

Final report on FfL Activities

WP4 – Activity 4.2 – Fishing for litter catches:
composition and quantities definition

DELIVERABLE D4.2.3.

Partner in Charge: PP2

Partners involved: All

Status: Final Version

Distribution: Public

Date: December 2019

ML-Repair Reducing and preventing, an integrated Approach to Marine
Litter Management in the Adriatic Sea – Axis 3 – SO 3.3

SUMMARY

1	PROJECT PRESENTATION	1
1.1	Project description.....	1
1.2	Marine litter problem	1
1.3	WP 4 - Supporting the Implementation of Fishing for Litter activities.....	2
2	ACTIVITY 4.2 - Fishing for litter catches: composition and quantities definition	2
2.1.1	Ports and vessels involved	3
2.1.2	Duration of the initiatives	6
2.1.3	Material provided by the project.....	6
2.2	PREPARATION PHASE.....	10
2.2.1	Chioggia.....	10
2.2.2	Cesenatico, Cattolica and Molfetta.....	11
2.2.3	Croatian ports Tribunj, Vira, Brižine, Rogoznica, Vinišće, Vela Luka, Supetar, Santa Marina Sustjepan-Čajkovići	14
2.3	DATA COLLECTION	22
2.3.1	Data collection methodology.....	22
3	RESULTS	26
3.1	Achieved results.....	26
4	BIBLIOGRAPHY	28

1 PROJECT PRESENTATION

1.1 Project description

The ML-REPAIR project (REducing and Preventing, an Integrated Approach to Marine Litter Management in the Adriatic Sea) started on 01.01.2018 and lasted 21 months, ending on 30 September 2019. The general objective of the ML – REPAIR project was to prevent and reduce the input of waste in the Adriatic Sea through the involvement of the main stakeholders. The Adriatic Sea is a semi-closed basin with slow streams, making it vulnerable to pollution. Marine Litter (ML) is defined as any solid, manufactured or processed solid material discarded, disposed of or abandoned into the marine and coastal environment. It is a growing cause of concern for the degradation of the marine and coastal ecosystems, potentially endangering the functionality of the ecosystem itself and reducing the quality of coastal waters for fishing and tourism. Sea cross-border issues due to their cross-border effects require common approaches from different countries and their joint efforts. Within the ML-REPAIR project, activities have been carried out in Croatia and Italy, and the main focus of the project was to involve the target groups – fishermen and fishing associations/cooperatives, local communities and the younger population, the tourism sector, public administration bodies and the FLAG – (Fisheries Local Action Groups in Croatia and Italy) and LAGs (Local Action Groups). The project leader was Ca' Foscari University of Venice, and partners were the Italian National Institute for Environmental Protection and Research (ISPRA), the cooperatives M.A.R.E. and LIMOSA for Italy and the Institute of Oceanography and Fisheries (IZOR), Public Institution RERA S.D. for the coordination and development of the Split-Dalmatia County and the Association for Nature, Environment and Sustainable Development (Sunce), for Croatia.

1.2 Marine litter problem

Marine litter (ML) is defined as any persistent, manufactured or processed solid material discarded, disposed of or abandoned in the marine and coastal environment (Galgani et al., 2013). The Adriatic Sea is a semi-closed pool with slow streams, making it extremely vulnerable to pollution and marine litter. Marine Litter (ML) is a cause of major concern for the degradation of the marine and coastal ecosystems, since it can endanger the functionality of the ecosystems and reduce the quality of coastal waters, with negative effects on fishing and tourism.

There are numerous sources of ML but there are only a few effective solutions for its removal. According to UNEP (2009), nearly 70% of the waste coming from the land ends up laying on the seabed where it accumulates.

Plastics accumulate in the marine environment, ultimately degrading after several centuries or millennia in the water. This leads to the fragmentation of plastic debris due to synergistic effects into four main categories: macroplastics (≥ 1 cm), mesoplastics (≥ 5 mm to 1 cm), microplastics (≤ 5 mm) and nanoplastics

($\leq 100 \mu\text{m}$). The ingestion of plastic debris by invertebrates, fishes, seabirds, turtles, and mammals has been extensively proved; marine organisms may confuse plastics with food or indirectly ingest plastics through prey already contaminated (Anastasopoulou and Fortibuoni, 2019; Cincinelli et al., 2019).

1.3 WP 4 - Supporting the Implementation of Fishing for Litter activities

The Fishing for Litter (FFL) scheme is a clean-up activity that aims to remove marine litter from the seafloor: fishing vessels collect marine litter caught in their nets during fishing activities and dispose of it on the quayside. FFL initiatives, at the present time, are strongly recommended by International Organizations as UE, UNEP MAP (Decision IG.22/10 Implementing the Marine Litter Regional Plan in the Mediterranean), as a key activity to remove marine litter from the sea by involving and sensitizing fishermen, the main stakeholders of the sector. Despite the increasing number of directives and strategies to address marine litter and the extensive public interest and media coverage, barriers to implementing the FFL scheme in the Adriatic-Ionian macroregion are still in place (Ronchi et al., 2019). One of the aims of the WP4 was to facilitate the implementation of FFL schemes by creating useful tools for decision-makers, in order for them to promote a National strategy for FFL implementation. In particular, the WP aimed to verify and clarify needs and concerns of the full implementation of the FFL in the two countries and to improve the available data on quantities and composition of marine litter and ALDFG (Abandoned, Lost or otherwise Discarded Fishing Gears) both on the seafloor and in vulnerable N2000 sites. As several participative projects (DeFishGear, GAP1, GAP2) clearly demonstrated, the interaction between scientists and fisheries stakeholders is a key tool for the success of every initiative concerning the marine environment. WP4 engaged fishermen in monitoring and collecting ML also experimenting innovative and “smart” and innovative tools (e.g. an application for tablet or smartphone).

Cooperative M.A.R.E. (PP2) was responsible for the work package 4, which was composed of three activities:

- 4.1 Fishing for Litter Implementation Status Map.
- 4.2 Fishing for litter catches: composition and quantities definition.
- 4.3 Monitoring of ALDFG and ML affecting Natura 2000 sites.

M.A.R.E. was the leader of the activity 4.2.; ISPRA (PP1) and IZOR (PP4) participated in the activity.

2 ACTIVITY 4.2 - Fishing for litter catches: composition and quantities definition

The fisheries sector can make a significant contribution to mitigating the problem of the ML laying on the seafloor, by participating in their removal through the "Fishing for Litter" (FfL) initiative.

This report presents the experiences and achievements of the ML-REPAIR project; one of the project goals was to design new strategies to reduce ML in the Adriatic Sea. The results achieved during the project could be used to further promote activities related to the collection and the disposal of the ML accumulated on the sea bottom in the Adriatic Sea. Project activities were conceived through the cross-border cooperation of partners from the INTERREG ITA-CRO dealing with the problem of marine litter removing by involving the fisheries sector.

Indeed, the aim of the activity 4.2 was to foster the collaboration with the fishery sector - started within the DeFishGear project - by involving a greater number of ports and vessels in the implementation of the FFL scheme in Italy and Croatia.

In particular, the project aimed at:

- solving some of the issues already encountered in DeFishGear project for ML collection;
- clarifying legislative boundaries and improving the collaboration with local and national authorities on the issue;
- collecting data on the distribution and quantities of ML;
- increase the number of fishermen involved and sensitized about the ML issue.

2.1.1 Ports and vessels involved

The ports involved in the activity in Italy were Chioggia (VE), Cesenatico (FC), Cattolica (RI) and Molfetta (BA). Fishing vessels participating were 7 in Cesenatico, 6 in Chioggia, 1 in Cattolica and 9 in Molfetta, reaching a total number of 23 fishing vessels actively participating to the activity in Italy (Fig. 1).

