



**The Plastic Busters MPAs showcases on  
how to prevent and mitigate marine litter  
in Mediterranean MPAs**

**Synthesis Report**

**PREPARED BY**

**THE INTERREG MED  
PLASTIC BUSTERS MPAS PROJECT**

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*Mediterranean*



**PLASTIC BUSTERS  
MPAs**

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## Document Information

This document (Deliverable 4.6.2) provides a synthesis report of the marine litter prevention and mitigation measures piloted within the framework of the Plastic Busters MPAs project.

## Approvals

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## 1. Introduction

### 1.1. Marine litter a lurking threat in Mediterranean MPAs

The Mediterranean Sea is one of the areas most affected by marine litter worldwide. Marine litter - any persistent, manufactured or processed solid material- is found lying on the shores, as well as floating anywhere from the surface to the bottom of the sea. Even in pristine environments of the Mediterranean, such as coastal and marine protected areas (MPAs), marine litter is building up threatening habitats and species. Impacts vary from entanglement and ingestion, to bio-accumulation and bio-magnification of toxic substances released from litter items, facilitation of introduction of invasive species, damages to benthic habitats, etc. MPA managers stand at the forefront of this issue, and sadly they lack the tools, knowledge, and often the resources to effectively tackle it. As a result, the achievement of the conservation goals set is hampered.



**FIGURE 1-1.** Marine litter a lurking threat in Mediterranean MPAs (Photo: Thomais Vlachogianni).

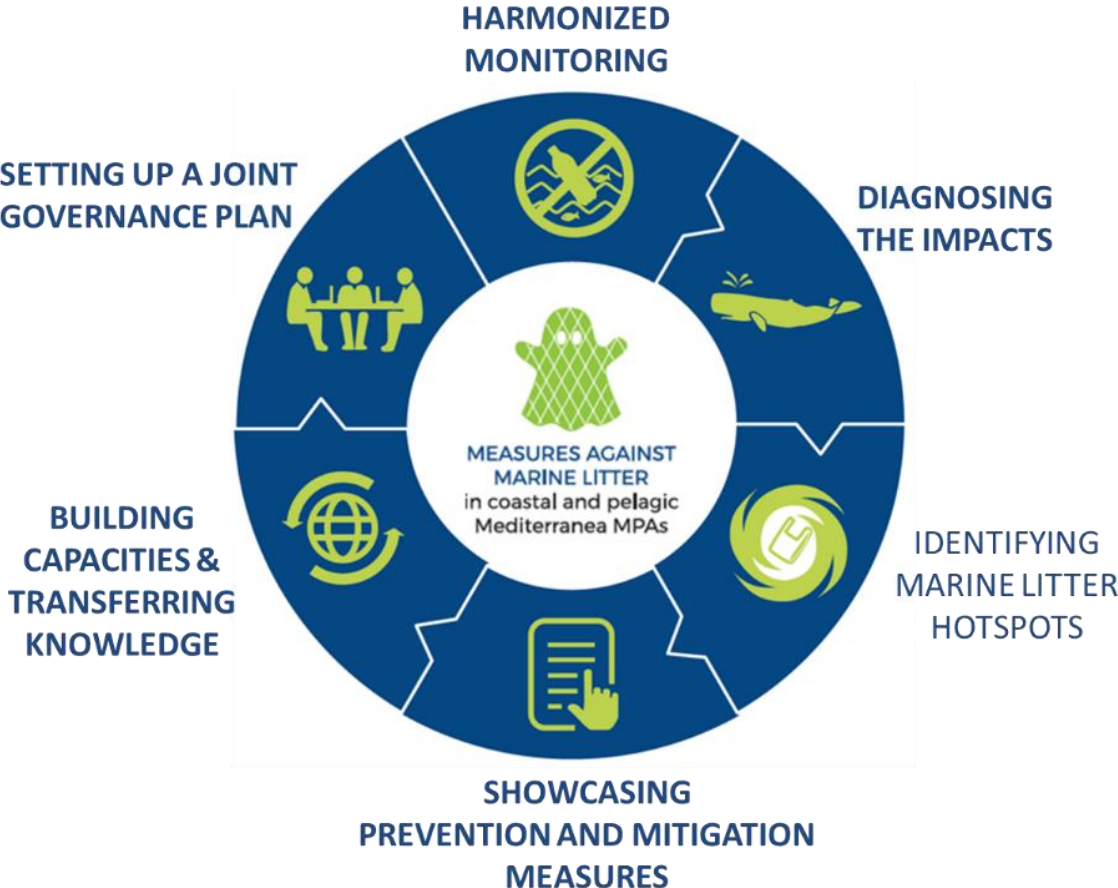
### 1.2. The Plastic Busters MPAs project in a nutshell

Plastic Busters MPAs, is a 4-year-long Interreg Mediterranean funded project aiming to contribute to maintaining biodiversity and preserving natural ecosystems in pelagic and coastal marine protected areas (MPAs), by defining and implementing a harmonized approach against marine litter. The project entails actions that address the whole management cycle of marine litter, from monitoring and assessment to prevention and mitigation, as well as actions to strengthen networking between and among pelagic and coastal MPAs.

The Plastic Busters MPAs consolidates Mediterranean efforts against marine litter by:

- ▶ Diagnosing the impacts of marine litter on biodiversity in MPAs and identifying marine litter 'hotspots';
- ▶ Defining and testing tailor-made marine litter surveillance, prevention and mitigation measures in MPAs;
- ▶ Developing a common framework of marine litter actions for Interreg Mediterranean regions towards the conservation of biodiversity in Med MPAs.

The Plastic Busters MPAs project deploys the multidisciplinary strategy and common framework of action developed within the Plastic Busters initiative led by the University of Siena and the Sustainable Development Solutions Network Mediterranean. This initiative frames the priority actions needed to tackle marine litter in the Mediterranean and was labelled under the Union for the Mediterranean (UfM) in 2016, capturing the political support of 43 Euro-Mediterranean countries.



**FIGURE 1-2.** *Plastic Busters MPAs in a nutshell.*

**1.3. Marine litter prevention and mitigation actions at the heart of Plastic Busters MPAs**

Marine litter prevention and mitigation actions lay at the heart of the Interreg Med Plastic Busters MPAs project. Working for and from the perspective of an MPA manager, Plastic Busters MPAs sought to offer concrete solutions to prevent and mitigate the impacts of marine litter by showcasing marine litter measures in 9 Mediterranean MPAs.

The collective experience of the pilot actions is captured within this document that provides an overview of the main lines of action, the achieved results and the lessons learned from the tested marine litter prevention and mitigation measures. This synthesis report seeks to serve as tool for catalysing the up-scaling and replication of the tested marine litter solutions in other Mediterranean MPAs.

## 2. The Plastic Busters MPAs featured marine litter prevention and mitigation measures

Following a step-by-step approach with the engagement of stakeholders, and considering the specific context and characteristics (marine litter pressure, organizational capacity and human resources, institutional setup and management priorities) of each pilot MPA, four major types of priority measures towards preventing and mitigating marine litter effectively in MPAs were selected to be tested and eventually to be replicated within the scope of the Plastic Busters MPAs project (Fig. 2-1). A map with the pilot MPAs is shown in Fig. 2-1 and the tested measures per pilot MPA are shown in Table 2-1.

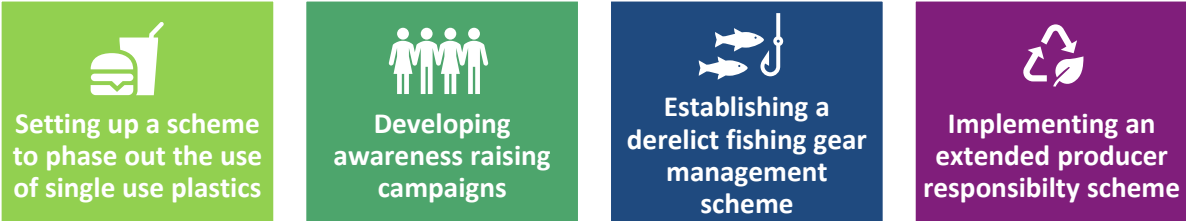


Figure 2-1. The Plastic Busters MPAs types of measures tested.

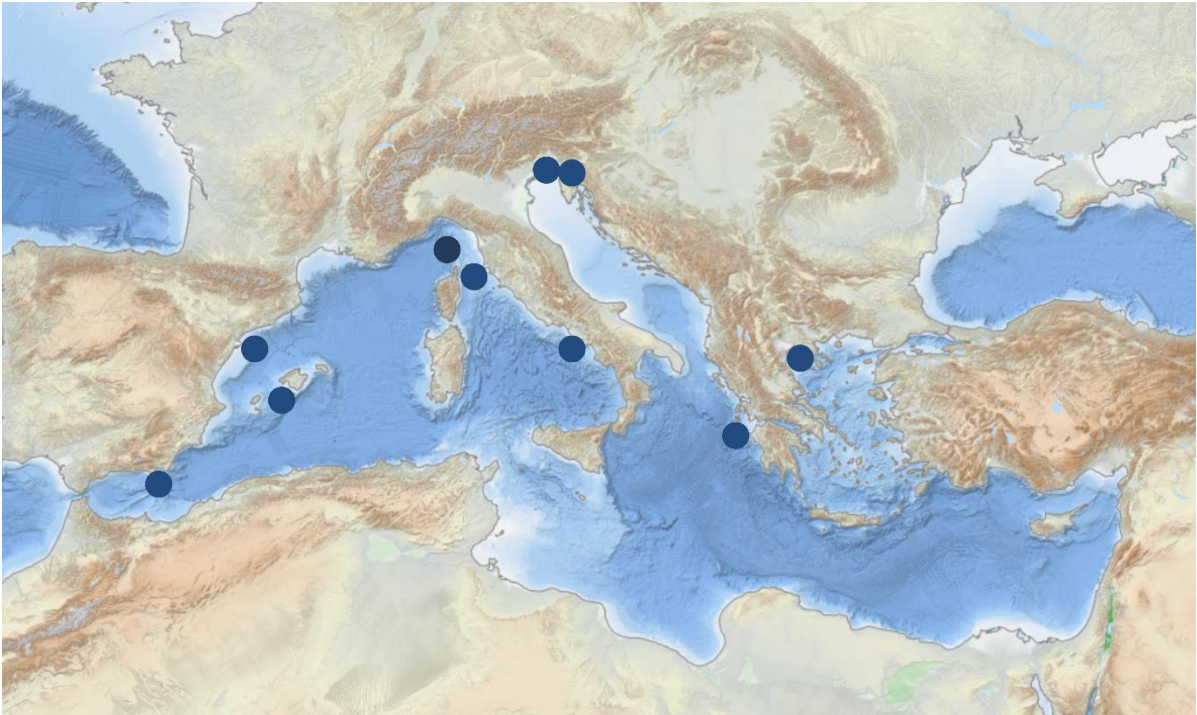













Figure 2-2. A map with the pilot MPAs.

**TABLE 2-1.** The tested Plastic Busters MPAs tested measures per pilot MPA.

Pilot MPA	Country	Tested measure	Measure type
<b>National Marine Park of Zakynthos</b>	GREECE	▶ Promoting SUPs-free beaches	
		▶ Developing an awareness raising campaign for cigarette-butt free beaches	
<b>Thermaikos Gulf Protected Areas</b>	GREECE	▶ Establishing a derelict fishing gear management scheme to tackle fisheries & aquaculture related litter	
<b>Miramare MPA</b>	ITALY	▶ Promoting the sustainable management of mussel farming nets	
<b>Pelagos Sanctuary</b>	ITALY	▶ Setting up a SUPs-free network of coastal food and beverage outlets	
<b>Tuscan Archipelago National Park</b>	ITALY	▶ Setting up a SUPs-free network of coastal food and beverage outlets	
<b>Strunjan Landscape Park</b>	SLOVENIA	▶ Setting up a SUPs-free network of coastal food and beverage outlets	
		▶ Setting up the adopt-a-beach scheme	
<b>Cabo de Gata-Níjar Natural Park</b>	SPAIN	▶ Developing a network of collection points for beverage containers	
<b>Natural Park of Ebro Delta</b>	SPAIN	▶ Setting up a reusable cup delivery system for beach bars and festivals	
<b>Cabrera National Park</b>	SPAIN	▶ Promoting best practices for reducing the use of SUPs	



### 3. Marine litter pilot actions in the National Marine Park of Zakynthos

#### 3.1. In a nutshell

<b>Pilot Action 1 Title</b>	<b>Promoting SUPs free beaches</b>
<b>Pilot MPA</b>	National Marine Park of Zakynthos, GREECE
<b>Partners</b>	National Marine Park of Zakynthos, University of the Aegean, MIO-ECSDE
<b>Lines of action</b>	<ul style="list-style-type: none"> <li>▶ Assess the willingness of tourism and recreation businesses to transform themselves;</li> <li>▶ Provide reusable alternatives to SUPs;</li> <li>▶ Engage with local communities and assess their perceptions on the issue of SUPs.</li> </ul>

<b>Pilot Action 2 Title</b>	<b>Developing an awareness raising campaign for cigarette-butt free beaches</b>
<b>Pilot MPA</b>	National Marine Park of Zakynthos, GREECE
<b>Partners</b>	National Marine Park of Zakynthos, University of the Aegean, MIO-ECSDE
<b>Lines of action</b>	<ul style="list-style-type: none"> <li>▶ Assess the attitudes of beach goers and beach users towards the discarding of cigarette butts in the park;</li> <li>▶ Carry out beach litter surveys and clean-up actions;</li> <li>▶ Promote sustainable practices towards cigarette butts' free beaches by:             <ol style="list-style-type: none"> <li>a. Distributing portable reusable and/or paper ashtrays at the beaches;</li> <li>b. Establishing smoking areas/spots on the beaches;</li> <li>c. Carrying out outreach actions targeting wide-ranging stakeholders;</li> <li>d. Installing cigarette butts' bins that are designed smartly.</li> </ol> </li> </ul>

#### 3.2. Context & overall approach

Within the framework of the Plastic Busters MPAs project, the National Marine Park of Zakynthos (NMPZ) in collaboration with the University of the Aegean (Dept. of Marine Science) and MIO-ECSDE implemented two pilot actions aiming to prevent and mitigate the effects of marine litter at the park.

The preliminary results of the Plastic Busters MPAs beach litter surveys indicated that the majority of the litter found was made of artificial polymer materials (95.4%), with some 23% of all plastic litter items being SUPs. Cigarette butts and filters ranked high in the top ten list of the most frequently encountered items in the beaches of the MPA; the majority of the litter items found were related to tourism and recreational activities. Within this context two measures were selected to be piloted in the park: (1) Promoting SUPs free beaches; (2) Developing an awareness raising campaign for cigarette-butt free beaches.



**FIGURE 3-1.** SUPs frequently encountered in the MPA.

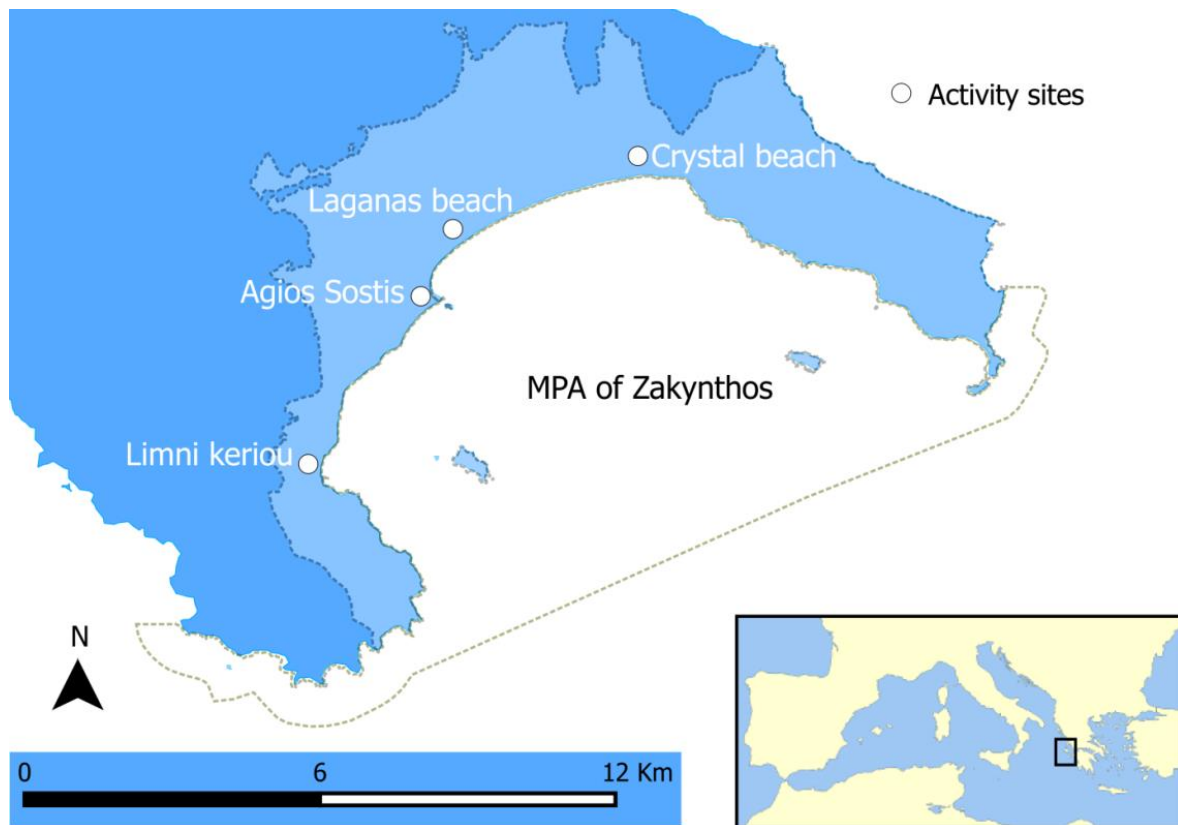


**FIGURE 3-2.** Cigarette butts and filters ranked high in the top ten list of the most frequently encountered items in the beaches of the MPA.

