

2014 - 2020 Interreg V-A
Italy - Croatia CBC Programme
Call for proposal 2019 Strategic

MARLESS (MARine Litter cross-border awarenESS and innovation actions)

Priority Axis: Environment and cultural heritage; Specific objective: 3.3 - Improve the environmental quality conditions of the sea and coastal area by use of sustainable and innovative technologies and approaches

D5.1.3 - Manual with the proposals of specific agreements in order to encourage passively fished waste collection and management held by fishermen

AT 5.1

WP 5

Version: FINAL
Distribution: PUBLIC
Date: 30/06/2023

PROJECT MARLESS

Work Package:	Number and name of WP
Activity:	Number and name of Activity
WP Leader:	Name and PP number of the Wp leader
Deliverable:	Number and name of deliverable

Version:	Final	Date:	13/09/2023
Type:	Report		
Availability:	Confidential/Pblic		
Responsible Partner:	Cetacea Foundation		
Involved Partner	Cetacea Foundation		
Editor:	Martina Monticelli		
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1. INTRODUCTION:

The United Nations Environment Programme (UNEP) defines marine litter as any solid material that is manufactured or transformed, persistent, and later dumped, abandoned, or lost at sea or along the coast. It is estimated that approximately 8 million tons of solid plastic waste are introduced into the marine ecosystem each year (Jambeck et al., 2015; UNEP/MAP, 2015; Villarrubia-Gómez et al., 2018). This material could originate from various sources including commercial and pleasure-boats, fishing, aquaculture, river discharges, urban and industrial areas, legal and illegal shoreline dumping, as well as recreational activities along the coast and harbours (Sheavly and Register, 2007). Once reached the marine ecosystem there several factors that determine the distribution of marine litter. In fact, marine litter could accumulate on beaches, on the sea surface (Palatinus et al., 2019), and on the seafloor and sediments (Renzi et al., 2019). The Adriatic Sea is a semi-enclosed basin characterized by slow currents and extended water retention time so it is highly susceptible to pollution from marine litter, predominantly composed of plastic materials. However, all forms and compositions of marine litter are a growing concern due to their adverse effects on marine and coastal ecosystems. Marine animal species can be directly affected by marine litter through ingestion or entanglement, leading to fatal outcomes. Moreover, rubbish can be easily transferred through the trophic web (Setälä et al., 2014; Romeo et al., 2015b).

The ingestion of marine debris may induce damage to the digestive system, and lead to death from starvation and debilitation. Conversely, entanglement in nets can result in physical injuries or amputations of body parts, as well as accidental captures. Ghost nets, in particular, pose a significant threat to marine life, as they restrict or prevent movement, thereby impeding the search for food and, in some cases, breathing.

The Adriatic Sea is among the regions that are most impacted by benthic litter (Pasquini et al. 2016), and the deposition of debris on the substrate results in physical harm to the environment and the inhibition of gas exchange between pore waters and overlying seawater, leading to anoxia and hypoxia. Furthermore, marine debris has the potential to modify the composition of marine communities, upsetting the equilibrium of ecosystems and resulting in additional environmental challenges. Apart from the aforementioned factors, the socio-economic aspect also warrants attention,

encompassing reduced tourism, mechanical harm to boats and fishing gear, diminished catch and clean-up expenses, as well as a decline in aesthetic worth and public utilization of the environment.

Nowadays, waste pollution is a complex and continuously expanding environmental problem with multiple sources and few straightforward solutions. Hence, addressing marine litter issues requires a joint effort from different countries, and their collaboration is essential in finding a suitable and appropriate solution.

In Europe, the issue of marine waste management has garnered more attention, particularly following the Barcelona Convention (BC) and, most significantly, with the enforcement of the Protocol for the Protection of the Mediterranean Sea from Pollution by Land-Based Sources and Activities (LBS), the ICZM Protocol, and Special areas under MARPOL Annex V (DeFishGear, 2016). However, despite the implementation of these contracts and protocols, the policy remains ineffective in many European nations, highlighting the growing need to address and find concrete solutions to the problem of marine waste.

