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Top Marine Beach Litter Items in Europe

A review and synthesis based on beach litter data

Anna Maria Addamo, Perrine Laroche, Georg Hanke

MSFD Technical Group on Marine Litter

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Foreword

The Marine Directors of the European Union (EU), Acceding Countries, Candidate Countries and European Free Trade Association (EFTA) Countries have jointly developed a common strategy for the coherent and harmonious implementation of the Directive 2008/56/EC, the "Marine Strategy Framework Directive" (MSFD). The focus is on methodological questions related to a common understanding of the technical and scientific implications of the MSFD. In particular, one of the objectives of the strategy is the development of non-legally binding and practical documents, such as this report, on various technical issues of the Directive. In order to support and advise the policy development and implementation process, the MSFD Technical Group on Marine Litter (TG Marine Litter hereafter) has been set up as part of the MSFD Implementation Strategy. The TG Marine Litter is led by the Directorate General for Environment (DG ENV) and chaired by the French Research Institute for Exploitation of the Sea (IFREMER), the German Environment Agency (UBA) and the European Commission's Joint Research Centre (EC JRC). Further information can be found on the JRC's MSFD Competence Centre website: http://mcc.jrc.ec.europa.eu/dev.py?N=41&O=434&titre_chap=TG%20Marine%20Litter.

This report has been prepared by the JRC, based on data and information collected by the JRC and revised by the TG Marine Litter.

The publication is part of a series of technical reports on specific thematic topics to do with marine litter, including: *Guidance on Monitoring of Marine Litter in the European Seas, Harm caused by Marine Litter*, *Identifying Sources of Marine Litter*, and *Riverine Litter Monitoring – Options and Recommendations.* These thematic reports are targeted to those experts who directly or indirectly implement the MSFD.

This technical report provides information to support the MSFD and the EU Plastics Strategy, to support EU Member States in the implementation of monitoring programmes and plans of measures to address the issue of marine litter.

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Abstract

Reducing litter in the coastal and marine environment is a major and priority challenge in the effort to preserve biota, ecosystems, as well as goods and services that humans derive from seas and oceans. The identification of the most abundant beach litter items, the 'Top Marine Beach Litter Items', is a matter of concern for the Marine Strategy Framework Directive (MSFD), the EU Plastics Strategy and in general for the prioritisation of measures against marine litter. Specific measures are needed to prevent further inputs and reduce the abundance of litter items.

Based on a 2016 beach litter data set, this report has identified the most abundant items on EU beaches. A total of 355 671 marine litter items were recorded during 679 surveys on 276 European beaches.

The quantification of items through beach litter monitoring enables a ranking of items based on their numerical abundance. While a few studies from regional sea conventions (RSCs), non-governmental organisations (NGOs) and research projects have ranked items by their occurrence on beaches at different spatial scales, there had been no EU-wide analysis before this report.

This report has been developed by the European Commission's Joint Research Centre (JRC) within the MSFD Technical Group on Marine Litter (TG Marine Litter). It compiles available studies and publications of lists of the main marine beach litter items. While several publications describe and apply different calculation methods, which might lead to different results, this report applies the 'total abundance method' to a set of European beach litter data that had been collected by the TG Marine Litter. Data is based on a one-year sampling exercise (2016) and includes the findings of monitoring programmes, clean-up campaigns and research projects.

The results of the report (which also address single-use products) are provided to support the development of the EU Plastics Strategy. The data analysis involved the grouping of spatial-temporal data at European, regional and national levels, and includes the seasonal variability of beach litter.

This report also gives a brief review of potential item-related risk, and prioritisation based on their potential to harm. The report provides information that will help develop and implement the most efficient measures against marine litter.

1 Introduction

1.1 Marine litter

Marine litter, or debris, is defined as "any persistent, manufactured or processed solid material discarded, disposed of or abandoned in the marine and coastal environment" (Cheshire et al., 2009; MSFD GES Technical Subgroup on Marine Litter, 2013; Schulz, van Loon, Fleet, Baggelaar, & van der Meulen, 2017). The marine environment can be considered as a sink in which anthropogenic litter accumulates (Van Acoleyen et al., 2013) coming from land-based and offshore sources (Veiga et al., 2016). Thus, marine litter is found in all marine compartments such as beaches, on the shallow and deep seafloor, in the sea surface layer and in the water column.

Marine litter is recognised as a worldwide concern by EU and global initiatives such as the United Nations Environment Programme (UNEP; see Sustainable Development Goal 14), the G7 and the G20. It causes harm to the environment and generates adverse economic, health and aesthetic impacts.

1.2 Marine Strategy Framework Directive

The MSFD (European Parliament & Council of the European Union, 2008) provides the EU legal framework for the protection of the European Seas. Marine litter is included as one of the Descriptors for the Good Environmental Status (GES) of the European Marine Waters (see Descriptor 10 in European Comission, 2010). The revised European Commission Decision COM/2017/848 (European Commission, 2017a) provides details for the assessment of litter in the environment.

The composition and distribution patterns of marine litter need to be determined in order to understand its origin, while source attribution and harm impact information are needed in order to prioritise efficient measures (MSFD GES Technical Subgroup on Marine Litter, 2011).

1.3 EU Plastics Strategy

Leaks from production processes or the use and inadequate waste disposal of plastics release plastics into the environment. Plastic items represent the major part of litter found in the marine environment (Galgani et al., 2010; Simeonova, Chuturkova, & Yaneva, 2017a; Watts et al., 2017). The sustainable development of the oceans therefore urgently requires the reduction of plastic releases (United Nations, 2016).

The EU Plastics Strategy (European Commission COM/2018/028, 2018) - "A European Strategy for Plastics in a Circular Economy" - aims to address the challenges caused by plastic throughout its value chain, by taking into account its entire life cycle (DG ENV & DG GROW, 2017) in order to progress toward a European Circular Economy (European Commission, 2017b). Reducing plastic leakage into the environment is one of the main goals of the EU Plastics Strategy (DG ENV & DG GROW, 2017) that requires sound scientific data and information in order to identify best measures and ascertain progress.

1.4 Top Litter Items

The most frequently occurring litter items in the environment, in the form of identifiable objects, fragments and pieces, are commonly known as "top litter items". They have been identified by different organisations as part of their efforts to prioritise activities against litter categories of greatest concern.

In 2016, the JRC provided an *ad hoc* technical report that compiled the EU "Top Marine Beach Litter Items" from available lists (Hanke, 2016).

1.5 Scope of this report

The scope of this report is to compile existing information about top marine beach litter items in Europe, including available ranking information, data treatment options, ranking approaches and data analysis.

It provides access to the main contents and references of the most relevant studies on the top marine beach litter items, in particular those of Regional Sea Conventions. A harmonised EU beach litter data set from 2016 provides up-to-date information on the most abundant items at different geographical and seasonal scales.

The information on top litter items published in this report has been made available for the development of the EU Plastics Strategy and the related Impact Assessments.

2 Available Studies on Top Marine Beach Litter Items

Following the increasing attention on marine litter, a number of studies on the most common items of litter on European beaches have become available. In 2016, a JRC report provided a list of top marine beach litter items at the European scale based on the different Top Items lists from OSPAR, ARCADIS, EEA Marine LitterWatch (MLW), the United Nations Environment Programme / Mediterranean Action Plan (UNEP/MAP) and the Black Sea Commission (BSC) (Hanke, 2016 and references therein). The data used for that report was collected between 2011 and 2015.

A wide range of organisations across Europe are involved in efforts to understand the composition of marine litter. This chapter provides currently available reports on top Marine Beach Litter items. All available reports (i.e. published in recent years, particularly 2016, 2017, and including some reports published in early 2018) dealing with quantitative beach litter assessment were consulted. These reports come from the RSCs involving European countries (2.1), national and European NGOs (2.2), national assessments (2.3), and research projects dedicated to the issue of Marine Litter in Europe (2.4). The MLW, developed by the European Environment Agency (EEA), has also been included (2.5), and the use of top marine beach litter items lists in peer-reviewed literature has been investigated (2.6). An aggregation of currently available top items studies is provided in the Annex I.

2.1 Regional Sea Convention Reports

Regional Sea Conventions (RSCs) are very active players in the field of marine litter, providing regional approaches where needed. In particular, the Oslo-Paris Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR convention) has been developing many concepts on marine litter assessments and can provide longstanding experience and decades of data. Furthermore, as marine litter is a transboundary issue, RSCs also provide international collaboration beyond the EU in the shared waters with numerous other non-European countries.

Marine areas under European jurisdiction belong to the following four RSCs (source: (http://ec.europa.eu/environment/marine/international-cooperation/regional-sea-conventions/index_en.htm):

- The Convention for the Protection of the Marine Environment in the North-East Atlantic of 1992 (further to earlier versions of 1972 and 1974) – the Oslo-Paris Convention (OSPAR)
- The Convention on the Protection of the Marine Environment in the Baltic Sea Area of 1992 (further to the earlier version of 1974) – the Helsinki Convention (HELCOM)
- The Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean of 1995 (further to the earlier version of 1976) – the Barcelona Convention (implemented through the United Nations Environment Programme/ Mediterranean Action Plan, UNEP/MAP)
- The Convention for the Protection of the Black Sea of 1992 – the Bucharest Convention (implemented through the Black Sea Commission).

The completeness of the information from all four RSCs reflects the state of monitoring implementation in the past years.

2.1.1 OSPAR Commission

The most advanced work on marine litter at the marine region scale has been carried out by OSPAR for the North-East Atlantic. OSPAR has developed a protocol for monitoring marine litter since 2000, including guidelines for selecting survey sites and conducting surveys, and a reference list to classify the items observed in the field (OSPAR Sea Convention, 2010). This protocol was tested between 2001 and 2006. Data collection continued for the periods 2009-2016, and is ongoing.

Two reports from the OSPAR Convention that contain lists of top marine beach litter items have been considered in this study:

- one from 2007 (OSPAR Commission, 2007), based on the data collected during the pilot period from 2001 to 2006. In that frame, 55 beaches located in the North-East Atlantic coast were monitored seasonally three to four times per year.

- the latest, released in 2017 (OSPAR Commission, 2017), presents the results of the Intermediate Assessment conducted by the OSPAR Commission on various topics. The chapter dedicated to marine litter uses data from two different monitoring periods. A first set from 2009 to 2014 gathered data obtained from 19 survey sites across the OSPAR region, and a second set from 2014 to 2015 includes data from 76 surveys sites. For the latter set of data and further information, please see Table 1.

Furthermore, the monitoring data of several EU countries in the North-East Atlantic region are being collected through OSPAR data systems.

Table 1: OSPAR subregional ranking lists of Top Litter Items from 2014-2015 surveys (OSPAR intermediate assessment, 2017)

Rank	North Sea - South 2014-2015	North Sea - North 2014-2015	Bay of Biscay 2014-2015	Celtic Coast 2014-2015
Ref.	Annex I, b) Fig.A17	Annex I, b) Fig.A18	Annex I, b) Fig.A19	Annex I, b) Fig.A20
1	Plastic polystyrene pieces < 50 cm	Nets + ropes	Plastic polystyrene pieces < 50 cm	Plastic polystyrene pieces < 50 cm
2	Nets + ropes	Plastic polystyrene pieces < 50 cm	Nets + ropes	Nets + ropes
3	Plastic: Caps + lids	Plastic: Caps + lids	Paper: Cigarette butts	Plastic: Drink bottles + containers
4	Plastic: Drink bottles + containers	San: Cotton bud sticks	Plastic: Caps + lids	Plastic: Caps + lids
5	Plastic: Foam sponge	Plastic: Shotgun cartridges	San: Cotton bud sticks	San: Cotton bud sticks
6	Plastic: Crisp/sweet packets and lolly sticks	Plastic: Crisp/sweet packets and lolly sticks	Plastic: Other items	Plastic: Crisp/sweet packets and lolly sticks
7	Wood: Other items < 50 cm	Plastic: Small plastic bags, e.g. freezer bags	Plastic: Drink bottles + containers	Metal: Drink cans
8	Plastic: Food containers, incl. fast food containers	Plastic: Food containers, incl. fast food containers	Plastic: Crisp/sweet packets and lolly sticks	Plastic: Food containers, incl. fast food containers
9	Plastic: Tangled nets/cords/rope and string	Plastic: Balloons	Plastic: Foam sponge	All gloves
10	Plastic: Plastic/polystyrene > 50 cm	San: Other items	Plastic: Small plastic bags, e.g. freezer bags	Plastic: Bags (e.g. shopping)
11	Rubber: Balloons	Plastic: Strapping bands	Plastic: Food containers, incl. fast food containers	Plastic: Fishing line
12	Plastic: Industrial packaging, plastic	Plastic:	Plastic:	Plastic: Shotgun

Rank	North Sea - South 2014-2015	North Sea - North 2014-2015	Bay of Biscay 2014-2015	Celtic Coast 2014-2015
	sheeting	Cutlery/trays/straws	Cutlery/trays/straws	cartridges
13	Plastic: Shotgun cartridges	Plastic: Tangled nets/cords/rope and string	Plastic: Tangled nets/cords/rope and string	Plastic: Tangled nets/cord/rope and string
14	Plastic: Small plastic bags, e.g. freezer bags	Plastic: Plastic/polystyrene > 50 cm	Wood: Other items < 50 cm	Plastic: Cutlery/trays/straws
15	Glass: Other items	San: Sanitary towels/panty liners/backing strips	Metal: Industrial scrap	Rubber: Other items

The OSPAR data set is homogeneous, due to a common recording and reporting scheme, and based on longstanding experience in data acquisition and treatment. The table above shows some differences in the top-ranked items between subregions, while other categories are relevant in all subregions. This example illustrates the importance of not restricting investigations to a limited number of rankings, e.g. the top 10 items, but of also considering lower-ranking items that may be of significance in another area.

2.1.2 **UNEP/MAP**

The United Nations Environment Programme / Mediterranean Action Plan (UNEP/MAP) published a report on marine litter in 2015 (UNEP, 2015). It includes an assessment of marine litter composition and distribution in all areas of the marine environment (beach, sea surface, seafloor), as well as an assessment of sources, pathways, and impacts. The data used for this report had been collected between 2011 and 2014. In January 2017, UNEP/MAP released an Action Plan dedicated to top marine litter items (UNEP, 2017) that presents a short analysis of the most abundant litter items found on the Mediterranean coast, surface, water column and seafloor. Both documents contain the same top items list extracted from the "2014 International Coastal Clean-up (ICC)". In 2018, UNEP/MAP published the "Mediterranean Quality Status Report", which contains a chapter on marine litter that compiles different sources of information on litter abundance in the Mediterranean Area (MAP, 2017).

2.1.3 **HELCOM**

For the Baltic Sea region, a first assessment (HELCOM Baltic Marine Environment Protection Commission, 2009) was based on data from beach monitoring sessions organised by NGOs (WWF Naturewatch, Ocean Conservancy) and by municipalities in the region. The report also included some information about the seasonal variability of items' concentration, but did not contain any list ranking top items at the marine region level.

In June 2017, the 'Second HELCOM Holistic Assessment of Ecosystem Health in the Baltic Sea' was published under the title "State of the Baltic Sea report, June 2017" (http://stateofthebalticsea.helcom.fi/). This assessment covers the whole Baltic Sea marine region and provides information on the overall environmental status of and pressures on the Baltic Sea, as well as social and economic aspects that are linked to the status of the Sea and the human activities impacting upon it. A descriptive approach in the presentation of marine litter was included in the report. The report was updated in June 2018, including an update of the marine litter section based on the outcomes of the

SPICE[1] project, whose work on marine litter was supported and guided by the HELCOM Expert Network on Marine Litter (HELCOM, 2018). SPICE, a HELCOM-coordinated project that was co-financed by the EU, ended in December 2017. The update includes the identification of the 10 most frequent litter items at Baltic Sea level on different types of beaches, categorised into urban, peri-urban and rural beaches. The results are based on data from Denmark, Estonia, Finland, Germany, Lithuania, Poland and Sweden (Table 2). Data for reference beaches in Denmark are included under rural beaches. For each survey, the 20 most frequently sampled items were listed, and scores were given to each item. After this, the results for different surveys were merged to provide regional lists of top ten items. Only data from seasonally monitored sites from the period 2012-2016 are included, to prevent the overestimation of occasional events (HELCOM 2018a).

Table 2. Ten most frequent litter items at Baltic Sea level on different types of beaches, categorised into urban, peri-urban and rural beaches. The colours identify items categorised as plastics (artificial polymer materials; grey), paper or cardboard (purple), metals (orange), glass or ceramics (pink), and processed wood (blue) (HELCOM 2018a)

Rank	Urban beach	Peri-urban	Rural beach
1	Drinking related items such as cups, caps, lids (plastic)	Plastic and polystyrene pieces	Plastic and polystyrene pieces
2	Plastic and polystyrene pieces	Food related items such as wrappers, packets (plastic)	Food related items such as wrappers, packets (plastic)
3	Cigarette butts and remains	Cigarette butts	Drinking related items such as cups, caps, lids (plastic)
4	Food related items such as wrappers, packets (plastic)	Drinking related items such as cups, caps, lids (plastic)	Plastic bags
5	Paper and cardboard items	Plastic bags	Bottles and containers (plastic)
6	Drinking related items such as bottle caps, pull tabs (metal)	Single-use cutlery and straws	String and ropes (plastic)
7	Plastic bags	Drinking related items such as bottle caps, pull tabs (metal)	Cigarette butts
8	Single-use cutlery and straws	Glass and ceramic fragments	Glass and ceramic fragments
9	Bottles and containers (plastic)	Foil wrappers and pieces of metal	Industrial packaging
10	Drinking related cans (metal)	String and ropes (plastic)	Processed wood and pieces of processed wood

Note that the attribution of litter ranking lists to different beach types (see section 3.2.2) in Table 2 is not available for all beaches from other data sources.

[1] Implementation and development of key components for the assessment of Status, Pressures and Impacts, and Social and Economic evaluation in the Baltic Sea marine region

2.1.4 Bucharest Convention - Black Sea Commission

The latest report of the Black Sea Commission (BSC) about marine litter (Birkun et al., 2009) states that "marine litter assessment in the Black Sea based on the monitoring of beaches is still scarce". Indeed, data used to conduct the analyses in the frame of this report was collected from 2001 to 2003 from only a few survey sites. The cited report does not include a top item list. The Environmental Monitoring in the Black Sea (EMBLAS) II project (http://emblasproject.org/), collaborating closely with the BSC and supported by the JRC, provides data on marine beach litter, channelled through the EEA Marine LitterWatch data system.

2.2 Non-Governmental Organisation (NGO) Reports

NGOs are the main actors in the field of marine litter monitoring, and their reports are a major source of information regarding beach litter in Europe. This reflects the huge interest of the general public in the topic and provides valuable data through the framework of clean-up events and multiannual survey work. As surveys are carried out by volunteers without specific training, and their results could be of differing quality, NGOs - such as the Surfrider Foundation, or NGO federations such as the Marine Conservation Society (MCS) and the Mediterranean Information Office for Environment, Culture and Sustainable Development (MIO-ECSDE) - organise activities including training and data feedback in order to provide fit-for-purpose data.

A non-exhaustive list of European, regional, and national NGOs working on marine litter issues was compiled, identifying those that supply data. Reports from this reduced set of NGOs were collected, when available. The six reports that corresponded to our criteria are presented in the Table 3 below, while the results are presented in Annex I.1.

Table 3: Activity reports from NGOs reviewed for this report.

NGO	Country	Monitoring Period	Title of the Report
The North Sea Foundation	Netherlands	2010-2015	OSPAR Beach Litter Monitoring in the Netherlands 2010-2015 Annual report (Hougee & Boonstra, 2016)
Marine Conservation Society	United Kingdom	2016	Great British Beach Clean 2016 Report (Marine Conservation Society, 2016)
Legambiente	Italy	2016	Beach Litter 2016 - Indagine sui rifiuti nelle spiagge italiane (Legambiente, 2016)
Surfrider Foundation	Europe	2016	Ocean Initiatives (Surf Rider Foundation, 2016)
Keep the Archipelago Tidy Association	Finland	2014-2015	Beach Clean Campaign 2014-2015 (Gustafsson, Siikasmaa, & Kaasalainen, 2015)
HELMEPA	Greece	2016	HELMEPA Annual Report 2016 (HELMEPA, 2016)

Some clean-up actions have been in place for many years. The Surfrider Foundation has been supervising clean-up events for monitoring purposes since 1995, the MCS has recorded data on beach litter for over 20 years, and the Italian NGO Legambiente started to implement beach litter clean-ups in 2014, reporting annually since then.

Since 2010, the MCS has been in charge of the United Kingdom's national monitoring programme of marine litter within the framework of the implementation of the OSPAR protocol. The Keep the Archipelago Tidy Association launched a clean beach event after the publication of the Baltic Marine Litter (MARLIN) project results, in order to harness the public willingness to get involved in the fight against marine litter. The Hellenic

Marine Environment Protection Association (HELMEPA) is the national coordinator of two international voluntary clean-up initiatives in Greece, such as the International Coastal Clean-Up Day directed by Ocean Conservancy at the international scale in September each year since 1997, and the European Clean-Up Day which is organised at the European scale in May each year since 2014.

The scattered information, the use of different methodologies for the identification of items and the different reporting standards hinder a thorough large-scale scientific data analysis. Below, some examples of top litter item ranking lists have been compiled in order to provide an overview (Table 4). Additional examples are given in Annex I.

Table 4: Ranking lists of Top 10 Items compiled from different reports (complete references can be found in Annex I).

Rank	MCS Great British Beach Clean 2016	Legambiente 2016	Surfrider 2016	HELMEPA 2016	ICC MED 2014
Ref.	Annex I, a) Fig. A1	Annex I, a) Fig. A2	Annex I, a) Fig. A4	Annex I, a) Fig. A6	Annex I, b) Fig. A7
1	Plastic/polystyrene pieces (0-50 cm)	Plastic + polystyrene pieces	Plastic pieces 2.5-50 cm	Cigarette filters	Cigarette butts
2	Cigarette butts	Cotton bud sticks	Cigarette butts	Plastic pieces < 2.5 cm	Food wrappers
3	Packets (crisp, sweet, lolly, sandwich)	Cigarette butts	Fishing cord + ropes (diameter < 1 cm)	Plastic bottles	Plastic bottles
4	Caps + lids	Caps + lids (plastic + metal)	Glass pieces	Straws	Caps
5	String /cord (thickness 0-1 cm)	Plastic drink bottles	Polystyrene fragments (2.5-50 cm)	Plastic bottle caps	Straws/stirrers
6	Cotton bud sticks	Net from fishing + aquaculture	Bottle caps	Food wraps	Grocery plastic bags
7	Glass	Plastic cutlery SUP	Cotton bud sticks	Plastic bags	Glass bottles
8	Wet wipes	Construction material	Plastic bags + fragments	Foam pieces < 2.5 cm	Other plastic bags
9	Fishing line	Glass bottles + pieces	Plastic bottles	Glass pieces < 2.5 cm	Paper bags
10	Plastic drink bottles	Detergent bottles + containers	Fishing line, rope	Aluminium cans	Cans

2.3 National Reports

Member States may also report about marine litter at the national scale, and the top items approach has been widely used to report on litter composition. For instance, the Danish Centre for Environment and Energy released a scientific report in 2015 dedicated to marine litter assessment on the Danish coast based on surveys conducted on four reference beaches, three times per year (Danish Centre for Environment and Energy, 2016), and seven top items lists are presented to report litter composition at various spatial scales.

It emerged that national assessments conducted by NGOs often feed into international data collection schemes and are then used for MSFD assessments.

Individual EU Member States provide reporting of marine litter assessments under MSFD obligations.

2.4 Research Projects

2.4.1 MARLIN Project

The Baltic Marine Litter (MARLIN) project was implemented in the Baltic Sea from 2011 to 2013. It was developed by the Keep Baltic Tidy network in response to the recognition that the "lack of comparable and reliable data is a major gap in marine litter issues in the Baltic Sea", as stated by HELCOM (HELCOM (Baltic Marine Environment Protection Commission), 2009). The Keep Baltic Tidy network involves national associations from Sweden, Finland, Estonian, and Latvia. The MARLIN project started in 2011 and was led by the Keep Sweden Tidy Foundation, through funding provided by the EU Central Baltic INTERREG IV A Programme. The main aim was to provide information about the status of litter in the Baltic Sea in order to raise awareness, to change people's behaviour, and to put the topic on the daily agenda of policymakers.

MARLIN has provided a harmonised assessment of litter found in beaches, based on the UNEP / Intergovernmental Oceanographic Commission (IOC) Guidelines (Cheshire et al., 2009). In the framework of the project, 23 beaches in the four Baltic countries involved in the programme were monitored three times a year for two years (2012-2013). The final report, including the results, was released in 2013 (MARLIN Baltic Marine Litter Project, 2013).

2.4.2 DeFishGear Project

In 2014, the Instrument for Pre-Accession Assistance (IPA)-Adriatic funded the three-year project DeFishGear (Derelict Fishing Gear Management System in the Adriatic Region, http://www.defishgear.net/) in order to address the need for accurate, coherent and comparable scientific data on marine litter in the Adriatic-Ionian macro region.

A quantitative assessment of marine beach litter was conducted. Surveys were undertaken for a year on 31 beaches, along the coastline of seven countries that share the Adriatic and Ionian Seas. Data of the amounts, composition and, as far as possible, sources of marine litter were collected in a harmonised way by applying the MSFD guidance (slightly modified with regard to the sampling unit). In each survey, a predefined sampling unit was used, corresponding to a 100-metre stretch of beach along the strandline and 10-metre width towards the back of the beach. The results, which include top litter items lists, were reported in 2017 and 2018 (Vlachogianni et al., 2017; 2018).

2.4.3 As-Made Project

The Assessment of Marine Debris on the Belgian Continental Shelf: occurrence and effects (As-Made project, http://www.vliz.be/projects/as-made/en/index.html), a national initiative from Belgium, was conducted from 2011 to 2013 along the coast. The

project aimed to offer a complete picture of the environmental risks of marine litter in the country, as well as to make the data available on an integrative platform. In this project, four 100-metre sections were surveyed on four different beaches in 2010 and in 2011, and the abundance of litter items was recorded according to the OSPAR Items List. The results were presented in a report released in 2013 (Claessens et al., 2013).

2.4.4 MARNOBA I and II Projects

The Spanish association Vertidos Cero implemented the MARNOBA project (http://vertidoscero.com/Marnoba_AVC/) to address the problem of marine beach litter on the Spanish coast. It mainly focuses on litter characterisation in order to allow for appropriate analyses and initiatives to eliminate litter at its source and to help design cleaning activities. The project included the monitoring and reporting of beach litter. Beginning in 2013, monitoring activities were continued in 2014.

The four projects presented above provided information about top litter items based on the results of their monitoring sessions. Although many other projects tackle marine litter, not all of them identify top litter items. For instance, from 2002 to 2004, the Save The North Sea project focused on the underlying causes of marine litter in the Netherlands, especially those related to waste management and institutional regulation. In consequence, the report included neither litter data, nor any top items approach (Save the North Sea, 2017). The Environmental Monitoring in the Black Sea (EMBLAS) II project, implemented in the Black Sea since 2016, aims to improve the availability and quality of data on the chemical and biological status of the Black Sea (EMBLAS-I, 2015). Beach litter surveys have been conducted and top litter items lists are expected to be made available.

A list of research projects on marine litter that have provided or will provide quantitative information about the abundance of litter items in Europe has been compiled by the MSFD TG Marine Litter, and has been consulted for this study.

2.5 EEA - Marine LitterWatch

Another source of beach litter data and top items lists is the Marine LitterWatch (MLW), an initiative undertaken by the European Environment Agency (EEA) to strengthen Europe's knowledge base on marine litter. Launched in 2013, it collects data through a mobile app designed to be used by communities and individuals to monitor beach litter. Each surveying organisation can use the mobile app to report beach litter items based on a harmonised protocol. Data are stored on an online platform and can be displayed at any time. The platform offers a large range of possibilities in terms of data visualisation and allows for the design of customised top items lists at different spatial and temporal scales.

For more info, see Marine LitterWatch data viewer: https://www.eea.europa.eu/themes/water/europes-seas-and-coasts/marine-litterwatch/data-and-results/marine-litterwatch-data-viewer-1

In June 2018, the EEA released a report on the most abundant beach litter items based on data collected through the LitterWatch initiative (European Environment Agency, 2018). Data were provided through communities that assess beach litter using agreed protocols and perform regular monitoring campaigns (such as Surfrider and EMBLAS II) and clean-up initiatives. While these data enable the ranking of items according to their abundance, they cannot be directly compared with rankings from other initiatives due to the different monitoring techniques used, beach selection, etc. (Figure 1).

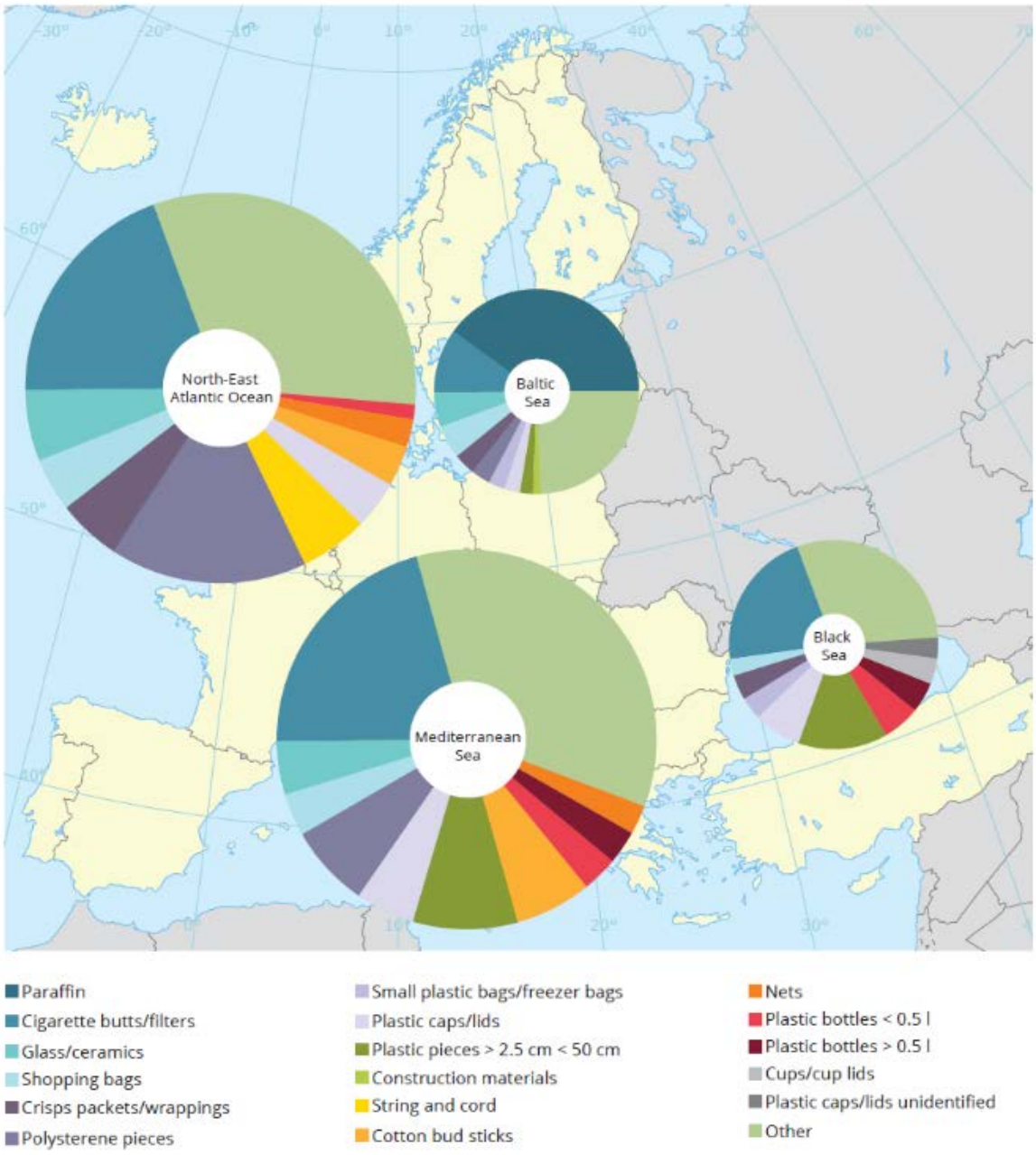

Figure 1: Beach Litter Item categories from EEA LitterWatch (European Environment Agency, 2018). Colours represent different litter items found in each marine region (North-East Atlantic Ocean, Baltic Sea, Black Sea and Mediterranean Sea). The size of the pie charts represents the amount of a litter, while the size of the pie slices shows the relative proportion of the data for each litter item.

2.6 Scientific Literature Review

Research results on top beach litter items have been published in scientific peer-reviewed journals.

A literature review was conducted with a keyword-based search ("beach litter", "top items") on the scientific literature portal "Science Direct" (including publications up to December 2017). Out of 49 publications, the screening process yielded nine scientific papers with relevant information on top litter classifications (Hengstmann et al., 2017; Schulz et al., 2015, 2017; Simeonova et al., 2017b; Prevenios et al., 2017; Van Cauwenberghe et al., 2013; Watts et al., 2017; Williamset al., 2017; Williams et al., 2016).

Some trends emerged regarding the features of top items lists and the methodological approaches:

1. All studies present local litter assessments. Half of the Top Items lists are expressed at the beach scale (Schulz et al., 2015, 2017; Prevenios et al., 2017; Van Cauwenberghe et al. 2013; Watts et al., 2017), while the other half presents data at the scale of the overall coastline (Hengstmann, et al., 2017; Simeonova et al., 2017a; Williams et al., 2017; Williams et al., 2016a).
2. Items lists are provided for one specific year (Hengstmann et al., 2017; Prevenios et al., 2017; Schulz et al., 2017; Van Cauwenberghe et al., 2013; Williams et al., 2017) or for a period encompassing several years (Schulz et al., 2015, 2017; Simeonova et al., 2017a; Watts et al., 2017; Williams et al., 2017).
3. Three different units were used for reporting item densities: a) total number of items observed (Hengstmann et al., 2017; Schulz et al., 2015; Simeonova et al., 2017a; A. T. Williams et al., 2017; Williams et al., 2016), b) number of items observed per 100 m (Prevenios et al., 2017; Schulz et al., 2017; Van Cauwenberghe et al., 2013), and c) number of items per m² (Watts et al., 2017).

2.7 Aggregation of Top Items Studies

Ideally, existing national or regional studies could be combined in order to provide results at a larger scale (e.g. EU level). Different studies have been analysed which unfortunately reveal a number of difficulties in achieving this:

1. The calculation modes are different: item counts are summed, averaged or progressively ranked.
2. The category lists used for litter items are different.
3. The ranking length of the top items differs between studies, thus excluding lower-ranking items from comparison.
4. Surveys differ in terms of the size classes of litter items; e.g. the MSFD guidelines recommend to survey macro-litter items with a minimum length of 2.5 cm. In other protocols, litter size classes include items from 0-2.5 cm.
5. The reporting units differ between studies: depending on the protocol followed to collect the data in the field, the number of items may be expressed per 100-m transect length, per m^2, or with no spatial indicator.
6. The sampling units may differ between studies: for studies that use a predefined sampling unit (e.g. beach dimension measured in an inland direction), setting boundaries can be a problem if beaches have no clear end.
7. The beach litter assessments are made at different spatial scales: the heterogeneous spatial coverage could be a barrier for relevant assessments at the European scale.
8. The beach litter assessments are performed at specific sites, in particular those performed by volunteers or communities. These sites are usually located in locations characterised by tourism and recreational activities, which can lead to a bias in top litter items lists.
9. Not all studies employ trained observers: data quality can be an issue if observers do not have basic training and harmonised approaches are not used.

Due to the abovementioned problems, the aggregation of different studies proved to be unfeasible. A European beach litter data set from 2016 has therefore been used to provide top litter item lists at different spatial scales (chapter 4).

3 Top Marine Beach Litter Item Identification

All top litter item rankings are based on the processing of data obtained by observation or the collection of beach litter in a selected area. The resulting data are very dependent on the methodology used, which includes the survey transect, the category list for item identification, the data aggregation and data treatment procedure as well as the reporting formats and units.

In order to describe the process from observations to the compilation of lists of top litter items, information about current monitoring protocols, reviews of their similarities and differences, and data quality are provided (3.1-3.2). A review of the methodology used to identify top litter items is presented (3.2), based on analyses of the reports described in the previous section. Section 3.3 describes the different lists of litter categories applied in the reports, while further sections (3.4-3.6) discuss spatial and temporal scales, aggregation methodologies and provide final comments.

3.1 Monitoring protocols

The identification and ranking of litter items depends fundamentally on the environmental observation data acquired. Monitoring protocols have been developed in order to obtain comparable data. Protocols that include approaches for monitoring litter on the coastline have been described for the Baltic Sea (HELCOM, 2008; HELCOM 2018), Mediterranean Sea (UNEP/IOC, Cheshire et al., 2009), and North-East Atlantic Ocean (OSPAR, 2010). In 2013, the MSFD TG Marine Litter made a full review of existing protocols and published the *Guidance on Monitoring of Marine Litter in European Seas,* the objective of which is to provide Member States (MSs) with recommendations and the information needed to monitor the MSFD Descriptor 10 (MSFD GES Technical Subgroup on Marine Litter, 2013).

The guidance for monitoring marine litter under the MSFD and its Common Implementation Strategy (MSFD CIS) is a central document that provides comparable assessments and aims to reach an equal level of protection across Europe.

The guidance document is being reviewed in close collaboration with EU MSs, RSCs, NGOs and other stakeholders in order to progress towards comparable future assessments.

3.2 Beach Litter data quality

The quality of beach litter quantifications cannot be easily assessed, due to the nature of the observations and the variation in, or lack of, quality assurance and quality control frameworks.

3.2.1 Variability of beach litter and beach litter data

Numerous factors influence the acquired data. Environmental, social and methodological factors can cause variations in the amounts of litter monitored on beaches: such factors can include beach topography, meteorological events, periodical or seasonal beach usage, beach clean-ups, etc. For example, site topography, shape, slope and location in relation to winds and currents may lead to seasonal variability in the litter densities, as litter can build up in some areas or reduced litter abundancies can be observed as litter can be washed away, blown out to sea or buried in the sand. Seasonal tourism and recreational activities and *ad hoc* clean-ups can introduce variations that cannot be addressed in a representative way by a limited number of seasonal surveys. Furthermore, large amounts of seaweed or other natural debris present on the beach can 'mask' marine litter and make counting difficult. In addition, if large amounts of litter are present on the beach, data quality may be reduced if the observers miss smaller items, leading to varied reliability of results. Furthermore, observations and data acquisition can introduce uncertainties related to the applied methodology, e.g. when working with different guidance documents or when observers have different levels of experience.

Ambition and effort play an important role, as do different interpretations of monitoring guidance, also with regard to the attribution of litter categories. Therefore, beach litter data should be considered as a limited proxy for the amount of litter present in the coastal and marine environment, and requires careful interpretation. This shows that data analysis cannot rely on a known uncertainty of data. Specific metadata can help to ascertain if a data set is fit for purpose. Precise guidance, training and collaboration across countries, regions and projects are key to obtaining data that supports the planning, implementation and evaluation of measures.

3.2.2 Beach selection

The selection of beaches for the monitoring of beach litter influences the results due to the different source patterns of beaches that are in urban areas, areas strongly affected by tourism, and rural or remote areas. While reference beaches are selected, demographic and geographical conditions drive their classification procedures.

Moreover, while monitoring programmes take these differences into account when planning the surveys, beach clean-up activities or citizen observation-based initiatives do not necessarily consider this variability in beach types. Top litter item ranking lists from various organisations can therefore differ and may not be comparable.

3.3 Litter Category Lists

The reference list for the identification of items is of crucial importance, as the only way to report the identity of a litter object is by attributing it to a descriptive category. This information is required to identify priority needs for action and to check the success of mitigation measures. There needs to be a balance between the interest in receiving very detailed information about items and the effort needed to record that information. In principle, very detailed information, such as the specific type or even brand of item, would support source attribution.

Therefore, category reference lists have been set up in order to identify and report on observed litter items:

- **OSPAR Items List** for 100-metre sampling contains 121 marine litter items divided into 11 groups of classes.

- **UNEP/IOC Items List** includes 77 beach litter items grouped in 10 material classes.

- **MSFD Litter Category Master List** (MSFD Master List hereafter) contains 217 marine litter items grouped into eight material classes. Excluding G103-123, which are categories for micro-litter, the residual types of items refer to macro-litter and are applicable to monitoring marine macro litter on beaches. The MSFD litter category list was set up and disseminated as part of a guidance document (MSFD, 2013) through the TG Marine Litter in order to provide comparability and compatibility of other previously available lists.

Important Note: The MSFD Master List, published in 2013 as part of guidance for the monitoring of marine litter, is being further developed. That list had been derived in order to move towards harmonised monitoring, but different lists have been and are still being used in parallel.

