Libera il Mare

Pulizia delle spiagge e cultura ambientale

Marine Litter Program

Monitoring Report - Phase I

CoNISMa
Consorzio Nazionale Interuniversitario per le Scienze del Mare

Trans Adriatic Pipeline

Stampato a cura di TAP nel dicembre 2017

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Marine Litter Program Preliminary Assessment

Introduction

The project **'Libera il Mare - Phase I'** is based on an agreement between TAP (Trans Adriatic Pipeline) and the National Interuniversity Consortium for Marine Sciences (CoNISMa, Local Research Unit - ULR - Lecce based at Di.S.Te.B.A., University of Salento) signed in April 2016. This Phase I of six months aims to assess a preliminary set of data on the actual Marine Litter Program (hereafter ML) on beaches and calibrate the following activities of the Program. A set of four different beaches has been selected for the survey, each beach with three transects. The Phase I consists of two 'times' (**TIME 1** in February-March and **TIME 2** in May-June) for sampling the beaches and it will provide a preliminary assessment of the ML (**baseline survey**). Here we present the results of both TIME 1 and TIME 2 and an overview on the entire survey carried out on the beaches. Moreover, the results of the ghostfishing monitoring are also presented together with the guidelines for marine litter removal and management.

Timeline of the Program

January 20, 2017 — CoNISMa launches the call n° 006/17 (record 918) to select a PhD in Ecology responsible for:

- preliminary survey (qualitative and quantitative) of the marine litter along the beaches of the southern Adriatic coasts;
- ghostfishing monitoring;
- formulation of the guidelines for marine litter removal and management.

February 5, 2017 — CoNISMa confers the task. The expiring date has been fixed on **June 30 2017**.

February 8, 2017 — Start of the *TIME 1* of surveys on beaches.

March 6, 2017 — End of *TIME 1* of surveys on beaches.

April 15, 2017 — Delivery of the ***Intermediate Report on the baseline survey***.

May 03, 2017 — Start of the *TIME 2* of surveys on beaches.

June 09, 2017 — End of the *TIME 2* of surveys on beaches.

June 14-15, 2017 — Ghostfishing monitoring. The underwater survey.

July 2017 — Delivery of the ***Final Report on the baseline survey***.

Sampling methods for the monitoring of Marine Litter Program on beaches

The followed guidelines

The necessity of a uniform way of monitoring the marine litter led to standardize the methodologies to be followed during samplings. These methodologies allow comparisons between different countries and regions. The monitoring methods are different with respect to beached, floating and submerged marine litter. The monitoring of the beached marine litter entails different codes for the same items according the specific guideline followed. The guidelines used in the framework of the present survey were those produced by the **OSPAR Commission (2010)**[1]. In detail, the **OSPAR guidelines** involve filling a questionnaire with the basic information on the monitored **transects of 100 m**. The information, in addition to the names of the beaches and sampling dates, include: GPS coordinates, beach width, slope, type of beach material (% coverage), currents, winds.

The **OSPAR codes** for the Marine Litter Program are **116** and numbered from 1 to 121 (codes 51, 58, 85, 106, 107 do not exist in the OSPAR guidelines). The 116 codes are grouped in **13 different macro-categories** according to their material: Plastic/Polystyrene, Rubber, Cloth/Textile, Paper/Cardboard, Machined Wood, Metal, Glass, Pottery/Ceramics, Sanitary waste, Medical waste, Faeces, Paraffin or wax pieces, Other pollutants to be specified. When possible, the correspondence with codes of the other guidelines (**UNEP**[2], **TSG_ML**[3]) was also reported in the matrix of the sampled data.

For each item-code both the **number of pieces** and the **weight per code** were noted; these are the SMART **Key Performance Indicators** (KPIs) used for the reports, together with the **number of operators** and **time** required for field work and elaboration of data. In addition, the weight of the beached **Natural Wood** was also evaluated within all the sampled transects.

1 2010, Guideline for Monitoring Marine Litter Program on the Beaches in the OSPAR Maritime Area.

2 2009, Cheshire, A. C., Adler, E., Barbière, J., Cohen, Y., Evans, S., Jarayabhand, S., Jeftic, L., Jung, R.T., Kinsey, S., Kusui, E.T., Lavine, I., Manyara, P., Oosterbaan, L., Pereira, M.A., Sheavly, S., Tkalin, A., Varadarajan, S., Wenneker, B., Westphalen, G.. UNEP/IOC Guidelines on Survey and Monitoring of Marine Litter Program. UNEP Regional Seas Reports and Studies 186 (IOC Technical Series No. 83): 120.

3 2013, Guidance on Monitoring of Marine Litter Program in European Seas. MSFD Technical Subgroup on Marine Litter Program.

Field operations

The first operations on the beach includes the measuring of the 100m of the established transect (**Figure 1**) and the filling of the OSPAR questionnaire with information on the beach and transect. Then all the operators, protected by personal gloves, are involved in the collection of all items of marine litter present on the transect (**Figure 2**).

Figure 1 – Preliminary measurement of a 100 m transect on the beach of Torre dell'Orso. *02 March 2017*

Figure 2 – Collection of the Marine Litter Program. San Foca (Lido San Basilio)*, 17 March 2017*

All the collected items are separated according to the OSPAR codes (**Figure 3**), counted and then weighed with a portable scale (**Figure 4**).

Figure 3 – Grouping of the marine litter in different sacs for codes

Figure 4 – Weighing of the marine litter in sacs containing items of the same code

The study area of the beached Marine Litter Program

The monitored coast

The monitoring program of the Marine Litter Program pertains to about 20 km of the eastern coast of the Salento peninsula (**Figure 5**) in the province of Lecce.

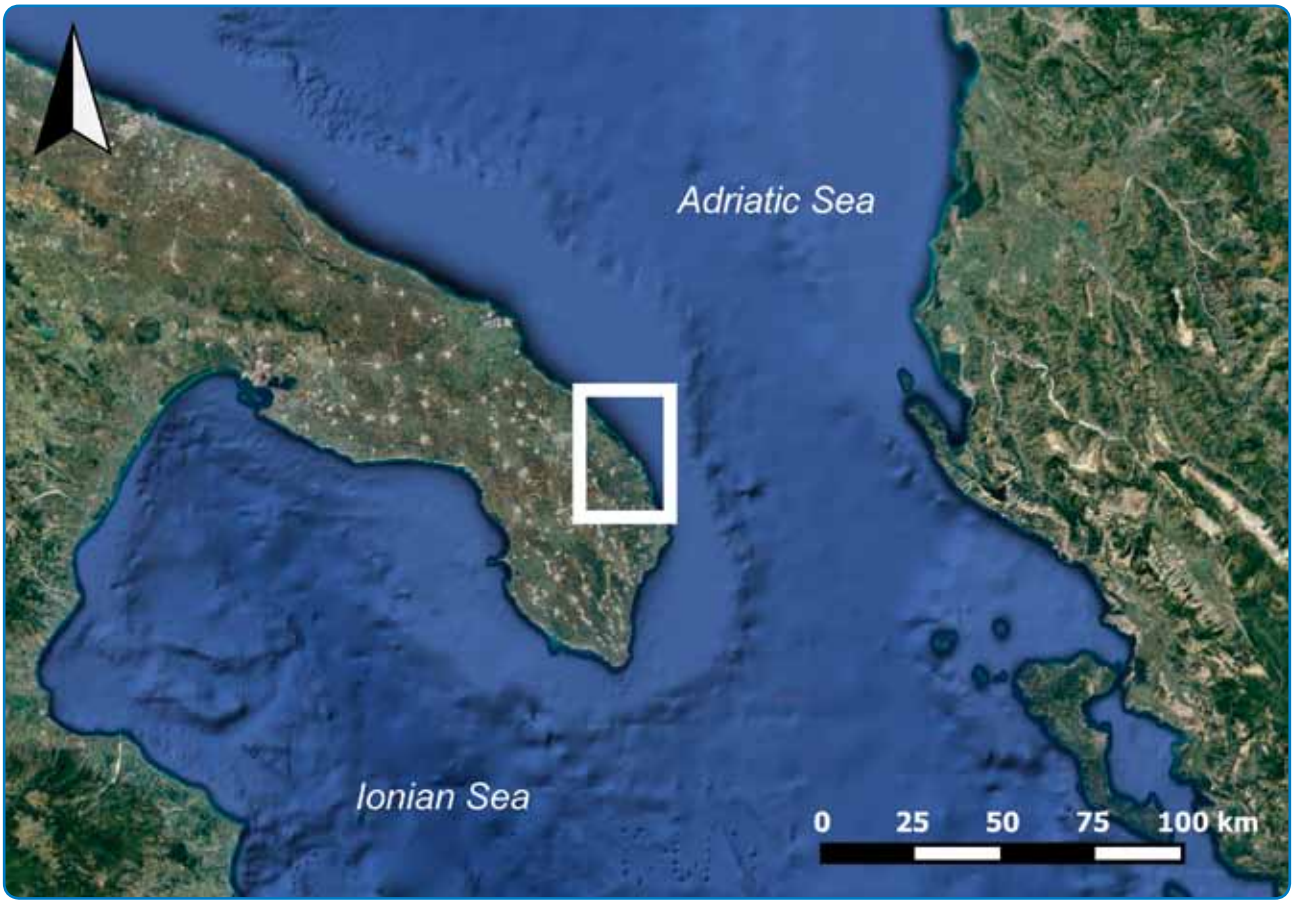


Figure 5 – Location of the study area in the Salento peninsula. Google Satellite Images

In detail (**Figure 6**), the trait of the monitored coast goes from the locality of *San Cataldo* (at North), belonging to the municipalities of Lecce and Vernole, and reaches *Torre dell' Orso* (at South), in the municipality of Melendugno, passing through *San Foca* and *Roca Vecchia* (both belonging to the municipality of Melendugno). Lecce is the administrative centre of the province.

Figure 6 – Detail of the eastern coast of the Salento peninsula. The yellow line shows the trait of 20 km of coast monitored for the marine litter

Maps of the transects

The four beaches selected are: *Le Cesine – North* (**Figure 7**), *Le Cesine – South* (**Figure 8**), *San Basilio* (**Figure 9**), *Torre dell'Orso* (**Figure 10**). The two beaches of *Le Cesine* are located in front of the State Natural Reserve managed by WWF and belongs to the administrative area of Vernole. *San Basilio* and *Torre dell'Orso* belong to Melendugno. These four beaches have been selected considering: the appropriate distance among them, their accessibility, the prevalence of sand on rocks.

A single transect of 100 m represents the **sampling unit**. Each one of the monitored beaches has been sampled in three different transects respecting the minimum distance of 50 m at least among two contiguous transects.

Figure 7 – Transects of Le Cesine *- North*

Figure 8 - Transects of Le Cesine – South

Figure 9 – Transects of San Basilio

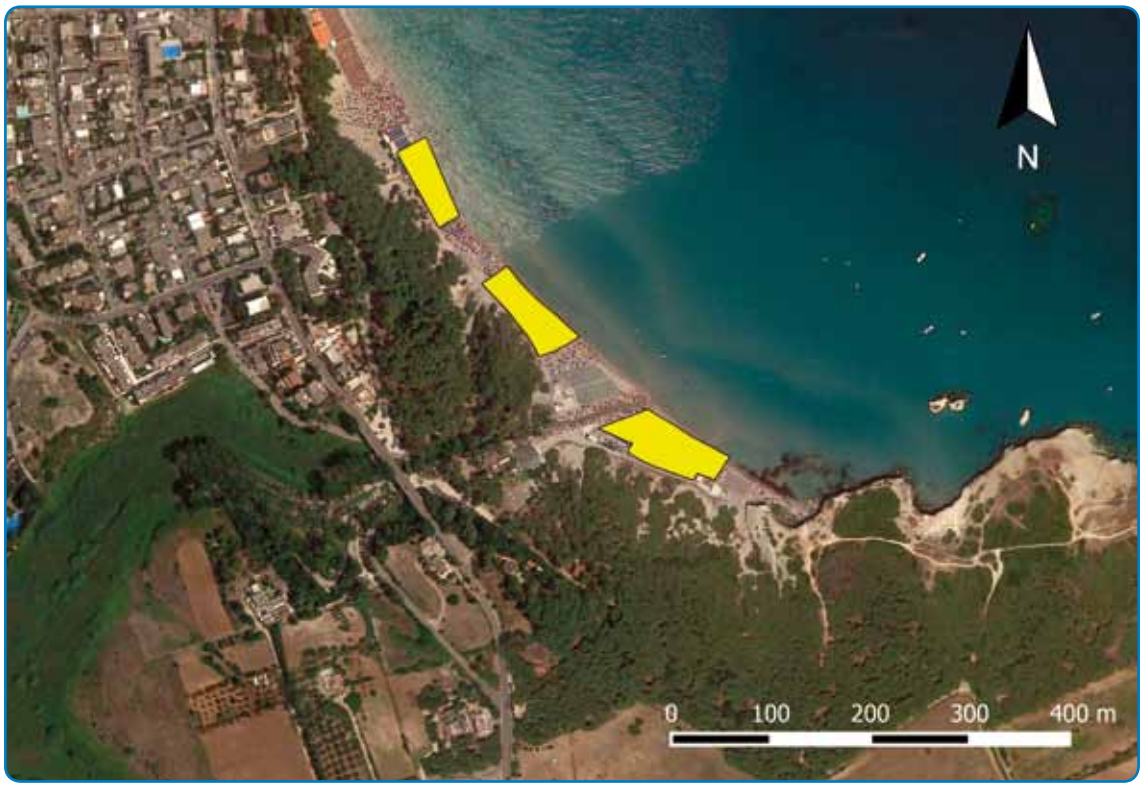


Figure 10 – Transects of Torre dell'Orso

Basic data of the transects

The **GPS coordinates** of the twelve transects are reported in the **Table 1**. In particular, both coordinates of the starting and ending points of the 100 m transects are reported together with the width and the slope of the beach in the respective points. The transect width has been measured from the margin beach-dune vegetation to the middle of the intertidal zone (the tidal range is **-0.2 –+ 0.6 m** in this trait of the Adriatic coast).

	start		end	
	Latitude N	Longitude E	Latitude N	Longitude E
CeN_T1_1	40°21'34.10"	18°20'20.53"	40°21'31.84"	18°20'23.55"
CeN_T1_2	40°21'14.04"	18°20'55.00"	40°21'16.00"	18°20'51.67"
CeN_T1_3	40°21'22.50"	18°20'39.00"	40°21'24.77"	18°20'35.73"
CeS_T1_1	40°20'50.06"	18°21'22.09"	40°20'51.94"	18°21'18.67"
CeS_T1_2	40°20'55.10"	18°21'14.05"	40°20'57.47"	18°21'11.01"
CeS_T1_3	40°20'43.45"	18°21'30.74"	40°20'45.65"	18°21'27.43"
SF_T1_1	40°18'43.70"	18°23'22.50"	40°18'42.02"	18°23'25.99"
SF_T1_2	40°18'40.70"	18°23'28.50"	40°18'39.00"	18°23'31.90"
SF_T1_3	40°18'35.46"	18°23'37.07"	40°18'37.30"	18°23'33.90"
TO_T1_1	40°16'09.30"	18°26'03.39"	40°16'11.10"	18°25'59.90"
TO_T1_2	40°16'13.30"	18°25'56.70"	40°16'15.76"	18°25'54.05"
TO_T1_3	40°16'19.80"	18°25'50.10"	40°16'17.10"	18°25'51.00"

Table 1 – List of the transects

The **beach material** has been also noted and reported in the **Table 2**

Beach	material (% coverage)
Le Cesine - North	74% calcareus sand; 24% volcanic sand; 2% calcareus rocks
Le Cesine - South	74% calcareus sand; 24% volcanic sand; 2% calcareus rocks
San Foca	80% calcareus sand; 8% volcanic sand; 12% calcareus rocks
Torre dell'Orso	95 % calcareus sand; 5% volcanic sand; 0% calcareus rocks

Table 2 – Beach material

Personnel involved and timetable per date

TIME1

date	transect	time required
08/02/2017	CeS_T1_1	5 h 30'
16/02/2017	CeS_T1_1	2 h 30'
16/02/2017	CeS_T1_2	4 h 20'
17/02/2017	CeN_T1_1	6 h 15'
17/02/2017	CeS_T1_3	4 h 30'
22/02/2017	CeN_T1_2	5 h 30'
23/02/2017	CeN_T1_3	5 h 25'
01/03/2017	SF_T1_1	5 h 40'
02/03/2017	TO_T1_1	4 h 50'
06/03/2017	TO_T1_2	3 h 10'
06/03/2017	TO_T1_3	2 h 30'
06/03/2017	SF_T1_2	3 h 30'
17/03/2017	SF_T1_3	4 h 45'
Total time		**58 h 25'**

Table 3 – Dates and times of samplings during the TIME 1

Five operators have been involved for the samplings of Marine Litter Program during surveys of the TIME 1, including the responsible (PhD in Ecology) selected by CoNISMa. Dates and schedules of samplings are resumed in the **Table 3.** The field work of the TIME 1 started on 8 February 2017 and were completed on 17 March 2017. A total time of **58 h 25'** was necessary for the 5 operators to complete the field samplings and evaluation of the Marine Litter Program during the TIME 1. An additional time of **15 h** was necessary to the responsible operator for transferring the sampling data from paper sheets to excel file and a total time of **32 h** for elaborating data and produce the intermediate report.

TIME 2

A variable number of operators were involved during the samplings of the TIME 2, with an average of 4 operators per day. Dates and schedules of samplings are showed in the **Table 4.** Field surveys of TIME 2 started on 3 May and were completed on 9 June requiring a total time of **31h 30'**.

date	transect	time required
03/05/2017	CeS_T2_3	3 h
04/05/2017	CeS_T2_1	2 h 30'
04/05/2017	CeS_T2_2	2 h
10/05/2017	TO_T2_2	1 h 30'
10/05/2017	TO_T2_1	1 h 30'
10/05/2017	TO_T2_3	1 h
19/05/2017	SF_T2_1	3 h
19/05/2017	SF_T2_2	3 h
20/03/2017	SF_T2_3	4 h
18/05/2017	CeN_T2_2	3 h
18/05/2017	CeN_T2_3	2 h 30'
09/06/2017	CeN_T2_1	4 h
Total time		**31 h 30'**

Table 4 – Dates and times of samplings during the TIME 2

The elaboration of data and the writing of the final report required an additional time of **30** hours.