### 3.3. Main lines of action & results

The two pilot actions were implemented in the following 4 sites:

- ▶ Site 1. Crystal beach
- ▶ Site 2. Laganas beach
- ▶ Site 3. Limni Keriou beach
- ▶ Site 4. Agios Sostis harbour



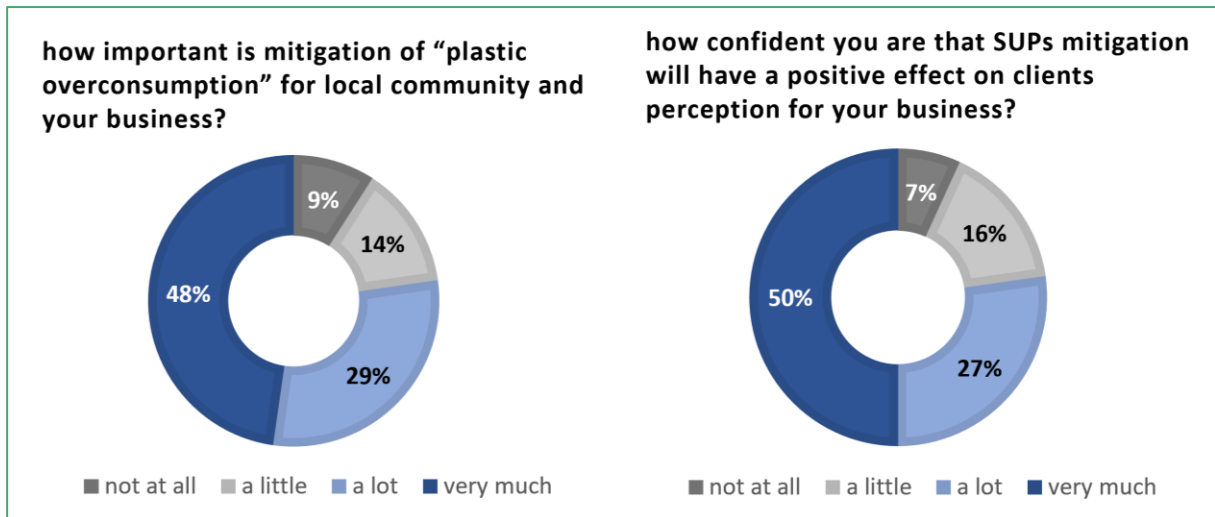
**FIGURE 3-3.** Map with the intervention sites.

### 3.3.1. SUPs-free beaches

#### **Survey targeting touristic businesses**

A survey targeting stakeholders of the tourism sector was carried out in order to assess their willingness to transform their business into more sustainable ones. Forty-eight (48) tourism and recreation related businesses participated in the survey with most of them operating only during the summer season. The vast majority of the businesses (88%) were micro-enterprises (<10 staff) and the remaining 12% were small enterprises (<50 staff). The touristic businesses were classified in six major categories (rooms to let, hotel, restaurant, bar/café, mini market, other; the latter category consists of businesses related to water sports, rent a bike, etc.

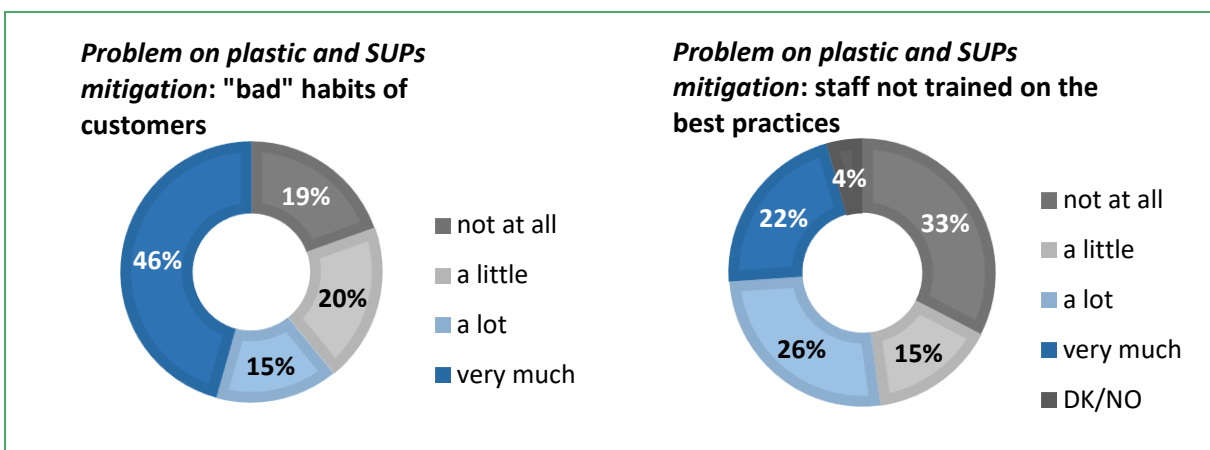
The majority of the businesses (77%, sum of the responses ‘very much’ and ‘a lot’) recognized the importance of the measures taken for the reduction in the consumption of plastic products for the local community and their businesses. Very few (14%) considered that the mitigation of plastic overconsumption is of low importance, while fewer considered that this is not at all important for the local community and businesses. Furthermore, most of the businesses (77%, sum of the responses ‘very much’ and ‘a lot’) are confident that the implementation of the measures for reducing significantly and/or phasing out SUPs such as straws and stirrers, cups, cutlery, plates, bottles, shopping bags, etc. will influence positively the perception of their clients.



**FIGURE 3-4.** Businesses perceptions on plastic (left) and SUPs mitigation (right).

Almost half of the businesses (47%, sum of the responses 'very much' and 'a lot') consider the high cost alternative products to substitute the routinely used SUPs as an obstacle to the implementation of the SUPs reduction measures in their business operations. In addition, about six to ten businesses (sum of the answers 'very much' and 'a lot') stated that the "bad" habits of customers (e.g., they take for granted that plastic straws will be offered to them drink their coffee or beverage) is a problem for the implementation of any related measures.

Almost half of the businesses (48%, sum of the responses 'very much' and 'a lot') underline the need of capacity building of owners and staff on ways to implement targeted measures to prevent and reduce the use of SUPs. However, three to ten businesses responded that the lack of staff training on the ways to minimize and/or phase out SUPs is not a major problem.



**FIGURE 3-5.** Businesses perceptions on the problems on plastic and SUPs mitigation caused by the 'bad' habits of customers (left) and the lack of staff training on the ways to minimize and/or phase out SUPs (right).

### **Promoting the reduction of SUPs**

In order to concretely promote the reduction of the use of single-use products, NMPZ in collaboration with the University of the Aegean carried a market search to identify environmental-friendly options for reusable cups and straws. The amount of 1,500 reusable cups made primarily of bamboo fiber with a silicone lid were purchased as well as 2,000 packs of paper straws (10 straws per pack).

**TABLE 3-1.** Specifications of the SUPs-free beaches related action.

<b>1. Number of materials produced</b>	<ul style="list-style-type: none"><li>▶ 1500 reusable cups</li><li>▶ 2000 packs of paper straws (20000 straws)</li></ul>
<b>2. Type of actors involved</b>	<ul style="list-style-type: none"><li>▶ Residents</li><li>▶ Tourists</li><li>▶ Businesses: beach bars, hotels, rental apartments, restaurants, cruises businesses, water sports services</li></ul>
<b>3. Number of people reached</b>	<ul style="list-style-type: none"><li>▶ Face-to-face: more than 300 people were reached, approximately 160 directly participated in the activities</li></ul>



**FIGURE 3-6.** The reusable cups and paper straws distributed.

A key aspect of the overall action was the identification of the distribution partner for the cups and straws. After careful consideration it was decided to distribute these promo materials via a local enterprise, namely the “Crystal Beach” Hotel and Bar which is located at the nesting beach of Crystal. This enterprise was identified as a partner for the implementation of this action as it met specific criteria that were set by the NMPZ Management Body. The criteria that were considered were:

- ▶ The long cooperation history between the enterprise and the Management Body of the NMPZ and the fact that the owner proved to be cooperative, motivated and committed to the process;
- ▶ The overall profile of the business in the area, which fully meets all legislations and regulations with respect to labour, the environment, human rights, health and safety issues and professionalism.
- ▶ The fact that the hotel management was willing to collaborate and invest in the sustainable development of the destination following a participatory approach. In fact, the business owner has been very positive in developing a tourism product based on the principles, characteristics and requirements of the NMPZ. ecotourism strategy.

In order to establish this collaboration, a cooperation agreement (Memorandum of Understanding - MoU) was signed between the owner of this enterprise and the NMPZ Management Body. Within this

framework, both parties agreed into setting up a reusable cup delivery system for the customers of the hotel in order to minimize SUPs and specifically plastic cups in the nesting beaches of the NMPZ. A basic requirement of this cooperation agreement was that the hotel should distribute the reusable cups and paper straws at no charge for customers.



**FIGURE 3-7.** *The Crystal Beach hotel and bar.*

The NMPZ Management Body supervised and monitored the cups and straws distribution procedure as to ensure the proper implementation of the action, identify malfunctions and come up with the proper formula in order to replicate the action. Monitoring of the action showed that the use of reusable cups and paper straws was successful, as most customers chose to refill their reusable cup instead of using a SUP cup and straw. Additionally, the clean-up operations conducted on regular basis at the nesting beach by the NMPZ staff showed that after the implementation of this action the quantity of SUPs (cups and straws) was significantly reduced.

It should be highlighted that the Management Body of the NMPZ in the framework of developing ecotourism activities in the area of the park, has developed the ‘National Marine Park of Zakynthos Eco-label’ project. In line with the related Greek legislation and by following the required procedure of the Ministry of Development and Investments, the Management Body of the park designed and certified a logo/trademark for three sustainable activities that take place in the Park: Sea Tours, Turtle Spotting and Sustainable Fishing. Currently, the NMPZ Management Body has initiated the procedures for registering the ‘Green accommodation – Green houses’ ecolabel which will certify the cooperation of the NMPZ Management Body with hotel units that focus on sustainability in their business practices and promote the prevention and mitigation of waste and especially disposable plastics. The SUPs free beach bars practice will be an additional criterion to be integrated in the related MoU between a hotel enterprise and the NMPZ Management Body.



**FIGURE 3-8.** *The labels of the 3 ecotourism related activities.*

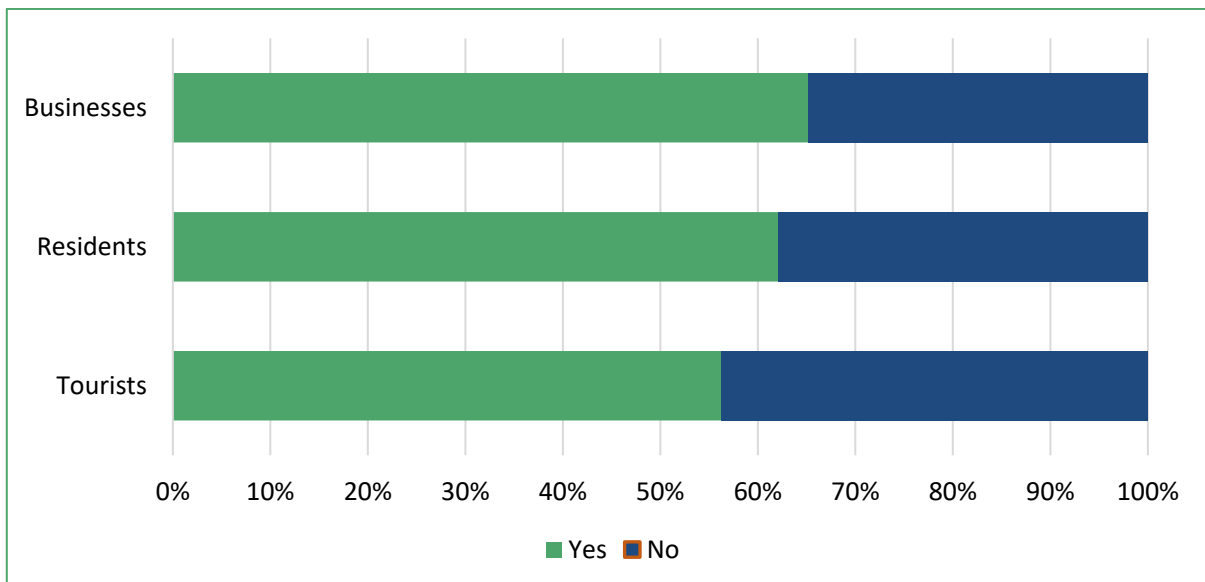


**FIGURE 3-9.** The ‘Green accommodation – Green houses’ label.

**Engaging with local communities and assessing their perceptions on SUPs**

The Management Body of NMPZ engaged with local communities and tourists in order to assess their perceptions on the issue of SUPs; the survey results will be used to design targeted measures to tackle SUPs. The survey took place in the wider area of Laganas Bay and in the city of Zakynthos. In total, 159 respondents took part in the survey. The respondents were evenly distributed (50%) based on their gender. In addition, a wide range of ages, from <15 to 69 years old, was recorded, while the most frequent ages of the participants were between 21 and 49 years old. The primary aim of the survey was to target different stakeholder groups that are considered to be involved in or affected by the plastic pollution issue in the study area. Thus, businesses related to tourism and recreation activities (hotels, restaurants, canteens, cafes, snack bars, etc.), residents and tourists were engaged in the survey.

The survey results were insightful. Only 62% of the respondents were aware of the SUPs related directive, while 38% of them had not heard of it. The responses of the 3 stakeholder groups differ, with the businesses being more aware about the SUPs legislation.



**FIGURE 3-10.** Responses of the three stakeholder groups (%) on the question “Do you know that a new legislation for SUPs came to force in July?”.

Nonetheless, 84% of the participants considered themselves ready to respond to the new measures both at the level of their day-to-day life and businesses management. Tourists appear much more prepared to comply with the EU restrictions on SUPs and use (93%), while the residents and businesses stated almost the same level of readiness, 82% and 85%, respectively.

When asked about the waste disposal facilities, all three stakeholder groups were of the opinion that the absence or sparseness of proper waste disposal facilities (e.g., common bins, recycling bins) is the determinant factor of the presence of litter on the beaches of the area.

It was very encouraging to see that some 90% of the respondents expressed the willingness to participate in relevant actions. A large fraction of the respondents representing businesses (72%) and residents (66%) reported that they use biodegradable plastic products as a more sustainable alternative, whereas the answers regarding the use of oxo-degradable plastic products were fewer; 45% and 47%, respectively. It is quite possible that the term 'oxo-degradable' was unknown to the participants while the term 'biodegradable' sounded more consistent with the goals of the survey. It must be mentioned that the definition of both terms was provided to the survey participants and the differences in their degradation process and products were explained, while some examples of both types of SUPs used in everyday life were given. Their replies highlight the great confusion of the wider public regarding optimum solutions and alternatives to SUPs; biodegradable and oxo-degradable plastics pollute the coasts and seas just like conventional plastics, as they behave quite differently in the marine environment than in a terrestrial setting (landfill, composter) where the conditions required for rapid biodegradation are unlikely to occur.

### 3.3.2. Cigarette butts free beaches

A survey was run in order to assess the attitudes of beach goers and beach users towards the discarding of cigarette butts in 3 locations of the park (Daphni beach, Kalamaki beach, Agios Sostis beach). Concerning cigarette butts, the following pre-defined behaviours were included in the survey sheet:

**TABLE 3-2.** Pre-defined behaviours for cigarette butts included in the survey form.

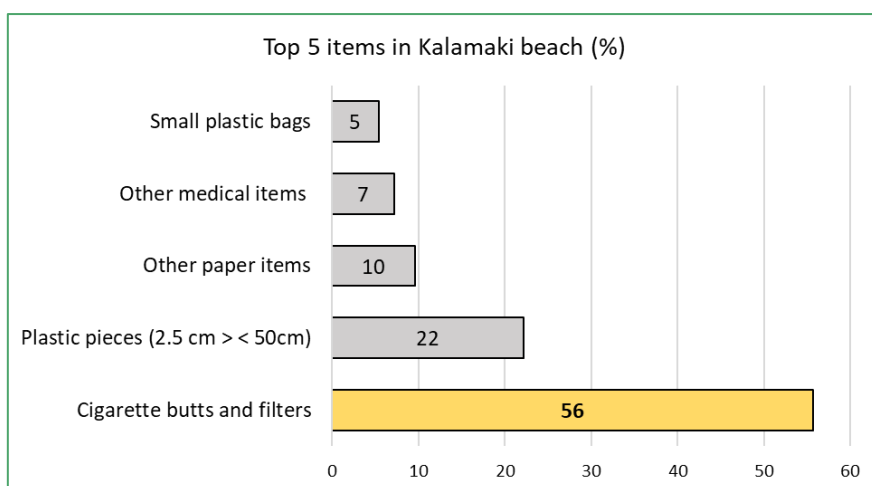
<i>Pre-defined behaviours</i>
A.5 Gathered the cigarette-butts
A.8 Left cigarette butts in the sand
C.1 Read the informative materials found at the beach
C.2 Brought/made an ashtray
C.4 Any other behaviors

None of the aforementioned behaviours were recorded in the three survey sites in autumn, while the same occurred in the summer season at the beaches of Daphni and Kalamaki. The only behaviour recorded was the A.5 (Gathered the cigarette butts); it was recorded at Agios Sostis in the summertime and corresponded to the 21% of the total behaviours recorded.