3.3.1 Harmonisation of litter item reporting

Within this report, not all issues regarding the comparability of monitoring results could be solved or considered. While the harmonisation of litter item reporting is beyond the scope of this report, TG Marine Litter is tackling the issue as part of its efforts to harmonise beach litter monitoring, in close collaboration with EU MS and RSCs.

In particular, this concerns the grouping of items in different ways, resulting in the non-compatibility of several major and top-ranking categories: e.g. combining several single

items into one category is problematic as it alters the ranking of these items and influences the measures that can be assigned to individual items.

A thorough analysis of the problematic issues is being developed through an analysis of a 2012-2016 EU beach litter data set that is compiled by the JRC within the TG Marine Litter for testing baseline-setting scenarios. That information is being provided for the MSFD Master List revision. A process for the inclusion of new items, and thus the mechanism for updating of the MSFD Master List, also needs to be set up.

TG Marine Litter aims to provide a joint list of litter item categories, which allows for the consideration of regional specificities, while maintaining comparability among different monitoring frameworks and facilitating data treatment and analysis. A joint list with the additional inclusion of regionally specific items, will also allow for the processing of the resulting data in joint databases. Regional Sea Conventions are contributing to such a common approach, and review work is in progress.

3.4 Spatial and temporal scales of monitoring and measures

Monitoring approaches must consider temporal and spatial litter distribution factors and provide a spatial and temporal resolution that matches the variability of litter amounts in a representative way and provides data that support policy actions.

Due to the effort required (which is often voluntary-based), the frequencies of marine litter surveys are not very high. Typically, four surveys per beach are carried out during a year in the different seasons (e.g. OSPAR), sometimes lower or higher frequencies per country are available (e.g. the EEA carries out several surveys per season) and the representativeness of the resulting data can be questionable. The averaging of surveys over different years, the "rolling averages", can provide more stable data, although the resulting information may not be up-to-date and may not show recent developments. The spatial data resolution is dependent on the availability of suitable beaches and on the invested sampling effort.

Measures against marine litter depend on the abundance, sources and pathways of litter to the coastal and marine environment. They can be applied at different spatial scales, such as local interventions (e.g. littering fines, voluntary restrictions, additional waste bins, etc.) or at large scales (e.g. marketing restrictions, taxes on Single Use Plastic items (SUP), extended producer responsibility schemes, etc.). Thus, information on priorities and potential implementation of measures must be provided at the appropriate spatial and temporal scales.

3.5 Spatial aggregation and calculation methods

The reports and publications considered in the previous chapter were screened in order to identify the approaches used for calculating the ranking of top items.

The spatial monitoring unit for beach litter surveys is a transect, typically of 100 m in length. One beach may contain several surveyed transects of 100 m (called "sections", MSFD 2013) and might be monitored several times a year. Twenty-three EU countries have a coastal area, in four marine regions (Baltic Sea, Black Sea, Mediterranean Sea and North-East Atlantic Ocean) and some of these a coastline in more than one marine regions (e.g. Sweden, Denmark, France, Germany and Spain). To go from one scale (e.g. local) to another (e.g. subregional, regional, etc.) and provide a ranking of top items, it is necessary to aggregate the survey data collected.

Different data aggregation approaches in the reviewed literature are presented in the section below.

3.5.1 **Total Abundance**

This method is based on the total number of items recorded for each litter type for all surveys on all beaches for a given time period (e.g. season, one year, multiple years,

etc.). The ranking can be on the basis of the total number of items per litter type or on the percentage of the total number of litter items recorded for each litter type.

This approach has been implemented by the Surfrider Europe Foundation (Surfrider Foundation, 2016), in the frame of the DeFishGear (Vlachogianni et al., 2017), As-Made (Claessens et al., 2013), and MARLIN (MARLIN Baltic Marine Litter Project, 2013) projects, then employed by RSCs and NGOs (e.g. Legambiente, 2016; HELMEPA, 2016).

This method has also been used in four of the nine peer-reviewed papers (Schulz et al., 2015; Williams et al., 2016; Prevenios et al., 2017) and in the Marine LitterWatch (MLW, EEA). The method is straightforward and the influence of raw data on the result can be readily assessed.

A modification of this method, which aims to exclude the influence of weighting multiple surveys on one beach in comparison with beaches with only one survey, can be applied. The average number of litter items recorded per survey for each litter type is calculated, and the sum of these averages is used for ranking. This calculation can be made in order to reduce the impact of multiple annual surveys on the spatial analysis and avoid that areas with frequent surveys would have more statistical weight than areas with fewer surveys.

3.5.2 **Average per 100 m**

With this method, the ranking is based on the average number of items recorded for each litter type during surveys of 100 m of beach. The average can be calculated at different temporal (e.g. for a season, one year, multiple years) and spatial (e.g. local, national, subregional or beach, country, regional sea, European) scales.

To apply this method, it is fundamental to use data that have been collected on survey transects of 100 m in length, or where a different transect length used, to normalise the results and express them as the number of items per 100-m-transect length. Since the existing monitoring protocols from OSPAR (OSPAR Sea Convention, 2010), UNEP (Cheshire et al., 2009), and MSFD TG Marine Litter (MSFD GES Technical Subgroup on Marine Litter, 2013) recommend the use of 100-m-survey transects, the data collected in that framework can be used to compare and calculate the average as an indicator of beach litter.

This method has been used in four of the nine peer-reviewed papers (Hengstmann et al., 2017; Schulz et al., 2015, 2017; Watts et al., 2017). It has been also applied to provide top item lists by RSCs (e.g. OSPAR and UNEP/MAP reports) and NGOs (e.g. North Sea Foundation and Marine Conservation Society, in charge of implementing the OSPAR protocol for the Netherlands and the United Kingdom, respectively).

There are two options for the application of the averaging methodology:

a) to calculate the average number of each items per 100 m for the whole target area based on data per beach;

b) to calculate averages in sequence at the different spatial scales (i.e. different aggregation of survey sites, e.g. beach, country region, country, EU): "average of averages". This eliminates the influence of the number of surveys/beaches at the different aggregation levels.

With the averaging method, areas with different numbers of survey sites and surveys are weighted equally. Nevertheless, the circumstances under which the application of this method is desirable need to be evaluated, as survey/beach numbers could also be a proxy for e.g. coastline length, and thus for the relative weight of the data.

3.5.3 **Progressive ranking**

With this method, the litter types are ranked according to their abundance in each survey at a survey-site level. Each litter item is attributed a rank value according to its position in the abundance list. The use of inverse rank values (i.e. 20 for the most abundant, 19

for the second most abundant, etc.) allows for the aggregation of ranks at higher spatial scales. In order to calculate ranks at a larger spatial scale (e.g. beach, country, marine region...), these individual rank values are added together for each litter type and a standard ranking procedure is applied, i.e. the litter item with the highest value is given the rank value of one, the second highest value of two, etc.

The method has been developed by the Danish Centre for Environment and Energy (DCE, 2016). Data from all surveys were ranked based on their abundance, the associated indexes were summed and items were ranked at the beach scale. In contrast to the abundance methods presented above, which can over-emphasise rare mass occurrences (outliers), e.g. when large numbers of one litter type are recorded during one individual survey, this ranking method focuses more on common litter items that are recorded regularly. It should be noted that this provides relative ranking comparisons and does not consider the absolute litter abundance. The aggregation schemes must therefore be carefully set up.

3.5.4 **Comparison of methodologies**

The calculation methodology influences the results, based on the different weighting of single surveys and data variability. Further work is strongly recommended in order to provide a scientifically complete evaluation of the application of these methods to litter data sets. In particular, the availability of comparable data and sampling strategies is required to provide the basis for litter abundance rankings.

In addition to the methods described above, alternative methods that are not based on the abundance of items have been used in past reports. For instance, in the 2007 report from the OSPAR Convention (OSPAR Commission, 2007), the items were ranked based on the occurrence of the items surveyed in order to highlight the ones that are found in the largest number of survey sites. Another option may be to use the median number of items per 100 m to rank the litter items. In the 2017 Intermediate Assessment, the OSPAR Convention includes the median as an additional indicator, though the ranking is not based on it (OSPAR Commission, 2017).

3.5.5 **Ranking list length**

The lists of top litter items published in the different studies do not provide the same number of ranked items. The lists include from 5 to 20 items (see Table 5). The most common practice is to list the 10 most abundant items.

OSPAR provides considerations about the lengths of ranking lists for the Intermediate Assessment 2017 (IA2017, https://oap.ospar.org/en/ospar-assessments/intermediate-assessment-2017/). OSPAR included a criterion for validating the top items list: the cumulated abundance of these items should be at least equal to 80 % of the total abundance, and categories of single items that represent more than 10 % of the total of items, and those that represent 5 % of the total items numbers are highlighted in the list.

The selection of litter items included in the ranking should be considered when presenting top item categories. Ranking lists that only include identifiable items can be helpful to plan measures aimed at reducing litter pollution by specific products, whereas lists that include litter fragment categories, which cannot easily be attributed to sources, can be used when assessing potential harm. It should also be noted that the item abundance lists could, in a later step, be combined with risk-based factors.

Table 5: Number of items included in the top items lists in the different sources of information.

Document	Length of Top Items list
The North Sea Foundation	15
Marine Conservation Society	10
Legambiente	10
Surfrider Europe Foundation	10 and 5
HELMEPA	10
Danish Centre for Environment and Energy	10
DeFishGear Project	20
MARLIN project	10
As-Made project	10
MARNOBA I and II	10
HELCOM (2018)	10
UNEP/MAP (2015)	10 and 5
OSPAR Commission (2007)	20
OSPAR Commission (2017)	15
EEA - Marine LitterWatch	10

3.6 Comments on Top Litter Item Studies

An analysis of existing approaches for the identification of top litter items revealed a number of different methodologies and underlying data sets. The temporal and spatial comparability and coverage of different studies was limited. While some studies provide an important regional or subregional and local assessment, it was not possible to compare and evaluate data across regions and Europe.

The description of litter item categories is the basis of data acquisition and the analysis of macro litter items. Though the subject of harmonisation efforts, not all litter item categories are comparable. Further efforts are needed, and collaboration among stakeholders will further improve the resource efficiency of such studies.

4 Top Beach Litter Items 2016

During the identification and the assessment of existing studies on the most abundant beach litter items, it was found that the comparison of existing studies did not enable an overview at European level. Therefore, a study on a 2016 pan-European data set was performed in order to derive most abundant beach litter items from a single data set.

The total abundance method (section 3.5.1) was used in order to allow for a transparent and simple overview, including the tracing back to original data sets.

For the development of baselines for marine litter, the TG Marine Litter launched a call in March 2017 to collect available marine beach litter data sets. For the specific purpose of identifying the most frequently found beach litter items, a subset of these data has been used, referring to data obtained with one-year-long surveys carried out in 2016 (including the end of 2015 and beginning of 2017), as the most complete and recent data set. However, data from different sources were not always compatible. Given the incoherencies between data sets, in particular because of the use of different identification systems (see section 3.3), some additional item categories have been added to the list by inserting additional codes (e.g. x_a, x_b, x_c...); items belonging to several categories have consequently been related to a range of codes (e.g. G4 - G20). The resulting data set was used for ranking the top litter items.

4.1 Data and metadata

Data sets have been provided by national authorities, scientific projects and NGOs in 17 Member States from all four marine regions (Figure 6). For further details, see Table 6.

Table 6: Data provider information is listed per country and marine region (NE Atl = North-East Atlantic Ocean; Med Sea = Mediterranean Sea; Black Sea; Baltic Sea). The different data providers are differentiated as Member State (MS), NGOs, Database, Projects and Company (Consultancy). [1]OSPAR Beach Litter Database, https://www.mcsuk.org/ospar/; [2]ISOTECH Ltd Company for Environmental Research and Consultancy, http://www.isotech.com.cy/gallery/marine-litter-database/; [3]DeFishGear Project/MIO-ECSDE, http://www.defishgear.net/www.mio-ecsde.org; [4]Legambiente Onlus, http://international.legambiente.it; [5]MARLIN Project, http://projects.centralbaltic.eu/project/447-marlin.

Country	Region	Data Provider	Country	Region	Data Provider
Belgium	NE Atl	Database – OSPAR[1]	Ireland	NE Atl	Database – OSPAR[1]
Bulgaria	Black Sea	MS	Italy	Med Sea	NGO – Legambiente[4]
Cyprus	Med Sea	Consultancy – ISOTECH[2]	Latvia	Baltic Sea	MS
Denmark	NE Atl	Database – OSPAR[1]	Lithuania	Baltic Sea	MS
	Baltic Sea	MS	Netherlands	NE Atl	Database – OSPAR[1]
Estonia	Baltic Sea	MS	Poland	Baltic Sea	MS
Finland	Baltic Sea	MS	Portugal	NE Atl	Database – OSPAR[1]
France	NE Atl	Database – OSPAR[1]	Spain	Med Sea	MS
	Med Sea	MS		NE Atl	MS
Germany	NE Atl	Database – OSPAR[1]	Sweden	NE Atl	Database – OSPAR[1]
	Baltic Sea	MS		Baltic Sea	Project – MARLIN[5]
Greece	Med Sea	Project – DeFishGear/NGO - MIO-ECSDE[3]	United Kingdom	NE Atl	Database – OSPAR[1]

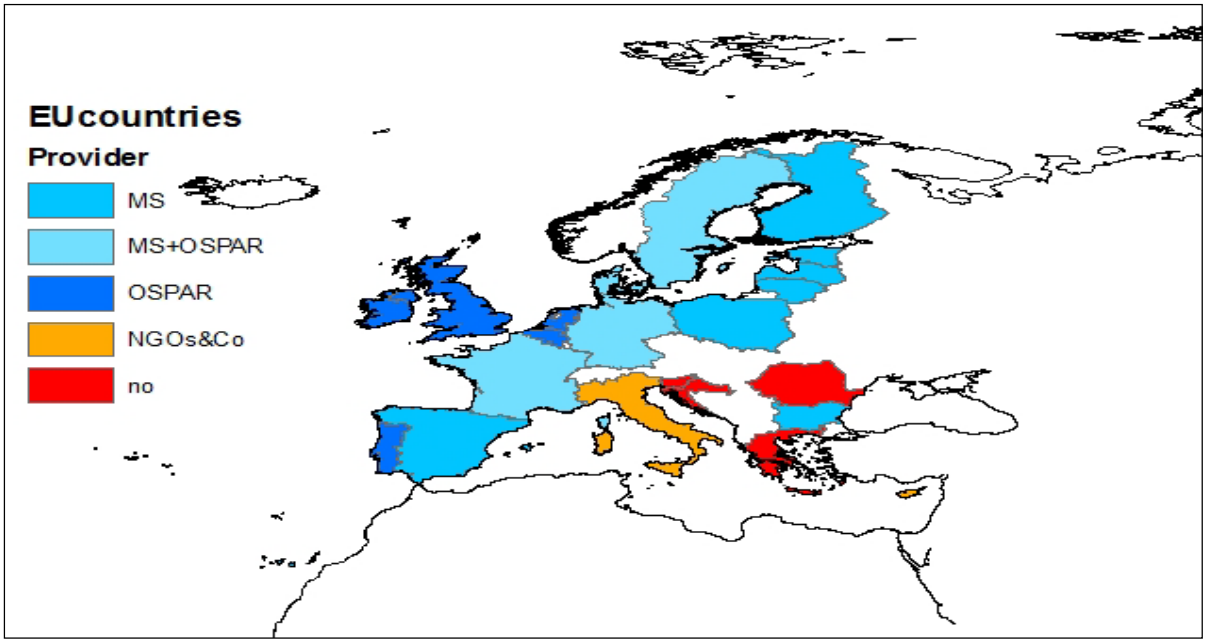

Figure 2: Map of countries contributing to the 2016 data set with different data providers. MS = Member States; no = no data received.

The combined final 2016 data set includes 69 134 records from 277 beaches with 379 847 observed items that were collected during 679 surveys over four seasons. For further details on the data set, see Table 7.

Table 7: Detailed information about the European marine beach litter data set from December 2015 to January 2017, which was used to determine the top marine beach litter at spatial and temporal scales.

Type of data	Amount	Type of data	Amount
No. records	69 134	No. months 2016	12
Total items	379 847	No. months 2015	1
No. items types	260	No. months 2017	1
No. surveys	679	No. countries/winter	10
Transect length	na – 3 000m	No. countries/spring	15
Total metres surveyed	135 706	No. countries/summer	15
No. marine regions	4	No. countries/autumn	15
No. countries	17	No. beaches/winter	105
No. beaches	277	No. beaches/spring	200
No. seasons	4	No. beaches/summer	196
No. days	225	No. beaches/autumn	130

The number of beaches per country and the transect length per beach range from 2 (e.g. Belgium) to 51 (e.g. Italy), and from "not available" (na) (e.g. Cyprus) to 3 000 metres (e.g. Estonia), respectively. For further details, see Figure 3 and Tables 8a-c.

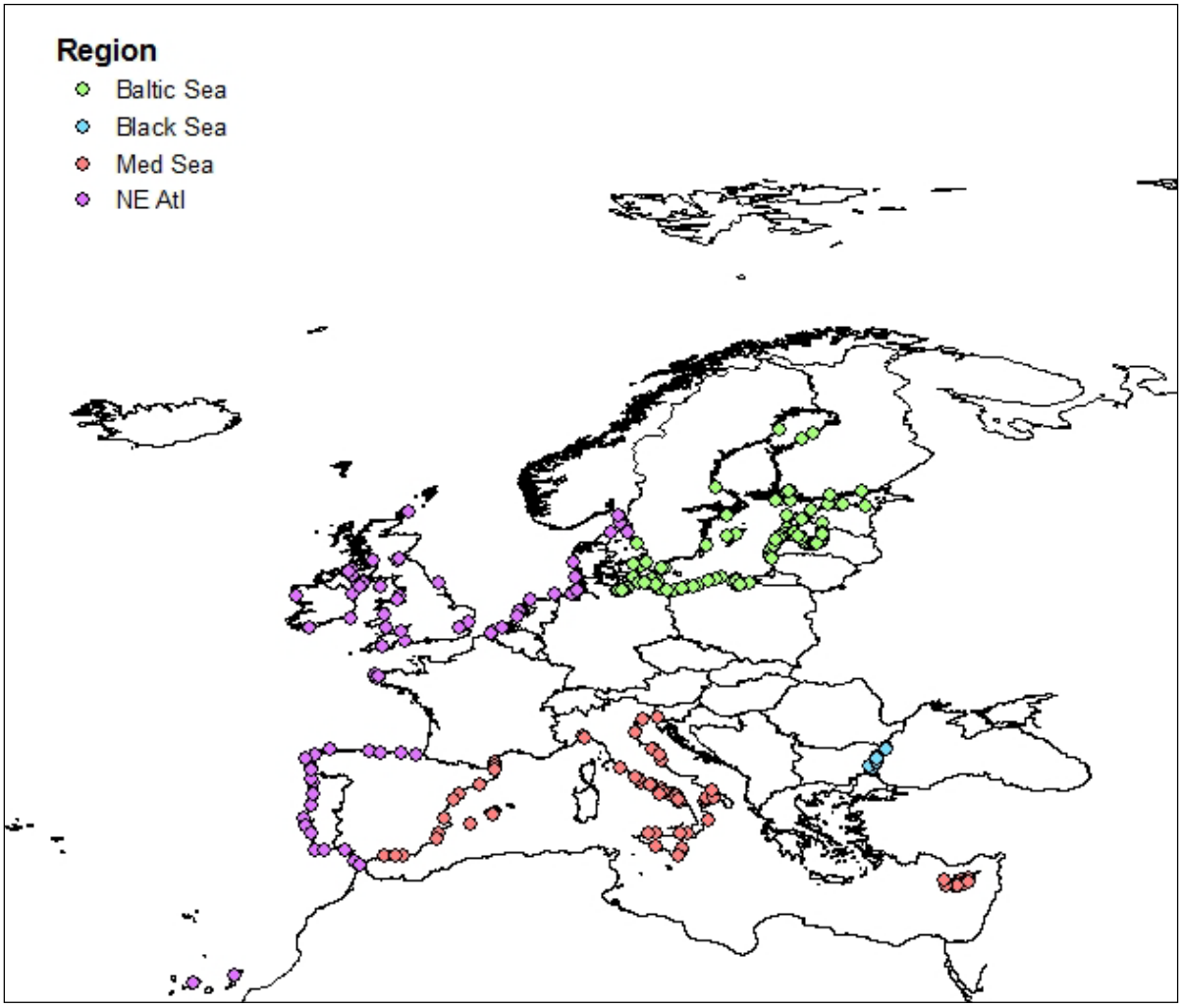

Figure 3: Map of the distribution of beaches included in the 2016 data set. The marine regions represented in the data set are the Baltic Sea (green), the Black Sea (blue), the Mediterranean Sea (red) and the Northern-East Atlantic Ocean (pink).

Table 8: Detailed information about the European marine beach litter data collected from December 2015 to January 2017) and used to determine the top marine beach litter at spatial and temporal scales.

a) Number of beaches per country and marine region and the transect length (metres) applied in each country.

a)		Beaches / Marine Region				Transect length (metres)			
Country	**No. beaches**	**NE Atl**	**Baltic Sea**	**Med Sea**	**Black Sea**	**NE Atl**	**Baltic Sea**	**Med Sea**	**Black Sea**
Belgium	2	2				100			
Bulgaria	8				8				1 000
Cyprus	14			14				na- 1 500	
Denmark	5	2				100			
			3				100		
Estonia	10		10				300- 3 000		
Finland	11		11				100- 326		

a)		Beaches / Marine Region				Transect length (metres)			
Country	**No. beaches**	**NE Atl**	**Baltic Sea**	**Med Sea**	**Black Sea**	**NE Atl**	**Baltic Sea**	**Med Sea**	**Black Sea**
France	6	4				100			
				2				100	
Germany	26	4				100			
			22				100		
Ireland	4	4				100			
Italy	51			51				100	
Latvia	38		38				100		
Netherlands	4	4				100			
Poland	15		15				1000		
Portugal	9	9				100			
Spain	27	14				100			
				13				100	
Sweden	16	6				100			
			10				100		
United Kingdom	31	31				100			
TOT	***277***	***80***	***109***	***80***	***8***	***1 000***	***1 400***	***300***	***1 000***

*b) Number of surveys per country and marine region and the total metres surveyed in each country (*excluding transects of unknown lengths).*

b)	Tot. Surveys				Tot. Metres Surveyed			
Country	**NE Atl**	**Baltic Sea**	**Med Sea**	**Black Sea**	**NE Atl**	**Baltic Sea**	**Med Sea**	**Black Sea**
Belgium	8				800			
Bulgaria				8				8 000
Cyprus			16				2 150*	
Denmark	6				600			
		10				1 000		
Estonia		10				9 350		
Finland		27				4 006		
France	7				700			
			24				2 400	
Germany	14				1 400			
		77				7 700		
Ireland	16				1 600			
Italy			51				5 100	
Latvia		38				3 800		
Netherlands	16				1 600			
Poland		56				56 000		
Portugal	33				3 300			

b)	Tot. Surveys				Tot. Metres Surveyed			
Country	**NE Atl**	**Baltic Sea**	**Med Sea**	**Black Sea**	**NE Atl**	**Baltic Sea**	**Med Sea**	**Black Sea**
Spain	54				5 400			
			48				4 800	
Sweden	17				1 700			
		30				3 000		
United Kingdom	112				11 200			
TOT	***284***	***248***	***139***	***8***	***28 400***	***84 856***	***14 450***	***8 000***

c) Number of beaches and surveys per country, marine region and season (WIN = winter; SPR = spring; SUM = summer; AUT = autumn).

c)		Tot. Beaches/Season				Tot. Surveys/Season			
Country	**Region**	**WIN**	**SPR**	**SUM**	**AUT**	**WIN**	**SPR**	**SUM**	**AUT**
Belgium	NE Atl	2	2	2	1	2	2	3	1
Bulgaria	Black Sea		8				8		
Cyprus	Med Sea		4	11	1		4	11	1
Denmark	NE Atl		2	2	2		2	2	2
Denmark	Baltic Sea	1	3	3	3	1	3	3	3
Estonia	Baltic Sea			6	4			6	4
Finland	Baltic Sea		11	9	7		11	9	7
France	NE Atl	4	1	1	1	4	1	1	1
	Med Sea		2	2	2	6	6	6	6
Germany	NE Atl	3	3	4	4	3	3	4	4
	Baltic Sea	13	17	19	19	13	22	23	19
Ireland	NE Atl	4	3	4	4	4	4	4	4
Italy	Med Sea		46		4		46		5
Latvia	Baltic Sea			38				38	
Netherlands	NE Atl	4	4	4	4	4	4	4	4
Poland	Baltic Sea	11	15	15	15	11	15	15	15
Portugal	NE Atl	8	9	9	6	8	10	9	6
Spain	NE Atl	14	12	14	10	14	12	14	14
	Med Sea	12	12	12	12	12	12	12	12
Sweden	NE Atl		6	5	6		6	5	6
	Baltic Sea		10	10	9		11	10	9
United Kingdom	NE Atl	27	29	26	23	27	32	29	24
TOT		***103***	***199***	***196***	***137***	***110***	***214***	***208***	***147***

The total number of litter items present in the data set differ between European marine regions (Table 9). For the purpose of top litter item identification, this difference means that some regions have proportionally less weight than others. The low number of items recorded in the Black Sea area is due to a very limited number of surveys. A detailed analysis of litter amounts and concentrations will be part of the work on litter baselines performed in the TG Marine Litter.

Table 9: Total litter item counts in each marine region.

	Total EU	NE Atl	Baltic Sea	Med Sea	Black Sea
Item Sum Number	355 671	250 913	29 217	75 130	411

4.2 Beach Litter 2016 Data Analysis

The ranking list of the 10 top marine litter items at European level has been derived using the total abundance method (i.e. total sum of items collected in each survey, and normalised with transect lengths of 100 m) on a compiled 2016 pan-European data set. The complete list and results at spatial level (e.g. regional and country level) and temporal level (season) are shown in Annex II.

The results are represented at the European scale (Table 10)

Table 10: Top ten marine beach litter items at European scale and the total amount per each item, listed by total abundance. Detailed information indicate the TG ML-General Code (ID), Material and Name of each item, following the MSFD Master List of Litter Item Categories.

Top	ID	Material	Name	Amount
1	G76+G79+G82*	Plastic	Plastic/polystyrene pieces 2.5cm > < 50 cm	52999
2	G75+G78+G81*	Plastic	Plastic/polystyrene pieces 0-2.5 cm**	49198
3	G50	Plastic	String and cord (diameter less than 1 cm)**	48919
4	G27	Plastic	Cigarette butts and filters	21854
5	G20+G21+G22+G23+G24*	Plastic	Plastic caps and lids (drinks, chemicals, detergents (non-food), unidentified)/plastic rings from bottle caps/lids	18732
6	G95	Plastic	Cotton-bud-sticks	13579
7	G213	Chemicals	Paraffin/wax***	10305
8	G30	Plastic	Crisp packets/sweet wrappers	10267
9	G124	Plastic	Other plastic/polystyrene items (identifiable)	10142
10	G2+G3+G4+G5*	Plastic	Plastic bag (Shopping bags, small plastic bags, e.g. freezer bags, plastic bag collective role; what remains from rip-off plastic bags)	6197

**While the Master List (MSFD TSG Litter, 2013) presents several codes for different size classes of plastic pieces (e.g. G78,G79,G80), polystyrene pieces (e.g. G81,G82,G83), plastic/polystyrene pieces (e.g. G75,G76,G77); for plastic caps and lids (e.g. G20,G21,G22,G23, G24), for plastic bags (e.g. G2,G3,G4,G5), in this report plastic and polystyrene pieces, plastic caps and lids and plastic bags have been presented under the joint aggregated categories "Plastic/polystyrene pieces" (e.g. G75+G78+G82), "Plastic caps and lids (drinks, chemicals, detergents (non-food), unidentified)/plastic rings from bottle caps/lids" (G20+G21+G20+G22+G23+G24) and "Plastic bag (shopping bags, small plastic bags, e.g. freezer bags, plastic bag collective role; what remains from rip-off plastic bags)" (G2+G3+G4+G5) respectively.*

*** This category has not been monitored by all data providers.*

**** The category "Paraffin/wax" is not limited to paraffin wax but includes a number of other chemical compounds, some of which look like paraffin. The method used to assess the occurrence of paraffin-wax-like compounds on beaches is not the same as the method used to monitor litter items. The two data sets are not comparable. In addition, the assessment method is not standardised between regions or even used in a standardised way within regional seas.*

Note that the resulting list cannot be directly compared with other lists provided from Regional Sea Conventions or other activities. The underlying data are different, the calculation methodologies vary and the litter item categories are often different. This list has been derived only for the purpose of providing an *ad hoc* list at EU level and at regional level made with a single calculation method.

The total abundance method can be biased through single surveys with extremely high abundances of specific categories (e.g. paraffin). While this reflects actual findings at single survey sites, it requires careful interpretation. Data interpretation must include the tracing of such events to original data in order to provide the correct conclusions (e.g. measures against container loss in the case of "freak" occurrences of items due to loss during transportation).

5 Beach Litter one-year Data (2016) Analysis: Spatial-Temporal Scale

Analyses were made based on the compiled 2016 beach litter data set to derive information on rankings, spatial-temporal scales and different litter category groups such as single-use plastics and fisheries-related items.

5.1 Spatial scale

The top ten European beach litter items per each marine region were identified using the total abundance method, and compared to observe the heterogeneity of ranking among regions. The following table was derived for the purpose of tracing rankings in the EU-level table down to the regional and national levels. It is not meant to substitute or override the assessments made by Regional Sea Conventions. The presence / absence of certain items indicates spatial variability in their distribution and abundance (Table 11, Figure 4).

Table 11: Total litter abundance ranking in EU marine regions.

Rank	NE Atlantic		Baltic Sea		Mediterranean Sea		Black Sea	
1	G50	String and cord (diameter less than 1cm)**	G213	Paraffin/wax ***	G27	Cigarette butts and filters	G20+ G21+ G22+ G23+ G24*	Plastic caps and lids (drinks, chemicals, detergents (non-food), unidentified)/plastic rings from bottle caps/lids
2	G76+ G79+ G82*	Plastic/polystyrene pieces 2.5cm > < 50 cm	G124	Other plastic/polystyrene items (identifiable)	G75+ G78+ G81*	Plastic/polystyrene pieces 0-2.5cm**	G27	Cigarette butts and filters
3	G75+ G78+ G81*	Plastic/polystyrene pieces 0-2.5cm**	G27	Cigarette butts and filters	G76+ G79+ G82*	Plastic/polystyrene pieces 2.5cm > < 50 cm	G76+ G79+ G82*	Plastic/polystyrene pieces 2.5cm > < 50 cm
4	G20+ G21+ G22+ G23+ G24*	Plastic caps and lids (drinks, chemicals, detergents (non-food), unidentified)/plastic rings from bottle caps/lids	G2+G3+G4+G5	Plastic bag (Shopping bags, Small plastic bags, e.g. freezer bags, Plastic bag collective role; what remains from rip-off plastic bags)	G20+ G21+ G22+ G23+ G24*	Plastic caps and lids (drinks, chemicals, detergents (non-food), unidentified)/plastic rings from bottle caps/lids	G8	Drink bottles >0.5 l
5	G95	Cotton bud sticks	G76+ G79+ G82*	Plastic/polystyrene pieces 2.5cm > < 50 cm	G95	Cotton bud sticks	G2+G3G4+G5	Plastic bag (Shopping bags, small plastic bags, e.g. freezer bags, plastic bag collective role; what remains from rip-off plastic bags)
6	G30	Crisp packets/sweet wrappers	G20+ G21+ G22+ G23+ G24*	Plastic caps and lids (drinks, chemicals, detergents (non-food), unidentified)/plastic rings from bottle caps/lids	G54	Nets and pieces of net > 50 cm	G32	Toys & party poppers
7	G27	Cigarette butts	G154 -	Paper (including newspapers and	G200	Bottles incl.	G7	Drink bottles

Rank	NE Atlantic		Baltic Sea		Mediterranean Sea		Black Sea	
		and filters	G157	magazines)		pieces		≤0.5 l
8	G124	Other plastic/polystyrene items (identifiable)	G153	Cups, food trays, food wrappers, drink containers	G73	Foam Sponge	G75+ G78+ G81*	Plastic/polystyrene pieces 0-2.5cm
9	G211	Other medical items (swabs, bandaging, adhesive plaster etc.)	G49-G50	Rope, string, cord	G152	Cigarette packets	G33	Cups and cup lids
10	x_a	Other (e.g. diapers, toilet paper, tissue paper, shaving razors)	G204	Construction material (brick, cement, pipes)	G2+ G3+ G4+ G5	Plastic bag (Shopping bags, small plastic bags, e.g. freezer bags, plastic bag collective role; what remains from rip-off plastic bags)	G30	Crisp packets/sweet wrappers

**See comment on aggregated categories in Table 10.*

*** This category has not been monitored by all data providers.*

****See comment on paraffin/wax in Table 10.*

Note that this table contains categories that had not been considered by all monitoring actors. This needs to be considered when interpreting results and is planned to be solved in future data acquisition exercises by the ongoing harmonisation work of the TG Marine Litter.

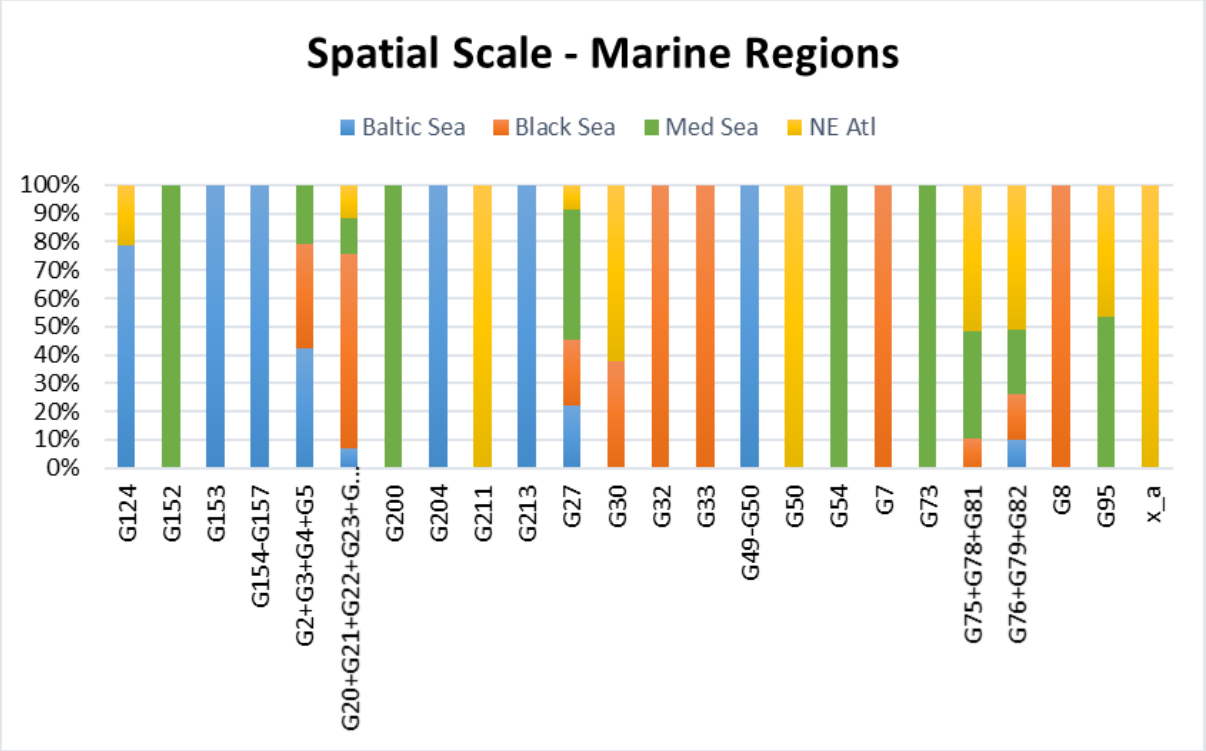

Figure 4: Spatial distribution of the top ten marine beach litter items at European scale. The abundance is expressed as a percentage of the total amount per each item found on European beaches. Spatial scales are represented by marine region (Baltic Sea=blue; Black Sea=orange;

Mediterranean Sea=green; Northern-East Atlantic Ocean=yellow). Legend item ID: G2+G3+G4+G5=Plastic bag (shopping bags, small plastic bags, e.g. freezer bags, plastic bag collective role; rip-off from plastic bags); G7=Drink bottles ≤0.5 l; G8=Drink bottles > 0.5 L; G20+G21+G22+G23+G24=Plastic caps and lids (drinks, chemicals, detergents (non-food),unidentified)/plastic rings from bottle caps/lids; G27=Cigarette butts and filters; G30=Crisp packets / sweet wrappers; G32=Toys & party poppers; G33=Cups and cup lids; G49-G50=Rope, string, cord ; G50=String and cord (diameter less than 1 cm); G54=Nets and pieces of net > 50 cm; G73=Foam sponge; G75+G78+G81=Plastic/polystyrene pieces 0-2.5 cm; G76+G79+G82=Plastic/polystyrene pieces 2.5 cm > < 50 cm; G95=Cotton bud sticks; G124=Other plastic/polystyrene items (identifiable); G152=Cigarette packets; G153=Cups, food trays, food wrappers, drink containers; G154-G157=Paper (including newspapers and magazines); G200=Bottles incl. pieces; G204= Construction material (brick, cement, pipes); G211=Other medical items (swabs, bandaging, adhesive plaster etc.); G213=Paraffin/Wax; x_a=Other (e.g. diapers, toilet paper, tissue paper, shaving razors).

5.2 Weighting in spatial data analysis

The main reason for employing different methodologies to analyse the abundance of beach litter items is to be able to weight the number of surveys at higher aggregation levels. In a simple summing of litter items (e.g. total abundance method), areas/countries with a higher number of surveys (either in terms of survey frequency on the same sites or in terms of more sites being surveyed) will have a stronger impact on the aggregated results. While this might be correct (as a larger country with more beaches may have a stronger influence on the total abundance of marine litter), it can lead to a bias in cases of different sampling efforts among countries, areas or regions.

The coastal length and population size of EU countries is extremely variable. This illustrates the need for careful analysis when deriving relative sampling efforts for beach litter monitoring in different EU countries. This topic will be further elaborated in the context of setting baselines for marine litter within the TG Marine Litter, and will be included in the revision of guidance on beach litter monitoring.

5.3 Temporal scale

The top ten European beach litter items for each season were identified using the total abundance method. These were compared in order to observe the heterogeneity of the top 10 beach litter items rankings between seasons. The presence and absence of certain items show the temporal variability in distribution and abundance (Figure 5).

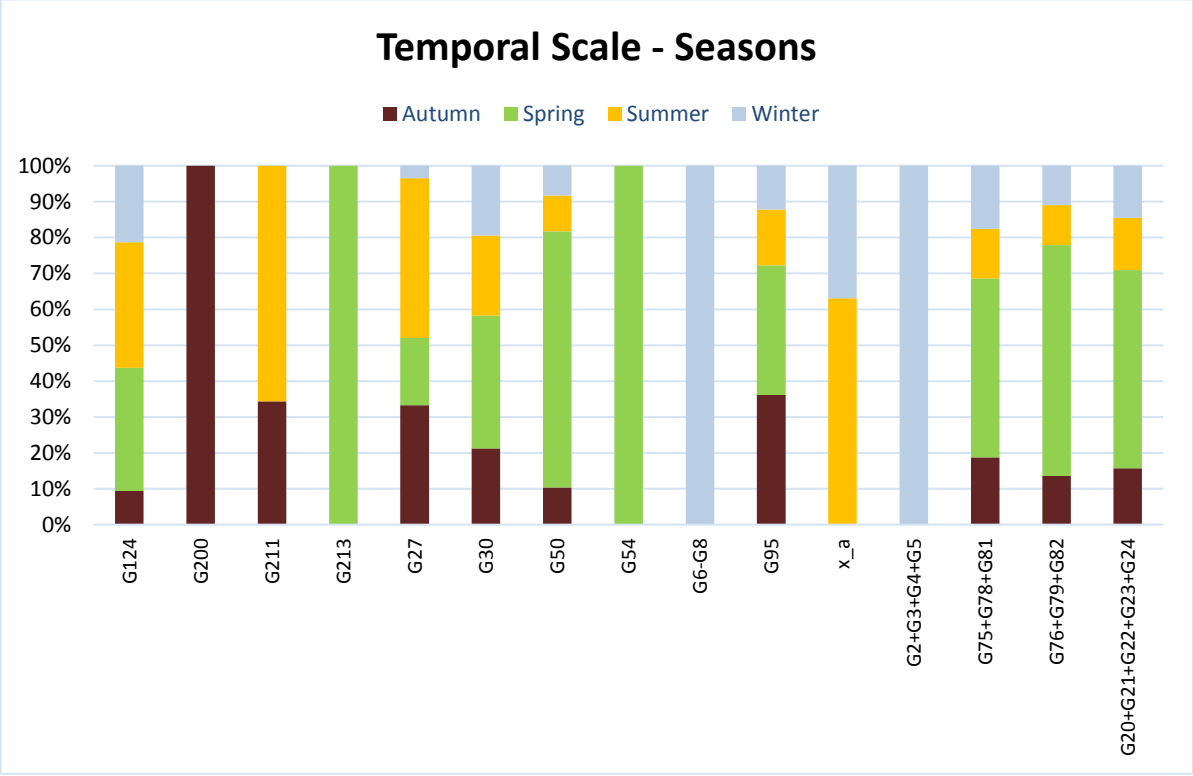

Figure 5: Seasonal distribution of the top 10 beach litter items at European scale. The abundance is expressed as percentage of total amount per each item found on European beaches. Temporal scale are represented by season (Autumn=brown; Winter=light blue; Spring=green; Summer=yellow). Legend item ID: G2+G3+G4+G5=Plastic bag (Shopping bags, small plastic bags, e.g. freezer bags, plastic bag collective role; rip-off from plastic bags); G6-G8=Bottles (incl. drink bottles < = > 0.5 l); G20+G21+G22+G23+G24=Plastic caps and lids (drinks, chemicals, detergents (non-food),unidentified)/plastic rings from bottle caps/lids; G27=Cigarette butt and filters; G30=Crisp packets / sweet wrappers; G50=String and cord (diameter less than 1cm); G54=Nets and pieces of net > 50 cm; G75+G78+G81=Plastic/polystyrene pieces 0-2.5 cm; G76+G79+G82=Plastic/polystyrene pieces 2.5 cm > < 50 cm; G95=Cotton bud sticks; G124=

Other plastic/polystyrene items (identifiable); G200= Bottles incl. pieces; G211= Other medical items (swabs, bandaging, adhesive plaster etc.); G213= Paraffin/Wax; x_a= Other (e.g. diapers, toilet paper, tissue paper, shaving razors).