Results

Field data during surveys

TIME 1

transect	date	Prevailing currents off the beach	Prevailing winds	Beach width (m) [start]	Beach slope (°) [start]	Beach width (m) [end]	Beach slope (°) [end]
CeS_T1_1	08/02/2017	N	N	22	6	20	4
CeS_T1_1	16/02/2017	E-NE	E-NE	22	4	20	7
CeS_T1_2	16/02/2017	E-NE	E-NE	19	3.8	23	3.05
CeN_T1_1	17/02/2017	E	E	30	3.2	25	3
CeS_T1_3	17/02/2017	E	E	15	3	15	8
CeN_T1_2	22/02/2017	NE	NE	18	4.75	17	0.3
CeN_T1_3	23/02/2017	SW	S	20.4	3.8	30.5	3.05
SF_T1_1	01/03/2017	SE	SE	16	1.8	32	1.6
TO_T1_1	02/03/2017	NW	N	52.5	4.3	28.7	5.6
TO_T1_2	06/03/2017	W	W-NW	45.3	3.8	31.8	3.6
TO_T1_3	06/03/2017	W	W-NW	23.3	2.6	32.6	7
SF_T1_2	06/03/2017	W	NW	23.4	5.4	24.8	1.5
SF_T1_3	17/03/2017	NNW	N	23	6	21.5	5.2

Table 5 - Currents, winds and beach width and slope during samplings of TIME 1

TIME 2

transect	date	Prevailing currents off the beach	Prevailing winds	Beach width (m) [start]	Beach slope (°) [start]	Beach width (m) [end]	Beach slope (°) [end]
CeS_T2_3	03/05/2017	N	NNW	9.7	12.5	17.3	3
CeS_T2_1	04/05/2017	NE	E	15.4	24	14.5	29
CeS_T2_2	04/05/2017	NE	E	22.1	27	16.1	28
TO_T2_1	10/05/2017	NE	E	45	3.5	60	3.5
TO_T2_2	10/05/2017	E	E	61	4	39.7	5
TO_T2_3	10/05/2017	SE	SE	55	7	22.8	8
SF_T2_1	19/05/2017	N	NE	5.3	12	23	7.7
SF_T2_2	19/05/2017	E	NEE	31	11.5	20	9.8
SF_T2_3	20/05/2017	N	NNE	27	9.6	23	9.2
CeN_T2_1	09/06/2017	N	NNW	11.2	7.4	18.5	9.6
CeN_T2_2	23/05/2017	N	NW	23	9	18.3	8
CeN_T2_3	23/05/2017	NW	N	9.6	6	20.2	5

Table 6 - Currents, winds and beach width and slope during samplings of TIME 2

An overview on the general results

	TIME 1 (Feb-Mar 2017)	TIME 2 (May-Jun 2017)
• Total number of items found and catalogued	16951	7262
• Average number of items per transect	1412	605
• Total weight of marine litter found	2170 kg	615 kg
• Average weight of marine litter per transect	181 kg	51 kg

The main results show a considerable difference between data of the ML in the two different TIMES. Both 'number of items' and 'weight' found in TIME 2 are much lower than those in TIME 1. Basing on the average weight found of ML in the sampled transect, the estimated amount of marine litter along the coast of 20 km between San Cataldo and Torre dell'Orso is about **40 t** during the TIME 1 and **10 t** during TIME 2 (TABLE 7). Moreover, **in the TIME 1 more than 270000 items** were estimated to be present on the whole in this trait of coast and **about 118000 items in TIME 2** (TABLE 8).

BEACH	beach length (m)	average weight found of ML per 100 m (kg)		estimated weight of ML for each beach and in total (kg)	
		TIME 1	TIME 2	TIME 1	TIME 2
San Cataldo - Cesine North	6000	333	60	19952	3600
Cesine South - Torre Specchia	3500	114	74	3973	2590
Torre Specchia - Roca Vecchia	6200	250	67	15530	4154
Roca Vecchia - Torre dell'Orso	4000	27	5	1076	90
Total	19700			**40531**	**10434**

Table 7 – Evaluation of the ML in the 20 km of coast surveyed

BEACH	beach length (m)	average n° of items of ML found per 100 m		estimated number of items of ML for each beach and in total	
		TIME 1	TIME 2	TIME 1	TIME 2
San Cataldo - Cesine North	6000	947	622	56820	37320
Cesine South - Torre Specchia	3500	1784	619	62428	21665
Torre Specchia - Roca Vecchia	6200	1724	522	106888	32364
Roca Vecchia - Torre dell'Orso	4000	1196	656	47827	26240
Total	19700			**273963**	**117589**

Table 8 – Evaluation of the number of ML items in the 20 km of coast surveyed

The **number of the different categories** (number of ML codes) of item found is **128** in TIME 1 and **101** in TIME 2.

The composition of the ML has been calculated based on the complessive weight measured for each macro-category in both the sampling TIMES (**Table 9**). All the macrocategories showed a decrease of both weight and number of items in the TIME 2 with respect to the TIME 1.

The **dominance of plastic/polystyrene items** was detected in both times. Referring to the total weight, the percentage of plastic/polystyrene is **66.6%** of total ML in the TIME 1, **70.2%** in the TIME 2) (**Figure 11** and **Figure 12** respectively). Considering the total number of items catalogued, the **plastic/polystyrene items** are the **91% of total items** in the TIME 1 and **85%** in the TIME 2.

The **machined wood** is confirmed to be the second most represented macro-category (after **plastic/polystyrene)** also in the TIME 2.

	TIME 1		TIME 2	
Macro-Category	**Weight measured (Kg)**	**Number of items**	**Weight measured (Kg)**	**Number of items**
Plastic/Polystyrene	1445	15510	430	6239
Machined Wood	579	205	83	44
Metal	55	94	57	73
Glass	38	161	29	84
Cloth/Textile	15	35	2.47	8
Pottery/Ceramics	14	25	0.07	0
Other - Engine Oil	14	1	0	0
Medical waste	5.45	178	0.47	55
Paper/Cardboard	1.82	148	2.70	389
Rubber	1.64	116	6	55
Sanitary waste	1.01	471	0.17	312
Faeces	0.35	1	0	0
Paraffin or wax pieces	0.31	5	0.47	1
Other - Engine Grease	0.03	1	0	0

Table 9 – Total weight of ML and items based on their material (macro-categories)

TIME 1

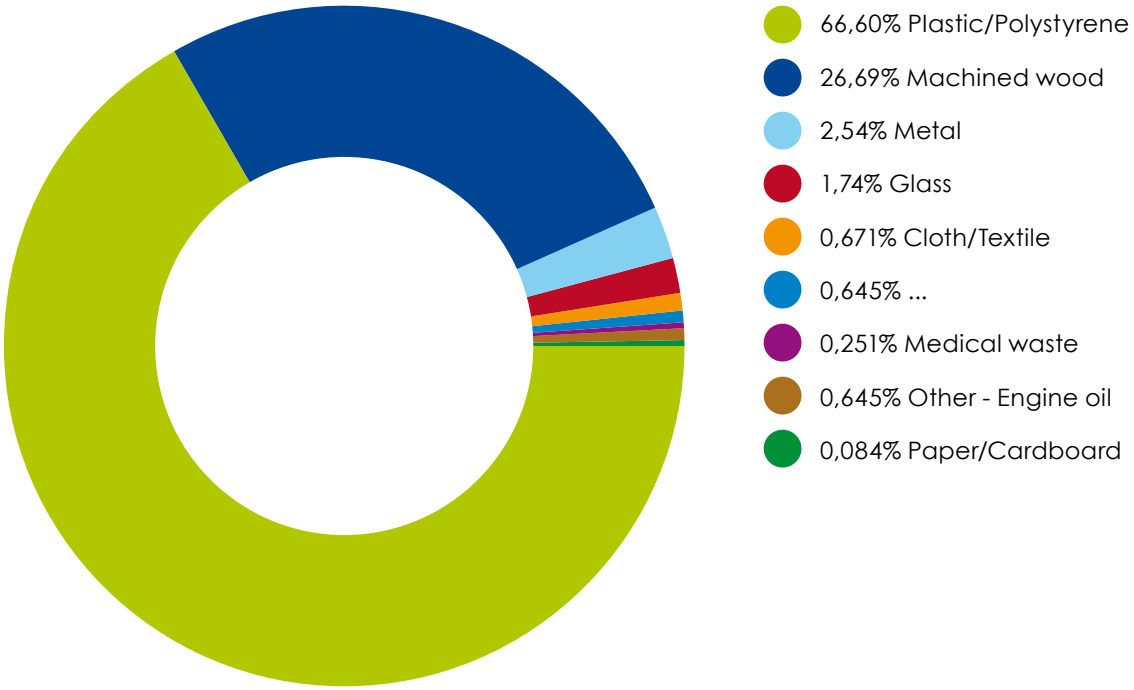


Figure 11 – The Marine Litter Program composition (percentage based on the total weight) evaluated during the TIME 1

TIME 2

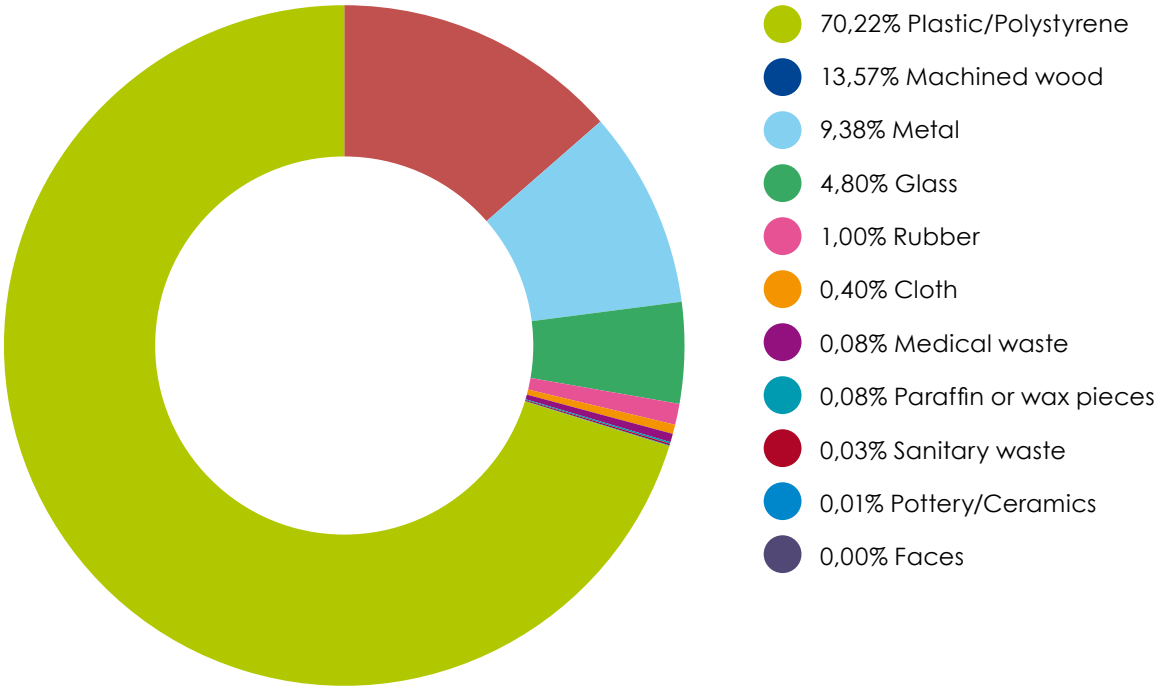


Figure 12 - The Marine Litter Program composition (percentage based on the total weight) evaluated during the TIME 2

Considering only the number of plastic items (and not their weight), the top ten list is reported in the **Table 10.** Among these items, there is a prevalence of pieces and fragments of plastic objects (**Figure 13**), followed by caps (**Figure 14**), mussels nets (**Figure 15**), bottles, foam sponge, cords, bags and even BioBalls (**Figure 16**).

OSPAR - code	TSG_ML General- Code	UNEP - code	General Name	Number of plastic items	
				TIME 1	TIME 2
46	G76		Plastic/polystyrene pieces 2.5 cm > <50cm	3083	1324
117	G75		Plastic/polystyrene pieces 0 - 2.5 cm	2008	1185
15	G21	PL01	Plastic caps/lids drinks	1833	522
28	G45	PL15	Mussels nets, Oyster nets	1562	900
4	G6	PL02	Drinks Bottles	1082	435
45	G73	FP01	Foam sponge	1025	244
32	G50	PL19	String and cord (diameter less than 1cm)	629	205
3	G4	PL07	Small plastic bags, e.g. freezer bags incl. Pieces	610	94
19	G30		Crisps packets/sweets wrappers	518	260
48	-	-	**BioBalls**	404	7

Table 10 – List of the most numerous plastic items among the ML

Figure 13 – Fragments of plastic on the beach. Le Cesine, *8 February 2017*

Figure 14 –Details of the amount of caps/lids collected in a single transects. Torre dell'Orso, *2 March 2017*

Figure 15 – The mussels nets are among the most abundant plastic items collected

Although the OSPAR codes are 116, in the framework of TIME 1 of the marine litter survey a total amount of **128 different item types** were found, with 55 additional items to the OSPAR guidelines (38 OSPAR items were not found). Most of items out of OSPAR codes, 34 items, can be associated to the 'Plastic/Polystyrene' category. During the TIME 1, among the most abundant items out of the OSPAR guidelines

there are: Bioballs (**Figure 16**); ends of poles for beach umbrellas (**Figure 17**); irrigation pipes (**Figure 18**); coffee capsules (**Figure 19**). All these items were listed under the OSPAR code 48 (other plastic/polystyrene items identifiable). These items were much lesser during TIME 2.

Figure 16 – BioBalls. *Plastic tools used in the filters for aquaculture*

Figure 17 - Ends of poles for beach umbrellas

Figure 18 – Irrigation pipes

Figure 19 - Coffee capsules

Le Cesine North

TIME 1

OSPAR - code	TSG_ML General- Code	UNEP - code	General Name	OSPAR Group	CeN_T1_1	CeN_T1_1	CeN_T1_2	CeN_T1_2	CeN_T1_3	CeN_T1_3
					pcs	Kg	pcs	Kg	pcs	Kg
3	G4	PL07	Small plastic bags, e.g. freezer bags incl. Pieces	Plastic/Polystyrene	30	1.2	8	1	20	0.88
112	G5		Plastic bag collective role; what remains from rip-off plastic bags	Plastic/Polystyrene	1	0.03			2	0.08
4	G6	PL02	Drinks Bottles	Plastic/Polystyrene			130	27.5	65	25
5	G9	PL02	Cleaner bottles & containers	Plastic/Polystyrene	1	0.17	41	9.3	27	2.4
6	G10	PL06	Food containers incl. fast food containers	Plastic/Polystyrene			8	0.3	9	0.3
7	G11	PL02	Beach use related cosmetic bottles and containers, e.g. Sunblocks	Plastic/Polystyrene	8	0.08	40	2.35	35	1.9
8	G14		Engine oil bottles & containers <50 cm	Plastic/Polystyrene	1	0.05	1	0.8	6	1.2
10	G16	PL03	Jerry cans (square plastic containers with handle)	Plastic/Polystyrene	5	0.8	10	14.65		
11	G17		Injection gun containers	Plastic/Polystyrene	2	0.25	1	0.2	2	0.32
12	G13	PL02	Other bottles & containers (drums)	Plastic/Polystyrene	15	3.5	1	10.6		
13	G18	PL13	Crates and containers / baskets	Plastic/Polystyrene	1	3.13	9	1.23		
14	G19		Car parts	Plastic/Polystyrene					4	367
15	G21	PL01	Plastic caps/lids drinks	Plastic/Polystyrene	34	0.2	89	0.6	108	0.66
16	G26	PL01	Cigarette lighters	Plastic/Polystyrene			5	0.07	4	0.09
17	G28		Pens and pen lids	Plastic/Polystyrene			7	0.05	6	0.04
19	G30		Crisps packets/sweets wrappers	Plastic/Polystyrene	5	0.01	34	0.15		
19	G31		Lolly sticks	Plastic/Polystyrene					48	0.88
20	G32	PL08	Toys and party poppers	Plastic/Polystyrene	4	0.16	7	0.2	8	0.6
21	G33	PL06	Cups and cup lids	Plastic/Polystyrene			48	0.33	24	0.15
22	G34	PL04	Cutlery and trays	Plastic/Polystyrene	12	0.07	71	0.023	23	0.04
28	G45	PL15	Mussels nets, Oyster nets	Plastic/Polystyrene	70	1.4	130	2.7	168	4.4
31	G49	PL19	Rope (diameter more than 1cm)	Plastic/Polystyrene	1	3.1	2	91.5		
32	G50	PL19	String and cord (diameter less than 1cm)	Plastic/Polystyrene	12	2.8	19	0.24	82	3.3
33	G56	PL20	Tangled nets/cord	Plastic/Polystyrene					8	13.5
34	G57	PL17	Fish boxes - plastic	Plastic/Polystyrene	3	3.4			3	1.3
35	G59	PL18	Fishing line/monofilament (angling)	Plastic/Polystyrene	1	0.35	4	11.27	5	0.45
36	G60	PL17	Light sticks (tubes with fluid) incl. Packaging	Plastic/Polystyrene					1	0.025
37	G62	PL14	Floats for fishing nets	Plastic/Polystyrene	1	1.3	2	16		
38	G65	PL03	Buckets	Plastic/Polystyrene	1	0.05	7	1.9	4	2.5
39	G66	PL21	Strapping bands	Plastic/Polystyrene	2	0.04			2	0.03
40	G67	PL16	Sheets, industrial packaging, plastic sheeting	Plastic/Polystyrene	30	2			48	2
41	G68	PL22	Fibre glass/fragments	Plastic/Polystyrene	1	0.3				
43	G70		Shotgun cartridges	Plastic/Polystyrene					7	0.06
44	G71	CL01	Shoes/sandals	Plastic/Polystyrene	5	1.1	40	7.16	26	6

45	G73	FP01	Foam sponge	Plastic/Polystyrene	4	0.03	23	0.18	10	0.22
117	G75		Plastic/polystyrene pieces 0 - 2.5 cm	Plastic/Polystyrene	10	0.5	48	0.4	64	1.5
46	G76		Plastic/polystyrene pieces 2.5 cm > <50cm	Plastic/Polystyrene	41	1.8	245	5.45	167	3.83
47	G77		Plastic/polystyrene pieces > 50 cm	Plastic/Polystyrene					1	3.1
48			beach umbrella support	Plastic/Polystyrene			1	0.7		
48			**BioBalls**	Plastic/Polystyrene	5	0.0015	78	0.02	35	0.01
48			**broom**	Plastic/Polystyrene	1	0.75	2	0.36	2	0.33
48			building site net	Plastic/Polystyrene			1	1.2		
48			camping stove	Plastic/Polystyrene			3	0.5		
48			**coffee capsule**	Plastic/Polystyrene	1	0.015	3	0.06	1	0.02
48			dishwashing sponge	Plastic/Polystyrene	1	0.02			1	0.15
48			**end of pole for beach umbrella**	Plastic/Polystyrene					1	0.02
48			glue (gun charge)	Plastic/Polystyrene					1	0.02
48			hanger	Plastic/Polystyrene	1	0.1				
48			**irrigation pipes**	Plastic/Polystyrene	2	0.1	5	1.49		
48			packaging of pesticide	Plastic/Polystyrene					1	0.2
48			padding	Plastic/Polystyrene			2	2.15		
48			Paint roller handle	Plastic/Polystyrene					1	0.03
48			seat	Plastic/Polystyrene			1	0.96		
48			vacuum cleaner bucket	Plastic/Polystyrene			1	0.62		
48			various pipes	Plastic/Polystyrene					8	3.2
48			wheels of pressure washer	Plastic/Polystyrene			2	0.17		
48			**window cleaner**	Plastic/Polystyrene	1	0.05			1	0.04
48	G90		Plastic flower pots	Plastic/Polystyrene	1	0.05	2	0.04		
49	G125	RB01	Balloons and balloon sticks, including plastic valves, ribbons, strings etc.	Rubber	3	0.07	2	0.015	4	0.035
54	G137	CL01	Clothing / rags (clothing, hats, towels)	Cloth	1	0.06			1	0.13
59	G145	CL06	Other textiles (incl. rags) (please specify in other item box*)	Cloth			1	0.05		
118	G150	PC03	Cartons/Tetrapack Milk	Paper/Cardboard	1	0.025	3	0.51	1	0.07
62	G151	PC03	Cartons/Tetrapack (others)	Paper/Cardboard			5	0.22	1	0.1
69	G160	WD04	Pallets	Machined Wood	6	70			2	62.3
74	G171	WD06	Other wood < 50 cm	Machined Wood	5	1.5	13	7		
75	G172	WD06	Other wood > 50 cm	Machined Wood			7	4.7	12	80
76	G174		Aerosol/Spray cans industry	Metal	1	0.07	5	1.06	2	0.25
78	G175	ME03	Cans (beverage)	Metal			2	0.032	2	0.032
79	G180	ME10	Appliances (refrigerators, washers, etc.)	Metal					1	0.2
82	G176	ME04	Cans (food)	Metal	1	0.05				
86	G190	ME05	Paint tins	Metal			3	5.26		
90	G189	ME05	Gas bottles, drums & buckets (> 4 L)	Metal	1	25				
91	G200	GC02	Bottles incl. pieces	Glass	3	1.3	30	10.12	21	5.6
92	G202	GC04	Light bulbs/Tubes	Glass	1	0.03	2	0.077	2	0.3
93	G210	GC08	Other glass items	Glass			8	0.38		
94	G204	GC01	Construction material (brick, cement, pipes)	Pottery/Ceramics	25	14				
98	G95	0T02	Cotton bud sticks	Sanitary waste	12	0.006	85	0.042	33	0.0165
100	G144	0T02	Tampons and tampon applicators	Sanitary waste			2	0.022		
101	G97	0T02	Toilet fresheners	Sanitary waste					7	0.16
103	G100		Medical/Pharmaceuticals containers/tubes	Medical waste	2	0.04	20	1.36	13	0.3

