if at all, so a continuous input of these items results in a gradual build-up in the marine and coastal environment.

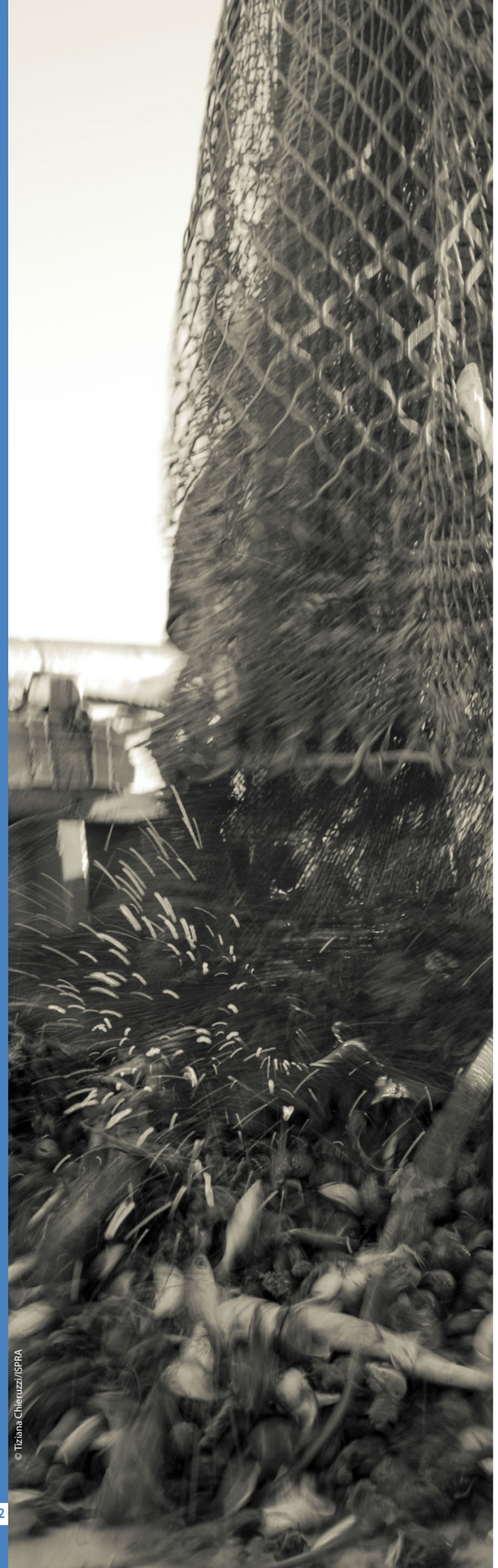
ALDFG has a number of harmful effects and impacts for the marine and coastal environment and human livelihoods and well being (NOAA Marine Debris Program Report, 2015; Macfadyen et al, 2009; UNEP, 2005). The environmental impacts include:

- continued catch of target and non-target species;
- interactions with threatened/endangered species;
- physical impacts on the benthos;
- distribution of marine and terrestrial litter;
- a role as a vector for invasive species;
- introduction of synthetic material into the marine food web.

The ability of ALDFG to "ghost fish" is one of the most significant impacts of ALDFG and is highly specific to the gear type and the specificities of the marine environment (e.g. currents, depth, etc.). Ghost fishing refers to DFG that continues to capture fish and other marine animals (e.g. crustaceans, sea turtles, etc.) after the gear is no longer under the control of a fisherman. The most common types of DFG that ghost fish are gillnets and crab pots/traps, but other types of fishing gear, like longlines and trawls, can also ghost fish if they become DFG (Macfadyen et al, 2009).

ALDFG also results in both economic and social impacts that can be significant. ALDFG effects upon marine users include:

- navigational hazards;
- loss of amenity and disruption to enjoyment of beaches and coastal areas;
- safety concerns;
- additional costs resulting from fouling vessels and other gear.



© Tiziana Chieruzzi/ISPRA

The Mediterranean context

In the Mediterranean, despite the scarcity and inconsistency of ALDFG related data, ALDFG has been recognized as an issue of major concern. The findings of the recently updated UNEP/MAP "Assessment of the status of marine litter in the Mediterranean" show that synthetic polymer items among fishing nets make up the largest proportion of overall litter pollution (UNEP/MAP-MEDPOL, 2015). Recent research carried out in several locations of the Mediterranean Sea indicate that fishing gear may account for a large or even the largest part of marine litter items recorded, with figures reaching even the amount of 89% (Bo et al, 2014; Ioakeimidis et al, 2014; Tubau et al, 2015).

In addition, currently in the Adriatic Sea -a sea with intensified fishing activities- a large scale IPA-Adriatic funded project entitled 'Derelict Fishing Gear Management System in the Adriatic Region' is being implemented, with actions focusing to a large extent on ALDFG. The DeFishGear project (www.defishgear.net) is not only piloting measures on ALDFG removal and management but is also carrying out a comprehensive assessment of the status of marine litter in the Adriatic through harmonized and coordinated pilot monitoring activities which provide major insights on the amounts of ALDFG. Preliminary findings show that fisheries (including aquaculture) related litter items account for some 35-40% on the seafloor (DeFishGear/ISPRA, in press; DeFishGear/HCMR) or are among the top 10 items (13%) recorded on beaches (DeFishGear/MIO-ECSDE, in press) or among the main floating items recorded (DeFishGear/MIO-ECSDE & Accademia Leviatano/ in press). Another important project is also being implemented in the Northern Adriatic Sea, the LIFE + funded project entitled 'GHOST' (http://www.life-ghost.eu) which provides valuable information on ALDFG obtained from acoustic and underwater surveys.

Despite the aforementioned research efforts, available data does not allow the evaluation of the relevant importance of the ALDF related threat. However, given the intensification of fishing activities over the past fifty years in the region coupled with the insights provided by marine litter related studies, it is evident that ALDFG is an important component of the overall marine litter issue. Taking this into consideration, targeted measures to tackle this have been adopted by the Contracting Parties to the Barcelona Convention within the Regional Plan for Marine Litter Management in the Mediterranean (UNEP/MAP IG.21/9). These include:

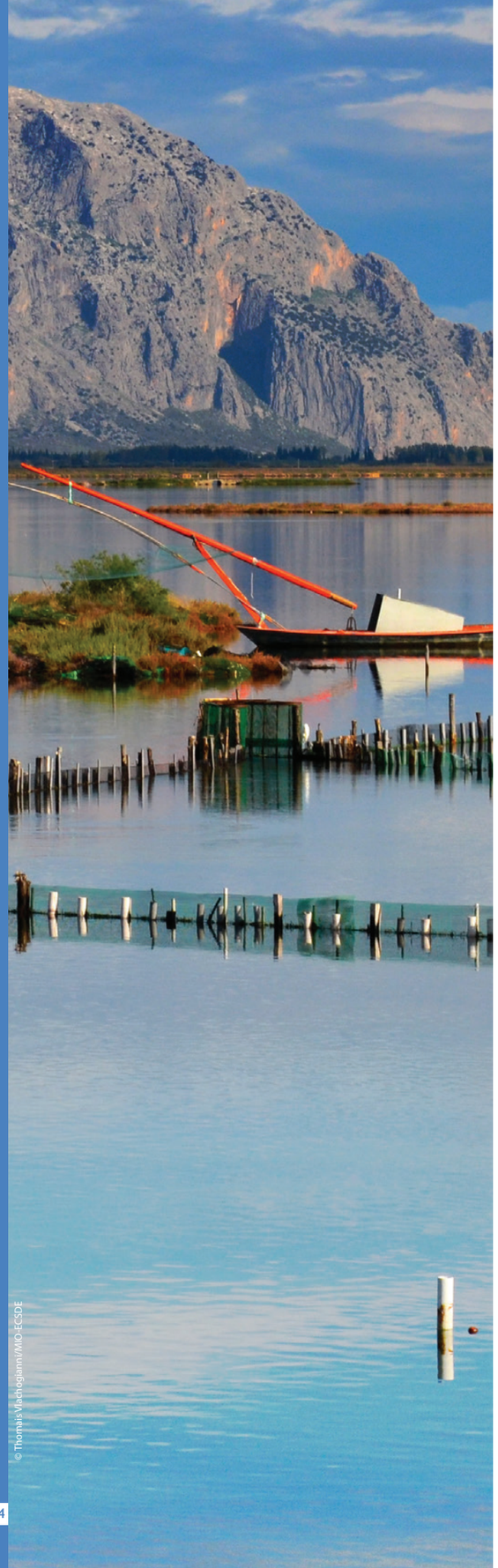
- The implementation of "Fishing for Litter" environmentally sound practices, in consultation with the competent international and regional organizations, to facilitate clean up of the floating litter and the seabed from marine litter caught incidentally and/or generated by fishing vessels in their regular activities including derelict fishing gear (Art. 9 - Prevention of Marine Litter).
- The implementation of the "Gear marking to indicate ownership" concept and "reduced ghost catches through the use of environmentally neutral upon degradation of nets, pots and traps concept" in consultation with the competent international and regional organizations in the fishing sector (Art. 9. Prevention of Marine Litter).
- The implementation of the Fishing for Litter practices, in consultation with the competent international and regional organizations and in partnership with fishermen and ensure adequate collection, sorting and/or environmentally sound disposal of fished litter (Art.10 – Removing existing marine litter and its environmentally sound disposal).

With the aim to support the Contracting Parties to implement the Fishing for Litter (FfL) related measure UNEP/MAP MEDPOL produced a 'Guide on best practices for fishing for litter in the Mediterranean' (UNEP/MAP-MEDOL, 2015). The objective of this guide is two-fold: to provide technical guidance on the mechanism to remove litter from the sea in an environmentally friendly manner ensuring negative impacts on marine environment and ecosystems are avoided, and to provide guidance on the process of involving the stakeholders responsible for the implementation and coordination of FfL practices. It should be stressed that throughout the guide but also the Regional Plan for Marine Litter Management in the Mediterranean the passive FfL practices are considered. Passive practices are carried out by fishermen during their regular fishing activities without financial compensation, while active ones are specifically performed to remove marine litter and fishermen involved may be financially compensated. The Regional Plan foresees active FfL either in marine litter accumulation spots or in protected areas.