While this study shows the potential of a seasonal analysis to provide a link to litter sources, e.g. direct littering during the tourist season or increased loss of lighter marine items during stormy seasons, the 2016 data set does not provide an easy interpretation. Categories G78 and G81 (which both represent small plastic/polystyrene) appear more frequently in winter surveys and could be linked to increased fragmentation through wave action or winds, while larger fragments and bottles are predominantly found in autumn. A multiannual data set could potentially yield better analyses of seasonal variability.

5.4 Litter Material and Categories

Analyses, performed with a specific focus on material and categories, have been provided in support to the development of the EU Plastics Strategy (https://ec.europa.eu/commission/news/first-ever-europe-wide-strategy-plastics-2018-jan-16_en). The analysis involved the aggregation of spatial data at the European level. Results have been obtained by the total abundance method (i.e. total sum approach, see 3.5.1 for further details).

Plastic material represents 84 % of the total marine litter items found on European beaches in 2016 (Figure 6). This high percentage of artificial polymer materials found on beaches confirms the need for action against this type of litter.

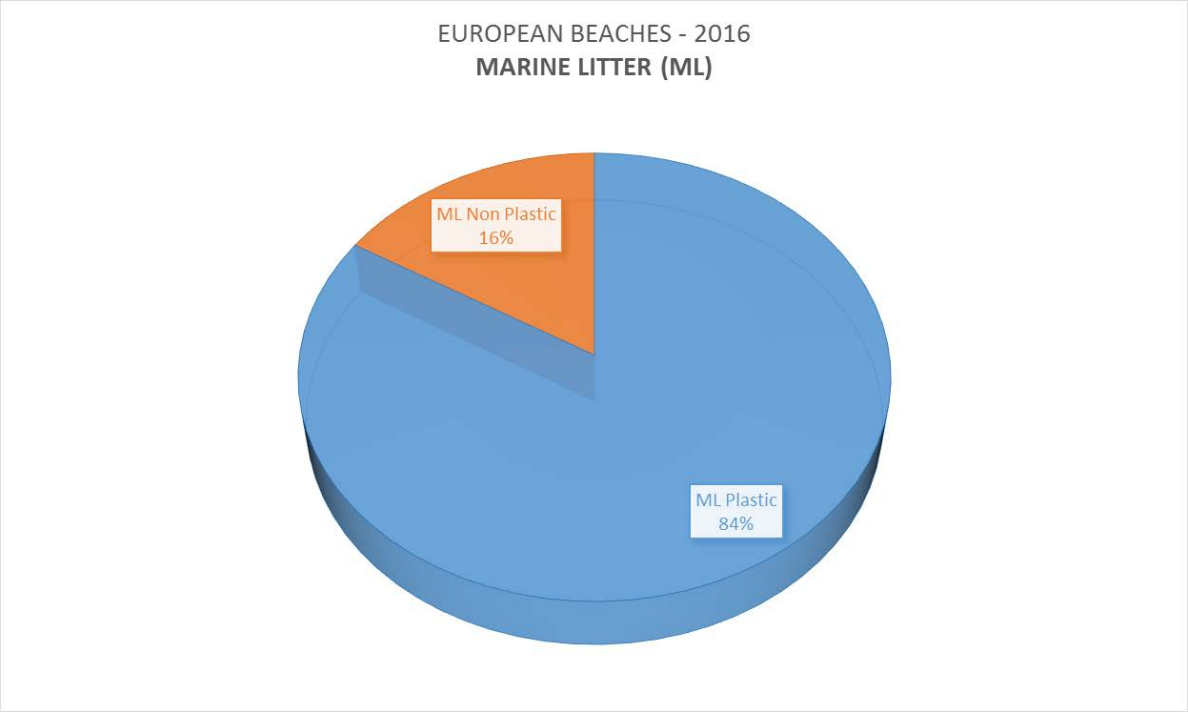

Figure 6: Beach litter material at the European scale. The abundance is expressed as the percentage of total litter amounts.

The top ten litter items represent ca. 63 % of the total marine litter items found on European Beaches in 2016 (Figure 7, also represented previously in Table 9). They are mainly made of plastic materials (e.g. string and cord, cigarette butts, crisp packets and sweet wrappers).

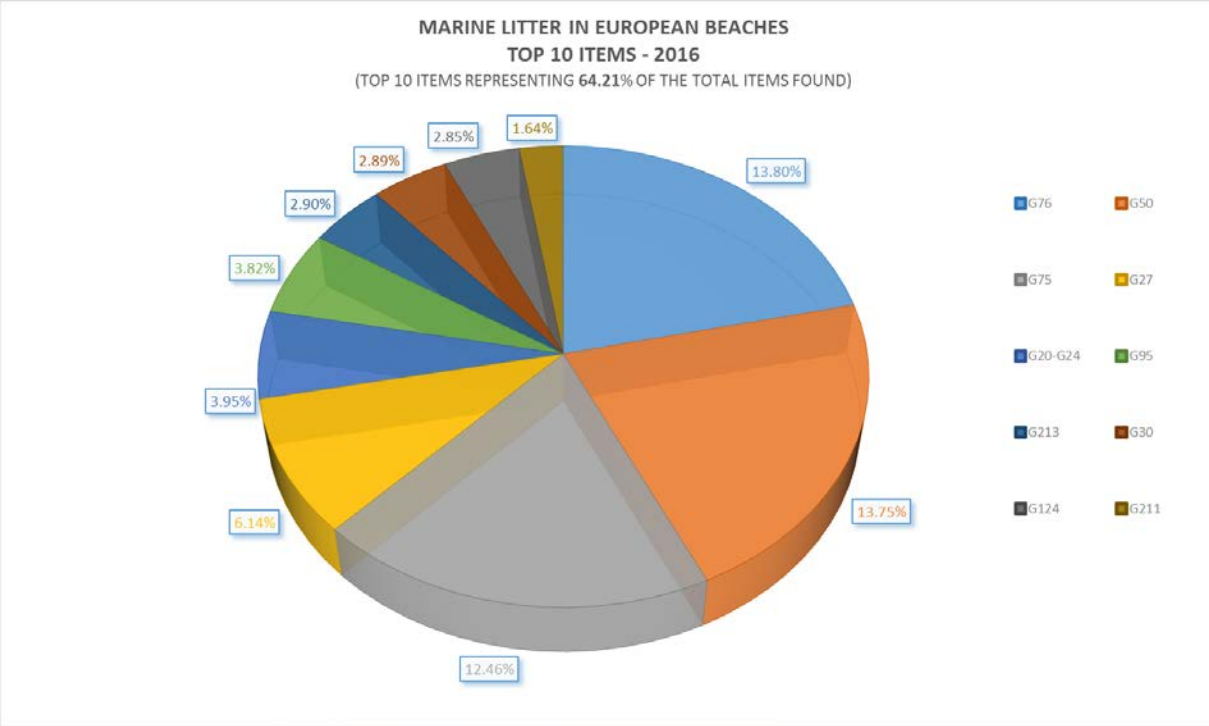

Figure 7: Pie Chart of top ten marine beach litter items at the European scale. Items have been ranked by abundance, mainly according to the MSFD Master List Categories of Beach Litter Items. The abundance is expressed as a percentage of the total. Legend item ID: G20-24=Plastic caps and lids (drinks, chemicals, detergents (non-food), unidentified)/plastic rings from bottle caps/lids; G27=Cigarette butt and filters; G30=Crisp packets / sweet wrappers; G50=String and cord (diameter less than 1 cm); G75=Plastic / polystyrene pieces 0-2.5 cm; G76=Plastic / polystyrene pieces 2.5 cm > < 50 cm; G95=Cotton bud sticks; G124=Other plastic / polystyrene items (identifiable); G211= Other medical items (swabs, bandaging, adhesive plaster etc.); G213= Paraffin/Wax.

Particular attention should be given to the plastic fragments (size ranges: 0 – 2.5 cm and 2.5 - 50 cm) that represent about 25 % of marine litter. The origin of plastic fragments that enter the environment cannot be directly linked to a specific source, though assumptions based on material types can be made. Such fragments can derive from original items of different size, and their number can increase drastically through mechanical fragmentation. The plastic/polystyrene fragments category includes a very wide range of litter item numbers and weights. Note that one 50 x 50 cm plastic litter piece, e.g. a plastic sheet, can potentially fragment into hundreds or thousands of smaller pieces.

5.5 Single-Use Plastic Items

The management of marine litter requires the identification of item categories that are particularly frequent and on which management actions can be successfully applied. Single-Use Plastics (SUPs, hereafter) items (i.e. items that have been designed for a one-time use with subsequent disposal) have been identified as a category of items that requires particular attention. SUPs, including a relative proportion of plastic fragments (assuming that a part of the fragments, according to its percentage in identifiable objects, also derives from SUPs), represent 50 % of the total marine litter items found on European Beaches in 2016 (Figure 8).

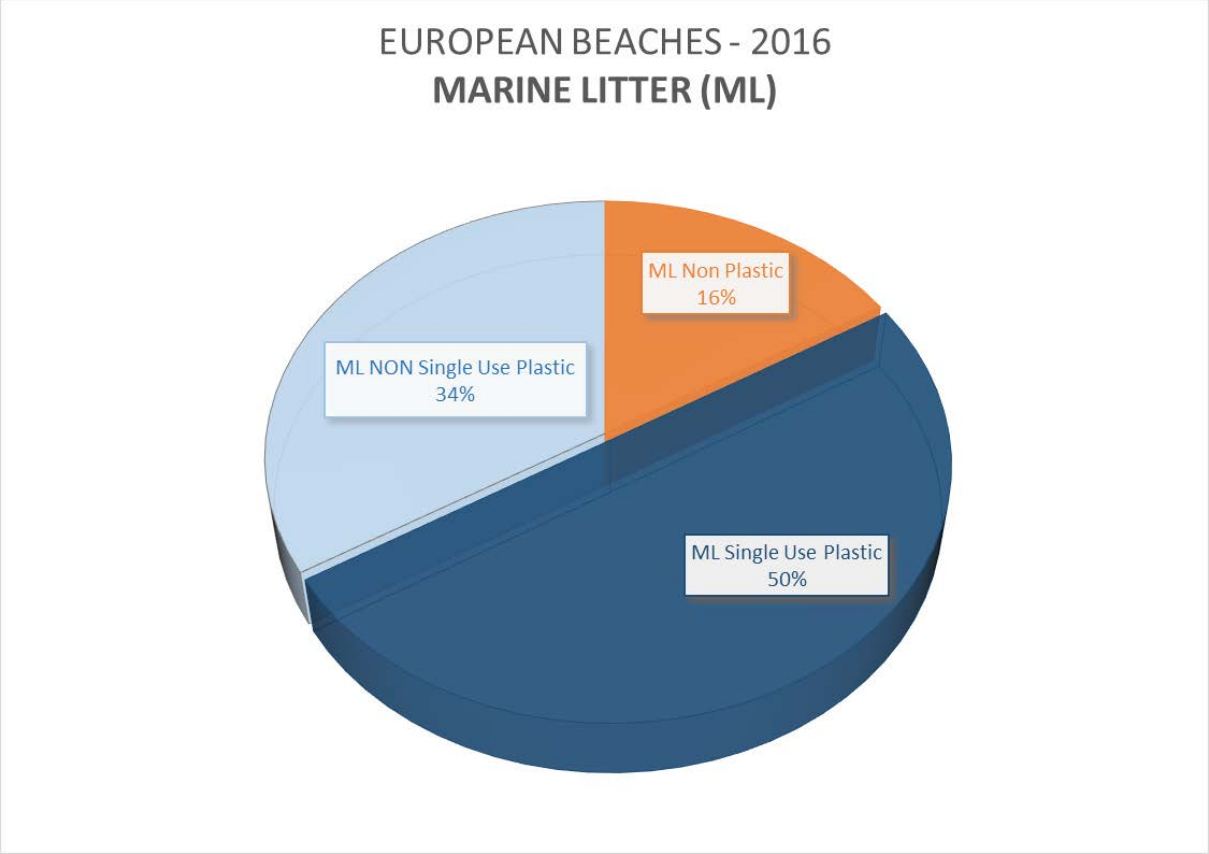

Figure 8: Pie chart of marine beach litter and single use plastic material at the European scale. The abundance is expressed as a percentage of the total.

The most common single-use plastic items represent about 27 % of the total marine litter (including non-plastic items) found on European beaches in 2016 (Table 12, Figure 9). The data have been further analysed to derive the rankings and thus the relative abundance of SUPs in Europe.

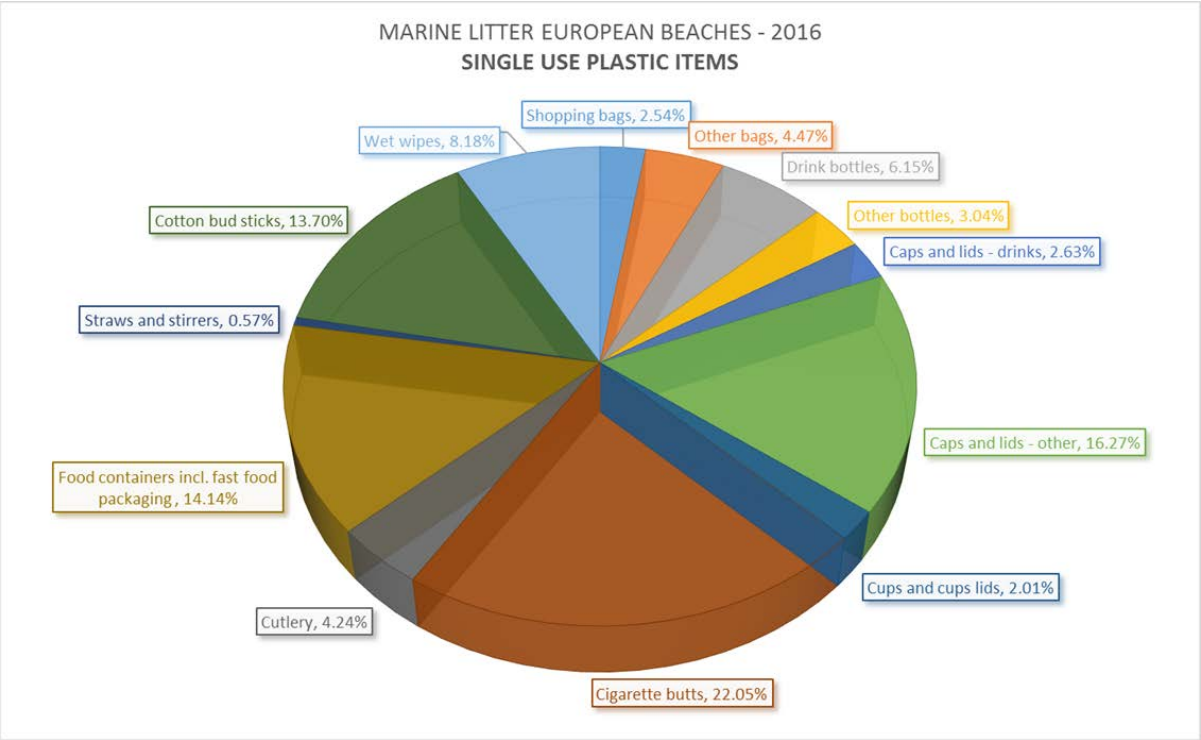

Figure 9: Pie chart of single-use plastic items at the European scale. The abundance is expressed as a percentage of the total litter items.

Table 12: List of common single-use plastic items found in European beaches. Detailed information is provided for the material the item is made of, and the name and code of each item, following the Master List of Categories of Litter Items. The abundance is expressed as total number of items, percentage of total marine litter (ML) and single use plastic (SUP).

Rank	Material	General Name Litter Item	Code	Number of Items	% over total of ML	% over total of SUP
1	Plastic	Cigarette butts	G27	21 854	6.14 %	22.05 %
2	Plastic	Caps and lids - other	G20-G24	16 125	4.53 %	16.27 %
3	Sanitary waste	Food containers incl. fast food packaging	G10/G16/G30-G34/x_n	14 012	3.94 %	14.14 %
4	Sanitary waste	Cotton bud sticks	G95	13 579	3.82 %	13.70 %
5	Plastic	Wet wipes	G95-98/G144/x_a	8 101	2.28 %	8.18 %
6	Plastic	Drink bottles	G6-G8	6 095	1.71 %	6.15 %
7	Plastic	Other bags	G1-G5/G36-G37/G45/G101	4 429	1.25 %	4.47 %
8	Plastic	Cutlery	G34-G35	4 203	1.18 %	4.24 %
9	Plastic	Other bottles	G6-G9/G11-G13/G15-G16/G65	3 011	0.85 %	3.04 %
10	Plastic	Caps and lids - drinks	G21	2 605	0.73 %	2.63 %
11	Plastic	Shopping bags	G3	2 520	0.71 %	2.54 %
12	Plastic	Cups and cups lids	G33	1 995	0.56 %	2.01 %
13	Plastic	Straws and stirrers	G35	566	0.16 %	0.57 %

Note that the table contains aggregated as well as individual categories (e.g. caps, bags and bottles) in order to highlight the importance of subcategories for which data was available.

5.6 Fishery-Related Items

Items linked to fisheries activities (Abandoned, Lost or otherwise Discarded Fishing Gear (ALDFG), e.g. nets, fishing lines, buoys), can be partially identified through litter category identification lists. However, some items (in particular ropes, string and lines) cannot be attributed only to fisheries activities. Therefore the contribution of fishery-related litter could be estimated to be between about 3 % and 15 % of marine litter (Figure 10, Table 13), if ropes, string and cords, which often may include dolly ropes or other fishery-related material, are considered in the analysis.

It should be noted that information about the individual beach location and use was not available for this analysis. There might therefore be a bias to more tourism-affected beaches that could result in lower findings of ALDFG items.

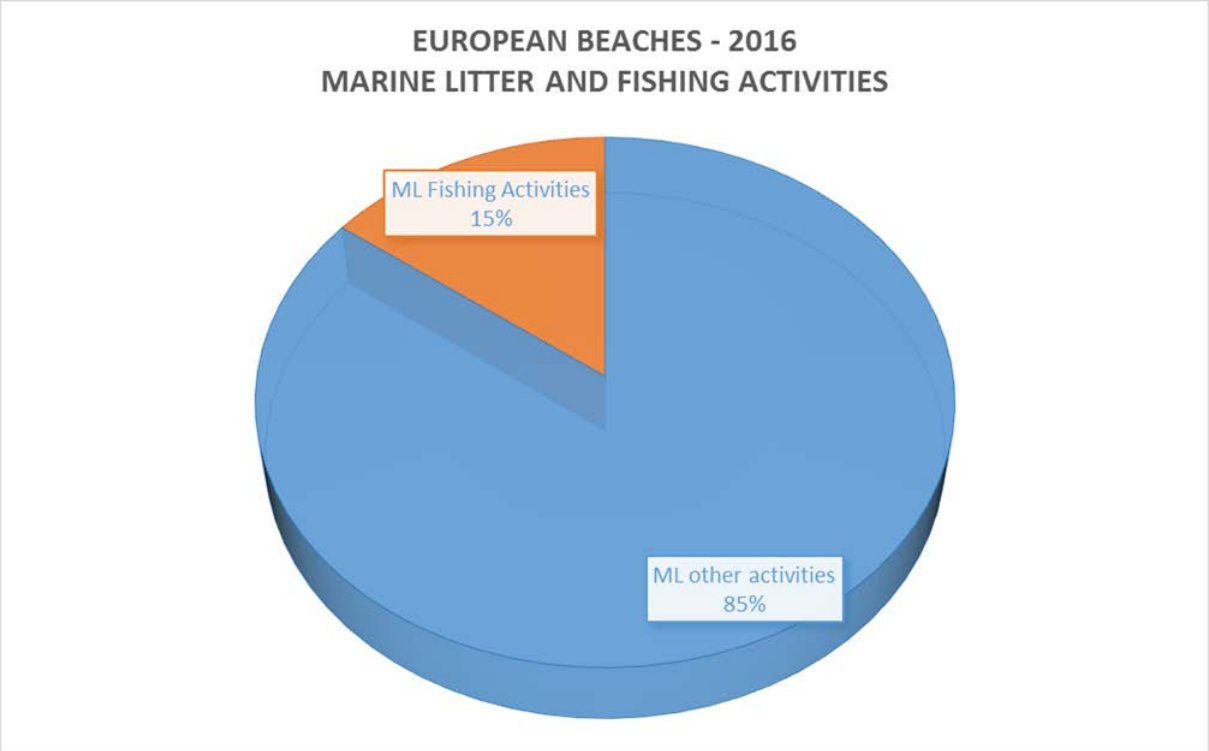

Figure 10: Pie chart of marine litter from fishing activities found on European beaches.

Note that many fishery-related items, such as monofilament lines and nets, may not be representatively monitored during beach surveys due to their use pattern and physical properties. Fishing lines, nets and related items may often remain at sea and only be identified by shallow water seafloor observation and seafloor imaging surveys.

Polystyrene fragments deriving from fish boxes could not be attributed to their specific source.

Table 13: List of items from fishing activities commonly found in European beaches. Detailed information includes the material, name and code of each item, following the Master List of Categories of Litter Items. The abundance is expressed as the total number of items, and the percentage of the total marine litter (ML) and of the total ML from fishing activities (ML Fish Act).

Rank	Material	General Name Litter Item	Master List Code	Number of Items	% of total ML	% of total ML Fish Act
1	Plastic	String and cord (diameter less than 1 cm)	G50	48 919	13.75 %	81.01 %
2	Plastic	Nets and pieces of net > 50 cm	G54	3 499	0.98 %	5.79 %
3	Plastic	Tangled nets / cord	G56	2 108	0.59 %	3.49 %
4	Plastic	Nets and pieces of net < 50 cm	G53	1 865	0.52 %	3.09 %
5	Plastic	Fishing line / monofilament (angling)	G59	1 351	0.38 %	2.24 %
6	Plastic	Mussel nets, Oyster nets	G45	1 142	0.32 %	1.89 %
7	Plastic	Floats/Buoys	G62-G63	478	0.13 %	0.79 %
8	Cloth/Textile	Rope, string and nets	G142	243	0.07 %	0.40 %
9	Plastic	Tags (fishing and industry)	G43	174	0.05 %	0.29 %
10	Plastic	Crab / lobster pots and tops	G42	120	0.03 %	0.20 %
11	Plastic	Fish boxes	G57-G58	104	0.03 %	0.17 %
12	Plastic	Fish boxes - expanded polystyrene	G58	68	0.02 %	0.11 %
13	Metal	Fishing related (weights, sinkers, lures, hooks)	G182	58	0.02 %	0.10 %
14	Plastic	Octopus pots	G44	53	0.01 %	0.09 %
15	Plastic	Fishing line (entangled)	G55	50	0.01 %	0.08 %
16	Plastic	Oyster trays (round from oyster cultures)	G46	27	0.01 %	0.04 %
17	Plastic	Other fishing related	G61	20	0.01 %	0.03 %
18	Plastic	Fish boxes - plastic	G57	17	0.00 %	0.03 %
19	Plastic	Buoys	G63	15	0.00 %	0.02 %
20	Processed/Worked Wood	Fish boxes	G164	11	0.00 %	0.02 %
21	Plastic	Fishing net	G51-G54/G56	11	0.00 %	0.02 %
22	Foamed Plastic	Foam buoys	x_o	11	0.00 %	0.02 %
23	Plastic	Fishing gear (lures, traps and pots)	G42/G44/G57-G58/G60	10	0.00 %	0.02 %
24	Metal	Lobster / crab pots	G184	6	0.00 %	0.01 %
25	Plastic	Mesh bags (vegetable, oyster nets and mussel bags)	G37/G45	5	0.00 %	0.01 %
26	Plastic	Nets and pieces of net	G52	5	0.00 %	0.01 %
27	Metal	Fishing related (sinkers, lures, hooks, traps and pots)	G182-G184	4	0.00 %	0.01%
28	Processed/Worked Wood	Crab / lobster pots	G163	4	0.00 %	0.01 %
29	Plastic	Fishing Net Pieces	G51-G54	3	0.00 %	0.00 %
30	Metal	Fish hook remains	G183	2	0.00 %	0.00 %
31	Glass/Ceramic	Octopus pots	G207	2	0.00 %	0.00 %
32	Plastic	Fishing Buoys Pots Traps	G63/G42/G44	1	0.00 %	0.00 %

5.7 Comments on Top Litter Items: one-year (2016) Data Analysis

The compilation of a dedicated 2016 data set on available EU beach litter data, derived *ad hoc* from the TG Marine Litter data collection for litter baseline assessments, allowed for the analysis of data across Europe and its marine regions. While the harmonisation of the data sets proved challenging and not possible in all details, top litter items at EU level could be identified. A simple methodology has been used for data analysis. The data set contains some extreme events, potentially deriving from massive single spills (e.g. container loss), that need to be considered in data interpretation. Other methodologies, following a further review of survey data, could be applied in follow-up work.

It could be shown that several top litter items do not vary much across Europe. However, some categories do differ, presumably related to use patterns. Data availability and the number of surveys carried out were very different in different regions. Therefore, an evaluation of sampling effort, beach types and other factors (e.g. riverine input, coastal towns, tourist beaches, fishing, shipping, water currents, prevailing winds), and the weighting of the results (e.g. according to coastline length and population) should be part of future studies.

As mentioned in previous studies, the majority of beach litter is represented by plastic materials. The results of this analysis show that 84 % of beach litter found in 2016 on European beaches is made up of plastic material. This confirms the results obtained in other studies, and highlights the importance of the EU Plastics Strategy in tackling marine litter.

6 Risk-Based Approach

The top litter items need to be identified in order to prioritise specific measures against litter. This prioritisation should ideally be based on the environmental, economic or societal harm caused by litter in order to provide for the most cost-effective measures. In particular, potentially harmful litter items can be identified and reported, as proposed for the OSPAR area (Schulz 2017). Though the topic has been discussed within the TG Marine Litter (Werner et al., 2016), there is currently no risk-related ranking of litter categories available. The TG Marine Litter has identified three general categories (Galgani et al., 2010; Werner et al., 2016), that encompass the notion of "harm" caused by litter:

1. Ecological harm (mortality or sub-lethal impacts on plants and animals through entanglement, physical damage and ingestion, including the uptake of microplastics, accumulation of chemicals from plastics, facilitation of the invasion of alien species, or alteration of the benthic community structure);
2. Economic harm (e.g. cost to tourism, damage to vessels, fishing gear and facilities, losses to fishery operations, cleaning costs); and
3. Social harm (reduction in aesthetic value and public safety).

There are categories of litter, e.g. fishing line, gill nets, dolly ropes, packaging bands and six-pack rings, which pose high entanglement risks. Some categories, such as plastic fragments, plastic bags and bottle caps, are flagged as posing elevated ingestion risks. Other categories, such as medical syringes with needles, metal can fragments and recently broken glass fragments, pose a high risk for human health.

The TG Marine Litter report on harm (Werner et al., 2016) has provided considerations for risk assessment and an example of its application. Overall, it appears that it will be difficult to attribute quantitative risk parameters to each litter (sub)category and type of risk. The most viable way might be to use an abundance-based ranking list that is then updated based on expert judgement to highlight litter categories that pose particularly high risk and thus deserve special attention and priority in implementing measures.

7 Discussion

This report provides a pan-European compilation of information on the most frequent beach litter items, based on existing reports (in particular from Regional Sea Conventions) and an *ad hoc* analysis of a beach litter data set from the year 2016, in order to support policy actions. The shortcomings of available data and procedures for deriving top litter items are described (e.g. see Chapters 3.4). However, identification of the most frequent items reveals the consistently frequent occurrence of specific litter categories and types across Europe. This valuable information can inform measures at different policy levels, in particular at the EU level.

Specific analyses of litter types such as single-use plastics and fishery-related items have been made to support the EU Plastics Strategy, which aims to protect the environment from plastic pollution. Plastic is the most abundant material in marine litter. As single-use-plastic items represent a large part of marine beach litter, they are specifically targeted in the recently adopted EU Strategy for Plastics in the Circular Economy (European Commission, 2018).

The study also provides insight into the problems concerning data and assessment comparability. These are related to methodological inconsistencies in data collection, for example the number of surveys, variable transect lengths and sampling units, or different lists of litter items used during the surveys. Efforts have been made to harmonise the identification of litter items through category lists, in order to relate them to potential sources, but some incompatibilities still remain.

The spatial scale of assessments should be closely related to the scale of variability and to the organisational scale at which measures are being planned and implemented. It can be important to analyse data at lower spatial scales (e.g. marine region, country, country region, even locally) and temporal scales (e.g. season, month) to identify where action should be taken.

8 Outlook

The quality of top marine litter item rankings depends on the quality (fitness for purpose) of their underlying data. The technicalities of data acquisition in terms of monitoring methods and item identification need to be further improved and harmonised, in a collaborative effort, and should include risk-based assessments.

Collaboration at EU level with Member States, the Regional Sea Conventions, NGOs, other stakeholders and dedicated research projects can improve the approach and lead to higher resource efficiency in the development processes. As financial and human resources are scarce, the best use of resources from authorities, research funding and in-kind contributions by NGOs and citizens should be made. Good coordination is crucial.

Feedback from policy-level users of the ranking lists is needed in order to provide useful information for the policy processes at different organisational levels.

Only stable long-term and large-scale data acquisition processes can provide litter trend data that enable reasonable policy decisions for mid- and long-term strategies. The identification of the most frequent litter items is closely linked to the development of baselines, the setting of thresholds and the development of monitoring guidance and litter category lists. The creation of databases or data portals for the EU and beyond is crucial to facilitate easy access to data and data products. The European Marine Observation and Data Network (EMODNET) is a strong driver behind such a process.

While results should be harmonised and comparable across Europe for the implementation of the MSFD, there is an increasing interest in the global comparability of monitoring results that enables prioritisation at a larger scale, linked to international efforts such as those of the G7, the G20 and the UN Sustainable Development Goal 14. This is necessary as Europe is also contributing to global efforts to tackle marine litter, and must rely on credible data.

The key to overcoming all of these challenges and to move towards effective and confirmed marine litter reduction is close collaboration at different technical and policy levels.

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List of abbreviations and definitions

ALFG	Abandoned or Lost Fishing Gear
ALDFG	Abandoned, Lost or otherwise Discarded Fishing Gear
ARCADIS	Global design & consultancy firm for natural and built assets
As-Made	Project on Assessment of Marine Debris on the Belgian Continental Shelf: occurrence and effects.
BSC	Black Sea Commision
DeFishGear	Project on Derelict Fishing Gear Management System in the Adriatic Region
EC	European Commission
EEA	European Environment Agency
EMBLAS	Environmental Monitoring of the Black Sea
EU	European Union
GES	Good Environmental Status
HELCOM	Baltic Marine Environment Protection Commission - Helsinki Commission
HELMEPA	Hellenic Marine Environment Protection Association
ICC	International Coastal Clean Up
INTERREG IVA	EU Programme for Cross-Border Territorial Cooperation
IPA Adriatic	Cross-border Cooperation Programme in Adriatic Sea
ISOTECH Ltd	Company for Environmental Research and Consultancy
JRC	Joint Research Centre
KAT	Keep the Archipelago Tidy
MARLIN	Project on Marine Littering in the Baltic Sea Area
MARNOBA	Project on Mar No Basura (Sea without litter)
MCC	MSFD Competence Centre
MCS	Marine Conservation Society
ML	Marine Litter
MLW	Marine LitterWatch
MS	Member State
MSFD	Marine Strategy Framework Directive
MSFD CIS	MSFD Common Implementation Strategy
NGO	non-governmental organisation
NOAA	National Oceanic and Atmospheric Administration
OSPAR	Oslo-Paris Convention for the Protection of the Marine Environment of the North-East Atlantic
RSC	Regional Sea Convention
SPICE	Project on the Assessment of Status, Pressures and Impacts and Social and Economic Evaluation, in the Baltic Sea Marine Region
SUP	Single Use Plastics
TG Marine Litter	MSFD GES Technical Group on Marine Litter
TMBLI	Top Marine Beach Litter Items
UN	United Nations
UNEP	United Nations Environment Programme
UNEP/IOC	Intergovernmental Oceanographic Commission of the United Nations Environment Programme
UNEP/MAP	Mediterranean Action Plan
WWF	World Wildlife Fund

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Figure 1: Beach Litter Item categories from EEA LitterWatch (European Environment Agency, 2018).The legend is embedded in the figure: colours represent different litter items found in each marine region (North-East Atlantic Ocean, Baltic Sea, Black Sea and Mediterranean Sea). Pie chart's size represents the amount of litter, while the pie slice size shows the relative proportion of the data for each litter item.

Figure 2: Map of countries contributing to the 2016 data set with different data providers. MS = Member States; no = no data received.

Figure 3: Map of distribution of beaches included in the 2016 data set. Marine regions represented in the data set are Baltic Sea (green), Black Sea (blue), Mediterranean Sea (red) and Northern-East Atlantic Ocean (pink).

Figure 4: Spatial distribution of the top ten marine beach litter items at European scale. The abundance is expressed as a percentage of total amount per each item found on European beaches. Spatial scales are represented by marine region (Baltic Sea=blue; Black Sea=orange; Mediterranean Sea=green; Northern-East Atlantic Ocean=yellow). Legend item ID: G2+G3+G4+G5=Plastic bag (Shopping bags, small plastic bags, e.g. freezer bags, plastic bag collective role; what remains from rip-off plastic bags); G7=Drink bottles ≤0.5 l; G8=Drink bottles > 0.5 l; G20+G21+G22+G23+G24=Plastic caps and lids (drinks, chemicals, detergents (non-food), unidentified)/plastic rings from bottle caps/lids; G27=Cigarette butts and filters; G30=Crisp packets / sweet wrappers; G32=Toys & party poppers; G33=Cups and cup lids; G49-G50=Rope, string, cord; G50=String and cord (diameter less than 1 cm); G54=Nets and pieces of net > 50 cm; G73=Foam sponge; G75+G78+G81=Plastic/polystyrene pieces 0-2.5 cm; G76+G79+G82=Plastic/polystyrene pieces 2.5 cm > < 50 cm; G95=Cotton bud sticks; G124=Other plastic/polystyrene items (identifiable); G152=Cigarette packets; G153=Cups, food trays, food wrappers, drink containers; G154-G157=Paper (including newspapers and magazines); G200=Bottles incl. pieces; G204=Construction material (brick, cement, pipes); G211=Other medical items (swabs, bandaging, adhesive plaster etc.); G213=Paraffin/Wax; x_a=Other (e.g. diapers, toilet paper, tissue paper, shaving razors).

Figure 5: Seasonal distribution of the top 10 beach litter items at European scale. The abundance is expressed as a percentage of the total amount of each item found on European beaches. Temporal scales are represented by season (Autumn=brown; Winter=light blue; Spring=green; Summer=yellow). Legend item ID: G2+G3+G4+G5=Plastic bag (Shopping bags, small plastic bags, e.g. freezer bags, plastic bag collective role; remains of rip-off plastic bags); G6-G8=Bottles (incl. drink bottles < = > 0.5 l); G20+G21+G22+G23+G24=Plastic caps and lids (drinks, chemicals, detergents (non-food), unidentified), plastic rings from bottle caps/lids; G27=Cigarette butt and filters; G30=Crisp packets / sweet wrappers; G50=String and cord (diameter less than 1cm); G54=Nets and pieces of net > 50 cm; G75+G78+G81=Plastic/polystyrene pieces 0-2.5cm; G76+G79+G82=Plastic/polystyrene pieces 2.5cm > < 50 cm; G95=Cotton bud sticks; G124= Other plastic/polystyrene items (identifiable); G200= Bottles incl. pieces; G211= Other medical items (swabs, bandaging, adhesive plaster, etc.); G213= Paraffin/Wax; x_a= Other (e.g. diapers, toilet paper, tissue paper, shaving razors).

Figure 6: Pie Chart of beach litter material at European scale. The abundance is expressed as percentage of total litter numbers.

Figure 7: Pie Chart of top ten marine beach litter items listed at European scale. Items have been ranked by abundance, mainly according to the MSFD Master List Categories of Beach Litter Items. The abundance is expressed as a percentage of the total. Legend item ID: G20-24=Plastic caps and lids (drinks, chemicals, detergents (non-food), unidentified), plastic rings from bottle caps/lids; G27=Cigarette butt and filters; G30=Crisp packets / sweet wrappers; G50=String and cord (diameter less than 1cm); G75=Plastic / polystyrene pieces 0-2.5cm; G76=Plastic / polystyrene pieces 2.5cm > < 50 cm; G95=Cotton bud sticks; G124=Other plastic / polystyrene items (identifiable); G211= Other medical items (swabs, bandaging, adhesive plaster, etc.); G213= Paraffin/Wax.

Figure 8: Pie Chart of marine beach litter and single-use plastic material at European scale. The abundance is expressed as a percentage of the total.

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Table 2: Ten most frequent litter items at Baltic Sea level in different types of beaches, categorised into urban, peri-urban and rural beaches. The colours identify items categorised as: plastics (artificial polymer materials; grey), paper or cardboard (purple), metals (orange), glass or ceramics (pink), and processed wood (blue). (HELCOM 2018a)

Table 3: Activity reports from NGOs reviewed for this report.

Table 4: Top 10 Item ranking lists compiled from different reports (complete references can be found in Annex I).

Table 5: Number of items included in the top items lists in the different sources of information.

Table 6: Data provider information is listed per country and marine region (NE Atl = North-East Atlantic Ocean; Med Sea = Mediterranean Sea; Black Sea; Baltic Sea). The different data providers are differentiated as Member State (MS), NGOs, Database, Projects and Company (Consultancy). [1]OSPAR Beach Litter Database, https://www.mcsuk.org/ospar/; [2]ISOTECH Ltd Company for Environmental Research and Consultancy, http://www.isotech.com.cy/gallery/marine-litter-database/; [3]DeFishGear Project/MIO-ECSDE, http://www.defishgear.net/www.mio-ecsde.org; [4]Legambiente Onlus, http://international.legambiente.it; [5]MARLIN Project, http://projects.centralbaltic.eu/project/447-marlin.

Table 7: Detailed information about the European marine beach litter data set from December 2015 to January 2017 and used in the analyses to determine the top marine beach litter at spatial and temporal scale.

Table 8: Detailed information about the European marine beach litter data collected from December 2015 to January 2017) and used in the analyses to determine the top marine beach litter at spatial and temporal scales.

a) Number of beaches per country and marine region and the transect length (metres) applied in each country.

*b) Number of surveys per country and marine region and the total metres surveyed in each country. (*excluding transects of unknown length).*

c) Number of beaches per country, marine region and number of surveys per season (WIN = winter; SPR = spring; SUM = summer; AUT = autumn).

Table 9: Total litter item counts in each marine region.

Table 10: Top ten marine beach litter items listed at European scale and the total amount per each item. Detailed information indicates the TG ML-General Code (ID), Material and Name per each item, following the MSFD Master List of Litter Item Categories.

Table 11: Total litter abundance ranking in marine regions.