104	G99	PL12	Syringes/needles	Medical waste			3	0.01	1	0.0015
111	G214		Oil/Tar	Other pollutant to be specified			1	14		
			TOTAL	**TOTAL**	**376**	**141.06**	**1323**	**259.28**	**1142**	**597.27**
			DEAD ANIMALS							
			cow						1	
			Caretta caretta		1					
			LARGE NATURAL WOOD	**Natural wood**		**630**		**1550**		**1650**
			SMALL NATURAL WOOD	**Natural wood**		**55**		**630**		**270**

TIME 2

OSPAR - code	TSG_ML General-Code	UNEP - code	General Name	OSPAR groups	CeN_T2_1	CeN_T2_1	CeN_T2_2	CeN_T2_2	CeN_T2_3	CeN_T2_3
					pcs	Kg	pcs	Kg	pcs	Kg
1	G1	PL05	4/6-pack yokes, six-pack rings	Plastic/Polystyrene					1	0.002
3	G4	PL07	Small plastic bags, e.g. freezer bags incl. Pieces	Plastic/Polystyrene	19	0.16			18	0.68
112	G5		Plastic bag collective role; what remains from rip-off plastic bags	Plastic/Polystyrene	1	0.02	19	0.44	1	0.04
4	G6	PL02	Drinks Bottles	Plastic/Polystyrene	15	1.86	42	4.39	43	12
5	G9	PL02	Cleaner bottles & containers	Plastic/Polystyrene	15	1.56			4	0.25
6	G10	PL06	Food containers incl. fast food containers	Plastic/Polystyrene	1	0.005	16	0.9	6	0.003
7	G11	PL02	Beach use related cosmetic bottles and containers, e.g. Sunblocks	Plastic/Polystyrene	4	0.08	4	0.16	38	2.6
8	G14		Engine oil bottles & containers <50 cm	Plastic/Polystyrene	1	0.03	1	0.39	7	0.4
9	G15	PL03	Engine oil bottles & containers >50 cm	Plastic/Polystyrene	1	1.38				
10	G16	PL03	Jerry cans (square plastic containers with handle)	Plastic/Polystyrene					1	1.16
11	G17		Injection gun containers	Plastic/Polystyrene	1	0.08			1	0.57
15	G21	PL01	Plastic caps/lids drinks	Plastic/Polystyrene	20	0.2	83	0.38	83	0.57
16	G26	PL01	Cigarette lighters	Plastic/Polystyrene			1	0.022	7	0.154
17	G28		Pens and pen lids	Plastic/Polystyrene			5	0.008		
18	G29		Combs/hair brushes/sunglasses	Plastic/Polystyrene	2	0.015				
19	G30		Crisps packets/sweets wrappers	Plastic/Polystyrene			34	0.1	13	0.04
19	G31		Lolly sticks	Plastic/Polystyrene	9	0.02				
20	G32	PL08	Toys and party poppers	Plastic/Polystyrene	4	0.11	6	0.29		
21	G33	PL06	Cups and cup lids	Plastic/Polystyrene	19	0.2	8	0.02	21	0.0525
22	G34	PL04	Cutlery and trays	Plastic/Polystyrene	1	0.003	7	0.006		
114	G43		Tags (fishing and industry)	Plastic/Polystyrene			1	0.003		
28	G45	PL15	Mussels nets, Oyster nets	Plastic/Polystyrene	62	1.15	163	3.82	106	2.5
31	G49	PL19	Rope (diameter more than 1cm)	Plastic/Polystyrene					1	1.16
32	G50	PL19	String and cord (diameter less than 1cm)	Plastic/Polystyrene	13	0.06	53	0.62	16	0.69
115	G53	PL20	Nets and pieces of net < 50 cm	Plastic/Polystyrene	3	0.27				

33	G56	PL20	Tangled nets/cord	Plastic/Polystyrene	1	2			1	0.57
34	G57	PL17	Fish boxes - plastic	Plastic/Polystyrene	1	1.03			2	0.17
34	G58	PL17	Fish boxes - expanded polystyrene	Plastic/Polystyrene			1	0.06		
36	G60	PL17	Light sticks (tubes with fluid) incl. Packaging	Plastic/Polystyrene			2	0.015		
37	G62	PL14	Floats for fishing nets	Plastic/Polystyrene	3	25	8	23.648	4	1.2
38	G65	PL03	Buckets	Plastic/Polystyrene	3	0.96			1	0.41
39	G66	PL21	Strapping bands	Plastic/Polystyrene			1	0.015	2	0.008
40	G67	PL16	Sheets, industrial packaging, plastic sheeting	Plastic/Polystyrene			1	0.03		
41	G68	PL22	Fibre glass/fragments	Plastic/Polystyrene	1	0.33				
43	G70		Shotgun cartridges	Plastic/Polystyrene	2	0.054	6	0.0132	8	0.0174
44	G71	CL01	Shoes/sandals	Plastic/Polystyrene	6	1.26	6	1.23	7	0.87
45	G73	FP01	Foam sponge	Plastic/Polystyrene	4	0.03	14	0.11	13	0.13
117	G75		Plastic/polystyrene pieces 0 - 2.5 cm	Plastic/Polystyrene	15	0.015	102	0.14	70	0.33
46	G76		Plastic/polystyrene pieces 2.5 cm > <50cm	Plastic/Polystyrene	47	0.92	121	1.5	130	2.6
47	G77		Plastic/polystyrene pieces > 50 cm	Plastic/Polystyrene			38	2.21	5	8.23
48			**coffee capsule**	Plastic/Polystyrene					1	0.015
48			container wall paint color	Plastic/Polystyrene			1	0.008		
48			dishwashing sponge	Plastic/Polystyrene	1	0.1			1	0.19
48			**end of pole for beach umbrella**	Plastic/Polystyrene			2	0.0112		
48			**gasket (guarnizione)**				1	0.07	1	0.25
48			**irrigation pipes**	Plastic/Polystyrene	2	0.26	1	0.06	1	0.08
48			neoprene	Plastic/Polystyrene	1	0.004	1	0.05		
48			packaging of pesticide	Plastic/Polystyrene					1	0.45
48			rations of emergency water	Plastic/Polystyrene			1	0.05	1	0.5
48			**shoe polish**	Plastic/Polystyrene			1	0.023		
48	G90		Plastic flower pots	Plastic/Polystyrene	3	1.051	1	0.004	4	0.155
49	G125	RB01	Balloons and balloon sticks, including plastic valves, ribbons, strings etc.	Rubber	2	0.0015			9	0.3
57	G138	CL01	Shoes and sandals (e.g. Leather, cloth)	Cloth			1	0.78		
59	G145	CL06	Other textiles (incl. rags) (please specify in other item box*)	Cloth					1	1.1
118	G150	PC03	Cartons/Tetrapack Milk	Paper/Cardboard			1	0.06		
62	G151	PC03	Cartons/Tetrapack (others)	Paper/Cardboard	1	0.008	3	0.18	3	0.42
63	G152	PC03	Cigarette packets	Paper/Cardboard					1	0.02
73	G166		Paint brushes	Machined Wood					1	0.04
75	G172	WD06	Other wood > 50 cm	Machined Wood	4	20	7	9	17	10
76	G174		Aerosol/Spray cans industry	Metal	4	0.04				
78	G175	ME03	Cans (beverage)	Metal	2	0.03	1	0.02	1	0.02
81	G177	ME06	Foil wrappers, aluminium foil	Metal	2	0.03				
89	G198	ME10	Other metal pieces < 50 cm	Metal	1	0.04				
89			distress flares	Metal					1	0.56
91	G200	GC02	Bottles incl. pieces	Glass	7	8.85	6	2.6	12	3.34
92	G202	GC04	Light bulbs/Tubes	Glass	3	0.008	3	0.24	1	0.015
93	G210	GC08	Other glass items	Glass			1	0.3		
97	G133	RB07	Condoms (incl. packaging)	Sanitary waste					1	0.004
98	G95	0T02	Cotton bud sticks	Sanitary waste	6	0.002	54	0.0135	31	0.008
100	G144	0T02	Tampons and tampon applicators	Sanitary waste	1	0.025				
101	G97	0T02	Toilet fresheners	Sanitary waste	1	0.005				

102			Other sanitary items (please specify in other item box*)	Sanitary waste			1	0.005		
103	G100		Medical/Pharmaceuticals containers/tubes	Medical waste	4	0.05				
104	G99	PL12	Syringes/needles	Medical waste	1	0.05	1	0.0022	1	0.0022
105	G211	OT05	Other medical items (swabs, bandaging, adhesive plaster etc.)	Medical waste	1	0.025	11	0.78	4	0.03
			TOTAL	**TOTAL**	**321**	**69**	**842**	**55**	**704**	**55**
			DEAD ANIMALS							
			common buzzard (*Buteo buteo*)						1	
			LARGE NATURAL WOOD	**Natural wood**		**110**		**410**		**5500**
			SMALL NATURAL WOOD	**Natural wood**		**80**		**140**		**400**

Summary of Le Cesine North:

	TIME 1	TIME 2	(% of reduction)
• Total items found and catalogued	2841	1867	- 34%
• Average items *per* transect	947	622	
• Total ML weighed	998 kg	180 kg - 82%	
• Average ML weighed *per* transect	333 kg	60 kg	

Figure 20 – Le Cesine North, 18 May 2017

Le Cesine South

TIME 1

OSPAR - code	TSG_ML General-Code	UNEP - code	General Name	OSPAR Group	CeS_T1_1	CeS_T1_1	CeS_T1_2	CeS_T1_2	CeS_T1_3	CeS_T1_3
					pcs	Kg	pcs	Kg	pcs	Kg
4	G6	PL02	Drinks Bottles	Plastic/Polystyrene	347	42.32	210	14.3	25	3.4
5	G9	PL02	Cleaner bottles & containers	Plastic/Polystyrene	15	2			10	0.5
6	G10	PL06	Food containers incl. fast food containers	Plastic/Polystyrene					14	0.68
7	G11	PL02	Beach use related cosmetic bottles and containers, e.g. Sunblocks	Plastic/Polystyrene	51	2.85	13	0.6	2	0.016
8	G14		Engine oil bottles & containers <50 cm	Plastic/Polystyrene	17	1.81	1	0.025	3	0.45
10	G16	PL03	Jerry cans (square plastic containers with handle)	Plastic/Polystyrene	16	13.91			6	6
11	G17		Injection gun containers	Plastic/Polystyrene	1	0.07				
13	G18	PL13	Crates and containers / baskets	Plastic/Polystyrene	2	0.8				
15	G21	PL01	Plastic caps/lids drinks	Plastic/Polystyrene	158	0.753	1	0.14	60	0.3
16	G26	PL01	Cigarette lighters	Plastic/Polystyrene	25	0.81	1	0.01		
17	G28		Pens and pen lids	Plastic/Polystyrene	17	0.058	1	0.006	4	0.048
19	G30		Crisps packets/sweets wrappers	Plastic/Polystyrene	48	0.332				
19	G31		Lolly sticks	Plastic/Polystyrene	1	0.003				
20	G32	PL08	Toys and party poppers	Plastic/Polystyrene	15	0.15	3	0.05	6	0.3
21	G33	PL06	Cups and cup lids	Plastic/Polystyrene	54	0.365	21	0.0525	20	0.4
22	G34	PL04	Cutlery and trays	Plastic/Polystyrene					6	0.03
25	G40	PL09	Gloves (washing up)	Plastic/Polystyrene	2	0.005	3	0.08		
113	G41	RB03	Gloves (industrial/professional rubber gloves)	Plastic/Polystyrene	1	0.08	1	0.1		
28	G45	PL15	Mussels nets, Oyster nets	Plastic/Polystyrene	264	4.5	123	2.5	180	11
31	G49	PL19	Rope (diameter more than 1cm)	Plastic/Polystyrene	1	0.3				
32	G50	PL19	String and cord (diameter less than 1cm)	Plastic/Polystyrene	31	0.045	15	0.31	80	2.5
115	G53	PL20	Nets and pieces of net < 50 cm	Plastic/Polystyrene	0				1	0.3
34	G57	PL17	Fish boxes - plastic	Plastic/Polystyrene	0				2	0.4
34	G58	PL17	Fish boxes - expanded polystyrene	Plastic/Polystyrene	1	0.95	1	0.2		
36	G60	PL17	Light sticks (tubes with fluid) incl. Packaging	Plastic/Polystyrene	9	0.011				
37	G62	PL14	Floats for fishing nets	Plastic/Polystyrene	14	9.52				
37	G63	PL14	Buoys	Plastic/Polystyrene			15	0.06		
38	G65	PL03	Buckets	Plastic/Polystyrene					4	2.3
39	G66	PL21	Strapping bands	Plastic/Polystyrene					16	0.6
40	G67	PL16	Sheets, industrial packaging, plastic sheeting	Plastic/Polystyrene			17	1.3	240	21
43	G70		Shotgun cartridges	Plastic/Polystyrene	1	0.005				
44	G71	CL01	Shoes/sandals	Plastic/Polystyrene	74	10.06	13	0.7	22	1
45	G73	FP01	Foam sponge	Plastic/Polystyrene	347	1.9			24	2
	G74		Foam packaging/insulation/ polyurethane	Plastic/Polystyrene					1	2.3
117	G75		Plastic/polystyrene pieces 0 - 2.5 cm	Plastic/Polystyrene	283	3.577	27	3.7		
46	G76		Plastic/polystyrene pieces 2.5 cm > <50cm	Plastic/Polystyrene	351	2.62	1411	6	101	1.46

48			**BioBalls**	Plastic/Polystyrene	127	0.023	85	0.0266	11	0.003
48			**coffee capsule**	Plastic/Polystyrene					4	0.05
48			container wall paint color	Plastic/Polystyrene	3	0.045				
48			drainpipe	Plastic/Polystyrene	1	0.38				
48			**end of pole for beach umbrella**	Plastic/Polystyrene	13	0.221				
48			float for swimming pool	Plastic/Polystyrene			1	0.02		
48			**irrigation pipes**	Plastic/Polystyrene	1	6			2	1
48			neoprene	Plastic/Polystyrene	1	0.015				
48			packaging of pesticide	Plastic/Polystyrene			1	0.05		
48			sewer pipe	Plastic/Polystyrene					1	6
48			sheath for conditioners	Plastic/Polystyrene	1	0.33				
48			**shoe polish**	Plastic/Polystyrene	1	0.04	1	0.06		
48			supports for furniture	Plastic/Polystyrene	2	0.14				
48			various pipes	Plastic/Polystyrene	3	0.025				
48	G90		Plastic flower pots	Plastic/Polystyrene					4	0.5
49	G125	RB01	Balloons and balloon sticks, including plastic valves, ribbons, strings etc.	Rubber					4	0.05
53	G134	RB08	Other rubber pieces (please specify in other item box*)	Rubber	1	0.83				
59	G145	CL06	Other textiles (incl. rags) (please specify in other item box*)	Cloth	1	0.005				
118	G150	PC03	Cartons/Tetrapack Milk	Paper/Cardboard	1	0.08			4	0.26
62	G151	PC03	Cartons/Tetrapack (others)	Paper/Cardboard	3	0.075	1	0.025		
68	G159	WD01	Corks	Machined Wood	8	0.032				
69	G160	WD04	Pallets	Machined Wood	3	5.3				
119	G164		Fish boxes	Machined Wood	1	0.61				
74	G171	WD06	Other wood < 50 cm	Machined Wood	2	1.3			15	13.6
75	G172	WD06	Other wood > 50 cm	Machined Wood			6	80		
76	G174		Aerosol/Spray cans industry	Metal	11	1.03	4	0.3		
78	G175	ME03	Cans (beverage)	Metal			1	0.016		
79	G180	ME10	Appliances (refrigerators, washers, etc.)	Metal	1	0.008				
86	G190	ME05	Paint tins	Metal	1	0.09				
89			wheel for baby carriage	Metal	1	0.6				
90	G189	ME05	Gas bottles, drums & buckets (> 4 L)	Metal					1	17.6
91	G200	GC02	Bottles incl. pieces	Glass	33	10.81	3	0.8	4	1.6
92	G202	GC04	Light bulbs/Tubes	Glass	13	0.71	5	0.4	2	0.11
93	G210	GC08	Other glass items	Glass	1	0.06				
98	G95	0T02	Cotton bud sticks	Sanitary waste	17	0.015	4	0.002	40	0.01
101	G97	0T02	Toilet fresheners	Sanitary waste			1	0.06		
103	G100		Medical/Pharmaceuticals containers/tubes	Medical waste	22	1.825	9	0.34	6	0.04
104	G99	PL12	Syringes/needles	Medical waste			3	0.016	2	0.025
105	G211	OT05	Other medical items (swabs, bandaging, adhesive plaster etc.)	Medical waste	1	0.005				
109	G213	OT01	Paraffin/Wax 1-10 cm	Paraffin or wax pieces	1	0.001				
111			grease for engine	Other pollutant to be specified					1	0.03
			TOTAL	**TOTAL**	**2421**	**130.40**	**2002**	**112.24**	**928**	**97.86**
			LARGE NATURAL WOOD	**Natural wood**		**1750**		**800**		**570**
			SMALL NATURAL WOOD	**Natural wood**		**58**		**45**		**90**