Similarly, at European level and within the framework of the Marine Strategy Framework Directive, the Mediterranean Member States are considering within their Programmes of Measures the: installation of appropriate recovery and recycling systems for used fishing gear; the implementation of "gear marking to indicate ownership" concept and "reduced ghost catches through the use of environmentally neutral upon degradation of nets, pots and traps" concept; the implementation of "fishing for litter" environmentally sound practices to facilitate clean up of floating litter and the seabed from marine litter caught incidentally and/or generated by fishing vessels in their regular fishing activities including derelict fishing gear.

At global/international level a series of additional preventative methods and measures to avoid and minimize fishing gear from becoming abandoned, lost and discarded are being considered (Gilman E, 2015; Scheld et al, 2016) including: changes in fishing gear designs or materials might reduce the incidence of loss (Chaves & Silveira, 2014); limiting the amount of fishing effort or capacity e.g. by limiting the length of gear soak time (Macfadyen et al, 2009; FAO, 2011); economic incentives to reduce the incidence of gear becoming abandoned, lost or discarded e.g. by creating a mandatory deposit on new gear, which is returned when unwanted gear is delivered to an appropriate port reception facility and not subsidizing the cost for fishers to replace ALDFG (MacMullen et al, 2003); etc.

Currently in the Mediterranean, several projects are piloting some of the aforementioned measures to address ALDFG including: the DeFishGear project (www.defishgear.net), the GHOST project (http://www.life-ghost.eu), the HealthySeas project (http://healthyseas.org/), the MARELITT project (http://www.marelitt.eu), etc.



REGIONAL SURVEY TO ASSESS ALDFG

Overall goal and objectives

The overarching aim of the survey and its results is to directly contribute to the implementation of the Regional Plan on Marine litter Management in the Mediterranean adopted by the 18th meeting of the Contracting Parties to the Barcelona Convention in December 2013 (Istanbul, Turkey) in the framework of Article 15 of the LBS Protocol, and the Ecosystem Approach (EcAp) Implementation Roadmap.

Pursuing this overall goal, the survey aimed to:

- collect data on marine litter and fishing gear;
- provide opinion-based assessment of current trends related to ALDFG, as well as marine litter;
- provide information on practices that contribute to the problem but could be part of the solution;
- take stock of available information on measures and regulations that are in place concerning the management of ALDFG;
- provide insights into opinions, behaviors and perceptions of fishermen and the other fisheries related target groups on the issue ;
- capture what the fishermen think about their role in the management of ALDFG and assess their intentions to engage themselves in 'Fishing for Litter' schemes.

Methodological approach

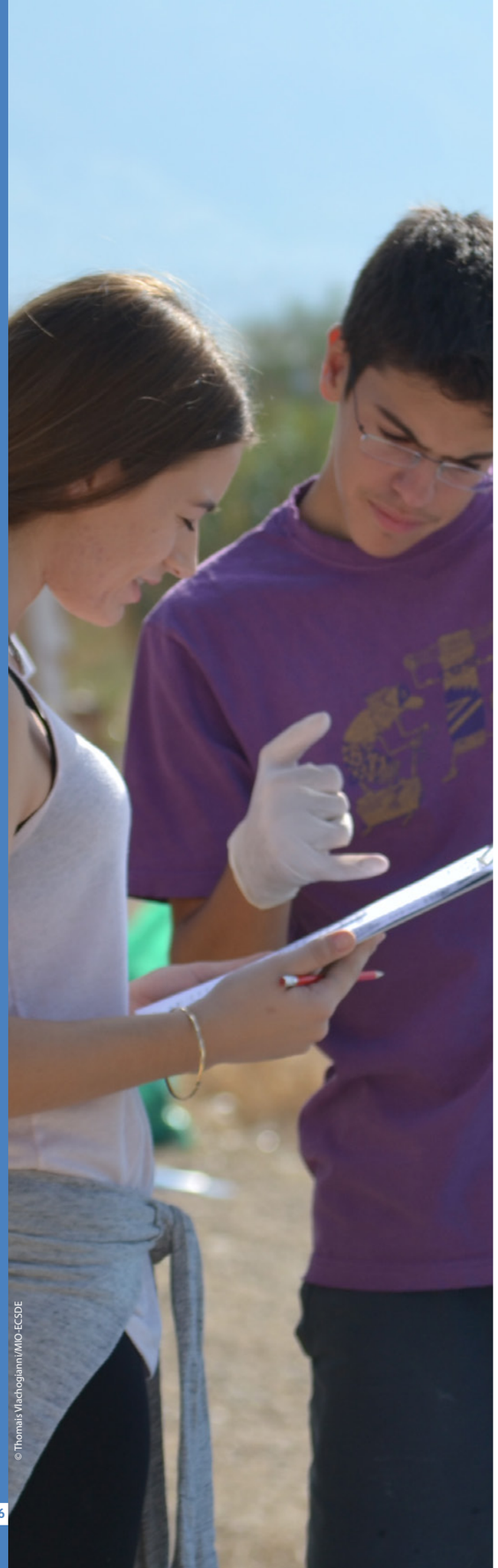
Within the framework of an agreement with UNEP/MAP, MIO-ECSDE undertook the task of conducting a survey-based regional assessment of abandoned, lost or discarded fishing gear and ghost nets, as well as marine litter, relying on information collected mainly from fishermen in eleven Mediterranean countries: Albania, Algeria, Croatia, Egypt, Israel, Lebanon, Morocco (Atlantic and Mediterranean side), Palestine (Gaza), Syria, Tunisia and Turkey. The countries of focus are non-EU Mediterranean countries (with the exception of Croatia) with a significant length of Mediterranean coastline and for which ALDFG data is scarce, inconsistent or totally lacking.

The activity was launched in mid-March 2015. By the end of March the design and preparation phase was completed and the country partners were identified and contracted. During the months of April and May the country based activities took place as well as the necessary complementary literature review. By late May the compilation of all of the collected data and information into a report had begun.

The approach followed by this effort was a straightforward combination of country surveys conducted with a common questionnaire (see Annex I) in all targeted countries and a review of the relevant existing literature and project results in the region. The main vehicle for collecting the needed information from the eleven countries was a questionnaire. It was developed by MIO-ECSDE -taking into consideration relevant experiences and lessons learned by the DeFishGear project- shared with the country partners and eventually approved by UNEP/MAP MEDPOL. It was designed so as to address fishermen and crew members of vessels taking into account that the fisheries sector is very diverse. Another target group were professional divers, particularly those that have participated in clean ups and have experience in removing abandoned/lost nets from the sea and coasts. The same applied for environmental NGOs that have a long standing experience in marine litter issues. Other target groups were port authorities, researchers, etc.

During the design phase, it was decided to involve as country partners in charge of the collection of national data, civil society actors or professionals that already have a good relationship with the fishing community in their countries. This allowed the targeted number of respondents (minimum around 50) per country to be met in the short duration of the activity (~1.5 month). The target number of approximately 50 respondents per country (survey sample size) was decided jointly with the national partners and also via the use of a sample size calculating form (margin of error 5%, confidence level 95%).

The questionnaire was built around four thematic areas: general background information; information related to derelict fishing gear; information related to lost fishing gear (ghost nets); information related to marine litter found at sea.



© Thomais Vlachogianni/MIO-ECSDE

Survey areas, target groups and levels of completion

The survey was successfully implemented in Albania, Algeria, Croatia, Egypt, Israel, Lebanon, Morocco, Palestine (Gaza), Syria, Tunisia and Turkey. Although Libya made serious effort to collect the information as in the other countries, the security situation did not permit the task to take place without risking physical harm. It was decided to not take this risk. In the case of Morocco, the survey was conducted both on the Mediterranean and the Atlantic coasts of the country.

In the end, the targeted number of questionnaires was surpassed. 557 out of the expected 550 questionnaires (best case scenario) were filled in (more than 100% response rate), mostly through direct interviews with the targeted respondents in person or over the phone.

As shown in Fig.1 out of a total 557 collected surveys, 53% where completed by fishermen, 12% by sailors, 20% by skippers and the remaining 15% by other target groups (including vessel owners, divers, representatives of unions and cooperatives of fishermen, etc.).

The analysis and processing of the data was performed in two steps. Firstly, national aggregation of results was performed and results were compiled into national reports and at a second step results were aggregated at regional level and are presented in detail within this report.