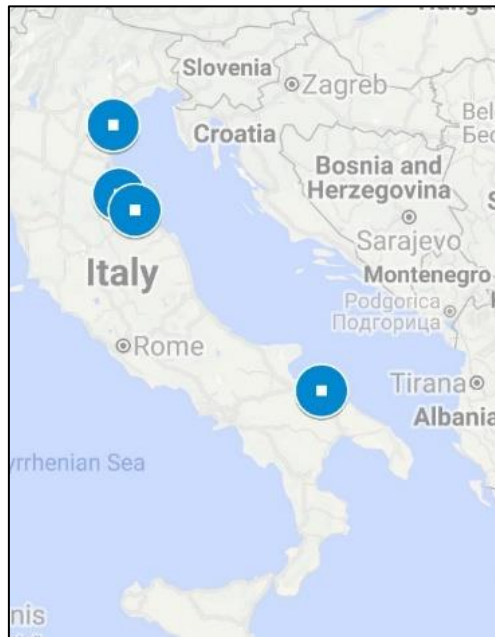


Fig. 1. Fishing ports involved in FFL activities in Italy: Chioggia, Cesenatico, Cattolica, Molfetta

In Croatia, 9 fishermen's ports and/or landing sites were involved thanks to an agreement with port administrations and local governments: Santa Marina, Tribunj, Rogoznica, Vinišće, Brižine in Kaštel Sućurac Split, Supetar on the island Brač, Vira on the island of Hvar, Vela Luka on the island of Korčula and Sustjepan/Čajkovići near Dubrovnik (Fig. 2). A total of 37 boats with 120 fishermen have been involved in the activities in Croatia.

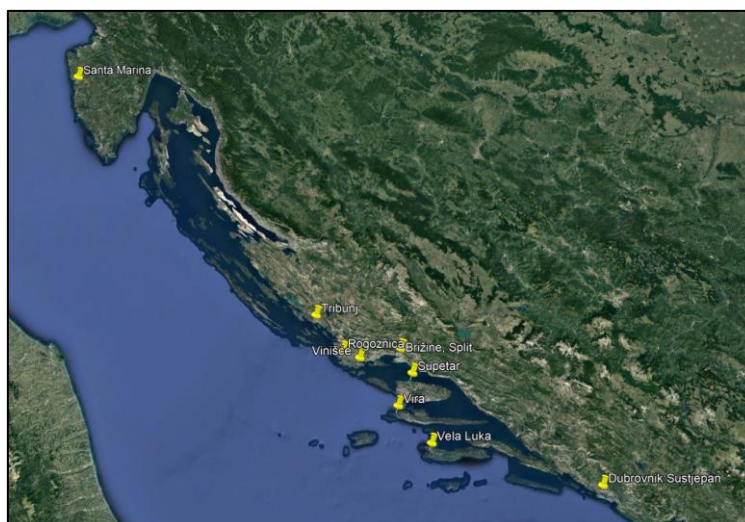


Fig. 2. Fishing ports involved in FFL activities in Croatia: Santa Marina, Tribunj, Rogoznica, Vinišće, Brižine, Supetar, Vira, Vela Luka, Čajkovići.

All the ports involved in both countries were equipped with containers where the fishermen could unload the ML collect at sea (Fig. 3 and 4).



Fig.3. Communal containers placement in the Croatian port of Vinišće

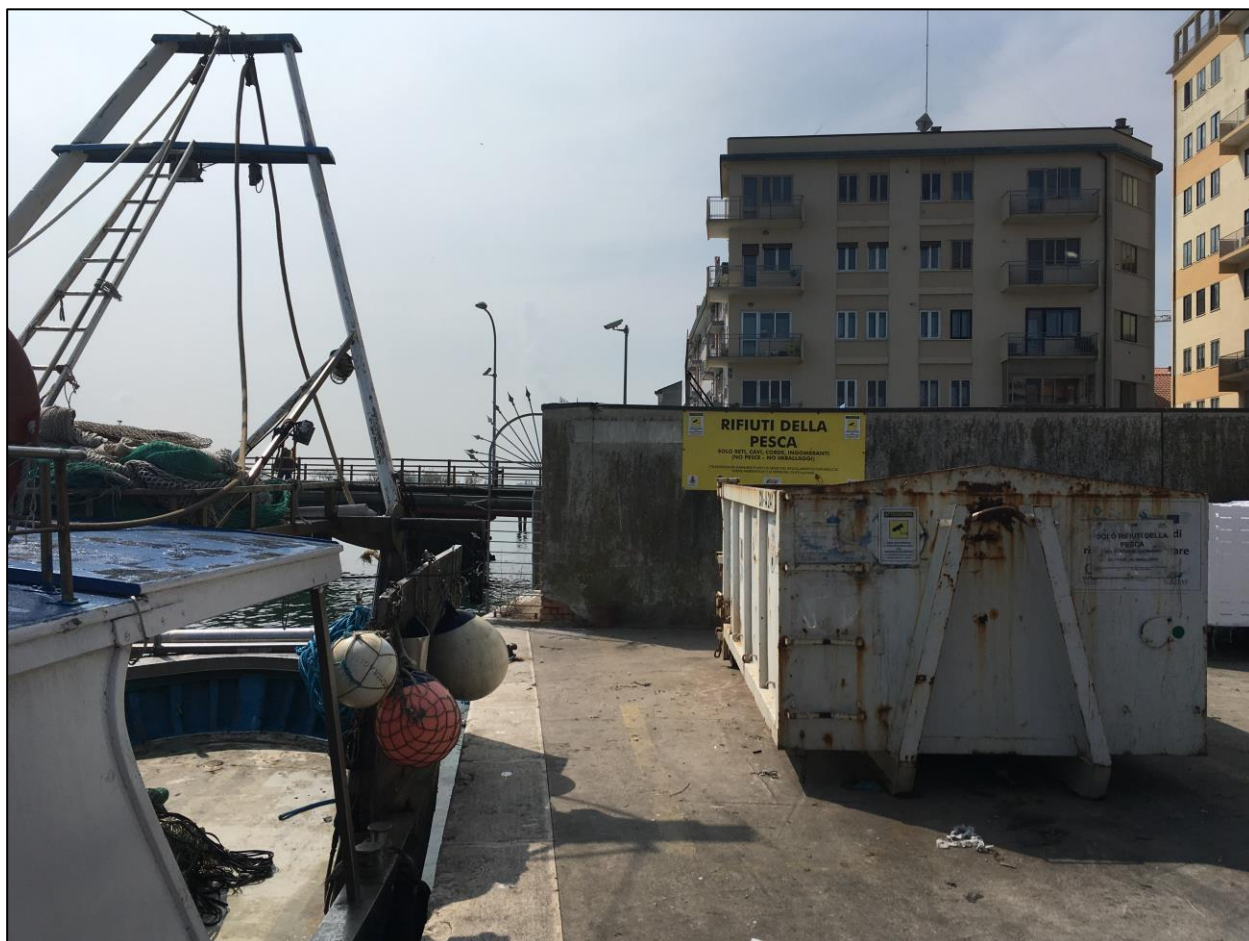


Fig.4. Communal container in the Italian port of Chioggia

2.1.2 Duration of the initiatives

In Italy, FFL activities in Chioggia started on the 1st of September 2018 and ended on the 30th April 2019. FFL was implemented from 1st of September 2018 to the 30th of July 2019 in Cesenatico; from the 5th of October 2018 to the 30th of July 2019 in Molfetta, from 7th of January to 30th of September in Cattolica. In Croatia FFL activities started in June 2018 in Tribunj with 5 fishing vessels, the other ports started in January 2019. Operations ended in May 2019.

2.1.3 Material provided by the project

In Chioggia, each captain involved in the FFL activity was provided by PP1 ISPRA with:

- transparent resistant bags for the collection and storage on board of ML;
- coloured ribbons to be used for closing the bags (the use of different coloured ribbons allowed the identification of the boat of origin during the subsequent characterization phase of the waste collected);

- monthly paper-forms where fishermen noted the number of bags landed on the quayside each day, an estimate of the total weight of ML collected and the indications on the fishing area (Annex A). The use of this particular datasheet was chosen by PP1 after a confrontation with the fishermen;
- stickers with the sentence “This boat takes care of the sea” (Fig. 5).

Moreover, 2 tablets were provided to 2 captains in order to test the ML-REPAIR APP developed within the project (Fig. 10);



Fig. 5. Sticker (this boat takes care of the sea), Italian version

In Cesenatico, Cattolica and Molfetta each captain involved in the FFL activity was provided by PP2 MARE Soc. Coop. a r.l. with:

- resistant bags for the collection and storage on board of ML;
- daily datasheets in which to record the data on the type and weight of ML collected and indications on the fishing area (Annex A);
- waterproof dungarees with the logo of the project (Fig. 6);
- stickers with the sentence “this boat takes care of the sea”.

Also, 15 tablets were given to 15 fishing vessels in order to use the ML-REPAIR APP developed within the project (Fig. 10).



Fig. 6. Waterproof dungarees delivered to fishermen in Cesenatico, Cattolica and Molfetta.