Table 12: List of common single-use plastic items found in European beaches. Detailed information is provided for the material the item is made of, the name and the code per each item, following the Master List of Categories of Litter Items. The abundance is expressed as total number of items, percentage of total marine litter (ML) and single use plastic (SUP) items.

Table 13: List of items from fishing activities commonly found in European beaches. Detailed information includes material, name and code per each item, following the Master List of Categories of Litter Items. The abundance is expressed in total number of items, percentage of the total marine litter (ML) and the total of marine litter from fishing activities (ML Fish Act).

Annex I: Top Marine Litter Items Lists from different Studies

The Top Marine Litter Item ranking lists from different sources are provided from their original sources. This includes top items lists identified through NGOs, Regional Sea Conventions, European projects, peer-reviewed literature and the EEA Marine LitterWatch mobile app.

1. NGO reports

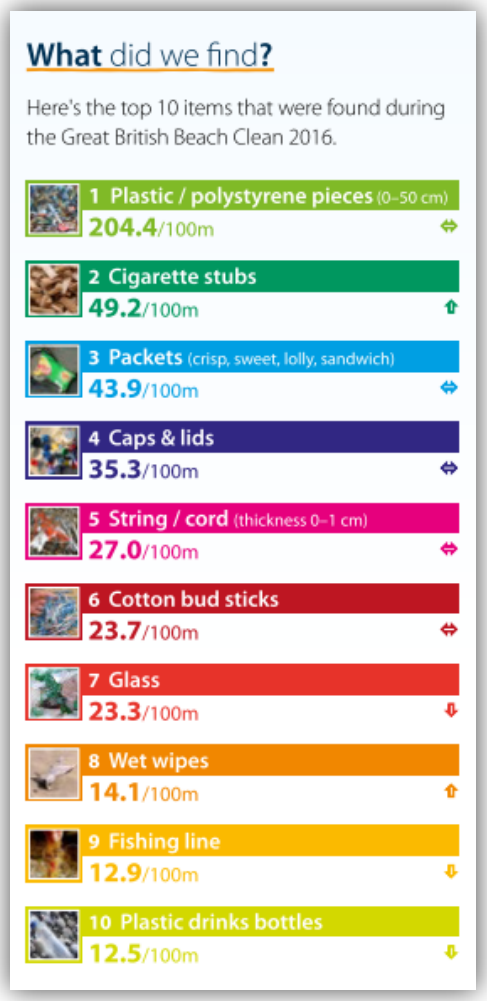


Figure A1 (left): What did we find? Top 10 items found during the Great British Beach Clean 2016. (Source: Marine Conservation Society - Great British Beach Clean 2016 Report)

Figure A2 (right): Top 10 litter items found during the Beach Litter surveys. (Source: Legambiente - BEACH LITTER (2016).

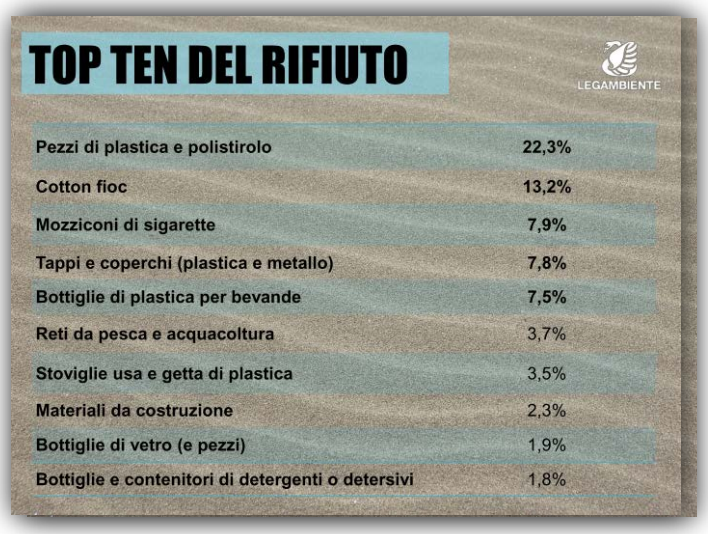


Figure A3 (below): Top 80 % of most found items along the Dutch coast, including median and average count per 100 metre, percentage of total count, trend (count/year), and significance of trend for the period 2010-2015. Aggregated results for beaches Terschelling, Bergen, Noordwijk, and Veere. (Source: Hougee, M., & Boonstra, M. (2016). OSPAR Beach Litter Monitoring In the Netherlands 2010-2015 Annual Report)

Rank	Litter category [OSPAR-100-ID]	Med. Count / 100 m	Aver. count/ 100 m	% of total count	Trend (counts/ Year)	Signifi-cance of trend (p-value)
1	Nets and ropes [300]	126,1	137,5	37.8%	-11.5	0.031
2	Plastic polystyrene pieces < 50 cm [301]	60,6	63,6	17.5%	-4.8	0.206
3	Plastic: Caps [15]	19,8	19,5	5.4%	-2.0	0.029
4	Plastic: Tangled [33]	13,1	13,8	3.8%	-1.4	0.035
5	Rubber: Balloons [49]	11,8	13,5	3.7%	-1.5	0.044
6	Plastic: Crisp [19]	11,1	13,1	3.6%	-1.8	0.029
7	Plastic: Small_bags [3]	10,5	12,8	3.5%	-2.2	0.013
8	Plastic: Bags [2]	7,8	9,4	2.6%	-1.4	0.006
9	Plastic: Foam_sponge [45]	7,4	7,8	2.1%	0.2	0.487
10	Plastic: Industrial [40]	6,5	7,1	2.0%	-1.5	0.003
11	Plastic: Drinks [4]	5,8	6,4	1.8%	-1.2	0.017
12	Plastic: Other [48]	4,9	6,3	1.7%	-1.9	0.000
13	Plastic: Food [6]	5,0	5,3	1.5%	-0.3	0.065
14	San: Buds [98]	4,9	4,4	1.2%	-0.4	0.117
15	Wood: Other_small [74]	3,3	3,5	1.0%	-0.5	0.014

Figure A4 (below): Top 10 items found on the beaches of the North-East Atlantic Ocean and Mediterranean Sea (Source: Surf Rider Foundation (2016); BILAN ENVIRONNEMENTAL).

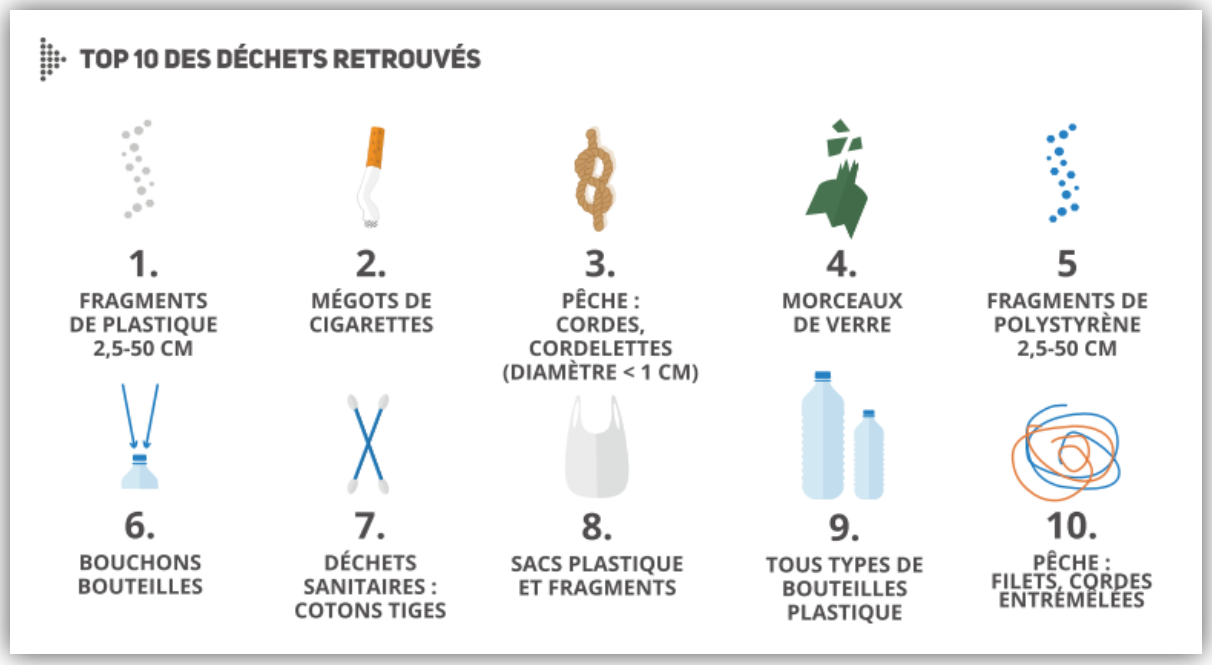
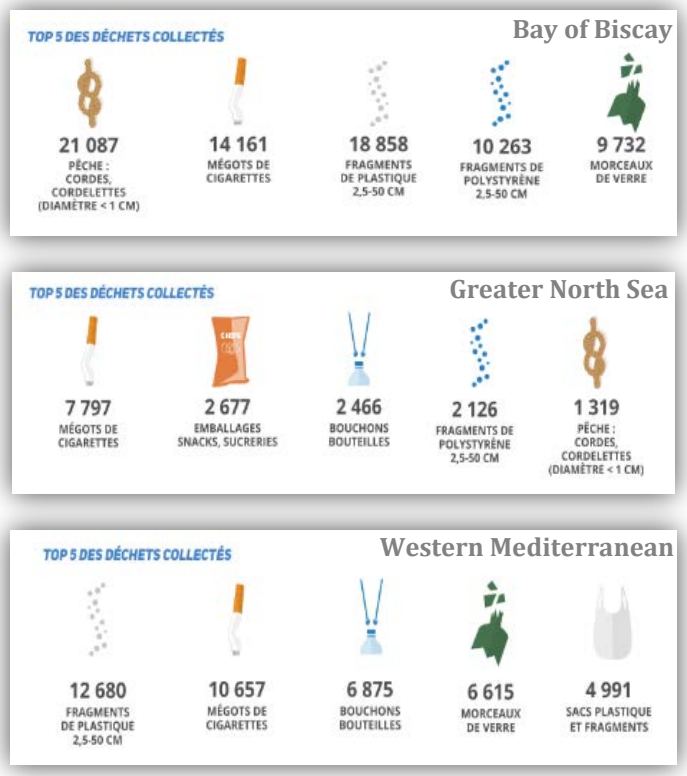


Figure A5 (left): Top 5 items found in the beaches of the Bay of Biscay, Greater North Sea and Western Mediterranean Sea (modified. from Surf Rider Foundation. (2016); BILAN ENVIRONNEMENTAL)

Figure A6 (right): Top 10 marine litter items in Greece during 2016. (Source: HELMEPA, 2016; HELMEPA Annual Report 2016)



Type	Pieces
1. Cigarette filters	59,189
2. Plastic pieces less than 2.5 cm	18,349
3. Plastic bottles	16,931
4. Straws	11,697
5. Plastic bottle caps	11,347
6. Food wraps	9,003
7. Plastic bags	8,143
8. Foam pieces less than 2.5 cm	7,626
9. Glass pieces less than 2.5 cm	6,364
10. Aluminum cans	5,941

2. Regional Sea Convention Reports

Figure A7: Top ten litter items in the Mediterranean Sea (International Coastal Clean-up ICC, 2014). Total number is the number of items collected on 59.2 miles of beaches from 8 different countries. (Source: UNEP (2015); Marine Litter Assessment in the Mediterranean)

	cigarette butts	food wrappers	plastic bottles	caps	straws/ stirrers	Grocery bags (plast.)	glass bottles	other plastic bags	paper bags	cans
Total collected number	98117	6796	11295	16490	24724	6350	3443	4706	2436	6405
number /100m	175	12	20	29	44	11	6	8	4	11

Figure A8: Top ten litter items by country (International Coastal Clean-up ICC, 2014) expressed as number of items/100 m of beach. (Source: UNEP, 2015; Marine Litter Assessment in the Mediterranean)

Number of items per 100 m										
COUNTRY	Cigarette butts	Food wrappers	Beverage bottles (plastic)	Bottle caps (plastic)	Straws Stirrers	Grocery bags (plastic)	Beverage bottles (glass)	Other plastic bags	Paper bags	Beverage cans
Croatia	1540	97	21	86	0	83	34	74	36	22
Egypt	1	2	40	18	1	15	33	6	0	6
Greece	116	6	11	15	13	4	3	3	2	5
Italy	0	0	2	0	0	4	14	0	0	7
Malta	0	15	22	40	13	0	7	3	0	0
Slovenia	21	5	3	6	6	1	1	2	0	2
Spain	79	9	15	23	57	13	5	9	4	8
Turkey	785	14	29	73	22	26	18	4	4	26

Figure A9: Extraction of information from text. (Source: HELCOM, 2018; State of the Baltic Sea – Second HELCOM holistic assessment 2011-2016 (in preparation)

"The most frequently occurring beach litter items at Baltic Sea scale are attributed to eating, drinking or smoking activities, such as food wrappings, bottles or lids, as well as plastic pieces of different sizes (Table 4.3.3). These items are common in all parts of the Baltic Sea, together with items related to industrial packaging, such as sheeting, strapping bands and masking tape (based on data from fifteen sub-basins). Derelict fishing gear are among the twenty most common items in the Eastern Gotland Basin, Gdansk Basin and Kiel Bay. It is noteworthy that balloons or balloon-related items are found among the top ten items in nine of the fifteen sub-basins (HELCOM 2018ad)."

Figure A11: Fifteen most recorded litter items, which make up at least 80 % of the total number of items recorded on survey sites in the Southern North Sea during 2009-2014. H: Harmful to the marine environment, CV: Coefficient of Variation. (modified from Source: OSPAR, 2017; Intermediate Assessment)

Item name [OSPAR ID number]	Median number of items/100m of coast	Average number of items/100m of coast	St. dev.	CV	% of total number of litter items recorded
Plastic/polystyrene pieces < 50 cm [301] H	103.5	135.9	144.6	106.50%	30.10%
Nets and ropes [300] H	125.7	135.8	68.8	50.70%	30.10%
Plastic: Caps and lids [15] H	26.5	31	18.4	59.20%	6.90%
Plastic: Drinks bottles and containers[4]	11.9	11.9	4.5	38.00%	2.60%
Plastic: Foam sponge [45] H	8.1	11	8.1	73.70%	2.40%
Plastic: Other items [48]	6.1	8.9	7.9	88.40%	2.00%
Plastic: Crisp/sweet packets and lolly sticks [19] H	7.7	8.1	2.9	35.90%	1.80%
Plastic: Tangled nets/cord/rope and string [33] H	7.3	7.2	4.1	57.20%	1.60%
Rubber: Balloons [49] H	5.5	6.1	2.4	39.70%	1.40%
Plastic: Food containers incl. fast food containers [6]	5.3	5.9	2.8	47.00%	1.30%
Plastic: Industrial packaging, plastic sheetingl [40] H	6	5.7	1.8	32.30%	1.30%
Wood: Other items < 50 cm [74]	3.8	5.7	6.4	113.10%	1.30%
San: Cotton bud sticks [98] H	3.2	4.9	3.9	79.70%	1.10%
Glass: Other items [93]	3.5	4.5	3.4	74.70%	1.00%
Plastic: Plastic/polystyrene pieces > 50 cm [47] H	2.6	4.5	5.5	124.50%	1.00%

Figure A12: Results for the material/use categories recorded on survey sites in the North Sea during 2009-2014. CV: Coefficient of Variation. (modified from Source: OSPAR, 2017; Intermediate Assessment)

Item name [OSPAR ID number]	Median number of items/100m of coast	Average number of items/100m of coast	St. dev.	CV	% of total number of litter items recorded
plastic/polystyrene [406]	339.6	400.2	216	54.00%	88.60%
wood [410]	9.8	12.2	8.3	68.20%	2.70%
rubber [407]	7.7	8.2	2.6	32.00%	1.80%
metal [411]	4.6	7.5	8.2	109.80%	1.70%
glass [412]	5.8	7.2	5.1	70.80%	1.60%
paper/cardboard [409]	3.2	6.4	8.8	138.40%	1.40%
sanitary [414]	4.4	6	4.1	68.00%	1.30%
cloth/textile [408]	2.9	3	1.3	45.20%	0.70%
ceramic/pottery [413]	0.4	0.6	0.4	77.30%	0.10%
medical [415]	0.3	0.3	0.3	88.70%	0.10%

Figure A13: Fifteen most recorded items, which make up at least 80 % of the total number of items recorded on survey sites in the North-West coast of Spain during 2009-2014. H: Harmful to the marine environment, CV: Coefficient of Variation. (modified from Source: OSPAR, 2017; Intermediate Assessment)

Item name [OSPAR ID number]	Median number of items/100m of coast	Average number of items/100m of coast	St. dev.	CV	% of total number of litter items recorded
San: Cotton bud sticks [98] H	64.3	151.8	199.4	131.40%	20.90%
Nets and ropes [300] H	86	141.5	127	89.80%	19.50%
Plastic: Caps and lids [15] H	38.6	134.1	178.9	133.40%	18.50%
Plastic/polystyrene pieces < 50 cm [301] H	16	81.6	162.6	199.30%	11.20%
Paper: Cigarette butts [64]	25.4	43.2	51	118.20%	5.90%
Wood: Other items < 50 cm [74]	2.3	22.8	83.3	365.30%	3.10%
Plastic: Other items [48]	11.5	21.5	27.7	128.60%	3.00%
Plastic: Crisp/sweet packets and lolly sticks [19] H	10.1	15.1	14.6	96.60%	2.10%
Plastic: Oyster nets or mussel bags incl. plastic stoppers [28] H	6	11.3	12.9	114.40%	1.60%
Plastic: Drinks bottles and containers[4]	5.9	8.4	6.5	76.70%	1.20%
Plastic: Tangled nets/cord/rope and string [33] H	2.5	7.6	10.2	133.40%	1.10%
Plastic: Strapping bands [39]	4.3	6.9	6.5	94.90%	0.90%
Plastic: Lobsterpots [26] H	2.5	5.7	8	141.10%	0.80%
Plastic: Cutlery/trays/straws [22]	4.4	5.5	6.2	113.10%	0.80%
Metal: Industrial scrap [83]	0	5	21	422.20%	0.70%

Figure A14: Results for the material/use categories recorded on survey sites in the North-West coast of Spain during 2009-2014. CV: Coefficient of Variation. (modified from Source: OSPAR, 2017; Intermediate Assessment)

Item name [OSPAR ID number]	Median number of items/100m of coast	Average number of items/100m of coast	St. dev.	CV	% of total number of litter items recorded
plastic/polystyrene [406]	268.3	482.1	475.2	98.60%	66.50%
sanitary [414]	68.1	157.1	202.7	129.00%	21.70%
paper/cardboard [409]	28	45.9	52	113.10%	6.30%
wood [410]	4.6	26.2	86	328.20%	3.60%
metal [411]	4.2	9.3	20.5	220.30%	1.30%
glass [412]	1.3	1.9	1.5	78.80%	0.30%
rubber [407]	1	1.3	1.1	85.20%	0.20%
cloth/textile [408]	1	0.9	0.7	71.50%	0.10%
medical [415]	0.3	0.5	0.5	99.00%	0.10%
ceramic/pottery [413]	0	0.1	0.2	259.00%	0.00%

Figure A15: Fifteen most recorded litter items, which make up at least 80 % of the total number of items recorded on survey sites in the west coast of Sweden during 2009-2014. H: Harmful to the marine environment, CV: Coefficient of Variation. (modified from Source: OSPAR, 2017; Intermediate Assessment)

Item name [OSPAR ID number]	Median number of items/100m of coast	Average number of items/100m of coast	St. dev.	CV	% of total number of litter items recorded
Plastic: Industrial packaging, plastic sheetingl [40] H	0.5	186.8	470.7	251.90%	14.70%
Nets and ropes [300] H	139.3	172.3	172.2	99.90%	13.50%
Plastic: Caps and lids [15] H	117.3	155.1	109.8	70.80%	12.20%
Plastic/polystyrene pieces < 50 cm [301] H	106	108.3	82	75.70%	8.50%
San: Cotton bud sticks [98] H	71.5	102.6	67.8	66.10%	8.10%
Plastic: Tangled nets/cord/rope and string [33] H	1	96.8	275.1	284.10%	7.60%
Rubber: Balloons [49] H	35	51.6	54.5	105.60%	4.10%
Plastic: Strapping bands [39]	24.5	48	73.7	153.50%	3.80%
Plastic: Other items [48]	1.3	46.7	128.6	275.50%	3.70%
Plastic: Small plastic bags, e.g., freezer bags [3]	12	42.5	86	202.10%	3.30%
Plastic: Crisp/sweet packets and lolly sticks [19] H	8.5	26.4	43.2	163.50%	2.10%
Plastic: Shotgun cartridges [43]	17.5	25.6	31.2	121.90%	2.00%
Plastic: Food containers incl. fast food containers [6]	3.5	22.6	38.9	171.80%	1.80%
Plastic: Drinks bottles and containers[4]	10.5	19.5	20	102.40%	1.50%
Plastic: Cutlery/trays/straws [22]	14	17.8	17.3	97.10%	1.40%

Figure A16: Results for the material/use categories recorded on survey sites in the west coast of Sweden during 2009-2014. CV: Coefficient of Variation. (modified from Source: OSPAR, 2017; Intermediate Assessment)

Item name [OSPAR ID number]	Median number of items/100m of coast	Average number of items/100m of coast	St. dev.	CV	% of total number of litter items recorded
plastic/polystyrene [406]	693.8	1050	1105.3	105.30%	82.50%
sanitary [414]	72	103	67.9	65.90%	8.10%
rubber [407]	37.5	55.2	56	101.40%	4.30%
metal [411]	3.5	20.7	41.1	198.00%	1.60%
wood [410]	7.5	17.1	21.1	122.90%	1.30%
paper/cardboard [409]	7.5	13.7	13.9	101.60%	1.10%
glass [412]	1.5	5.9	10.4	177.60%	0.50%
cloth/textile [408]	2	4	6.5	165.20%	0.30%
medical [415]	0.5	3.6	9.1	255.30%	0.30%
ceramic/pottery [413]	0	0	0.1	360.60%	0.00%

Figure A17: Top litter items recorded on survey sites in the Southern North Sea during 2014 and 2015. SD: Standard Deviation. (Source: OSPAR, 2017; Intermediate Assessment)

Item	median	average	SD	% of total number of items
Plastic polystyrene pieces < 50 cm [301]	80.6	176.7	220.3	41.10%
Nets and ropes [300]	99.1	98.2	38	22.80%
Plastic: Caps and lids [15]	28.6	32.5	19.7	7.60%
Plastic: Drinks bottles and containers [4]	10.1	10.4	7.3	2.40%
Plastic: Foam sponge [45]	5.2	9.3	6.6	2.20%
Plastic: Crisp/sweet packets and lolly sticks [19] H	9.3	8.0	3.9	1.90%
Wood: Other items < 50 cm [74]	3	7.8	10	1.80%
Plastic: Food containers incl. fast food containers [6]	7.2	6.4	2.8	1.50%
Plastic: Tangled nets/cord/rope and string [33] H	6.4	5.3	2	1.20%
Plastic: Plastic/polystyrene pieces > 50 cm [47] H	2.2	5.1	6.6	1.20%
Rubber: Balloons [49]	5.3	4.9	1.8	1.10%
Plastic: Industrial packaging, plastic sheetingl [40] H	3.9	4.6	1.3	1.10%
Plastic: Shotgun cartridges [43]	3.6	4.0	2.2	0.90%
Plastic: Small plastic bags, e.g., freezer bags [3]	3.3	4.0	2	0.90%
Glass: Other items [93]	2.5	3.7	3.6	0.80%

Figure A18: Top litter items recorded on survey sites in the Northern North Sea during 2014 and 2015. SD: Standard Deviation. (Source: OSPAR, 2017; Intermediate Assessment)

Item	median	average	SD	% of total number of items
Nets and ropes [300]	2024.3	2024.3	0	33.20%
Plastic polystyrene pieces < 50 cm [301]	1497.7	1497.7	0	24.60%
Plastic: Caps and lids [15]	763.6	763.6	0	12.50%
San: Cotton bud sticks [98] H	414.6	414.6	0	6.80%
Plastic: Shotgun cartridges [43]	117	117.0	0	1.90%
Plastic: Crisp/sweet packets and lolly sticks [19] H	109.3	109.3	0	1.80%
Plastic: Small plastic bags, e.g., freezer bags [3]	104.9	104.9	0	1.70%
Plastic: Food containers incl. fast food containers [6]	96.4	96.4	0	1.60%
Rubber: Balloons [49]	94	94.0	0	1.50%
San: Other items [102]	81.4	81.4	0	1.30%
Plastic: Strapping bands [39]	60.5	60.5	0	1.00%
Plastic: Cutlery/trays/straws [22]	55.6	55.6	0	0.90%
Plastic: Tangled nets/cord/rope and string [33] H	52.8	52.8	0	0.90%
Plastic: Plastic/polystyrene pieces > 50 cm [47] H	49.6	49.6	0	0.80%
San: Sanitary towels/panty liners/backing strips [99]	46	46.0	0	0.80%

Figure A19: Top litter items recorded on survey sites in the Bay of Biscay and Iberian Coast during 2014 and 2015. SD: Standard Deviation. (Source: OSPAR, 2017; Intermediate Assessment)

Item	median	average	SD	% of total number of items
Plastic polystyrene pieces < 50 cm [301]	88.3	81.4	28.7	21.30%
Nets and ropes [300]	50.5	52.5	11.1	13.80%
Paper: Cigarette butts [64]	29.5	39.1	23.9	10.20%
Plastic: Caps and lids [15]	26.3	27.8	12.6	7.30%
San: Cotton bud sticks [98] H	22.1	22.0	8.8	5.80%
Plastic: Other items [48]	23.1	21.0	12	5.50%
Plastic: Drinks bottles and containers [4]	12.1	15.0	8	3.90%
Plastic: Crisp/sweet packets and lolly sticks [19] H	12.2	11.6	5.4	3.00%
Plastic: Foam sponge [45]	7.3	8.7	4.5	2.30%
Plastic: Small plastic bags, e.g., freezer bags [3]	6.3	6.9	3.7	1.80%
Plastic: Food containers incl. fast food containers [6]	4.8	5.4	2.4	1.40%
Plastic: Cutlery/trays/straws [22]	4.9	5.3	1.2	1.40%
Plastic: Tangled nets/cord/rope and string [33] H	5.2	4.9	2.8	1.30%
Wood: Other items < 50 cm [74]	4.1	4.9	2.3	1.30%
Metal: Industrial scrap [83]	0.3	4.7	8.8	1.20%

Figure A20: Top litter items recorded on survey sites in the Celtic Sea during 2014 and 2015. SD: Standard Deviation. (Source: OSPAR, 2017; Intermediate Assessment)

Item	median	average	SD	% of total number of items
Plastic polystyrene pieces < 50 cm [301]	105.7	161.1	109.5	31.50%
Nets and ropes [300]	72.2	68.6	8.8	13.40%
Plastic: Drinks bottles and containers [4]	26.3	33.2	12	6.50%
Plastic: Caps and lids [15]	19.6	32.5	27.1	6.40%
San: Cotton bud sticks [98] H	13.9	27.5	26.7	5.40%
Plastic: Crisp/sweet packets and lolly sticks [19] H	25.9	24.3	5.1	4.70%
Metal: Drink cans [78]	12.3	12.1	1	2.40%
Plastic: Food containers incl. fast food containers [6]	11.2	11.6	1.7	2.30%
All gloves [304]	8.2	8.8	2.5	1.70%
Plastic: Bags (e.g. shopping) [2]	9	8.1	2.5	1.60%
Plastic: Fishing_line [35]	9	7.1	4.6	1.40%
Plastic: Shotgun cartridges [43]	4.2	7.0	5.7	1.40%
Plastic: Tangled nets/cord/rope and string [33] H	5.1	6.4	2.8	1.30%
Plastic: Cutlery/trays/straws [22]	7.5	6.2	3.1	1.20%
Rubber: Other items [53]	7.2	6.2	2.2	1.20%

Figure A21: Top ten litter items recorded on all types of beaches surveyed in the Baltic Sea during 2012 and 2013 – MARLIN PROJECT. (Source: MARLIN Baltic Marine Litter Project, 2013; Final Report of Baltic Marine Litter Project Marlin - Litter Monitoring and Raising Awareness)

Material type	Litter type	%
Plastic	Other	25,3
Glass & ceramics	Fragments	5,1
Plastic	Bottle caps and lids	4,8
Plastic	Plastic bags	4,3
Foamed plastic	Foam (insulation and packaging)	4,2
Plastic	Food containers, candy wrappers	3,2
Metal	Bottle caps, lids and pull tabs	2,8
Plastic	Knives, forks, spoons, straws, stirrers	2,4
Wood	Processed timber and pallet crates	2,4
Paper & cardboard	Cups, food trays, food wrappers, cigarrette packs, drink containers	2,1

Figure A22 (right): Top ten litter items recorded on rural beaches surveyed in the Baltic Sea during 2012 and 2013. (Source: MARLIN Baltic Marine Litter Project, 2013; Final Report of Baltic Marine Litter Project Marlin - Litter Monitoring and Raising Awareness)

Material type	Litter type	%
Plastic	Other	19
Glass & ceramics	Fragments	8,2
Other litter	Other litter	7,7
Plastic	Plastic bags	7,3
Plastic	Rope	4,8
Plastic	Bottle caps and lids	3,6
Plastic	Bottles < 2l	3,1
Glass & ceramics	Construction material	3
Wood	Processed timber and pallet crates	2,4
Plastic	Food containers, candy wrappers	2,3

Material type	Litter type	%
Plastic	Other	32,2
Plastic	Bottle caps and lids	5,3
Foamed plastic	Foam (insulation and packaging)	5,2
Glass & ceramics	Fragments	3,5
Metal	Bottle caps, lids and pull tabs	3,1
Plastic	Plastic bags	3
Wood	Processed timber and pallet crates	3
Paper & cardboard	Paper (incl. Newspapers and magazines)	2,3
Plastic	Food containers, candy wrappers	2,3
Plastic	Knives, forks, spoons, straws, stirrers	2,2

Figure A23 (left): Top ten litter items recorded on urban beaches surveyed in the Baltic Sea during 2012 and 2013. (Source: MARLIN Baltic Marine Litter Project, 2013; Final Report of Baltic Marine Litter Project Marlin - Litter Monitoring and Raising Awareness)

Figure A24 (right): Top ten litter items recorded on peri-urban beaches surveyed in the Baltic Sea during 2012 and 2013. (Source: MARLIN Baltic Marine Litter Project, 2013; Final Report of Baltic Marine Litter Project Marlin - Litter Monitoring and Raising Awareness)

Material type	Litter type	%
Plastic	Other	15,5
Glass & ceramic	Fragments	6,4
Plastic	Food containers, candy wrappers	5,4
Plastic	Plastic bags	5,4
Plastic	Bottle caps and lids	4,5
Plastic	Knives, forks, spoons, straws, stirrers	3,5
Foamed plastic	Foam (insulation and packaging)	3,4
Plastic	Strapping	2,8
Paper & cardboard	Other	2,8
Metal	Bottle caps, lids and pull tabs	2,8

Figure A25: Top 20 items found in the 31 surveyed beaches of the Adriatic and Ionian coastline, calculated on an aggregated basis of total litter counts in all beaches during 2014 and 2016 – DeFishGear PROJECT. (Source: Vlachogianni T., Anastasopoulou A., Fortibuoni T., Ronchi F., & Zeri C., 2017; DeFishGear Marine Litter Assessment in the Adriatic and Ionian Seas)

TOP 20	Code	Items name	Total counts	%
1	G79	Plastic pieces 2.5 cm > < 50 cm	14,040	19.89
2	G82	Polystyrene pieces 2.5 cm > < 50 cm	8,422	11.93
3	G95	Cotton bud sticks	6,475	9.17
4	G21	Plastic caps/lids from drinks	4,705	6.67
5	G27	Cigarette butts and filters	4,660	6.60
6	G23	Plastic caps/lids unidentified	1,743	2.47
7	G45	Mussel nets, Oyster nets	1,716	2.43
8	G30	Crisps packets/sweets wrappers	1,492	2.11
9	G208	Glass or ceramic fragments >2.5 cm	1,368	1.94
10	G124	Other plastic/polystyrene items (identifiable)	1,350	1.91
11	G67	Sheets, industrial packaging, plastic sheeting	1,336	1.89
12	G10	Food containers incl. fast food containers	1,332	1.89
13	G35	Straws and stirrers	1,273	1.80
14	G33	Cups and cup lids	1,161	1.65
15	G22	Plastic caps/lids from chemicals, detergents	1,058	1.50
16	G3	Shopping bags, incl. pieces	974	1.38
17	G7	Drink bottles <=0.5 l	872	1.24
18	G8	Drink bottles >0.5 l	794	1.13
19	G24	Plastic rings from bottle caps/lids	770	1.09
20	G50	String and cord (diameter less than 1 cm)	748	1.06

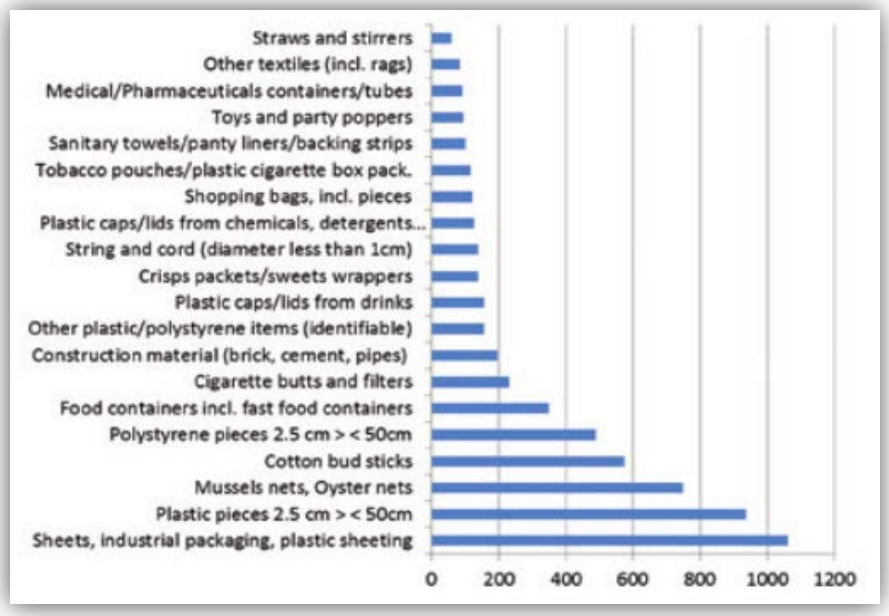
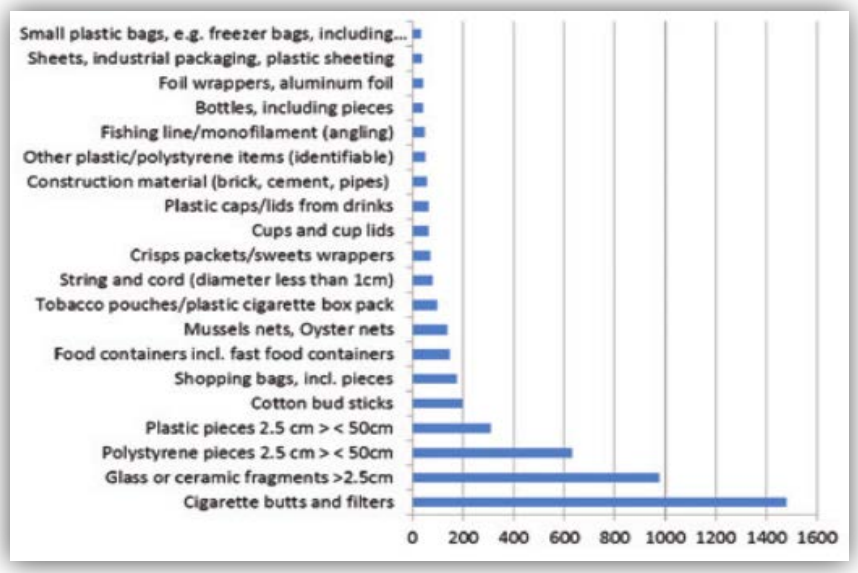


Figure A26 (left): Top 20 items found in Italy, on an aggregated basis of total litter counts in all surveyed beaches during 2014 and 2016 – DeFishGear project. (Source: Vlachogianni T., Anastasopoulou A., Fortibuoni T., Ronchi F., & Zeri C., 2017. DeFishGear Marine Litter Assessment in the Adriatic and Ionian Seas)

Figure A27 (right): Top 20 items found in Slovenia, on an aggregated basis of total litter counts in all surveyed beaches during 2014 and 2016 – DeFishGear project. (Source: Vlachogianni T., Anastasopoulou A., Fortibuoni T., Ronchi F., & Zeri C., 2017; DeFishGear Marine Litter Assessment in the Adriatic and Ionian Seas)



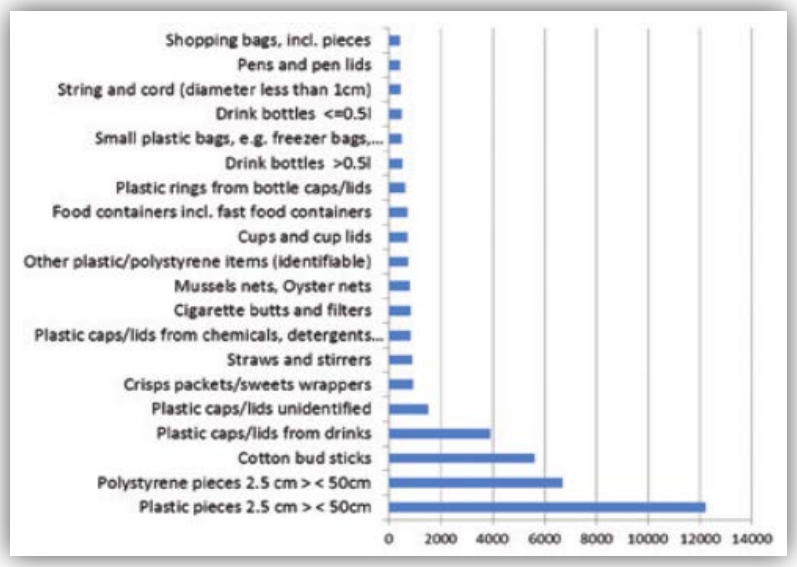
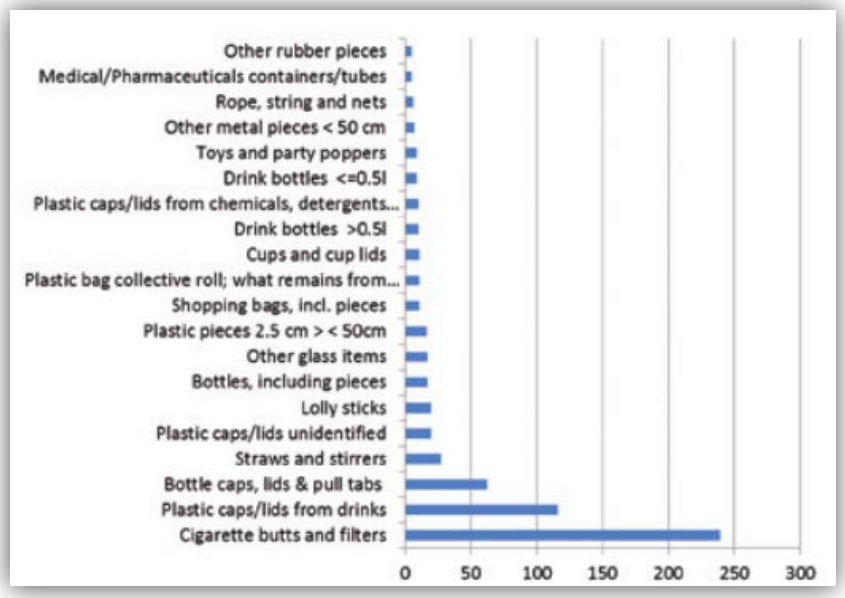


Figure A28 (left): Top 20 items found in Croatia, on an aggregated basis of total litter counts in all surveyed beaches during 2014 and 2016 – DeFishGear project. (Source: Vlachogianni T., Anastasopoulou A., Fortibuoni T., Ronchi F., & Zeri C., 2017; DeFishGear Marine Litter Assessment in the Adriatic and Ionian Seas)

Figure A29 (right): Top 20 items found in Bosnia and Herzegovina, on an aggregated basis of total litter counts in all surveyed beaches during 2014 and 2016 – DeFishGear project. (Source: Vlachogianni T., Anastasopoulou A., Fortibuoni T., Ronchi F., & Zeri C., 2017; DeFishGear Marine Litter Assessment in the Adriatic and Ionian Seas)



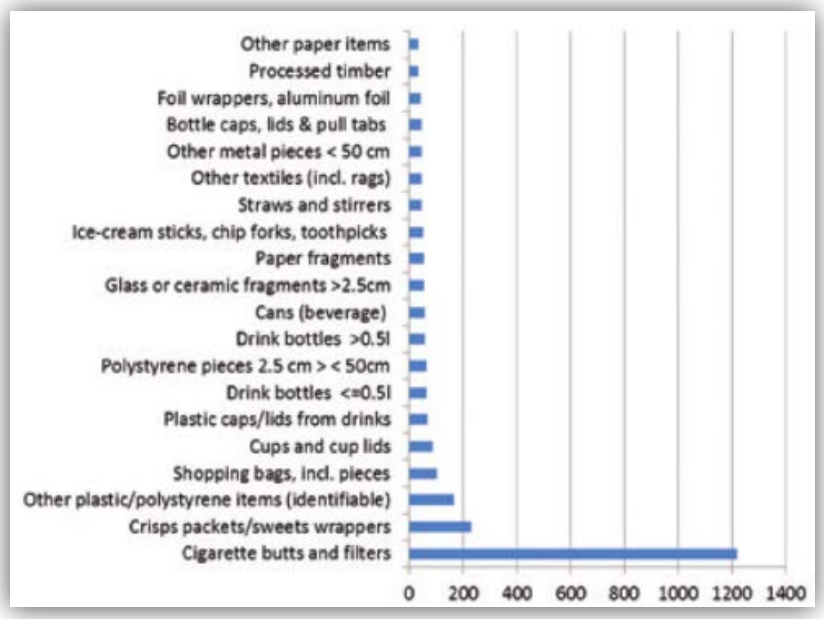
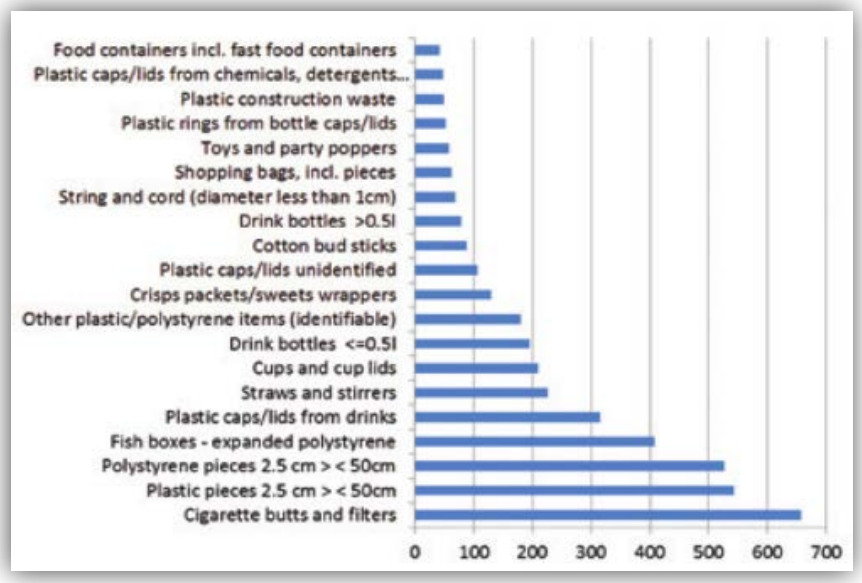


Figure A30 (left): Top 20 items found in Montenegro, on an aggregated basis of total litter counts in all surveyed beaches during 2014 and 2016 – DeFishGear project. (Source: Vlachogianni T., Anastasopoulou A., Fortibuoni T., Ronchi F., & Zeri C., 2017; DeFishGear Marine Litter Assessment in the Adriatic and Ionian Seas)

Figure A31 (right): Top 20 items found in Greece, on an aggregated basis of total litter counts in all surveyed beaches during 2014 and 2016 – DeFishGear project. (Source: Vlachogianni T., Anastasopoulou A., Fortibuoni T., Ronchi F., & Zeri C., 2017; DeFishGear Marine Litter Assessment in the Adriatic and Ionian Seas)



4. Scientific Literature

Figure A32: Top 10 of items collected on the four sampling locations for two different sampling periods: summer 2010 and spring 2011. (Source: Van Cauwenberghe L., Claessens M., Vandegehuchte M. B., Mees J., & Janssen C. R., 2013; Assessment of marine debris on the Belgian Continental Shelf. Marine Pollution Bulletin, 73(1), 161–169)

Ranking	Summer 2010		Spring 2011	
	Item	% Of total	Item	% Of total
1	Resin pellets[a]	83.3	Resin pellets[a]	79.0
2	Plastic fragments <50 cm[a]	5.5	Plastic fragments <50 cm[a]	5.7
3	Monofilament line[a]	1.9	Monofilament line[a]	2.9
4	Rope/cord <50 cm[a]	1.2	Rope/cord <50 cm[a]	2.3
5	Cigarette butts and filters[a]	0.8	Bottle caps and lids[a]	0.9
6	Bottle caps and lids[a]	0.7	Construction material	0.9
7	Plastic cutlery and straws[a]	0.5	Crisp/sweet packages, lolly sticks[a]	0.8
8	Crisp/sweet packages, lolly sticks[a]	0.5	Cotton bud sticks	0.7
9	Cotton bud sticks	0.5	Rope/string	0.7
10	Small plastic bags[a]	0.4	Cigarette butts and filters[a]	0.5

Figure A33: Extraction information from text. (Source: Williams A. T., Randerson P., Di Giacomo C., Anfuso G., Macias A., & Perales J. A., 2016; Distribution of beach litter along the coastline of Cádiz, Spain. Marine Pollution Bulletin, 107(1), 77–87)

found, the most abundant were va
(total 736; 32% of all items), foil
(181; 8%), cleaner bottles (138:
(104; 5%) and plastic drinking st
the litter were food packaging (f
plastic containers — 310; 14% of t
(metal cans, glass bottles and plas
total litter items).