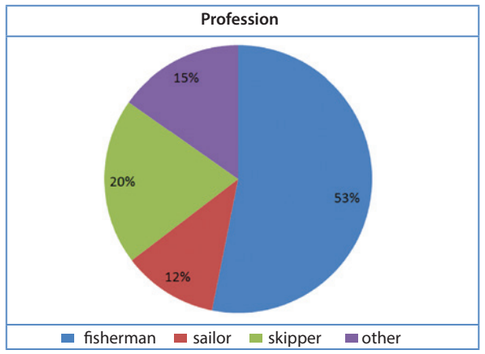


Figure 1: *Survey respondents per target group.*

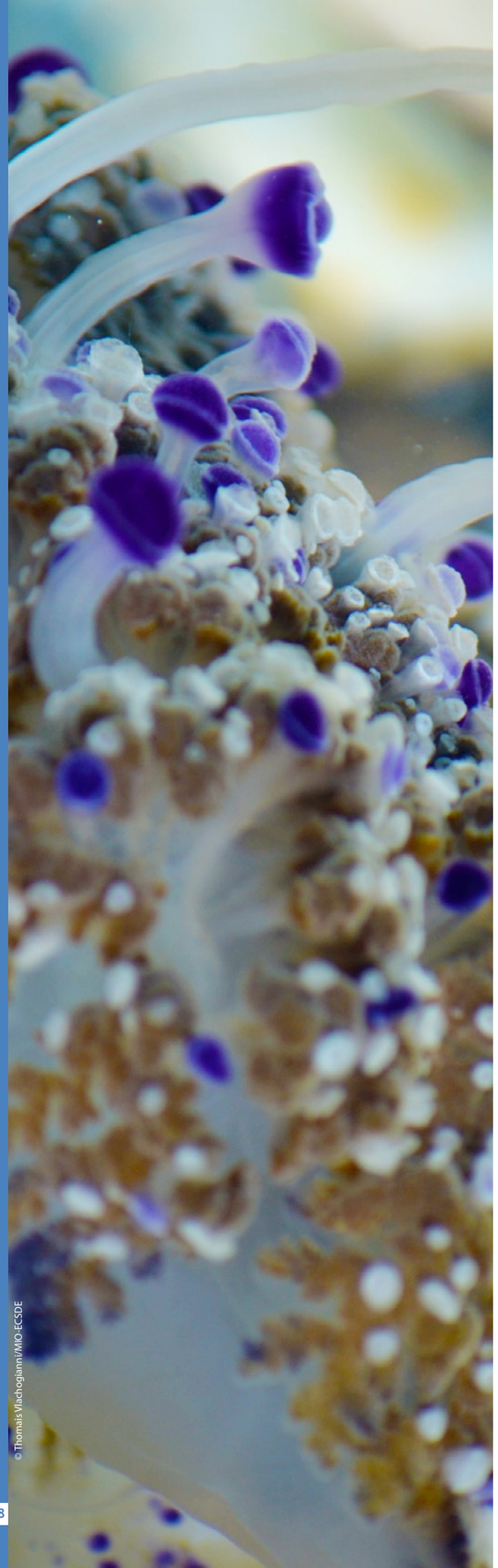
Figure 2: *Geographical location of the survey areas.*

Survey Countries	Survey locations	Partner	Category
Albania	Vlora, Durresi, Saranda, Lushnje-Fier, Shengjin	ECAT	NGO
Algeria	Zemmouri, Djinet, Dellys	Association Ecologique de Boumerdès (AEB)	NGO
	Taza National Park	MedPAN South Project (WWF MEDPO)	NGO
Croatia	Komiža, Umag, Zadar, Poreč, Split, Hvar island, Banjole, Sali, Vela Luka, Sreser, Lošinj, Novalja, Vinišće, Pula, Kali, Podgora, Lastovo, Tribunj, Biograd na moru, Savudrija, Senj, Bol, Primošten, Rijeka, Zaglav	Sunce	NGO
Egypt	North Sinai (mostly in Areesh, Bear Al Abd - Bardaweel Lake, El Kherba village)	Arab Network for Environment and Development (RAED)	NGO
Israel	Various locations along the 190km long coast of Israel	EcoOcean	NGO
Lebanon	Alsarafand, Manara Rass Beirut, Saida, Bebnin, Ouzai, Tyre, Alnakora and Tripoli	Operation Big Blue Association (OBBA)	NGO
Morocco	Tangiers, Mehdia (Atlantic)	Moroccan Club for Environment & Development (CMED)	NGO
	Alhoceima (Mediterranean)	AGIR	NGO
Tunisia	Gaza and surrounding area	Mahmoud Ibrahim Alsheikh Eld	Consultant
Turkey	Lattakia and surrounding area	Syrian Coast Society for Environmental Protection (SCSEP)	NGO
Syria	Kelibia	Association de l'Environnement de Kelibia	NGO
Palestine (Gaza)	Marmara Bay, Bodrum, Fethiye, İzmir	Turkish Marine Environment Protection Association (TURMEPA)	NGO

Table 1: *Survey locations and partners (For partners contact details see Annex II)*

Target Group	All countries	Albania	Algeria	Croatia	Egypt	Israel	Lebanon	Tunisia	Turkey	Syria	Palestine	Morocco
Fisherman	**296**	4	2	37	47	22	42	3	30	48	40	21
Sailor	**64**	0	0	0	0	1	6	20	6	2	1	28
Skipper	**112**	3	36	4	4	7	2	23	7	1	6	19
Other	**85**	43	0	11	0	21	0	0	6	0	3	1
Total	**557**	50	38	52	51	51	50	46	49	51	50	69

Table 2: *Survey target groups and questionnaire completion rates.*



© Thomais Vlachogianni/MIO-ECSDE

MAIN FINDINGS

There is very little information available in the Mediterranean about the status of derelict fishing gear (where it occurs and why; to what extent it is removed or not; how it is stored and/or destroyed, etc.) and what the national regulatory frameworks are (if they exist). This was acknowledged back in 2012 by the 17th Meeting of the Contracting Parties to the Barcelona Convention by the Mediterranean Framework Strategy on Marine Litter that was adopted at the time. With the Regional Plan on Marine Litter Management in the Mediterranean in place since 2013 (18th Meeting of the Contracting Parties), and in support of its implementation, UNEP/MAP addressed this gap by collaborating with MIO-ECSDE, a MAP Partner, in conducting this survey-based regional assessment in eleven Mediterranean countries with the contribution of twelve civil society actors. The results of the survey contribute some valuable insights and findings.

There was strong recognition of the marine litter issue among the fishermen and other fisheries related target groups, with 91% of the respondents considering marine litter as a serious or moderate problem. Furthermore, the majority of the respondents (64%) were of the opinion that this is a growing problem. Some 52% reported that they experience often or almost every time problems with marine litter caught in their nets, which highlights also the socio-economic related implications of marine litter to the fisheries sector.

Almost half of the respondents were in a position to indicate marine litter accumulation spots which underlines their valuable contribution into designing and implementing targeted marine litter removal operations.

It was interesting to see that on the basis of national but also aggregated results the relative importance of sea-based sources of marine litter was considered to be higher and roughly estimated to be around 34%, which strengthens the view that sea-based sources of marine litter in the region might have been underestimated and don't necessarily correspond to the commonly referenced 20% (sea-based sources)-80% (land-based sources) ratio.

Regarding marine litter management practices on board and on shore it seems that there is a lot of room for improvement. Just a bit less than 50% claim to have no waste bins on board and some 38% of this admits to throwing litter back overboard. Some 40% of the respondents are not satisfied with the waste collection facilities back at ports, with accessibility being also one major issue.

Regarding DFG it was eye-opening to see that 37% of the respondents admitted to eventually dumping it on land (illegal dumpsites), since according to the views of 67% there are no specific collection points for derelict fishing gear at ports and marinas. This clearly demonstrates the need for considerably improving the waste reception facilities at ports and establishing derelict fishing gear management schemes.

Regarding specific measures taken to support the sustainable management of used fishing gear or lost fishing gear, the overwhelming majority replied (76%) that no such measures have been taken, although some initiatives of interest seem to be in place or in the pipeline.

On the level of aggregated results, the big majority of the respondents (71%) considered the issue of ghost nets as a serious (42%) or moderate (29%) problem. Almost half of them (47%) felt that this is a growing problem and similarly some 41% of the respondents considered the impacts of ghost nets as a serious problem. There was lack of universal recognition of ALDFG effects and in particular of ghost nets, which can be attributed to the lack of awareness of the professionals but also the variability (local, national, regional) in terms of the scale of the problem. Considerable awareness raising efforts are needed to address the former while the latter requires more research to address the knowledge gaps and indicates that marine litter cannot be necessarily tackled with horizontal region-wide measures.

The large majority of some 98% of the fishermen expressed their willingness and interest to engage themselves in the 'fishing for litter' measure.

Despite the knowledge gaps related to ALDFG, and in particular the issue of ghost nets, this survey confirms that that there is a problem in the region. Further work is needed to make accurate estimates of the extent of the problem for the Mediterranean at local, national and regional level in order to facilitate effective decision making and management responses.

Not surprisingly, one of the main recommendations of all country surveys was the need for increased awareness-raising and education activities calling for better waste management and disposal by the sector itself, which should go hand in hand with derelict fishing gear collection or recycling programs. So there is an important role to be played by civil society. But, civil society can also be valuable in filling in the knowledge gaps that stand in the way of effective decision making. Participatory science and community-based data collection initiatives embedded within or complementing comprehensive monitoring programmes are key to providing accurate, coherent and comparable scientific data on marine litter.

Despite the uncertainties and knowledge gaps related to ALDFG, there is enough evidence to trigger concern and the inclusion and implementation at national level of provisions, measures and incentives that will enable fishing gear being handled in a sustainable manner.

© Thomais Vlachogianni/MIO-ECSDE

DETAILED RESULTS OF THE SURVEY ON ALDFG IN THE MEDITERRANEAN

The detailed results and findings of the regional survey are presented below and they are clustered on the basis of the four thematic areas of the questionnaire: (a) general information related to fishing operations such as vessel characteristics & fishing areas, number of fishing days per year (of vessel), number of fishing days per year (of vessel), average number of fishing hours per day; (b) information related to derelict fishing gear; (c) information related to lost fishing gear (ghost nets); (d) information related to marine litter found at sea.

The results are presented on the level of aggregated information from all of the country surveys. However, country specificities are also mentioned where merited. Some of the figures might be an underestimate, since illegal and undocumented fishing, is still practiced, including fishing of protected species, sometimes as by-catch.

General information related to fishing operations

The majority of the interviewees (94%) claimed to fish or work within their country's national waters with only 6% (also) working outside national waters. This is expected since most of the fishing activity in several of the countries of the survey takes place relatively close to the coast. The survey confirmed that a little over 80% of the fleet comprises small scale vessels (Sacchi, 2011) with the majority of the respondents claiming to spend over 120 days a year at sea and around 4-12 hours on each of these days. However, it should be noted that country averages varied as some claimed to spend considerably more time (Lebanon) and others considerably less (Algeria: 70 days/year; Israel: less than 60 days/year and less than 4 hours/day).

When it comes to the main types of fishing gear used these mainly include longlines and hooks (27%) and trawls (25%), and to a lesser extent gillnets and similar nets (15%), seines (12%), surrounding nets and lift nets (12%) and pots and traps (6%) (Fig. 3).