A relatively new solution that emerged in several European and regional projects, also integrated into the measures provided by the Marine Strategy Framework Directive (MSFD) to achieve the Good Environmental State (GES), is the activity of Fishing For Litter.

Fishing for litter is the process of removing trash and waste from marine environments such as oceans, rivers, and lakes. The main goal is to prevent pollution of the marine environment and to protect marine life. Conventionally, this practice involves using specialized equipment such as nets, hooks, and traps to collect and remove various types of waste from water bodies. Additionally, fishing for litter means any kind of voluntary agreement with the fishing sector in order to engage fishermen in the removal of marine debris from marine waters and seabeds. This is a growing practice that aims to increase the involvement of fishing communities in the protection of the marine environment. Waste fishing is mainly carried out by non-governmental organizations and volunteer groups, who collaborate with local authorities and public institutions to organize clean-up campaigns of marine waters and seabeds.

Since the problem of waste in the oceans has become a globally significant issue, it requires immediate and concrete solutions. Waste fishing represents an important step forward in the fight against marine pollution, but it must be accompanied by public and private policies that promote

greater attention to waste management. By working together, fishing communities can play a critical role in preventing pollution and protecting the oceans and marine life.

In fact, the waste that lies on the seafloor or floats in the water column is commonly captured by fishing nets, especially bottom trawlers, and constitutes a variable part of the daily catch of fishermen. If fishermen dispose of these items safely on land, the result is a direct removal of waste from the sea without the need for a specific cleaning action. Fishing for litter activity is built on the assumption that the activity must be as simple as possible for fishermen and that it must not have direct or indirect costs for them. There are several initiatives that facilitate the Fishing for litter activities: provides fishers with bags or bins in which to store litter and ensures that disposal facilities are established and easy to access and help fishermen to directly remove the litter from marine environments (F. Ronchi et al. 2018).

This report aims to provide a comprehensive overview of the present state of coastal and maritime management in Italy and Croatia while formulating proposals for specific agreements to promote the collection and management of passively fished waste by fishermen.

2. LEGAL ASPECT

2.1 General overview in Italy.

In 1989, the CAMP projects were established as coastal management programs with the main goal of developing and implementing strategies and procedures for sustainable development of coastal areas. They aimed to identify and apply specialized methodologies and tools for managing these significant pilot areas. In Italy, the Ministry of Environment, Land, and Sea established the CAMP Italy Project, which is coordinated by the Barcelona Convention.

Under the UN Environment Mediterranean Action Plan (UNEP MAP), CAMP focuses on coastal management projects in five pilot areas located in three coastal regions (Emilia-Romagna, Sardinia, and Tuscany). The next generation of CAMP projects is based on the Barcelona Convention's Integrated Coastal Zone Management Protocol (ICZM), adopted in 2008 and in force since 2011. Its primary objective was to achieve sustainable development in coastal areas by implementing Integrated Coastal Zone Management (ICZM) in the selected pilot areas of Emilia-Romagna, Sardinia, and Tuscany.