#### **Beach litter surveys & cleanup actions**

Beach litter surveys and clean-up actions were implemented by at Kalamaki beach. Cigarette butts were the most frequently found items during the summer survey; they amounted to 56% of the total items recorded. The abundance of cigarette butts appears to be high only in the summer period, while it is much lower during the rest of the year. Similar findings were obtained by beach surveys carried out at Vrontonero beach, located nearby Kalamaki beach.





**FIGURE 3-11.** Percentages of the top 5 litter items recorded in the beach litter surveys at Kalamaki beach during summer.

### **Promoting sustainable practices for cigarette butts**

For the scope of this action 2,000 reusable paper ashtrays were purchased and distributed by the “Crystal Beach” Hotel and Bar, a partner enterprise of the park. The paper ashtrays were distributed to all customers of the hotel in order to use them when visiting the nesting beach in front of the hotel. Additionally, the paper ashtrays were distributed to all visitors of the Kalamaki Beach (at the entrance of the beach by staff of the hotel). The provision of paper ashtrays was made without any economic benefit for the enterprise, and the NMPZ Management Body supervised the implementation of this activity.

Additionally, an awareness raising campaign was developed aiming at banning the dumping of cigarette butts on the nesting beaches of the National Marine Park of Zakynthos. Within the framework of this campaign, the NMPZ Management Body designed information signs with the key message “Cigarette-butt and single use plastic free beaches” and placed these signs in key areas of the Laganas Bay (the port of Agios Sostis, the beach of Laganas, the beach of Keri). The installation of the signs also brought positive results. Based on the cleanups of the nesting beach of Kalamaki which are conducted on regular basis by the NMPZ staff, alongside with the SUPs, the quantity of discarded cigarette butts was significantly reduced.

**TABLE 3-3.** Specifications of the cigarette butts related action.

1. Number of materials produced	▶ 2,000 reusable paper ashtrays
2. Type of actors involved	▶ Residents ▶ Tourists ▶ Businesses: Beach bars, hotels, rental apartments, restaurants, cruises businesses, water sports services
3. Number of people reached	▶ Face-to-face: more than 300 people were reached; approximately 160 participated directly in the activities



**FIGURE 3-12.** The reusable paper ashtrays



**FIGURE 3-13.** The information signs installed by the NMPZ Management Body.

### 3.4. Challenges & lessons learned

This paragraph features the main lessons learned drawn based on the overall experience of the two pilot actions in the NMPZ and outlines some recommendations for future actions:

- ▶ The installation of additional waste bins with larger storage capacity for both recyclable and non-recyclable litter on the beaches or near the beaches will significantly contribute to enhanced SUPs disposal at the sea turtle nesting sites and the park's beaches in general.

Furthermore, the frequency of waste collection operations needs to be significantly increased during the summer season.

- ▶ Single-use plastic cups are among the most frequently found items, either properly discarded in the waste bins or found lying outside the bins. The promotion of reusable cups contributed to reduced amounts of single-use cups used, paving the way for the abatement and/or phase out of this type of items. Within this context further actions need to be undertaken by tourism and recreation businesses following the waste hierarchy, where waste prevention and re-use are the most preferred options, followed by recycling or composting.
- ▶ Although, participants to the survey stated that they are ready to face the plastic pollution issue and have already investigated alternatives to SUPs, they had an obvious difficulty to understand the meaning of different definitions such as biodegradable and oxo-degradable, and thus were confused about the different products, their use and impact. Furthermore, they were not aware that some of the products used in their daily lives and business operations contain plastic materials. These findings highlight the necessity of actions to increase awareness of beach users on the SUPs issue (sources, pathways, properties, impacts and solutions).
- ▶ Training of business staff to build the necessary capacities and skills to implement targeted measures to prevent and reduce the use of SUPs in the daily operations of their businesses is essential.
- ▶ The awareness of beach users on the detrimental effects of cigarette butts' pollution, should be strengthened through education for sustainable development programs and public participation activities.
- ▶ The production and distribution of portable, reusable paper ashtrays, was considered to be an appropriate solution to tackle the issue of cigarette butts found on nesting beaches, compensating the lack of ashtrays on the beaches. Supplementary portable ashtrays production and/or fixed ashtrays settlements on the beaches will help minimize further the abundance of this marine litter.
- ▶ On-going monitoring of marine litter through visual surveys could be used in the following years, as a valuable tool to assess the effectiveness of the park's actions and facilitate the identification of new litter related threats, such as those produced by SUPs related to COVID-19.

## 4. Marine litter pilot action in Thermaikos Gulf Protected Areas

### 4.1. In a nutshell

<b>Pilot Action Title</b>	Establishing a derelict fishing gear management scheme to tackle fisheries & aquaculture related litter
<b>Pilot MPA</b>	Thermaikos Gulf Protected Areas, GREECE
<b>Partners</b>	MIO-ECSDE, iSea, Management Authority of Thermaikos Gulf Protected Areas, BlueCycle
<b>Lines of action</b>	<ul style="list-style-type: none"> <li>▶ Monitor and assess the presence of DFG</li> <li>▶ Promote best practices among the fisheries and aquaculture sectors for the proper collection and management of DFG</li> <li>▶ Set up a derelict fishing gear management scheme and install collection bins in selected sites</li> <li>▶ Organize stakeholder engagement and awareness-raising activities targeted also to the local communities</li> </ul>

### 4.2. Context & overall approach

The Plastic Busters MPAs marine litter pilot in Thermaikos Gulf Protected Areas aimed at showcasing how a derelict fishing gear (DFG) management scheme can be established and how the sustainable management of such gear can be ensured with the involvement of the fisheries and aquaculture sectors. The pilot action placed special emphasis on mussel nets.



**Figure 4-1.** Derelict fishing gear on the coastline of the Thermaikos Gulf Protected Areas (Photo © iSea).

Derelict mussel nets are a major issue for the entire coastline of the western part of Thermaikos Gulf, which hosts a large number of marine mussel farms and is responsible for almost 80-90% of the national mussel production. Due to the intense mussel farming activities in the area, high volumes of plastic waste of mussel nets are being generated and mismanaged. The main causes of DFG are numerous and vary between and within fisheries and aquaculture activities. Direct causes of DFG include factors such as the weather; 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. Illegal incineration of the nets has been reported to take place as well.

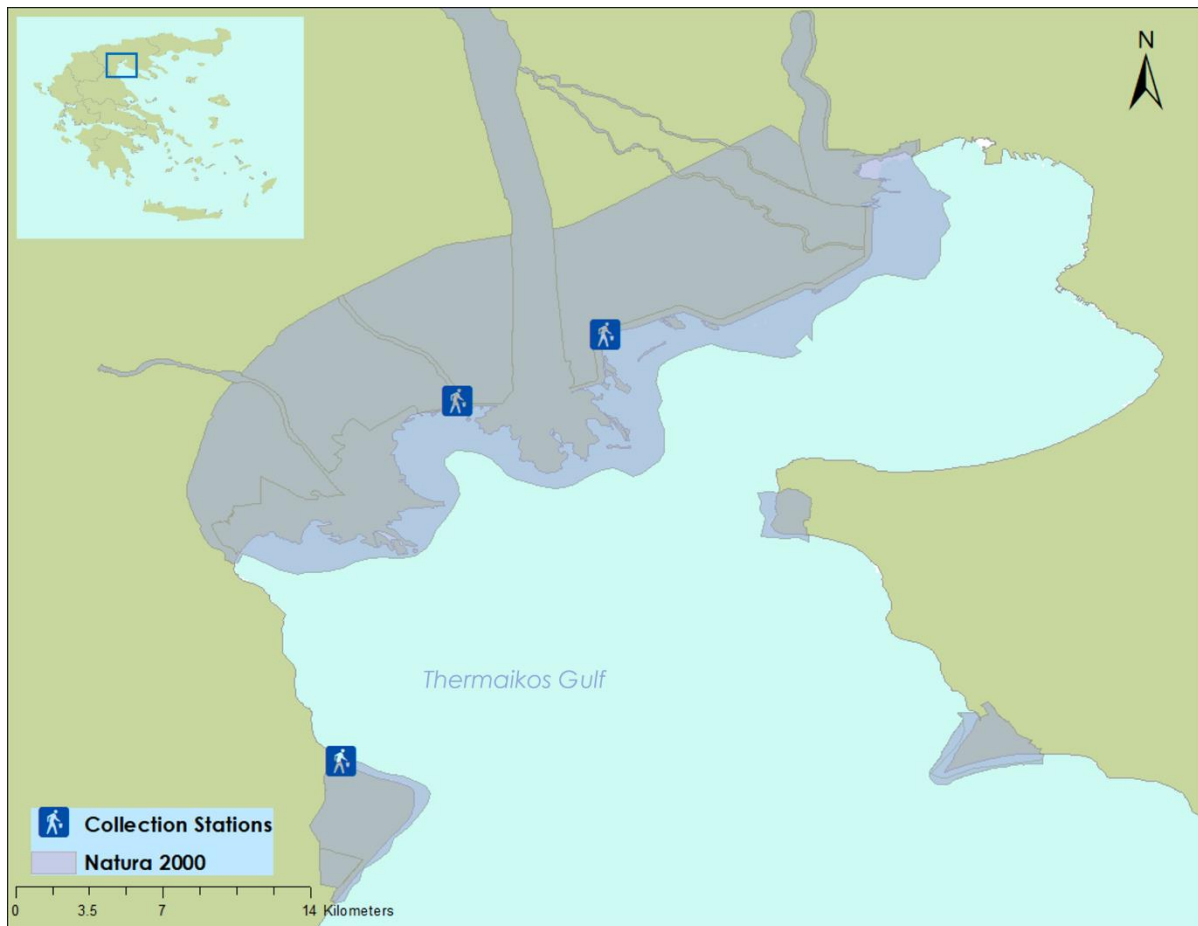


**FIGURE 4-2.** Mussel nets collected in the Thermaikos Gulf Protected Areas (Photo © iSea).

### 4.3. Main lines of action & results

The pilot action was implemented in three different locations of the Thermaikos Gulf Protected Areas: the area of Alykes Kitrous, the area of Chalastra and the area of Loudias estuary. These areas host the majority of Greece's mussel farming units and they produce annually some 40,000 tons of mussels. Instrumental to the identification of the pilot areas were the inputs obtained via interviews by mussel farmers and their respective associations, as well as representatives of port authorities and local authorities. The interviews focused on issues related to the types and quantities of mussel farming related litter items, the availability of related disposal facilities, etc.

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**Figure 4-3.** The 3 locations of the pilot action.

Beach litter surveys were carried out at the three pilot areas, in accordance with the methodological approach featured in the Plastic Busters MPAs marine litter monitoring toolkit. In all cases the beaches were considered as “very dirty” according to the Clean Coast Index and the European Threshold Value for beach litter (20 items per 100 meter stretch of beach). An average of more than 250 mussel nets (including pieces) were recorded in every 100-metre transect surveyed per pilot area and more than 300 strings and cords (including pieces). The latter items, which are the most abundant items in the pilot areas, originate from the mussel farming activities; in fact, these particular strings and cords are used for tying the mussel nets and hanging them on the long lines and/or the poles. Some 73% of the total litter items surveyed were directly linked to fishing and mussel farming activities as shown in the table below. Other litter items found that are directly related to fishing and mussel farming activities included floats for fishing nets, ropes and fishing lines, sinkers, hooks, bait packaging and fish boxes.

The amounts of fisheries and mussel farming related litter items disposed of were assessed, also by means of a questionnaire targeting fishers and mussel farmers. A total number of 15 respondents (8 fishers and 7 mussel farmers) confirmed the findings of the beach litter surveys. According to the respondents, more than 3.000.000 mussel nets are used annually and a large amount of these are lost, discarded or disposed in Thermaikos Gulf. The amount of strings and cords is higher based both on the beach survey’s findings and the participants’ responses to the questionnaire.

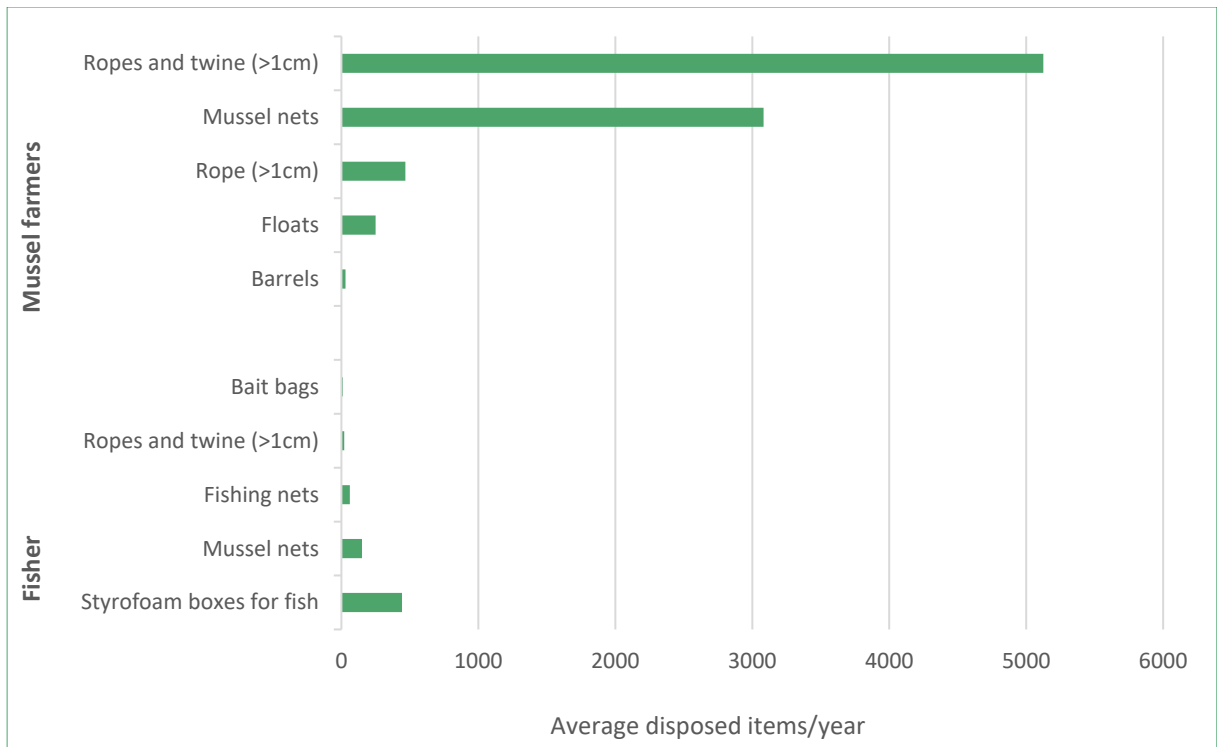
**TABLE 4-1.** The top 10 litter items recorded in the pilot areas (expressed in percentage of total litter abundance).

	ITEM	%
1	Plastic strings and cords (diameter less than 1 cm)	39.6
2	Mussel nets, Oyster nets	33.5
3	Plastic drink bottles >0.5l	6.5
4	Floats for fishing nets	4.5
5	Plastic drink bottles <0.5l	3.4
6	Plastic cups and cup lids	3.4
7	Polystyrene pieces 2.5cm > < 50cm	2.9
8	Plastic pieces 2.5cm > < 50cm	2.3
9	Plastic shopping bags	1.9
10	Plastic caps/lids from drinks	1.6

The data obtained from the beach litter surveys and from the questionnaires were used to raise the awareness of local communities and engage all stakeholders in setting up a derelict fishing gear management scheme. Collection points for DFG were setup in several locations and the logistics associated with the full value chain of recycling (collection, cleaning, sorting, transportation) were defined, while best practices for the proper collection and management of DFG were disseminated to the local fisheries and the aquaculture sector.

The following results were achieved in each one of the three pilot areas:

- ▶ **Chalasta.** A total amount of 7.5 tons of disposed mussel nets were removed from the Chalastra fishing port, in collaboration with the Municipality of Delta and the Agricultural and Fishery Association of Delta Municipality. Two large collection bins for bulk waste material were installed, since there were no adequate facilities in place for the storage of the collected DFG and their subsequent transfer to the BlueCycle facilities for recycling.
- ▶ **Loudias estuary.** A total of 14.3 tons of abandoned mussel nets were removed from the estuary of Loudias, in collaboration with the Municipality of Delta, the Agricultural and Fishery Association of Delta Municipality, the Region of Central Macedonia.
- ▶ **Alykes Kitrous.** A roadmap with the exact number and areas identified for the installation of separate bins for DFG was elaborated, in collaboration with the Municipality and the local mussel farming association. The bins selected were similar to the ones already used for the municipal solid waste, considering that the Municipality provides the means and facilities for the temporary storage of the collected mussel nets until their final transportation to the BlueCycle facilities for recycling. The role of each stakeholder involved is defined in a common collaboration agreement and the separate collection of the area's disposed mussel nets will begin upon official signature of the agreement from the competent authorities.