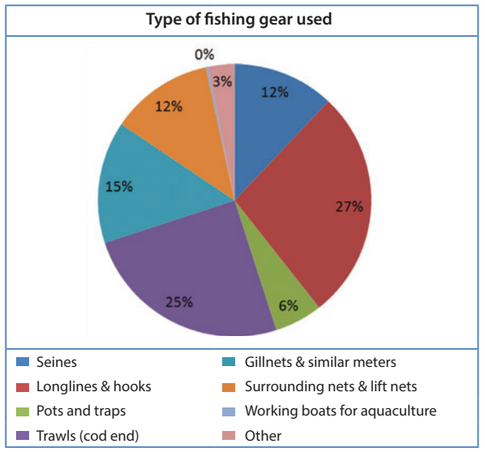


Figure 3: *Types of fishing gear used.*

Information related to derelict fishing gear

The most common types of fishing gear used in terms of amounts expressed in length (m) are longlines and hooks, gillnets, surrounding nets and lift nets, seine nets and trawl nets. When these are expressed in numbers the prevailing types of gear used are longlines and hooks and trawl nets. In Fig. 4 one can see the relation between gear that is used, disposed of (end of use) and lost within a year. Apparently, longlines & hooks, gillnets and surrounding/lift nets are considered as the most commonly disposed of or lost gear, with thousands of meters lost annually. Trawl nets and purse seines may be lost or abandoned less, but often small pieces are torn. Fish cages are commonly damaged, destroyed and lost during storms. Chains, cables etc. are rarely lost, but lead weights are frequently lost.

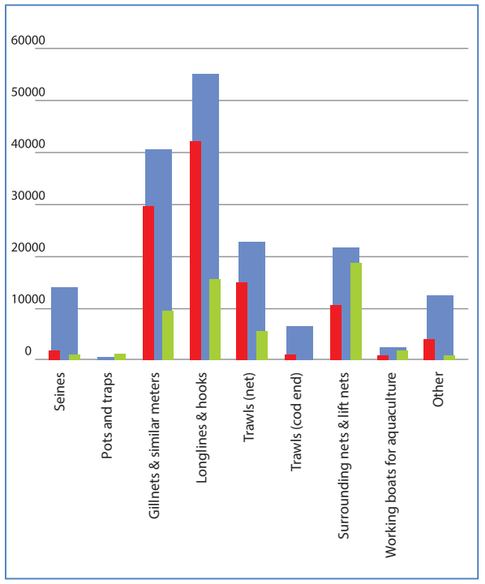
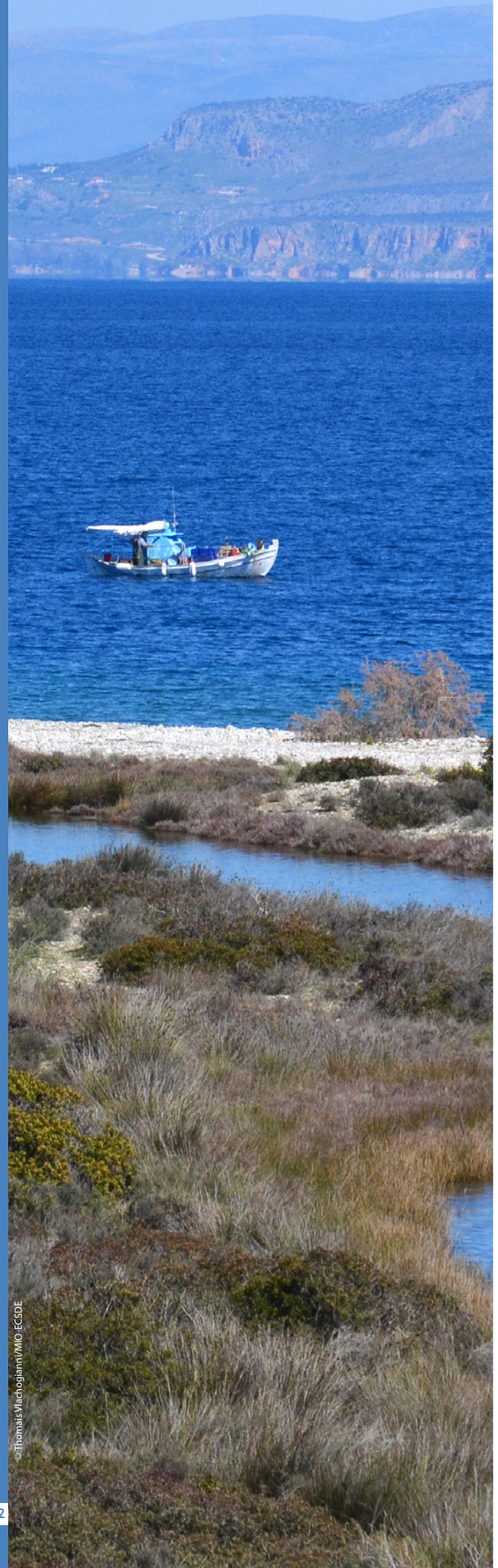


Figure 4: *Estimates of types and amounts of fishing gear used, disposed and lost throughout the year (length, m).*



©Thomais Vlachogianni/MIO-ECSDE

The majority of the interviewed people (60%) stated that fishing gear is managed in a way that minimizes rather than increases the risk of its loss into the sea [Fig. 5 (a)]. The driver for such behavior is that they want to avoid additional costs to the extent possible, so they recover, reuse and repair a much as possible.

Half of the time, fishermen store derelict nets themselves with a little less than a third of them admitting to destroying them [Fig. 5 (d)] as well (e.g. burning). 37% admitted to eventually dumping it on land (illegal dumpsites) [Fig. 5 (c)] and 18% claimed to always dispose of nets and equipment in the relevant waste facility on land [Fig. 5 (e)]. When asked about the existence of specific collection points for derelict fishing gear at ports and marinas, 67% replied that they do not exist [Fig. 6 (a)]. In the cases where they do exist they are disposed together with other types of waste [Fig. 6 (d)] while 43% pointed out that accessibility to such facilities is a problem in any case [Fig. 6 (b)].

The overwhelming majority replied (76%) that there have not been specific measures taken that support the sustainable management of used fishing gear nor for lost fishing gear (Fig. 7) and the mostly indirect legal provisions that do exist are hardly enforced. However, there were some few exceptions mentioned and some new initiatives were also mentioned that are being piloted or in the making, linked mostly with measures taken or projects implemented to support the sustainability of the fishing sector (e.g. Morocco, Tunisia and Turkey) or in the framework of a coastal management scheme (*Ports bleus*-Algeria, MEDPOL Coastal Litter Management-Lebanon). The latter type of efforts may potentially also contribute to minimizing some of the land-based sources of marine litter as well as the contribution of the fishing sector to marine litter and also to the occurrence of ghost nets.

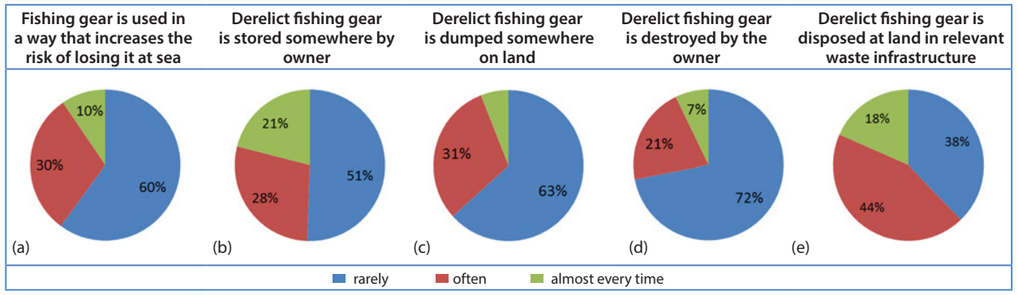


Figure 5: *Respondents assessment of the occurrence of the following practices within the fishing community regarding the usage and disposal of fishing gear: (a) Fishing gear is used in a way that increases the risk of losing it at sea; (b) Derelict fishing gear is stored somewhere by owner; (c) Derelict fishing gear is dumped somewhere on land (illegal dumpsite); (d) Derelict fishing gear is destroyed by the owner (burned?); (e) Derelict fishing gear is disposed at land in relevant waste infrastructure.*

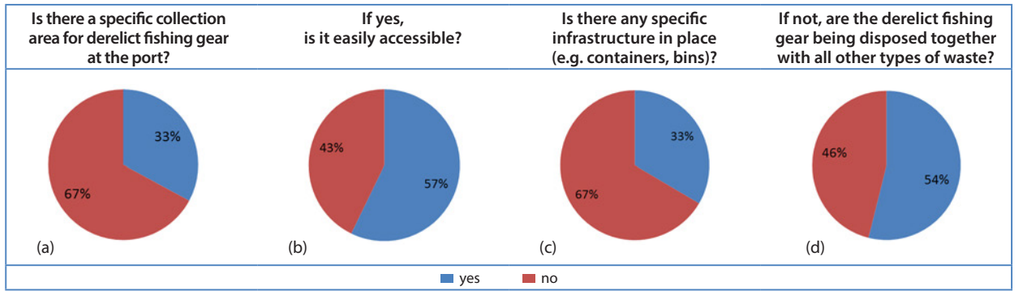


Figure 6: *Respondents replies related to disposal schemes in place: (a) Is there a specific collection area for derelict fishing gear at the port?; (b) If yes, is it easily accessible?; (c) Is there any specific infrastructure in place (e.g. containers, bins)?; (d) If not, are the derelict fishing gear being disposed together with all other types of waste?*

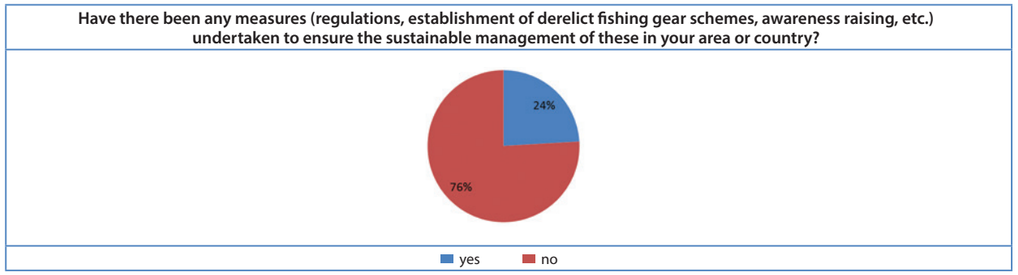


Figure 7: *Respondents replies related to whether specific measures have been taken that support the sustainable management of used, discarded or lost fishing gear.*

© Thomais Vlachogianni/MIO-ECSDE

Information related to ghost nets

The perception of whether ghost nets are a problem or not, varies from country to country, and port to port depending (a) on the level of awareness on the issue of derelict fishing gear as part of the overall marine litter problem and its implications on biodiversity and fisheries, (b) the actual scale of the problem. For example on the Atlantic side of Morocco, the interviewees felt that ghost nets are a significant problem and an increasing one at that (16.600 meters lost per year from the 36.000 used). On the Mediterranean side, it was not considered a serious problem probably because of the fewer meters used, disposed and lost. In Albania and Algeria, the problem is considered insignificant by the fishermen in terms of implications on marine biodiversity potentially due to the considerably low level of exposure to relevant information and education. It was however clear from the survey results that a little over half of the interviewees were in a position to identify areas where ghost nets tend to accumulate and they admit that it is a growing problem (Fig. 8).