Figure A34 (right): Top 10 litter items found in recent survey: OC: Ocean Conservancy 2016 (97 countries), GBBC: Great British Beach Clean 2016 (362 beaches). (Source: Schulz M., Clemens T., Förster H., Harder T., Fleet D., Gaus S., Hartwig E., 2015; Statistical analyses of the results of 25 years of beach litter surveys on the South-Eastern North Sea coast. Marine Pollution Bulletin)

Item	OC (2016) Rank	GBBC, 2016 Rank	This paper Rank
Cigarette stubs	1	2	–
Plastic drink bottles	2	10	8
Food wrappers	3	3	6
Plastic caps/lids…	4	4	5
Straws	5	–	–
Plastic bags	6	–	–
Glass	7	7	10
Metal cans	–	–	5
Plastic/polystyrene pieces	–	1	2 and 3
Plastic grocery bags	8	–	–
String and cord	–	5	1
Cotton bud sticks	–	6	9
Rope	–	–	7
Drinks	–	–	4
Wet wipes	–	8	–
Fishing lines	–	9	–
Metal bottle caps	9	–	–
Plastic lids	10	–	–

	Minimum	Maximum	Mean
Plastic/styrofoam/foam rubber	52.7	91.3	74.0
Paper/Cardboard	0.9	7.2	2.9
Metal	0.9	14.7	3.1
Glass/Porcelain	2.2	6.5	3.7
Cloth/textiles	0.5	1.6	0.9
Food	0.3	1.7	0.8
Wood	4.6	15.8	9.2
Miscellaneous	0.6	17.0	5.4

Figure A35 (left): Composition of beach litter averaged for the eight NGO beaches. Percentages are given. (Source: Williams, A. T., Randerson, P., Allen, C., & Cooper, J. A. G., 2017; Beach litter sourcing: A trawl along the Northern Ireland coastline. Marine Pollution Bulletin)

F Figure A36: Classification of macrolitter items including the top ten items collected on the four beaches on Rügen. (Source: Hengstmann E., Gräwe D., Tamminga M., & Fischer E. K., 2017; Marine litter abundance and distribution on beaches on the Isle of Rügen considering the influence of exposition, morphology and recreational activities. Marine Pollution, 115 (1-2) 297-306)

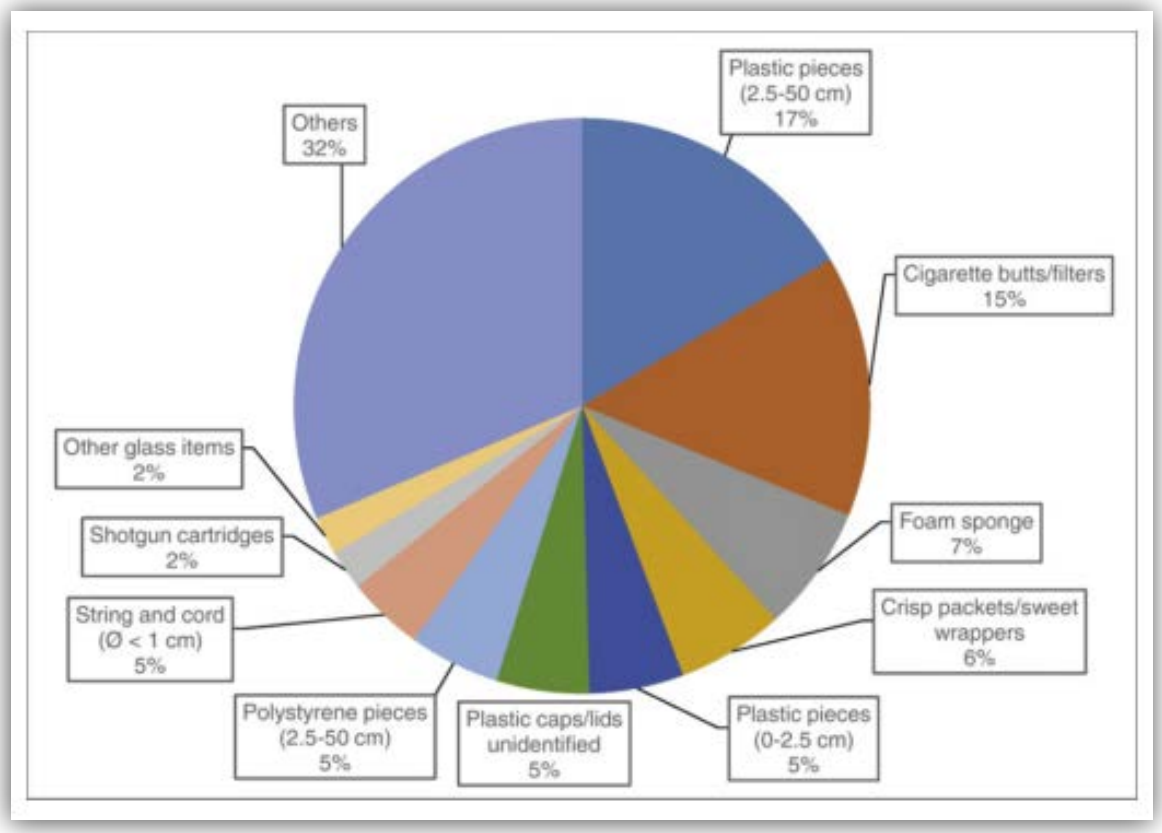


Figure A37: Examples of the trend analyses of abundance for individual litter types calculated by litter Analyst based on a) non-aggregated data from the selected seven beaches, b) nationally aggregated data, and c) subregionally aggregated data for the period from January 2009 to December 2014. (n) Number of surveys. (Source: Schulz, M., van Loon, W., Fleet, D. M., Baggelaar, P., & van der Meulen, E. (2017); OSPAR standard method and software for statistical analysis of beach litter data. Marine Pollution Bulletin. https://doi.org/10.1016/j.marpolbul.2017.06)

Beach name/country/sub-region	Top-X litter types Litter type code	Litter type definition	Median [counts survey^{-1}]	Average [counts survey^{-1}]	% of total counts	Trend (slope) [counts year^{-1}]	p-value
Juist (Germany, n = 23)	300	Nets and ropes [300]	27.0	49.0	40.6%	1.7	0.566
	301	Plastic polystyrene pieces < 50 cm [301]	4.0	12.7	10.6%	0.7	0.222
	15	Plastic: Caps [15]	2.0	7.4	6.1%	0.9	0.018
	49	Rubber: Balloons [49]	2.0	5.3	4.4%	0.7	0.244
	6	Plastic: Food [6]	2.0	4.4	3.6%	0.0	0.854
	19	Plastic: Crisp [19]	2.0	3.9	3.2%	0.0	0.975
	40	Plastic: Industrial [40]	3.0	3.6	3.0%	0.3	0.310
	3	Plastic: Small bags [3]	3.0	3.5	2.9%	0.3	0.377
	4	Plastic: Drinks [4]	1.0	2.4	2.0%	−0.3	0.193
	74	Wood: Other small [74]	0.0	2.1	1.8%	0.0	1.000
	39	Plastic: Strapping [39]	1.0	2.0	1.7%	0.3	0.033
	23	Plastic: Fertiliser [23]	0.0	2.0	1.7%	0.0	0.598
	75	Wood: Other large [75]	1.0	1.7	1.4%	0.0	0.824
	302	All cartons/tetra-paks [302]	1.0	1.6	1.3%	0.0	0.924
	5	Plastic: Cleaner [5]	0.0	1.5	1.3%	0.0	0.717
Minsener Oog (island, Germany, n = 24)	300	Nets and ropes [300]	31.0	46.9	39.6%	−1.6	0.731
	93	Glass: Other [93]	3.5	10.5	8.9%	1.0	0.200
	33	Plastic: Tangled [33]	2.0	9.3	7.8%	1.0	0.006
	301	Plastic polystyrene pieces < 50 cm [301]	3.5	5.8	4.9%	0.4	0.425
	48	Plastic: Other [48]	1.5	4.4	3.7%	0.7	0.046
	90	Metal: Other large [90]	0.0	4.0	3.4%	0.0	0.506
	91	Glass: Bottles [91]	1.0	4.0	3.3%	0.6	0.002
	40	Plastic: Industrial [40]	1.0	2.6	2.2%	0.7	0.018
	74	Wood: Other small [74]	0.0	2.4	2.0%	0.0	0.319
	39	Plastic: Strapping [39]	2.0	2.3	2.0%	0.0	0.342
	3	Plastic: Small bags [3]	1.5	2.2	1.8%	0.0	0.759
	24	Plastic: Mesh bags [24]	0.5	1.5	1.2%	0.0	0.480
	89	Metal: Other small [89]	0.5	1.4	1.2%	0.2	0.045
	6	Plastic: Food [6]	0.0	1.2	1.0%	0.0	0.102
	96	Pottery: Other [96]	0.0	1.2	1.0%	0.0	0.003
Sylt (island, Germany, n = 24)	300	Nets and ropes [300]	40.0	46.0	25.1%	1.6	0.713
	301	Plastic polystyrene pieces < 50 cm [301]	13.5	23.0	12.6%	5.6	0.054
	15	Plastic: Caps [15]	9.0	12.3	6.7%	−1.3	0.184
	48	Plastic: Other [48]	4.0	12.0	6.6%	−0.8	0.253
	4	Plastic: Drinks [4]	5.5	8.0	4.4%	2.0	0.044
	19	Plastic: Crisp [19]	1.5	5.1	2.8%	0.0	0.681
	3	Plastic: Small bags [3]	2.5	5.0	2.7%	0.0	0.384
	45	Plastic: Foam sponge [45]	3.0	4.9	2.7%	−0.2	0.650
	39	Plastic: Strapping [39]	4.0	4.6	2.5%	0.0	0.865
	49	Rubber: Balloons [49]	3.0	4.6	2.5%	0.0	0.627
	40	Plastic: Industrial [40]	4.5	4.5	2.4%	0.0	0.909
	89	Metal: Other small [89]	0.0	4.4	2.4%	0.0	0.718
	6	Plastic: Food [6]	1.5	4.3	2.4%	0.9	0.010
	74	Wood: Other small [74]	2.0	4.1	2.3%	0.0	0.797
	93	Glass: Other [93]	2.0	2.8	1.6%	0.0	0.932
	91	Glass: Bottles [91]	1.0	2.8	1.5%	0.0	0.745
Bergen (The Netherlands, n = 24)	300	Nets and ropes [300]	68.0	121.0	38.4%	19.3	0.056
	301	Plastic polystyrene pieces < 50 cm [301]	35.5	51.3	16.3%	1.7	0.637
	49	Rubber: Balloons [49]	10.5	14.0	4.4%	1.6	0.066
	15	Plastic: Caps [15]	11.0	12.7	4.0%	1.8	0.117
	3	Plastic: Small bags [3]	9.0	12.5	4.0%	0.0	0.940
	19	Plastic: Crisp [19]	8.0	12.4	3.9%	1.1	0.261
	33	Plastic: Tangled [33]	7.5	9.7	3.1%	0.0	1.000
	2	Plastic: Bags [2]	6.5	8.9	2.8%	0.1	0.765
	45	Plastic: Foam sponge [45]	6.0	7.3	2.3%	1.8	0.008
	40	Plastic: Industrial [40]	5.5	6.3	2.0%	0.5	0.241
	98	Sum: Buds [98]	3.0	5.4	1.7%	0.2	0.437
	4	Plastic: Drinks [4]	4.0	4.8	1.5%	0.0	0.599
	22	Plastic: Cutlery [22]	3.0	4.8	1.5%	0.4	0.305
	48	Plastic: Other [48]	1.0	4.8	1.5%	0.0	0.288
	6	Plastic: Food [6]	3.5	3.5	1.1%	−0.4	0.219
Noordwijk (The Netherlands, n = 23)	300	Nets and ropes [300]	103.0	163.1	36.1%	16.3	0.126
	301	Plastic polystyrene pieces < 50 cm [301]	68.0	94.3	20.9%	12.9	0.050
	15	Plastic: Caps [15]	19.0	24.7	5.5%	2.7	0.214

(continued on next page)

Figure A37 (continued): Examples of the trend analyses of abundance for individual litter types calculated by litter Analyst based on a) non-aggregated data from the selected seven beaches, b) nationally aggregated data, and c) subregionally aggregated data for the period from January 2009 to December 2014. (n) Number of surveys. (Source: Schulz, M., van Loon, W., Fleet, D. M., Baggelaar, P., & van der Meulen, E. (2017); OSPAR standard method and software for statistical analysis of beach litter data. Marine Pollution Bulletin. https://doi.org/10.1016/j.marpolbul.2017.06)

Beach name/country/sub-region	Top-X litter types Litter type code	Litter type definition	Median [counts survey^{-1}]	Average [counts survey^{-1}]	% of total counts	Trend (slope) [counts year^{-1}]	p-value
	49	Rubber: Balloons [49]	18.0	19.4	4.3%	0.5	0.633
	19	Plastic: Crisp [19]	14.0	17.8	3.9%	1.7	0.095
	45	Plastic: Foam sponge [45]	8.0	17.2	3.8%	4.4	0.002
	3	Plastic: Small bags [3]	11.0	13.5	3.0%	−1.4	0.158
	33	Plastic: Tangled [33]	7.0	10.8	2.4%	0.2	0.750
	98	Sun: Buds [98]	4.0	7.7	1.7%	0.6	0.276
	48	Plastic: Other [48]	6.0	7.5	1.7%	1.1	0.024
	4	Plastic: Drinks [4]	6.0	7.0	1.5%	0.0	1.000
	2	Plastic: Bags [2]	6.0	6.8	1.5%	−0.2	0.710
	40	Plastic: Industrial [40]	5.0	6.1	1.3%	0.3	0.296
	22	Plastic: Cutlery [22]	5.0	5.9	1.3%	0.4	0.472
	6	Plastic: Food [6]	3.0	4.8	1.1%	−0.3	0.439
Terschelling (The Netherlands, n = 24)	300	Nets and ropes [300]	132.5	150.7	37.2%	−4.7	0.812
	301	Plastic polystyrene pieces < 50 cm [301]	50.5	61.1	15.1%	0.2	0.916
	15	Plastic: Caps [15]	16.5	23.4	5.8%	0.2	0.895
	33	Plastic: Tangled [33]	11.5	17.9	4.4%	−1.0	0.427
	49	Rubber: Balloons [49]	14.5	16.8	4.1%	0.7	0.578
	19	Plastic: Crisp [19]	9.0	15.0	3.7%	−1.4	0.459
	45	Plastic: Foam sponge [45]	7.0	13.1	3.2%	0.7	0.366
	40	Plastic: Industrial [40]	9.0	11.7	2.9%	1.3	0.160
	3	Plastic: Small bags [3]	10.0	11.0	2.7%	−1.5	0.100
	2	Plastic: Bags [2]	4.0	11.0	2.7%	−1.0	0.310
	4	Plastic: Drinks [4]	6.0	6.7	1.7%	0.5	0.352
	39	Plastic: Strapping [39]	3.0	5.1	1.3%	0.4	0.363
	6	Plastic: Food [6]	5.0	4.9	1.2%	0.0	0.611
	48	Plastic: Other [48]	1.0	4.6	1.1%	0.0	0.477
	98	Sun: Buds [98]	2.0	3.8	0.9%	0.0	0.537
Veere (The Netherlands, n = 24)	300	Nets and ropes [300]	144.0	132.0	34.0%	−15.1	0.078
	301	Plastic polystyrene pieces < 50 cm [301]	71.5	63.9	16.5%	−13.7	0.010
	15	Plastic: Caps [15]	23.0	27.2	7.0%	−7.0	0.000
	33	Plastic: Tangled [33]	11.5	16.5	4.3%	−1.5	0.172
	48	Plastic: Other [48]	11.0	15.0	3.9%	−1.7	0.253
	19	Plastic: Crisp [19]	10.5	13.7	3.5%	−4.0	0.000
	45	Plastic: Foam sponge [45]	7.0	13.7	3.5%	−0.6	0.727
	98	Sun: Buds [98]	12.5	12.5	3.2%	−2.4	0.046
	49	Rubber: Balloons [49]	11.5	12.0	3.1%	−2.7	0.006
	3	Plastic: Small bags [3]	4.0	6.3	1.6%	−0.8	0.128
	40	Plastic: Industrial [40]	3.5	5.9	1.5%	−1.5	0.002
	4	Plastic: Drinks [4]	4.5	5.4	1.4%	−1.2	0.006
	74	Wood: Other small [74]	2.5	5.0	1.3%	−1.1	0.156
	22	Plastic: Cutlery [22]	4.0	4.7	1.2%	−1.2	0.035
	2	Plastic: Bags [2]	2.5	4.1	1.1%	−1.1	0.011
The Netherlands (n = 22)	300	Nets and ropes [300]	141.3	144.6	36.6%	5.3	0.463
	301	Plastic polystyrene pieces < 50 cm [301]	63.3	68.5	17.3%	1.7	0.481
	15	Plastic: Caps [15]	20.8	22.1	5.6%	−0.4	0.611
	49	Rubber: Balloons [49]	14.0	15.5	3.9%	−0.2	0.866
	19	Plastic: Crisp [19]	14.6	14.9	3.8%	−0.8	0.463
	33	Plastic: Tangled [33]	12.3	13.8	3.5%	−1.3	0.176
	45	Plastic: Foam sponge [45]	12.8	12.7	3.2%	1.8	0.113
	3	Plastic: Small bags [3]	9.0	10.9	2.8%	−1.3	0.039
	48	Plastic: Other [48]	6.5	8.0	2.0%	0.0	0.932
	2	Plastic: Bags [2]	6.9	7.9	2.0%	−1.4	0.004
	98	Sun: Buds [98]	6.6	7.6	1.9%	−0.5	0.381
	40	Plastic: Industrial [40]	6.9	7.4	1.9%	0.4	0.352
	4	Plastic: Drinks [4]	5.3	6.0	1.5%	−0.4	0.183
	22	Plastic: Cutlery [22]	5.0	4.7	1.2%	0.0	0.821
	6	Plastic: Food [6]	3.9	4.3	1.1%	−0.7	0.007
Germany (n = 20)	300	Nets and ropes [300]	37.5	48.4	34.6%	−1.1	0.795
	301	Plastic polystyrene pieces < 50 cm [301]	9.7	13.0	9.3%	2.9	0.074
	15	Plastic: Caps [15]	3.7	6.5	4.7%	0.3	0.495
	48	Plastic: Other [48]	3.2	5.5	3.9%	−0.1	0.922
	93	Glass: Other [93]	2.7	5.1	3.7%	0.4	0.435
	4	Plastic: Drinks [4]	3.0	3.7	2.6%	0.4	0.345
	40	Plastic: Industrial [40]	3.3	3.6	2.6%	0.6	0.074
	33	Plastic: Tangled [33]	1.3	3.6	2.6%	0.3	0.084
	3	Plastic: Small bags [3]	3.0	3.6	2.5%	−0.1	0.820
	6	Plastic: Food [6]	2.3	3.4	2.4%	0.5	0.026
	49	Rubber: Balloons [49]	2.5	3.2	2.3%	0.3	0.435

(continued on next page)

Figure A38: Top 20 litter types collected from all beaches in all months. Proportion in relation to all litter items from each beach, the other 81 litter items were < 0.01 % of the total. (Source: Watts, A. J. R., Porter, A., Hembrow, N., Sharpe, J., Galloway, T. S., & Lewis, C., 2017; Through the sands of time: Beach litter trends from nine cleaned north cornish beaches. Environmental Pollution, 228, 416–424)

Rank number	Litter type	Litter category[a]	Litter material[b]	Number	Proportion
1	Plastic pieces large > 1 cm-50 cm	Un-categorised	Plastic	42,940	0.17
2	Cord <50 cm	Fishing	Plastic	41,011	0.17
3	Plastic pieces small < 1 cm	Un-categorised	Plastic	38,150	0.15
4	Caps/lids (Drinks)	Un-categorised	Plastic	13,115	0.05
5	Rope < 50 cm	Fishing	Plastic	12,402	0.05
6	Fishing net < 50 cm	Fishing	Plastic	10,569	0.04
7	Crisp/sweet/lolly wrappers	Beach Visitors	Plastic	7648	0.03
8	Cord >50 cm	Fishing	Plastic	7401	0.03
9	Cigarette stubs	Beach Visitors	Other	5257	0.02
10	Polystyrene pieces < 50 cm	Un-categorised	Plastic	3713	0.01
11	Foam/sponge	Un-categorised	Plastic	3682	0.01
12	Drinks bottles	Beach Visitors	Plastic	3109	0.01
13	Paper pieces	Beach Visitors	Paper/card board	2781	0.01
14	Rope > 50 cm	Fishing	Plastic	2756	0.01
15	Bottle caps	Un-categorised	Plastic	2645	0.01
16	Cotton bud sticks	Sewage related	Plastic	2509	0.01
17	Bags (including supermarket)	Un-categorised	Plastic	2264	0.01
18	Drinks cans	Beach Visitors	Metal	2154	0.01
19	Caps/lids (Heavy Duty)	Shipping	Plastic	2006	0.01
20	Shotgun cartridges	Beach Visitors	Metal	1886	0.01

[a] Total proportion of each Litter category: **Fishing** 32% (79,439 items); **Beach users** 18% 44,684; **shipping, sewage and fly-tipped combined** 4% (9930 items); **un-sourced** 46% (114,193 items).

[b] Total proportion of each Litter material: **Plastic** 88.9% (220,802 items); **Paper/cardboard and timber** 4.1% (10,269 items); **Metal** 3.0% (7475 items); **Glass** 0.3% (787 items); **Other** 3.6% (8913 items).

Figure A39: Seasonal fluctuation of top 10 marine litter items at each survey station along the Bulgarian Black Sea coast during 2015-2016, mean number of items and standard deviation ±SD. (Source: Simeonova, A., Chuturkova, R., & Yaneva, V. (2017); Seasonal dynamics of marine litter along the Bulgarian Black Sea coast. Marine Pollution Bulletin, 119(1), 110–118)

Figure A39 (continued): Seasonal fluctuation of top 10 marine litter on each survey station along

No	ML items	Seasons			
		Summer	Autumn	Winter	Spring
Durankulak					
1	Cigarette butts and filters	682 ± 53.55	52 ± 9.85	102 ± 7.55	10 ± 2.40
2	Small plastic bags	32 ± 3.61	3 ± 1.96	6 ± 2.61	11 ± 4.56
3	Paper fragments	28 ± 6.08	17 ± 6.24	3 ± 1.36	2 ± 1.05
4	Plastic cups and cup lids	24 ± 5.57	59 ± 7.94	175 ± 13.23	10 ± 3.46
5	Plastic caps/lids drinks	22 ± 6.56	18 ± 6.50	2 ± 1.65	21 ± 6.21
6	Food containers incl. fast food containers	18 ± 4.36	2 ± 1.15	7 ± 2.35	2 ± 1.01
7	Plastic/polystyrene pieces 2.5 ÷ 50 cm	15 ± 5.20	10 ± 3.34	21 ± 6.18	7 ± 3.22
8	Straws and stirrers	13 ± 3.16	4 ± 2.15	8 ± 3.61	3 ± 1.36
9	Cans (beverage)	12 ± 4.20	8 ± 3.22	2 ± 1.23	11 ± 1.83
10	Crisps packets/sweets wrappers	11 ± 1.71	76 ± 6.02	13 ± 2.65	3 ± 1.48
Krapets					
1	Cigarette butts and filters	474 ± 21.17	407 ± 31.10	42 ± 6.56	25 ± 4.36
2	Plastic/polystyrene pieces 2.5 ÷ 50 cm	154 ± 6.93	5 ± 2.13	13 ± 2.65	4 ± 1.93
3	Plastic/polystyrene pieces 0 ÷ 2.5 cm	50 ± 6.24	25 ± 5.01	21 ± 2.25	3 ± 1.43
4	Plastic cups and cup lids	29 ± 6.36	44 ± 4.00	5 ± 2.38	43 ± 4.36
5	Plastic caps/lids unidentified	28 ± 6.46	102 ± 15.72	12 ± 6.00	3 ± 1.38
6	Plastic caps/lids drinks	22 ± 3.00	58 ± 4.36	8 ± 2.65	5 ± 2.36
7	Other paper items	21 ± 5.57	6 ± 2.16	2 ± 1.26	2 ± 1.05
8	Tobacco pouches/plastic cigarette box packaging	20 ± 7.01	2 ± 1.31	3 ± 1.60	2 ± 1.23
9	Other textiles (incl. rags)	14 ± 5.29	5 ± 2.04	3 ± 1.55	2 ± 1.18
10	Crisps packets/sweets wrappers	12 ± 2.26	86 ± 4.02	11 ± 3.61	5 ± 2.34
Channel 2 - Varna					
1	Crisps packets/sweets wrappers	168 ± 7.55	35 ± 4.58	32 ± 3.21	48 ± 6.54
2	Plastic/polystyrene pieces 2.5 ÷ 50 cm	113 ± 15.72	61 ± 3.65	11 ± 3.46	8 ± 2.62
3	Cigarette butts and filters	101 ± 8.54	10 ± 2.65	108 ± 14.11	98 ± 6.08
4	Drink bottles >0.5 L	75 ± 5.57	41 ± 6.56	28 ± 5.53	19 ± 5.20
5	Cigarette packets	64 ± 6.03	60 ± 7.01	40 ± 7.66	16 ± 5.94
6	Cups, food trays, food wrappers, drink containers	52 ± 7.55	4 ± 2.06	23 ± 5.21	7 ± 3.25
7	Other textiles (incl. rags)	50 ± 2.95	3 ± 1.28	7 ± 3.48	4 ± 2.05
8	Drink bottles < = 0.5 L	47 ± 6.93	36 ± 6.00	27 ± 5.56	19 ± 5.08
9	Small plastic bags	47 ± 4.36	21 ± 6.08	5 ± 2.51	28 ± 3.61
10	Plastic caps/lids unidentified	46 ± 6.56	50 ± 7.94	19 ± 2.65	31 ± 6.02
Shorpilovtsi					
1	Cigarette butts and filters	1008 ± 10.58	89 ± 7.81	52 ± 7.55	19 ± 3.41
2	Plastic/polystyrene pieces 2.5 ÷ 50 cm	42 ± 6.56	6 ± 2.35	7 ± 3.01	12 ± 3.15
3	Plastic caps/lids unidentified	35 ± 6.50	31 ± 5.56	23 ± 5.05	2 ± 1.02
4	Plastic caps/lids drinks	32 ± 6.54	5 ± 2.04	30 ± 4.36	59 ± 7.81
5	Small plastic bags	31 ± 3.61	11 ± 3.46	2 ± 1.25	16 ± 4.36
6	Straws and stirrers	24 ± 6.07	23 ± 7.55	17 ± 5.95	13 ± 4.27
7	Crisps packets/sweets wrappers	22 ± 5.57	14 ± 5.08	4 ± 2.03	10 ± 4.25
8	Plastic cups and cup lids	22 ± 5.24	21 ± 5.29	10 ± 3.46	17 ± 4.31
9	Cups, food trays, food wrappers, drink containers	21 ± 3.40	13 ± 4.35	3 ± 1.65	2 ± 1.23
10	Drink bottles ≤0.5 L	13 ± 4.58	9 ± 3.26	4 ± 1.95	8 ± 3.61
Obzor					
1	Cigarette butts and filters	135 ± 13.23	20 ± 7.02	16 ± 5.93	8 ± 3.52
2	Paper fragments	70 ± 5.57	5 ± 2.65	9 ± 2.86	3 ± 1.09
3	Small plastic bags	54 ± 7.94	7 ± 3.00	13 ± 4.58	2 ± 1.53
4	Plastic caps/lids drinks	47 ± 6.24	53 ± 7.02	27 ± 5.56	53 ± 7.54
5	Plastic cups and cup lids	37 ± 6.25	23 ± 5.57	5 ± 2.36	31 ± 3.60
6	Plastic/polystyrene pieces 2.5 ÷ 50 cm	32 ± 4.36	18 ± 4.21	10 ± 4.15	24 ± 5.87
7	Drink bottles >0.5 L	29 ± 5.01	20 ± 4.28	11 ± 4.32	29 ± 5.54
8	Cans (beverage)	19 ± 4.81	11 ± 4.35	2 ± 1.05	3 ± 1.46
9	Drink bottles ≤0.5 L	18 ± 5.29	13 ± 3.61	14 ± 4.57	17 ± 5.24
10	Crisps packets/sweets wrappers	10 ± 4.28	15 ± 4.95	8 ± 3.46	5 ± 2.25
Irakli					
1	Plastic/polystyrene pieces 2.5 ÷ 50 cm	285 ± 30.41	30 ± 5.57	7 ± 3.00	23 ± 4.58
2	Plastic caps/lids drinks	249 ± 16.82	32 ± 5.57	61 ± 6.24	232 ± 7.55
3	Cigarette butts and filters	67 ± 6.08	54 ± 6.56	6 ± 2.65	40 ± 5.00
4	Plastic pieces 2.5 ÷ 50 cm	58 ± 11.85	12 ± 5.08	10 ± 2.04	173 ± 9.64
5	Paper fragments	51 ± 6.56	3 ± 1.23	2 ± 1.18	7 ± 2.81
6	Small plastic bags	43 ± 7.55	3 ± 1.97	4 ± 2.05	10 ± 4.16
7	Plastic cups and cup lids	42 ± 6.24	18 ± 5.21	12 ± 5.19	24 ± 5.29
8	Plastic caps/lids unidentified	21 ± 5.15	57 ± 6.08	8 ± 3.60	405 ± 13.23
9	Crisps packets/sweets wrappers	20 ± 5.03	23 ± 6.55	17 ± 6.21	19 ± 5.54
10	Drink bottles >0.5 L	19 ± 5.56	21 ± 5.88	18 ± 5.93	25 ± 5.01

the Bulgarian Black Sea coast during 2015-2016, mean number of items and standard deviation ±SD. (Source: Simeonova, A., Chuturkova, R., & Yaneva, V. (2017). Seasonal dynamics of marine litter along the Bulgarian Black Sea coast. Marine Pollution Bulletin, 119(1), 110–118)

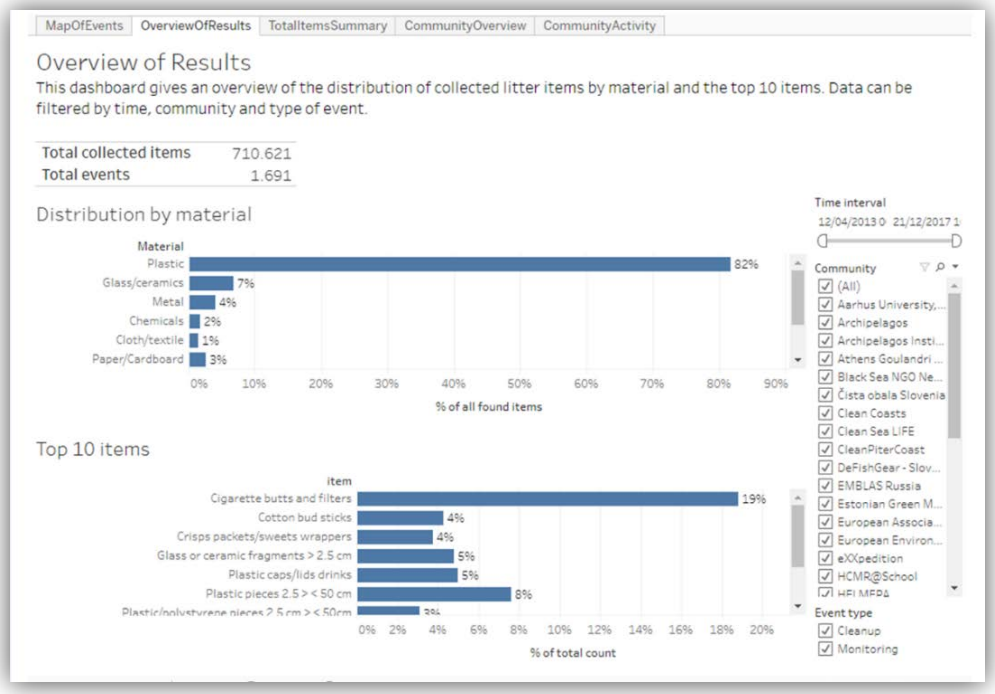
Figure A40: Component loading derived from PCA analysis on the top 10 litter item categories and indicator items (loading values > 0.5 are marked in bold). (Source: Prevenios, M., zeri, C., Tsangaris, C., Liubartseva, S., Fakiris, E., & Papatheodorou, G. (2017); Marine Pollution Bulletin, in press)

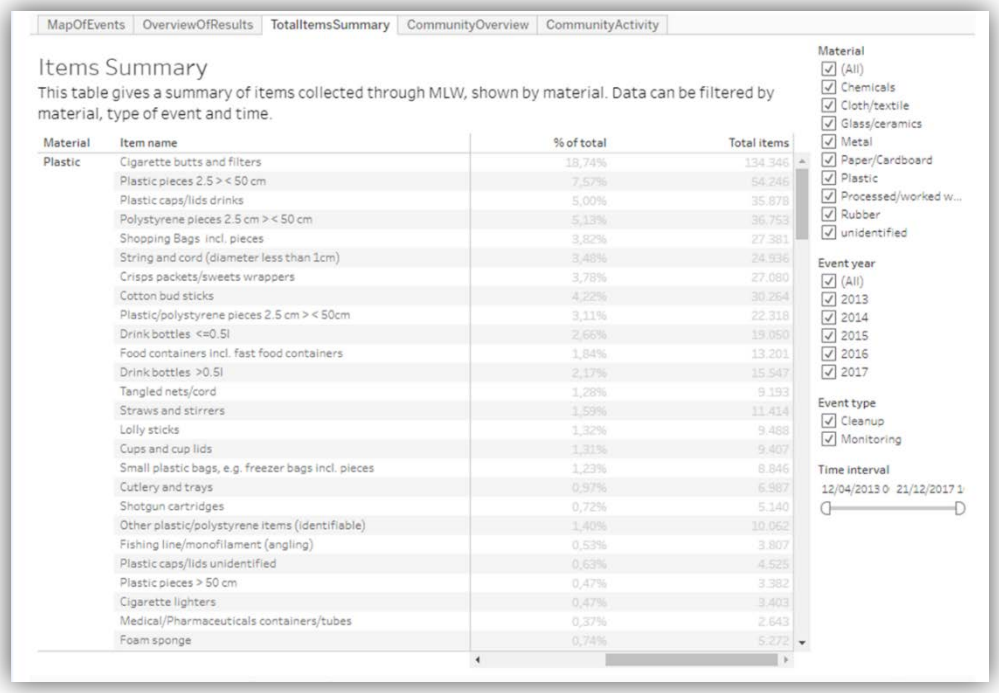
	Items categories	Beach A			Beach B			Beach C			Beach D		
		1	2	3	1	2	3	1	2	3	1	2	3
G13	Other bottles & containers							0.133	**0.880**	0.244			
G27	Cigarette butts and filters	0.215	**0.556**	0.460	0.091	**0.932**	−0.128				0.375	**0.571**	0.089
G30	Crisps packets/sweets wrappers	0.278	0.342	**0.833**	0.466	−0.021	**0.719**						
G33	Cups and cup lids				**0.601**	−0.316	**0.564**	**0.520**	**0.574**	−0.224			
G35	Straws and stirrers	**0.751**	0.319	0.264	**0.863**	0.400	0.142	**0.838**	0.263	−0.032	**0.837**	0.296	0.253
G50	String and cord (diam. < 1 cm)	**0.877**	0.167	0.258				**0.921**	0.152	−0.081	**0.834**	0.040	0.098
G67	Sheets, industrial packaging	0.137	−0.140	**0.931**	0.234	−0.284	0.748				0.167	0.315	**0.787**
G70	Shotgun cartridges							**0.702**	0.477	0.297			
G79	Plastic pieces 2.5 cm > < 50 cm	**0.885**	0.297	0.056	**0.828**	0.001	0.203	**0.658**	**0.589**	0.206	**0.917**	−0.099	−0.131
G82	Polystyrene pieces 2.5 cm > < 50 cm				0.269	**−0.731**	0.365				0.129	−0.169	0.470
G95	Cotton bud sticks	**0.872**	−0.323	0.160	0.071	**0.830**	0.086	**0.850**	0.135	0.265	**0.810**	−0.149	−0.032
G-bags		**0.583**	0.233	0.159	−0.101	0.227	**0.838**	0.266	**0.753**	−0.039	0.396	0.334	**−0.743**
G-bottles		0.335	0.442	0.307	0.386	**−0.572**	0.444	0.152	**0.876**	0.080	0.247	**−0.709**	0.151
G-caps		**0.878**	0.339	0.108	**0.895**	−0.124	0.246	**0.618**	**0.656**	0.334	**0.930**	−0.256	−0.063
G-fish		**0.644**	**0.532**	0.172	**0.687**	−0.323	0.306	**0.593**	**0.669**	0.251	**0.888**	−0.055	0.223
G-paper		0.004	**0.943**	−0.080	0.080	**0.811**	0.097	0.007	−0.025	**−0.919**	−0.063	**0.754**	−0.023
G-wood		0.370	−0.169	0.134	**0.570**	0.142	−0.292	0.374	0.492	**0.593**	0.497	**−0.526**	0.194

5. Marine LitterWatch

The Marine LitterWatch (MLW) data viewer provides a map of beach litter data collection events organised by MLW communities and citizens of science (for further information see https://www.eea.europa.eu/themes/water/europes-seas-and-coasts/assessments/marine-litterwatch). The data presented is provided by the user community using either the EEA Marine LitterWatch smartphone app (MLW source) or an agreed data exchange mechanism with the EEA Marine LitterWatch database (external import).