In Croatia, each captain involved in the activities was previously provided with:

- resistant bags for the collection and storage on board of ML;
- personalized folders with project logo in order to hold the datasheet (Fig. 8);
- daily datasheets in which to record the data on type and weight of ML collected and indications on the fishing area (Annex D);
- waterproof weather jackets and trousers, winter jackets, trousers and vests, sweater and boots (Fig. 7);
- stickers with the sentence “this boat takes care of the sea” (Fig. 9).

Moreover, 7 tablets were given to 7 fishing vessels in order to use the ML-REPAIR APP developed within the project (Fig. 10);



Fig. 7. Waterproof weather jackets and trousers delivered to fishermen in Croatia.



Fig. 8. Personalized folders for holding datasheet



Fig. 9. Sticker (this boat takes care of the sea), Croatian version



Fig. 10. Tablet delivered by the project in Italy and Croatia

2.2 PREPARATION PHASE

2.2.1 Chioggia

Fishermen participating in the FFL activities during DeFishGear continued collecting ML also after the end of the project; when the ML-REPAIR project started, we informed them about the project and asked them to inform their colleagues (Fig. 11). Three informal meetings were held to agree about the data they could record onboard and to provide them with big bags to collect ML. Moreover, one meeting with representatives of the Interregional Provveditorate for Public Works of Veneto, Trentino Alto Adige and Friuli Venezia Giulia and three meetings with counsellors of the Chioggia Municipality were organized to plan and implement FFL activities.



Fig. 11. Meeting with the fishermen in Chioggia

Special stickers were created to be applied to the bin dedicated to FFL; the stickers gave information about the type of waste to be disposed of in the bin and a short explanation of the project, together with an invitation for other fishermen to join the scheme (Fig. 12).



Fig. 12. Stickers applied to the reception facilities in Chioggia

Metal plaques, stickers and flags reporting the sentence “This boat takes care of the sea” were donated to the fishermen at the end of the project during a public event (Fig. 13) held on 13 September 2019 at the Town Hall of Chioggia, organized by ISPRA together with the Municipality of Chioggia. During the event, the video with the “Voices of the fishermen” produced in the framework of the project (Deliverable 3.4.1) was shown to the public.



Fig. 13. Public event in Chioggia on 13th of September

2.2.2 Cesenatico, Cattolica and Molfetta

PP2 started this activity by contacting the fishermen cooperative of Cesenatico. At the beginning of the project, PP2 met twice (28th of May and 22th of June 2018) the director of Cesenatico fishermen cooperative in order to plan the activities.

MEETING ATTENDANCE			
Progetto ML-REPAIR "Raising and Promoting an Integrated Approach to Marine Litter Management in the Adriatic Sea"			
ID 18042541 - CUP H7118000090006 (Inscrizione INLURIG Italia-Croazia 2014-2020)			
Name of institution/social subject involved	Institution or social subject	Address of the institution/social subject	Aims of meeting
Federazione Pescaatori Chioggia	Fishermen cooperative	Via Galvani 11, Chioggia	WPA 2 PSL
N°	NAME AND SURNAME (NOME E COGNOME)	ENTITY AND POSITION (IMPRESA E POSIZIONE SINDACATA)	SIGNATURE (FIRMA)
1	Andrea Cagnoli	M.A. S.E. Soc. Coop. s.r.l.	<i>[Signature]</i>
2	Maurizio Scanzilli	Coord. del Pesatore Cesenatico	<i>[Signature]</i>
3			
4			
Location of the meeting		Date	
Fishermen cooperative Feder. Chioggia		28/05/2018	
MEETING ATTENDANCE			
Progetto ML-REPAIR "Raising and Promoting an Integrated Approach to Marine Litter Management in the Adriatic Sea"			
ID 18042541 - CUP H7118000090006 (Inscrizione INLURIG Italia-Croazia 2014-2020)			
Name of institution/social subject involved	Institution or social subject	Address of the institution/social subject	Aims of meeting
Federazione Pescaatori Chioggia	Fishermen cooperative	Via Galvani 11, Chioggia	WPA 2 PSL
N°	NAME AND SURNAME (NOME E COGNOME)	ENTITY AND POSITION (IMPRESA E POSIZIONE SINDACATA)	SIGNATURE (FIRMA)
1	Andrea Cagnoli	M.A. S.E. Soc. Coop. s.r.l.	<i>[Signature]</i>
2	Maurizio Scanzilli	Coord. del Pesatore Cesenatico	<i>[Signature]</i>
3			
4			
Location of the meeting		Date	
Fishermen cooperative Feder. Chioggia		22/06/2018	

Fig. 14. Signature sheet of meetings with the director of Cesenatico fishermen cooperative.

On 6th of September 2018, PP2 met all the 7 fishing vessels involved in FFL in order to present the project, start the activities and deliver all the materials and equipment to the fishermen.

Interreg Italy - Croatia ML-REPAIR

REGISTER OF THE CONSIGNED MATERIAL
(REGISTRO DEL MATERIALE CONSEGNA TO AI PARTECIPANTI)

Progetto ML-REPAIR "Adaptig and Preventig an Integrated Approach to Marine Litter Management in the Adriatic Sea"
ID 1004254 - CUP H73J18H000000000 - Programma INTERREG Italia-Croazia 2014-2020

Consigned material (Materiale consegnato)
Place, date (Luogo e data): Cesenatico 06/09/2018

Description (Descrizione)	Amount (Quantità)	Total Amount (Quantità totale)
Tablet modello e-trapper (Ray Gorken)	2 per ogni imbarcazione coinvolta nel progetto	14
"Water Hunter" T3 10	1 per ogni imbarcazione coinvolta nel progetto	7
Water Hunter distributor	1 per ogni imbarcazione coinvolta nel progetto	7

N°	NAME AND SURNAME (NOME E COGNOME)	ENTITY AND POSITION (IMPRESA E POSIZIONE LAVORATIVA)	SIGNATURE (FIRMA)
1	ALE SANDRO PERAZZI	PERAZZI AND ASSOCIATI - COSENA S.p.A. - Via S. Maria 10 - 47014 Cesenatico (FC)	<i>Ale Sandro Perazzi</i>
2	KRISTINA BILICIC	PERAZZI AND ASSOCIATI - COSENA S.p.A. - Via S. Maria 10 - 47014 Cesenatico (FC)	<i>Kristina Bilicic</i>
3	LUIGI ROSSI	PERAZZI AND ASSOCIATI - COSENA S.p.A. - Via S. Maria 10 - 47014 Cesenatico (FC)	<i>Luigi Rossi</i>
4	FRANCESCO BIANCHI	PERAZZI AND ASSOCIATI - COSENA S.p.A. - Via S. Maria 10 - 47014 Cesenatico (FC)	<i>Francesco Bianchi</i>
5	ANTONIO VIGARI	PERAZZI AND ASSOCIATI - COSENA S.p.A. - Via S. Maria 10 - 47014 Cesenatico (FC)	<i>Antonio Vigari</i>
6	GIULIO VIGARI	PERAZZI AND ASSOCIATI - COSENA S.p.A. - Via S. Maria 10 - 47014 Cesenatico (FC)	<i>Giulio Vigari</i>
7	GIORGIO ZANOTTI	PERAZZI AND ASSOCIATI - COSENA S.p.A. - Via S. Maria 10 - 47014 Cesenatico (FC)	<i>Giorgio Zanotti</i>



Fig. 15. Equipment delivery (Tablet, waterproof dungarees, stickers) and signature sheet document and photos of Cesenatico meeting

In Molfetta, the meeting to start FFL activities was held on 29th of September 2018. Also in this case materials and equipments were delivered to fishermen.