**FIGURE 4-4.** The top 5 aquaculture and fisheries related items disposed per fisher/mussel farmer annually.



**FIGURE 4-5.** The end product from the mechanical recycling of mussel nets (Photos © iSea).



#### 4.4. Challenges & lessons learned

In order to ensure the sustainability of the demo, every action was designed and implemented in order to meet the beneficiaries' needs and capacities. Within this context, the DFG collection stations were decided to be installed close to the areas where the mussel farmers and fishers already dispose of their nets. These areas can easily be reached by boat and are in the vicinity of the locations where the DFG processing takes place, right before they are shipped off to the recycling facility. Furthermore, the DFG collection points are placed in areas where related municipal facilities are located such as waste storage places, waste collection machines and transportation vehicles.

One of the biggest challenges of the demo implementation was related to the logistics involved in the collection, storage and transportation of the DFG. Due to the large volume of the mussel nets collected in the demo areas, finding a cost-effective way for their transportation to the recycling plant located in Athens was not easy, considering that the profit from the recycling of mussel nest is lower than their transportation cost. For a long-term implementation of the measure piloted additional resources for the transportation of the collected mussel nets need to be allocated.

Apart from the challenges relevant to the logistics, conflict of interest among different stakeholders in the area emerged. A collaborative conflict resolution approach coupled with a bottom-up approach, proved to be the most efficient way to address the issue. The involvement of different stakeholders in all the steps process, was extremely valuable for the elaboration of a sound and suitable design for the DFG scheme, while it also induced teamwork towards a common goal, softening the disagreements that arose.

Consultations and interaction among different stakeholders not only led to common decisions, but also proved to be a means of pressure for drawing attention to the issue by the decision makers. In addition, it set the baseline for involving stakeholders in environmental issues with the aim to develop their pro-environmental attitude and behaviour within the context of their activities. Finally, managing to create an alliance among key players for local issues provides further opportunities for participating in processes towards the improvement of environmental issues of the area.



**FIGURE 4-6.** Derelict fishing gear removal from the coastline of the Thermaikos Gulf Protected Areas (Photo © iSea).

## 5. Marine litter pilot action in Miramare MPA

### 5.1. In a nutshell

<b>Pilot Action Title</b>	Promoting the sustainable management of mussel farming nets
<b>Pilot MPA</b>	Miramare MPA, ITALY
<b>Partners</b>	SCP/RAC, SHORELINE Community Cooperative, the Management Body of the Miramare MPA, ITTIOMAR Community Cooperative
<b>Lines of action</b>	<ul style="list-style-type: none"> <li>▶ Identify best practices for the sustainable management of mussel nets and the reduction of related releases into the marine environment;</li> <li>▶ Provide training to concretely promote the uptake of these sustainable management practices by mussel farms;</li> <li>▶ Organize stakeholder engagement and public awareness raising activities;</li> <li>▶ Explore the option of alternative materials (i.e. cotton and hemp) and demonstrate how this could be considered as a best practice within the sector.</li> </ul>

### 5.2. Context & overall approach

Within the framework of the Plastic Busters MPAs project, SCP/RAC (Regional Activity Centre for Sustainable Consumption and Production) in collaboration with the SHORELINE cooperative, launched a marine litter demo at Miramare Marine Protected Area (MPA) to promote the sustainable management of mussel farming nets.



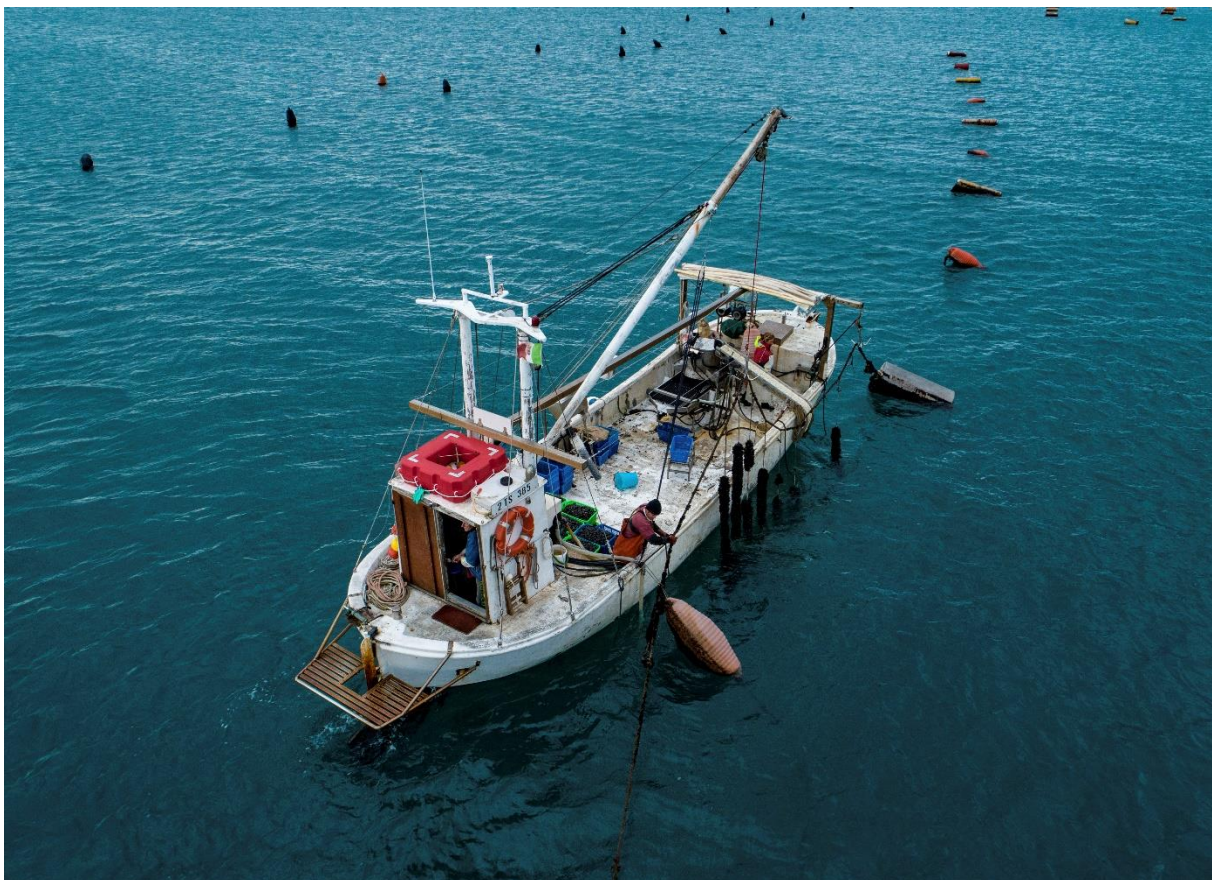
**FIGURE 5-1.** Mussel nets washed ashore on the beaches of the Miramare MPA (Photo © Miramare MPA archive).

The recording and analysis of the marine litter found ashore at Miramare MPA show that mussel nets are consistently present on the beaches of the MPA and that together with fragments of polystyrene fish boxes, they constitute the most pervasive types of marine litter. This evidence is based on quantitative and qualitative data obtained in recent years, in particular within the framework of the Interreg Med ACT4LITTER project. Based on marine litter snapshot assessment of the ACT4LITTER project, the Miramare MPA beaches were classified as “dirty”, due to the high number of litter items recorded.

The presence of mussel nets on the coastline of the Miramare MPA is directly attributed to the maricultural activities taking place in the area. Mussel farming is well-developed in the Gulf of Trieste. To-date, 15 companies are operational, producing a total amount of 3,550 tons/year of mussels. In line with the MPA’s marine litter action plan elaborated within the framework of the ACT4LITTER project, targeted awareness raising actions and the promotion of best practices were considered as a priority for tackling marine litter in the area. In particular, the mussel farmers, whose installations are located as close as 700 m from the protected area, were identified as a priority target group.

The pilot action at Miramare MPA aimed at raising the awareness of the maricultural sector on the problem of marine litter generated by the sector and on best practices to eliminate the marine litter generated by mussel-farming. Within this context relevant best practices for the management of mussel nets (from use and collection to final disposal) were identified, while also the option of replacing existing plastic mussel nets with nets made from vegetable fibres was explored as a more sustainable option.

The pilot action directly involved six mussel farming companies operating in the gulf of Trieste (Trieste province). In addition, close collaboration was established since the very beginning of the action with the Union of Mussel Farmers (Consorzio Giuliano Maricoltura), the Chamber of Commerce and the Regional Office for Fisheries (Hunting and Fish Resources Department).

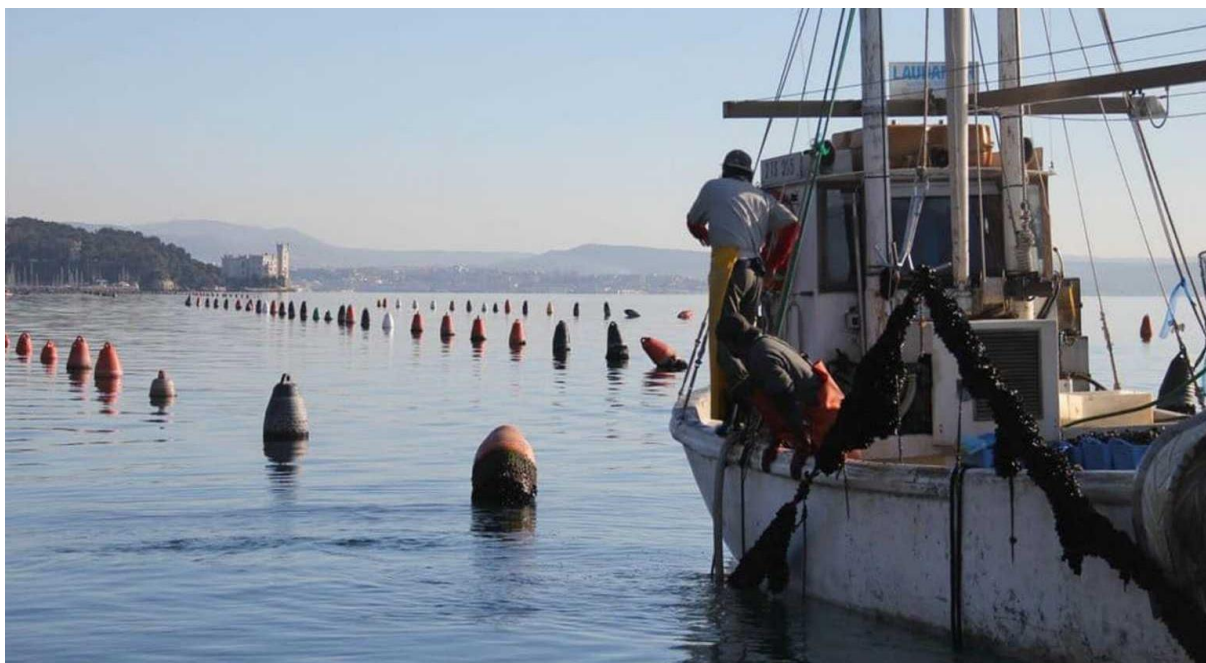


**FIGURE 5-2.** Mussel farming in the Gulf of Trieste (Photo © Fabio Papalettera).

### 5.3. Main lines of action & results

#### *Outreach and communication actions*

At the very beginning of the pilot action preparatory meetings were carried out with the involvement of the management body of the Miramare MPA and other relevant local stakeholders -mussel farmers, representatives of the Chamber of Commerce, representatives of local authorities. Furthermore, several communication actions were undertaken and information on the pilot action was disseminated via the MPAs channels and tools (newsletter, social media, etc.) but also via local newspapers, the national radio, events (i.e. the ECOMONDO fair), etc.



**FIGURE 5-3.** Mussel farm in the vicinity of the Miramare MPA (Photo © Carlo Franzosini).

#### *Identifying and promoting best practices for the sustainable management of mussel nets*

Two major practices were identified as a key when it comes to reducing the amount of mussel nets that ends up in the coastal and marine environment:

- ▶ **Installation of bins for net cuttings onboard.** Targeting net cuttings waste at its source is the most effective way to prevent material from becoming marine litter. Several bins for the collection of mussel net cuttings with a storage capacity of 40 litres were distributed to the six boats participating in the pilot action. These bins were explicitly made for the purpose of the pilot action and they were characterized by a tubular net section wrapping a segment of pipe topped by a cone made from disused floater (acting as a funnel). The pipe and funnel are then removed, leaving the tubular net segment filled with all the collected residues.
- ▶ **Distribution of bags and pouches for net cuttings.** Bags and pouches for net cuttings can be made easily and inexpensively. Within the context of the pilot action pouches were distributed to the staff onboard of the maricultural vessels for the collection of the mussel net cuttings (the 'tails' of the nets). The design for the pouch must fit the staff's needs and should not get in the way of their work. The design of the pouch was inspired by the 'Le Sacabout pouch', a related pouch designed by Maëlis Audugé (a student in fishing and environmental management at Le Guilvinec Maritime College in Brittany, France).



**FIGURE 5-4.** The bins for the net cuttings installed onboard the maricultural vessels (Photos © Walter De Walderstein).

#### ***Seafloor survey and litter removal actions***

A seafloor survey via scuba diving was performed to collect valuable photovideo documentation on the environmental state of the seafloor below the mussel farms. A group of divers was accompanied to the breeding facilities of the maricultural farms by the mussel farmers. Video footage (it can be found [here](#)) taken underneath the installations showed the presence of a large number of residual materials lying on the seabed: cordage, anchoring blocks, mussel nets. The video footage will be used to estimate the amount of materials to be removed in the upcoming seabed clean-up operations, which are expected to lead in a significant reduction of beached mussel farming related litter items.



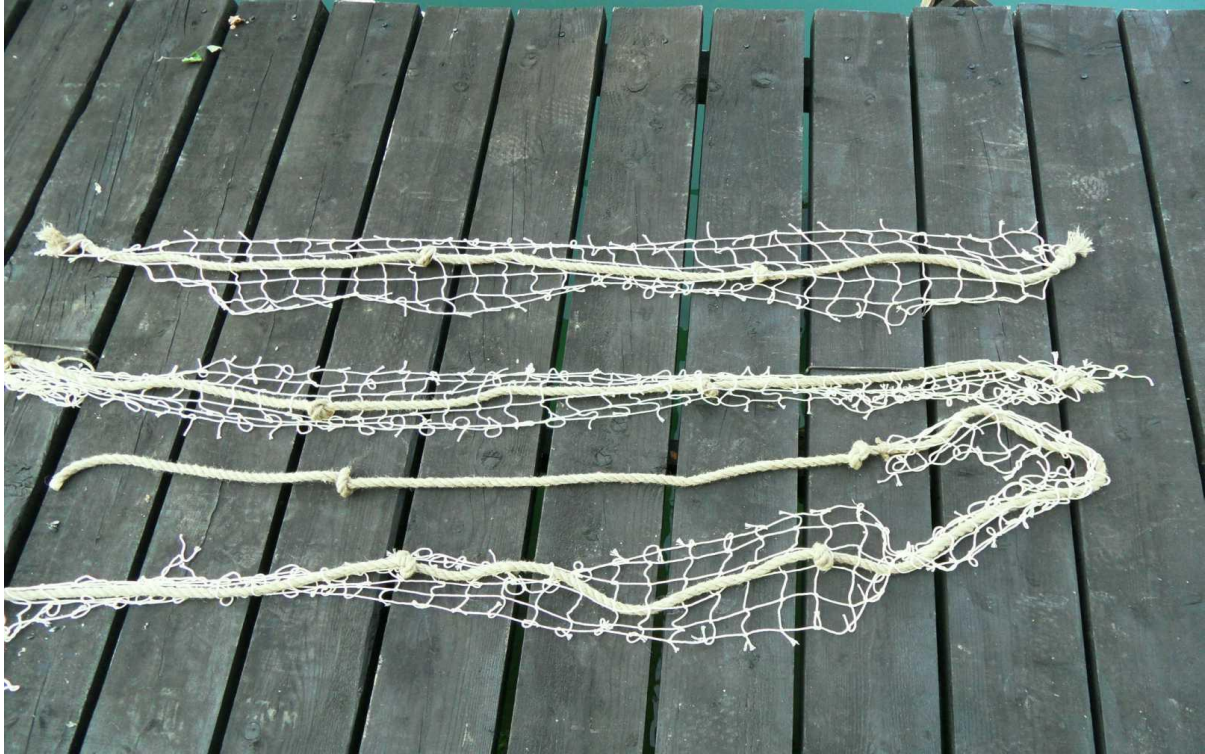
**FIGURE 5-5.** Mussel nets on the seafloor below the mussel breeding plants (Photo © Walter De Walderstein).

#### ***Testing natural fibres as an alternative material for plastic mussel nets***

Within the framework of the pilot action the use of natural fibres as an alternative material for plastic mussel nets was explored. To that end, 100 3-metre long tubular nets made of vegetable fibres were hand made. Two different types of nettings (with and without horizontal pegs) and two different types of fibres for the outer net (cotton and hemp) have been used for the testing. In each of the tubular nets a cord made of vegetable fibres was also inserted in order to potentially increase the mechanical strength of the mussel net. This is the first time that this kind of technique is used. Lastly, vegetable fibres (cotton) were tested in developing lightweight panel arranged horizontally in order to act as catchers of juvenile mussels. The cotton mesh panel was tested as an alternative to the practice of collecting juvenile mussels on stretches of plastic tubular net.



**FIGURE 5-6.** Cotton lightweight mesh panels tested. Mesh panels are used to catch of juvenile mussels (Photo © Walter De Walderstein).