TIME 2

OSPAR - code	TSG_ML General- Code	UNEP - code	General Name	OSPAR Group	CeS_T2_1	CeS_T2_1	CeS_T2_2	CeS_T2_2	CeS_T2_3	CeS_T2_3
					pcs	Kg	pcs	Kg	pcs	Kg
3	G4	PL07	Small plastic bags, e.g. freezer bags incl. Pieces	Plastic/Polystyrene	4	0.08	3	0.13	11	0.5
4	G6	PL02	Drinks Bottles	Plastic/Polystyrene	177	31.134	27	1.2	62	5.13
4	G7	PL02	Drink bottles <=0.5l	Plastic/Polystyrene			4	1.43		
5	G9	PL02	Cleaner bottles & containers	Plastic/Polystyrene	34	4.45			11	1.65
6	G10	PL06	Food containers incl. fast food containers	Plastic/Polystyrene	12	0.4	14	0.19	1	0.015
7	G11	PL02	Beach use related cosmetic bottles and containers, e.g. Sunblocks	Plastic/Polystyrene	21	1.3	1	0.03	2	0.18
8	G14		Engine oil bottles & containers <50 cm	Plastic/Polystyrene	11	5.4	1	0.08	1	0.08
10	G16	PL03	Jerry cans (square plastic containers with handle)	Plastic/Polystyrene	2	0.46			2	3.2
11	G17		Injection gun containers	Plastic/Polystyrene					2	0.28
13	G18	PL13	Crates and containers / baskets	Plastic/Polystyrene	3	1.8			1	0.25
14	G19		Car parts	Plastic/Polystyrene			1	0.031		
15	G21	PL01	Plastic caps/lids drinks	Plastic/Polystyrene	25	0.18	5	0.06	7	0.025
16	G26	PL01	Cigarette lighters	Plastic/Polystyrene	1	0.022			1	0.022
17	G28		Pens and pen lids	Plastic/Polystyrene	5	0.03			1	0.006
19	G30		Crisps packets/sweets wrappers	Plastic/Polystyrene	35	0.23				
20	G32	PL08	Toys and party poppers	Plastic/Polystyrene	10	0.21	6	0.27		
21	G33	PL06	Cups and cup lids	Plastic/Polystyrene	6	0.025	3	0.04	4	0.01
22	G34	PL04	Cutlery and trays	Plastic/Polystyrene			2	0.005		
25	G40	PL09	Gloves (washing up)	Plastic/Polystyrene					1	0.015
28	G45	PL15	Mussels nets, Oyster nets	Plastic/Polystyrene	234	4.55	24	0.37	123	4.87
31	G49	PL19	Rope (diameter more than 1cm)	Plastic/Polystyrene	1	1.11				
32	G50	PL19	String and cord (diameter less than 1cm)	Plastic/Polystyrene	23	0.031	1	0.005	21	2.36
33	G56	PL20	Tangled nets/cord	Plastic/Polystyrene					3	0.035
34	G57	PL17	Fish boxes - plastic	Plastic/Polystyrene	2	0.25	9	0.95		
37	G62	PL14	Floats for fishing nets	Plastic/Polystyrene	7	0.5			1	0.005
37	G63	PL14	Buoys	Plastic/Polystyrene	5	3.73				
38	G65	PL03	Buckets	Plastic/Polystyrene			2	0.92	2	1.28
39	G66	PL21	Strapping bands	Plastic/Polystyrene					4	0.015
43	G70		Shotgun cartridges	Plastic/Polystyrene	2	0.0042				
44	G71	CL01	Shoes/sandals	Plastic/Polystyrene	32	9.9	5	0.97	3	0.15
45	G73	FP01	Foam sponge	Plastic/Polystyrene	56	1.16	11	0.64	19	0.77
117	G75		Plastic/polystyrene pieces 0 - 2.5 cm	Plastic/Polystyrene	45	0.23	32	0.05	87	1.2
46	G76		Plastic/polystyrene pieces 2.5 cm> <50cm	Plastic/Polystyrene	209	5.18	142	1.82	79	1.98
47	G77		Plastic/polystyrene pieces > 50 cm	Plastic/Polystyrene			2	1.1		
48			broom	Plastic/Polystyrene	4	0.093				
48			coffee capsule	Plastic/Polystyrene	1	0.015				
48			end of pole for beach umbrella	Plastic/Polystyrene	2	0.01				
48			various pipes	Plastic/Polystyrene					1	0.24
48	G90		Plastic flower pots	Plastic/Polystyrene	2	0.08	1	0.08		
49	G125	RB01	Balloons and balloon sticks, including plastic valves, ribbons, strings etc.	Rubber	11	0.08	1	0.003	4	0.013
52	G128	RB04	Tyres and belts	Rubber			1	5.7		
118	G150	PC03	Cartons/Tetrapack Milk	Paper/Cardboard	1	0.025				
62	G151	PC03	Cartons/Tetrapack (others)	Paper/Cardboard	2	0.18	1	0.012	1	0.025

67	G158	PC05	Other paper items (please specify in other item box*)	Paper/Cardboard			1	0.005	1	0.017
69	G160	WD04	Pallets	Machined Wood					1	20
69	G161	WD04	Processed timber	Machined Wood					3	60
119	G164		Fish boxes	Machined Wood	1	0.42				
75	G172	WD06	Other wood > 50 cm	Machined Wood	7	14.881				
76	G174		Aerosol/Spray cans industry	Metal	12	0.72			2	0.325
78	G175	ME03	Cans (beverage)	Metal	2	0.003			1	0.021
91	G200	GC02	Bottles incl. pieces	Glass	27	10.12			3	0.25
92	G202	GC04	Light bulbs/Tubes	Glass	4	0.11				
93	G210	GC08	Other glass items	Glass			2	0.25	3	0.22
98	G95	0T02	Cotton bud sticks	Sanitary waste	15	0.004	3	0.00075	11	0.00275
101	G97	0T02	Toilet fresheners	Sanitary waste	1	0.002				
104	G99	PL12	Syringes/needles	Medical waste					1	0.0055
105	G211	OT05	Other medical items (swabs, bandaging, adhesive plaster etc.)	Medical waste	15	0.48	2	0.12		
111	G214		Oil/Tar	Other pollutant to be specified	1	0.8			1	0.5
			TOTAL	**TOTAL**	**1070**	**100.39**	**307**	**16.46**	**482**	**105.64**
			LARGE NATURAL WOOD	**Natural wood**		**1600**		**600**		**730**
			SMALL NATURAL WOOD	**Natural wood**		**390**		**160**		**260**

Figure 21 – Le Cesine South, 3 May 2017

Summary of Le Cesine South:

	TIME 1	TIME 2	(% of reduction)
• Total items found and catalogued	5351	1070	- 80%
• Average items *per* transect	1784	619	
• Total ML weighed	341 kg	223 kg	- 34%
• Average ML weighed *per* transect	114 kg	74 kg	

San Foca

TIME 1

OSPAR - code	TSG_ML General-Code	UNEP - code	General Name	OSPAR Group	SF_T1_1	SF_T1_1	SF_T1_2	SF_T1_2	SF_T1_3	SF_T1_3
					pcs	Kg	pcs	Kg	pcs	Kg
2	G3	PL07	Shopping Bags incl. pieces	Plastic/Polystyrene	12	0.02	25	0.47	21	9.3
3	G4	PL07	Small plastic bags, e.g. freezer bags incl. Pieces	Plastic/Polystyrene			220	0.6	63	1.65
112	G5		Plastic bag collective role; what remains from rip-off plastic bags	Plastic/Polystyrene			3	0.17	2	0.06
4	G6	PL02	Drinks Bottles	Plastic/Polystyrene	68	8	10	0.85	188	16.82
5	G9	PL02	Cleaner bottles & containers	Plastic/Polystyrene	22	1.45	10	0.25	12	1.75
6	G10	PL06	Food containers incl. fast food containers	Plastic/Polystyrene	11	0.6	4	0.06	11	0.3
7	G11	PL02	Beach use related cosmetic bottles and containers, e.g. Sunblocks	Plastic/Polystyrene	8	0.08	21	0.29	17	0.7
8	G14		Engine oil bottles & containers <50 cm	Plastic/Polystyrene			3	0.02	2	4
10	G16	PL03	Jerry cans (square plastic containers with handle)	Plastic/Polystyrene	7	8			3	2.05
14	G19		Car parts	Plastic/Polystyrene	2	0.6				
15	G21	PL01	Plastic caps/lids drinks	Plastic/Polystyrene	89	0.44	510	1.3	198	0.97
16	G26	PL01	Cigarette lighters	Plastic/Polystyrene	4	0.088	15	0.16	2	0.044
17	G28		Pens and pen lids	Plastic/Polystyrene	6	0.036	22	0.11	5	0.09
19	G30		Crisps packets/sweets wrappers	Plastic/Polystyrene	15	0.03	160	0.06	51	0.05
20	G32	PL08	Toys and party poppers	Plastic/Polystyrene	11	0.13	22	0.1	11	0.12
21	G33	PL06	Cups and cup lids	Plastic/Polystyrene	23	0.22	31	0.13	23	0.31
22	G34	PL04	Cutlery and trays	Plastic/Polystyrene	17	0.035	71	0.09	11	0.005
113	G41	RB03	Gloves (industrial/professional rubber gloves)	Plastic/Polystyrene					2	0.15
114	G43		Tags (fishing and industry)	Plastic/Polystyrene			2	0.007		
28	G45	PL15	Mussels nets, Oyster nets	Plastic/Polystyrene	130	1.9	157	1.2	105	2
31	G49	PL19	Rope (diameter more than 1cm)	Plastic/Polystyrene	1	400	6	0.21		
32	G50	PL19	String and cord (diameter less than 1cm)	Plastic/Polystyrene	32	0.11	135	0.27	63	0.19
115	G53	PL20	Nets and pieces of net < 50 cm	Plastic/Polystyrene			11	0.11		
33	G56	PL20	Tangled nets/cord	Plastic/Polystyrene	9	7.6			8	5.6
34	G57	PL17	Fish boxes - plastic	Plastic/Polystyrene					3	1.4
35	G59	PL18	Fishing line/monofilament (angling)	Plastic/Polystyrene	2	0.025				
36	G60	PL17	Light sticks (tubes with fluid) incl. Packaging	Plastic/Polystyrene	1	0.01	9	0.015		
37	G62	PL14	Floats for fishing nets	Plastic/Polystyrene	3	0.01				
37	G63	PL14	Buoys	Plastic/Polystyrene			3	0.03		
38	G65	PL03	Buckets	Plastic/Polystyrene	6	2.5			1	0.25
39	G66	PL21	Strapping bands	Plastic/Polystyrene	1	0.01	11	0.035		
42	G69		Hard hats/Helmets	Plastic/Polystyrene					1	0.45
43	G70		Shotgun cartridges	Plastic/Polystyrene	5	0.03	44	0.13	17	0.06
44	G71	CL01	Shoes/sandals	Plastic/Polystyrene	18	3.5	7	0.46		
45	G73	FP01	Foam sponge	Plastic/Polystyrene	68	0.91	32	0.93	12	0.015

117	G75		Plastic/polystyrene pieces 0 - 2.5 cm	Plastic/Polystyrene	225	0.84	427	0.55	443	1.3
46	G76		Plastic/polystyrene pieces 2.5 cm > <50cm	Plastic/Polystyrene	114	0.37	278	2.38	256	4.9
47	G77		Plastic/polystyrene pieces > 50 cm	Plastic/Polystyrene	26	2				
48			**BioBalls**	Plastic/Polystyrene	8	0.0025	48	0.015	7	0.0021
48			**broom**	Plastic/Polystyrene	2	0.85	1	0.14		
48			**coffee capsule**	Plastic/Polystyrene	1	0.02	4	0.25	1	0.015
48			drainpipe	Plastic/Polystyrene	2	0.78				
48			**end of pole for beach umbrella**	Plastic/Polystyrene	1	0.015	2	0.012	3	0.017
48			**irrigation pipes**	Plastic/Polystyrene			10	0.3	1	0.09
48			padding	Plastic/Polystyrene					1	0.3
48			rations of emergency water	Plastic/Polystyrene					8	0.4
48			**shoe polish**	Plastic/Polystyrene	1	0.03				
48			various pipes	Plastic/Polystyrene	7	0.08				
48	G89		Cable ties	Plastic/Polystyrene			4	0.015		
48	G90		Plastic flower pots	Plastic/Polystyrene	1	0.1			1	0.3
49	G125	RB01	Balloons and balloon sticks, including plastic valves, ribbons, strings etc.	Rubber	3	0.015	43	0.12	5	0.08
53	G134	RB08	Other rubber pieces (please specify in other item box*)	Rubber	8	0.05	11	0.059	1	0.05
54	G137	CL01	Clothing / rags (clothing, hats, towels)	Cloth			4	0.03		
57	G138	CL01	Shoes and sandals (e.g. Leather, cloth)	Cloth					11	1.1
59	G145	CL06	Other textiles (incl. rags) (please specify in other item box*)	Cloth			5	0.05		
61	G148	PC02	Cardboard (boxes & fragments)	Paper/Cardboard			1	0.015		
62	G151	PC03	Cartons/Tetrapack (others)	Paper/Cardboard			2	0.03	1	0.04
63	G152	PC03	Cigarette packets	Paper/Cardboard					1	0.02
64	G27	PL11	Cigarette butts and filters	Paper/Cardboard	17	0.005	27	0.004		
68	G159	WD01	Corks	Machined Wood	3	0.012	4	0.016	1	0.004
69	G160	WD04	Pallets	Machined Wood					1	35
74	G171	WD06	Other wood < 50 cm	Machined Wood	20	13	12	15.38		
75	G172	WD06	Other wood > 50 cm	Machined Wood	5	15	5	135	12	18.8
76	G174		Aerosol/Spray cans industry	Metal	7	0.4			1	0.06
77	G178	ME02	Bottle caps, lids & pull tabs	Metal			13	0.08		
78	G175	ME03	Cans (beverage)	Metal	2	0.032	2	0.11		
81	G177	ME06	Foil wrappers, aluminium foil	Metal	2	0.02	1	0.08		
89	G198	ME10	Other metal pieces < 50 cm	Metal			2	0.015		
89			distress flares	Metal	1	0.015				
89			weights for diving	Metal	2	2				
91	G200	GC02	Bottles incl. pieces	Glass	6	1	3	0.7	7	2.43
92	G202	GC04	Light bulbs/Tubes	Glass	1	0.06	2	0.018		
93	G210	GC08	Other glass items	Glass	7	0.12	1	0.07		
100	G144	0T02	Tampons and tampon applicators	Sanitary waste			1	0.005		
101	G97	0T02	Toilet fresheners	Sanitary waste					1	0.02
102			Other sanitary items (please specify in other item box*)	Sanitary waste	7	0.05				
103	G100		Medical/Pharmaceuticals containers/tubes	Medical waste	9	0.38	18	0.31	13	0.41
104	G99	PL12	Syringes/needles	Medical waste	5	0.007	17	0.1	5	0.015
108	G213	OT01	Paraffin/Wax 0-1 cm	Paraffin or wax pieces			2	0.05		

109	G213	OT01	Paraffin/Wax 1-10 cm	Paraffin or wax pieces			1	0.21		
			TOTAL	**TOTAL**	**1064**	**473.59**	**2495**	**164.17**	**1613**	**113.69**
			LARGE NATURAL WOOD	**Natural wood**		**1300**		**1450**		**350**
			SMALL NATURAL WOOD	**Natural wood**		**250**		**450**		**60**

Time 2

OSPAR - code	TSG_ML General-Code	UNEP - code	General Name	OSPAR Group	SF_T2_1	SF_T2_1	SF_T2_2	SF_T2_2	SF_T2_3	SF_T2_3
					pcs	Kg	pcs	Kg	pcs	Kg
3	G4	PL07	Small plastic bags, e.g. freezer bags incl. Pieces	Plastic/Polystyrene			16	0.95	7	0.13
112	G5		Plastic bag collective role; what remains from rip-off plastic bags	Plastic/Polystyrene	33	0.4	2	0.15		
4	G6	PL02	Drinks Bottles	Plastic/Polystyrene	11	0.4	14	0.58	27	1.15
5	G9	PL02	Cleaner bottles & containers	Plastic/Polystyrene	7	0.24	7	1.25	11	0.68
6	G10	PL06	Food containers incl. fast food containers	Plastic/Polystyrene	4	0.187			6	0.06
7	G11	PL02	Beach use related cosmetic bottles and containers, e.g. Sunblocks	Plastic/Polystyrene			6	0.2	6	0.13
8	G14		Engine oil bottles & containers <50 cm	Plastic/Polystyrene			1	0.08	1	0.09
10	G16	PL03	Jerry cans (square plastic containers with handle)	Plastic/Polystyrene					2	0.58
11	G17		Injection gun containers	Plastic/Polystyrene	1	0.02				
13	G18	PL13	Crates and containers / baskets	Plastic/Polystyrene	1	0.7				
15	G21	PL01	Plastic caps/lids drinks	Plastic/Polystyrene	45	0.13	95	0.32	30	0.14
16	G26	PL01	Cigarette lighters	Plastic/Polystyrene	5	0.11	5	0.11	2	0.044
17	G28		Pens and pen lids	Plastic/Polystyrene			3	0.01		
18	G29		Combs/hair brushes/sunglasses	Plastic/Polystyrene	2	0.023			1	0.025
19	G30		Crisps packets/sweets wrappers	Plastic/Polystyrene	24	0.015	15	0.005	2	0.002
20	G32	PL08	Toys and party poppers	Plastic/Polystyrene	4	0.05	6	0.23	5	0.05
21	G33	PL06	Cups and cup lids	Plastic/Polystyrene	4	0.02	7	0.0175	20	0.12
22	G34	PL04	Cutlery and trays	Plastic/Polystyrene	7	0.009			1	0.003
22	G35	PL04	Straws and stirrers	Plastic/Polystyrene			14	0.018		
28	G45	PL15	Mussels nets, Oyster nets	Plastic/Polystyrene	41	0.32	23	0.35	36	0.43
31	G49	PL19	Rope (diameter more than 1cm)	Plastic/Polystyrene	3	160			1	5
32	G50	PL19	String and cord (diameter less than 1cm)	Plastic/Polystyrene	5	0.008	13	0.41	7	0.1
33	G56	PL20	Tangled nets/cord	Plastic/Polystyrene	7	0.11			5	0.17
34	G57	PL17	Fish boxes - plastic	Plastic/Polystyrene	4	0.6				
34	G58	PL17	Fish boxes - expanded polystyrene	Plastic/Polystyrene			1	0.07		
35	G59	PL18	Fishing line/monofilament (angling)	Plastic/Polystyrene			1	0.005		
37	G62	PL14	Floats for fishing nets	Plastic/Polystyrene	3	0.015				
37	G63	PL14	Buoys	Plastic/Polystyrene					1	9.8
38	G65	PL03	Buckets	Plastic/Polystyrene	1	0.13			1	0.32
39	G66	PL21	Strapping bands	Plastic/Polystyrene	2	0.03	2	0.008	1	0.005

43	G70		Shotgun cartridges	Plastic/Polystyrene	3	0.063	5	0.0105	1	0.002
44	G71	CL01	Shoes/sandals	Plastic/Polystyrene			6	0.65	5	0.75
45	G73	FP01	Foam sponge	Plastic/Polystyrene	19	0.023	31	0.2	14	0.22
117	G75		Plastic/polystyrene pieces 0 - 2.5 cm	Plastic/Polystyrene			230	0.26	66	0.11
46	G76		Plastic/polystyrene pieces 2.5 cm > <50cm	Plastic/Polystyrene	193	0.35	79	1.16	59	0.97
47	G77		Plastic/polystyrene pieces > 50 cm	Plastic/Polystyrene	55	1			3	0.015
48			**BioBalls**	Plastic/Polystyrene	4	0.00125	2	0.00625	1	0.003125
48			**coffee capsule**	Plastic/Polystyrene			2	0.03	2	0.03
48			dishwashing sponge	Plastic/Polystyrene					1	0.08
48			**end of pole for beach umbrella**	Plastic/Polystyrene			2	0.0112		
48			various pipes	Plastic/Polystyrene					4	0.4
49	G125	RB01	Balloons and balloon sticks, including plastic valves, ribbons, strings etc.	Rubber	2	0.003	2	0.007	3	0.013
50	G127		Rubber boots	Rubber	7	0.62				
53	G134	RB08	Other rubber pieces (please specify in other item box*)	Rubber	2	0.077				
54	G137	CL01	Clothing / rags (clothing, hats, towels)	Cloth					1	0.12
118	G150	PC03	Cartons/Tetrapack Milk	Paper/Cardboard	1	0.03				
62	G151	PC03	Cartons/Tetrapack (others)	Paper/Cardboard	1	0.02	1	0.013	1	0.06
64	G27	PL11	Cigarette butts and filters	Paper/Cardboard	3	0.002	10	0.012		
67	G158	PC05	Other paper items (please specify in other item box*)	Paper/Cardboard	7	0.018			2	0.035
68	G159	WD01	Corks	Machined Wood			1	0.004		
119	G164		Fish boxes	Machined Wood					1	2.4
76	G174		Aerosol/Spray cans industry	Metal					3	0.43
77	G178	ME02	Bottle caps, lids & pull tabs	Metal	2	0.004				
78	G175	ME03	Cans (beverage)	Metal	1	0.016			1	0.016
81	G177	ME06	Foil wrappers, aluminium foil	Metal					1	0.025
82	G176	ME04	Cans (food)	Metal			1	0.03		
89	G198	ME10	Other metal pieces < 50 cm	Metal	4	0.03	4	0.06		
91	G200	GC02	Bottles incl. pieces	Glass	5	1.53	1	0.17	1	0.15
92	G202	GC04	Light bulbs/Tubes	Glass					1	0.05
98	G95	0T02	Cotton bud sticks	Sanitary waste	28	0.007	45	0.011	8	0.002
100	G144	0T02	Tampons and tampon applicators	Sanitary waste	1	0.006				
103	G100		Medical/Pharmaceuticals containers/tubes	Medical waste	1	0.001	5	0.15	2	0.17
104	G99	PL12	Syringes/needles	Medical waste	1	0.015	1	0.0055		
109	G213	OT01	Paraffin/Wax 1-10 cm	Paraffin or wax pieces					1	0.07
			TOTAL	**TOTAL**	**554**	**167.33**	**659**	**7.55**	**355**	**25.15**
			LARGE NATURAL WOOD	**NATURAL WOOD**		**950**		**2500**		**600**
			SMALL NATURAL WOOD	**NATURAL WOOD**		**95**		**350**		**110**