Interreg Italy - Croatia ML-REPAIR

REGISTER OF THE CONSIGNED MATERIAL
(REGISTRO DEL MATERIALE CONSEGNA TO AI PARTECIPANTI)

Progetto ML-REPAIR "Adaptig and Preventig an Integrated Approach to Marine Litter Management in the Adriatic Sea"
ID 1004254 - CUP H73J18H000000000 - Programma INTERREG Italia-Croazia 2014-2020

Consigned material (Materiale consegnato)
Place, date (Luogo e data): Molfetta 29/09/2018

Description (Descrizione)	Amount (Quantità)	Total Amount (Quantità totale)
Tablet modello e-trapper (Ray Gorken)	2 per ogni imbarcazione coinvolta nel progetto	14
"Water Hunter" T3 10	1 per ogni imbarcazione coinvolta nel progetto (per 7 imbarcazioni)	7
Water Hunter distributor	1 per ogni imbarcazione coinvolta nel progetto (per 7 imbarcazioni)	7

N°	NAME AND SURNAME (NOME E COGNOME)	ENTITY AND POSITION (IMPRESA E POSIZIONE LAVORATIVA)	SIGNATURE (FIRMA)
1	PAOLO SPADACINA	PERAZZI AND ASSOCIATI - COSENA S.p.A. - Via S. Maria 10 - 47014 Cesenatico (FC)	<i>Paolo Spadacina</i>
2	FRANCESCO SPADACINA	PERAZZI AND ASSOCIATI - COSENA S.p.A. - Via S. Maria 10 - 47014 Cesenatico (FC)	<i>Francesco Spadacina</i>
3	VINCENZO SPADACINA	PERAZZI AND ASSOCIATI - COSENA S.p.A. - Via S. Maria 10 - 47014 Cesenatico (FC)	<i>Vincenzo Spadacina</i>
4	LUCA SPADACINA	PERAZZI AND ASSOCIATI - COSENA S.p.A. - Via S. Maria 10 - 47014 Cesenatico (FC)	<i>Luca Spadacina</i>
5	GIORGIO SPADACINA	PERAZZI AND ASSOCIATI - COSENA S.p.A. - Via S. Maria 10 - 47014 Cesenatico (FC)	<i>Giorgio Spadacina</i>
6	GIULIO SPADACINA	PERAZZI AND ASSOCIATI - COSENA S.p.A. - Via S. Maria 10 - 47014 Cesenatico (FC)	<i>Giulio Spadacina</i>
7	GIORGIO SPADACINA	PERAZZI AND ASSOCIATI - COSENA S.p.A. - Via S. Maria 10 - 47014 Cesenatico (FC)	<i>Giorgio Spadacina</i>



Fig. 16. Equipment delivery (tablet, waterproof dungarees, stickers) and signature sheet document of Molfetta meeting (photo)

On 7th of November 2018, PP2 met the crew unique fishing vessel mooring in the Cattolica port in order to present the project, start the activities and deliver all the materials and equipment to the fishermen.



Fig. 17. Equipment delivery document and signature sheet and photos of Cattolica meeting

The FFL activities ended in September with a meeting in Cesenatico where the fishers and the cooperatives involved in the project were rewarded with a parchment of recognition for their work. These parchments was delivered during the meeting by the councilor for the environment of Cesenatico and did not entail economic advantages for the fishing companies.



Fig. 18. Signature sheet, parchment of recognition and photos of Cesenatico final meeting

2.2.3 Croatian ports Tribunj, Vira, Brižine, Rogoznica, Vinišće, Vela Luka, Supetar, Santa Marina Sustjepan-Čajkovići

PP4 started this activity already in February 2018 by contacting the fishermen cooperatives “Adria” from Tribunj and “Hvar” from Vira (Island of Hvar) that were involved in FFL initiative during DeFishGear project. Also, PP4 contacted FLAG Brač that included fishermen from Supetar, and fishermen cooperative “Friška riba” from Split whose members land their catches in several different ports; Brižine near Split, Rogoznica, Vinišće and Vela Luka on the island of Korčula. A few months after the project started, some fishermen from fishing ports Sustjepan-Čajkovići in Dubrovnik and Santa Marina in Istria contacted the Institute, willing to participate in the project so they were also included. In those first months of the project, PP4 organized the meetings in all the fishing ports involved, in order to present the project purpose, to meet with the relevant stakeholders and to arrange the implementation of the project activities as smooth as possible.



Fig. 19. Signature sheet and photo of Tribunj meeting

Institut za oceanografiju i ribarstvo
Šetalište 1, Metkovićka 63,
P.P. 550
21000 ŠPILJ, HRVATSKA
tel: +385 21 483000, fax: +385 21 238600
e-mail: info@ioz.hr, web: www.ioz.hr

Institute of oceanography and fisheries
Šetalište 1, Metkovićka 63,
P.O. Box 500
21000 ŠPILJ, CROATIA
tel: +385 21 483000, fax: +385 21 238600
e-mail: info@ioz.hr, web: www.ioz.hr

INSTITUT ZA OCEANOGRAFIJU I RIBARSTVO ŠPILJ

1. RADNI SASTANAK U VEZI PROVEDBE PLANIRANIH AKTIVNOSTI NA PROJEKTU ML-REPAIR

Grad Hvar
15. veljače 2018. 11:30 sati

Ured Odsjeka za komunalne djelatnosti, prostorno uređenje, graditeljstvo i zaštitu okoliša, europske fondove i jamu nabavu
Ulica Milana Kukurina 2, 21450 Hvar

R. br.	IME I PREZIME	ORGANIZACIJA/USTANOVA	KONTAKT: mob. e-Mail	Potpis
1.	VERINA CURIĆ	GRAD HVAR	verina.curic@hvar.hr	<i>[Signature]</i>
2.	LUJMIAN MOJAK	GRAD HVAR	lmojak@hvar.hr	<i>[Signature]</i>
3.	CRNEVA KRZIĆ	Green Seal	mlre@green-seal.com	<i>[Signature]</i>
4.	IVANA KAPUČIĆ	Green Seal	ivana.kapucic@green-seal.com	<i>[Signature]</i>
5.	ITA TRUJIC	GRAD HVAR	ita.trujic@hvar.hr	<i>[Signature]</i>
6.	ŠIME KAVRANČIĆ	K.P. "HVAR"	simokavran@hvar.hr	<i>[Signature]</i>
7.	ANTE BUBIĆ	NAUČNO ISTRAŽIVAČKI INSTITUT ZA OCEANOGRAFIJU I RIBARSTVO ŠPILJ	antebubic@ioz.hr	<i>[Signature]</i>

interreg
Italy - Croatia

Projekt ML-REPAIR

Reducing and Preventing, an Integrated Approach to Marine Litter Management in the Adriatic Sea

The project is co-funded by the European Union
supported by the Adriatic Sea Region

Institut za oceanografiju i ribarstvo
Šetalište 1, Metkovićka 63,
P.P. 550
21000 ŠPILJ, HRVATSKA
tel: +385 21 483000, fax: +385 21 238600
e-mail: info@ioz.hr, web: www.ioz.hr

Institute of oceanography and fisheries
Šetalište 1, Metkovićka 63,
P.O. Box 500
21000 ŠPILJ, CROATIA
tel: +385 21 483000, fax: +385 21 238600
e-mail: info@ioz.hr, web: www.ioz.hr

INSTITUT ZA OCEANOGRAFIJU I RIBARSTVO ŠPILJ

R. br.	IME I PREZIME	ORGANIZACIJA/USTANOVA	KONTAKT: mob. e-Mail	Potpis
8.	BOJANA LUČIĆ	UJ VEČE I VAS	bojana.lucic@hvar.hr	<i>[Signature]</i>
9.	BOJANA BOGARIĆ	IOR ŠPILJ	bojanabogaric@ioz.hr	<i>[Signature]</i>
10.	IVANA KAPUČIĆ			<i>[Signature]</i>
11.	MATKO PETREVIĆ	KIPARSKI ZAVOD "HVAR"	matko.petrevic@hvar.hr	<i>[Signature]</i>
12.	BRANKO VIŠIĆ	ORBIT HVAR	branko.visic@orbit.hr	<i>[Signature]</i>
13.				
14.				
15.				
16.				

interreg
Italy - Croatia

Projekt ML-REPAIR

Reducing and Preventing, an Integrated Approach to Marine Litter Management in the Adriatic Sea

The project is co-funded by the European Union
supported by the Adriatic Sea Region

Page 2



Fig. 20. signature sheet and photo of Hvar meeting

During November and December 2018, special bags for the collection of MLr, personalized folders, daily datasheets and special stickers were made for each boat and delivered to the fishermen, as well as info tables with project and activity summary for each port included.



Fig. 21. Placement of info table and delivery of litter bags, folders and stickers to the fishing port Tribunj



Fig. 22. Placement of an info table and delivery of the big bags to store ML, folders and stickers to the fishing port Vira, Island of Hvar.

PP4 purchased communal containers for all nine ports that were delivered and placed during January 2019.



Fig. 23. Delivery of the communal containers



Fig. 24. Placement of the communal containers in the fishing ports Vira (Island of Hvar), Rogoznica, Vela Luka, Vinišće and Supetar

From March 2019, PP4 purchased and delivered the tablets to the chosen fishermen in order to test the functioning of the ML-REPAIR APP. The tablets were delivered to 7 fishermen.