**FIGURE 5-7.** Mussel nets made of vegetable fibres (Photo © Walter De Walderstein).



**FIGURE 5-8.** The tubular mussel nets made of vegetable fibres, filled with juvenile mussels and ready to be placed into the sea (Photo © Walter De Walderstein).

## 5.4. Challenges & lessons learned

The kickstarting of the pilot action coincided with the summer holidays which inhibited to some extent the effectiveness of the communication and stakeholder engagement actions. The period after the summertime was also no ideal as this is the mussels harvesting time and mussel farmers are very busy. Nevertheless, a large number of mussel farmers and other stakeholders were directly reached, providing a good solid starting point for the upcoming awareness raising activities on sustainable mussel farming. To that end, the video footage produced by the pilot action featuring the large amount of mussel farming related waste deposited on the seafloor is considered instrumental as it will also be used to raise the awareness of mussel byers.

The pilot action successfully demonstrated that bins and pouches for the collection of mussel net cuttings are a practical, simple, inexpensive and easy to implement solution for the significant reduction of the amount of mussel nets and mussel farming waste that ends up in the coastal and marine environment. Furthermore, these user-friendly practices can be easily adapted to the individual mussel farmer's working environment. This is precisely why these practices were well-received by the mussel farmers involved in the pilot action, who committed themselves to identify additional ways to minimize the losses of mussel net cuttings in the sea.

The testing of mussel nets made of vegetable fibres didn't give conclusive results as more time is required (the life cycle of mussels corresponds to 12-15 months) in order to obtain valuable insights on the mussel growth rate on these nets, as well as their mechanical strength in terms of withstanding the weight of the mussels, which is increasing over time, and the stresses of the waves. It is evident that this kind of experiments require time and multiple testing conditions before an alternative material can be considered as an optimum solution in terms of applicability, productivity and environmental performance. The preliminary results indicate that hemp is a very well-performing material for the tubular mussel nets. Regarding the vertical cordage that holds the tubular net and is attached to the horizontal rope, further testing is required, as cotton alone was not strong enough to hold the increasing weight of the tubular net. To this end agave fibres will be tested. Hemp, and even better agave fibres, are more durable but they are hard and stiff and therefore are more difficult to process. Lastly, one major challenge is associated with the manufacturing process of the mussel nets made of vegetable fibres; the existing machinery currently used to fill plastic tubular nets with mussels will have to be adjusted in order to be able to use materials from vegetable fibre instead of plastic.



## 6. Marine litter pilot action in Pelagos Sanctuary & Tuscan Archipelago National Park

### 7.1. In a nutshell

<b>Pilot Action Title</b>	Promoting SUPs-free businesses & cigarette butt-free beaches
<b>Pilot MPA</b>	Pelagos Sanctuary & Tuscan Archipelago National Park, ITALY
<b>Partners</b>	EXELIXIS, HCMR & UNICI
<b>Lines of action</b>	<ul style="list-style-type: none"> <li>▶ Identification of the pilot areas;</li> <li>▶ Mapping of stakeholders and relevant businesses;</li> <li>▶ Development of communication &amp; outreach materials;</li> <li>▶ Engaging with businesses and signing the SUPs-free commitment;</li> <li>▶ Elaboration of guidelines for reducing the use of SUPs.</li> </ul>

### 7.2. Context & overall approach

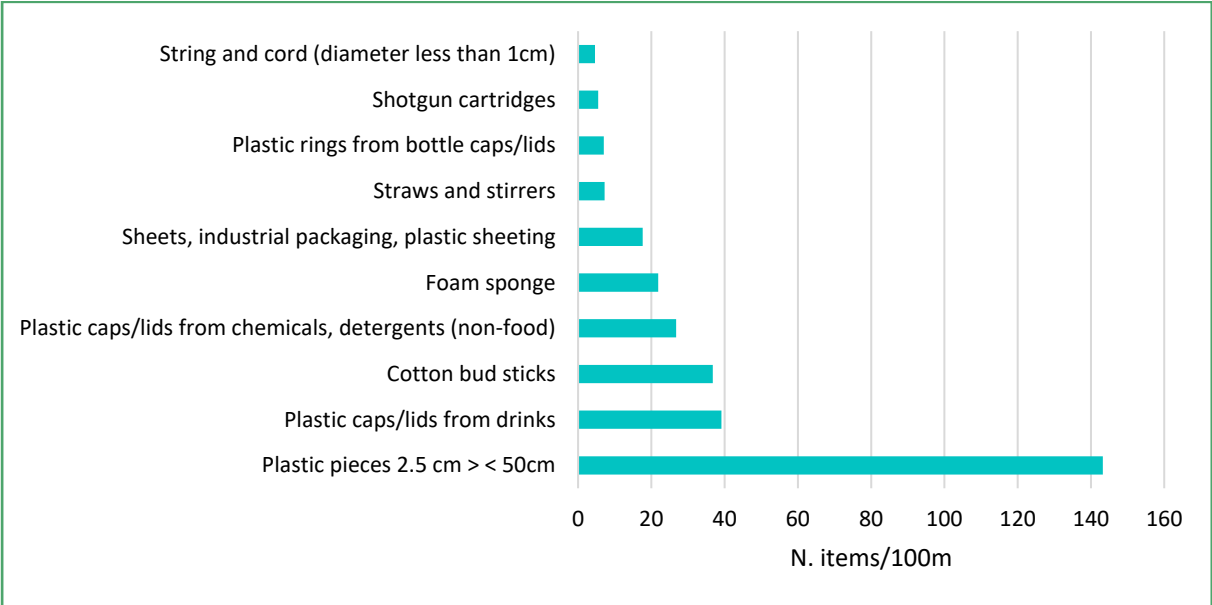
The Plastic Busters MPAs marine litter pilot action in Pelagos Sanctuary and Tuscan Archipelago National Park aimed at reducing single-use plastics and cigarette butts. Single-use plastics, including cigarette butts are among the most frequently found items on the beaches of the two protected areas.

The pilot action was two-fold and aimed to operationalize two prevention measures shortlisted within the Plastic Busters MPAs project: (i) Establishing SUPs-free beach bars, and (ii) Raising awareness for cigarette-butt free beaches. The pilot action was implemented by EXELIXIS in collaboration with HCMR, UNICI and the Management Authority of the Marine Protected Areas/SPAMI.

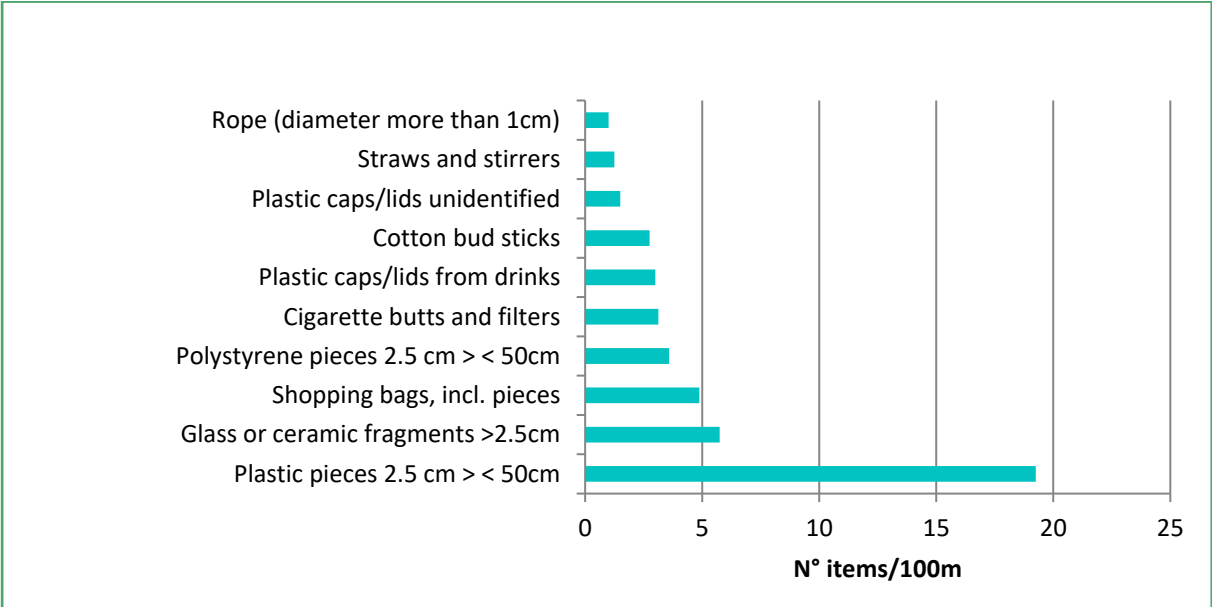


**FIGURE 6-1.** Straws found on the beaches of the SPAMI Pelagos Sanctuary (Photo © Cristina Panti).

The pilot action was designed to promote best practices within the tourism and recreation sector located within the protected area with regard to reducing significantly and/or phasing out single-use plastics (SUPs) and foster the mitigation of cigarette butts in nearby beaches. Coastal touristic businesses (such as coastal food and beverage outlets, hotels, restaurants, etc.) voluntarily register to a network and commit themselves to comply with a set of good environmental practices related to the prevention, reduction, reuse and recycling of waste, with special emphasis on plastics, SUPs and cigarette butts.



**FIGURE 6-2.** Top 10 marine litter items found on the beaches of the SPAMI Pelagos Sanctuary (source: UNISI).



**FIGURE 6-3.** Top 10 marine litter items found on the beaches of the Tuscany Archipelago National Park (source: UNISI).

### 7.3. Main lines of action & results

#### **Identification of the pilot areas**

The municipalities selected for the implementation of the pilot action were four: (i) Vecchiano (Italy), ii) Saint Florent (France), iii) Marciana (Italy) and iv) Portoferraio (Italy). The four municipalities were identified in close collaboration and inputs by the municipalities and the Management Bodies of the protected areas.

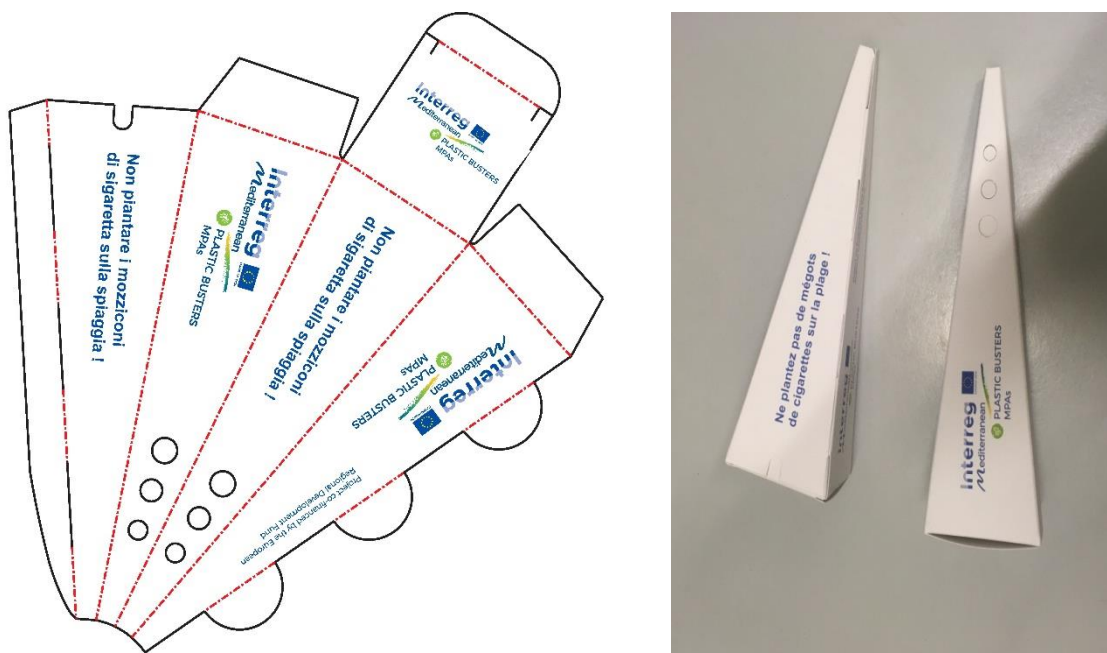
#### **Mapping of stakeholders and relevant businesses**

As an initial step, external local collaborators from the wider area were recruited to facilitate the stakeholder mapping and corresponding communications within the time-frame of the pilot action. The identification of the pilot locations and the mapping of the stakeholders and the businesses was conducted in collaboration with the municipalities involved. For this reason, the establishment of effective communication of the local collaborators with the representatives of the municipalities was critical to successfully identify businesses willing to transform their business into more sustainable ones. Overall, 23 coastal businesses were proposed by the municipalities, mainly restaurants, hotels and beach bars. On-site visits at the operating businesses were followed to directly contact and engage the owners and managers of the facilities.

#### **Development of communication & outreach materials**

In order to facilitate the implementation of the pilot action key communication and outreach materials were elaborated in Italian and French, including the SUPs-free commitment document, the audit questionnaire for assessing the use of single-use plastics, and portable paper ashtrays.

The aim of the ashtrays was to be used as a vehicle for raising the environmental awareness of the businesses' customers on the detrimental effects of cigarette butts on beaches. The provided ashtrays featured the short message "Do not plant cigarette butts on the beach!" in Italian (Non piantare i mozziconi di sigaretta sulla spiaggia!) and French (Ne plantez pas de mégots de cigarettes sur la plage!). A total of 3.000 portable ashtrays were produced; 2.000 of them with the Italian text and 1.000 with the French text which were distributed by the businesses without any economic benefit, as well as the involved municipalities and Tuscan Archipelago National Park.



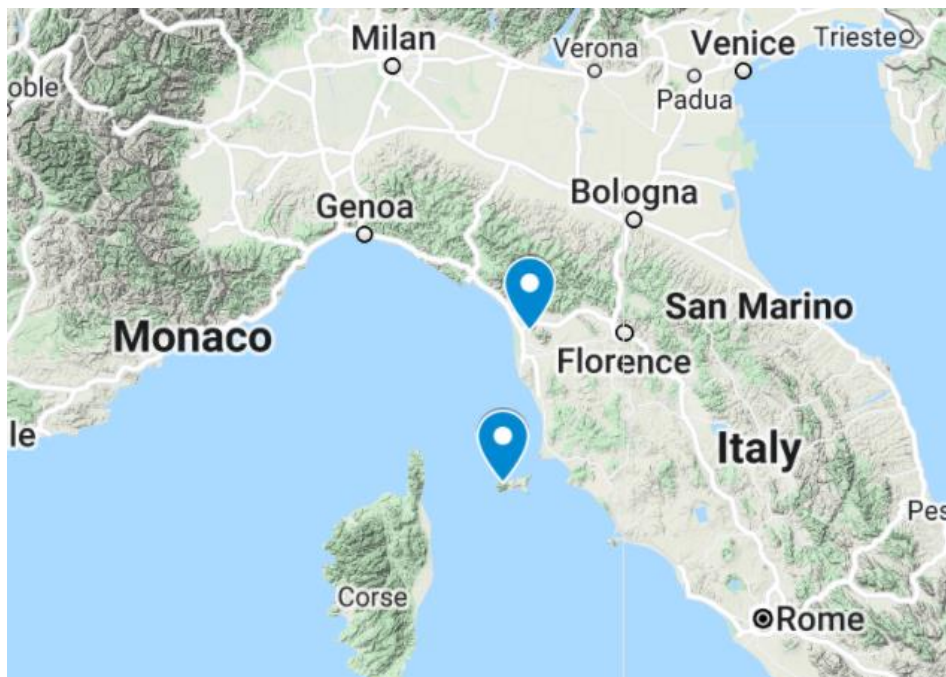
**FIGURE 6-4.** The reusable paper ashtrays designed.

### ***Engaging with businesses and signing the SUPs-free commitment***

Personal meetings with the identified businesses were arranged to inform the managers of the facilities about the scope of the Plastic Busters MPAs project, the aim of the SUPs & cigarette butt-free initiative, as well as the benefits of their participation to the “SUPs-free” network.

In total, three businesses agreed to actively participate in the pilot action, one restaurant in the Vecchiano Municipality, and a beach-bar and hotel restaurant in the Marciana Municipality. Initially, the businesses performed an audit to collect detailed information on the amount and types of SUPs used in the daily operations of the coastal business and their main management practices.

To officialise the collaboration with the businesses the SUPs-free commitment document was signed; with this document the businesses declared their willingness to participate in the pilot action and commit to the main objectives of reducing the amounts of SUPs used by their businesses and to contribute to raising the awareness of their customers on the proper disposal of cigarette butts. The signed commitment document was the first and most important step for the creation of a SUPs-free network of businesses by declaring their engagement to take actions to limit the use of disposable plastics in their operation towards their “transformation” to more sustainable enterprises.



**FIGURE 6-5.** *The location of the engaged businesses.*

### ***Elaboration of guidelines for reducing the use of SUPs***

Following the first audit and the collection of detailed information on the use of SUPs by the businesses, guidelines for the reduction of SUPs were formulated and provided as recommendations to the participating businesses. It was decided that instead of producing an action plan that its monitoring would be challenging for some businesses, simple and user-friendly recommendations based on the amount and types of SUPs used in their daily operations would be more accessible. The guidelines included a brief description of the project and the issue at hand, the EU SUPs Directive and the national legislation, what are the benefits for participating companies, SUPs related good practices, and customized recommendations for each company.

The suggested recommendations include few, targeted and concrete actions, such as:

- ▶ Phase out or eliminate
- ▶ Reuse
- ▶ Reduce
- ▶ Replace with a sustainable or more sustainable alternative
- ▶ Replace for enhanced recyclability or reuse
- ▶ Improve recycling.