Another critical issue regarding marine legislation is the management of waste in harbour and waste collected from the marine environment. Over the past seventy years, there has been a significant increase in the consumption of plastic materials in Italy. In the context of national waste management, a number of directives are involved, including the transposition of directives 2008/98/EC and 2000/59/EC. These directives are concerned with the management of waste produced by ships, including their disposal and the role of port authorities in their management. In Directive 2008/56/EC (Marine Strategy Framework Directive), marine litter is listed among the pressures and impacts affecting marine ecosystems and is one of the descriptors of the good ecological status. Additionally, Legislative Decree 182/2003 was introduced with the aim of reducing waste and cargo residue discharges from ships into the sea, whilst simultaneously improving the availability and use of port collection facilities for such waste and residue. On the other hand, Legislative Decree 152/2006 regulates all aspects relating to the disposal of urban and industrial waste. However, it is worth noting that while waste present on beaches or in ports is classified within the aforementioned decrees, waste collected from the sea is not mentioned. As a result, "marine litter" is not classified as either urban or industrial waste and is considered as special waste within the regulatory framework described. Consequently, it is subject to different regulations, and contracts for its disposal were won by companies that applied much higher rates than those applied to normal waste. This caused fishermen to stop depositing it, leading to a continued accumulation of waste at sea. In alignment with EU Regulation 508/2014, the European Maritime and Fisheries Fund (FEAMP) aims to safeguard marine biodiversity and ecosystems, implementing compensation schemes for sustainable fishing activities that involve fishermen. As a part of this initiative, the FEAMP supports the collection of marine litter by fishermen, including the removal of lost fishing gear and other debris from the sea. To address environmental concerns, on February 15th, 2019, the Ministry of Environment and Territory and Sea Protection issued a Decree that updated the requirements for achieving good environmental status and defined the environmental targets of the Marine Strategy (MSFD). This decree ensures compliance with articles 9 and 10 of Legislative Decree 190/2010. A further step forward in the regulation of marine waste management was taken in 2022 when the new "Salvamare" Decree was approved. These initiatives demonstrate the commitment of the authorities to marine environmental protection and reflect the importance of preserving marine biodiversity for future generations. This decree aims to contribute to the restoration of the marine ecosystem and the promotion of the circular

economy, as well as raising awareness among the community for the adoption of virtuous behavioral patterns aimed at preventing waste abandonment in the sea, lakes, rivers, and lagoons and ensuring their proper management. Additionally, it provides that waste accidentally collected by fishermen will be equated to waste produced by ships, and the cost of disposal will be included in the citizens' waste tax. Since we are still in the early stages of implementing the law, there are still some issues, therefore the change must be evaluated over time. However, at the moment we can say that this law will encourage fishermen to collect and dispose of plastic material, recognizing and valuing the activities that were previously carried out involuntarily by the fishermen themselves.

Despite the presence of a series of current regulations and legislative acts, the management of coastal and maritime areas in Italy remains fragmented among various authorities at the national, regional, and municipal levels. Currently, there is a lack of a unified approach in the management planning, both concerning Integrated Coastal Zone Management (ICZM) and the treatment and management of marine waste.

2.2 General overview in Croatia

The Republic of Croatia is a country that has signed the ICZM Protocol (Integrated Coastal Zone Management), the Barcelona Convention and its related LBS Protocol, and has incorporated the Marine Strategy Framework Directive into its legislation for the management and planning of maritime and coastal areas. By means of the Program of Measures for the Protection and Management of the Marine Environment and Coastal Area (Official Gazette NN. 97/17), the official adoption of the national Program of Measures for the protection and management of the marine environment and coastal region of the Republic of Croatia is declared. This program is an action plan that is part of the Strategy for the management of the marine environment and coastal zone, as presented to the Government of the Republic of Croatia by the Ministry of Environmental Protection and Energy.

Furthermore, the Republic of Croatia is bound to fulfill the obligations arising from international conventions and other legislative acts, including the EQS (Environmental Quality Standards) of the European Parliament and the Council, the Decision 2010/477/EU of the Commission concerning criteria and methodological standards for maintaining good environmental conditions of the marine environment, the Directive 2000/59/EC of the European Parliament and the Council, the MARPOL Convention and its Annex V, the London Convention and its protocol, the Dumping Protocol, the

Emergency Protocol, and the Protocol for the Integrated Management of Coastal Zones in the Mediterranean, in addition to complying with specific national regulations.

Waste management is one of the most challenging sectors in environmental protection, requiring priority solutions and compliance with European Union (EU) standards. The foundations of waste management policy in the Republic of Croatia are outlined in the Law on Sustainable Waste Management (Official Gazette, nos. 94/13, 73/17) and the Waste Management Strategy of the Republic of Croatia (Official Gazette, no. 130/05), as well as in the Waste Management Plan of the Republic of Croatia for the period 2017-2022 (Official Gazette, no. 03/17).