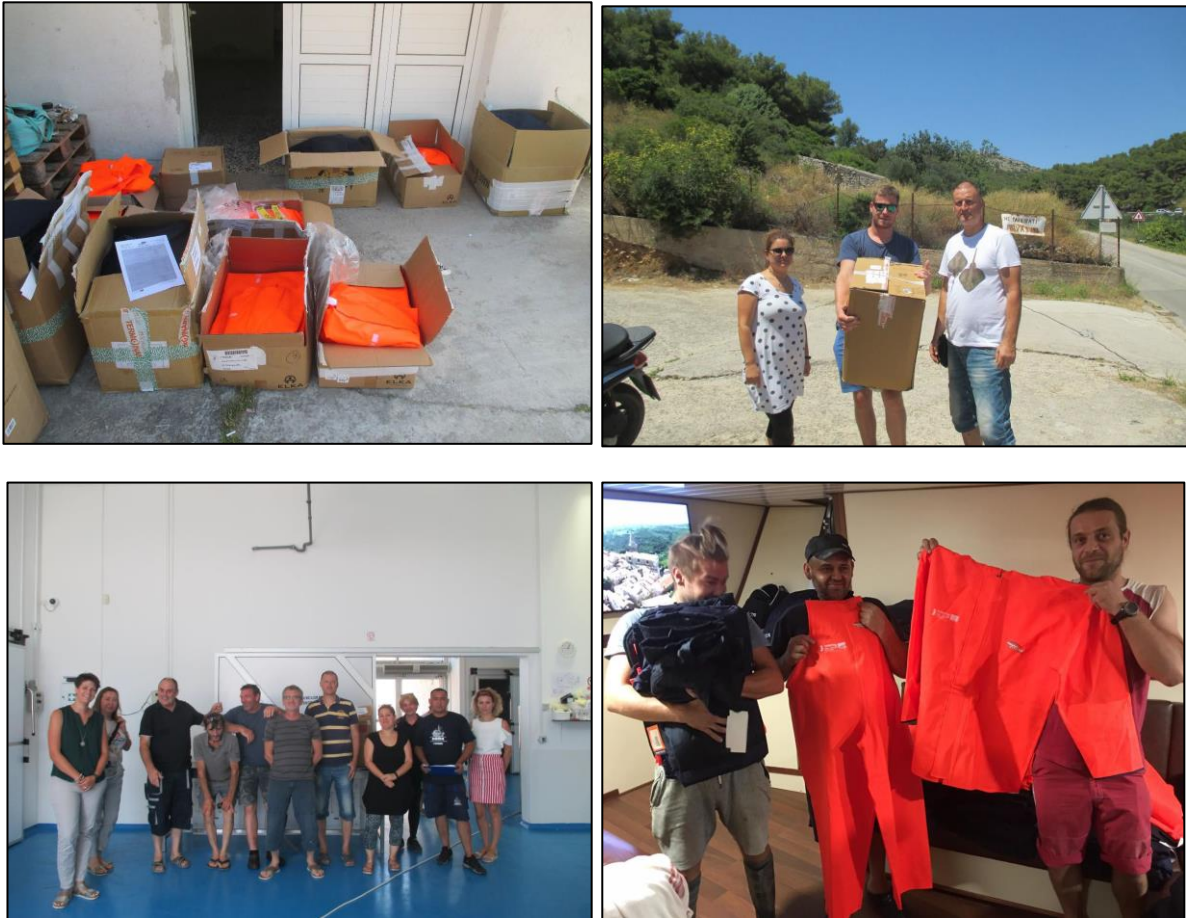


Fig. 27. Delivery of the promotional clothes and footwear to the fishermen in Hvar, Tribunj and Dubrovnik

During September 2019, PP4 organized the final meetings in all nine fishing ports with all relevant stakeholders to present the results of the project and also to award the acknowledge notes to all participants in the project activities.



Fig. 28. Acknowledge note for all participating stakeholders



Fig. 29. Final meetings in Tar (Santa Marina), Hvar, Tribunj and Supetar



Fig. 30. Awarding the Fishermen in Dubrovnik and Split and City of Hvar

2.3 DATA COLLECTION

2.3.1 Data collection methodology

To collect FFL data the project partners set three data collection methods:

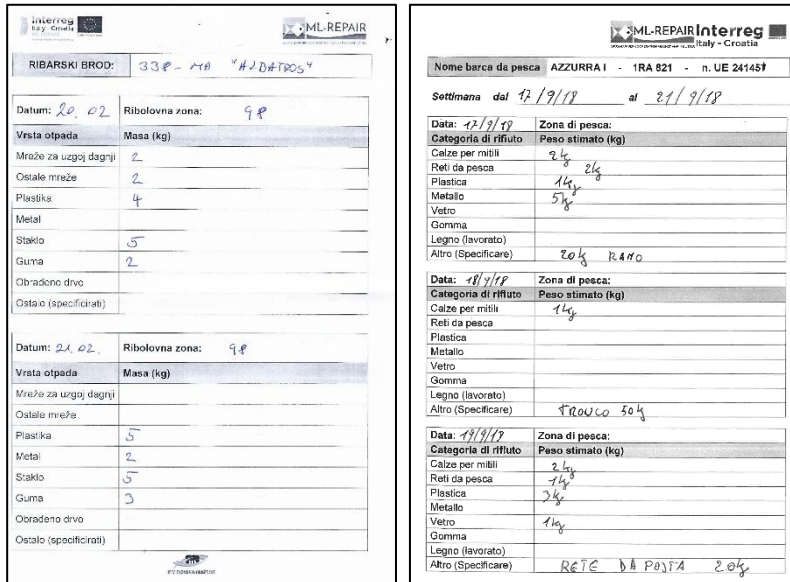
- Datasheet filled by fishermen on board;
- Sampling on the quayside;
- ML-REPAIR APP provided by the project.

Datasheet filled by fishermen on board

A specific datasheet was conceived by the project and provided to the fishermen, where they could take note of the types and quantities (weight) of ML collected during their normal fishing activity (Annex A). The datasheet was meant to be filled onboard during the working activities, so only few information were required.

However, in Chioggia fishermen were not available to record these data and they accepted to provide only the number of bags collected per day and an estimate of the total weight using a different form (Annex B).

The compiled sheets were collected by the project staff almost monthly, and data were entered into a database (Annex C).



RIBARSKI BROD: 338 - RA #20#TROS	
Datum: 20.02.	Ribolovna zona: 98
Vrsta otpada	Masa (kg)
Mreže za uzgoj dagnji	2
Ostale mreže	2
Plastika	4
Metali	
Staklo	5
Guma	2
Obradeno drvo	
Ostalo (specificirati)	
Datum: 21.02.	Ribolovna zona: 98
Vrsta otpada	Masa (kg)
Mreže za uzgoj dagnji	
Ostale mreže	
Plastika	5
Metali	2
Staklo	5
Guma	3
Obradeno drvo	
Ostalo (specificirati)	

Nome barca da pesca AZZURRA I - 1RA 821 - n. UE 241457	
Settimana dal 17/9/18	al 21/9/18
Data: 17/9/18	Zona di pesca:
Categoria di rifiuto	Peso stimato (kg)
Calze per mitili	2 kg
Reti da pesca	2 kg
Plastica	14 kg
Metallo	5 kg
Vetro	
Gomma	
Legno (lavorato)	
Altro (Specificare)	20 kg RARO
Data: 18/9/18	Zona di pesca:
Categoria di rifiuto	Peso stimato (kg)
Calze per mitili	1 kg
Reti da pesca	
Plastica	
Metallo	
Vetro	
Gomma	
Legno (lavorato)	
Altro (Specificare)	50 kg
Data: 19/9/18	Zona di pesca:
Categoria di rifiuto	Peso stimato (kg)
Calze per mitili	2 kg
Reti da pesca	14 kg
Plastica	2 kg
Metallo	1 kg
Vetro	
Gomma	
Legno (lavorato)	
Altro (Specificare)	RETE DA PESCA 20 kg

Fig. 31. Examples of datasheet compiled by fishermen

Classification and characterization of ML on the quayside

Scientific staff involved: 2 operators.

Equipment used for the monitoring of ML on the quayside:

- Data collection sheets;
- Dynamometer;
- Camera;
- Personal Protective Equipment (PPE).

Sampling method

In order to collect accurate data on ML, the scientific personnel of the project carried out a characterization of a sub-sample of the waste landed by the fishing vessels. Operators worked near the reception facilities and analyzed the whole content of some of the bags, randomly selected (Fig. 33). Based on the colour of the ribbons used to close the bags, it was possible to identify the vessels that collected the ML analyzed. The content was photographed (Fig. 34) and the waste was sorted, classified according to the categories agreed among the partners involved in this activity, weighed and recorded in the data collection form (Annex D). When possible, the number of items for each category was counted and recorded. The data were then inserted into a specific database (Annex E).