The first three actions were suggested as the most favourable ones.

#### 7.4. Challenges & lessons learned

One of the biggest challenges encountered was engaging the local businesses to address the issue of marine plastic pollution in the area. Despite great efforts to approach the businesses by the local collaborators only few companies were willing to collaborate. The main reason behind this was related to the unfavorable timing due to the COVID-19 pandemic. Following the summer season of 2020 which was low on profit -forcing numerous businesses to shut down- many of these businesses were reluctant and unreceptive, expressing their uncertainties and doubts about their participation while trying to achieve the set financial goals of the year. Other reasons included the lack of financial incentives for the participation of the businesses or the lack of time available for the implementation of the pilot action during the summer period.

It is worth mentioning that the virtual format of many communication and outreach activities, due to COVID-19 restrictions, was discouraging for many business owners who are not familiar with the use of computers or were unable to attend informative webinars. Indeed, the timing of the dissemination activities was proven fundamental for the case of Pelagos Sanctuary and Tuscan Archipelago National Park for the effective engagement of the coastal businesses. Initiating outreach activities before the start of the summer season would have been more effective in terms of engaging more business owners and building a lasting relationship of trust with them. Furthermore, starting the outreach actions earlier would also make possible to collaborate with companies that may have a temporary concession for the commercial activity on the beach (e.g. for only one year) or are not open for the entire year. In fact, this type of “temporary” businesses was identified as the most reluctant to participate.

The provision of a sticker for the “SUPs-free” attestation that can be attached on the wall/door or any other gadgets that can be exposed to the public (e.g. stickers, posters etc.) could be examined. This kind of material might draw the attention of business owners in order to have a positive effect to their engagement and finally meet the scope of the initiative, which is to comply with good environmental practices related to the prevention, reduction, reuse and recycling of waste, with particular emphasis on plastics, SUPs and cigarette butts.

Lastly, the pilot action underlines that despite the key involvement of local experts and the municipalities for the stakeholder engagement, motivating them to be part of the solution is more challenging. Awareness raising and education activities regarding marine litter pollution and the detrimental effects of SUPs and cigarette butts are essential to spark the interest of business owners and managers.

Nevertheless, the 3 committed businesses in the initiative can constitute the pioneering members of a SUP-free network. The proposed recommendations to the businesses were welcomed as they provided simple and clear solutions, as well as motivated the use of alternative and eco-friendly solutions (e.g. provision of reusable cup and/or paper cups without plastic coating), without discouraging them to monitor them. Sharing experiences and lessons learned with other business can be instrumental for follow-up actions. It was noted that some businesses that could not participate in

the demo activities at the requested time, could be interested in follow-up activities, therefore their engagement by the municipalities and the Management Bodies of the Protected Areas should be considered.



**FIGURE 6-6.** Cigarette butts found on the beaches of the Tuscany Archipelago National Park (Photo © Cristina Fossi).

The lessons learned drawn based on the overall experience of the demo actions and recommendations for future actions should be summarized as follows:

- ▶ The summer season is a high touristic period for the implementation of the activities as businesses do not have enough time to dedicate to the scope of the project. All preparatory actions and communications for the engagement of businesses should be made ideally before or at the beginning of the summer season.
- ▶ The short time available for implementation of the pilot action may act as an inhibiting factor for businesses to be engaged.
- ▶ The production and distribution of portable, reusable paper ashtrays, was considered to be an appropriate solution to tackle the issue of cigarette butts found on the beaches close to the approached businesses and it should be made at the beginning of the summer season.
- ▶ The local context is crucial for the identification of the successful designation of communication and outreach material to enhance stakeholder engagement.
- ▶ The involvement of the municipalities and the Management Bodies of the Protected Areas is very important for stakeholder engagement and implementation of the measures.
- ▶ In person communication with business owners was proven instrumental to understand to local context and possible limitations of the proposed activities.

## 7. Marine litter pilot actions in Strunjan Landscape Park

### 7.1. In a nutshell

<b>Pilot Action 1 Title</b>	<b>SUPs-free beach bars</b>
<b>Pilot MPA</b>	Strunjan Landscape Park, SLOVENIA
<b>Partners</b>	MIO-ECSDE, Public Institute Strunjan Landscape Park, Chamber of Commerce and Industry of Slovenia
<b>Lines of action</b>	<ul style="list-style-type: none"> <li>▶ Development of communication and supporting materials;</li> <li>▶ Implementation of outreach activities;</li> <li>▶ Elaboration of guidelines for ‘SUPs-free Snack Bars’;</li> <li>▶ Engaging with businesses and awarding the certificate.</li> </ul>

<b>Pilot Action 2 Title</b>	<b>Adopt-a-beach</b>
<b>Pilot MPA</b>	Strunjan Landscape Park, SLOVENIA
<b>Partners</b>	MIO-ECSDE, Public Institute Strunjan Landscape Park, Zavod TRI NITI
<b>Lines of action</b>	<ul style="list-style-type: none"> <li>▶ Perform clean-up operations while carrying out beach litter surveys;</li> <li>▶ Organize public awareness-raising activities and develop tailored-made communication materials;</li> <li>▶ Install bins for cigarette butts to “nudge” smokers.</li> </ul>

### 7.2. Context & overall approach

Within the framework of the Plastic Busters MPAs project, MIO-ECSDE in collaboration with the Public Institute Strunjan Landscape Park and with the involvement of the Chamber of Commerce and Industry of Slovenia and Zavod TRI NITI implemented two marine litter pilot actions at the Strunjan Landscape Park. The Slovenian marine litter pilot actions have been identified as priority measures within the ‘Action Plan for Marine Litter in Landscape Park Strunjan’ that was developed by the Public Institute Strunjan Landscape Park within the framework of the Interreg Med ACT4LITTER project.

The marine litter measures showcased in the Strunjan Landscape Park were the following:

- ▶ **SUPs-free beach bars.** This is a measure designed to promote best practices within the tourism and recreation sector with regard to reducing significantly and/or phasing out single-use plastics (SUPs) such as straws and stirrers, cups, cutlery, plates, glasses, bags, etc. Coastal food and beverage outlets (snack bars, restaurants, canteens, coffee shops, etc.) voluntarily register to a network and commit themselves to comply with a set of good environmental practices related to the prevention, reduction, reuse and recycling of waste, with special emphasis on plastics and SUPs. The food and beverage outlets that register to the ‘SUPs-free Snack Bars’ network obtain a specific in-store labelling. The ‘SUPs-free Snack Bars’ is a measure that has been identified as a priority action within the Marine Litter Action Plan of the Strunjan Landscape Park. It is

implemented within the framework of the Interreg Med Plastic Busters MPAs project, in synergy with the national campaign "Living with the sea".

- ▶ **Adopt-a-beach.** This is a measure designed to foster volunteer stewardship by encouraging volunteers to 'adopt' beaches, clean them up and survey them throughout the year, thus collecting valuable marine litter data essential for facilitating effective responses against marine litter. The "adopt-a-beach" is a measure that has been identified as a priority action within the Marine Litter Action Plan of the Strunjan Landscape Park. It is implemented within the framework of the Interreg Med Plastic Busters MPAs project and in synergy with the national campaign "Living with the sea".

### 7.3. Main lines of action & results

#### 7.3.1. SUPs-free beach bars

##### *Development of communication and supporting materials*

As an initial step, CCIS developed a label and a certificate for the members of the SUPs free snack bars network, entitled 'SUPer GOSTINEC' (SUPer CATERER). The word "SUP" is the abbreviation for 'single-use plastic' and is often used to refer to the Directive 2019/904 on the reduction of the impact of certain plastic products on the environment (SUP Directive). The word 'GOSTINEC' refers to companies in the tourism and hospitality sector. Lastly, the word 'SUPer' refers to something of high grade or better quality. Therefore, the phrase used 'SUPer GOSTINEC' links the issue of single-use plastic reduction with caterers that are of high grade or better quality.



**FIGURE 7-1.** SUPer GOSTINEC label.



### ***Implementation of outreach activities***

The pilot action that promoted the phasing-out of SUPs in the tourism sector successfully reached and engaged some 30 business representatives and relevant stakeholders via a workshop entitled ‘SUPER CATERER – how to reduce the usage of single-use plastics in the catering business’ which was organized by CCIS.

In June 2020, CCIS organized an online workshop entitled ‘SUPER CATERER – How to reduce single-use plastic usage in the hospitality sector’ in order to inform tourism sector about the related initiative and how to join it. The workshop was held back-to-back with the biggest annual environmental conference organized by CCIS; the Environmental Business Day. In 2020 this day was dedicated to SUPs and the SUP Directive. More than 150 participants from eleven EU countries attended the hybrid conference.

The SUPER CATERER workshop was held right after the Environmental Business Day conference; the initiative was presented to some 30 business representatives and relevant stakeholders. More than 2,200 registered email recipients were informed about the workshop and initiative directly via e-mail, while also the event was promoted on social media with the following hashtags: #OkoljskiDan, #SingleUsePlastics.

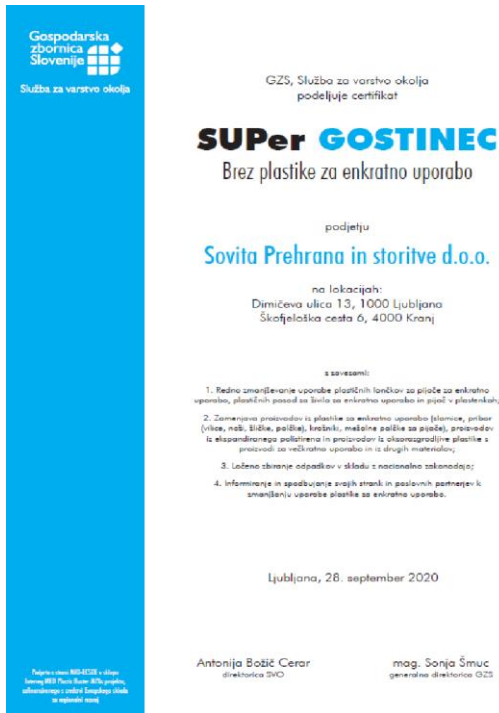
### ***Elaboration of guidelines for reducing the use of SUPs***

Within the scope of the initiative, CCIS prepared a set of guidelines on reducing the use of single-use plastic products in the catering sector. The guidelines include: facts about the requirements of the SUP Directive, why a caterer should become SUPs-free, Covid-19 specificities and considerations, ways to reduce the use of SUP items defined in the SUP Directive; SUPs related good practices, and a workplan on where and how to start working in order to reduce the use of SUPs.

### ***Engaging with businesses and awarding the certificate***

The first business that was approached and involved in the SUPER GOSTINEC related activity was SOVITA, a company that owns two restaurants; one in Ljubljana and one in Kranj. A SUPs audit was performed in order to collect detailed information on the amount and types of SUPs used in the daily operations of the restaurants. In addition, the management practices of the SUPs related waste were recorded. The audit showed that SOVITA had already put in place measures to reduce the use of SUPs. Further options and measures for phasing out and/or reducing SUPs were carefully examined and it was agreed to focus on drinking cups and take-away packaging. These SUPs were replaced with items made of cardboard or wood. A few months later, SOVITA became the first company to sign the contract of collaboration; the contract entailed the company’s commitment to the use of SUPs in the aforementioned restaurants. In October 2020, SOVITA was awarded with the SUPER GOSTINEC certificate and the corresponding label; the new SUPs audit carried out showed that SOVITA reduced the number of purchased SUPs by 70% compared to the 2019 SUPs audit.

Within July 2020 and October 2020 seven more businesses (bars and restaurants) were reached in order to engage them in the SUPER GOSTINEC related activities. All welcomed the initiative and in December 2020 five of them agreed to become a SUPER caterer and signed the related commitment. Two of these companies are located in Strunjan, three in Izola and one in Portoroz. Within 2021 all five companies were supported to achieve their SUPs reduction goals; within 2022 two more companies have met the progress milestones set and have received the certificate and label.



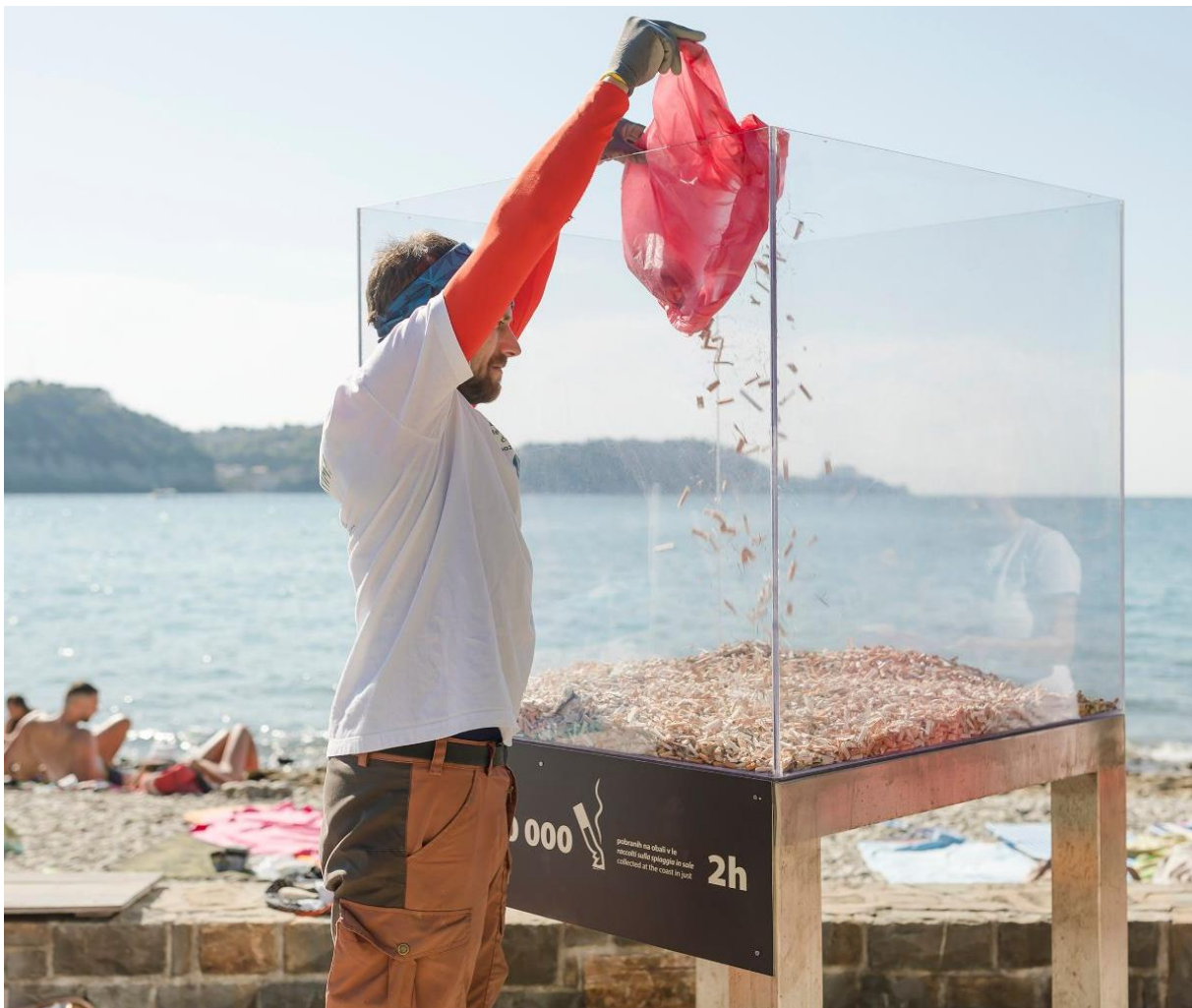
**FIGURE 7-2.** Irena Žolnir, Head of the environmental department of SOVITA being awarded with the SUPER GOSTINEC certificate.



**FIGURE 7-3.** Engaging with businesses.

### 7.3.2. Adopt-a-beach

Within the adopt-a-beach demo, more than 350 students and educators were directly involved in educational, awareness raising and participatory science activities. Specifically, eight fit-for-purpose marine litter datasets were generated via beach litter survey campaigns; school interventions were made featuring the adopt-a-beach scheme and its added value; cleanup operations were performed; an informative webpage was setup; and a full-blown social media campaign was carried out. One of the main highlights of the overall action was the installation of quiz bins ‘nudging’ smokers to use them for their cigarette butts as well as the installation of a sculpture to capture the attention of the local communities and visitors of the Park. Cigarette butts are among the most frequently found items on the beaches of Strunjan. Another major highlight was the involvement of Slovenian actress Ana Maria Mitič in the awareness raising activities.



**FIGURE 7-4.** The cigarette butts sculpture installed to capture the attention of the local communities and visitors of the Park.

The beach macrolitter surveys were carried out following the methodology featured in the EU MSFD TGML “Guidance on Monitoring of Marine Litter in European Seas” (Galgani et al., 2013); this approach has been applied in all beach macrolitter monitoring activities conducted within the scope of the Plastic Busters MPAs project. Considering several criteria, including beach accessibility and beach facilities, two beaches were decided to be ‘adopted’ and monitored; the Bele Skale beach and the Strunjan beach.

The abundance of litter items recorded in Bele Skale ranged from 154 to 353 items/100m (median: 155 items/100m), in Strunjan from 44 to 120 items/100m (median: 63 items/100m) and in Mesecev Zaliv from 55 to 101 items/100m (median: 83 items/100m). All three densities are higher than the threshold value of 20 items/100m adopted at European level for macrolitter on beaches. The majority of items were single use plastics in all three locations.