According to the Waste Management Plan of the Republic of Croatia, marine litter falls into the category of "special" waste, but at the present, there is a lack of official data and adequate estimates concerning the amounts of marine debris in the Republic of Croatia. Therefore it is necessary to develop a monitoring methodology for marine waste, as envisioned by the Adriatic Monitoring Plan, developed in alignment with the Decision that adopts the Action Programme of the Strategy of Marine Environment and Coastal Area Management: Monitoring System for a Continuous Assessment of the Adriatic Sea's Status (OG 153/14). The primary objective of the Waste Management Plan of the Republic of Croatia is to establish a comprehensive marine waste management system. This can be achieved initially by identifying the locations, sources, and hotspots of marine waste. Subsequently, a prevention system will be established, followed by the promotion of intervention, collection, and proper disposal of marine waste. The Waste Management Plan 2017-2022 are adopted only for 2022. Meanwhile, a new Waste Management Plan 2023-2029 is being developed.

Considering that the issue of marine litter remains a critical and largely unaddressed matter, it necessitates a comprehensive approach encompassing legal and cultural dimensions. This entails promoting scientific dissemination and engaging all stakeholders to collaboratively devise a shared solution.

3. PROPOSAL TO ENCOURAGE PASSIVELY FISHED WASTE COLLECTION AND MANAGEMENT HELD BY FISHERMEN:

"Fishing For Litter" (hereinafter: FFL) constitutes a locally embraced initiative that actively engages stakeholders from the fishing industry and scientific researchers. The primary objective of these endeavors revolves around the removal of debris from marine ecosystems. The initiative has granted participating fishermen a pivotal role in safeguarding the marine environment through the collection of waste during their fishing activities. This symbiotic collaboration between the fishing sector and the scientific community assumes paramount significance, as it advances a sustainable and conscientious approach to addressing the emergency of marine litter. The initiative's positive impact extends to fostering cleaner seas and preserving marine biodiversity for the prosperity of future generations. Moreover, the importance of marine litter collection activities is emphasized by their key role in scientific outreach and promoted public awareness regarding critical concerns such as marine waste pollution. However, it is noteworthy that prevailing regulations concerning appropriate marine waste management remain inadequately defined and perplexing. Consequently, the need to intensify political and social pressures emerges to establish an unequivocal and efficacious management protocol. To date, the FFL initiatives has been facilitated by local organizations and/or regional and European projects. Notably, the "DeFishGear" project (IPA Adriatic CBC program 2007-2013), titled "Derelict Fishing Gear Management System in the Adriatic Region," conducted between 2013 and 2016, played a pivotal role in disseminating these activities and establishing an effective scientific framework. Among the salient objectives of the project was the assessment of litter composition and distribution on the seabed. Consequently, other FFL endeavors have increased in the Adriatic Sea, buoyed by the support of European projects (e.g., CleanSea Life, ML-REPAIR) and local initiatives (e.g., FEAMP). Despite the continuous growth of FFL activity, there are still areas that need to be addressed. Consequently, it is necessary to establish protocols to govern the activities themselves and to increase stakeholders' awareness and involvement. To achieve this objective, the first step is to establish a comprehensive plan that incorporates precise details about the local context. This plan will particularly focus on addressing the legal aspects, encompassing regulations and compliance requirements pertinent to the management of marine litter in the specific

region. Furthermore, the plan must consider the optimal timing and location for execution, delving into the unique biological and geological aspects of the study area.

Before initiating the FFL activity, conducting a thorough situation analysis is important to comprehend the problems and limitations associated with marine litter in the study area, which may include identifying the primary sources of marine litter and assessing the involvement of socio-economic actors contributing to marine litter pollution. This comprehensive analysis will serve as a foundation for establishing clear and well-defined objectives and devising appropriate activities to accomplish them. The subsequent crucial step entails actively engaging key stakeholders, including fishermen and relevant authorities like the Coast Guard or Port Authority, with the primary objective of identifying measures that address the specific needs of fishermen and promote efficient waste management practices. The effective management of waste fishing in marine ecosystems calls for a holistic approach involving all stakeholders. A pivotal step is the establishment of an ongoing discussion table, aimed at ensuring a continuous dialogue among all involved parties, including fishermen. This open dialogue fosters the sharing of knowledge and perspectives, thereby contributing to the development of more effective and sustainable waste fishing strategies.