Overall, 71% of the respondents considered the issue of ghost nets as a serious (42%) or moderate (29%) problem. Almost half of them (47%) felt that this is a growing problem, while 38% claimed that there is no noticeable trend. 15% thought that the problem is actually diminishing.

Similarly to the occurrence related perceptions, some 41% of the respondents considered the impacts of ghost nets as a serious problem, while some 30% felt that this is not a problem at all (Fig. 9).

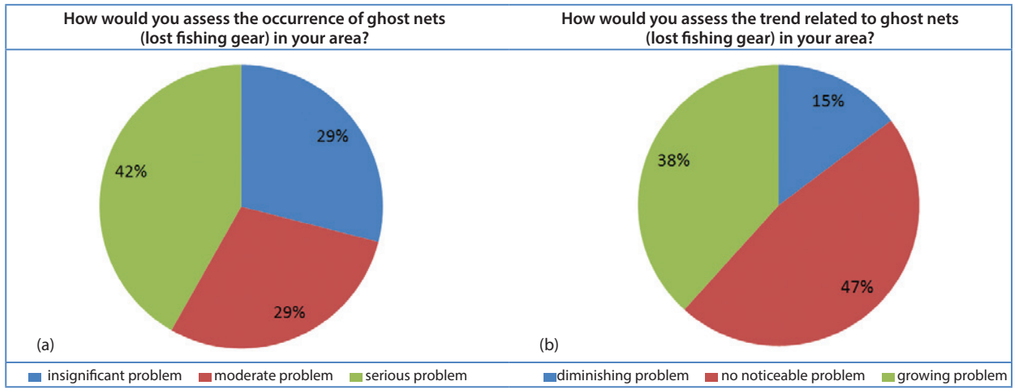


Figure 8: *Respondents perception of (a) whether ghost nets are a problem or not; (b) whether there is an associated trend.*

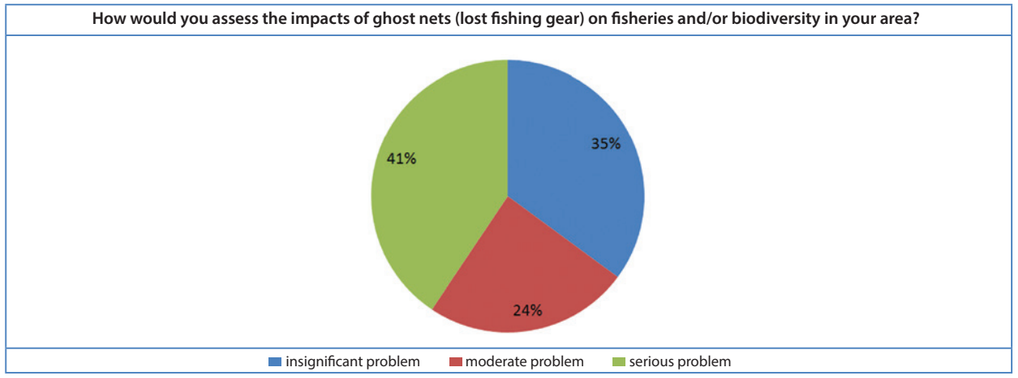


Figure 9: *Respondents perception of the impacts.*

Information related to marine litter found at sea

On an aggregated level, the sea-based economic sector targeted by this study is of the opinion that roughly 34% of marine litter (in terms of number of items) originates from sea-based sources and 66% from land based sources [Fig. 10 (a)]. Interviewees in some countries (e.g. those with rivers feeding solid and other waste into the sea, or those with difficulties in supporting proper waste management systems, etc.) were of the opinion that the vast majority of the input of litter into the sea is land-based (e.g. Albania: 95%; Turkey: 81%, Syria: 81%)[Fig. 10 (b)].

Only 9% of the participants felt that marine litter is an insignificant problem, while the big majority felt that this is serious problem (62%) or a moderate problem (29%) [Fig. 11 (a)]. 16% were of the opinion that it is a diminishing problem, while the rest felt it is a growing problem (64%) or a stable one (25%) [Fig. 11 (b)]. 47% were in a position to say that they do observe areas where marine litter tends to accumulate.

When asked of their experienced-based assessment on the percentage that the various types of marine litter represent in terms of numbers of items, plastic/polystyrene ranked highest (42%) followed by metal (16%), processed wood (11%), cloth (10%), glass and rubber (8%) and paper/cardboard (5%) (Fig. 12).

As to marine litter getting caught in hauls/nets, occurrence seems to vary. A little less than half of the respondents (48%) replied that they never (13%) or rarely (35%) experience such a problem while the rest 52% do experience problems often or almost every time (Fig. 13).

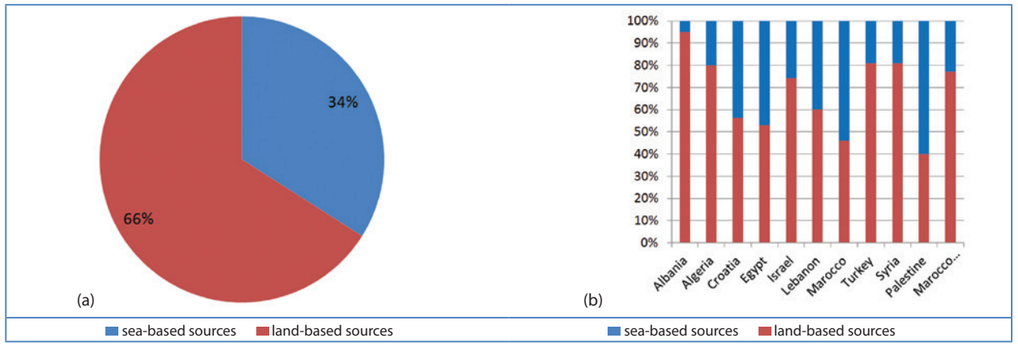


Figure 10: *Respondents perception of the sources (a) overall results; (b) results per country.*

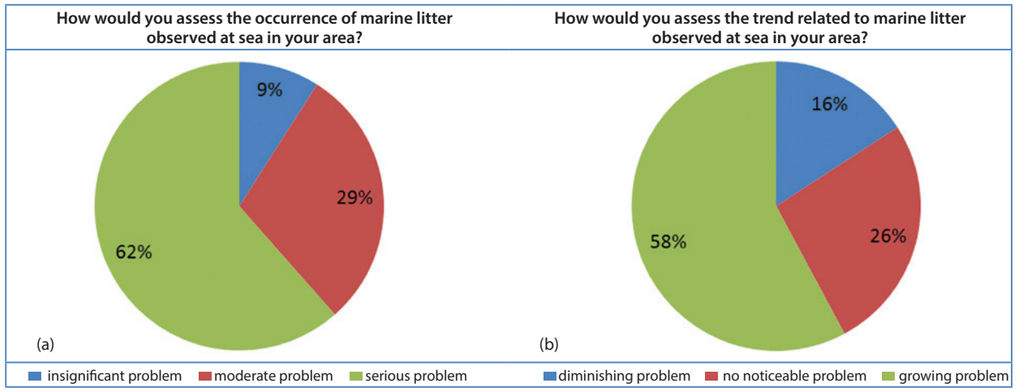


Figure 11: *Respondents perception of the (a) occurrence of marine litter observed at sea; (b) trend related to marine litter observed at sea.*

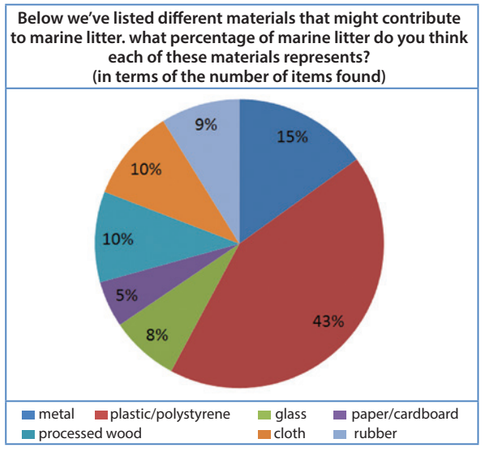


Figure 12: *Respondents perception the percentage that the various types of marine litter represent in terms of numbers of items*

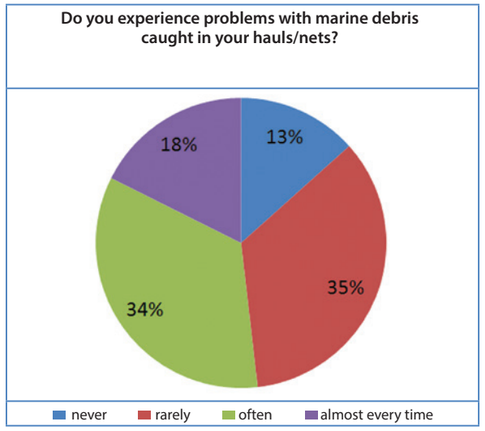


Figure 13: *Respondents experiences with marine debris problems caught in their hauls/nets.*

Each of the participants was asked to assess the frequency with which 10 specific items of marine litter are caught in their hauls/nets. Plastic bags (47%) and plastic bottles (29%) are most frequently caught every time, followed by food packaging/wrappers (38%). (Fig. 14)

A little over half (55%) of the respondents claim to have waste bins on board, 36% of which sort it on board as well. From the other half that does not have bins on board, some 38% admit to throwing litter back overboard (Fig. 15).