Summary of San Foca:

	TIME 1	TIME 2	(% of reduction)
• Total items found and catalogued	5172	1568	- 69%
• Average items *per* transect	1724	522	
• Total ML weighed	751.40 kg	200 kg	- 35%
• Average ML weighed *per* transect	250.48 kg	66 kg	

Figure 22 – San Foca, 19 May 2017

Torre dell'Orso

TIME 1

OSPAR - code	TSG_ML General-Code	UNEP - code	General Group	OSPAR Items	TO_T1_1	TO_T1_1	TO_T1_2	TO_T1_2	TO_T1_3	TO_T1_3
					pcs	Kg	pcs	Kg	pcs	Kg
3	G4	PL07	Small plastic bags, e.g. freezer bags incl. Pieces	Plastic/Polystyrene	244	2.4	25	0.36		
4	G6	PL02	Drinks Bottles	Plastic/Polystyrene	28	1.9	8	0.35	3	0.12
5	G9	PL02	Cleaner bottles & containers	Plastic/Polystyrene			7	0.65	2	0.3
6	G10	PL06	Food containers incl. fast food containers	Plastic/Polystyrene	14	0.21	1	0.05		
7	G11	PL02	Beach use related cosmetic bottles and containers, e.g. Sun-blocks	Plastic/Polystyrene	10	0.6			2	0.1
8	G14		Engine oil bottles & containers <50 cm	Plastic/Polystyrene	2	0.11				
10	G16	PL03	Jerry cans (square plastic containers with handle)	Plastic/Polystyrene	1	0.51				
11	G17		Injection gun containers	Plastic/Polystyrene	1	0.04				
13	G18	PL13	Crates and containers / baskets	Plastic/Polystyrene	8	1.25	2	0.15		
14	G19		Car parts	Plastic/Polystyrene	1	0.31				
15	G21	PL01	Plastic caps/lids drinks	Plastic/Polystyrene	483	1.26	80	0.36	23	0.1
16	G26	PL01	Cigarette lighters	Plastic/Polystyrene	14	0.16				
17	G28		Pens and pen lids	Plastic/Polystyrene	18	0.05	2	0.012		
19	G30		Crisps packets/sweets wrappers	Plastic/Polystyrene	164	0.24	34	0.01	7	0.04
20	G32	PL08	Toys and party poppers	Plastic/Polystyrene	36	0.17	6	0.15		
21	G33	PL06	Cups and cup lids	Plastic/Polystyrene	50	0.29	21	0.0525	12	0.03
22	G34	PL04	Cutlery and trays	Plastic/Polystyrene	16	0.8			6	0.03
22	G35	PL04	Straws and stirrers	Plastic/Polystyrene	112	0.11	5	0.03		
113	G41	RB03	Gloves (industrial/professional rubber gloves)	Plastic/Polystyrene	1	0.23				
28	G45	PL15	Mussels nets, Oyster nets	Plastic/Polystyrene	191	2.65	44	0.75		
31	G49	PL19	Rope (diameter more than 1cm)	Plastic/Polystyrene	1	0.45				
32	G50	PL19	String and cord (diameter less than 1cm)	Plastic/Polystyrene	149	0.22	11	0.003		
33	G56	PL20	Tangled nets/cord	Plastic/Polystyrene	13	10.4	1	0.3		
34	G57	PL17	Fish boxes - plastic	Plastic/Polystyrene	1	0.17				
35	G59	PL18	Fishing line/monofilament (angling)	Plastic/Polystyrene	7	0.04			1	0.01
36	G60	PL17	Light sticks (tubes with fluid) incl. Packaging	Plastic/Polystyrene	2	0.005	2	0.014		
37	G62	PL14	Floats for fishing nets	Plastic/Polystyrene					1	0.54
37	G63	PL14	Buoys	Plastic/Polystyrene	1	1.8				
39	G66	PL21	Strapping bands	Plastic/Polystyrene	17	0.1	4	0.028	2	0.002
42	G69		Hard hats/Helmets	Plastic/Polystyrene	1	0.11				
43	G70		Shotgun cartridges	Plastic/Polystyrene	18	0.06	6	0.0162		
44	G71	CL01	Shoes/sandals	Plastic/Polystyrene	9	0.95	3	0.35	1	0.09
45	G73	FP01	Foam sponge	Plastic/Polystyrene	483	1.7	9	0.06	13	0.05
117	G75		Plastic/polystyrene pieces 0 - 2.5 cm	Plastic/Polystyrene	407	2.42	28	0.2	46	0.19

46	G76		Plastic/polystyrene pieces 2.5 cm > <50cm	Plastic/Polystyrene	49	1.8	55	0.6	15	0.43
48			billboard	Plastic/Polystyrene	1	1.8				
48			**broom**	Plastic/Polystyrene	1	0.28				
48			**coffee capsule**	Plastic/Polystyrene	2	0.015				
48			dishwashing sponge	Plastic/Polystyrene	1	0.01				
48			drainpipe	Plastic/Polystyrene	1	0.23				
48			**end of pole for beach umbrella**	Plastic/Polystyrene	21	0.22	5	0.03	3	0.017
48			**funnel**	Plastic/Polystyrene	2	0.05				
48			**irrigation pipes**	Plastic/Polystyrene	1	0.23	4	0.37		
48	G90		Plastic flower pots	Plastic/Polystyrene	1	0.15				
49	G125	RB01	Balloons and balloon sticks, including plastic valves, ribbons, strings etc.	Rubber	25	0.2	4	0.003	2	0.06
54	G137	CL01	Clothing / rags (clothing, hats, towels)	Cloth	2	0.04				
55	G141	CL05	Carpet & Furnishing	Cloth	9	13.1				
61	G148	PC02	Cardboard (boxes & fragments)	Paper/Cardboard			4	0.07		
62	G151	PC03	Cartons/Tetrapack (others)	Paper/Cardboard			1	0.03	1	0.008
63	G152	PC03	Cigarette packets	Paper/Cardboard	1	0.004	1	0.02	4	0.03
64	G27	PL11	Cigarette butts and filters	Paper/Cardboard	25	0.025	35	0.042		
67	G158	PC05	Other paper items (please specify in other item box*)	Paper/Cardboard	7	0.11				
68	G159	WD01	Corks	Machined Wood	6	0.024	2	0.008	1	0.004
74	G171	WD06	Other wood < 50 cm	Machined Wood	31	4.5	14	2.01		
75	G172	WD06	Other wood > 50 cm	Machined Wood	5	10	3	4.12		
76	G174		Aerosol/Spray cans industry	Metal	1	0.03				
77	G178	ME02	Bottle caps, lids & pull tabs	Metal					1	0.002
81	G177	ME06	Foil wrappers, aluminium foil	Metal					5	0.16
89	G198	ME10	Other metal pieces < 50 cm	Metal	12	0.17			3	0.01
90	G199	ME10	Other metal pieces > 50 cm	Metal	1	0.23				
91	G200	GC02	Bottles incl. pieces	Glass	4	0.92				
92	G202	GC04	Light bulbs/Tubes	Glass			1	0.06	1	0.015
98	G95	0T02	Cotton bud sticks	Sanitary waste	181	0.05	35	0.009	18	0.004
102			Other sanitary items (please specify in other item box*)	Sanitary waste	23	0.5	4	0.04		
103	G100		Medical/Pharmaceuticals containers/tubes	Medical waste	17	0.2				
104	G99	PL12	Syringes/needles	Medical waste	2	0.016	3	0.0165	4	0.022
105	G211	OT05	Other medical items (swabs, bandaging, adhesive plaster etc.)	Medical waste					3	0.015
121	G101		Dog faeces bag	Faeces					1	0.35
109	G213	OT01	Paraffin/Wax 1-10 cm	Paraffin or wax pieces			1	0.05		
			TOTAL	**TOTAL**	**2935**	**66.62**	**471**	**11.37**	**181**	**2.73**
			LARGE NATURAL WOOD	**Natural wood**		450		90		0
			SMALL NATURAL WOOD	**Natural wood**		280		450		30

TIME 2

OSPAR - code	TSG_ML General-Code	UNEP - code	General Name	OSPAR Items	TO_T2_1	TO_T2_1	TO_T2_2	TO_T2_2	TO_T2_3	TO_T2_3
					pcs	Kg	pcs	Kg	pcs	Kg
3	G4	PL07	Small plastic bags, e.g. freezer bags incl. Pieces	Plastic/Polystyrene	6	0.13	6	0.29	4	0.11
112	G5		Plastic bag collective role; what remains from rip-off plastic bags	Plastic/Polystyrene	1	0.03				
4	G6	PL02	Drinks Bottles	Plastic/Polystyrene	8	0.39	5	0.35	4	0.23
6	G10	PL06	Food containers incl. fast food containers	Plastic/Polystyrene	4	0.03	2	0.3		
7	G11	PL02	Beach use related cosmetic bottles and containers, e.g. Sunblocks	Plastic/Polystyrene	4	0.3	1	0.005		
13	G18	PL13	Crates and containers / baskets	Plastic/Polystyrene			1	0.48		
15	G21	PL01	Plastic caps/lids drinks	Plastic/Polystyrene	73	0.45	40	0.31	16	0.05
16	G26	PL01	Cigarette lighters	Plastic/Polystyrene	1	0.022	2	0.044	1	0.022
17	G28		Pens and pen lids	Plastic/Polystyrene			4	0.03		
18	G29		Combs/hair brushes/sunglasses	Plastic/Polystyrene			1	0.02		
19	G30		Crisps packets/sweets wrappers	Plastic/Polystyrene	76	0.14	46	0.11	15	0.02
20	G32	PL08	Toys and party poppers	Plastic/Polystyrene	8	0.06				
21	G33	PL06	Cups and cup lids	Plastic/Polystyrene	21	0.075	14	0.06	15	0.09
22	G34	PL04	Cutlery and trays	Plastic/Polystyrene	23	0.04	19	0.02		
114	G43		Tags (fishing and industry)	Plastic/Polystyrene			2	0.003		
28	G45	PL15	Mussels nets, Oyster nets	Plastic/Polystyrene	28	0.3	20	0.3	40	0.06
32	G50	PL19	String and cord (diameter less than 1cm)	Plastic/Polystyrene	26	0.09	23	0.02	4	0.01
116	G54	PL20	Nets and pieces of net > 50 cm	Plastic/Polystyrene	2	2				
36	G60	PL17	Light sticks (tubes with fluid) incl. Packaging	Plastic/Polystyrene	1	0.004	1	0.002		
39	G66	PL21	Strapping bands	Plastic/Polystyrene	2	0.002				
43	G70		Shotgun cartridges	Plastic/Polystyrene	5	0.0105	2	0.0042		
44	G71	CL01	Shoes/sandals	Plastic/Polystyrene			7	0.31		
45	G73	FP01	Foam sponge	Plastic/Polystyrene	45	0.005	16	0.015	2	0.005
117	G75		Plastic/polystyrene pieces 0 - 2.5 cm	Plastic/Polystyrene	282	0.19	215	0.29	41	0.08
46	G76		Plastic/polystyrene pieces 2.5 cm > <50cm	Plastic/Polystyrene	201	1	55	0.59	9	0.11
48			**coffee capsule**	Plastic/Polystyrene	1	0.015				
48			**end of pole for beach umbrella**	Plastic/Polystyrene	4	0.022	1	0.022	7	0.17
48	G90		Plastic flower pots	Plastic/Polystyrene			1	0.01		
49	G125	RB01	Balloons and balloon sticks, including plastic valves, ribbons, strings etc.	Rubber	7	0.07	1	0.03	2	0.005
53	G134	RB08	Other rubber pieces (please specify in other item box*)	Rubber	1	0.15				
54	G137	CL01	Clothing / rags (clothing, hats, towels)	Cloth	2	0.06				
57	G138	CL01	Shoes and sandals (e.g. Leather, cloth)	Cloth	2	0.15	1	0.44		
118	G150	PC03	Cartons/Tetrapack Milk	Paper/Cardboard					2	0.05
62	G151	PC03	Cartons/Tetrapack (others)	Paper/Cardboard			2	0.03	3	0.17
63	G152	PC03	Cigarette packets	Paper/Cardboard	1	0.02	2	0.01	5	0.03
64	G27	PL11	Cigarette butts and filters	Paper/Cardboard	49	0.0588	104	0.023	122	0.14
67	G158	PC05	Other paper items (please specify in other item box*)	Paper/Cardboard			18	0.065	39	0.04

75	G172	WD06	Other wood > 50 cm	Machined Wood	1	1				
77	G178	ME02	Bottle caps, lids & pull tabs	Metal	2	0.004	3	0.006	8	0.015
78	G175	ME03	Cans (beverage)	Metal			1	0.032	1	0.016
81	G177	ME06	Foil wrappers, aluminium foil	Metal	2	0.01	3	0.03	6	0.015
89	G198	ME10	Other metal pieces < 50 cm	Metal					1	0.07
91	G200	GC02	Bottles incl. pieces	Glass	1	0.4			3	0.84
98	G95	0T02	Cotton bud sticks	Sanitary waste	44	0.011			10	0.0025
99	G96	0T02	Sanitary towels/panty liners/backing strips	Sanitary waste			47	0.035	2	0.01
101	G97	0T02	Toilet fresheners	Sanitary waste	1	0.002	1	0.02		
104	G99	PL12	Syringes/needles	Medical waste			2	0.016		
105	G211	OT05	Other medical items (swabs, bandaging, adhesive plaster etc.)	Medical waste	1	0.012	1	0.015		
			TOTAL	**TOTAL**	**936**	**7.2533**	**670**	**4.3372**	**362**	**2.3605**
			LARGE NATURAL WOOD			**300**		**180**		**75**
			SMALL NATURAL WOOD			**60**		**35**		**40**

Figure 23 – Torre dell'Orso, *10 May 2017*

Summary of Torre dell'Orso:

	TIME 1	TIME 2	(% of reduction)
• Total items found and catalogued	3587	1968	- 45%
• Average items *per* transect	1196	656	
• Total ML weighed	81 kg	14 kg	- 82%
• Average ML weighed *per* transect	27 kg	5 kg	

On the natural wood

A large amount of **natural wood** (Figure 24) has been found along the monitored transects mixed with the marine litter. The natural wood has been distinguished in 'Small Natural Wood' (trunks with diameter lesser than 10 cm) and 'Large Natural Wood' (trunks with diameter larger than 10 cm) (Figure 25).

Figure 24 – Several pieces of natural wood beached together with Marine Litter Program. Le Cesine, *8 February 2017*

Figure 25 – A large trunk beached. Le Cesine, *8 February 2017*

During the TIME 1, **13258 kg** of natural wood (10590 kg large; 2668 small) have been estimated in total for the twelve transects, **15675 kg** in the TIME 2. The average amount per transect is **1104 kg** in TIME 1 and **1306 kg** in TIME 2, but the higher accumulations were recorder at Le Cesine North (where the average is **1595 kg** per transect during TIME 1 and **2213 kg** in TIME 2). The lower accumulation of natural wood were recorded at Torre dell'Orso (average is **433 kg** per transect in TIME 1 and **230 kg** in TIME 2). The origin of all this wood is allegedly related to the vegetation of rivers and lakes of Northern Italy. Then this material is transported by the currents of the Adriatic Sea that are towards south along the Italian coast. Considering the respective average values for each one of the four beaches in both TIME 1 and 2, **it has been estimated that more than 200 t of natural wood are currently present on the beaches of the 20 km of coast between San Cataldo and Torre dell'Orso**.

Figure 26 - A large amount of beached natural wood at Le Cesine *North, 18 May 2017*

In addition, a conspicuous quantity of *Cymodocea nodosa* was detected mainly on the beaches of San Foca e Torre dell'Orso during samplings of the TIME 1 reaching the maximum estimated weight of 600 kg in the transect 1 of Torre dell'Orso.

The case of *Trapa natans*

The nuts of the aquatic plant *Trapa natans* (**Figure 27a**), the water chestnut, are often found along the monitored beaches. The distribution of this plant in Italy pertains mainly to the lakes of the river Po plane (**Figure 27b**), and outside Italy in the central-eastern Europe (**Figure 28**), including Balkans.

Figure 27 – a) Nuts of Trapa natans, *an aquatic plant present in lakes of the Northern Italy. b) Distribution of* Trapa natans *in Italy (Bianco & Casella, 2012)*[4]

Figure 28 – Current distribution of Trapa natans *in Europe (Miotk-Szpiganowicz & Gałka, 2014)*[5]

4 2012, Bianco P. M. & L. Casella. Relazioni specie-habitat nelle aree umide italiane. ISPRA Report.

5 2014, Miotk-Szpiganowicz & Gałka. A new site of Holocene fossil Trapa natans L. at the Kaszuby Lakeland (Poland). Limnological Review 9,4: 165-173

The ‘foreign’ Marine Litter Program sampled

Made in Albania

Figure 29 – Fruit juice produced in Albania. Le Cesine, *17 February 2017*

Figure 30 – Sour cream produced in Albania. Le Cesine, *17 February 2017*

Figure 31 – Yoghurt produced in Albania. Torre dell'Orso, *6 March 2017*

Figure 32 – Box for beer bottles, produced in Albania. Le Cesine, *17 February 2017*

Figure 33 – Yoghurt produced in Albania. Le Cesine *North, 9 June 2017*

Made in Bosnia

Figure 34 - Can of spray paint produced in Bosnia. Le Cesine, *8 February 2017*

Made in Finland

Figure 35 - Fruit juice produced in Finland. Le Cesine, *22 February 2017*

Made in Germany

Figure 36 – Can of spray anti-rust produced in Germany. Le Cesine, *8 February 2017*

Made in Greece

Figure 37 – Yoghurt produced in Greece. Torre dell'Orso, *2 March 2017*

Figure 38 – Shoe polish produced in Greece. Le Cesine, *16 February 2017*

Figure 39 - Shoe polish produced in Greece. Le Cesine, *16 February 2017*

Figure 40 – Paracetamol produced in Greece. San Basilio, *1th March 2017*

Made in Israel

Figure 41 – Ketchup packaged in Israel. Le Cesine, *17 February 2017*

Made in Lebanon

Figure 42 – Vanilla manufactured in Lebanon. San Foca, 19 May 2017

Made in Montenegro

Figure 43 – Yoghurt produced in Montenegro. Torre dell'Orso, *6 March 2017*

Made in Portugal

Figure 44 – Milk bottled in Portugal. Le Cesine Nord, 18 May 2017

Made in Romania

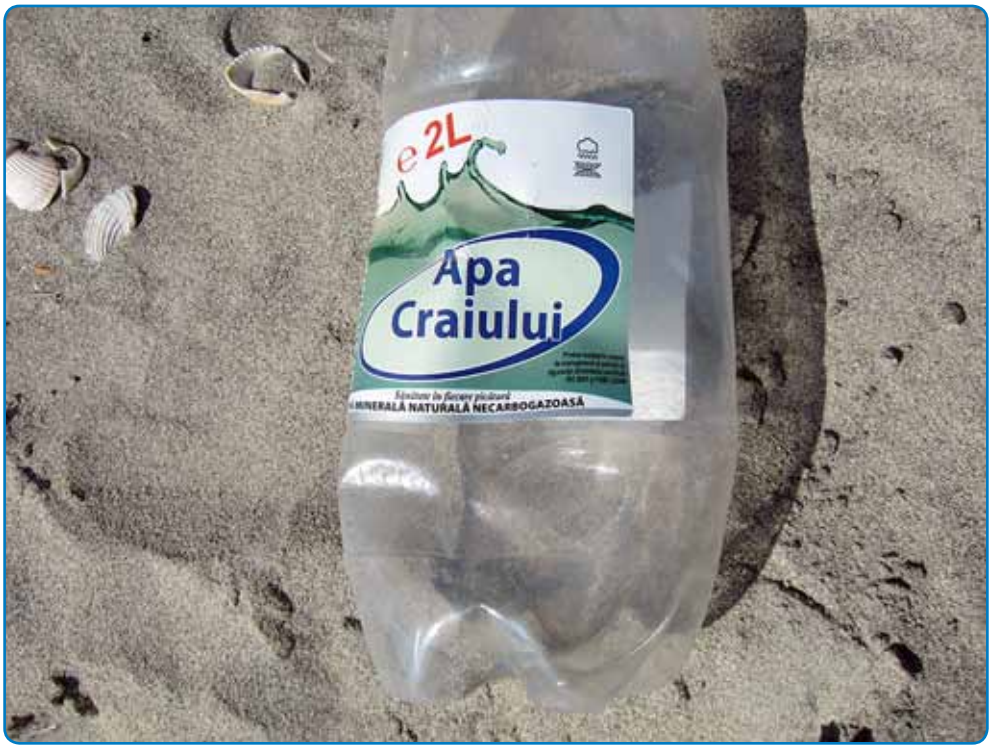


Figure 45 – Drinking water from Romania

Made in Russia

Figure 46 – A tetra Pak of milk produced in Russia. Le Cesine, *8 February 2017*

Figure 47 - Fruit juice produced in Russia. Le Cesine, *23 February 2017*

Made in Serbia

Figure 48 - A tetra Pak of milk produced in Serbia. Le Cesine, *17 February 2017*