Figure A41: Overview graphs and tables of materials, top 10 items and summary of items collected and community engagement during the events from 2013 to 2017.





Annex II: 2016 Ranking Tables of Top Litter Items

Data from the combined and harmonised 2016 European marine beach litter data set has been analysed using different data aggregation and calculation methods. See comment on aggregated categories in Table 10.

1. Total Abundance Europe

Table A1: Marine beach litter list at European scale and the total amount per each item, normalised with transect lengths of 100m. Detailed information indicate the rank, material, general name, number, percentage and code of each item, following the Master List of Categories of Litter Items.

Rank	Material	General Name Litter Item	Master List Code	Number of Items	%
1	Plastic	Plastic/polystyrene pieces 2.5cm > < 50 cm	G76+G79+G82	52 999	14.90 %
2	Plastic	Plastic/polystyrene pieces 0-2.5cm	G75+G78+G81	49 198	13.83 %
3	Plastic	String and cord (diameter less than 1cm)	G50	48 919	13.75 %
4	Plastic	Cigarette butts and filters	G27	21 854	6.14 %
5	Plastic	Plastic caps and lids (drinks, chemicals, detergents (non-food), unidentified)/plastic rings from bottle caps/lids	G20+G21+G22+G23+G23+G24	18 732	5.27 %
6	Plastic	Cotton bud sticks	G95	13 579	3.82 %
7	Chemicals	Paraffin/wax	G213	10 305	2.90 %
8	Plastic	Crisp packets/sweet wrappers	G30	10 267	2.89 %
9	Plastic	Other plastic/polystyrene items (identifiable)	G124	10 142	2.85 %
10	Plastic	Plastic bag (Shopping bags, small plastic bags, e.g. freezer bags, plastic bag collective role; what remains from rip-off plastic bags)	G2+G3+G4+G5	6 197	1.74 %
11	unidentified	Other medical items (swabs, bandaging, adhesive plaster etc.)	G211	5 841	1.64 %
12	Plastic	Other (eg diapers, toilet paper, tissue paper, shaving razors)	x_a	5 077	1.43 %
13	Plastic	Foam sponge	G73	4 156	1.17 %
14	Plastic	Plastic/polystyrene pieces > 50 cm	G77+G80+G83	4 155	1.17 %
15	Glass/Ceramic	Bottles incl. pieces	G200	3 818	1.07 %
16	Plastic	Beverage bottles plastic	G6-G8	3 776	1.06 %
17	Plastic	Knives, forks, spoons, straws, stirrers, (cutlery)	G34-G35	3 666	1.03 %
18	Plastic	Nets and pieces of net > 50 cm	G54	3 499	0.98 %
19	Plastic	Sanitary towels/panty liners/backing strips	G96	2 877	0.81 %
20	Plastic	Rope (diameter more than 1cm)	G49	2 792	0.79 %
21	Rubber	Balloons and balloon sticks	G125	2 542	0.71 %
22	Processed/Worked Wood	Other wood < 50 cm	G171	2 468	0.69 %
23	Paper/Cardboard	Other paper items	G158	2 402	0.68 %
24	Rubber	Other rubber pieces	G134	2 385	0.67 %
25	Metal	Cans (beverage)	G175	2 373	0.67 %
26	Plastic	Food containers incl. fast food containers	G10	2 330	0.66 %
27	Plastic	Shotgun cartridges	G70	2 263	0.64 %
28	Plastic	Strapping bands	G66	2 239	0.63 %
29	Plastic	Tangled nets/cord	G56	2 108	0.59 %
30	Plastic	Cups and cup lids	G33	1 995	0.56 %

Rank	Material	General Name Litter Item	Master List Code	Number of Items	%
31	Metal	Bottle caps, lids and pull tabs	G178	1 982	0.56 %
32	Paper/Cardboard	Cigarette packets	G152	1 948	0.55 %
33	Plastic	Nets and pieces of net < 50 cm	G53	1 865	0.52 %
34	Glass/Ceramic	Other glass items	G210	1 710	0.48 %
35	Glass/Ceramic	Construction material (brick, cement, pipes)	G204	1 626	0.46 %
36	Plastic	Sheets, industrial packaging, plastic sheeting	G67	1 441	0.41 %
37	Metal	Foil wrappers, aluminum foil	G177	1 414	0.40 %
38	Plastic	Fishing line/monofilament (angling)	G59	1 351	0.38 %
39	Cloth/Textile	Clothing/rags (clothing, hats, towels)	G137	1 250	0.35 %
40	Plastic	Toys & partypoppers	G32	1 234	0.35 %
41	Plastic	Drink bottles ≤0.5 l	G7	1 188	0.33 %
42	Plastic	Cleaner bottles & containers	G9	1 148	0.32 %
43	Plastic	Mussel nets, Oyster nets	G45	1 142	0.32 %
44	Metal	Household batteries	G195	1 132	0.32 %
45	Plastic	Drink bottles >0.5 l	G8	1 131	0.32 %
46	Cloth/Textile	Other textiles (incl. rags)	G145	1 022	0.29 %
47	Paper/Cardboard	Cups, food trays, food wrappers, drink containers	G153	956	0.27 %
48	Processed/Worked Wood	Ice-cream sticks, chip forks, chopsticks, toothpicks	G165	850	0.24 %
49	Plastic	Cigarette lighters	G26	795	0.22 %
50	Cloth/Textile	Tampons and tampon applicators	G144	789	0.22 %
51	Plastic	Foam packaging/ insulation/polyurethane	G74	752	0.21 %
52	Processed/Worked Wood	Other wood > 50 cm	G172	717	0.20 %
53	Glass/Ceramic	Glass or ceramic fragments > 2.5cm	G208	714	0.20 %
54	Paper/Cardboard	Paper (including newspapers and magazines)	G154-G157	694	0.20 %
55	Plastic	Pens and pen lids	G28	642	0.18 %
56	Plastic	Rope, string, cord	G49-G50	629	0.18 %
57	Plastic	Shoes/sandals	G71	623	0.18 %
58	Plastic	Other bottles & containers (drums)	G13	617	0.17 %
59	Plastic	Crisp/sweet packets and lolly sticks	G30-G31	593	0.17 %
60	Plastic	Straws and stirrers	G35	566	0.16 %
61	Paper/Cardboard	Cardboard (boxes and fragments)	G148	557	0.16 %
62	Plastic	Plastic pieces	G74-G83/G103-G106/G122	545	0.15 %
63	Plastic	Cutlery and trays	G34	537	0.15 %
64	Plastic	Medical/pharmaceuticals containers/tubes	G100	495	0.14 %
65	Metal	Other metal pieces > 50 cm	G199	482	0.14 %
66	Rubber	Condoms (incl. packaging)	G133	480	0.14 %
67	Plastic	Floats/buoys	G62-G63	478	0.13 %
68	Plastic	Light sticks (tubes with fluid) incl. packaging	G60	458	0.13 %

Rank	Material	General Name Litter Item	Master List Code	Number of Items	%
69	Metal	Wire, wire mesh, barbed wire	G191	455	0.13 %
70	Plastic	Mesh vegetable bags	G37	452	0.13 %
71	Plastic	Gloves (industrial/ professional rubber gloves)	G41	445	0.13 %
72	Paper/Cardboard	Cartons/tetrapack (others)	G151	434	0.12 %
73	Plastic	Beach use related cosmetic bottles and containers, e.g. sunblocks	G11	422	0.12 %
74	Plastic	4/6-pack yokes, six-pack rings	G1	369	0.10 %
75	Metal	Aerosol/spray cans (industry)	G174	369	0.10 %
76	Plastic	Food containers, cups and cups lids	G10/G33	362	0.10 %
77	Processed/Worked Wood	Corks	G159	348	0.10 %
78	Paper/Cardboard	Newspapers and magazines	G154	337	0.09 %
79	Processed/Worked Wood	Processed timber and pallet	G160-G161	327	0.09 %
80	Plastic	Bottles & jars	G6	322	0.09 %
81	Metal	Gas bottles, drums and buckets (> 4L)	G189	320	0.09 %
82	Glass/Ceramic	Light bulbs	G202	294	0.08 %
83	Cloth/Textile	Shoes and sandals (e.g. leather, cloth)	G138	275	0.08 %
84	Rubber	Tyres and belts	G128	259	0.07 %
85	Cloth/Textile	Rope, string and nets	G142	243	0.07 %
86	Processed/Worked Wood	Paint brushes	G166	234	0.07 %
87	Cloth/Textile	Carpet and furnishing	G141	232	0.07 %
88	Metal	Industrial scrap	G186	232	0.07 %
89	Metal	Cans (food)	G176	210	0.06 %
90	Metal	Other metal pieces < 50 cm	G198	208	0.06 %
91	Plastic	Lolly sticks	G31	204	0.06 %
92	Cloth/Textile	Sacking (hessian)	G140	203	0.06 %
93	Plastic	Crates and containers/baskets	G18	199	0.06 %
94	Plastic	Other cosmetic bottles & containers	G12	190	0.05 %
95	Plastic	Buckets	G65	179	0.05 %
96	Plastic	Dog faeces bag	G101	178	0.05 %
97	Paper/Cardboard	Paper bags	G147	178	0.05 %
98	Organic	Fruit, food, pastry, candy and ice cream	x_t	176	0.05 %
99	Plastic	Tags (fishing and industry)	G43	174	0.05 %
100	Plastic	Jerry cans (square plastic containers with handle)	G16	170	0.05 %
101	Plastic	Injection gun containers	G17	168	0.05 %
102	Rubber	Balloons, balls and toys	G125-G126	164	0.05 %
103	Plastic	Combs/hair brushes/sunglasses	G29	161	0.05 %
104	Plastic	Syringes/needles	G99	160	0.05 %
105	Pollutants	Wax_small	x_b	153	0.04 %
106	Plastic	Tobacco pouches/plastic cigarette box packaging	G25	147	0.04 %

Rank	Material	General Name Litter Item	Master List Code	Number of Items	%
107	Plastic	Food containers, candy wrappers, cups and cups lids	G10/G30/G33	147	0.04 %
108	Paper/Cardboard	Cartons/tetrapack milk	G150	145	0.04 %
109	Plastic	Engine oil bottles & containers < 50 cm	G14	140	0.04 %
110	Plastic	Car parts	G19	135	0.04 %
111	Plastic	Gloves (washing up)	G40	132	0.04 %
112	Plastic	Crab/lobster pots and tops	G42	120	0.03 %
113	Plastic	Plastic sheeting from mussel culture (Tahitians)	G47	119	0.03 %
114	Plastic	Fibre glass/fragments	G68	113	0.03 %
115	Plastic	Fish boxes-plastic/polystyrene	G57-G58	104	0.03 %
116	Plastic	Toilet fresheners	G97	100	0.03 %
117	Plastic	Bottles < 2L	G6-G9/G11-G13	99	0.03 %
118	Paper/Cardboard	Paper fragments	G156	97	0.03 %
119	Rubber	Rubber bands (small, for kitchen/household/post use)	G131	94	0.03 %
120	Foamed Plastic	Other (specify)	x_p	93	0.03 %
121	Organic	Feces (excrement)	x_s	85	0.02 %
122	Plastic	Fertiliser/animal feed bags	G36	79	0.02 %
123	Plastic	Plastic flower pots	G90	74	0.02 %
124	Processed/Worked Wood	Matches and fireworks	G167	73	0.02 %
125	Plastic	Cups plates plastic	G33-34	73	0.02 %
126	Plastic	Hard hats/helmets	G69	71	0.02 %
127	Foamed Plastic	Cups and food packs	x_n	70	0.02 %
128	Plastic	Fish boxes - expanded polystyrene	G58	68	0.02 %
129	Rubber	Rubber boots	G127	62	0.02 %
130	Glass/Ceramic	Jars incl. pieces	G201	59	0.02 %
131	Processed/Worked Wood	Processed timber and pallet, crates	G160-G162	58	0.02 %
132	Metal	Fishing related (weights, sinkers, lures, hooks)	G182	58	0.02 %
133	Metal	Metal - Other (specify)	G186/G198-G199	53	0.01 %
134	Plastic	Masking tape	G87	53	0.01 %
135	Metal	Wire, wire mesh, barbed wire, cables	G191/G194	53	0.01 %
136	Plastic	Octopus pots	G44	53	0.01 %
137	Plastic	Engine oil bottles & containers > 50 cm	G15	53	0.01 %
138	Plastic	Plastic construction waste	G89	51	0.01 %
139	Glass/Ceramic	Bottles and jars	G200-G201	51	0.01 %
140	Processed/Worked Wood	Wood - Other < 50 cm, > 50 cm, (specify)	G171-G173	50	0.01%
141	Plastic	Fishing line (entangled)	G55	50	0.01 %
142	Sanitary waste	Sanitary (nappies, cotton buds, tampon applicators, toothbrushes)	G95-G98/G144	47	0.01 %
143	Metal	Disposable BBQ s	G179	46	0.01 %
144	Cloth/Textile	Clothing, shoes, rags, sandals ,hats and towels	G135-G138	45	0.01 %

Rank	Material	General Name Litter Item	Master List Code	Number of Items	%
145	Organic	Food waste (galley waste)	G215	44	0.01 %
146	Glass/Ceramic	Bulbs	G202/G205	44	0.01 %
147	Organic	Snuff, swedish snus	x_r	44	0.01 %
148	Metal	Appliances (refrigerators, washers, etc.)	G180	43	0.01 %
149	Organic	Other (specify)	x_u	43	0.01 %
150	Foamed Plastic	Foam pieces	G74-G83/G115/G121	42	0.01 %
151	Processed/Worked Wood	Crates	G162	41	0.01 %
152	Metal	Fragments	x_q	38	0.01 %
153	Plastic	4/6-pack yokes, six-pack rings/bags/shopping bags incl. pieces/small plastic bags, e.g. freezer bags incl. pieces	G1/G3-G5	37	0.01 %
154	Metal	Pint tins	G190	34	0.01 %
155	Processed/Worked Wood	Pallets	G160	33	0.01 %
156	Metal	Drums, e.g. oil	G187	29	0.01 %
157	Plastic	Oyster trays (round from oyster cultures)	G46	27	0.01 %
158	Plastic	Floats for fishing nets	G62	26	0.01 %
159	Rubber	Inner-tubes and rubber sheet	G129	26	0.01 %
160	Metal	Other metal pieces < 50 cm (incl. batteries)	G195/G198	26	0.01 %
161	Plastic	Cable ties	G93	26	0.01 %
162	Plastic	Synthetic rope, Rope diameter more than 1 cm	G48-G49	22	0.01 %
163	Plastic	Diapers/nappies	G98	21	0.01 %
164	Processed/Worked Wood	Wood (processed)	G170	20	0.01 %
165	Plastic	Other fishing related	G61	20	0.01 %
166	Processed/Worked Wood	Wood boards	G168	19	0.01 %
167	Pollutants	Other	x_c	19	0.01 %
168	Plastic	Biomass holder from sewage treatment plants	G91	18	0.01 %
169	Plastic	Monofilament line	G55/G59	18	0.00 %
170	Plastic	Fish boxes - plastic	G57	17	0.00 %
171	Paper/Cardboard	Tubes for fireworks	G155	16	0.00 %
172	Paper/Cardboard	Cups, food trays, food wrappers, cigarette packs, drink containers	G149-G153	15	0.00 %
173	Metal	Table ware (plates, cups and cutlery)	G181	15	0.00 %
174	Plastic/Paper	Tobacco packaging wrap	G25/G152	15	0.00 %
175	Plastic	Buoys	G63	15	0.00 %
176	Processed/Worked Wood	Wood - Other (specify)	G173	15	0.00 %
177	Cloth/Textile	Clothing, rags, sandals, hats and towels	G136-G138	14	0.00 %
178	Processed/Worked Wood	Processed timber	G161	14	0.00 %
179	Plastic	Bottles, drums, jerrycans and buckets > 2L	G15-G16/G65	14	0.00 %
180	Plastic	Flip - flops	G102	13	0.00 %
181	Plastic	Gloves/Gloves (industrial, washing up)	G39-G41	13	0.00 %

Rank	Material	General Name Litter Item	Master List Code	Number of Items	%
182	Cloth/Textile	Clothing (clothes, shoes)	G135	12	0.00 %
183	Cloth/Textile	Shoes	G136	11	0.00 %
184	Processed/Worked Wood	Fish boxes	G164	11	0.00 %
185	Plastic	Fishing net/net pieces, tangled nets/cord, lines	G51-G54/G56	11	0.00 %
186	Foamed Plastic	Foam buoys	x_o	11	0.00 %
187	Metal	Cables	G194	11	0.00 %
188	Plastic	Fishing gear (lures, traps and pots)	G42/G44/G57-G58/G60	10	0.00 %
189	Cloth/Textile	Backpack and bags	G139	9	0.00 %
190	Processed/Worked Wood	Beams/dunnage	G169	9	0.00 %
191	Cloth/Textile	Sails, canvas	G143	9	0.00 %
192	Foamed Plastic	Other plastic foam packaging	G38/G67/G74	8	0.00 %
193	Plastic	Beach use related cosmetic bottles and containers, e.g. sunblock/ other cosmetics bottles & containers	G11-G12	6	0.00 %
194	Paper/Cardboard	Paper packaging	G149	6	0.00 %
195	Metal	Lobster/crab pots	G184	6	0.00 %
196	Metal	Other cans (< 4L)	G188	5	0.00 %
197	Plastic	Telephone (incl. parts)	G88	5	0.00 %
198	Rubber	Balls	G126	5	0.00 %
199	Plastic	Mesh bags (vegetable, oyster nets and mussel bags)	G37/G45	5	0.00 %
200	Plastic	Nets and pieces of net	G52	5	0.00 %
201	Glass/Ceramic	Tableware (plates and cups)	G203	5	0.00 %
202	Plastic	Traffic cones	G72	4	0.00 %
203	Metal	Fishing related (sinkers, lures, hooks, traps and pots)	G182-G184	4	0.00 %
204	Chemicals	Slack/coal	G212	4	0.00 %
205	Processed/Worked Wood	Crab/lobster pots	G163	4	0.00 %
206	Plastic	Fishing net pieces	G51-G54	3	0.00 %
207	Glass/Ceramic	Glass buoys	G206	2	0.00 %
208	Cloth/Textile	Canvas, sailcloth, and sacking (hessian)	G140/G143	2	0.00 %
209	Metal	Fish hook remains	G183	2	0.00 %
210	Metal	Middle size containers	G185	2	0.00 %
211	Glass/Ceramic	Fluorescent light tubes	G205	2	0.00 %
212	Rubber	Wheels	G130	2	0.00 %
213	Glass/Ceramic	Octopus pots	G207	2	0.00 %
214	Plastic	CD, CD box	G84	2	0.00 %
215	unidentified	Various rubbish (worked wood, metal parts)	G216	1	0.00 %
216	Plastic	Bait containers/packaging	G92	1	0.00 %
217	Rubber	Bobbins (fishing)	G132	1	0.00 %
218	Metal	Car parts/batteries	G193	1	0.00 %

Rank	Material	General Name Litter Item	Master List Code	Number of Items	%
219	Plastic	Fishing buoys pots traps	G63/G42/G44	1	0.00 %
220	Metal	Other (metal)	G197	1	0.00 %
221	Glass/Ceramic	Large glass objects (specify)	G209	1	0.00 %
222	Plastic/Glass/Ceramic	Construction materials	G89/G204	1	0.00 %
223	Plastic	Fenders	G64	0	0.00 %
224	unidentified	Other (glass, metal, tar) < 5 mm	G217	0	0.00 %
225	Plastic	Industrial pellets	G112	0	0.00 %
226	Paper/Cardboard	Paper/cardboard	G146	0	0.00 %
227	Plastic	Salt packaging	G85	0	0.00 %
228	Plastic	Fin trees (from fins for scuba diving)	G86	0	0.00 %
229	Metal	Old oildrums old	x_j	0	0.00 %
230	Organic	Old human faeces	x_k	0	0.00 %
231	Organic	Old animal faeces	x_l	0	0.00 %
232	Cloth/Textile	Old cloth rope	x_m	0	0.00 %
233	Plastic	Old rope small	x_d	0	0.00 %
234	Plastic	Old rope large	x_e	0	0.00 %
235	Plastic	Old plastic pieces	x_f	0	0.00 %
236	Plastic/Rubber	Old gloves	x_g	0	0.00 %
237	Paper/Cardboard	Old cartons	x_h	0	0.00 %
238	Metal	Old drums new	x_i	0	0.00 %

2. Total Abundance Europe Seasonal - Winter

Table A2: Marine beach litter list at spatial (Europe) and temporal (winter season) scale with the total amount per each item, normalised with transect lengths of 100m. Detailed information indicate the rank, material, general name, number, percentage and code of each item, following the Master List of Categories of Litter Items.

Rank	Material	General Name Litter Item	Master List Code	Number of Items	%
1	Plastic	Plastic/polystyrene pieces 0-2.5cm	G75+G78+G81	8 658	20.07 %
2	Plastic	Plastic/polystyrene pieces 2.5cm > < 50 cm	G76+G79+G82	5 795	13.43 %
3	Plastic	String and cord (diameter less than 1cm)	G50	4 067	9.43 %
4	Plastic	Plastic caps and lids (drinks, chemicals, detergents (non-food), unidentified)/plastic rings from bottle caps/lids	G20+G21+G22+G23+G24	2 716	6.30 %
5	Plastic	Other plastic/polystyrene items (identifiable)	G124	2 157	5.00 %
6	Plastic	Crisp packets/sweet wrappers	G30	2 000	4.64 %
7	Plastic	Cotton bud sticks	G95	1 661	3.85 %
8	Plastic	Other (e.g. diapers, toilet paper, tissue paper, shaving razors)	x_a	1 378	3.19 %
9	Plastic	Beverage bottles plastic	G6-G8	909	2.11 %
10	Plastic	Plastic bag (Shopping bags, small plastic bags, e.g. freezer bags, plastic bag collective role; what remains from rip-off plastic bags)	G2+G3+G4+G5	852	1.98 %
11	Plastic	Cigarette butts and filters	G27	762	1.77 %
12	Plastic	Rope (diameter more than 1cm)	G49	713	1.65 %
13	Plastic	Sanitary towels/panty liners/backing strips	G96	550	1.28 %
14	Plastic	Foam sponge	G73	480	1.11 %
15	Plastic	Food containers incl. fast food containers	G10	470	1.09 %
16	Plastic	Knives, forks, spoons, straws, stirrers, (cutlery)	G34-G35	461	1.07 %
17	Metal	Cans (beverage)	G175	421	0.98 %
18	Plastic	Nets and pieces of net < 50 cm	G53	404	0.94 %
19	Plastic	Plastic/polystyrene pieces > 50 cm	G77+G80+G83	390	0.90 %
20	Glass/Ceramic	Bottles incl. pieces	G200	383	0.89 %
21	Processed/Worked Wood	Other wood < 50 cm	G171	348	0.81 %
22	Plastic	Sheets, industrial packaging, plastic sheeting	G67	287	0.67 %
23	Plastic	Shotgun cartridges	G70	272	0.63 %
24	Plastic	Strapping bands	G66	266	0.62 %
25	Metal	Household batteries	G195	256	0.59 %
26	Plastic	Fishing line/monofilament (angling)	G59	244	0.56 %
27	Plastic	Cups and cup lids	G33	242	0.56 %
28	Plastic	Toys&party poppers	G32	238	0.55 %
29	Plastic	Other bottles & containers (drums)	G13	234	0.54 %
30	Plastic	Tangled nets/cord	G56	210	0.49 %
31	Cloth/Textile	Other textiles (incl. rags)	G145	189	0.44 %
32	Metal	Foil wrappers, aluminum foil	G177	179	0.41 %
33	Cloth/Textile	Clothing/rags (clothing, hats, towels)	G137	177	0.41 %

Rank	Material	General Name Litter Item	Master List Code	Number of Items	%
34	Metal	Bottle caps, lids and pull tabs	G178	157	0.36 %
35	Plastic	Foam packaging/insulation/polyurethane	G74	149	0.35 %
36	Plastic	Cleaner bottles & containers	G9	141	0.33 %
37	Plastic	Crisp/sweet packets and lolly sticks	G30-G31	138	0.32 %
38	Rubber	Balloons and balloon sticks	G125	136	0.32 %
39	Processed/Worked Wood	Other wood > 50 cm	G172	133	0.31 %
40	Chemicals	Paraffin/wax	G213	132	0.31 %
41	Paper/Cardboard	Other paper items	G158	128	0.30 %
42	Glass/Ceramic	Other glass items	G210	128	0.30 %
43	Plastic	Pens and pen lids	G28	125	0.29 %
44	Cloth/Textile	Tampons and tampon applicators	G144	121	0.28 %
45	Plastic	Floats/buoys	G62-G63	120	0.28 %
46	Rubber	Other rubber pieces	G134	119	0.28 %
47	unidentified	Other medical items (swabs, bandaging, adhesive plaster etc.)	G211	115	0.27 %
48	Plastic	Nets and pieces of net > 50 cm	G54	113	0.26 %
49	Glass/Ceramic	Construction material (brick, cement, pipes)	G204	110	0.25 %
50	Plastic	Medical/pharmaceuticals containers/tubes	G100	101	0.23 %
51	Processed/Worked Wood	Corks	G159	100	0.23 %
52	Plastic	Mesh vegetable bags	G37	97	0.22 %
53	Plastic	Cigarette lighters	G26	96	0.22 %
54	Plastic	Beach use related cosmetic bottles and containers, e.g. sunblock	G11	95	0.22 %
55	Plastic	Bottles & jars	G6	89	0.21 %
56	Paper/Cardboard	Cardboard (boxes and fragments)	G148	88	0.20 %
57	Plastic	Drink bottles >0.5 l	G8	79	0.18 %
58	Plastic	Gloves (industrial/professional rubber gloves)	G41	78	0.18 %
59	Glass/Ceramic	Glass or ceramic fragments > 2.5cm	G208	73	0.17 %
60	Plastic	Lolly sticks	G31	73	0.17 %
61	Plastic	Mussel nets, Oyster nets	G45	72	0.17 %
62	Paper/Cardboard	Cartons/tetrapack (others)	G151	71	0.17 %
63	Plastic	Straws and stirrers	G35	70	0.16 %
64	Plastic	Drink bottles ≤0.5 l	G7	58	0.13 %
65	Metal	Aerosol/spray cans (industry)	G174	52	0.12 %
66	Plastic	Light sticks (tubes with fluid) incl. packaging	G60	50	0.12 %
67	Metal	Other metal pieces < 50 cm	G198	49	0.11 %
68	Plastic	Tobacco pouches/plastic cigarette box packaging	G25	48	0.11 %
69	Paper/Cardboard	Paper bags	G147	48	0.11 %
70	Plastic	Buckets	G65	46	0.11 %
71	Metal	Wire, wire mesh, barbed wire	G191	45	0.11 %
72	Processed/Worked Wood	Ice-cream sticks, chip forks, chopsticks, toothpicks	G165	42	0.10 %

Rank	Material	General Name Litter Item	Master List Code	Number of Items	%
73	Cloth/Textile	Shoes and sandals (e.g. leather, cloth)	G138	40	0.09 %
74	Plastic	Shoes/sandals	G71	37	0.09 %
75	Processed/Worked Wood	Processed timber and pallet	G160-G161	36	0.08 %
76	Plastic	Syringes/needles	G99	35	0.08 %
77	Metal	Cans (food)	G176	34	0.08 %
78	Rubber	Tyres and belts	G128	32	0.07 %
79	Plastic	Car parts	G19	29	0.07 %
80	Plastic	Fish boxes- plastic/polystyrene	G57-G58	29	0.07 %
81	Plastic	Combs/hair brushes/sunglasses	G29	28	0.07 %
82	Plastic	4/6-pack yokes, six-pack rings	G1	28	0.06 %
83	Plastic	Injection gun containers	G17	27	0.06 %
84	Cloth/Textile	Carpet and furnishing	G141	27	0.06 %
85	Metal	Gas bottles, drums and buckets (> 4L)	G189	27	0.06 %
86	Plastic	Crab/lobster pots and tops	G42	27	0.06 %
87	Plastic	Crates and containers/baskets	G18	27	0.06 %
88	Paper/Cardboard	Cups, food trays, food wrappers, drink containers	G153	26	0.06 %
89	Paper/Cardboard	Cigarette packets	G152	24	0.06 %
90	Metal	Industrial scrap	G186	24	0.06 %
91	Cloth/Textile	Sacking (hessian)	G140	23	0.05 %
92	Plastic	Gloves (washing up)	G40	23	0.05 %
93	Plastic	Plastic construction waste	G89	23	0.05 %
94	Plastic	Tags (fishing and industry)	G43	23	0.05 %
95	Plastic	Jerry cans (square plastic containers with handle)	G16	23	0.05 %
96	Cloth/Textile	Rope, string and nets	G142	20	0.05 %
97	Paper/Cardboard	Cartons/tetrapack milk	G150	18	0.04 %
98	Plastic	Dog faeces bag	G101	18	0.04 %
99	Plastic	Engine oil bottles & containers < 50 cm	G14	18	0.04 %
100	Metal	Other metal pieces > 50 cm	G199	17	0.04 %
101	Plastic	Diapers/nappies	G98	16	0.04 %
102	Paper/Cardboard	Newspapers and magazines	G154	14	0.03 %
103	Plastic	Octopus pots	G44	14	0.03 %
104	Plastic	4/6-pack yokes, six-pack rings/bags/shopping bags incl. pieces/small plastic bags, e.g. freezer bags incl. pieces	G1/G3-G5	14	0.03 %
105	Rubber	Rubber bands (small, for kitchen/household/post use)	G131	13	0.03 %
106	Plastic	Fishing line (entangled)	G55	13	0.03 %
107	Plastic	Fibre glass/fragments	G68	13	0.03 %
108	Rubber	Rubber boots	G127	11	0.03 %
109	Plastic	Masking tape	G87	11	0.03 %
110	Plastic	Fertiliser/animal feed bags	G36	10	0.02 %
111	Plastic	Cutlery and trays	G34	9	0.02 %

Rank	Material	General Name Litter Item	Master List Code	Number of Items	%
112	Rubber	Condoms (incl. packaging)	G133	8	0.02 %
113	Glass/Ceramic	Bulbs	G202/G205	8	0.02 %
114	Plastic	Fish boxes - plastic	G57	8	0.02 %
115	Plastic	Toilet fresheners	G97	8	0.02 %
116	Glass/Ceramic	Jars incl. pieces	G201	8	0.02 %
117	Processed/Worked Wood	Crates	G162	7	0.02 %
118	Metal	Fishing related (weights, sinkers, lures, hooks)	G182	7	0.02 %
119	Plastic	Other cosmetic bottles & containers	G12	7	0.02 %
120	Metal	Appliances (refrigirators, washers, etc.)	G180	7	0.02 %
121	Metal	Other metal pieces < 50 cm (incl. batteries)	G195/G198	7	0.02 %
122	Pollutants	Other	x_c	7	0.02 %
123	Plastic	Engine oil bottles & containers > 50 cm	G15	7	0.02 %
124	Plastic	Plastic flower pots	G90	6	0.01 %
125	Processed/Worked Wood	Wood (processed)	G170	6	0.01 %
126	Metal	Wire, wire mesh, barbed wire, cables	G191/G194	6	0.01 %
127	Paper/Cardboard	Tubes for fireworks	G155	6	0.01 %
128	Paper/Cardboard	Paper fragments	G156	6	0.01 %
129	Processed/Worked Wood	Pallets	G160	6	0.01 %
130	Metal	Lobster/crab pots	G184	5	0.01 %
131	Pollutants	Wax_small	x_b	5	0.01 %
132	Metal	Pint tins	G190	4	0.01 %
133	Processed/Worked Wood	Paint brushes	G166	4	0.01 %
134	Processed/Worked Wood	Wood boards	G168	4	0.01 %
135	Chemicals	Slack/coal	G212	4	0.01 %
136	Plastic	Other fishing related	G61	4	0.01 %
137	Glass/Ceramic	Light bulbs	G202	4	0.01 %
138	Metal	Cables	G194	3	0.01 %
139	Rubber	Inner-tubes and rubber sheet	G129	3	0.01 %
140	Cloth/Textile	Shoes	G136	3	0.01 %
141	Processed/Worked Wood	Beams/dunnage	G169	3	0.01 %
142	Metal	Disposable BBQ s	G179	3	0.01 %
143	Metal	Drums, e.g. oil	G187	3	0.01 %
144	Plastic	Beach use related cosmetic bottles and containers, e.g. sunblock/ other cosmetics bottles & containers	G11-G12	3	0.01 %
145	Plastic	Flip - flops	G102	2	0.00 %
146	Cloth/Textile	Clothing (clothes, shoes)	G135	2	0.00 %
147	Metal	Middle size containers	G185	2	0.00 %
148	Plastic	Hard hats/helmets	G69	2	0.00 %
149	Plastic	Biomass holder from sewage treatment plants	G91	2	0.00 %

Rank	Material	General Name Litter Item	Master List Code	Number of Items	%
150	Processed/Worked Wood	Wood - Other (specify)	G173	1	0.00 %
151	Organic	Food waste (galley waste)	G215	1	0.00 %
152	Rubber	Balls	G126	1	0.00 %
153	Paper/Cardboard	Paper packaging	G149	1	0.00 %
154	Processed/Worked Wood	Matches and fireworks	G167	1	0.00 %
155	Metal	Table ware (plates, cups and cutlery)	G181	1	0.00 %
156	Glass/Ceramic	Octopus pots	G207	1	0.00 %
157	Plastic	Plastic sheeting from mussel culture (Tahitians)	G47	1	0.00 %
158	Processed/Worked Wood	Processed timber	G161	0	0.00 %
159	Glass/Ceramic	Tableware (plates and cups)	G203	0	0.00 %
160	Glass/Ceramic	Large glass objects (specify)	G209	0	0.00 %
161	Plastic	Buoys	G63	0	0.00 %
162	Rubber	Wheels	G130	0	0.00 %
163	Rubber	Bobbins (fishing)	G132	0	0.00 %
164	Cloth/Textile	Backpack and bags	G139	0	0.00 %
165	Cloth/Textile	Sails, canvas	G143	0	0.00 %
166	Paper/Cardboard	Paper/cardboard	G146	0	0.00 %
167	Processed/Worked Wood	Crab/lobster pots	G163	0	0.00 %
168	Processed/Worked Wood	Fish boxes	G164	0	0.00 %
169	Metal	Other cans (< 4L)	G188	0	0.00 %
170	Metal	Car parts/batteries	G193	0	0.00 %
171	Glass/Ceramic	Fluorescent light tubes	G205	0	0.00 %
172	Glass/Ceramic	Glass buoys	G206	0	0.00 %
173	Plastic	Oyster trays (round from oyster cultures)	G46	0	0.00 %
174	Plastic	Nets and pieces of net	G52	0	0.00 %
175	Plastic	Fish boxes - expanded polystyrene	G58	0	0.00 %
176	Plastic	Floats for fishing nets	G62	0	0.00 %
177	Plastic	Fenders	G64	0	0.00 %
178	Plastic	Traffic cones	G72	0	0.00 %
179	Plastic	CD, CD box	G84	0	0.00 %
180	Plastic	Salt packaging	G85	0	0.00 %
181	Plastic	Fin trees (from fins for scuba diving)	G86	0	0.00 %
182	Plastic	Telephone (incl. parts)	G88	0	0.00 %
183	Plastic	Bait containers/packaging	G92	0	0.00 %
184	Plastic	Cable ties	G93	0	0.00 %
185	Metal	Old oildrums old	x_j	0	0.00 %
186	Organic	Old human faeces	x_k	0	0.00 %
187	Organic	Old animal faeces	x_l	0	0.00 %
188	Cloth/textile	Old cloth rope	x_m	0	0.00 %
189	Plastic	Old rope small	x_d	0	0.00 %

Rank	Material	General Name Litter Item	Master List Code	Number of Items	%
190	Plastic	Old rope large	x_e	0	0.00 %
191	Plastic	Old plastic pieces	x_f	0	0.00 %
192	Plastic/Rubber	Old gloves	x_g	0	0.00 %
193	Paper/Cardboard	Old cartons	x_h	0	0.00 %
194	Metal	Old oil drums new	x_i	0	0.00 %

3. Total Abundance Europe Seasonal - Spring

Table A3: Marine beach litter list at spatial (Europe) and temporal (spring season) scale with the total amount per each item. Detailed information indicates the rank, material, general name, number, percentage and code of each item, following the Master List of Categories of Litter Items.