Furthermore, it is crucial to provide suitable equipment to facilitate both the collection and the accumulation and storage of marine debris. Access to proper tools enables the maximization of cleaning operations' efficiency and reduces the overall environmental impact. This appropriate infrastructure is fundamental to ensuring that the collected waste is managed correctly and efficiently. A highly promising approach to successfully implement these activities is direct collaboration with fishermen. Actively involving them in the design and implementation of waste fishing initiatives not only taps into their knowledge of the marine environment but also promotes a sense of shared responsibility for safeguarding the marine environment. Moreover, seeking adequate funding is essential to ensure the long-term sustainability of these initiatives. Partnering with relevant organizations and institutions can help secure the financial and technical resources needed to support and expand waste fishing operations.

Another important action to enhance the effectiveness of FFL activities is to implement outreach efforts aimed at increasing awareness among all stakeholders and the general public. Through educational programs and outreach initiatives, the fishing community and local residents become more conscious of the environmental implications of marine litter and the role they can play in

mitigating its impact. Additionally, fostering an improved knowledge of litter types and locations equips fishermen with crucial insights to target high-impact areas, thereby optimizing their efforts in marine litter recovery. Moreover, fishermen's enhanced participation in marine litter recovery is a vital indicator of the FFL activity's effectiveness. By actively involving fishermen in the collection process, the initiative not only boosts litter removal but also cultivates a sense of stewardship and ownership within the fishing community. Their increasing involvement signifies the positive outcomes of the FFL activity, further reinforcing the importance of their continued cooperation.

To ensure seamarine litteress coordination and sustained engagement, the appointment of a dedicated fishery manager or port manager as the marine litter activity coordinator proves beneficial. This individual can facilitate daily management tasks and maintain regular contact with participating fishermen, fostering an environment of open communication and continuous improvement.

The success of the FFL initiative relies on active cooperation and the involvement of fishermen. By providing suitable equipment and incentives to adopt responsible practices regarding marine litter and by promoting their engagement, the FFL activity generates far-reaching effects, ranging from improved attitudes towards marine litter to a tangible reduction in its impact on coastal environments. By prioritizing the collaboration and participation of all the stakeholders, the FFL initiative lays the groundwork for a sustainable and cleaner marine ecosystem.

4. CONCLUSIONS:

The FFL program has provided valuable solutions for the management and disposal of marine litter. Based on previous experience with this program, it has become increasingly evident that there is a pressing need to continue with these activities. The issue of marine litter has been on the rise, and its management and disposal require further advancements to address the challenges posed by it.

Within the MARLESS project, FFL actions have been carried out in Cesenatico, thanks to the valuable collaboration of the fisherman, the municipalities and the coast guard. This synergy allowed for the proper disposal of waste in suitable containers already placed in ports, in locations easily accessible to fishermen, facilitating their disposal without tax burden. However, this procedure is not feasible in all Italian and Croatian municipalities. Hopefully, with further agreements it could be easier to achieve a favorable situation for the continued implementation of waste fishing activities.

Moreover, the FFL program has highlighted the importance of addressing the issue through collaborative efforts, particularly with the fishing sector. The program has brought together stakeholders from various sectors to work towards a common goal of managing marine litter effectively. Therefore, it is imperative to continue such initiatives to ensure that the problem of marine waste is tackled effectively. This will require sustained efforts towards developing innovative solutions for waste management, promoting responsible behavior among stakeholders, and strengthening collaboration between different sectors. By doing so, we can ensure that our marine ecosystems are protected and preserved for future generations.