Made in Turkey

Figure 49 – Fruit juice produced in Turkey. Le Cesine, *16 February 2017*

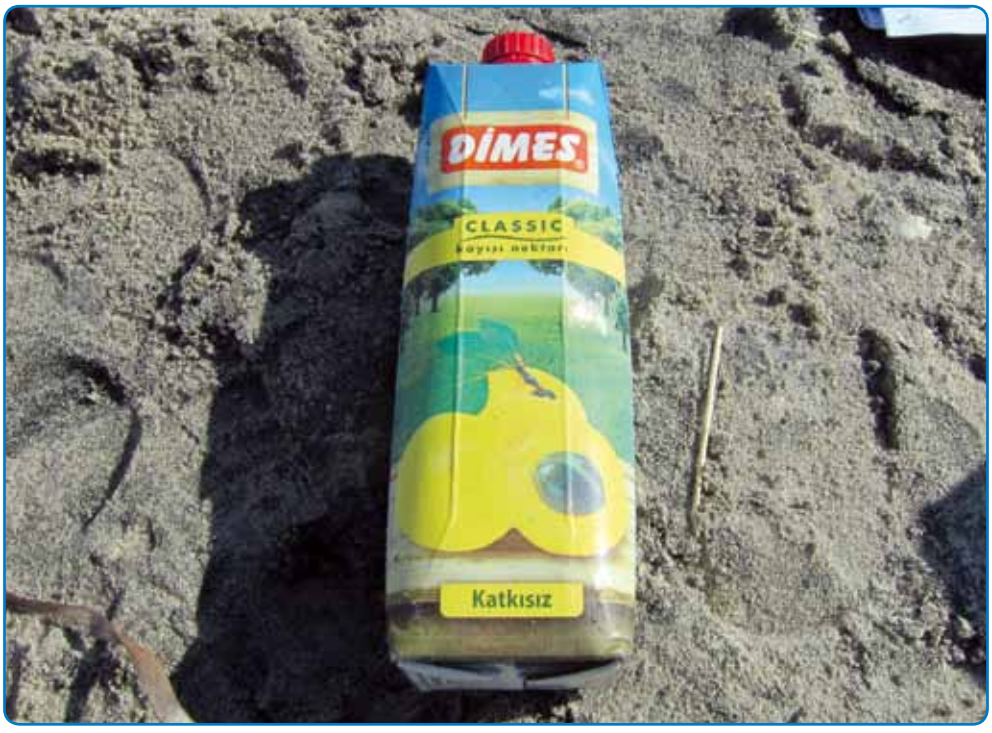


Figure 50 - Fruit juice produced in Turkey. Le Cesine, *22 February 2017*

Figure 51 – Plastic bottle of Coca Cola packaged in Turkey. Le Cesine, *22 February 2017*

Figure 52 – Milk wrapped in Turkey

Figure 53 - Figure 54 – Milk wrapped in Turkey

Figure 55 - Ketchup packaged in Turkey. Le Cesine, *17 February 2017*

Figure 56 – Spray can of foam sponge produced in Turkey. Le Cesine, *17 February 2017*

Figure 57 - Shoe polish produced in Turkey. San Basilio, *1th March 2017*

Figure 58 – Adhesive paste for dentures produced in Turkey. Torre dell'Orso, *6 March 2017*

The strangest findings

Figure 59 – A dead cow. Le Cesine, *23 February 2017. Different hypotheses could be proposed to explain this 'presence' on the beach. However, the most probable explanation is that this cow has been illegally thrown away from a ship*

Figure 60 – A bottle for Intravenous therapy. Le Cesine, *08 February 2017*

Figure 61 – Rations of emergency water. This kind of item testifies the social drama of refugees that try to cross the Adriatic Sea escaping from wars

Dead animals

Figure 62 – Caretta caretta – *Le Cesine Nord, 17 February 2017*

Figure 63 – Buteo buteo – *Le Cesine North, 18 May 2017*

Ghostfishing monitoring

As part of the program, a survey of submerged marine litter has been conducted in the sea bottom along the stretch of coast between San Foca and Le Cesine from 12 to 16 June with the aim to detect the marine litter potential dangerous for the marine fauna in this trait of coast. The fishing company of San Foca named *La Folgore* offered its support with the boat 'Anna Paola' (**Figure 64**) for a series of sites inspections off shore. The same boat has been used for underwater surveys in the suspected points for the presence of ML.

Figure 64 – The boat used for site inspections and support for the immersions. San Foca 14 June 2017

Nine suspected points have been recorded during the preliminary site inspection; their coordinates are reported in **Table 11**. The distribution of the immersion points in front of the harbor of San Foca are reported in **Figure 65.**

site	date	time		coordinates		depth	Site description	Marine Litter ad notes
		in	out	lat N	long E	(m)		
I	14/06/2017	14:30	14:45	40°18'55"	18°23'34"	8 - 10	infralittoral zone with photophilic organisms and patches of *Posidonia oceanica*	*Presence of longline fishing and pieces of gillnets (trammel nets and Japanese type) very recent.*
II	14/06/2017	15:03	15:25	40°17'57"	18°25'06"	7.5	infralittoral zone with photophilic organisms and patches of *Posidonia oceanica*	*This area is full of marine litter and fiberglass fragments of a boat. Several plastic sacks.*
III	14/06/2017	15:35	15:45	40°18'12"	18°25'02"	10.5	soft bottom (sand) with *Cymodocea nodosa*	*The presence of a wreck has been reported in this area, but it was not found during the present survey.*
IV	15/06/2017	16:05	16:25	40°18'35"	18°24'12"	12	infralittoral zone with photophilic organisms and patches of *Posidonia oceanica*	Not detected
V	15/06/2017	16:35	16:50	40°18'27"	18°24'48"	11	*This point is a shallow plateau with soft bottom (sand) and isolated rocks. Strong current from south-east.*	Not detected
VI	15/06/2017	16:55	17:08	40°18'22"	18°24'14"	3	Point known as 'i brigantini'. Superficial infralittoral zone with photophilic organisms.	Not detected
VII	16/06/2017	14:30	15:00	40° 19'47''	18°23'22''	20	Coralligenous	This area presents derelict fishing gear (nets, long lines and fish trap) lost or abandoned.
VIII	16/06/2017	15:15	15.45	40°19'58"	18°23'6"	18	Coralligenous	Nets, long lines and fish trap, lost or abandoned.
IX	16/06/2017	16:15	17:45	40°19'19"	18°23'57"	25	Coralligenous	Derelict Fishing Gear

Table 11 – Points of immersion for the detecting of submerged marine litter potentially dangerous as ghostfishing

Figure 65 – Immersion points for the ghostfishing monitoring off San Foca

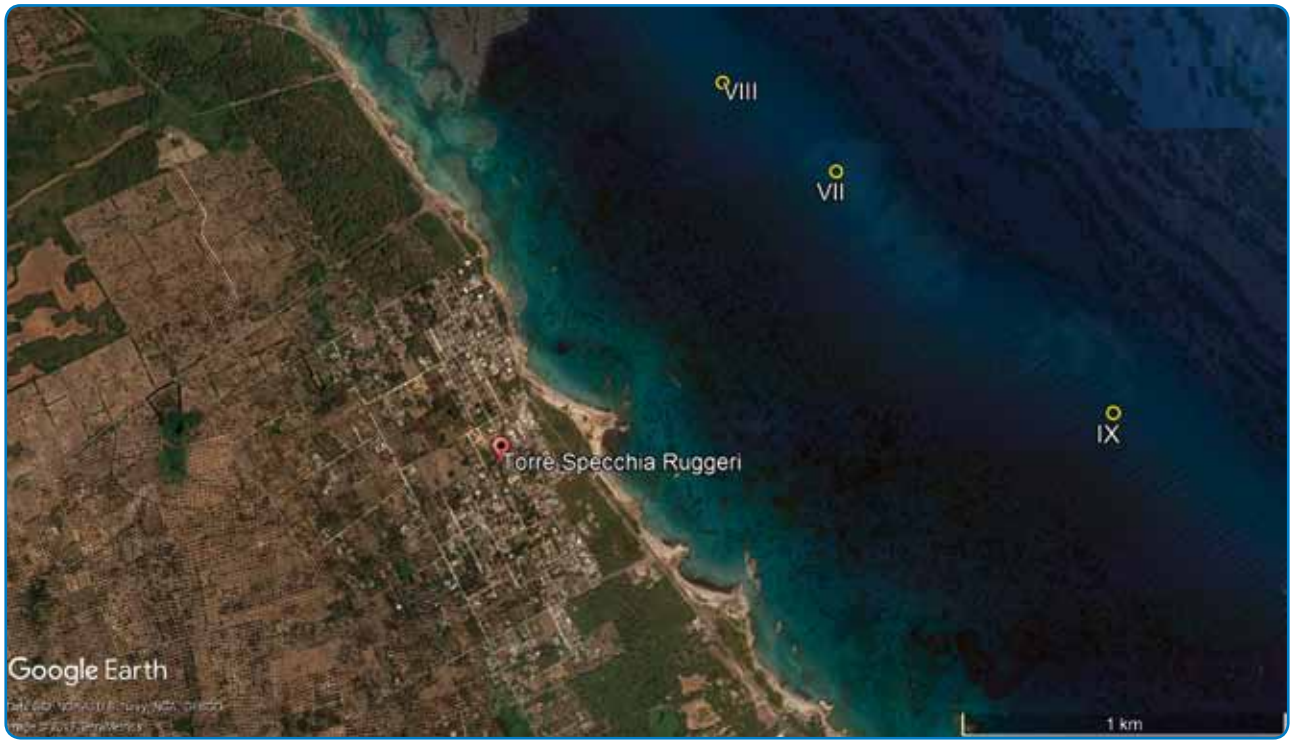


Figure 66 – Immersion points for the ghostfishing monitoring out off Torre Specchia Ruggeri (Le Cesine)

Figure 67 – Preparation for ghostfishing monitoring by diving with an aquascooter

A conspicuous mass of marine litter has been found in correspondence of the immersion points I, II, VII-IX. The presence of submerged marine litter in theses areas is mainly due to the local fishing activities since most of the items found here are monofilaments for longline fishing and fishing nets of various types (**Figure 68**,**69**,**70**). Fiberglass pieces of boats (**Figure 71**) and plastic sacs (**Figure 72**) were also found during the surveys.

Figure 68 – Monofilament for longline fishing

Figure 69 – An abandoned fishing net in the middle of a Posidonia oceanica *meadow*

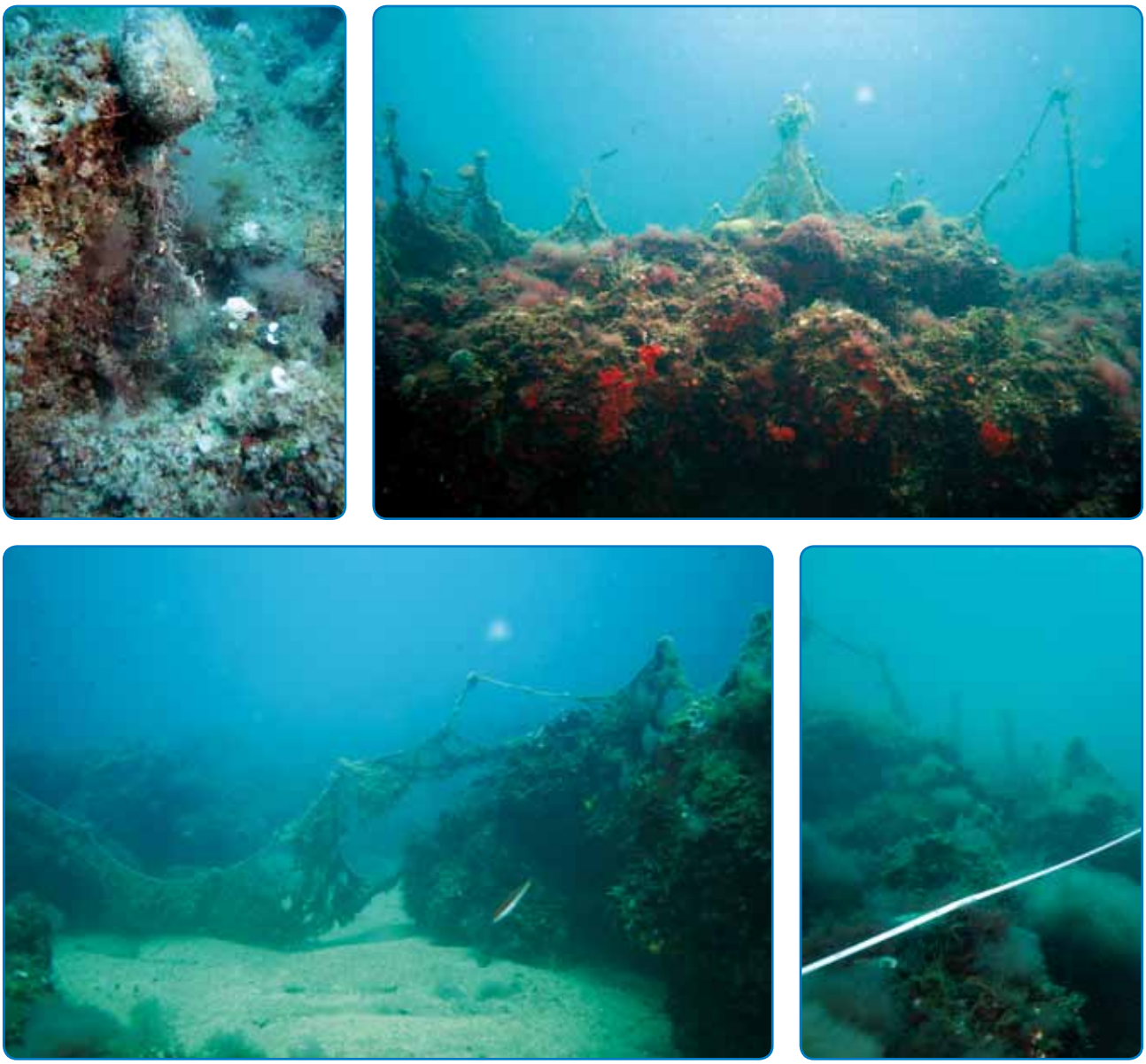


Figure 70 – Derelict fishing gears on coralligenous out of Torre Specchia Ruggeri (Le Cesine)

Figure 71 - Fiberglass pieces

Figure 72 – One of the plastic sacs (full of something) found in the immersion point II

Figure 73 – Marine litter covered by organisms (biofouling) found on coralligenous off Le Cesine

Final remarks

This 6-months monitoring program carried out between San Cataldo and Torre dell'Orso revealed the current status of the ML accumulation in the sandy beaches of this trait of Adriatic coast. This preliminary study also revealed a notable difference in the ML accumulation in time and space. In particular, in winter (i.e. TIME 1) we estimated on the whole 40 t of beached ML, and 10 t in springer (i.e. TIME 2) along the 20 km of the surveyed coast. The difference of 30 t between TIME 1 and 2 cannot be explained only by removal actions. Indeed, only beaches in correspondence of beach properties were cleaned just before the bathing season. This means that most of the ML counted and weighed in TIME 1 has been moved by following currents and winds again in the sea or gathered in the vegetation of the dunes or behind the dunes adding to the ML of the previous seasons and years. Another portion of ML remained buried by sand on the same beaches. For this reason, the ML visible on the beaches represent a 'temporary presence' subject to a seasonal turnover. Accordingly, the ML counted and weighed in TIME 2 only in part can include the same items of the TIME 1.

The higher amount of ML found in winter with respect to the spring could be explained by the higher rate of windy days and strong currents that contribute to transport the ML on the beaches.

Among the four examined beaches **the highest ML accumulations were recorded at Le Cesine Nord and San Basilio-San Foca** where the ML weighed was over 200 kg per 100 m of transect during the TIME 1. In particular, the weight of ML reached an average of about 330 kg at Le Cesine Nord and 250 kg at San Basilio-San Foca. During TIME 2 the ML remained at values generally lower than 70 kg per transect on all the beaches monitored. The number of items during the TIME 1 ranged between 1000 and 2000 pieces for 100 of transect; conversely, during the TIME generally it was around 600 pieces.

Considering the nature of the ML collected, it is clear that **plastic/polystyrene is the most abundant material representing about the 70% of the weight of beached ML (and around the 90% in terms of number of items)**. Among the plastic items the 'small pieces and fragments' are the most frequent followed by 'mussel nets', 'caps/lids' and 'drinks bottles'.

Basing on the material collected and catalogued **in the trait of coast between San Cataldo and Torre dell'Orso** it is possible to determine that:

- **most of the beached ML found is not locally produced but it periodically comes from the sea transported by currents and winds and following a rapid turnover**;
- **the main sources of the ML are the naval traffic and fishing activities**.

The types of items found on beaches testify that they are abandoned directly from the ships in navigation using the sea as a global dump.

Figure 74 – A polystyrene fish boxes with the label of the date and place of production

Operators of the mussel farms and fishermen use the same fool attitude abandoning hundreds of fragments of mussel nets and fish boxes directly in the sea. The abandoned mussel nets in the sea contribute to the formation of larger and larger tangles together with fishing lines and abandoned nets. These tangles are among the most dangerous floating debris causing the ghost-fishing. The polystyrene fish boxes (**Figure 74**) in time reduce itself in smaller and smaller floating fragments that cumulate in the natural environments and have a decomposition time of about 1000 years.

The machined wood is the second most represented material of ML detected in the present survey. In terms of weight, the machined wood (**Figure 75**) varied from 27% to 13% (respectively TIME 1 and TIME 2) of the total ML detected, that means about **10 t along the 20 km of coast monitored**. However, the **natural wood** reaches much higher amounts that have been estimated in about **250 t along the entire trait of coast between San Cataldo and Torre dell'Orso.**

Figure 75 – An example of machined wood found on beaches – Le Cesine South, 18 May 2017

Differently from the ML (that can be easily moved away by wind and currents) the natural wood once beached remains for long time on the coasts. In fact, the natural wood is the only category of 'beached litter' that increased in the TIME 2 (about 15 t) with respect to the TIME 1 (about 13 t) in the twelve transects examined. **Both natural and machined wood represent a precious resource to be easily recycled**.

Metals represent the third macro-category in terms of percentage (3% in TIME 1; 9% in TIME 2) on the total weighed ML, followed by **glass** (1,74% in TIME 1; 4,60% in TIME 2).

Guidelines for the marine litter removal and management

The treatment of the ML on beaches consists of two main processes: the **removal** and the **management**. In addition, a third process can be added: the **prevention** that is probably the most difficult process to realise.