Rank	Material	General Name Litter Item	Master List Code	Number of Items	%
1	Plastic	String and cord (diameter less than 1cm)	G50	34 925	19.15 %
2	Plastic	Plastic/polystyrene pieces 2.5cm > < 50 cm	G76+G79+G82	34 084	18.68 %
3	Plastic	Plastic/polystyrene pieces 0-2.5cm	G75+G78+G81	24 516	13.44 %
4	Plastic	Plastic caps and lids (drinks, chemicals, detergents (non-food), unidentified)/plastic rings from bottle caps/lids	G20+G21+G22+G23+G24	10 346	5.67 %
5	Chemicals	Paraffin/wax	G213	9 725	5.33 %
6	Plastic	Cotton bud sticks	G95	4 913	2.69 %
7	Plastic	Cigarette butts and filters	G27	4 091	2.24 %
8	Plastic	Crisp packets/sweet wrappers	G30	3 805	2.09 %
9	Plastic	Other plastic/polystyrene items (identifiable)	G124	3 480	1.91 %
10	Plastic	Nets and pieces of net > 50 cm	G54	3 255	1.78 %
11	Plastic	Plastic/polystyrene pieces > 50 cm	G77+G80+G83	3 102	1.70 %
12	Plastic	Plastic bag (Shopping bags, small plastic bags, e.g. freezer bags, plastic bag collective role; what remains from rip-off plastic bags)	G2+G3+G4+G5	2 590	1.42 %
13	Plastic	Foam sponge	G73	2 414	1.32 %
14	Paper/Cardboard	Cigarette packets	G152	1 762	0.97 %
15	Paper/Cardboard	Other paper items	G158	1 760	0.96 %
16	Rubber	Balloons and balloon sticks	G125	1 520	0.83 %
17	Plastic	Shotgun cartridges	G70	1 500	0.82 %
18	Plastic	Knives, forks, spoons, straws, stirrers, (cutlery)	G34-G35	1 485	0.81 %
19	Plastic	Beverage bottles plastic	G6-G8	1 339	0.73 %
20	Plastic	Strapping bands	G66	1 338	0.73 %
21	Plastic	Cups and cup lids	G33	1 123	0.62 %
22	Plastic	Rope (diameter more than 1cm)	G49	1 109	0.61 %
23	Glass/Ceramic	Bottles incl. pieces	G200	1 081	0.59 %
24	Rubber	Other rubber pieces	G134	1 056	0.58 %
25	Processed/Worked Wood	Other wood < 50 cm	G171	1 044	0.57 %
26	Plastic	Other (e.g. diapers, toilet paper, tissue paper, shaving razors)	x_a	1 042	0.57 %
27	Plastic	Mussel nets, Oyster nets	G45	1 030	0.56 %
28	Plastic	Tangled nets/cord	G56	1 014	0.56 %
29	Plastic	Drink bottles ≤0.5 l	G7	991	0.54 %
30	Plastic	Food containers incl. fast food containers	G10	967	0.53 %
31	Plastic	Drink bottles >0.5 l	G8	961	0.53 %
32	Metal	Cans (beverage)	G175	928	0.51 %
33	Metal	Bottle caps, lids and pull tabs	G178	787	0.43 %
34	Plastic	Cleaner bottles & containers	G9	784	0.43 %

Rank	Material	General Name Litter Item	Master List Code	Number of Items	%
35	Plastic	Nets and pieces of net < 50 cm	G53	721	0.40 %
36	Plastic	Toys & party poppers	G32	503	0.28 %
37	unidentified	Other medical items (swabs, bandaging, adhesive plaster etc.)	G211	472	0.26 %
38	Plastic	Cigarette lighters	G26	453	0.25 %
39	Glass/Ceramic	Construction material (brick, cement, pipes)	G204	448	0.25 %
40	Plastic	Cutlery and trays	G34	447	0.25 %
41	Rubber	Condoms (incl. packaging)	G133	437	0.24 %
42	Metal	Other metal pieces > 50 cm	G199	424	0.23 %
43	Cloth/Textile	Clothing/rags (clothing, hats, towels)	G137	422	0.23 %
44	Glass/Ceramic	Other glass items	G210	421	0.23 %
45	Plastic	Sheets, industrial packaging, plastic sheeting	G67	409	0.22 %
46	Plastic	Shoes/sandals	G71	394	0.22 %
47	Processed/Worked Wood	Other wood > 50 cm	G172	353	0.19 %
48	Plastic	Light sticks (tubes with fluid) incl. packaging	G60	331	0.18 %
49	Metal	Foil wrappers, aluminum foil	G177	331	0.18 %
50	Plastic	Fishing line/monofilament (angling)	G59	316	0.17 %
51	Cloth/Textile	Tampons and tampon applicators	G144	303	0.17 %
52	Plastic	Other bottles & containers (drums)	G13	300	0.16 %
53	Glass/Ceramic	Light bulbs	G202	284	0.16 %
54	Processed/Worked Wood	Ice-cream sticks, chip forks, chopsticks, toothpicks	G165	264	0.14 %
55	Cloth/Textile	Other textiles (incl. rags)	G145	258	0.14 %
56	Paper/Cardboard	Cartons/tetrapack (others)	G151	254	0.14 %
57	Plastic	Floats/buoys	G62-G63	247	0.14 %
58	Plastic	Pens and pen lids	G28	247	0.14 %
59	Metal	Aerosol/spray cans (industry)	G174	245	0.13 %
60	Plastic	Sanitary towels/panty liners/backing strips	G96	244	0.13 %
61	Plastic	Foam packaging/insulation/polyurethane	G74	235	0.13 %
62	Plastic	Medical/pharmaceuticals containers/tubes	G100	232	0.13 %
63	Processed/Worked Wood	Paint brushes	G166	219	0.12 %
64	Metal	Wire, wire mesh, barbed wire	G191	218	0.12 %
65	Paper/Cardboard	Cardboard (boxes and fragments)	G148	211	0.12 %
66	Plastic	Mesh vegetable bags	G37	208	0.11 %
67	Processed/Worked Wood	Processed timber and pallet	G160-G161	188	0.10 %
68	Plastic	Gloves (industrial/professional rubber gloves)	G41	182	0.10 %
69	Glass/Ceramic	Glass or ceramic fragments > 2.5cm	G208	179	0.10 %
70	Plastic	4/6-pack yokes, six-pack rings	G1	172	0.09 %
71	Plastic	Other cosmetic bottles & containers	G12	166	0.09 %
72	Metal	Household batteries	G195	165	0.09 %

Rank	Material	General Name Litter Item	Master List Code	Number of Items	%
73	Paper/Cardboard	Newspapers and magazines	G154	160	0.09 %
74	Plastic	Crates and containers/baskets	G18	157	0.09%
75	Cloth/Textile	Shoes and sandals (e.g. leather, cloth)	G138	153	0.08 %
76	Plastic	Crisp/sweet packets and lolly sticks	G30-G31	152	0.08 %
77	Plastic	Food containers, cups and cups lids	G10/G33	145	0.08 %
78	Plastic	Beach use related cosmetic bottles and containers, e.g. sunblock	G11	139	0.08 %
79	Plastic	Jerry cans (square plastic containers with handle)	G16	127	0.07 %
80	Metal	Gas bottles, drums and buckets (> 4L)	G189	125	0.07 %
81	Rubber	Tyres and belts	G128	122	0.07 %
82	Plastic	Rope, string, cord	G49-G50	112	0.06 %
83	Paper/Cardboard	Cups, food trays, food wrappers, drink containers	G153	111	0.06 %
84	Metal	Industrial scrap	G186	107	0.06 %
85	Plastic	Injection gun containers	G17	104	0.06 %
86	Metal	Cans (food)	G176	102	0.06 %
87	Plastic	Plastic sheeting from mussel culture (Tahitians)	G47	101	0.06 %
88	Plastic	Engine oil bottles & containers < 50 cm	G14	99	0.05 %
89	Plastic	Tags (fishing and industry)	G43	95	0.05 %
90	Plastic	Straws and stirrers	G35	94	0.05 %
91	Metal	Other metal pieces < 50 cm	G198	93	0.05 %
92	Plastic	Buckets	G65	88	0.05 %
93	Cloth/Textile	Carpet and furnishing	G141	86	0.05 %
94	Plastic	Syringes/needles	G99	85	0.05 %
95	Pollutants	Wax_small	x_b	76	0.04 %
96	Processed/Worked Wood	Corks	G159	76	0.04 %
97	Plastic	Crab/lobster pots and tops	G42	75	0.04 %
98	Foamed Plastic	Other (specify)	x_p	68	0.04 %
99	Plastic	Combs/hair brushes/sunglasses	G29	68	0.04 %
100	Paper/Cardboard	Paper bags	G147	67	0.04 %
101	Plastic	Fish boxes - expanded polystyrene	G58	64	0.04%
102	Paper/Cardboard	Cartons/tetrapack milk	G150	64	0.04 %
103	Plastic	Toilet fresheners	G97	63	0.03 %
104	Plastic	Car parts	G19	63	0.03 %
105	Plastic	Dog faeces bag	G101	60	0.03 %
106	Plastic	Hard hats/helmets	G69	56	0.03 %
107	Cloth/Textile	Sacking (hessian)	G140	56	0.03 %
108	Plastic	Plastic pieces	G74-G83/G103-G106/G122	55	0.03 %
109	Plastic	Lolly sticks	G31	54	0.03 %
110	Plastic	Fertiliser/animal feed bags	G36	50	0.03 %
111	Plastic	Bottles & jars	G6	47	0.03 %

Rank	Material	General Name Litter Item	Master List Code	Number of Items	%
112	Plastic	Fish boxes- plastic/polystyrene	G57-G58	45	0.02 %
113	Paper/Cardboard	Paper (including newspapers and magazines)	G154-G157	44	0.02 %
114	Plastic	Gloves (washing up)	G40	39	0.02 %
115	Plastic	Octopus pots	G44	35	0.02 %
116	Plastic	Fibre glass/fragments	G68	34	0.02 %
117	Processed/Worked Wood	Processed timber and pallet, crates	G160-G162	34	0.02 %
118	Metal	Fishing related (weights, sinkers, lures, hooks)	G182	33	0.02 %
119	Plastic	Engine oil bottles & containers > 50 cm	G15	30	0.02 %
120	Rubber	Rubber boots	G127	30	0.02 %
121	Plastic	Cups plates plastic	G33-34	29	0.02 %
122	Metal	Wire, wire mesh, barbed wire, cables	G191/G194	28	0.02 %
123	Plastic	Tobacco pouches/plastic cigarette box packaging	G25	28	0.02 %
124	Plastic	Food containers, candy wrappers, cups and cups lids	G10/G30/G33	27	0.01 %
125	Metal	Drums, e.g. oil	G187	26	0.01 %
126	Metal	Pint tins	G190	26	0.01 %
127	Processed/Worked Wood	Pallets	G160	24	0.01 %
128	Plastic	Bottles < 2L	G6-G9/G11-G13	23	0.01 %
129	Plastic	Oyster trays (round from oyster cultures)	G46	21	0.01 %
130	Processed/Worked Wood	Wood - Other < 50 cm, > 50 cm, (specify)	G171-G173	20	0.01 %
131	Cloth/Textile	Rope, string and nets	G142	20	0.01 %
132	Plastic	Floats for fishing nets	G62	18	0.01 %
133	Processed/Worked Wood	Crates	G162	18	0.01 %
134	Glass/Ceramic	Bulbs	G202/G205	17	0.01 %
135	Sanitary waste	Sanitary (nappies, cotton buds, tampon applicators, toothbrushes)	G95-G98/G144	16	0.01 %
136	Rubber	Rubber bands (small, for kitchen/household/post use)	G131	16	0.01 %
137	Glass/Ceramic	Bottles and jars	G200-G201	16	0.01 %
138	Metal	Appliances (refrigerators, washers, etc.)	G180	14	0.01 %
139	Rubber	Balloons, balls and toys	G125-G126	14	0.01 %
140	Processed/Worked Wood	Wood - Other (specify)	G173	13	0.01 %
141	Plastic	Buoys	G63	13	0.01 %
142	Paper/Cardboard	Paper fragments	G156	12	0.01 %
143	Glass/Ceramic	Jars incl. pieces	G201	12	0.01 %
144	Foamed Plastic	Cups and food packs	x_n	11	0.01 %
145	Plastic	Monofilament line	G55/G59	11	0.01 %
146	Plastic	Biomass holder from sewage treatment plants	G91	10	0.01 %
147	Processed/Worked Wood	Wood boards	G168	10	0.01 %
148	Metal	Disposable BBQ s	G179	10	0.01 %
149	Cloth/Textile	Clothing, rags, sandals, hats and towels	G136-G138	9	0.00 %
150	Processed/Worked Wood	Matches and fireworks	G167	9	0.00 %

Rank	Material	General Name Litter Item	Master List Code	Number of Items	%
151	Plastic	Plastic construction waste	G89	9	0.00 %
152	Organic	Fruit, food, pastry, candy and ice cream	x_t	8	0.00 %
153	Processed/Worked Wood	Wood (processed)	G170	8	0.00 %
154	Plastic	4/6-pack yokes, six-pack rings/bags/shopping bags incl. pieces/small plastic bags, e.g. freezer bags incl. pieces	G1/G3-G5	8	0.00 %
155	Organic	Food waste (galley waste)	G215	7	0.00 %
156	Cloth/Textile	Shoes	G136	7	0.00 %
157	Plastic	Fishing gear (lures, traps and pots)	G42/G44/G57-G58/G60	7	0.00 %
158	Plastic	Masking tape	G87	6	0.00 %
159	Processed/Worked Wood	Fish boxes	G164	6	0.00 %
160	Plastic	Cable ties	G93	6	0.00 %
161	Paper/Cardboard	Tubes for fireworks	G155	6	0.00 %
162	Metal	Metal - Other (specify)	G186/G198-G199	6	0.00 %
163	Plastic	Bottles, drums, jerrycans and buckets > 2L	G15-G16/G65	5	0.00 %
164	Foamed Plastic	Foam buoys	x_o	5	0.00 %
165	Rubber	Inner-tubes and rubber sheet	G129	4	0.00 %
166	Plastic	Telephone (incl. parts)	G88	4	0.00 %
167	Plastic	Flip - flops	G102	4	0.00 %
168	Cloth/Textile	Clothing, shoes, rags, sandals, hats and towels	G135-G138	4	0.00 %
169	Foamed Plastic	Other plastic foam packaging	G38/G67/G74	4	0.00 %
170	Cloth/Textile	Clothing (clothes, shoes)	G135	4	0.00 %
171	Processed/Worked Wood	Beams/dunnage	G169	4	0.00 %
172	Plastic	Other fishing related	G61	4	0.00 %
173	Metal	Fragments	x_q	4	0.00 %
174	Processed/Worked Wood	Processed timber	G161	4	0.00 %
175	Metal	Table ware (plates, cups and cutlery)	G181	3	0.00 %
176	Plastic	Plastic flower pots	G90	3	0.00 %
177	Plastic	Mesh bags (vegetable, oyster nets and mussel bags)	G37/G45	3	0.00 %
178	Organic	Other (specify)	x_u	3	0.00 %
179	Plastic	Fishing net/net pieces, tangled nets/cord, lines	G51-G54/G56	3	0.00 %
180	Organic	Feces (excrement)	x_s	2	0.00 %
181	Glass/Ceramic	Glass buoys	G206	2	0.00 %
182	Plastic/Paper	Tobacco packaging wrap	G25/G152	2	0.00 %
183	Plastic	Fish boxes - plastic	G57	2	0.00 %
184	Metal	Other metal pieces < 50 cm (incl. batteries)	G195/G198	2	0.00 %
185	Processed/Worked Wood	Crab/lobster pots	G163	2	0.00 %
186	Plastic	Synthetic rope, Rope diameter more than 1 cm	G48-G49	2	0.00 %
187	Glass/Ceramic	Fluorescent light tubes	G205	2	0.00 %
188	Plastic	CD, CD box	G84	2	0.00 %

Rank	Material	General Name Litter Item	Master List Code	Number of Items	%
189	Cloth/Textile	Sails, canvas	G143	1	0.00 %
190	Glass/Ceramic	Tableware (plates and cups)	G203	1	0.00 %
191	Metal	Cables	G194	1	0.00 %
192	Rubber	Bobbins (fishing)	G132	1	0.00 %
193	Metal	Other cans (< 4L)	G188	1	0.00 %
194	Plastic	Fishing net pieces	G51-G54	1	0.00 %
195	Foamed Plastic	Foam pieces	G74-G83/G115/G121	1	0.00 %
196	Rubber	Balls	G126	1	0.00 %
197	Cloth/Textile	Backpack and bags	G139	1	0.00 %
198	Metal	Fish hook remains	G183	1	0.00 %
199	Metal	Lobster/crab pots	G184	1	0.00 %
200	Plastic	Gloves/Gloves (industrial, washing up)	G39-G41	1	0.00 %
201	Plastic	Nets and pieces of net	G52	1	0.00 %
202	Plastic	Diapers/nappies	G98	1	0.00 %
203	Organic	Snuff, swedish snus	x_r	1	0.00 %
204	Pollutants	Other	x_c	1	0.00 %
205	Plastic	Beach use related cosmetic bottles and containers, e.g. sunblock/ other cosmetics bottles & containers	G11-G12	1	0.00 %
206	Metal	Other (metal)	G197	1	0.00 %
207	Plastic	Traffic cones	G72	1	0.00 %
208	unidentified	Various rubbish (worked wood, metal parts)	G216	1	0.00 %
209	Plastic/Glass/Ceramic	Construction materials	G89/G204	1	0.00 %
210	Rubber	Wheels	G130	1	0.00 %
211	Glass/Ceramic	Octopus pots	G207	1	0.00 %
212	Cloth/Textile	Canvas, sailcloth, and sacking (hessian)	G140/G143	0	0.00 %
213	Plastic	Fenders	G64	0	0.00 %
214	Plastic	Bait containers/packaging	G92	0	0.00 %
215	Glass/Ceramic	Large glass objects (specify)	G209	0	0.00 %
216	unidentified	Other (glass, metal, tar) < 5 mm	G217	0	0.00 %
217	Plastic	Industrial pellets	G112	0	0.00 %
218	Paper/Cardboard	Cups, food trays, food wrappers, cigarette packs, drink containers	G149-G153	0	0.00 %
219	Metal	Fishing related (sinkers, lures, hooks, traps and pots)	G182-G184	0	0.00 %
220	Metal	Car parts/batteries	G193	0	0.00 %
221	Plastic	Fishing buoys pots traps	G63/G42/G44	0	0.00 %
222	Plastic	Salt packaging	G85	0	0.00 %
223	Plastic	Fin trees (from fins for scuba diving)	G86	0	0.00 %
224	Metal	Old oildrums old	x_j	0	0.00 %
225	Organic	Old human faeces	x_k	0	0.00 %
226	Organic	Old animal faeces	x_l	0	0.00 %
227	Cloth/Textile	Old cloth rope	x_m	0	0.00 %

Rank	Material	General Name Litter Item	Master List Code	Number of Items	%
228	Plastic	Old rope small	x_d	0	0.00 %
229	Plastic	Old rope large	x_e	0	0.00 %
230	Plastic	Old plastic pieces	x_f	0	0.00 %
231	Plastic/Rubber	Old gloves	x_g	0	0.00 %
232	Paper/Cardboard	Old cartons	x_h	0	0.00 %
233	Metal	Old oildrums new	x_i	0	0.00 %

4. Total Abundance Europe Seasonal - Summer

Table A4: Marine beach litter list at spatial (Europe) and temporal (summer season) scale with the total amount per each item. Detailed information indicates the rank, material, general name, number, percentage and code of each item, following the Master List of Categories of Litter Items.

Rank	Material	General Name Litter Item	Master List Code	Number of Items	%
1	Plastic	Cigarette butts and filters	G27	9 727	14.17 %
2	Plastic	Plastic/polystyrene pieces 0-2.5cm	G75+G78+G81	6 789	9.89 %
3	Plastic	Plastic/polystyrene pieces 2.5cm > < 50 cm	G76+G79+G82	5 924	8.63 %
4	Plastic	String and cord (diameter less than 1cm)	G50	4 858	7.08 %
5	Plastic	Other plastic/polystyrene items (identifiable)	G124	3 554	5.18 %
6	unidentified	Other medical items (swabs, bandaging, adhesive plaster etc.)	G211	3 449	5.02 %
7	Plastic	Plastic caps and lids (drinks, chemicals, detergents (non-food), unidentified)/plastic rings from bottle caps/lids	G20+G21+G22+G23+G24	2 732	3.98 %
8	Plastic	Other (e.g. diapers, toilet paper, tissue paper, shaving razors)	x_a	2 352	3.43 %
9	Plastic	Crisp packets/sweet wrappers	G30	2 283	3.33 %
10	Plastic	Cotton bud sticks	G95	2 102	3.06 %
11	Plastic	Plastic bag (Shopping bags, small plastic bags, e.g. freezer bags, plastic bag collective role; what remains from rip-off plastic bags)	G2+G3+G4+G5	1 878	2.74 %
12	Plastic	Sanitary towels/panty liners/backing strips	G96	1 204	1.75 %
13	Plastic	Knives, forks, spoons, straws, stirrers, (cutlery)	G34-G35	951	1.39 %
14	Glass/Ceramic	Bottles incl. pieces	G200	921	1.34 %
15	Rubber	Other rubber pieces	G134	831	1.21 %
16	Paper/Cardboard	Cups, food trays, food wrappers, drink containers	G153	724	1.06 %
17	Plastic	Beverage bottles plastic	G6-G8	693	1.01 %
18	Plastic	Foam sponge	G73	653	0.95 %
19	Paper/Cardboard	Paper (including newspapers and magazines)	G154-G157	646	0.94 %
20	Glass/Ceramic	Construction material (brick, cement, pipes)	G204	606	0.88 %
21	Metal	Cans (beverage)	G175	585	0.85 %
22	Metal	Bottle caps, lids and pull tabs	G178	548	0.80 %
23	Metal	Foil wrappers, aluminum foil	G177	538	0.78 %
24	Plastic	Rope (diameter more than 1cm)	G49	503	0.73 %
25	Plastic	Rope, string, cord	G49-G50	503	0.73 %
26	Plastic	Fishing line/monofilament (angling)	G59	499	0.73 %
27	Rubber	Balloons and balloon sticks	G125	475	0.69 %
28	Plastic	Tangled nets/cord	G56	471	0.69 %
29	Plastic	Plastic pieces	G74-G83/G103-G106/G122	449	0.65 %
30	Plastic	Plastic/polystyrene pieces > 50 cm	G77+G80+G83	418	0.61 %
31	Plastic	Food containers incl. fast food containers	G10	408	0.59 %
32	Plastic	Sheets, industrial packaging, plastic sheeting	G67	394	0.57 %
33	Processed/Worked Wood	Other wood < 50 cm	G171	387	0.56 %

Rank	Material	General Name Litter Item	Master List Code	Number of Items	%
34	Glass/Ceramic	Glass or ceramic fragments > 2.5cm	G208	357	0.52 %
35	Cloth/Textile	Clothing/rags (clothing, hats, towels)	G137	356	0.52 %
36	Paper/Cardboard	Other paper items	G158	355	0.52 %
37	Plastic	Nets and pieces of net < 50 cm	G53	352	0.51 %
38	Glass/Ceramic	Other glass items	G210	333	0.49 %
39	Chemicals	Paraffin/wax	G213	332	0.48 %
40	Plastic	Straws and stirrers	G35	328	0.48 %
41	Cloth/Textile	Other textiles (incl. rags)	G145	317	0.46 %
42	Plastic	Strapping bands	G66	312	0.45 %
43	Plastic	Foam packaging/insulation/polyurethane	G74	295	0.43 %
44	Plastic	Cups and cup lids	G33	290	0.42 %
45	Processed/Worked Wood	Ice-cream sticks, chip forks, chopsticks, toothpicks	G165	258	0.38 %
46	Plastic	Shotgun cartridges	G70	255	0.37 %
47	Plastic	Toys & party poppers	G32	250	0.36 %
48	Plastic	Food containers, cups and cups lids	G10/G33	199	0.29 %
49	Cloth/Textile	Tampons and tampon applicators	G144	196	0.29 %
50	Metal	Household batteries	G195	192	0.28 %
51	Plastic	Crisp/sweet packets and lolly sticks	G30-G31	175	0.25 %
52	Plastic	Pens and pen lids	G28	143	0.21 %
53	Organic	Fruit, food, pastry, candy and ice cream	x_t	142	0.21 %
54	Rubber	Balloons, balls and toys	G125-G126	141	0.21 %
55	Cloth/Textile	Rope, string and nets	G142	129	0.19 %
56	Paper/Cardboard	Cardboard (boxes and fragments)	G148	127	0.18 %
57	Plastic	Gloves (industrial/professional rubber gloves)	G41	112	0.16 %
58	Plastic	Cleaner bottles & containers	G9	109	0.16 %
59	Plastic	Cigarette lighters	G26	105	0.15 %
60	Metal	Gas bottles, drums and buckets (> 4L)	G189	101	0.15 %
61	Metal	Wire, wire mesh, barbed wire	G191	99	0.14 %
62	Plastic	Beach use related cosmetic bottles and containers, e.g. sunblock	G11	97	0.14 %
63	Cloth/Textile	Sacking (hessian)	G140	96	0.14 %
64	Plastic	Food containers, candy wrappers, cups and cups lids	G10/G30/G33	93	0.14 %
65	Plastic	Mesh vegetable bags	G37	89	0.13 %
66	Plastic	4/6-pack yokes, six-pack rings	G1	89	0.13 %
67	Processed/Worked Wood	Other wood > 50 cm	G172	89	0.13 %
68	Processed/Worked Wood	Processed timber and pallet	G160-G161	88	0.13 %
69	Plastic	Bottles & jars	G6	84	0.12 %
70	Plastic	Shoes/sandals	G71	81	0.12 %
71	Paper/Cardboard	Cigarette packets	G152	78	0.11 %

Rank	Material	General Name Litter Item	Master List Code	Number of Items	%
72	Organic	Feces (excrement)	x_s	77	0.11 %
73	Plastic	Floats/buoys	G62-G63	75	0.11 %
74	Processed/Worked Wood	Corks	G159	72	0.11 %
75	Plastic	Nets and pieces of net > 50 cm	G54	69	0.10 %
76	Pollutants	Wax_small	x_b	66	0.10 %
77	Plastic	Bottles < 2L	G6-G9/G11-G13	66	0.10 %
78	Metal	Industrial scrap	G186	62	0.09 %
79	Paper/Cardboard	Newspapers and magazines	G154	59	0.09 %
80	Paper/Cardboard	Cartons/tetrapack (others)	G151	58	0.08 %
81	Foamed Plastic	Cups and food packs	x_n	58	0.08 %
82	Rubber	Tyres and belts	G128	57	0.08 %
83	Plastic	Medical/pharmaceuticals containers/tubes	G100	56	0.08 %
84	Cloth/Textile	Carpet and furnishing	G141	54	0.08 %
85	Processed/Worked Wood	Matches and fireworks	G167	49	0.07 %
86	Rubber	Rubber bands (small, for kitchen/household/post use)	G131	43	0.06 %
87	Metal	Metal - Other (specify)	G186/G198-G199	42	0.06 %
88	Plastic	Dog faeces bag	G101	41	0.06 %
89	Plastic	Cups plates plastic	G33-34	41	0.06 %
90	Plastic	Other bottles & containers (drums)	G13	40	0.06 %
91	Plastic	Fibre glass/fragments	G68	40	0.06 %
92	Foamed Plastic	Foam pieces	G74-G83/G115/G121	39	0.06 %
93	Cloth/Textile	Clothing, shoes, rags, sandals, hats and towels	G135-G138	38	0.06 %
94	Cloth/Textile	Shoes and sandals (e.g. leather, cloth)	G138	38	0.05 %
95	Paper/Cardboard	Cartons/tetrapack milk	G150	38	0.05 %
96	Organic	Snuff, swedish snus	x_r	37	0.05 %
97	Plastic	Combs/hair brushes/sunglasses	G29	36	0.05 %
98	Metal	Cans (food)	G176	35	0.05 %
99	Plastic	Gloves (washing up)	G40	34	0.05 %
100	Metal	Fragments	x_q	32	0.05 %
101	Metal	Aerosol/spray cans (industry)	G174	31	0.05 %
102	Glass/Ceramic	Bottles and jars	G200-G201	30	0.04 %
103	Plastic	Tags (fishing and industry)	G43	30	0.04 %
104	Paper/Cardboard	Paper fragments	G156	29	0.04 %
105	Plastic	Light sticks (tubes with fluid) incl. packaging	G60	27	0.04 %
106	Paper/Cardboard	Paper bags	G147	26	0.04 %
107	Sanitary waste	Sanitary (nappies, cotton buds, tampon applicators, toothbrushes)	G95-G98/G144	26	0.04 %
108	Plastic	Tobacco pouches/plastic cigarette box packaging	G25	26	0.04 %
109	Food waste	Food waste (galley waste)	G215	24	0.04 %
110	Plastic	Car parts	G19	24	0.03 %

Rank	Material	General Name Litter Item	Master List Code	Number of Items	%
111	Plastic	Toilet fresheners	G97	23	0.03 %
112	Processed/Worked Wood	Wood - Other < 50 cm, > 50 cm, (specify)	G171-G173	22	0.03 %
113	Plastic	Buckets	G65	21	0.03 %
114	Rubber	Condoms (incl. packaging)	G133	19	0.03 %
115	Foamed Plastic	Other (specify)	x_p	19	0.03 %
116	Plastic	Lolly sticks	G31	18	0.03 %
117	Plastic	Cutlery and trays	G34	18	0.03 %
118	Metal	Disposable BBQ s	G179	17	0.03 %
119	Plastic	Mussel nets, Oyster nets	G45	17	0.02 %
120	Plastic	Synthetic rope, Rope diameter more than 1 cm	G48-G49	17	0.02 %
121	Plastic	Drink bottles >0.5 l	G8	17	0.02 %
122	Plastic	Engine oil bottles & containers < 50 cm	G14	16	0.02 %
123	Plastic	Injection gun containers	G17	16	0.02 %
124	Plastic	Syringes/needles	G99	16	0.02 %
125	Metal	Other metal pieces < 50 cm	G198	14	0.02 %
126	Rubber	Inner-tubes and rubber sheet	G129	14	0.02 %
127	Plastic	Jerry cans (square plastic containers with handle)	G16	13	0.02 %
128	Rubber	Rubber boots	G127	13	0.02 %
129	Metal	Appliances (refrigerators, washers, etc.)	G180	13	0.02 %
130	Plastic	Fishing line (entangled)	G55	13	0.02 %
131	Paper/Cardboard	Cups, food trays, food wrappers, cigarette packs, drink containers	G149-G153	13	0.02 %
132	Processed/Worked Wood	Processed timber and pallet, crates	G160-G162	12	0.02 %
133	Glass/Ceramic	Bulbs	G202/G205	12	0.02 %
134	Plastic	Fish boxes- plastic/polystyrene	G57-G58	12	0.02 %
135	Plastic	Drink bottles ≤0.5 l	G7	12	0.02 %
136	Plastic/Paper	Tobacco packaging wrap	G25/G152	11	0.02 %
137	Plastic	Gloves/Gloves (industrial, washing up)	G39-G41	11	0.02 %
138	Plastic	Masking tape	G87	11	0.02 %
139	Plastic	Engine oil bottles & containers > 50 cm	G15	10	0.01 %
140	Plastic	Fertiliser/animal feed bags	G36	10	0.01 %
141	Plastic	Crab/lobster pots and tops	G42	10	0.01 %
142	Metal	Other metal pieces > 50 cm	G199	10	0.01 %
143	Metal	Table ware (plates, cups and cutlery)	G181	8	0.01 %
144	Plastic	4/6-pack yokes, six-pack rings/bags/shopping bags incl. pieces/small plastic bags, e.g. freezer bags incl. pieces	G1/G3-G5	7	0.01 %
145	Plastic	Crates and containers/baskets	G18	7	0.01 %
146	Plastic	Plastic construction waste	G89	7	0.01 %
147	Processed/Worked Wood	Paint brushes	G166	6	0.01 %
148	Metal	Wire, wire mesh, barbed wire, cables	G191/G194	6	0.01 %

Rank	Material	General Name Litter Item	Master List Code	Number of Items	%
149	Plastic	Fishing net/net pieces, tangled nets/cord, lines	G51-G54/G56	6	0.01 %
150	Foamed Plastic	Foam buoys	x_o	6	0.01 %
151	Plastic	Bottles, drums, jerrycans and buckets > 2L	G15-G16/G65	6	0.01 %
152	Cloth/Textile	Clothing, rags, sandals, hats and towels	G136-G138	5	0.01 %
153	Processed/Worked Wood	Crates	G162	5	0.01 %
154	Processed/Worked Wood	Fish boxes	G164	5	0.01 %
155	Metal	Other metal pieces < 50 cm (incl. batteries)	G195/G198	5	0.01 %
156	Plastic	Oyster trays (round from oyster cultures)	G46	5	0.01%
157	Plastic	Monofilament line	G55/G59	5	0.01 %
158	Paper/Cardboard	Paper packaging	G149	4	0.01 %
159	Metal	Fishing related (sinkers, lures, hooks, traps and pots)	G182-G184	4	0.01 %
160	Foamed Plastic	Other plastic foam packaging	G38/G67/G74	4	0.01 %
161	Metal	Other cans (< 4L)	G188	4	0.01 %
162	Glass/Ceramic	Light bulbs	G202	3	0.00 %
163	Plastic	Plastic flower pots	G90	3	0.00 %
164	Plastic	Other cosmetic bottles & containers	G12	3	0.00 %
165	Metal	Pint tins	G190	3	0.00 %
166	Plastic	Fishing gear (lures, traps and pots)	G42/G44/G57-G58/G60	3	0.00 %
167	Plastic	Octopus pots	G44	3	0.00 %
168	Plastic	Biomass holder from sewage treatment plants	G91	3	0.00 %
169	Plastic	Cable ties	G93	3	0.00 %
170	Organic	Other (specify)	x_u	3	0.00 %
171	Paper/Cardboard	Tubes for fireworks	G155	2	0.00 %
172	Processed/Worked Wood	Pallets	G160	2	0.00 %
173	Plastic	Flip - flops	G102	2	0.00 %
174	Processed/Worked Wood	Wood (processed)	G170	2	0.00 %
175	Plastic	Fishing net pieces	G51-G54	2	0.00 %
176	Plastic	Hard hats/helmets	G69	2	0.00 %
177	Pollutants	Other	x_c	2	0.00 %
178	Plastic	Diapers/nappies	G98	2	0.00 %
179	Cloth/Textile	Canvas, sailcloth, and sacking (hessian)	G140/G143	1	0.00 %
180	Glass/Ceramic	Tableware (plates and cups)	G203	1	0.00 %
181	Plastic	Buoys	G63	1	0.00 %
182	Plastic	Beach use related cosmetic bottles and containers, e.g. sunblock/ other cosmetics bottles & containers	G11-G12	1	0.00 %
183	Cloth/Textile	Backpack and bags	G139	1	0.00 %
184	Metal	Fishing related (weights, sinkers, lures, hooks)	G182	1	0.00 %
185	Metal	Fish hook remains	G183	1	0.00 %
186	Plastic	Mesh bags (vegetable, oyster nets and mussel bags)	G37/G45	1	0.00 %

Rank	Material	General Name Litter Item	Master List Code	Number of Items	%
187	Plastic	Other fishing related	G61	1	0.00 %
188	Plastic	Fishing buoys pots traps	G63/G42/G44	1	0.00 %
189	Processed/Worked Wood	Processed timber	G161	1	0.00 %
190	Glass/Ceramic	Jars incl. pieces	G201	1	0.00 %
191	Cloth/Textile	Sails, canvas	G143	0	0.00 %
192	Metal	Cables	G194	0	0.00 %
193	Metal	Other (metal)	G197	0	0.00 %
194	Glass/Ceramic	Large glass objects (specify)	G209	0	0.00 %
195	unidentified	Various rubbish (worked wood, metal parts)	G216	0	0.00 %
196	Processed/Worked Wood	Wood - Other (specify)	G173	0	0.00 %
197	Plastic	Industrial pellets	G112	0	0.00 %
198	Rubber	Balls	G126	0	0.00 %
199	Rubber	Wheels	G130	0	0.00 %
200	Rubber	Bobbins (fishing)	G132	0	0.00 %
201	Processed/Worked Wood	Crab/lobster pots	G163	0	0.00 %
202	Metal	Lobster/crab pots	G184	0	0.00 %
203	Metal	Drums, e.g. oil	G187	0	0.00 %
204	Metal	Car parts/batteries	G193	0	0.00 %
205	Glass/Ceramic	Fluorescent light tubes	G205	0	0.00 %
206	Glass/Ceramic	Glass buoys	G206	0	0.00 %
207	Glass/Ceramic	Octopus pots	G207	0	0.00 %
208	Plastic	Plastic sheeting from mussel culture (Tahitians)	G47	0	0.00 %
209	Plastic	Nets and pieces of net	G52	0	0.00 %
210	Plastic	Fish boxes - plastic	G57	0	0.00 %
211	Plastic	Fish boxes - expanded polystyrene	G58	0	0.00 %
212	Plastic	Floats for fishing nets	G62	0	0.00 %
213	Plastic	Fenders	G64	0	0.00 %
214	Plastic	Traffic cones	G72	0	0.00 %
215	Plastic	CD, CD box	G84	0	0.00 %
216	Plastic	Salt packaging	G85	0	0.00 %
217	Plastic	Fin trees (from fins for scuba diving)	G86	0	0.00 %
218	Plastic	Telephone (incl. parts)	G88	0	0.00 %
219	Plastic/Glass/Ceramic	Construction materials	G89/G204	0	0.00 %
220	Plastic	Bait containers/packaging	G92	0	0.00 %
221	Metal	Old oildrums old	x_j	0	0.00 %
222	Organic	Old human faeces	x_k	0	0.00 %
223	Organic	Old animal faeces	x_l	0	0.00 %
224	Cloth/Textile	Old cloth rope	x_m	0	0.00 %
225	Plastic	Old rope small	x_d	0	0.00 %
226	Plastic	Old rope large	x_e	0	0.00 %

Rank	Material	General Name Litter Item	Master List Code	Number of Items	%
227	Plastic	Old plastic pieces	x_f	0	0.00 %
228	Plastic/Rubber	Old gloves	x_g	0	0.00 %
229	Paper/Cardboard	Old cartons	x_h	0	0.00 %
230	Metal	Old oildrums new	x_i	0	0.00 %

5. Total Abundance Europe Seasonal - Autumn

Table A4: Marine beach litter list at spatial (Europe) and temporal (autumn season) scale with the total amount per each item. Detailed information indicate the rank, material, general name, number, percentage and code for each item, following the Master List of Categories of Litter Items.