Fig. 32. Left: bags containing the ML collected by fishermen and landed on the quayside in Italy and Croatia.



Fig. 33. Researchers from ISPRA sorting ML.



Fig. 34. Two examples of the content of the bags.

ML-REPAIR APP

Fishing vessels equipped with tablets provided by the project had the opportunity to test the ML-REPAIR APP developed by the project to record the main categories of ML caught in the nets.

The use of the APP allowed:

- shorter times to record the data;
- an instant usage of the data from catches;
- visual proofs (pictures) of the catches (Figure 35).

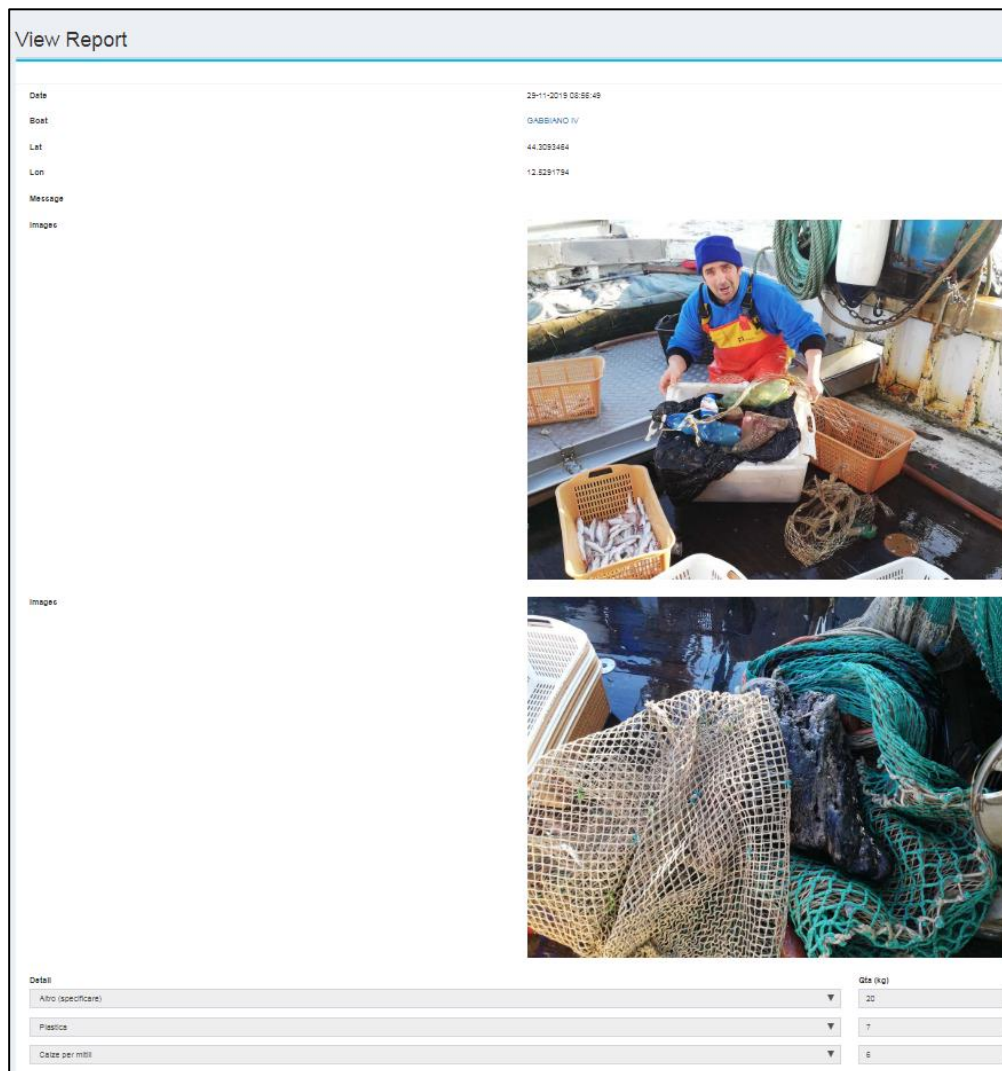


Fig. 35. Screenshot of a report from the ML-REPAIR APP.

More information about the APP can be found in the Deliverable 4.2.2.

All the data collected by the fishermen were entered in a specific database different from the one used for the sampling on the quayside (Annex C).

3 RESULTS

3.1 Achieved results

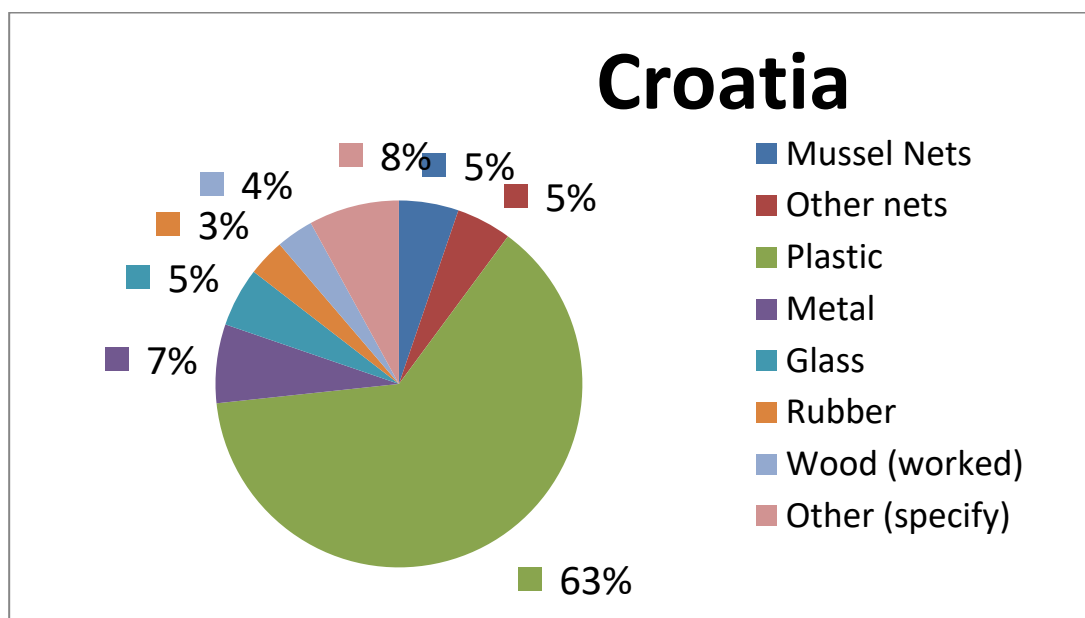
In Italy, 22 tons of ML were collected in a time period ranging from 6 months to 10 months, depending on the port. In Croatia, from June 2018 to May 2019, it was estimated that around 37 tons of litter were collected in the 9 port involved (Tab.1).

Port	Vessels	ML catches	Months
Italian ports (3)	23	22.000 kg	6/10
Croatian ports (9)	37	37.000 kg	11

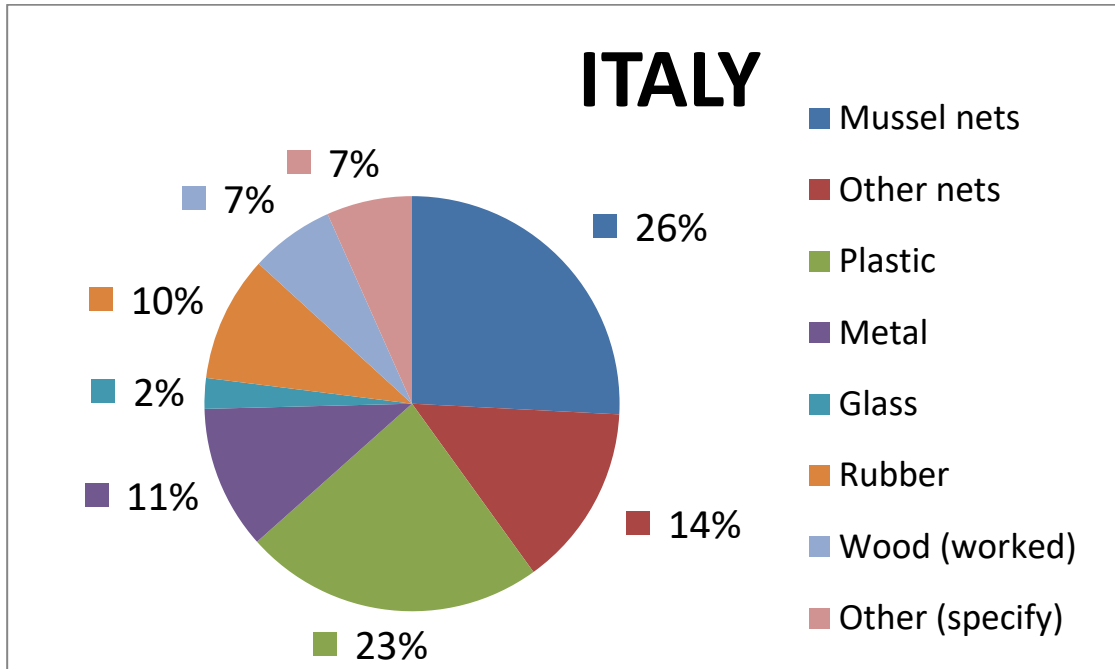
Tab.1. Marine Litter amount collected in project ports

Concerning the data collected by fisherman and reported in the graphics 1 and 2, about 60% of the marine litter collected was plastic, both for Italian and Croatian side. But in Italy a large part of the plastic was related to mussels nets (26%) or other fishing nets (14%). In Croatia this part was quite small (5%) and the dominant fraction was the normal plastic (bottles, bags ecc).