5. BIBLIOGRAPHY

CAMP Italy Project, Rapporto Finale, 2023. Retrieved from [https://www.mase.gov.it/sites/default/files/archivio/allegati/CAMP/CAMP_Italy_Final_Report_it.pdf].

DeFishGear, *Guidelines for Marine Litter and Derelict Fishing Gear Management in the Frame of ICZM*, 2016.

Fiorentino, F., Lefkaditou, E., Jadaud, A., Carbonara, P., Lembo, G., F., G., 2013. Protocol for litter data collection during the MEDITS trawl surveys. *Rapp. Comm. Int. Mer Medit.* 40.

Jambeck, J.R., Geyer, R., Wilcox, C., Siegler, T.R., Perryman, M., Andrady, A., Narayan, R., Law, K.L., 2015. Plastic waste inputs from land into the ocean. *Science* 347, 768-771.

ML-Repair. (2019). About Sea Waste. <http://www.ml-repair.eu/it/rifiuti-marini>.

Palatinus, A., Kovač Viršek, M., Robič, U., Grego, M., Bajt, O., Šiljić, J., Suaria, G., Liubartseva, S., Coppini, G., Peterlin, M., 2019. Marine litter in the Croatian part of the middle Adriatic Sea: simultaneous assessment of floating and seabed macro and micro litter abundance and composition. *Mar. Pollut. Bull.* 139, 427–439.

Pasquini, G., Ronchi, F., Strafella, P., Scarcella, G., Fortibuoni, T., 2016. Seabed litter composition, distribution and sources in the northern and central Adriatic Sea (Mediterranean). *Waste Manag.* 58, 41e51. <https://doi.org/10.1016/j.wasman.2016.08.038>.

Renzi, M., Čižmek, H., Blašković, A., 2019. Marine litter in sediments related to ecological features in impacted sites and marine protected areas (Croatia). *Mar. Pollut. Bull.* 138, 25–29.

Romeo, T., Battaglia, P., Pedà, C., Consoli, P., Andaloro, F., Fossi, M.C., 2015b. First evidence of presence of plastic debris in stomach of large pelagic fish in the Mediterranean Sea. *Mar. Pollut. Bull.* 95, 358–361.

Ronchi F., Galgani F., Binda F., Mandić M., Peterlin M., Tutman P., Anastasopoulou A., Fortibuoni T., *Fishing for Litter in the Adriatic-Ionian macroregion (Mediterranean Sea): Strengths, weaknesses, opportunities and threats*. *Mar. Policy*, 100 (2019).

Setälä, O., Fleming-Lehtinen, V., Lehtiniemi, M., 2014. Ingestion and transfer of microplastics in the planktonic food web. *Environ. Pollut.* 185, 77–78.

Sheavly, S.B., Register, K.M., 2007. Marine debris & plastics: Environmental concerns, sources, impacts and solutions. *Journal of Polymers and the Environment* 15, 301-305.

UNEP, 2009. *Marine Litter: A Global Challenge*. Nairobi: UNEP. 232 pp.

UNEP/MAP, 2015. *Marine Litter Assessment in the Mediterranean 2015*, in: United Nations Environmental Program/ Mediterranean Action Plan (Ed.), Athens.

Villarrubia-Gómez, P., Cornell, S.E., Fabres, J., 2018. Marine plastic pollution as a planetary boundary threat – The drifting piece in the sustainability puzzle. *Marine Policy* 96, 213-220.

WASTE Government of the Republic of Croatia. (2017). *Waste Management Plan of the Republic of Croatia for the Period 2017-2022*. Retrieved from [https://mingor.gov.hr/UserDocsImages/UPRAVA-ZA-PROCJENU-UTJECAJA-NA-OKOLIS-ODRZIVO-GOSPODARENJE-

OTPADOM/Sektor%20za%20odr%C5%BEivo%20gospodarenje%20otpadom/Ostalo/management_plan_of_the_republic_of_croatia_for_the_period_2017-2022.pdf].