**FIGURE 7-5.** *Bele Skale beach.*



**FIGURE 7-6.** *Strunjan beach.*

## 7.4. Challenges & lessons learned

### 7.4.1. SUPs-free beach bars

One of the biggest challenges encountered during the implementation of the SUPer CATERER initiative was the unfavourable timing due to the Covid-19 crisis. Catering businesses had to shut down for extended periods of time, with severe economic losses that had an effect as to how to approach them. In addition, many businesses changed their operations to offer take-away and delivery services, giving rise to the use of single-use plastics. And, lastly food safety risks in relation to Covid-19 also made businesses more reluctant to change their practices.

Reducing the use of SUPs in the catering sector proved to be difficult and demanding when it comes to finding a proper alternative that is characterized by low cost and high environmental performance. The need to establish a list of good and tested alternatives was identified. Showcasing applied best practices to businesses was found to be very important towards encouraging them to transform their businesses; many business owners were afraid that by making changes when it comes to the use of SUPs they might displease their customers.

Coastal caterers proved to be very busy in the summer months and less willing to collaborate. The optimum period to reach out to them and engage them in the SUPer CATERER initiative is from October to April.

Based on the initiative's experiences in order to promote the reduction of SUPs in Slovenia, a dedicated webpage on the issue should be developed by CCIS, outreach and mutual learning opportunities should be enhanced, while also communication with the Slovenian Ministry of Environment and Spatial Planning should be established in view of designing the new Decree on the SUP Directive implementation.

### 7.4.2. Adopt-a-beach

One of the most challenging aspects related to the implementation of the adopt-a-beach scheme was associated with motivating volunteers and in particular coordinators to perform the beach survey in line with the methodological approach provided. The classification list of litter items at a first glance looks intimidating; however, once applied in the field it is evident that the majority of the litter items (80-90%) consist of 10-20 different types of litter items. Breaking down the beach survey in the following two phases was proven to be essential for the successful implementation of the survey; small groups of pupils (6-8 children) (i) collect the litter items from a beach, and (ii) count and classify the litter items at school, using either a paper form or a web/mobile app.

Another major problem that was encountered was related to the difficulty in involving interested groups such as schools and groups with physical disabilities and specific needs. The aforementioned two-phase approach can facilitate the engagement of such groups in the second phase of the activity.

The adopt-a-beach scheme proved to be a valuable tool for collecting marine litter data. The data obtained by the beach surveys are fairly comparable to existing marine litter datasets, confirming that the adopt-a-beach scheme can generate reliable and fit-for-purpose data with the involvement of citizens.

Lastly, the demo underlines that awareness raising and dissemination activities are the easiest way to reach out to people and the interested public; however, educating them and motivating them to collect data according to protocols and guidelines, is more challenging and difficult. The demo generated a blueprint for concrete in-the-field actions and their successful outcome was acknowledged at national level. Furthermore, initial actions have been undertaken to replicate this scheme in other nature parks of Slovenia.

## 8. Marine litter pilot action in Cabo de Gata-Níjar Natural Park

### 8.1. In a nutshell

<b>Pilot Action Title</b>	Developing a network of collection points for beverage containers made of PET and aluminium
<b>Pilot MPA</b>	Cabo de Gata-Níjar Natural Park, SPAIN
<b>Partners</b>	SCP/RAC, Management Body of Cabo de Gata-Níjar Natural Park, ENT, Wondereko, Cabo de Gata-Níjar Natural Park Association of Entrepreneurs
<b>Lines of action</b>	<ul style="list-style-type: none"> <li>▶ Assessing the level of waste management of beverage containers at the Cabo de Gata-Níjar Natural Park;</li> <li>▶ Defining the operational and logistics requirements for the establishment of a network of collection points for beverage containers made of PET and aluminium;</li> <li>▶ Installing reverse vending machines in selected sites;</li> <li>▶ Carrying out public awareness-raising activities and developing tailored-made communication materials.</li> </ul>

### 8.2. Context & overall approach

Within the framework of the Plastic Busters MPAs project, Cabo de Gata-Níjar Natural Park, in collaboration with ARC- SCP/RAC, implemented a marine litter prevention demo in Cabo de Gata-Níjar Natural Park – UNESCO Global Geopark. The demo focused on establishing a network of collection points for beverage containers made of PET and aluminium. The aim of the pilot action was to enhance awareness and promote behavioural change of locals and tourists regarding the appropriate disposal of beverage containers.



**FIGURE 8-1.** Photo of the Cabo de Gata-Níjar Natural Park.

Beverage containers made of PET and aluminium are among the most frequently found items along the coastline of the Cabo de Gata-Níjar Natural Park and their reduction has been identified as a priority action within the park's Marine Litter Action Plan, which was developed within the context of the Interreg Med ACT4LITTER project.

The pilot action was implemented in close collaboration with ENT and Wondereko, which managed and carried out the demo activities locally. The Cabo de Gata-Níjar Natural Park Association of Entrepreneurs (ASEMPARNA) also participated in the implementation of the discount voucher scheme.

### 8.3. Main lines of action & results

#### ***Assessing the status of waste management of beverage containers***

The first step of the pilot action focused on the assessment of the status of waste management of beverage containers in the park. The assessment aimed at:

- ▶ Estimating the amount and types of beverage containers found in the park.
- ▶ Estimating the amount of beverage containers that end up as waste in the park.
- ▶ Mapping the waste collection scheme in place in the park (from waste generation sites to waste management activities).

Relevant data for calculating the types and amount of beverage containers found in the park was not available at the required resolution; instead the data collected by the waste collection services were used. Specifically, the amount of beverage containers related waste generated in the park was estimated as follows:

- ▶ By using waste collection data for both, recyclables sorted at source and co-mingled waste.
- ▶ By applying coefficients for the calculation of packaging waste within these two waste streams and in turn by calculating the share of beverage containers within the packaging waste.

Relevant data on waste collection was obtained for the municipalities of Almería (for the collection routes nearby and within the park) and Níjar (for Níjar town and all the urban settlements within the park), however such data were not obtained for the municipality of Carboneras.

Based on the data collected it was estimated that 3,000 tonnes of packaging waste per year is generated in the park, with 900 tonnes estimated to be waste from beverage containers. Low rates of separate waste collection were reported for Níjar and Almería indicating a great potential for improvement when it comes to the sorting of light packaging and beverage containers at source. The average separate collection of beverage containers in Spain via the yellow container was estimated to be around 50%. It should be highlighted that the poor availability and/or poor quality of the data obtained regarding waste generation strongly impacted the calculations made for packaging and beverage containers waste generation in the park.

#### ***Defining the operational and logistic requirements for the establishment of a network of collection points for beverage containers***

In order to establish the network of collection points for beverage containers a thorough mapping of operational and logistic requirements was made. Special emphasis was placed in identifying any constraints, barriers and issues for the return-refund scheme (RRS) and locations with very high influx of visitors were identified as potential sites for the installation of the reverse vending machines. Within this line of action, the incentives scheme was designed so that consumers depositing beverage containers in the designated reverse vending machines would be rewarded with a voucher, which could be redeemed in specific shops and tourism businesses in the area.

*An operational plan was developed that addressed key aspects such as: guidelines for local businesses on how to be involved in the discount voucher scheme, a support scheme for solving technical issues of*

*the reverse vending machines, a maintenance and cleaning scheme of the reverse vending machines, a scheme for the collection and proper disposal of packaging waste deposited in the collection points.*

***Installing and monitoring the reverse vending machines***

The reverse vending machines were installed in three sites at: (i) the Las Amoladeras Visitor Centre, (ii) the San José Tourist Information Office, (iii) the San Andrés Castle in the municipality of Carboneras.

The voucher of each beverage container corresponded to a 5-cent discount, with no upper limit for the number of containers that could be delivered per person, but with the ceiling of up to 1 euro vouchers value for every 10 euros of purchase value.



***FIGURE 8-2. The reverse vending machines installed in three locations of the park.***



In order to assess the impact of the pilot action, four key performance indicators were set and monitored (see table below). To-date 8,400 beverage containers have been collected, 12 businesses have been involved, 184 vouchers have been offered and 96 individuals have redeemed their vouchers. Two observations were made throughout the implementation of the pilot action: the users of the reverse vending machines tend to accumulate the vouchers before redeeming them; the users of the reverse vending machines tend to gather several beverage containers before depositing them. The highest number of users of the reverse vending machines was observed in the summer season, the season with the highest number of tourists and visitors. However, the discount vouchers started to be redeemed well after the summertime.

**FIGURE 8-3.** Performance indicators of the pilot action.

Performance indicator	End of September	Middle of October	End of October
Number of beverage containers collected	6400	7600	8400
Number of businesses involved	12	12	12
Number of vouchers used	94	178	184
Number of individuals making use of the vouchers	19	91	96

**Carrying out outreach and awareness raising activities**

The outreach and awareness raising actions were two-fold; targeting on the one hand local businesses and local authorities, while on the other targeting the general public and the local communities at large.

**FIGURE 8-4.** Main poster of the pilot action.

The general public was reached via social media campaigns, advertisements and posters that featured two key messages: sort your packaging waste at source (strategic message); get a discount by depositing your packaging waste (specific message). The level of public engagement varied across the three pilot sites; the highest levels of engagement were observed for the Las Amoladeras Visitor Centre and the Tourist Information Office in San José, while the lowest level of engagement was recorder in San Andrés Castle in Carboneras, probably due to the limited visibility of the reverse vending machine and the fact that there were no businesses in the vicinity where vouchers could be redeemed. Therefore, the proximity of the reverse vending machines to the businesses participating in voucher scheme seems to be a determining factor for an enhanced population and businesses engagement. In addition, increased participation could be achieved by broadening the profile of participating businesses to include bars, supermarkets, etc.



FIGURE 8-5. The voucher of pilot action.

#### 8.4. Challenges & lessons learned

The Plastic Busters MPAs pilot action in Cabo de Gata-Níjar Natural Park demonstrated on the ground how a return and refund scheme can be setup up and how such schemes can have an impact in enhancing the sorting of waste at source and improving waste management overall. The separate collection of beverage containers in the Natural Park could be improved considerably if the scheme was expanded, with a great potential to reduce the amount of beverage containers ending up as marine litter.

Based on the demo's experience the factors that play a crucial role in the success of such schemes are related to the actual installation sites for the reverse vending machines and the type of incentive provided as a return. Optimum sites to install the reverse vending machines are those that are in central spots characterised by high visibility and large number of visitors, while also their proximity to the businesses participating in the return and refund scheme is also very important. The type of incentive (money or reward) can be of crucial importance too; it is generally known that with monetary deposits of 10 cents or more, separate collection rises to 90% in most European countries. However, in the case of the park there was no possibility to apply a deposit and return system, so rewards were offered instead. The reward voucher worked well but it could be further improved by enlarging the types of businesses that could participate in the scheme, thus offering more options for redemption points. In particular approaching and involving businesses that sell drinks and beverages could be a good option.

## 9. Marine litter pilot action in Cabrera National Park

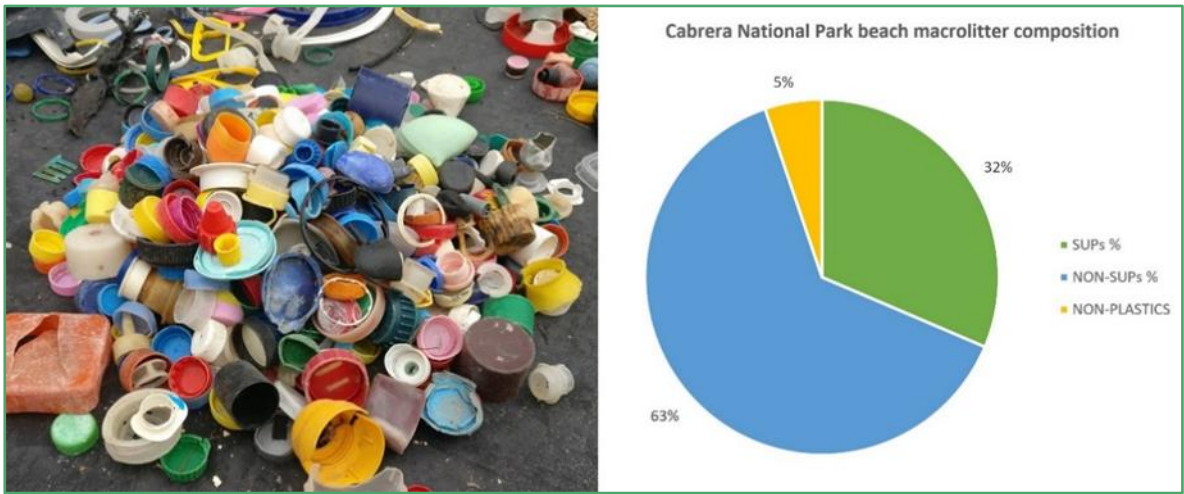
### 9.1. In a nutshell

<b>Pilot Action Title</b>	Promoting best practices for a SUPs-free Cabrera National Park
<b>Pilot MPA</b>	Cabrera National Park, SPAIN
<b>Partners</b>	CAIB - Cabrera National Park - Balearic Islands, IEO-COB, Ministry of Defence of Spain
<b>Lines of action</b>	<ul style="list-style-type: none"> <li>▶ Carrying out an audit on plastics use in the island</li> <li>▶ Organizing awareness raising and educational activities as well as developing relevant communication materials.</li> <li>▶ Developing concise guidelines including a list with alternatives to single-use plastics for different sectors.</li> </ul>

### 9.2. Context & overall approach

Within the framework of the Plastic Busters MPAs project, the management body of the Cabrera National Park of the Regional Government of Balearic Islands (CAIB), implemented a marine litter demo project at Cabrera National Park in collaboration with the Spanish Institute of Oceanography-Balearic Oceanographic Centre (IEO-COB), other entities such as the Ministry of Defence and the Red Cross.

The archipelago of the Balearic Islands and specifically the Cabrera National Park receives a large amount of marine litter on its coasts, most of which are single-use plastics (SUPs). Within the framework of Plastic Busters MPAs, marine research expeditions were conducted at the Park’s beaches in 2019 and 2020 by the management body of the Park and IEO-COB; the results showed that more than 30% of the marine litter items recorded were SUPs. The main sources of litter in the Park are poor waste management practices taking place in areas beyond the Park’s jurisdiction, tourism and recreational activities, fisheries and aquaculture related activities, and shipping.



**FIGURE 9-1.** Beach macrolitter composition expressed in percentages of the total litter recorded (SUPs; NON-SUPs and NON-PLASTICS).

The Plastic Busters MPAs pilot action at the Park aimed at addressing the pressing issue of SUPs, in full alignment with the Balearic law -approved in January 2019 by the Balearic Autonomous Government (Law 8/2019)- prohibiting as of 1st of March 2021, some SUPs, such as lightweight plastic bags, plastic dishes, straws, etc. The action kickstarted in October 2020 and aimed to promote best practices for a SUPs-free Cabrera National Park. The action targeted all staff and users of the Park. It especially focused on tourism & recreation, transport and the fisheries sectors operating in the Park.

### 9.3. Main lines of action & results

#### Audit on SUPs related waste

In order to evaluate the amounts of SUPs used and discarded in the Park, an audit of the Park’s plastic waste was carried out. The audit was carried out in the summertime, when the Park is visited by large numbers of visitors and workers. The plastics waste sampling was two-fold: (i) plastic waste was sampled from the waste bin of the Park’s canteen (bar) to determine the typology of waste discarded by the visitors; (ii) plastic waste was sampled from the waste bin of the Park’s premises to determine the typology of waste discarded by the Park’s staff.

The amount of waste sampled corresponds to the waste generated within a week by each group (visitors, Park’s staff). A total of 10.3 kg of plastic waste was collected and classified from the two waste containers; 2.7 kg of waste was collected from the canteen’s waste container and 7.6 kg from the waste container of the Park’s premises. The waste was classified according to the TGML 2021 Joint List of Macrolitter Items used for the classification of macrolitter within the framework of the Plastic Busters MPAs related actions.

The results of the first audit (July 2020) show that a high percentage of the waste generated from both groups are SUPs. The group that generated the highest percentage of SUPs were the visitors of the park and the canteen users (61% of the total litter recorded were SUPs), while the SUPs percentage generated by the Park’s staff was lower (41% of the total litter recorded were SUPs). A SUPs audit will be carried out on annual basis in the summertime to assess the effectiveness of the measures put in place.

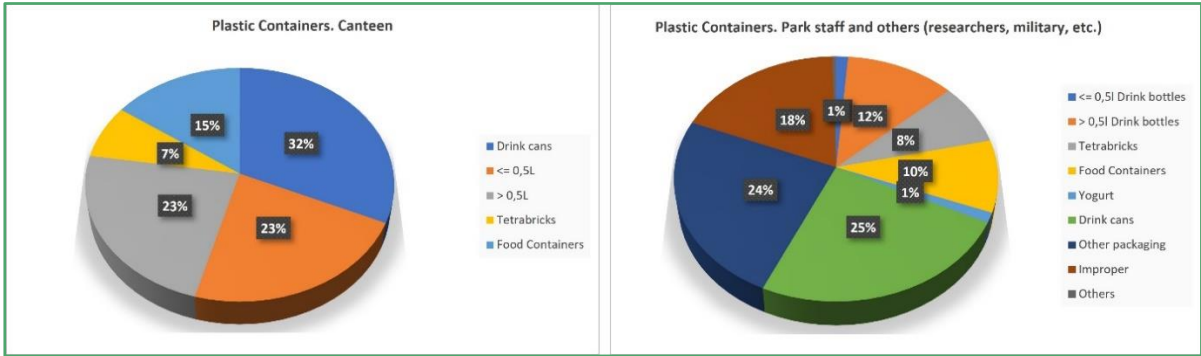


FIGURE 9-2. Plastic waste generated by visitors of the Park (canteen users) and staff of the Park.