The other categories were: metal (from 7 to 11%), glass (from 2 to 5%), rubber (from 3 to 10%), wood (from 4 to 7%) and Other (About 7/8%).

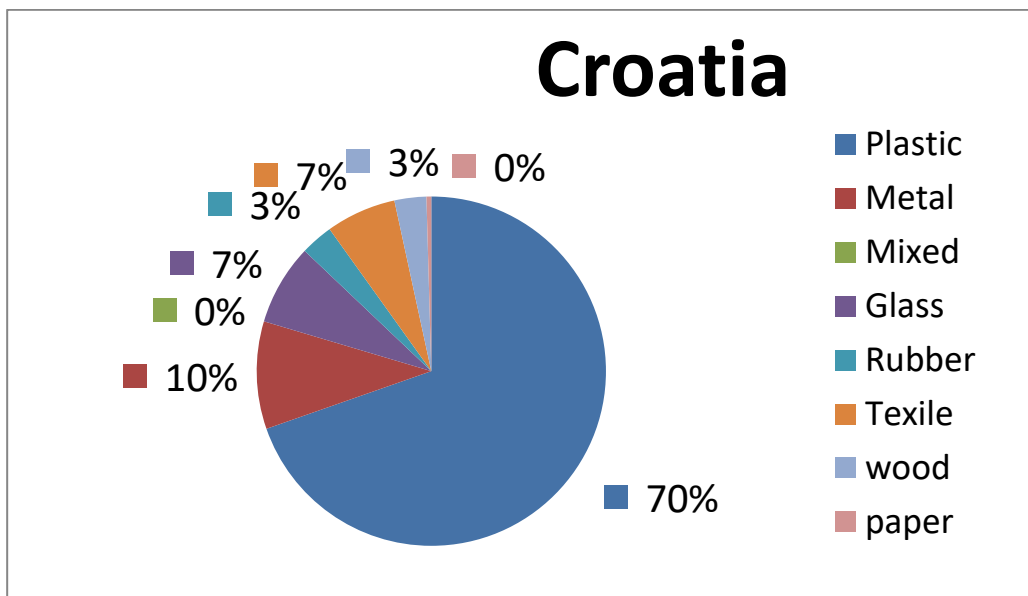


Graphic 1: Marine litter data collected by fishermen in Croatia

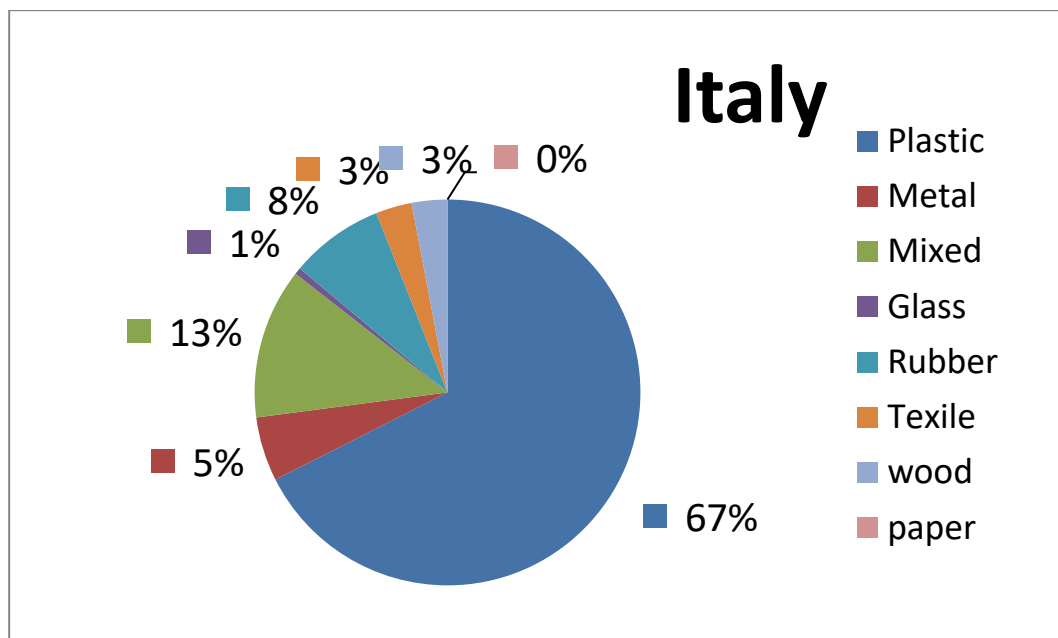


Graphic 2: Marine litter data collected by fishermen in Italy

Regarding the data collected on the quay and the characterization there are no many different between the two countries, as is evident in the last two graphs.



Graphic 3: Marine litter data collected by technicians on the quay in Croatia




Graphic 4: Marine litter data collected by technicians on the quay in Italy

4 BIBLIOGRAPHY

- Anastasopoulou A., Fortibuoni, T. (2019). Impact of Plastic Pollution on Marine Life in the Mediterranean Sea. In Friederike Stock, Georg Reifferscheid, Nicole Brennholt, and Evgeniia Kostianaia (eds.), *Plastics in the Aquatic Environment - Part I: Current Status and Challenges*, Hdb Env Chem, DOI 10.1007/698_2019_421, © Springer Nature Switzerland AG 2019.
- Galgani F., Hanke G., Maes T. (2015) Global Distribution, Composition and Abundance of Marine Litter. In: Bergmann M., Gutow L., Klages M. (eds) *Marine Anthropogenic Litter*. Springer, Cham
- Cincinelli A., Martellini T., Guerranti C., Scopetani C., Chelazzi D., Giarrizzo T. (2019) A potpourri of microplastics in the sea surface and water column of the Mediterranean Sea.
- F. Ronchi, F. Galgani, F. Binda, M. Mandić, M. Peterlin, P. Tutman, A. Anastasopoulou, T. Fortibuoni (2019). Fishing for Litter in the Adriatic-Ionian macroregion (Mediterranean Sea): strengths, weaknesses, opportunities and threats. *Marine Policy* 100: 226-237
<https://doi.org/10.1016/j.marpol.2018.11.041>
- UNEP, 2009. *Marine Litter: A Global Challenge*. Nairobi: UNEP. 232 pp

ANNEX A



Nome barca da pesca	
Settimana dal _____ al _____	

Data:	Zona di pesca:
Categoria di rifiuto	Peso stimato (kg)
Calze per mitili	
Reti da pesca	
Plastica	
Metallo	
Vetro	
Gomma	
Legno (lavorato)	
Altro (Specificare)	

Data:	Zona di pesca:
Categoria di rifiuto	Peso stimato (kg)
Calze per mitili	
Reti da pesca	
Plastica	
Metallo	
Vetro	
Gomma	
Legno (lavorato)	
Altro (Specificare)	

Data:	Zona di pesca:
Categoria di rifiuto	Peso stimato (kg)
Calze per mitili	
Reti da pesca	
Plastica	
Metallo	
Vetro	
Gomma	
Legno (lavorato)	
Altro (Specificare)	