Waste collection facilities back at ports exist in 65% of the cases, with 40% complaining that they are sub standard and not satisfied with them. Accessibility is an issue as well, with almost a third saying that they are not easily accessible (Fig. 16).

When asked about their opinion about the 'fishing for litter' measure (the practice whereby fishermen collect marine litter caught in their nets at sea and dispose it in waste collection infrastructure at the port upon return, instead of throwing it back into the sea) only 2% said that they would not support or participate in such a measure.

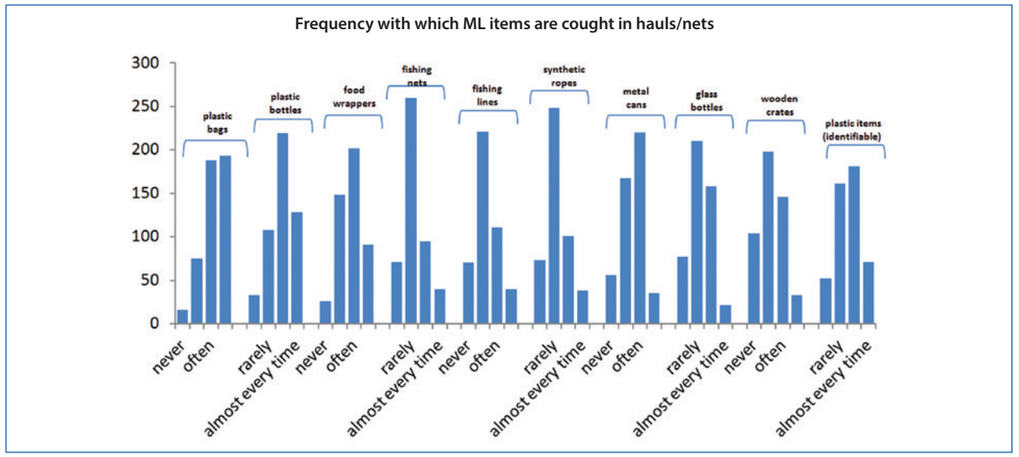


Figure 14: *Respondents' assessment of the frequency with which 10 specific items of marine litter are caught in their hauls/nets.*

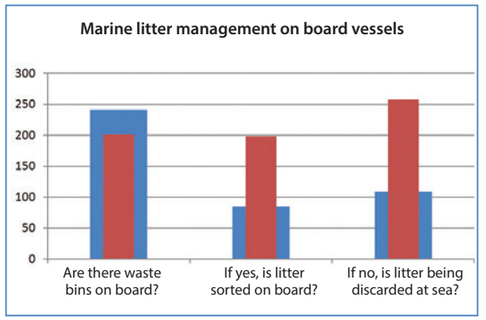


Figure 15: *Respondents' claims related to marine litter management on board vessels.*

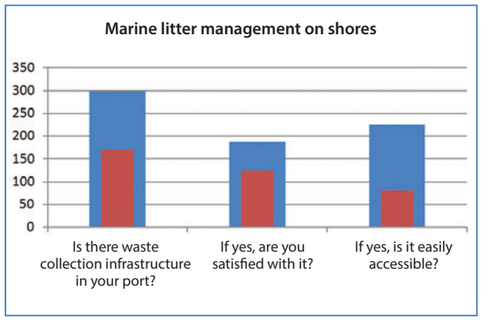


Figure 16: *Respondents' claims related to marine litter management on shores.*

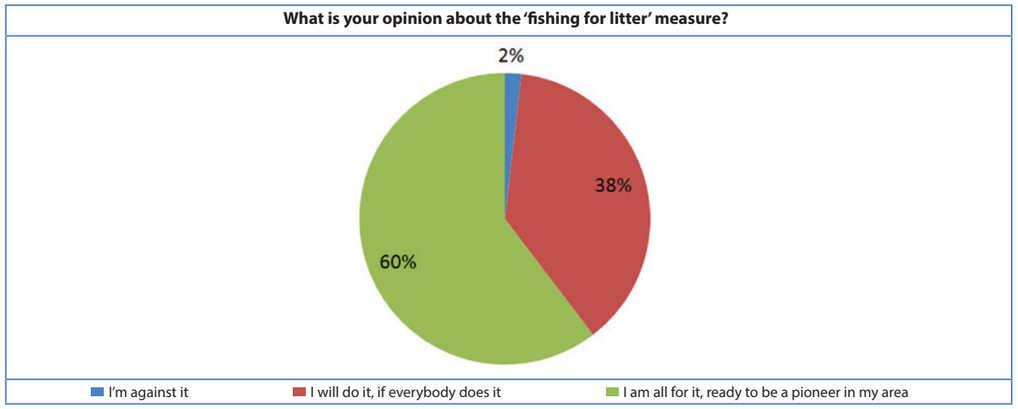
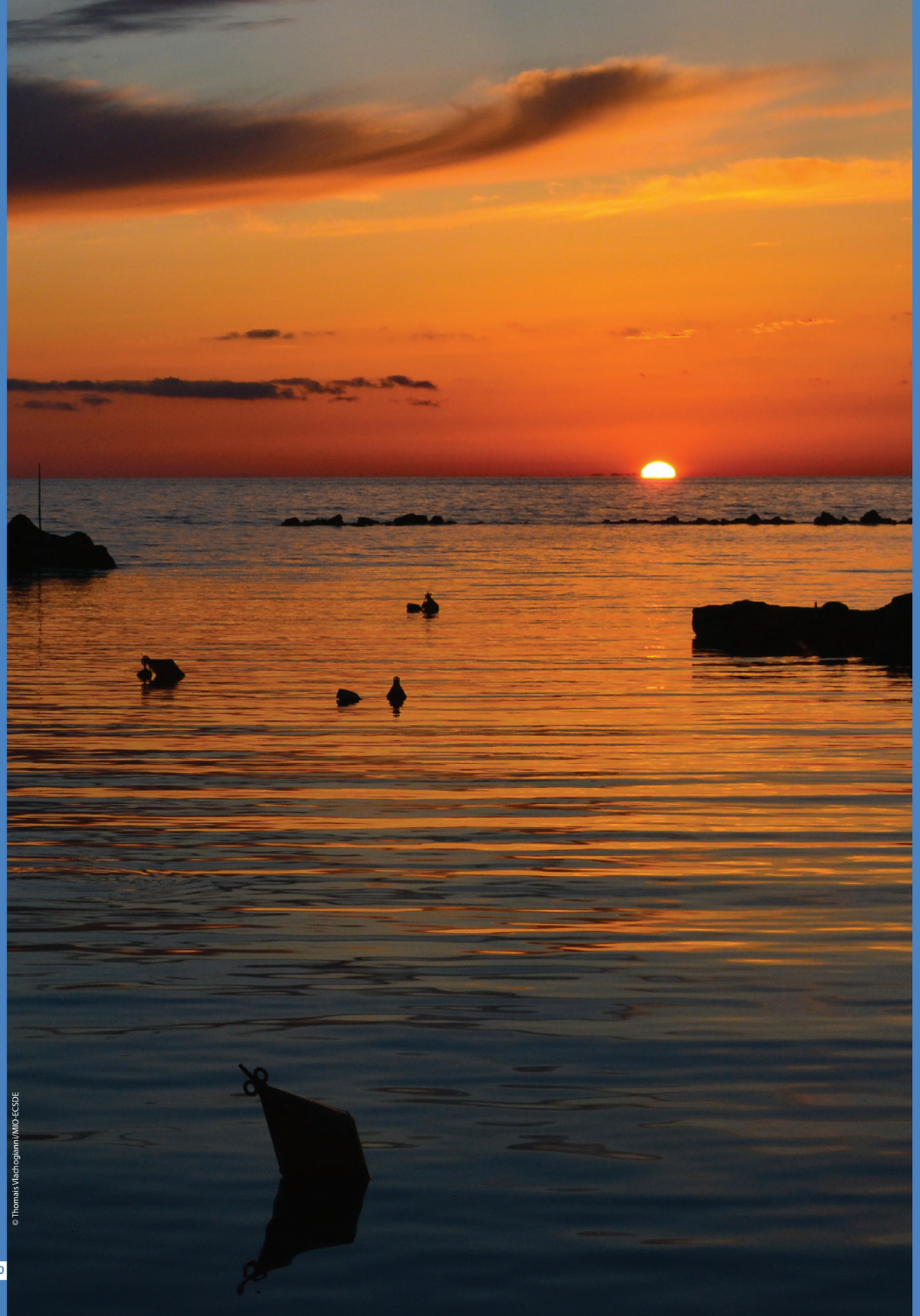


Figure 17: *Respondents' intentions to engage themselves in the fishing for litter measure.*



© Thomais Vlachogianni/MIO-ECSDE

ABBREVIATIONS AND ACRONYMS

AEB:	Association Ecologique de Boumerdès
AGIR:	Association de Gestion Intégrée des Ressources
ALDFG:	Abandoned, lost, discarded fishing gear
AOYE:	Arab Office for Youth & Environment
CMED:	Moroccan Club for Environment & Development
DFG:	Discarded fishing gear
DeFishGear:	Derelict Fishing Gear Management System in the Adriatic Region
EC:	European Commission
EcAp:	Ecosystem Approach
ECAT:	Environmental Center for Administration & Technology
EU:	European Union
FfL:	Fishing for Litter
GEF:	Global Environment Facility
GES:	Good Environmental Status
HCMR:	Hellenic Centre for Marine Research
IPA:	Instrument for Pre-accession Assistance
ISPRA:	Italian National Institute for Environmental Protection and Research
LBS:	Land-Based Sources
MAP:	Mediterranean Action Plan
MED:	Mediterranean
MedPAN:	Mediterranean Protected Area Network
MEDPOL:	Mediterranean Pollution Monitoring Programme
MIO-ECSDE:	Mediterranean Information Office for Environment, Culture and Sustainable Development
NGO:	Non-Governmental Organisation
NOAA:	National Oceanic and Atmospheric Administration
OBBA:	Operation Big Blue Association
RAED:	Arab Network for Environment and Development
SCSEP:	Syrian Coast Society for Environmental Protection
TURMEPA:	Turkish Marine Environment Protection Association
UNEP:	United Nations Environment Programme
WWF MEDPO:	WWF Mediterranean Programme

© Thomais Vlachogianni/MIO-ECSDE

REFERENCES

Arthur C, Sutton-Grier AE, Murphy P, Bamford H. Out of sight but not out of mind: Harmful effects of derelict traps in selected U.S. coastal waters. Marine Pollution Bulletin, 86: 19–28, 2014.