#### Awareness raising and educational activities on marine plastic pollution & SUPs

Several workshops were held during the pilot action in order to raise awareness about the issue of marine plastic pollution and its impacts on the Park’s environment. The workshop targeted wide-ranging stakeholders, including the park’s staff members, coast guards, skippers, guides, maintenance personnel, and Red Cross volunteers. More than 70 participants had the opportunity to obtain new knowledge and skills related to marine litter monitoring methodologies, marine litter prevention and

mitigation options, ocean science communication, best practices on SUPs reduction, and citizen science.



**FIGURE 9-3.** Awareness raising and educational activities on marine plastic pollution & SUPs.



**FIGURE 9-4.** Training sessions for the Park's maintenance staff on the classification of marine litter and fine-tuning of methodological protocols.

In addition to the aforementioned workshops, a training process for the Park's maintenance personnel was launched aiming to build their capacities to classify marine litter found on beaches. The methodological protocols deployed within the project have been tested and validated for their future implementation in the park.

**Alternatives to SUPs for the Park's personnel**

The Park's staff members work weekly shifts and during the shifts they stay at the park. Every week the staff members of the park go to the park from Mallorca with food and beverage supplies for an entire week. Inevitably, some of the food and drinks packaging they have been bringing were SUPs. To this end, the pilot action aimed at significantly reducing the number of SUPs, in particular plastic food and drink containers and/or packaging, that are transferred weekly to the park by the Park's personnel.

To encourage the elimination of SUPs used by the park's personnel and the park's collaborators, a comprehensive list of alternative products to SUPs was elaborated. This list was developed through a participatory process with inputs from the park's personnel. In addition to the list, a kit of selected products for the replacement of several SUPs was developed, to be soon purchased and distributed to the park's staff. Furthermore, the Park's personnel were strongly advised, if possible, to use and/or consume products that meet one, several or all of the following characteristics: local products (proximity); products in bulk (without plastic or other packaging, or bought with own reusable packaging); environmental-friendly products.



**FIGURE 9-5.** Selected products included in the kit for the replacement of several SUPs.

In addition to the aforementioned measures the Park sought to identify and promote best practices to reduce the amount of waste generated in the Park, as well as to improve its waste management plan. To that end guidelines have been developed on how to purchase more sustainable products following the principle of the 4Rs: Refuse, Reduce, Reuse and/or Recycle. Indicatively, the Park has decided to buy cleaning products, either in larger containers (in bulk) or in reusable containers that are being refilled.



**FIGURE 9-6.** *Cleaning products in bulk to reduce packaging waste.*

Within the pilot action the Park explored the feasibility of two more measures; one addressed the issue of optimizing the waste transport by reducing the volume of waste; the second focused on installing water dispensers to minimize the amount of plastic water bottles used:

- ▶ **Optimizing waste transport by reducing the volume of waste.** To improve the transport of waste to Mallorca, the option of purchasing a compactor for plastic waste to reduce its volume was explored. A closer look at the technical characteristics of the compactor revealed that this is a rather demanding device energy-wise and therefore it is not compatible with the energy consumption plan of the Park.
- ▶ **Water dispensers to minimize the amount of plastic water bottles used.** One of the major problems of the Park is that it doesn't have its own drinking water supply system and therefore the personnel transfers weekly large quantities of bottled water for consumption to the Park. The solution of installing water dispensers for Park's personnel was explored and decided and 9 units are expected to be purchased in the next months.

#### ***Alternatives to SUPs for the canteen staff & users***

The Park has collaborated closely with the canteen staff in order to reduce the amounts of SUPs and plastic waste generated by the canteen. Since spring 2021, most of the canteen SUPs products have been replaced by more sustainable options. Plastic bags have been replaced by compostable bags, plastic wrappers by paper or cardboard wrappers; plates, cutlery, straws and cups have been replaced by compostable or cardboard materials.

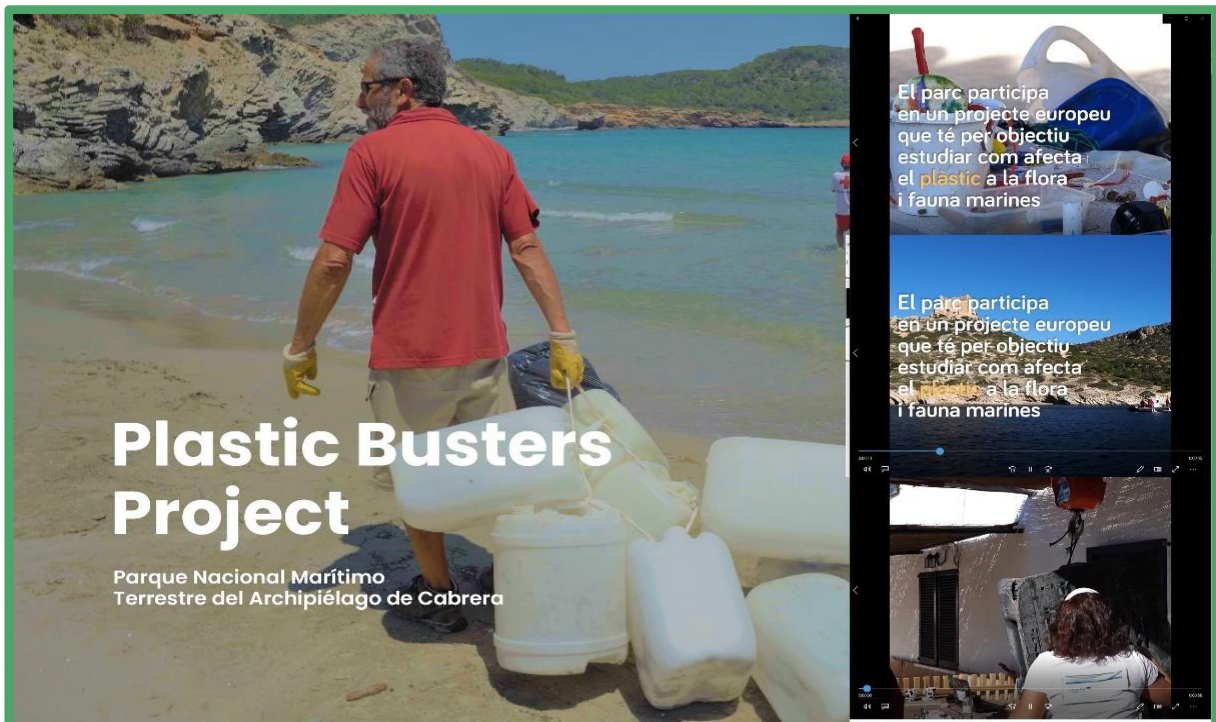




**FIGURE 9-7.** SUPs products used in the canteen before the pilot action.

### **Communication actions**

Two major divulgation activities in the media have been carried out during the development of the pilot action. The first one is related to the elaboration of an informative video depicting the work carried out within the framework of the project; this video was featured on local TV in January 2021 (IB3). The second related to an educational video that aims to raise awareness on the impact of plastics on marine ecosystems and on best practice approaches for SUPs-free Cabrera National Park.



**FIGURE 9-8.** Snapshots of the footage developed for promoting the pilot action.

#### 9.4. Challenges & lessons learned

One of the biggest challenges encountered during the implementation of the pilot action was the unfavorable timing due to the Covid-19 pandemic. Nevertheless, the associated restrictions were outweighed by the inherent interest of all involved parties to address the issue of marine plastic pollution and SUPs in the Park.

The pilot action has provided a concrete opportunity for exploring, identifying and deploying best practice approaches to reduce and/or eliminate the use of SUPs in the Park. Instrumental to the uptake of these practices have been educational and capacity building activities but also citizen science actions which provide a powerful tool for mobilizing and engaging local communities and visitors in the collective fight against marine litter. These educational and capacity building activities need to be embedded in the daily operations and day-to-day running dynamics of the Park in order to generate long-standing impact.

The overall experience of the pilot illustrates that relatively small changes in the way we shop and consume can yield lasting results when it comes to the amount of waste discarded and the amount of waste that turns into marine litter. At personal level these changes might prove to be easier to make while at administrative level these changes might be hampered down by procedural barriers; nevertheless, these barriers can be overcome. Sharing experiences and lessons learned with other administrations can be instrumental to that end.

Capitalizing on the experience of the Plastic Busters MPA pilot action in the Cabrera National Park, the management body and collaborating partners will continue seeking ways to further reduce the amounts of SUPs discarded as waste in the Park. Annual plastic waste audits will be performed to monitor the effectiveness of the measures put in place related to the amounts of plastic waste generated, while marine litter monitoring campaigns will assess the overall impact of the measures on the environmental status of the Park.

## 10. Marine litter pilot action in Natural Park of Ebro Delta

### 10.1. In a nutshell

<b>Pilot Action Title</b>	Setting up a reusable cup distribution system for beach bars and festivals
<b>Pilot MPA</b>	Ebro Delta Natural Park, SPAIN
<b>Partners</b>	SCP/RAC, Management Body of the Natural Park of Ebro Delta, L'escola del Parc, El 7 d'Astres' Foundation
<b>Lines of action</b>	<ul style="list-style-type: none"><li>▶ Reaching out to and engage with beach bars and festivals organizers;</li><li>▶ Defining the operational and logistics requirements for the establishment of the reusable cup distribution system;</li><li>▶ Installing dish washing machines in selected sites and supply them with reusable cups;</li><li>▶ Carrying out awareness raising activities and develop tailored-made communication materials.</li></ul>

### 10.2. Context & overall approach

Within the framework of the Plastic Busters MPAs project, the environmental education cooperative L'escola del Parc, in collaboration with ARC-SCP/RAC, implemented a marine litter prevention demo in Ebro Delta Natural Park. The pilot action focused on setting up a reusable cup distribution system for beach bars and festivals, with the voluntary involvement of beach bars and municipalities. A reusable cup was produced and distributed to beach bars and during festivals. Drinks were sold in this cup, which was available to the customer for a deposit. Upon completion of use, the customer could bring the cup back and receive the initial deposit back. This measure was identified as a priority action within the Marine Litter Action Plan of the Natural Park of Ebro Delta, which was developed within the context of the Interreg Med ACT4LITTER project. The pilot action was implemented in close collaboration with the management body of the Natural Park of Ebro Delta and the 'El 7 d'Astres' Foundation, a foundation, where people with functional diversity work to improve their autonomy. The involvement of this foundation enriched the project as it works with people at risk of social exclusion.



FIGURE 10-1. Map of the Natural Park of Ebro Delta.



**FIGURE 10-2.** Pictures of the Natural Park of Ebro Delta (Photos © Archive/PNDE).

### 10.3. Main lines of action & results

#### **Outreach and stakeholder engagement actions**

Outreach and stakeholder actions lay at the heart of the implementation of the demo. As a starting point the pilot action obtained the support of the seven municipalities of the park -L'Aldea, Deltebre, Sant Jaume d'Enveja, Sant Carles de la Ràpita, L'Ampolla, Camarles and Amposta. The municipalities contributed to all phases of implementation and supported festivals that joined in the reusable cup scheme. Outreach actions further targeted beach bars and festivals leading to the successful involvement of 14 beach bars and 9 beach events and/or beach festivals in the reusable cup scheme.

Public awareness raising actions were also carried out; the demo kicked off with a public event and press conference with local media, while communication materials (posters, stickers, leaflets, etc.) were distributed to beach bar owners, tourist information centres, town councils, museums and the local communities. The communication actions also included the development of an Instagram account with weekly updates, a promotional video, radio advertisements, etc.



**FIGURE 10-3.** Plastic cups found on the coastline of the Natural Park of Ebro Delta (Photos © Archive/PNDE).

### ***Defining the operational and logistics requirements for the establishment of the reusable cup distribution system***

Defining the operational requirements of the reusable cup scheme was a pretty straight forward task. In close cooperation with Management Body of the Natural Park of Ebro Delta the requirements of the cup per se were defined (material, design, size, etc.), while through a participatory process the value of the deposit for the reusable was set to be 1 euro. The collaborating beach bars and festivals were contacted in order to get an initial estimate of the total number of reusable cups to be purchased. The most challenging aspect of the scheme was related to the actual cleaning of the cups. Most of the involved beach bars didn't have their own cup cleaning system or service and therefore a cup cleaning service had to be offered during the pilot action.

The reusable cup scheme was organized around the following steps:

- ▶ Beach bars are supplied with the reusable cups;
- ▶ Beach bars provide consumers with reusable cups when ordering their drinks and in turn customers are asked to pay a €1 deposit;
- ▶ When consumers return the empty cups to the beach bars they take back their €1 deposit;
- ▶ A cup cleaning service is provided to those beach bars that don't have their own cleaning service/system in place;
- ▶ Additional reusable cups are provided to beach bars in case of cup losses or cup wear.



**FIGURE 10-4.** Photo of the reusable cup (Photos © Archive/PNDE).

### ***Putting the reusable cup scheme in motion***

To-date a total of 22,010 reusable cups have been distributed and these have been used a minimum of 35,829 times within the scheme that was implemented with the involvement of 14 beach bars and 9 beach festivals/events. Due to the fact that some beach bars used their own cleaning services for the cup, there are no accurate data to assess the total number of customers that used the reusable cups.

**TABLE 10-1.** The 14 beach bars that were involved in the reusable cup scheme.

N	BEACH BARS	CUPS SUPPLIED	CUPS USED
1	MIRADOR DE LA BADIA (Mussel bar)	500	1,583
2	TERRASSA VORA MAR	250	---
3	EBRE SURFERS	1,000	1,973
4	DELTA NATUR	250	274
5	LES DUNES	250	---
6	LA CANTINA	250	---
7	MONI	250	---
8	BUDA MAR	1,000	---
9	LA CASETA D'EUCALIPTUS	250	873
10	XIRI MEDITERRANI	1,000	---
11	LAMARDEBÉ	1,000	3,970
12	FLAMINGO BEACH BAR	2,250	7,693
13	L'AVI AGUSTÍ (Mussel bar)	1,000	3,835
14	MUSCLARIUM (Mussel bar)	750	---
	<b>TOTAL</b>	<b>10,000</b>	<b>20,201</b>

**TABLE 10-2.** The 9 festivals/events that were involved in the reusable cup scheme.

	FESTIVALS/EVENTS	CUPS SUPPLIED	CUPS USED
1	BUDA & BIKE	100	172
2	FESTES MAJORS D'AMPOSTA 2021	4,000	4,062
3	IIIa RIUADA DE MOIXONS	75	75
4	NETEJA BADIA ALFACS	85	85
5	FESTA JOVE (BARRI EL CASTELL)	1,000	280
6	IIIa FESTA DE L'ECOTURISME	250	28
7	FESTA DE LA SEGA ST. JAUME ENVEJA	500	67
8	FESTIVAL ORIGENS	6,000	6,000
9	FESTA DE LA SEGA DELS MUNTELLS	250	250
	<b>TOTAL</b>	<b>12,010</b>	<b>15,628</b>

In order to assess the effectiveness of the reusable cup scheme a survey was run targeting the beach bar owners involved in the scheme, as well as representatives of the town councils that supported the scheme. The following questions were asked:

- ▶ What did you think of the coordination of the scheme? Were you satisfied with the provided service and did you feel well-informed?
- ▶ Could you make an overall assessment of the pilot scheme? (Your point of view as a beach bar owner and that of your customers.)
- ▶ How do you think this scheme has reinvested in the protection and conservation of the Natural Park of Ebro Delta?

Overall, beach bar owners and users were very satisfied with the entire scheme. The only issue that came up during the survey was related to the size of the reusable cup; it was considered too big and it was suggested to be included in the suggestions for future improvement.



**FIGURE 10-5.** *The reusable cup (Photos © Archive/PNDE).*

#### 10.4. Challenges & lessons learned

The reusable cup scheme in the Natural Park of Ebro Delta was well-received; it concretely enhanced the capacities of beach bar owners and staff to minimise and/or gradually eliminate the use of single-use cups. The beach bar owners and event organisers stopped buying single-use cups, which allowed them to save money and to keep their working environment cleaner. This was highlighted by the fact that the beaches and festival sites, were cleaner and free of SUPs when using the reusable cups.

The vast majority of beach bar owners and event organizers are looking forward to continuing being involved in the reusable cup scheme next summer; to that end a contract between beach bar owners and those in charge of the reusable cups would be a good way to further strengthen and formalize the scheme by specifying the conditions for both parties. In addition, two aspects of the scheme need to be further explored and addressed: the reusable cup storage system in beach bars needs to be improved (for both clean and used cups); different-sized reusable cups should potentially be introduced in the scheme to address different needs.

Cup users welcomed the use of reusable cups. Initially, there were times when users were more reticent or sceptical, but eventually there was a general acceptance. The reusable cup was also used as an effective vehicle for raising public awareness on the problem of marine litter, marine plastic pollution and SUPs, and showcased the kind of solutions that can be implemented on the ground. Of fundamental importance to the overall approach was the introduction of the concepts of prevention and reuse as key elements for behavioural changes in the way we consume. The pilot action also reinforced the connection between the park’s visitors and park’s conservation objectives.

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# PLASTIC BUSTERS MPAs

## THE PLASTIC BUSTERS MPAs PARTNERSHIP