Annex B

NOME BARCA		
Aprile 2019		
ZONA DI PESCA		
GIORNO	NUMERO SACCHI	PESO TOTALE (Kg)
Lunedì 1		
Martedì 2		
Mercoledì 3		
Giovedì 4		
Venerdì 5		
Sabato 6		
Domenica 7		
Lunedì 8		
Martedì 9		
Mercoledì 10		
Giovedì 11		
Venerdì 12		
Sabato 13		
Domenica 14		
Lunedì 15		
Martedì 16		
Mercoledì 17		
Giovedì 18		
Venerdì 19		
Sabato 20		
Domenica 21		
Lunedì 22		
Martedì 23		
Mercoledì 24		
Giovedì 25		
Venerdì 26		
Sabato 27		
Domenica 28		
Lunedì 29		
Martedì 30		

Annex C

	A	B	C	D	E	F	G	H	I	J	K	L
1	Nation	Entity	Port	Date	Fishing area	Vessel type	Litter category	Fishing related	Weight (kg)	Additional notes		
1115	HR	IZOR	Tribunj	17/08/2018	G	Bottom trawler	Plastics	No	3			
1116	HR	IZOR	Tribunj	17/08/2018	G	Bottom trawler	Plastics	No	3			
1117	HR	IZOR	Tribunj	20/08/2018	G	Bottom trawler	Plastics	No	5,6			
1118	HR	IZOR	Tribunj	22/08/2018	G	Bottom trawler	Plastics	No	11			
1119	HR	IZOR	Tribunj	22/08/2018	G	Bottom trawler	Metal	No	6			
1120	HR	IZOR	Tribunj	24/08/2018	G	Bottom trawler	Plastics	No	30			
1121	HR	IZOR	Tribunj	24/08/2018	G	Bottom trawler	Plastics	No	4			
1122	HR	IZOR	Tribunj	24/08/2018	G	Bottom trawler	Plastics	No	6			
1123	HR	IZOR	Tribunj	27/08/2018	G	Bottom trawler	Plastics	No	8			
1124	HR	IZOR	Tribunj	30/08/2018	G	Bottom trawler			12	no specification		
1125	HR	IZOR	Tribunj	30/08/2018	G	Bottom trawler			9	no specification		
1126	HR	IZOR	Tribunj	30/08/2018	G	Bottom trawler			8	no specification		
1127	HR	IZOR	Tribunj	30/08/2018	G	Bottom trawler			5	no specification		
1128	HR	IZOR	Tribunj	03/09/2018	G	Bottom trawler	Plastics	No	4			
1129	HR	IZOR	Tribunj	03/09/2018	G	Bottom trawler	Metal	No	4			
1130	HR	IZOR	Tribunj	07/09/2018	G	Bottom trawler	Plastics	No	42			
1131	HR	IZOR	Tribunj	07/09/2018	G	Bottom trawler	Plastics	No	4			
1132	HR	IZOR	Tribunj	07/09/2018	G	Bottom trawler	Plastics	No	14,5			
1133	HR	IZOR	Tribunj	12/09/2018	G	Bottom trawler	Plastics	No	4,5			
1134	HR	IZOR	Tribunj	14/09/2018	G	Bottom trawler			35	no specification		
1135	HR	IZOR	Tribunj	21/09/2018	G	Bottom trawler			37	no specification		
1136	HR	IZOR	Tribunj	01/10/2018	G	Bottom trawler	Plastics	No	27			
1137	HR	IZOR	Tribunj	01/10/2018	G	Bottom trawler	Plastics	No	15			
1138	HR	IZOR	Tribunj	10/10/2018	G	Bottom trawler	Plastics	No	8			
1139	HR	IZOR	Tribunj	10/10/2018	G	Bottom trawler	Metal	No	5			
1140	HR	IZOR	Tribunj	11/10/2018	G	Bottom trawler	Plastics	No	14			
1141	HR	IZOR	Tribunj	14/10/2018	G	Bottom trawler	Plastics	No	3,7			
1142	HR	IZOR	Tribunj	17/10/2018	G	Bottom trawler	Other (specify)	No	48,5	mixed		
1143	HR	IZOR	Tribunj	18/10/2018	G	Bottom trawler	Other (specify)	Yes	10	mixed		
1144	HR	IZOR	Tribunj	18/10/2018	G	Bottom trawler	Other nets	Yes	1,5			
1145	HR	IZOR	Tribunj	18/10/2018	G	Bottom trawler	Plastics	No	1,5			
1146	HR	IZOR	Tribunj	20/10/2018	G	Bottom trawler	Other (specify)	No	32	mixed		
1147	HR	IZOR	Tribunj	23/10/2018	G	Bottom trawler	Plastics	No	2			
1148	HR	IZOR	Tribunj	23/10/2018	G	Bottom trawler	Metal	No	1			

Annex D

FFL SAMPLES - DATA COLLECTION FORM

Partner:	Operator:	Date:	Tare:
FISHING RELATED ITEMS	ID		
	Mussel Nets		
	Gill Nets		
	Other Nets		
	Pots & Traps		
	Rope		
	Cable		
	Foderone		
OTHER ITEMS	Other		
	Plastic		
	Metal		
	Rubber		
	Glass		
	Paper		
	Textile		
	Wood		
Mixed			

File Version - 22/06/2018

ANNEX E

R_4.2_FFL_data sheets V2.xlsx

File Modifica Visualizza Inserisci Formato Dati Strumenti Componenti aggiuntivi Guida Tutte le modifiche sono state salvate in Drive

100% € % .0 .00 123 Calibri 12 B I A

	Country												
1	Country	Institution	Port	ID (big bug/other)	Date	Operators	Vessel (if available)	Category	Material	Fishery related	Weight (kg)	Notes	
11	IT	ISPRA	Chioggia	1S_004	21/6/2018	Ronchi, Pasanisi, Bernarelo	Gianni Alberto	Other	Metal	No	0,228		
12	IT	ISPRA	Chioggia	1S_004	21/6/2018	Ronchi, Pasanisi, Bernarelo	Gianni Alberto	Other	Rubber	No	2,89		
13	IT	ISPRA	Chioggia	1S_004	21/6/2018	Ronchi, Pasanisi, Bernarelo	Gianni Alberto	Other	Textile	No	0,44		
14	IT	ISPRA	Chioggia	1S_005	21/6/2018	Ronchi, Pasanisi, Bernarelo	Gianni Alberto	Mussel Nets	Plastic	Yes	9,26		
15	IT	ISPRA	Chioggia	1S_005	21/6/2018	Ronchi, Pasanisi, Bernarelo	Gianni Alberto	Other	Plastic	Yes	0,68	Boa	
16	IT	ISPRA	Chioggia	1S_005	21/6/2018	Ronchi, Pasanisi, Bernarelo	Gianni Alberto	Other gear	Rubber	Yes	0,55	foderone	
17	IT	ISPRA	Chioggia	1S_005	21/6/2018	Ronchi, Pasanisi, Bernarelo	Gianni Alberto	Other	Rubber	Yes	1,25	Tappeto barca	
18	IT	ISPRA	Chioggia	1S_005	21/6/2018	Ronchi, Pasanisi, Bernarelo	Gianni Alberto	Other	Plastic	Yes	0,21	Retino	
19	IT	ISPRA	Chioggia	1S_005	21/6/2018	Ronchi, Pasanisi, Bernarelo	Gianni Alberto	Other	Plastic	No	1,06		
20	IT	ISPRA	Chioggia	1S_005	21/6/2018	Ronchi, Pasanisi, Bernarelo	Gianni Alberto	Other	Metal	No	0,16		
21	IT	ISPRA	Chioggia	1S_005	21/6/2018	Ronchi, Pasanisi, Bernarelo	Gianni Alberto	Other	Rubber	No	0,27		
22	IT	ISPRA	Chioggia	1S_005	21/6/2018	Ronchi, Pasanisi, Bernarelo	Gianni Alberto	Other	Textile	No	0,67		
23	IT	ISPRA	Chioggia	1S_005	21/6/2018	Ronchi, Pasanisi, Bernarelo	Gianni Alberto	Other	Mixed	No	2,45	Tappeto	
24	IT	ISPRA	Chioggia	2S_001	5/7/2018	Ronchi, Pasanisi	Gianni Alberto	Mussel Nets	Plastic	Yes	6,2		
25	IT	ISPRA	Chioggia	2S_001	5/7/2018	Ronchi, Pasanisi	Gianni Alberto	Other Nets	Plastic	Yes	0,07		
26	IT	ISPRA	Chioggia	2S_001	5/7/2018	Ronchi, Pasanisi	Gianni Alberto	Pots and Traps	Metal	Yes	0,17		
27	IT	ISPRA	Chioggia	2S_001	5/7/2018	Ronchi, Pasanisi	Gianni Alberto	Pots and Traps	Metal	Yes	0,17		