Baeta F, Costa MJ, Cabral H. Trammel nets' ghost fishing off the Portuguese central coast. Fisheries Research, 98: 33–39, 2009.

Bo M, Bava S, Canese S, Angiolillo M, Cattaneo-Vietti R, Bavestrello G. Fishing impact on deep Mediterranean rocky habitats as revealed by ROV investigation. Biological Conservation, 171: 167–176, 2014.

Brown J, Macfadyen G. Ghost fishing in European waters: Impacts and management responses. Marine Policy, 31: 488–504, 2007.

Chaves P, Silveira B. Working to reduce loss of gears in Brazilian fisheries. IN Abstracts. Fishery Dependent Information 2014. Food and Agriculture Organization of the United Nations and International Council for the Exploration of the Seas, Rome and Copenhagen, 2014.

FAO. International Guidelines on Bycatch Management and Reduction of Discards. Directives Internationales sur la Gestion des Prises Accessoires et la Réduction des Rejets en Mar. Directrices Internationales para la Ordenación de las Capturas Incidentales y la Reducción de los Descartes, Food and Agriculture Organization of the United Nations, Rome , pp. 73, 2011.

Gilman E. Status of international monitoring and management of abandoned, lost and discarded fishing gear and ghost fishing. Marine Policy, 60: 225–239, 2015.

Good TP, June JA, Etnier MA, Broadhurst G. Derelict fishing nets in puget sound and the northwest straits: Patterns and threats to marine fauna. Marine Pollution Bulletin, 60: 39–50, 2010.

Ioakeimidis C, Zeri C, Kaberi E, Galatchi M, Antoniadis K, Streftaris N, Galgani F, Papathanassiou E, Papatheodorou G. A comparative study of marine litter on the seafloor of coastal areas in the Eastern Mediterranean and Black Seas. Marine Pollution Bulletin, 89: 296–30, 2014.

Kühn S, Bravo Rebolledo EL, van Franeker JA. Deleterious Effects of Litter on Marine Life. In "Marine Anthropogenic Litter", Editors: Bergmann M, Gutow L, Klages M, Springer Open, pp. 76-80, 2015.

Macfadyen G, Huntington T, Cappell R. Abandoned, lost or otherwise discarded fishing gear. UNEP Regional Seas Reports and Studies, No. 185; FAO Fisheries and Aquaculture Technical Paper, No. 523. Rome, 2009.

MacMullen P, et al. A Study to Identify, Quantify and Ameliorate the Impacts of Static Gear Lost at Sea. FANTARED 2, 2003.

Matthews TR, Glazer RA. Assessing Opinions on Abandoned, Lost, or Discarded Fishing Gear in the Caribbean. GCFI, 62 2010.

McElwee K, Donohue MJ, Courtney CA, Morishige C, Rivera-Vicente A. A strategy for detecting derelict fishing gear at sea. Marine Pollution Bulletin, 65: 7–15, 2012.

Newman SJ, Skepper CL, Mitsopoulos GEA, Wakefield CB, Meeuwig JJ, Harvey ES. Assessment of the potential impacts of trap usage and ghost fishing on the northern demersal scalefish fishery. Reviews in Fisheries Science, 19: 74–84, 2011.

NOAA Marine Debris Program. 2015 Report on the impacts of "ghost fishing" via derelict fishing gear. Silver Spring, MD, 2015.

Scheld AM, Bilkovic DM, Havens KJ. The Dilemma of Derelict Gear. Scientific Reports 6: 19671, 2016.

Tubau X, Canals M, Lastras G, Rayo X, Rivera J, Amblas D. Marine litter on the floor of deep submarine canyons of the Northwestern Mediterranean Sea: The role of hydrodynamic processes. Progress in Oceanography, 134: 379–403, 2015.

UNEP Regional Seas Programme. Marine Litter and Abandoned Fishing Gear. Regional Seas Coordinating Office report to the Division of Ocean Affairs and the Law of the Sea, Office of Legal Affairs and Abandoned Fishing Gear, April 2005.

UNEP/MAP IG.21/9. Regional Plan on Marine Litter Management in the Mediterranean in the Framework of Article 15 of the Land Based Sources Protocol. UNEP(DEPI)/MED IG.21/9, ANNEX II – Thematic Decisions, pp.143-173.

UNEP/MAP-MEDOL. Guide on best practices for fishing for litter in the Mediterranean, 2015.

© Milica Mandic/IBM

ANNEX I

Survey on Marine Litter, Abandoned, Lost or Discarded Fishing Gear & Ghost Nets in the Mediterranean Sea

1. GENERAL INFORMATION

Interviewer's name	
Phone number	
e-mail	
Interviewee's name	
Profession	☐ Fisherman ☐ Sailor ☐ Skipper ☐ Other, specify :
Phone number	
e-mail	
Location name	
Country	
Date (dd/mm/yyyy)	

1.1 VESSEL CHARACTERISTICS & FISHING AREAS		
Vessel name		
Vessel port		
Vessel length (meters)		
Vessel tonnage (tonnes)		
Fishing area	☐ Within national waters NM (nautical miles): _____	☐ Outside national waters NM (nautical miles): _____

1.2 TYPE OF FISHING GEAR USED (INCLUDING VESSELS FOR AQUACULTURE)		
☐ Seines	☐ Trawls	☐ Working boats for aquaculture
☐ Longlines & hooks	☐ Gillnets and similar nets	☐ Other, please specify below
☐ Pots and traps	☐ Surrounding nets and lift nets	_____

1.3 NUMBER OF FISHING DAYS PER YEAR (of vessel)		
☐ <60	☐ 100-120	☐ 160-180
☐ 60-80	☐ 120-140	☐ 180-200
☐ 80-100	☐ 140-160	☐ >200

1.4 AVERAGE NUMBER OF FISHING HOURS PER DAY		
☐ <4	☐ 8-10	☐ 14-16
☐ 4-6	☐ 10-12	☐ 16-20
☐ 6-8	☐ 12-14	☐ >20

2. INFORMATION RELATED TO DERELICT FISHING GEAR

2.1 ESTIMATES OF TYPES AND AMOUNTS OF FISHING GEAR USED THROUOUT THE YEAR

Types	Number	Meters	Types	Number	Meters
Seines			Trawls (net)		
Pots and traps			Trawls (cod end)		
Gillnets and similar nets			Surrounding nets and lift nets		
Longlines & hooks			Working boats for aquaculture		
Other, specify_____			Other, specify_____		

2.2 ESTIMATES OF TYPES AND AMOUNTS OF FISHING GEAR DISPOSED OF THROUOUT THE YEAR

Types	Number	Meters	Types	Number	Meters
Seines			Trawls (net)		
Pots and traps			Trawls (cod end)		
Gillnets and similar nets			Surrounding nets and lift nets		
Longlines & hooks			Working boats for aquaculture		
Other, specify_____			Other, specify_____		

2.3 ESTIMATES OF QUANTITIES OF FISHING GEAR DISPOSED THROUOUT THE YEAR BY WEIGHT(Kg/y)

Metal (e.g. cables, chains, trawl doors, etc.)	
Plastic (e.g. cables, traps, buoys, mussel-culture socks, rope, etc.)	
Nets	
Other, specify _____	

2.4 HOW WOULD YOU ASSESS THE OCCURRENCE OF THE FOLLOWING PRACTICES WITHIN THE FISHING COMMUNITY REGARDING THE USAGE AND DISPOSAL OF FISHING GEAR?

Fishing gear is used in a way that increases the risk of losing it at sea	☐ rarely	☐ often	☐ almost every time
Derelict fishing gear is stored somewhere by owner	☐ rarely	☐ often	☐ almost every time
Derelict fishing gear is dumped somewhere on land (illegal dumpsite)	☐ rarely	☐ often	☐ almost every time
Derelict fishing gear is destroyed by the owner (burned?)	☐ rarely	☐ often	☐ almost every time
Derelict fishing gear is disposed at land in relevant waste infrastructure	☐ rarely	☐ often	☐ almost every time
Other, specify_____	☐ rarely	☐ often	☐ almost every time

2.5 DISPOSAL SCHEMES IN PLACE

Is there a specific collection area for derelict fishing gear at the port?	☐ Yes ☐ No
If yes, is it easily accessible?	☐ Yes ☐ No
Is there any specific infrastructure in place (e.g. containers, bins)?	☐ Yes ☐ No
If not, are the derelict fishing gear being disposed together with all other types of waste?	☐ Yes ☐ No
Other, specify	

2.6 HAVE THERE BEEN ANY MEASURES (REGULATIONS, ESTABLISHMENT OF DERELICT FISHING GEAR SCHEMES, AWARENESS RAISING, ETC.) UNDERTAKEN TO ENSURE THE SUSTAINABLE MANAGEMENT OF THESE IN YOUR AREA or COUNTRY?