The removal

The removal of the beached ML is a delicate process that paradoxically could disturb the wild fauna and natural ecosystems. For this reason, **it is appropriate to plan a time window out of the seasons used by species nesting on the beaches**. For example, the sea turtle (*Caretta caretta*) lay its eggs on beaches between May and August. Another species to consider is the bird *Charadrius alexandrinus* (the Kentish plover; the common Italian name is 'fratino') which use to nest in spring-summer digging small cavities on the beaches. Its population is considered as decreasing in Europe ([6]) and recently it was included in the European Red List of Birds.

Figure 76 – Waste accumulation behind the dunes. Le Cesine North, 22 February 2017

It is desirable that the ML removal on the beaches in front of *Le Cesine* - WWF State Natural Reserve should be planned in accordance with the Reserve Operator and will include also dunes and the lagoons behind dunes (**Figure 76**).

The use of vehicles should be minimized on the beaches also to prevent a levelling of the natural slopes of the beaches. The manual collection of items also facilitates a direct separation of the different materials and prearrange the ML items for the following management. An adequate number of field workers should be organised considering that five operators could require up to 4 hours to clear completely a transect of 100

6 2015, BirdLife International. European Red List of Birds.

meters of beach surface (excluding dunes). A vehicle of adequate capability, but not too bulky, should be used to collect sacs of differentiated ML on the beaches and to transport them in a larger vehicle parked in the closer way.

Regarding derelict fishing gear, we recommend to periodically clean up investigated areas (at least one a year), by involving scientific SCUBA divers, in order to reduce damage to marine habitats. Modern gears are mostly made of non-biodegradable synthetic fibres and can persist in the environment for long periods. Ghost fishing can, therefore, continue to catch commercially important species of fish and crustaceans as well as non-commercial species of fish and crustaceans, birds, marine mammals and turtles for long periods of time. Moreover, ghost gears may damage benthic habitats (by scraping or pulling out organisms) and can potentially pose safety risks for fishers if they become entangled with active fishing gear and vessel propulsion systems. Although the loss of marine resources due to ghost fishing is difficult to evaluate, several studies showed that it amounts to about 10% of the target population (UNEP, 2005), and outside of Europe, it was estimated the financial losses due to ghost fishing was at 3–13.5% of total catch value (Al-Masroori et al. 2004, *Fish Res* 69: 407-414).

Under the EU Regulation of the Common Fisheries Policy (CFP), measures should be taken for resource conservation and management purposes, and the limitation of the environmental impact of fishing. As a source of fishing mortality and impacts on marine environment, it is therefore necessary to implement mitigation and prevention measures for reducing ghost fishing in the Mediterranean basin.

The management

Being the plastic/polystyrene items the most abundant material found on the beaches, it is important that the management of the ML collected is 'plastic-based'. Data on the amount of plastic on the beaches represent not only a terrifying effect of global pollution, but also a chance to have a considerable mass of recyclable material to remove from the natural environment. In the any case the management of collected ML have to follow strictly the legal provisions.

Currently, the trait of coast between San Cataldo and Torre dell'Orso during the year collects at least **30 t of plastic, 8 t of machined wood, 2 t of metal, 1,2 t of glass.** In addition, special waste is also present with medicals, engine oil, gas bottles, paints as reported in the tables of results for each transect. The companies involved in the ML collection and management have to be equipped also for the treatment of these special wastes.

On the natural biomasses

In 2015, the APULIA REGION published the guidelines for the management of the beached vegetal biomasses that refers mainly to the marine plants *Posidonia oceanica* e *Cymodocea nodosa* and are based on the Italian Law n. 52/2006 and following modifications. No reference to the natural wood (i.e. small or large trunk) has been reported in these documents.

Figure 77 – Le Cesine Nord. The width of beach and dune is reduced to few meters

A combined recycle of beached marine plants (*Posidonia* and *Cymodocea*) **with the natural wood** (trunks and branches of trees) **can be assessed in order to save the coast from the erosion and realise a restoration of the dunes**. In some cases, for example at Le Cesine Nord, the strip of beach separating the sea from the lagoon behind dunes (**Figure 77**) dramatically reduced in the last years with the risk of its complete disappearing and the fusion of the lagoon with the sea. This could led to a heavy loss of biodiversity typical of the coastal lagoon of the Le Cesine WWF Natural Reserve where tens of species of birds, reptiles, invertebrates and plants would not find their optimal conditions.

A spontaneous reuse by common people of the natural wood on the beaches of Le Cesine led to the realisation of scattered huts available for anyone (**Figure 78**).

Figure 78 – Hut realised by common people with the beached natural wood

The prevention

One of the local causes of waste accumulation on the beaches paradoxically is the presence of wastebaskets. Especially in summer, the frequency by which the wastebaskets are emptied is lower than the frequency by which people leave waste in the baskets or in their proximity. For this reason, people who attend the beaches should be instructed to take away the garbage that themselves produce. Consequently, the wastebaskets would be useless.

Another important local source of ML are kiosks on the beach. This is particularly evident at Torre dell'Orso where typical 'bar items' were found in a large amount. Hundreds of straws, plastic cups, crown caps and beer bottles characterised the results of the ML survey, especially during TIME 1. This demonstrate that what we found in February-March is what was left in the past summer.

The educational program carried out in the schools during this preliminary study had the aim to sensitize young citizens on these themes. Obviously, this is a kind of prevention useful at local scale but other kinds of approaches should be adopted at larger scales.

As it was above mentioned, the main sources of the beached ML are naval traffic and fishing activities. This means that foreign countries are involved in the ML accumulation along the southern Adriatic coasts of Italy. The theme is problematic also from a political and diplomatic point of view. Crew of ships and fishing operators should be instructed to do not abandon waste in the sea. Waste produced on board have to be collected, differentiated and delivered in the next harbour. Governments should incentivize these good practises and punish the defaults.

Fishing activities should be re-organised considering alternative (biodegradable) materials at least for fish-boxes and mussel nets. Their use revealed to be too unsustainable for the natural environments and their impact is already evident.

ANNEX - List of some companies of the territory of Lecce and Brindisi equipped for the ML removal and management

In the framework of the

1) ALMIVERDE Srl
contrada Faraschita - 72020 Torchiarolo (BR)
TEL +39 0831 620954
E-MAIL info@almiverde.it

2) ARMANDO MUCCIO Srl
via Duca d'Aosta, 6 - 73056 Taurisano (LE)
TEL +39 0833 721153
FAX +39 0833 721153
E-MAIL muccio.ambiente@alice.It

3) AXA Srl - LECCE
viale Japigia - 73100 Lecce (LE)
TEL +39 0832 347879
E-MAIL info@gruppoaxa.it
WEBSITE www.facebook.com/axaaziendeambiente

4) BASTONE SALVATORE & C. SAS
via Puglia, 41 - 73048 Nardò (LE)
TEL +39 0833 567676
E-MAIL info@bastonesalvatore.it
WEBSITE www.bastonesalvatore.com

5) BIANCO IGIENE AMBIENTALE Srl
via dei Bernardini, 85 - 73048 Nardò (LE)
TEL +39 0833 561513
FAX +39 0833 562777
E-MAIL info@biancoigiene.it
WEBSITE www.biancoigiene.it

6) CENTRO SERVIZI MERIDIONALI Srl
via Riccardo Moretti, 6 - 72100 BRINDISI
TEL +39 0831 575656
E-MAIL centroservizimeridionali@alice.it

7) CF AMBIENTE Srl
corso Roma, 57 - 73039 Tricase (LE)
TEL +39 0833 771755
MOBILE +39 339 3589797
WEBSITE www.cfambientesrl.com

8) ECOLOGICA PUGLIESE Srl BRINDISI

Legal offices: via Ognissanti - 70010 Capurso (BA)

TEL +39 0831 1822743
FAX +39 0831 1822742
E-MAIL segreteria@ecologicapugliese.it

9) ECOM SERVIZI AMBIENTALI Srl

corso Re d'Italia, 51 - 73013 Galatina (LE)

TEL +39 800 662430
+39 0836 566902
FAX +39 0836 566312
WEBSITE www.ecomserviziambientali.it

10) ELIO STAIANI DISINFESTAZIONI

corso Italia, 89 - 73012 Campi Salentina (LE)

TEL +39 0832 794773
MOBILE +39 335 6563156
FAX +39 0832 794773
E-MAIL elio.staiani@alice.it
WEBSITE www.eliostaiani.com

11) GTC Srl (of Vincenzo Cazzolla)

Ostuni (BR)

MOBILE +39 335 8155222
E-MAIL gtcsrl2010@yahoo.it

12) MONTECO Srl

via Campania, 30 - 73100 Lecce (LE)

TEL +39 0832 720411
FAX +39 0832 792301
E-MAIL info@montecosrl.it
WEBSITE www.montecosrl.it

13) SALENTO MULTISERVIZI Srl

via Cirillo, 40 - 73010 Surbo (LE)

TEL 0832 1690672
FAX 0832 1690672
MOBILE +39 342 8564112
E-MAIL salentoservizi2013@libero.it
WEBSITE www.salentomultiservizisrl.com

Final Report on the Marine Debris Awareness Campaign

Libera il Mare

Pulizia delle spiagge e cultura ambientale

Marine Debris Awareness Campaign

Introduction and objectives

The awareness raising campaign was carried out thanks to the collaboration of the Salento University staff, dr. Serena Felline and dr. Manuela Piccardo, under the supervision of prof. Ferdinando Boero and prof. Antonio Terlizzi.

The main objective of the activities was to raise awareness on the issue of marine litter and increase the assumption of responsibility by young people of the primary and middle schools.

As scheduled by contract, for the project were planned 50 hours of activity involving at least five schools belonging to the city of Lecce, Melendugno and Vernole (i.e. 10 hours per institution, with lectures and laboratory).

Preliminary scouting activity was carried out by phone interviews aimed at seeking primary and middle schools potentially interested to the project. A formal request was sent via e-mail to schools showing interest, in which details about the course was provided.

Only two institutes accepted to get involved, namely "Istituto Comprensivo A. Diaz" in Lecce, and "Istituto comprensivo A. Galateo" in Frigole and Lecce).

Due to the delays in the production of gadgets and informative brochure, the begin of activities was postponed in May, causing the waiver by the A. Diaz Institute, already engaged in other activities (i.e school trips and final exams).

The number of expected hours was, therefore, re-arranged for only one Institute (Annex A – Letter of intent signed between the head teacher and Prof. Ferdinando Boero).

Ten additional hours of activities were organized at the primary school "Istituto Comprensivo Polo 2 G. Marconi" in Veglie, thanks to the co-founding European project CleanSea Life.

Totally, 16 classes with 331 students (120 of primary and 211 of middle schools, respectively) and 21 teachers were involved.

The aims of the project were:

- to stimulate a major awareness of the various types of marine debris and their features;
- to inform about the sources of waste production and the causes of their dispersal in the environment;
- to understand the negative consequences for humans and the environment resulting from the waste abandonment;
- to encourage critical decisions and motivated action that can lead to an improvement of the marine litter issue;
- to inform about the current tools and policies aimed to counteract the problem of marine litter.

Seminarial activities

Lectures were split in two parts. A first seminar introduced topics never addressed in classes, including the functioning of marine ecosystems, the role of biodiversity and trophic chains, major threats to marine habitats, in order to increase awareness of the importance to preserve these systems.

Figure 79. Lectures on marine ecosystem and threats posed by marine litter at primary and junior secondary schools

The second seminar, was focused on the issue of marine litter covering the following points:

- a general introduction to the different types of marine debris and their different features;
- quantity, distribution and behavior of marine litter in the marine environment;
- major source of marine litter production and dispersal (sea-based and land-based);
- impacts on the ecosystem and organisms;
- likely solutions to mitigate impacts and prevent further marine litter dispersion.

On the other hand, laboratory activities helped students to familiarize with the issue of marine litter by stimulating observation, curiosity, imagination, creativity and action skills.

Laboratory

Laboratorial activities were organized taking into account the specific age group. In particular, they were structured as follows:

Primary school

Marine debris most commonly found along our beaches were distributed to the students, asking them to observe and recognize items, examine their different nature and describe their features.

In this activity students familiarized themselves with marine litter by playing classification and description games. They brainstormed ideas on the concept of "litter" and discovered that objects disposed improperly, could end up as marine litter. They also reflected on specific consumption habits that generate marine litter and on how changes in these behaviors could prevent its generation.

The description of the nature of each item allowed students to classify the marine litter into seven macro-categories (plastic, glass, metal, paper, sanitary, wood, rubber) in order to teach them the correct disposal method and the possibility to recycle waste. The final aim was to explain at the students the active role they can have in contributing to the well-being of the environment.

Figure 80. Laboratory on classification and disposal of marine litter. Example on how to fill sheet during a beach clean-up activity

Students carried out some experiments with debris by testing their characteristics and effects on the environment. Learners investigated the degradation time by putting one item for each macro-category in tanks filled with sea water. This experiment lasted one month, at the end of which students observed the status of each item and reflected on the role of weather conditions on the degradation process.

Figure 81. Experiment for testing degradation times of several macrocategories of litter

Students reflected also on the difference between "waste" and "marine waste", on how debris arrive to the sea, in order to understand the point that marine litter items continue "travelling" from place to place, creating a problem of global dimensions, with no borders.

It was also explained to the students that natural objects commonly found along beaches and erroneously considered waste, could become a resource for the territory through recycling. In order to familiarize with these arguments, students created artworks with plastic bottles and caps collected by tutors along the beaches.

Figure 82. Students observe natural objects frequently found along beaches and learn how to reuse them for protecting environment

At the end of the lessons, each class created a poster summarizing topics covered during the project.

Figure 83. Laboratory on reuse of marine litter for artwork creation and poster summarizing the topics learned during the project

Finally, students participated to a clean-up day in their local area following the protocol followed by the CoNISMa staff during the marine litter preliminary assessment.

Junior secondary schools

Lectures and laboratory developed for the junior secondary students were the same of the primary school, except for the realization of artworks and posters. Instead of this workshop, students were provided with samples of sand taken along the Salento coasts, in which they had to find and describe plastics fragments (nature, color, shape, origin).

Filters with different types of microplastics (particles smaller than 5 mm) frequently found in the environmental compartments and fish fauna, were also provided and it was asked to the students to observe them at the microscope. This activity allowed learners to become familiar with the concept of "microplastics", explaining their origin and how they spread in the environment, as well as the danger they pose to marine life and humans. This increased the perception of the problem and encouraged students to have a responsible behavior towards society and the environment.

Figure 84. Junior secondary students during laboratory activity on description and classification of marine litter

Figure 85. Group photo of junior secondary students during laboratory activity

Figure 86. Experiment setting for testing degradation times of several macrocategories of litter

At the end of the activities, information brochures were distributed to all students and teachers ("Libera il Mare" brochure, Annex B) along with shopper and hats produced by TAP, as well as one removable cardboard basket for waste management was left in each classroom.

Figure 87. Group shot with primary school children

Annex A – Letter of intent between school involved in the project and CoNISMa

CoNISMa
Consorzio Nazionale Interuniversitario per le Scienze del Mare

Ferdinando Boero
Professor of Zoology

Voice: +39 0832 298619
Fax: +39 0832 298702
Home: +39 0832 316758
Mobile: 333 2144956
email: boero@unisalento.it

data, 20 aprile 2017

Alla cortese attenzione del Dirigente Scolastico
dell'Istituto Comprensivo Statale "Galateo-Frigole"
via Domenico Fontana, 1 – 73100 Lecce

Il sottoscritto Prof. Ferdinando Boero, docente di Zoologia e Biologia marina presso l'Università del Salento, Lecce, Unità Locale di Ricerca (ULR) CoNISMa (Consorzio Nazionale Interuniversitario per le Scienze del Mare) di Lecce, nell'ambito del Progetto di educazione ambientale "LIBERA IL MARE" sottoposto all'attenzione della Dirigenza scolastica dell'Istituto Comprensivo Statale "Galateo-Frigole", dichiara che:

- il percorso prevede lo svolgimento di attività formative suddivise in attività seminariali e laboratoriali progettate e sostenute da personale afferente al CoNISMa secondo quanto dettagliato nel Progetto "LIBERA IL MARE";
- tali attività inizieranno e si concluderanno nel mese di maggio 2017 secondo il calendario fornito dalla scuola;
- tali attività saranno considerate parte integrante del curricolo scolastico ordinario e vengono disciplinate, per quanto concerne lo status degli studenti, dalle norme di legislazione scolastica, ivi comprese quelle concernenti le assenze e le sanzioni disciplinari;
- l'Istituto si impegna a far seguire lo svolgimento delle attività di formazione da un tutor designato in veste di responsabile didattico-organizzativo;
- al termine delle attività, verranno distribuiti materiali informativi sugli argomenti svolti, nonché gadget da lasciare agli studenti (shopper e ai cappellini) e alla scuola (cestino montabile in cartone per la raccolta differenziata);
- nessun compenso o indennizzo di qualsiasi natura è dovuto alla scuola e agli studenti partecipanti al programma.

Per l'Isitituto
Il Dirigente Scolastico

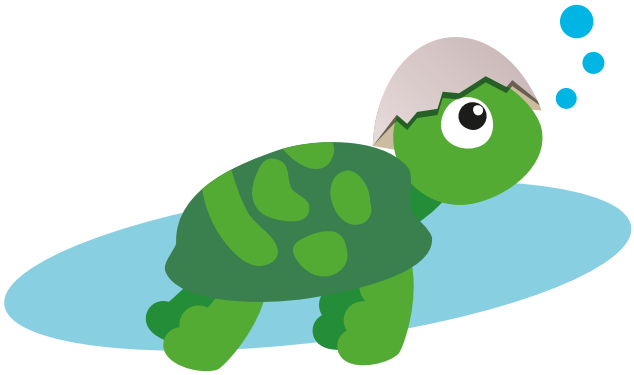
.....

Per il CoNISMa

Piazzale Flaminio, 9 – 00196 Roma
Telefono: 06 85355476
Fax: 06 8543810
Email: info@conisma.it

P. I. 01069050993 / C. F. 91020470109

Annex B – Informative brochure



Valentina

L'amica del mare

Trans Adriatic Pipeline

CoNISMa
Consorzio Nazionale Interuniversitario per le Scienze del Mare

EVENTO IN COLLABORAZIONE CON
CLEAN SEA Life

merces
restoring marine ecosystems

Stampato a cura di TAP nel dicembre 2017

CoNISMa

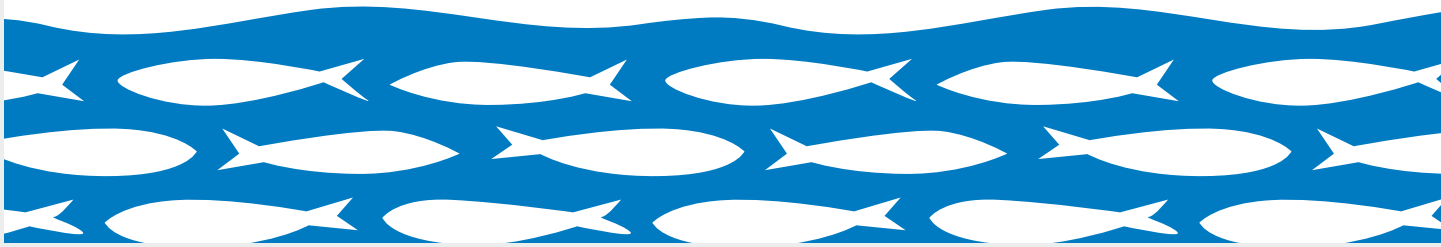
RESPONSABILITÀ PROGETTO Ferdinando Boero
Antonio Terlizzi

PARTECIPANTI Giuseppe Alfonso
Serena Felline
Manuela Piccardo

IDEE E CONCETTI Ferdinando Boero

ILLUSTRAZIONI Alberto Gennari

GRAFICA Fabio Tresca



Libera il Mare

Pulizia delle spiagge e cultura ambientale

2

La civiltà dei consumi

Per far "girare" l'economia
dobbiamo consumare,
consumare, consumare.