☐ Yes ☐ No If yes, please list below these measures

3. INFORMATION RELATED TO GHOST NETS (LOST FISHING NETS)

3.1 HOW WOULD YOU ASSESS THE OCCURRENCE OF GHOST NETS (LOST FISHING GEAR) IN YOUR AREA?

☐ insignificant problem	☐ moderate problem	☐ serious problem

3.2 HOW WOULD YOU ASSESS THE *TREND* RELATED TO GHOST NETS (LOST FISHING GEAR) IN YOUR AREA?

☐ diminishing problem	☐ no noticeable trend	☐ growing problem

3.3 HOW WOULD YOU ASSESS THE IMPACTS OF GHOST NETS (LOST FISHING GEAR) ON FISHERIES AND/OR BIODIVERSITY IN YOUR AREA?

☐ insignificant problem	☐ moderate problem	☐ serious problem
	In case it is a moderate or serious problem, can you specify which species are the ones most affected? (name them)	

3.4 WHICH TYPE OF FISHING GEAR DO YOU OBSERVE BEING LOST AT SEA IN YOUR AREA?

☐ Seines	☐ Trawls	☐ Working boats for aquaculture
☐ Longlines & hooks	☐ Gillnets and similar nets	☐ Other, please specify below
☐ Pots and traps	☐ Surrounding nets and lift nets	_____

3.5 ESTIMATES OF TYPES AND AMOUNTS OF FISHING GEAR YOU LOSE AT SEA THROUOUT THE YEAR

Types	Number	Meters	Types	Number	Meters
Seines			Trawls (net)		
Pots and traps			Trawls (cod end)		
Gillnets and similar nets			Surrounding nets and lift nets		
Longlines & hooks			Working boats for aquaculture		
Other, specify_____			Other, specify_____		

3.6 HAVE YOU OBSERVED ANY AREAS WHERE GHOST NETS ACCUMULATE?

☐ Yes ☐ No If yes, list these areas below

Area (name and coverage in m²)	Depth (m)	Distance from the coast (km)	Latitude (if possible)	Longitude (if possible)

3.7 HAVE MEASURES (REGULATIONS, CLEANUP OPERATIONS, ETC.) BEEN TAKEN TO MITIGATE GHOST FISHING IN YOUR AREA OR COUNTRY?

☐ Yes ☐ No If yes, list these areas below

4. INFORMATION RELATED TO MARINE LITTER FOUND AT SEA

4.1 HOW WOULD YOU ASSESS *THE OCCURRENCE* OF MARINE LITTER OBSERVED AT SEA IN YOUR AREA?

☐ insignificant problem	☐ moderate problem	☐ serious problem

4.2 HOW WOULD YOU ASSESS *THE TREND* RELATED TO MARINE LITTER OBSERVED AT SEA IN YOUR AREA?

☐ diminishing problem	☐ no noticeable trend	☐ growing problem

4.3 HAVE YOU OBSERVED AREAS WHERE MARINE LITTER TENDS TO ACCUMULATE AT SEA?

☐ Yes ☐ No If yes, list below these areas

Area (name and coverage in m2)	Depth (m)	Distance from the coast (km)	Latitude (if possible)	Longitude (if possible)

4.4 DO YOU EXPERIENCE PROBLEMS WITH MARINE DEBRIS CAUGHT IN YOUR HAULS/NETS?

☐ never	☐ rarely	☐ often	☐ almost every time

4.5 LITTER. WHAT PERCENTAGE OF MARINE LITTER DO YOU THINK EACH OF THESE MATERIALS REPRESENTS? (IN TERMS OF THE NUMBER OF ITEMS FOUND)
Please mark your estimates along the % scales. Your estimate for all the materials listed should add up to 100 %.

Metal
0 10 20 30 40 50 60 70 80 90 100
|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|

Plastic/polystyrene
0 10 20 30 40 50 60 70 80 90 100
|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|

Glass
0 10 20 30 40 50 60 70 80 90 100
|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|

Paper/cardboard
0 10 20 30 40 50 60 70 80 90 100
|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|

Processed wood
0 10 20 30 40 50 60 70 80 90 100
|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|

Cloth
0 10 20 30 40 50 60 70 80 90 100
|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|

Rubber
0 10 20 30 40 50 60 70 80 90 100
|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|

4.6 BELOW WE'VE LISTED THE TOP 10 ITEMS OF MARINE LITTER FOUND IN THE MEDITERRANEAN. PLEASE ASSESS THE FREQUENCY WITH WHICH THESE ARE CAUGHT IN YOUR HAULS/NETS.				
Plastic bags	☐ never	☐ rarely	☐ often	☐ almost every time
Plastic bottles	☐ never	☐ rarely	☐ often	☐ almost every time
Food wrappers	☐ never	☐ rarely	☐ often	☐ almost every time
Fishing nets	☐ never	☐ rarely	☐ often	☐ almost every time
Fishing lines	☐ never	☐ rarely	☐ often	☐ almost every time
Synthetic ropes	☐ never	☐ rarely	☐ often	☐ almost every time
Metal cans	☐ never	☐ rarely	☐ often	☐ almost every time
Glass bottles	☐ never	☐ rarely	☐ often	☐ almost every time
Wooden crates	☐ never	☐ rarely	☐ often	☐ almost every time
Plastic items (identifiable)	☐ never	☐ rarely	☐ often	☐ almost every time
Other, specify_____	☐ never	☐ rarely	☐ often	☐ almost every time

4.7 MARINE LITTER ORIGINATES FROM LAND-BASED OR SEA BASED SOURCES. IN YOUR OPINION, IN YOUR AREA WHAT PERCENTAGE OF MARINE LITTER COMES FROM LAND-BASED OR SEA BASED SOURCES? (IN TERMS OF THE NUMBER OF ITEMS FOUND)
Please mark your estimates along the % scales. Your estimate for the two sources listed should add up to 100 %.

Land-based sources

0 10 20 30 40 50 60 70 80 90 100
|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|

Sea-based sources

0 10 20 30 40 50 60 70 80 90 100
|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|

4.8 MARINE LITTER MANAGEMENT ON BOARD VESSELS	
Are there waste bins on board?	☐ Yes ☐ No
If yes, is litter sorted on board?	☐ Yes ☐ No
If no, is litter being discarded at sea?	☐ Yes ☐ No
Other, specify	

4.9 MARINE LITTER MANAGEMENT ON SHORE	
Is there waste collection infrastructure in your port?	☐ Yes ☐ No
If yes, are you satisfied with it?	☐ Yes ☐ No
If yes, is it easily accessible?	☐ Yes ☐ No
Other, specify	

4.10 WHAT IS YOUR OPINION ABOUT THE 'FISHING FOR LITTER' MEASURE? IT IS THE PRACTICE WHEREBY FISHERMEN COLLECT MARINE LITTER CAUGHT IN THEIR NETS AT SEA AND DISPOSE IT IN WASTE COLLECTION INFRASTRUCTURE AT THE PORT UPON RETURN, INSTEAD OF THROWING IT BACK INTO THE SEA.		
I am against it	I will do it, if everybody does it	I am all for it, ready to be a pioneer in my area

ANNEX II

Country	Areas	Partner	Category	Contact person	Email
Albania	Vlora, Durresi, Saranda, Lushnje-Fier, Shengjin	ECAT	NGO	Marieta Mima	ecat@ecat-tirana.org, mima@ecat-tirana.org
Algeria	Zemmouri, Djinet, Dellys	Association Ecologique de Boumerdès (AEB)	NGO	Riad Naser Bendaoud	Aeb_boum@hotmail.com, rmb_algerie@yahoo.fr
	Taza National Park	MedPAN South Project (WWF MEDPO)	NGO	Mauro Randone	mrandone@wwfmedpo.org
Croatia	Komiža, Umag, Zadar, Poreč, Split, Hvar island, Banjole, Sali, Vela Luka, Sreser, Lošinj, Novalja, Vinišće, Pula, Kali, Podgora, Lastovo, Tribunj, Biograd na moru, Savudrija, Senj, Bol, Primošten, Rijeka, Zaglav	Sunce	NGO	Mosor Prvan	mosor.prvan@sunce-st.org
Egypt	North Sinai (Areesh, Bear Al Abd - Bardaweel Lake, El Kherba village), Shakshouk lake	Arab Network for Environment and Development (RAED)	NGO	Essam Nada	enada2002@yahoo.com, e.nada@aoye.org
Israel	Various locations along the 190km long coast of Israel	EcoOcean	NGO	Asaf Ariel	asaf@ecoocean.com
Lebanon	Alsarafand, Manara Rass Beirut, Saida, Bebnin, Ouzai, Tyre, Alnakora and Tripoli	Operation Big Blue Association (OBBA)	NGO	Iffat Edriss	president@operationbigblue.org, info@operationbigblue.org
Morocco	Tangiers, Mehdia (Atlantic)	Moroccan Club for Environment & Development (CMED)	NGO	Mohamed Ftouhi	cmepe2000@yahoo.fr
	Alhoceima (Mediterranean)	AGIR	NGO	Houssine Nibani	agirnibani@gmail.com
Palestine (Gaza)	Gaza and surrounding area	Mahmoud Ibrahim Alsheikh Eld	Consultant		mahmoudeid85@hotmail.com
Syria	Lattakia and surrounding area	Syrian Coast Society for Environmental Protection (SCSEP)	NGO	Suheir Raies	dr.suheirraies@gmail.com
Tunisia	Kelibia	Association de l'Environnement de Kelibia	NGO	Wahid Jenhani	wahid.jenhani@gmail.com
Turkey	Marmara Bay, Bodrum, Fethiye, İzmir	Turkish Marine Environment Protection Association (TURMEPA)	NGO	Şeyda Dağdeviren	info@turmepa.org.tr, seydad@turmepa.org.tr

REGIONAL SURVEY ON ABANDONED, LOST OR DISCARDED FISHING GEAR & GHOST NETS IN THE MEDITERRANEAN SEA

United Nations Environment Programme
Coordinating Unit for the Mediterranean Action Plan
Barcelona Convention Secretariat

Vassileos Konstantinou 48, Athens 11635, Greece
Tel.: +30 210 7273100 - Fax: +30 210 7253196
www.unepmap.org