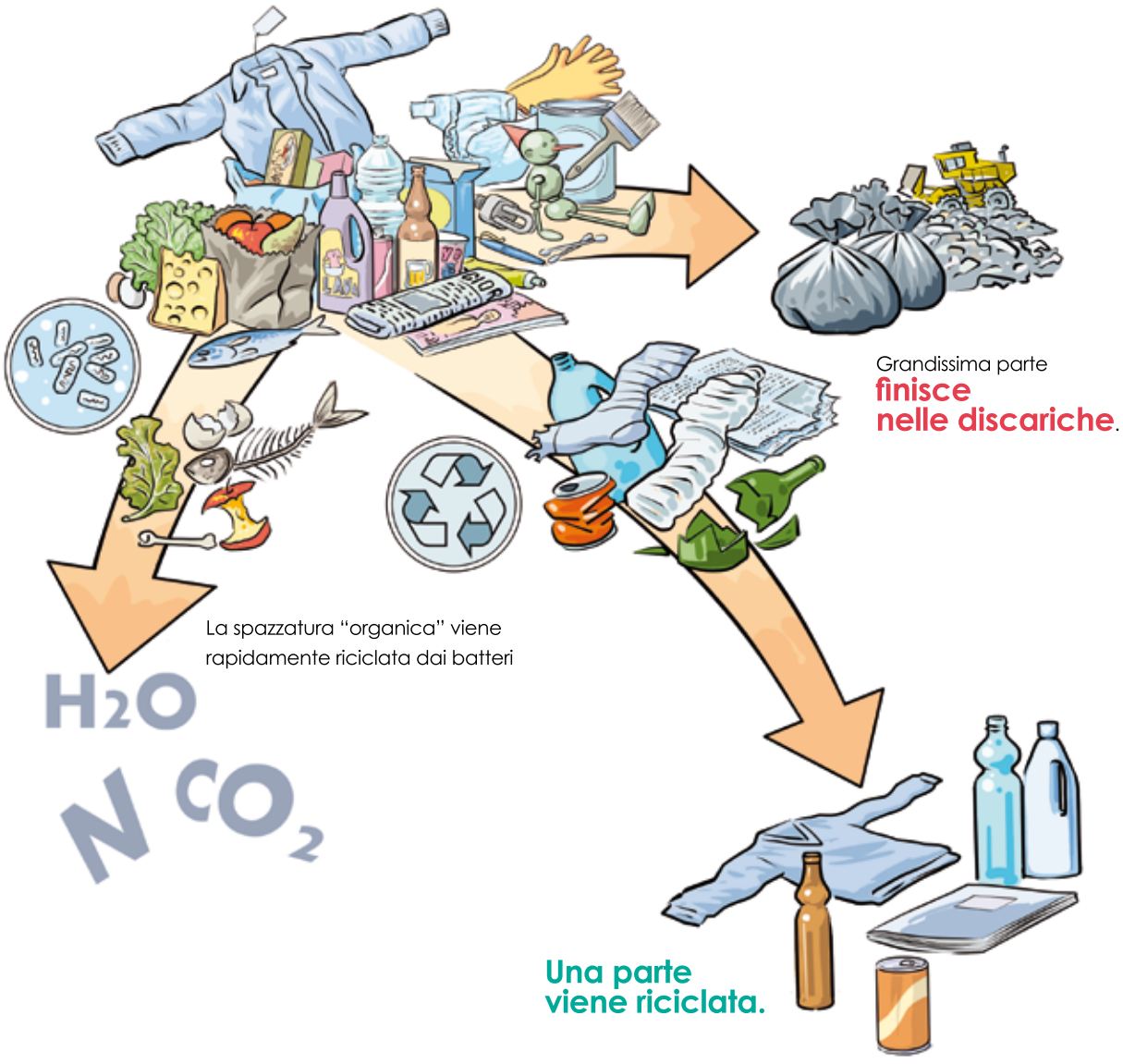
Le cose non si aggiustano più...
si cambiano.

Le cose che **non ci servono più**
finiscono nella **spazzatura**.

Molte sono **imballaggi**.

La **busta di plastica**
è il **più usato**
e il **più famigerato.**

Il destino della spazzatura



Finalmente abbiamo capito che bisogna **riciclare per "ridare vita" ai materiali**.

4

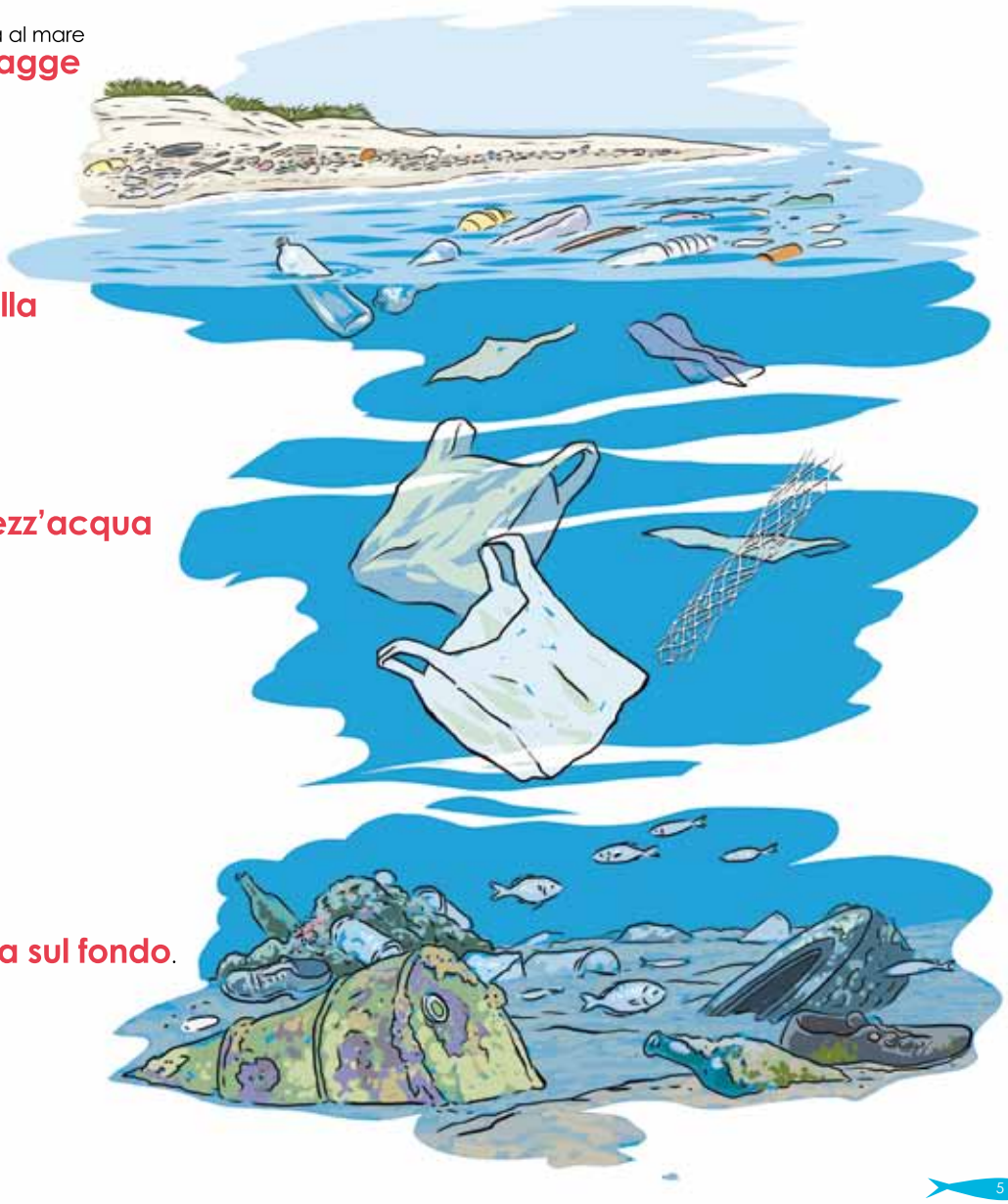
La spazzatura marina

La spazzatura che arriva al mare
finisce sulle spiagge

oppure **resta a galla**

o **a mezz'acqua**

o si **deposita sul fondo**.

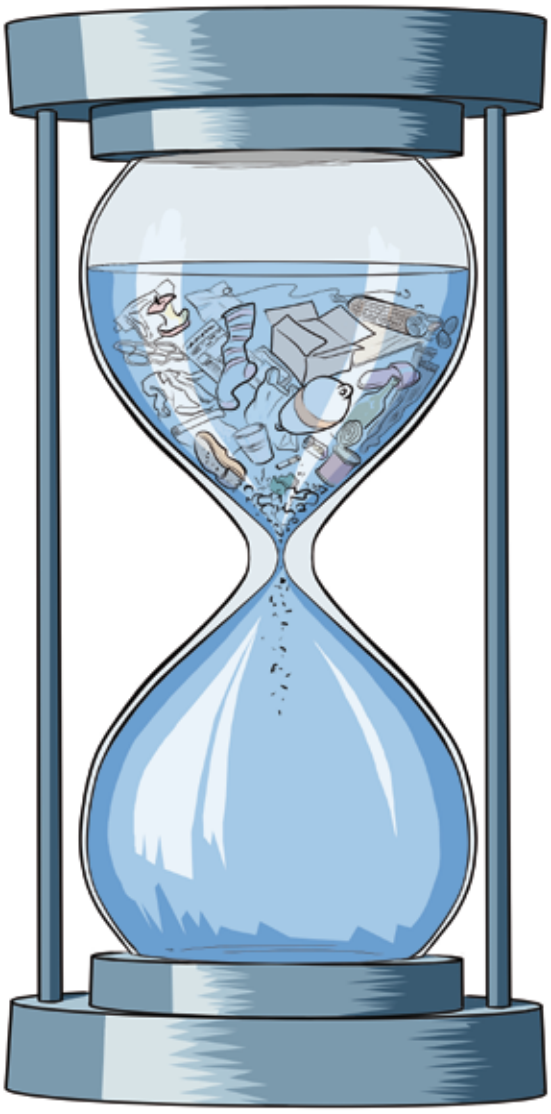


5

Quanto “vive” la spazzatura?

Di seguito alcune stime:

Fazzoletto di carta	*2-4 settimane*
Giornale	*6 settimane*
Torsolo di mela	*2 mesi*
Scatola di cartone	*2 mesi*
Contenitore di cartone	*3 mesi*
Camicia di cotone	*2-5 mesi*
Porta lattine fotodegradabile	*6 mesi*
Legno compensato	*1-3 anni*
Mozzicone di sigaretta	*1-5 anni*
Calze di lana	*1-5 anni*
Suola di gomma	*10-12 anni*
Busta di plastica	*10-20 anni*
Scarpe di cuoio	*25-40 anni*
Tessuti di nylon	*30-40 anni*
Bicchiere di plastica	*50 anni*
Barattolo di latta	*50 anni*
Batterie	*100 anni*
Polistirolo	*100anni*
Lattina di alluminio	*200 anni*
Bottiglia di plastica	*450 anni*
Reti cozze	*400 anni*
Porta lattine di plastica	*400 anni*
Pannolino	*450 anni*
Lenza	*600 anni*
Bottiglia di vetro	*indeterminato*



Dobbiamo reagire!

I G7 riuniti a Berlino hanno riconosciuto
nella spazzatura marina, in particolare la plastica,
**uno dei problemi
che affliggono gli oceani**.

Puliamo le nostre spiagge

e cerchiamo di capire
da cosa sia fatta la spazzatura marina.

Perché così tanta spazzatura sulle coste adriatiche della Puglia?

Una corrente entra dal Canale d'Otranto, risale lungo le coste orientali dell'Adriatico e poi scende lungo le coste italiane.

I vortici connettono la costa orientale e quella occidentale.

☆ La costa adriatica della penisola salentina è un **hot spot di accumulo di spazzatura marina.**

8

Cosa arriva sulle nostre coste?

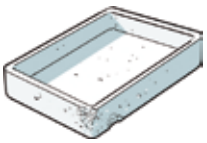
FIBRE

LEGNO

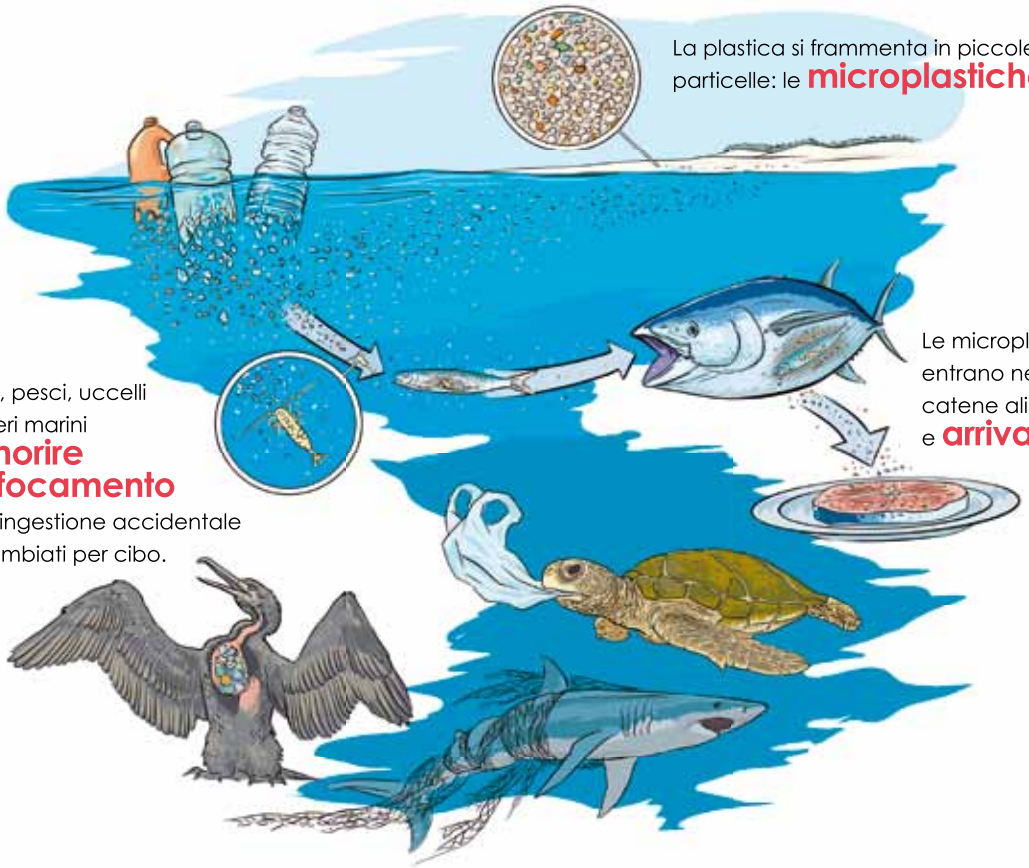
PLASTICA

VETRO

POLISTIROLO



Quello che non vediamo

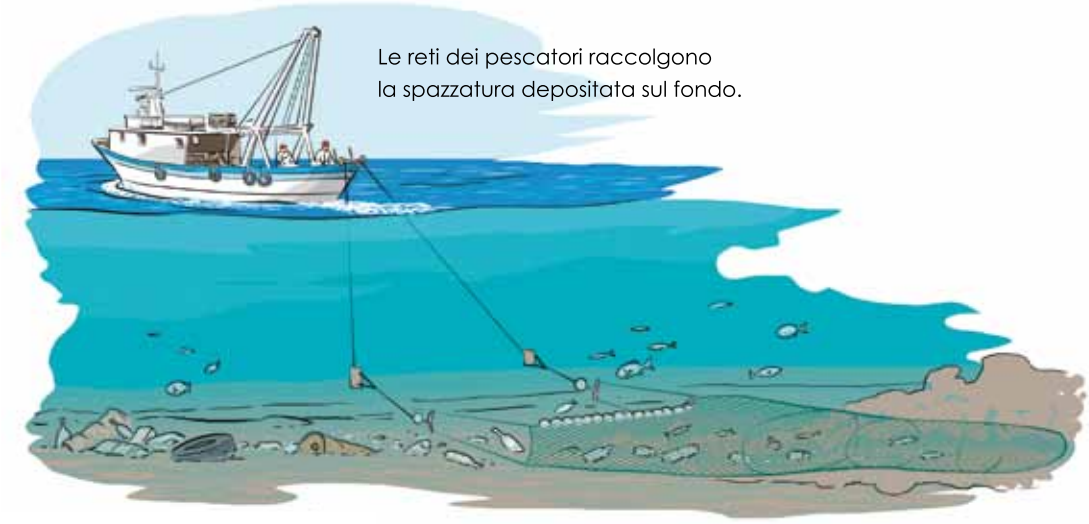


La plastica si frammenta in piccole particelle: le **microplastiche**.

Le microplastiche entrano nelle catene alimentari e **arrivano a noi**.

Tartarughe, pesci, uccelli e mammiferi marini possono **morire per soffocamento** dovuto all'ingestione accidentale di rifiuti scambiati per cibo.

Pulire i fondali



Le reti dei pescatori raccolgono
la spazzatura depositata sul fondo.

La spazzatura viene
portata a bordo.

Se esistessero opportuni contenitori nei porti,
i pescatori potrebbero smaltire a terra quanto raccolto sul fondo marino.

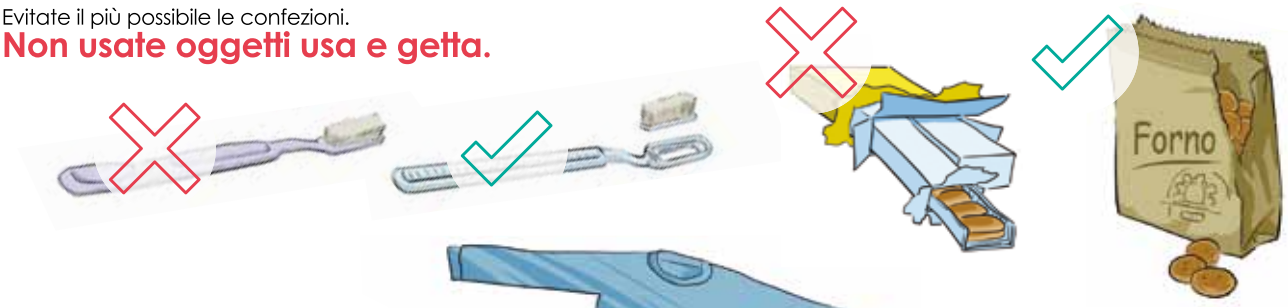
10

E noi cosa possiamo fare?

Molto dipende da chi realizza le cose che consumiamo.
L'impiego di materiali riciclabili deve essere promosso da norme internazionali.
Ma noi possiamo, col nostro comportamento, innescare buoni processi:

Non usate le buste di plastica:
andate a fare la spesa con una sporta di tela.

Comprate prodotti con imballaggi ridotti.
Evitate il più possibile le confezioni.
Non usate oggetti usa e getta.



Comprate indumenti di **fibre naturali**
(la maggior parte delle microplastiche
deriva da indumenti di fibre sintetiche).

Se fate un picnic riportate la spazzatura a casa e riciclatela.
Usate bicchieri e bottiglie di vetro.
Usate posate di metallo.
Usate piatti di ceramica.
Usate oggetti di materiale riciclato.

11

Guardatevi attorno
e apprezzate la bellezza della natura.

Imparate a riconoscere
cosa la deturpa.

13

14

Riutilizzare: quando la spazzatura marina può essere una risorsa

Le dune svolgono un ruolo importantissimo nell'equilibrio della costa.

Le foglie spiaggiate di Posidonia proteggono le dune dall'erosione costiera e proteggono gli ecosistemi più interni.

Anche il legno naturale spiaggiato può essere riutilizzato per il **consolidamento delle dune**.

Legnetti, tronchi e foglie di Posidonia oceanica possono divenire una facile risposta al problema dell'erosione costiera, costituendo **una valida barriera naturale** contro le forti mareggiate.

15

Stampato a cura di TAP nel dicembre 2017

CoNISMa
Consorzio Nazionale Interuniversitario per le Scienze del Mare

Trans Adriatic Pipeline