Rank	Material	General Name Litter Item	Master List Code	Number of Items	%
1	Plastic	Plastic/polystyrene pieces 0-2.5cm	G75+G78+G81	9 235	15.02 %
2	Plastic	Cigarette butts and filters	G27	7 274	11.83 %
3	Plastic	Plastic/polystyrene pieces 2.5cm > < 50 cm	G76+G79+G82	7 197	11.71 %
4	Plastic	String and cord (diameter less than 1cm)	G50	5 069	8.25 %
5	Plastic	Cotton bud sticks	G95	4 904	7.98 %
6	Plastic	Plastic caps and lids (drinks, chemicals, detergents (non-food), unidentified)/plastic rings from bottle caps/lids	G20+G21+G22+G23+G24	2 938	4.78 %
7	Plastic	Crisp packets/sweet wrappers	G30	2 179	3.55 %
8	unidentified	Other medical items (swabs, bandaging, adhesive plaster etc.)	G211	1 805	2.94 %
9	Glass/Ceramic	Bottles incl. pieces	G200	1 434	2.33 %
10	Plastic	Other plastic/polystyrene items (identifiable)	G124	951	1.55 %
11	Plastic	Sanitary towels/panty liners/backing strips	G96	879	1.43 %
12	Plastic	Plastic bag (Shopping bags, Small plastic bags, e.g. freezer bags, Plastic bag collective role; what remains from rip-off plastic bags)	G2+G3+G4+G5	877	1.43 %
13	Plastic	Beverage bottles plastic	G6-G8	835	1.36 %
14	Glass/Ceramic	Other glass items	G210	829	1.35 %
15	Plastic	Knives, forks, spoons, straws, stirrers, (cutlery)	G34-G35	769	1.25 %
16	Processed/Worked Wood	Other wood < 50 cm	G171	690	1.12 %
17	Plastic	Foam sponge	G73	609	0.99 %
18	Metal	Household batteries	G195	518	0.84 %
19	Metal	Bottle caps, lids and pull tabs	G178	490	0.80 %
20	Plastic	Food containers incl. fast food containers	G10	485	0.79 %
21	Plastic	Rope (diameter more than 1cm)	G49	467	0.76 %
22	Glass/Ceramic	Construction material (brick, cement, pipes)	G204	463	0.75 %
23	Metal	Cans (beverage)	G175	439	0.71 %
24	Plastic	Tangled nets/cord	G56	414	0.67 %
25	Rubber	Balloons and balloon sticks	G125	411	0.67 %
26	Plastic	Nets and pieces of net < 50 cm	G53	388	0.63 %
27	Rubber	Other rubber pieces	G134	380	0.62 %
28	Metal	Foil wrappers, aluminum foil	G177	367	0.60 %
29	Plastic	Sheets, industrial packaging, plastic sheeting	G67	350	0.57 %
30	Plastic	Cups and cup lids	G33	341	0.56 %
31	Plastic	Strapping bands	G66	323	0.52 %
32	Plastic	Other (e.g. diapers, toilet paper, tissue paper, shaving razors)	x_a	305	0.50 %
33	Cloth/Textile	Clothing/rags (clothing, hats, towels)	G137	295	0.48 %
34	Plastic	Fishing line/monofilament	G59	292	0.48 %

Rank	Material	General Name Litter Item	Master List Code	Number of Items	%
		(angling)			
35	Processed/Worked Wood	Ice-cream sticks, chip forks, chopsticks, toothpicks	G165	286	0.47 %
36	Cloth/Textile	Other textiles (incl. rags)	G145	258	0.42 %
37	Plastic	Plastic/polystyrene pieces > 50 cm	G77+G80+G83	245	0.40 %
38	Plastic	Toys & party poppers	G32	243	0.40 %
39	Plastic	Shotgun cartridges	G70	236	0.38 %
40	Cloth/Textile	Tampons and tampon applicators	G144	168	0.27 %
41	Paper/Cardboard	Other paper items	G158	158	0.26 %
42	Processed/Worked Wood	Other wood > 50 cm	G172	142	0.23 %
43	Plastic	Cigarette lighters	G26	141	0.23 %
44	Paper/Cardboard	Cardboard (boxes and fragments)	G148	131	0.21 %
45	Plastic	Crisp/sweet packets and lolly sticks	G30-G31	129	0.21 %
46	Plastic	Drink bottles ≤0.5 l	G7	127	0.21 %
47	Plastic	Pens and pen lids	G28	126	0.21 %
48	Chemicals	Paraffin/wax	G213	116	0.19 %
49	Plastic	Cleaner bottles & containers	G9	114	0.18 %
50	Plastic	Shoes/sandals	G71	111	0.18 %
51	Plastic	Medical/pharmaceuticals containers/tubes	G100	106	0.17 %
52	Glass/Ceramic	Glass or ceramic fragments > 2.5cm	G208	104	0.17 %
53	Paper/Cardboard	Newspapers and magazines	G154	104	0.17 %
54	Plastic	Bottles & jars	G6	102	0.17 %
55	Processed/Worked Wood	Corks	G159	101	0.16 %
56	Paper/Cardboard	Cups, food trays, food wrappers, drink containers	G153	96	0.16 %
57	Metal	Wire, wire mesh, barbed wire	G191	92	0.15 %
58	Plastic	Beach use related cosmetic bottles and containers, e.g. sunblock	G11	91	0.15 %
59	Paper/Cardboard	Cigarette packets	G152	84	0.14 %
60	Plastic	4/6-pack yokes, six-pack rings	G1	80	0.13 %
61	Cloth/Textile	Rope, string and nets	G142	74	0.12 %
62	Plastic	Straws and stirrers	G35	74	0.12 %
63	Plastic	Drink bottles >0.5 l	G8	73	0.12 %
64	Plastic	Foam packaging/insulation/polyurethane	G74	73	0.12 %
65	Plastic	Gloves (industrial/professional rubber gloves)	G41	72	0.12 %
66	Metal	Gas bottles, drums and buckets (> 4L)	G189	67	0.11 %
67	Cloth/Textile	Carpet and furnishing	G141	65	0.11 %
68	Plastic	Cutlery and trays	G34	63	0.10 %
69	Plastic	Nets and pieces of net > 50 cm	G54	61	0.10 %
70	Plastic	Plastic flower pots	G90	61	0.10 %
71	Plastic	Dog faeces bag	G101	59	0.10 %

Rank	Material	General Name Litter Item	Master List Code	Number of Items	%
72	Plastic	Lolly sticks	G31	59	0.10 %
73	Plastic	Mesh vegetable bags	G37	58	0.09 %
74	Metal	Other metal pieces < 50 cm	G198	52	0.08 %
75	Paper/Cardboard	Cartons/tetrapack (others)	G151	51	0.08 %
76	Paper/Cardboard	Paper fragments	G156	51	0.08 %
77	Plastic	Light sticks (tubes with fluid) incl. packaging	G60	50	0.08 %
78	Rubber	Tyres and belts	G128	49	0.08 %
79	Plastic	Tobacco pouches/plastic cigarette box packaging	G25	46	0.07 %
80	Cloth/Textile	Shoes and sandals (e.g. leather, cloth)	G138	44	0.07 %
81	Plastic	Other bottles & containers (drums)	G13	43	0.07 %
82	Plastic	Plastic pieces	G74-G83/G103-G106/G122	42	0.07 %
83	Metal	Cans (food)	G176	40	0.07 %
84	Metal	Aerosol/spray cans (industry)	G174	40	0.06 %
85	Metal	Industrial scrap	G186	39	0.06 %
86	Glass/Ceramic	Jars incl. pieces	G201	39	0.06 %
87	Paper/Cardboard	Paper bags	G147	37	0.06 %
88	Organic	Other (specify)	x_u	37	0.06 %
89	Plastic	Floats/buoys	G62-G63	36	0.06 %
90	Plastic	Gloves (washing up)	G40	35	0.06 %
91	Metal	Other metal pieces > 50 cm	G199	31	0.05 %
92	Plastic	Combs/hair brushes/sunglasses	G29	29	0.05 %
93	Cloth/Textile	Sacking (hessian)	G140	29	0.05 %
94	Plastic	Food containers, candy wrappers, cups and cups lids	G10/G30/G33	27	0.04 %
95	Plastic	Tags (fishing and industry)	G43	26	0.04 %
96	Plastic	Fibre glass/fragments	G68	26	0.04 %
97	Organic	Fruit, food, pastry, candy and ice cream	x_t	26	0.04 %
98	Paper/Cardboard	Cartons/tetrapack milk	G150	25	0.04 %
99	Plastic	Masking tape	G87	25	0.04 %
100	Plastic	Syringes/needles	G99	24	0.04 %
101	Plastic	Buckets	G65	24	0.04 %
102	Plastic	Fishing line (entangled)	G55	24	0.04 %
103	Plastic	Mussel nets, Oyster nets	G45	23	0.04 %
104	Rubber	Rubber bands (small, for kitchen/household/post use)	G131	22	0.04 %
105	Plastic	Injection gun containers	G17	21	0.03 %
106	Plastic	Car parts	G19	19	0.03 %
107	Plastic	Fish boxes- plastic/polystyrene	G57-G58	18	0.03 %
108	Plastic	Food containers, cups and cups lids	G10/G33	18	0.03 %
109	Metal	Fishing related (weights, sinkers, lures, hooks)	G182	17	0.03 %
110	Plastic	Plastic sheeting from mussel culture (Tahitians)	G47	17	0.03 %

Rank	Material	General Name Litter Item	Master List Code	Number of Items	%
111	Plastic	Cable ties	G93	17	0.03 %
112	Rubber	Condoms (incl. packaging)	G133	16	0.03 %
113	Metal	Disposable BBQ s	G179	16	0.03 %
114	Processed/Worked Wood	Processed timber and pallet	G160-G161	15	0.02 %
115	Plastic	Rope, string, cord	G49-G50	14	0.02 %
116	Plastic	Other cosmetic bottles & containers	G12	14	0.02 %
117	Processed/Worked Wood	Matches and fireworks	G167	14	0.02 %
118	Metal	Wire, wire mesh, barbed wire, cables	G191/G194	13	0.02 %
119	Plastic	Plastic construction waste	G89	12	0.02 %
120	Processed/Worked Wood	Processed timber and pallet, crates	G160-G162	12	0.02 %
121	Metal	Other metal pieces < 50 cm (incl. batteries)	G195/G198	12	0.02 %
122	Organic	Food waste (galley waste)	G215	12	0.02 %
123	Processed/Worked Wood	Crates	G162	11	0.02 %
124	Plastic	Other fishing related	G61	11	0.02 %
125	Plastic	Hard hats/helmets	G69	11	0.02 %
126	Plastic	Bottles < 2L	G6-G9/G11-G13	10	0.02 %
127	Processed/Worked Wood	Processed timber	G161	9	0.02 %
128	Metal	Appliances (refrigerators, washers, etc.)	G180	9	0.01 %
129	Rubber	Balloons, balls and toys	G125-G126	9	0.01 %
130	Plastic	Fertiliser/animal feed bags	G36	9	0.01 %
131	Pollutants	Other	x_c	9	0.01 %
132	Plastic	4/6-pack yokes, six-pack rings/bags/shopping bags incl. pieces/small plastic bags, e.g. freezer bags incl. pieces	G1/G3-G5	9	0.01 %
133	Plastic	Crates and containers/baskets	G18	8	0.01 %
134	Processed/Worked Wood	Wood - Other < 50 cm, > 50 cm, (specify)	G171-G173	8	0.01 %
135	Plastic	Crab/lobster pots and tops	G42	8	0.01 %
136	Plastic	Floats for fishing nets	G62	8	0.01 %
137	Cloth/Textile	Sails, canvas	G143	7	0.01 %
138	Plastic	Fish boxes - plastic	G57	7	0.01 %
139	Rubber	Rubber boots	G127	7	0.01 %
140	Cloth/Textile	Backpack and bags	G139	7	0.01 %
141	Plastic	Engine oil bottles & containers < 50 cm	G14	7	0.01 %
142	Glass/Ceramic	Bulbs	G202/G205	7	0.01 %
143	Plastic	Jerry cans (square plastic containers with handle)	G16	6	0.01 %
144	Cloth/Textile	Clothing (clothes, shoes)	G135	6	0.01 %
145	Plastic	Engine oil bottles & containers > 50 cm	G15	6	0.01 %
146	Metal	Cables	G194	6	0.01 %
147	Plastic	Toilet fresheners	G97	6	0.01 %
148	Foamed Plastic	Other (specify)	x_p	6	0.01 %

Rank	Material	General Name Litter Item	Master List Code	Number of Items	%
149	Organic	Snuff, swedish snus	x_r	6	0.01 %
150	Pollutants	Wax_small	x_b	6	0.01 %
151	Organic	Feces (excrement)	x_s	6	0.01 %
152	Metal	Metal - Other (specify)	G186/G198-G199	6	0.01 %
153	Glass/Ceramic	Bottles and jars	G200-G201	5	0.01 %
154	Plastic	Flip - flops	G102	5	0.01 %
155	Rubber	Inner-tubes and rubber sheet	G129	5	0.01 %
156	Processed/Worked Wood	Paint brushes	G166	5	0.01 %
157	Processed/Worked Wood	Wood boards	G168	5	0.01 %
158	Sanitary waste	Sanitary (nappies, cotton buds, tampon applicators, toothbrushes)	G95-G98/G144	5	0.01 %
159	Processed/Worked Wood	Wood (processed)	G170	4	0.01 %
160	Plastic	Nets and pieces of net	G52	4	0.01 %
161	Plastic	Fish boxes - expanded polystyrene	G58	4	0.01 %
162	Paper/Cardboard	Paper (including newspapers and magazines)	G154-G157	4	0.01 %
163	Plastic	Traffic cones	G72	4	0.01 %
164	Plastic	Synthetic rope, Rope diameter more than 1 cm	G48-G49	3	0.01 %
165	Glass/Ceramic	Light bulbs	G202	3	0.01 %
166	Rubber	Balls	G126	3	0.00 %
167	Plastic	Bottles, drums, jerrycans and buckets > 2L	G15-G16/G65	3	0.00 %
168	Metal	Table ware (plates, cups and cutlery)	G181	3	0.00 %
169	Plastic	Biomass holder from sewage treatment plants	G91	3	0.00 %
170	Paper/Cardboard	Cups, food trays, food wrappers, cigarette packs, drink containers	G149-G153	3	0.00 %
171	Cloth/Textile	Clothing, shoes, rags, sandals, hats and towels	G135-G138	3	0.00 %
172	Paper/Cardboard	Tubes for fireworks	G155	3	0.00 %
173	Plastic	Cups plates plastic	G33-34	3	0.00 %
174	Metal	Fragments	x_q	2	0.00 %
175	Plastic	Diapers/nappies	G98	2	0.00 %
176	Processed/Worked Wood	Crab/lobster pots	G163	2	0.00 %
177	Processed/Worked Wood	Beams/dunnage	G169	2	0.00 %
178	Glass/Ceramic	Tableware (plates and cups)	G203	2	0.00 %
179	Plastic/Paper	Tobacco packaging wrap	G25/G152	2	0.00 %
180	Plastic	Fishing net/net pieces, tangled nets/cord, lines	G51-G54/G56	2	0.00 %
181	Plastic	Monofilament line	G55/G59	2	0.00 %
182	Plastic	Beach use related cosmetic bottles and containers, e.g. sunblock/ other cosmetics bottles & containers	G11-G12	2	0.00 %
183	Foamed Plastic	Foam pieces	G74-G83/G115/G121	2	0.00 %
184	Processed/Worked Wood	Pallets	G160	1	0.00%
185	Plastic	Buoys	G63	1	0.00 %
186	Rubber	Wheels	G130	1	0.00 %

Rank	Material	General Name Litter Item	Master List Code	Number of Items	%
187	Cloth/Textile	Shoes	G136	1	0.00 %
188	Paper/Cardboard	Paper packaging	G149	1	0.00 %
189	Metal	Pint tins	G190	1	0.00 %
190	Metal	Car parts/batteries	G193	1	0.00 %
191	Plastic	Mesh bags (vegetable, oyster nets and mussel bags)	G37/G45	1	0.00 %
192	Plastic	Octopus pots	G44	1	0.00 %
193	Plastic	Oyster trays (round from oyster cultures)	G46	1	0.00 %
194	Plastic	Telephone (incl. parts)	G88	1	0.00 %
195	Plastic	Bait containers/packaging	G92	1	0.00 %
196	Foamed Plastic	Cups and food packs	x_n	1	0.00 %
197	Plastic	Gloves/Gloves (industrial, washing up)	G39-G41	1	0.00 %
198	Processed/Worked Wood	Wood - Other (specify)	G173	1	0.00 %
199	Cloth/Textile	Canvas, sailcloth, and sacking (hessian)	G140/G143	1	0.00 %
200	unidentified	Various rubbish (worked wood, metal parts)	G216	1	0.00 %
201	Metal	Other cans (< 4L)	G188	1	0.00 %
202	Metal	Other (metal)	G197	0	0.00 %
203	Glass/Ceramic	Fluorescent light tubes	G205	0	0.00 %
204	Glass/Ceramic	Large glass objects (specify)	G209	0	0.00 %
205	unidentified	Other (glass, metal, tar) < 5 mm	G217	0	0.00 %
206	Plastic	Industrial pellets	G112	0	0.00 %
207	Rubber	Bobbins (fishing)	G132	0	0.00 %
208	Cloth/Textile	Clothing, rags, sandals, hats and towels	G136-G138	0	0.00 %
209	Processed/Worked Wood	Fish boxes	G164	0	0.00 %
210	Metal	Fishing related (sinkers, lures, hooks, traps and pots)	G182-G184	0	0.00 %
211	Metal	Lobster/crab pots	G184	0	0.00 %
212	Metal	Drums, e.g. oil	G187	0	0.00 %
213	Glass/Ceramic	Glass buoys	G206	0	0.00 %
214	Glass/Ceramic	Octopus pots	G207	0	0.00 %
215	Foamed Plastic	Other plastic foam packaging	G38/G67/G74	0	0.00 %
216	Plastic	Fishing gear (lures, traps and pots)	G42/G44/G57-G58/G60	0	0.00 %
217	Plastic	Fishing net pieces	G51-G54	0	0.00 %
218	Plastic	Fishing buoys pots traps	G63/G42/G44	0	0.00 %
219	Plastic	Fenders	G64	0	0.00 %
220	Plastic	CD, CD box	G84	0	0.00 %
221	Plastic	Salt packaging	G85	0	0.00 %
222	Plastic	Fin trees (from fins for scuba diving)	G86	0	0.00 %
223	Plastic/Glass/Ceramic	Construction materials	G89/G204	0	0.00 %
224	Metal	Old oildrums old	x_j	0	0.00 %
225	Organic	Old human faeces	x_k	0	0.00 %

Rank	Material	General Name Litter Item	Master List Code	Number of Items	%
226	Organic	Old animal faeces	x_l	0	0.00 %
227	Cloth/Textile	Old cloth rope	x_m	0	0.00 %
228	Foamed Plastic	Foam buoys	x_o	0	0.00 %
229	Plastic	Old rope small	x_d	0	0.00 %
230	Plastic	Old rope large	x_e	0	0.00 %
231	Plastic	Old plastic pieces	x_f	0	0.00 %
232	Plastic/Rubber	Old gloves	x_g	0	0.00 %
233	Paper/Cardboard	Old cartons	x_h	0	0.00 %
234	Metal	Old oildrums new	x_i	0	0.00 %

6. Total Abundance Marine Regions

Table A5: Marine beach litter list at spatial (marine regions) scale with each item's percentage of the total. Detailed information indicates the rank, material, general name, number, percentage and code for each item, following the Master List of Categories of Litter Items.

#	Master List Code	Material	General Name Litter Item	Baltic Sea	Black Sea	Med Sea	NE Atl
0	*Total*	*Total*	*Total*	*29 217*	*411*	*75 130*	*250 913*
1	G1	Plastic	4/6-pack yokes, six-pack rings	0.28 %	0.00 %	0.25 %	0.04 %
2	G1/G3-G5	Plastic	4/6-pack yokes, six-pack rings/bags/shopping bags incl. pieces/small plastic bags, e.g. freezer bags incl. pieces	0.13 %	0.00 %	0.00 %	0.00 %
3	G10	Plastic	Food containers incl. fast food containers	0.35 %	0.49 %	0.64 %	0.70 %
4	G10/G30/G33	Plastic	Food containers, candy wrappers	0.50 %	0.00 %	0.00 %	0.00 %
5	G10/G33	Plastic	Food containers, candy wrappers	1.24 %	0.00 %	0.00 %	0.00 %
6	G100	Plastic	Medical / pharmaceuticals containers / tubes	0.01 %	0.00 %	0.41 %	0.07 %
7	G101	Plastic	Dog faeces bag	0.06 %	0.00 %	0.03 %	0.06 %
8	G102	Plastic	Flip - flops	0.02 %	0.24 %	0.01 %	0.00 %
9	G11	Plastic	Beach use related cosmetic bottles and containers, e.g. sunblock	0.00 %	0.24 %	0.05 %	0.15 %
10	G112	Plastic	Industrial pellets	0.00 %	0.00 %	0.00 %	0.00 %
11	G11-G12	Plastic	beach use related cosmetic bottles and containers, e.g. sunblock/ other cosmetics bottles &containers	0.02 %	0.00 %	0.00 %	0.00 %
12	G12	Plastic	Other cosmetic bottles & containers	0.03 %	0.24 %	0.24 %	0.00 %
13	G124	Plastic	Other plastic / polystyrene items (identifiable)	8.98 %	0.49 %	1.78 %	2.46 %
14	G125	Rubber	Balloons and balloon sticks	0.26 %	0.00 %	0.10 %	0.95 %
15	G125-G126	Rubber	Balloons, balls and toys	0.56 %	0.00 %	0.00 %	0.00 %
16	G126	Rubber	Balls	0.00 %	0.00 %	0.01 %	0.00 %
17	G127	Rubber	Rubber boots	0.01 %	0.24 %	0.03 %	0.01 %
18	G128	Rubber	Tyres and belts	0.04 %	0.24 %	0.09 %	0.07 %
19	G129	Rubber	Inner-tubes and rubber sheet	0.06 %	0.24 %	0.01 %	0.00 %
20	G13	Plastic	Other bottles & containers (drums)	0.01 %	0.00 %	0.56 %	0.08 %
21	G130	Rubber	Wheels	0.00 %	0.00 %	0.00 %	0.00 %
22	G131	Rubber	Rubber bands (small, for kitchen / household / post use)	0.14 %	0.00 %	0.07 %	0.00 %
23	G132	Rubber	Bobbins (fishing)	0.00 %	0.00 %	0.00 %	0.00 %
24	G133	Rubber	Condoms (incl. packaging)	0.01 %	0.00 %	0.59 %	0.01 %
25	G134	Rubber	Other rubber pieces	0.36 %	0.24 %	0.46 %	0.77 %
26	G135	Cloth/Textile	Clothing (clothes, shoes)	0.00 %	0.00 %	0.02 %	0.00 %
27	G135-138	Cloth	Clothing, shoes, hats and towels	0.15 %	0.00 %	0.00 %	0.00 %

#	Master List Code	Material	General Name Litter Item	Baltic Sea	Black Sea	Med Sea	NE Atl
28	G136	Cloth/Textile	Shoes	0.00 %	0.00 %	0.01 %	0.00 %
29	G136-G138	Cloth	Clothing, shoes, hats and towels	0.05 %	0.00 %	0.00 %	0.00 %
30	G137	Cloth/Textile	Clothing / rags (clothing, hats, towels)	0.14 %	0.24 %	0.20 %	0.42 %
31	G138	Cloth/Textile	Shoes and sandals (e.g. leather, cloth)	0.06 %	0.24 %	0.11 %	0.07 %
32	G139	Cloth/Textile	Backpack and bags	0.00 %	0.00 %	0.01 %	0.00 %
33	G14	Plastic	Engine oil bottles & containers < 50 cm	0.01 %	0.00 %	0.10 %	0.03 %
34	G140	Cloth/Textile	Sacking (hessian)	0.03 %	0.24 %	0.03 %	0.07 %
35	G140/G143	Cloth	Canvas, sailcloth, and sacking (hessian)	0.01 %	0.00 %	0.00 %	0.00 %
36	G141	Cloth/Textile	Carpet and furnishing	0.08 %	0.24 %	0.09 %	0.06 %
37	G142	Cloth/Textile	Rope, string and nets	0.43 %	0.24 %	0.15 %	0.00 %
38	G143	Cloth/Textile	Sails, canvas	0.00 %	0.00 %	0.01 %	0.00 %
39	G144	Cloth/Textile	Tampons and tampon applicators	0.02 %	0.00 %	0.16 %	0.26 %
40	G145	Cloth/Textile	Other textiles (incl. rags)	0.51 %	0.49 %	0.68 %	0.14 %
41	G146	Paper/Cardboard	Paper/Cardboard	0.00 %	0.00 %	0.00 %	0.00 %
42	G147	Paper/ Cardboard	Paper bags	0.03 %	0.00 %	0.07 %	0.05 %
43	G148	Paper/ Cardboard	Cardboard (boxes and fragments)	0.19 %	0.24 %	0.17 %	0.15 %
44	G149	Paper/ Cardboard	Paper packaging	0.00 %	0.00 %	0.01 %	0.00 %
45	G149-G153	Paper & cardboard	Cups, food trays, food wrappers, cigarette packs, drink containers	0.05 %	0.00 %	0.00 %	0.00 %
46	G15	Plastic	Engine oil bottles & containers > 50 cm	0.01 %	0.00 %	0.03 %	0.01 %
47	G150	Paper/ Cardboard	Cartons / tetrapack milk	0.04 %	0.97 %	0.05 %	0.04 %
48	G151	Paper/ Cardboard	Cartons / tetrapack (others)	0.04 %	0.49 %	0.36 %	0.06 %
49	G152	Paper/ Cardboard	Cigarette packets	0.09 %	0.73 %	2.34 %	0.07 %
50	G153	Paper/ Cardboard	Cups, food trays, food wrappers, drink containers	2.16 %	0.73 %	0.30 %	0.04 %
51	G154	Paper/ Cardboard	Newspapers and magazines	0.09 %	0.49 %	0.16 %	0.07 %
52	G154-G157	Paper & cardboard	Paper (including newspapers and magazines)	2.38 %	0.00 %	0.00 %	0.00 %
53	G155	Paper/ Cardboard	Tubes for fireworks	0.03 %	0.00 %	0.01 %	0.00 %
54	G156	Paper/ Cardboard	Paper fragments	0.10 %	0.49 %	0.09 %	0.00 %
55	G158	Paper/ Cardboard	Other paper items	0.65 %	0.24 %	1.79 %	0.35 %
56	G159	Processed/worked wood	Corks	0.16 %	0.24 %	0.20 %	0.06 %
57	G15-G16/G65	Plastic	Bottles, drums, jerrycans and buckets > 2 L	0.05 %	0.00 %	0.00 %	0.00 %
58	G16	Plastic	Jerry cans (square plastic containers with handle)	0.01 %	0.00 %	0.09 %	0.04 %
59	G160	Processed/worked wood	Pallets	0.01 %	0.24 %	0.04 %	0.00 %
60	G160-G161	Wood	Processed timber and pallet	0.73 %	0.00 %	0.00 %	0.05 %
61	G160-G162	Wood	Processed timber and pallet crates	0.20 %	0.00 %	0.00 %	0.00 %
62	G161	Processed/worked wood	Processed timber	0.02 %	0.24 %	0.01 %	0.00 %

#	Master List Code	Material	General Name Litter Item	Baltic Sea	Black Sea	Med Sea	NE Atl
63	G162	Processed/worked wood	Crates	0.00 %	0.00 %	0.03 %	0.01 %
64	G163	Processed/worked wood	Crab / lobster pots	0.00 %	0.24 %	0.00 %	0.00 %
65	G164	Processed/worked wood	Fish boxes	0.01 %	0.00 %	0.01 %	0.00 %
66	G165	Processed/worked wood	Ice-cream sticks, chip forks, chopsticks, toothpicks	0.45 %	0.24 %	0.15 %	0.24 %
67	G166	Processed/worked wood	Paint brushes	0.01 %	0.00 %	0.24 %	0.02 %
68	G167	Processed/worked wood	Matches and fireworks	0.25 %	0.00 %	0.00 %	0.00 %
69	G168	Processed/worked wood	Wood boards	0.00 %	0.00 %	0.03 %	0.00 %
70	G169	Processed/worked wood	Beams / dunnage	0.00 %	0.00 %	0.01 %	0.00 %
71	G17	Plastic	Injection gun containers	0.00 %	0.00 %	0.07 %	0.05 %
72	G170	Processed/worked wood	Wood (processed)	0.00 %	0.00 %	0.03 %	0.00 %
73	G171	Processed/worked wood	Other wood < 50 cm	0.66 %	0.24 %	0.36 %	0.80 %
74	G171-G172	Wood	Other (specify)	0.05 %	0.00 %	0.00 %	0.00 %
75	G171-G173	Wood	Other (specify)	0.12 %	0.00 %	0.00 %	0.00 %
76	G172	Processed/worked wood	Other wood > 50 cm	0.37 %	0.24 %	0.12 %	0.21 %
77	G173	Processed/worked wood	Other (specify)	0.05 %	0.00 %	0.00 %	0.00 %
78	G174	Metal	Aerosol / spray cans (industry)	0.08 %	0.24 %	0.31 %	0.05 %
79	G175	Metal	Cans (beverage)	0.61 %	0.49 %	0.75 %	0.65 %
80	G176	Metal	Cans (food)	0.04 %	0.73 %	0.12 %	0.04 %
81	G177	Metal	Foil wrappers, aluminum foil	1.01 %	0.49 %	0.45 %	0.31 %
82	G178	Metal	Bottle caps, lids and pull tabs	1.65 %	0.24 %	0.93 %	0.32 %
83	G179	Metal	Disposable BBQ s	0.03 %	0.00 %	0.01 %	0.01 %
84	G18	Plastic	Crates and containers / baskets	0.04 %	0.24 %	0.20 %	0.01 %
85	G180	Metal	Appliances (refrigerators, washers, etc.)	0.01 %	0.00 %	0.01 %	0.01 %
86	G181	Metal	Table ware (plates, cups and cutlery)	0.03 %	0.00 %	0.01 %	0.00 %
87	G182	Metal	Fishing related (weights, sinkers, lures, hooks)	0.00 %	0.00 %	0.04 %	0.01 %
88	G182-G184	Metal	Fishing related (sinkers, lures, hooks, traps and pots)	0.01 %	0.00 %	0.00 %	0.00 %
89	G183	Metal	Fish hook remains	0.00 %	0.00 %	0.00 %	0.00 %
90	G184	Metal	Lobster / crab pots	0.00 %	0.00 %	0.00 %	0.00 %
91	G185	Metal	Middle size containers	0.00 %	0.00 %	0.00 %	0.00 %
92	G186	Metal	Industrial scrap	0.01 %	0.00 %	0.05 %	0.08 %
93	G186/G198-G199	Metal	Other (specify)	0.13 %	0.00 %	0.00 %	0.00 %
94	G187	Metal	Drums, e.g. oil	0.00 %	0.00 %	0.03 %	0.00 %
95	G188	Metal	Other cans (< 4L)	0.02 %	0.00 %	0.00 %	0.00 %
96	G189	Metal	Gas bottles, drums and buckets (> 4L)	0.00 %	0.00 %	0.00 %	0.13 %
97	G19	Plastic	Car parts	0.00 %	1.46 %	0.07 %	0.03 %
98	G190	Metal	Pint tins	0.00 %	0.24 %	0.03 %	0.00 %
99	G191	Metal	Wire, wire mesh,	0.23 %	0.00 %	0.24 %	0.08 %

#	Master List Code	Material	General Name Litter Item	Baltic Sea	Black Sea	Med Sea	NE Atl
			barbed wire				
100	G191/G194	Metal	Wire, wire mesh, barbed wire	0.00 %	0.00 %	0.07 %	0.00 %
101	G193	Metal	Car parts / batteries	0.00 %	0.00 %	0.00 %	0.00 %
102	G194	Metal	Cables	0.01 %	0.00 %	0.01 %	0.00 %
103	G195	Metal	Household batteries	0.03 %	0.00 %	1.49 %	0.00 %
104	G195/G198	Metal	Other metal pieces < 50 cm	0.00 %	0.00 %	0.03 %	0.00 %
105	G197	Metal	Other (metal)	0.00 %	0.00 %	0.00 %	0.00 %
106	G198	Metal	Other metal pieces < 50 cm	0.13 %	0.49 %	0.22 %	0.00 %
107	G198-G199	Metal	Other (specify)	0.05 %	0.00 %	0.00 %	0.00 %
108	G199	Metal	Other metal pieces > 50 cm	0.02 %	0.24 %	0.57 %	0.02 %
109	G2+G3+G4+G5	Plastic	Plastic bag (Shopping bags, Small plastic bags, e.g. freezer bags, Plastic bag collective role; what remains from rip-off plastic bags)	4.19 %	3.65 %	2.04 %	1.37 %
110	G20+G21+G22+G23+G24	Plastic	Plastic caps and lids (drinks, chemicals, detergents (non-food), unidentified)/plastic rings from bottle caps/lids	3.04 %	31.14 %	5.64 %	5.37 %
111	G200	Glass/Ceramics	Bottles incl. pieces	0.46 %	0.24 %	3.88 %	0.31 %
112	G200-G201	Glass & ceramic	Bottles and jars	0.17 %	0.00 %	0.00 %	0.00 %
113	G201	Glass/Ceramics	Jars incl. pieces	0.04 %	0.49 %	0.06 %	0.00 %
114	G202	Glass/Ceramics	Light bulbs	0.02 %	0.24 %	0.38 %	0.00 %
115	G202/G205	Glass	Bulbs	0.00 %	0.00 %	0.00 %	0.02 %
116	G203	Glass/Ceramics	Tableware (plates and cups)	0.01 %	0.24 %	0.00 %	0.00 %
117	G204	Glass/Ceramics	Construction material (brick, cement, pipes)	1.87 %	0.24 %	1.04 %	0.12 %
118	G205	Glass/Ceramics	Fluorescent light tubes	0.00 %	0.24 %	0.00 %	0.00 %
119	G206	Glass/Ceramics	Glass buoys	0.01 %	0.00 %	0.00 %	0.00 %
120	G207	Glass/Ceramics	Octopus pots	0.00 %	0.24 %	0.00 %	0.00 %
121	G208	Glass/Ceramics	Glass or ceramic fragments > 2.5 cm	1.43 %	0.24 %	0.39 %	0.00 %
122	G209	Glass/Ceramics	Large glass objects (specify)	0.00 %	0.00 %	0.00 %	0.00 %
123	G210	Glass/Ceramics	Other glass items	0.28 %	0.00 %	0.05 %	0.63 %
124	G211	unidentified	Other medical items (swabs, bandaging, adhesive plaster etc.)	1.65 %	0.00 %	0.10 %	2.11 %
125	G212	unidentified	Slack/Coal	0.00 %	0.00 %	0.01 %	0.00 %
126	G213	Chemicals	Paraffin/Wax	31.85 %	0.00 %	0.01 %	0.39 %
127	G215	Food waste	Food waste (galley waste)	0.06 %	0.00 %	0.04 %	0.00 %
128	G216	unidentified	Various rubbish (worked wood, metal parts)	0.00 %	0.00 %	0.00 %	0.00 %
129	G217	unidentified	Other (glass, metal, tar) < 5 mm	0.00 %	0.00 %	0.00 %	0.00 %
130	G25	Plastic	Tobacco pouches / plastic cigarette box packaging	0.10 %	0.97 %	0.15 %	0.00 %
131	G25/G152	Plastic/Paper	Tobacco Packaging Wrap	0.00 %	0.00 %	0.02 %	0.00 %

#	Master List Code	Material	General Name Litter Item	Baltic Sea	Black Sea	Med Sea	NE Atl
132	G26	Plastic	Cigarette lighters	0.15 %	0.49 %	0.32 %	0.20 %
133	G27	Plastic	Cigarette butts and filters	7.74 %	8.27 %	16.14%	2.96 %
134	G28	Plastic	Pens and pen lids	0.13 %	0.24 %	0.19 %	0.18 %
135	G29	Plastic	Combs/hair brushes/sunglasses	0.03 %	1.22 %	0.02 %	0.05 %
136	G30	Plastic	Crisp packets / sweet wrappers	0.15 %	2.19 %	1.50 %	3.62 %
137	G30-G31	Plastic	Crisp/sweet packets and lolly sticks	0.78 %	0.00 %	0.43 %	0.02 %
138	G31	Plastic	Lolly sticks	0.00 %	0.73 %	0.27 %	0.00 %
139	G32	Plastic	Toys & party poppers	0.37 %	3.16 %	0.27 %	0.36 %
140	G33	Plastic	Cups and cup lids	0.23 %	2.43 %	1.30 %	0.38 %
141	G33-34	Plastic	Cups Plates Plastic	0.00 %	0.00 %	0.10 %	0.00 %
142	G34	Plastic	Cutlery and trays	0.00 %	0.97 %	0.71 %	0.00 %
143	G34-G35	Plastic	Knives, forks, spoons, straws, stirrers, (cutlery)	1.62 %	0.00 %	0.33 %	1.17 %
144	G35	Plastic	Straws and stirrers	0.02 %	0.49 %	0.74 %	0.00 %
145	G36	Plastic	Fertiliser/animal feed bags	0.00 %	0.24 %	0.03 %	0.02 %
146	G37	Plastic	Mesh vegetable bags	0.08 %	0.24 %	0.19 %	0.11 %
147	G37/G45	Plastic	Mesh bags (vegetable, oyster nets and mussel bags)	0.02 %	0.00 %	0.00 %	0.00 %
148	G38/G67/G74	Foamed Plastic	Other Plastic Foam Packaging	0.00 %	0.00 %	0.01 %	0.00 %
149	G39-G40	Plastic	Gloves	0.04 %	0.00 %	0.00 %	0.00 %
150	G40	Plastic	Gloves (washing up)	0.02 %	0.00 %	0.02 %	0.04 %
151	G41	Plastic	Gloves (industrial / professional rubber gloves)	0.04 %	0.00 %	0.01 %	0.17 %
152	G42	Plastic	Crab / lobster pots and tops	0.00 %	0.00 %	0.03 %	0.04 %
153	G42/G44/G57-G58/G60	Plastic	Fishing gear (lures, traps and pots)	0.03 %	0.00 %	0.00 %	0.00 %
154	G43	Plastic	Tags (fishing and industry)	0.02 %	0.00 %	0.07 %	0.05 %
155	G44	Plastic	Octopus pots	0.00 %	0.00 %	0.01 %	0.02 %
156	G45	Plastic	Mussel nets, Oyster nets	0.00 %	0.00 %	1.14 %	0.11 %
157	G46	Plastic	Oyster trays (round from oyster cultures)	0.00 %	0.00 %	0.02 %	0.00 %
158	G47	Plastic	Plastic sheeting from mussel culture (Tahitians)	0.00 %	0.00 %	0.08 %	0.02 %
159	G48-G49	Plastic	Synthetic rope, Rope diameter more than 1 cm	0.00 %	0.00 %	0.03 %	0.00 %
160	G49	Plastic	Rope (diameter more than 1cm)	0.07 %	0.49 %	0.31 %	1.01 %
161	G49-G50	Plastic	Rope, string, cord	2.15 %	0.00 %	0.00 %	0.00 %
162	G50	Plastic	String and cord (diameter less than 1cm)	0.59 %	0.73 %	1.46 %	18.99 %
163	G51-G54	Plastic	Fishing Net Pieces	0.00 %	0.00 %	0.00 %	0.00 %
164	G51-G54/G56	Plastic	Fishing net	0.04 %	0.00 %	0.00 %	0.00 %
165	G52	Plastic	Nets and pieces of net	0.00 %	0.24 %	0.01 %	0.00 %
166	G53	Plastic	Nets and pieces of net < 50 cm	0.08 %	0.00 %	0.28 %	0.65 %
167	G54	Plastic	Nets and pieces of net > 50 cm	0.03 %	0.00 %	3.93 %	0.21 %

#	Master List Code	Material	General Name Litter Item	Baltic Sea	Black Sea	Med Sea	NE Atl
168	G55	Plastic	Fishing line (entangled)	0.00 %	0.00 %	0.07 %	0.00 %
169	G55/G59	Plastic	Monofilament line	0.05 %	0.00 %	0.00 %	0.00 %
170	G56	Plastic	Tangled nets / cord	0.14 %	0.00 %	0.14 %	0.78 %
171	G57	Plastic	Fish boxes - plastic	0.00 %	0.00 %	0.02 %	0.00 %
172	G57-G58	Plastic	Fish boxes	0.01 %	0.00 %	0.00 %	0.04 %
173	G58	Plastic	Fish boxes - expanded polystyrene	0.00 %	0.00 %	0.09 %	0.00 %
174	G59	Plastic	Fishing line / monofilament (angling)	0.21 %	0.00 %	0.27 %	0.43 %
175	G6	Plastic	Bottles & jars	0.41 %	0.00 %	0.22 %	0.01 %
176	G60	Plastic	Light sticks (tubes with fluid) incl. packaging	0.00 %	0.00 %	0.42 %	0.06 %
177	G61	Plastic	Other fishing related	0.00 %	0.00 %	0.03 %	0.00 %
178	G62	Plastic	Floats for fishing nets	0.00 %	0.00 %	0.03 %	0.00 %
179	G62-G63	Plastic	Floats/Buoys	0.03 %	0.00 %	0.01 %	0.18 %
180	G63	Plastic	Buoys	0.01 %	0.00 %	0.01 %	0.00 %
181	G63/G42/G44	Plastic	Fishing Buoys Pots Traps	0.00 %	0.00 %	0.00 %	0.00 %
182	G64	Plastic	Fenders	0.00 %	0.00 %	0.00 %	0.00 %
183	G65	Plastic	Buckets	0.04 %	0.00 %	0.08 %	0.04 %
184	G66	Plastic	Strapping bands	0.39 %	0.00 %	0.37 %	0.74 %
185	G67	Plastic	Sheets, industrial packaging, plastic sheeting	0.19 %	0.24 %	0.47 %	0.41 %
186	G68	Plastic	Fibre glass / fragments	0.19 %	0.00 %	0.05 %	0.01 %
187	G69	Plastic	Hard hats / Helmets	0.00 %	0.00 %	0.08 %	0.00 %
188	G6-G8	Plastic	Beverage Bottles Plastic	0.00 %	0.00 %	0.14 %	1.46 %
189	G6-G9/G11-G13	Plastic	Bottles < 2 L	0.34 %	0.00 %	0.00 %	0.00 %
190	G7	Plastic	Drink bottles <=0.5 l	0.14 %	3.16 %	1.51 %	0.00 %
191	G70	Plastic	Shotgun cartridges	0.42 %	0.49 %	0.60 %	0.67 %
192	G71	Plastic	Shoes / sandals	0.07 %	0.49 %	0.52 %	0.08 %
193	G72	Plastic	Traffic cones	0.00 %	0.24 %	0.00 %	0.00 %
194	G73	Plastic	Foam sponge	0.35 %	0.97 %	2.54 %	0.85 %
195	G74	Plastic	Foam packaging / insulation / polyurethane	1.57 %	0.00 %	0.39 %	0.00 %
196	G74-G83/G103-G106/G122	Plastic	Plastic Pieces	0.00 %	0.00 %	0.73 %	0.00 %
197	G74-G83/G115/G121	Foamed Plastic	Foam Pieces	0.00 %	0.00 %	0.06 %	0.00 %
198	G75+G78+G81	Plastic	Plastic/polystyrene pieces 0 - 2.5 cm	1.45 %	3.16 %	11.68 %	15.94 %
199	G76+G79+G82	Plastic	Plastic/polystyrene pieces 2.5 cm > < 50 cm	3.53 %	5.84 %	8.21 %	18.24 %
200	G77+G80+G83	Plastic	Plastic/polystyrene pieces > 50 cm	0.09 %	1.95 %	0.66 %	1.45 %
201	G8	Plastic	Drink bottles >0.5 l	0.28 %	5.35 %	1.37 %	0.00 %
202	G84	Plastic	CD, CD box	0.00 %	0.00 %	0.00 %	0.00 %
203	G85	Plastic	Salt packaging	0.00 %	0.00 %	0.00 %	0.00 %
204	G86	Plastic	Fin trees (from fins for scuba diving)	0.00 %	0.00 %	0.00 %	0.00 %

#	Master List Code	Material	General Name Litter Item	Baltic Sea	Black Sea	Med Sea	NE Atl
205	G87	Plastic	Masking tape	0.02 %	0.00 %	0.06 %	0.00 %
206	G88	Plastic	Telephone (incl. parts)	0.00 %	0.73 %	0.00 %	0.00 %
207	G89	Plastic	Plastic construction waste	0.04 %	0.49 %	0.05 %	0.00 %
208	G89/G204	Plastic/Glass/Ceramics	Construction Materials	0.00 %	0.00 %	0.00 %	0.00 %
209	G9	Plastic	Cleaner bottles & containers	0.07 %	0.73 %	0.90 %	0.18 %
210	G90	Plastic	Plastic flower pots	0.01 %	0.00 %	0.09 %	0.00 %
211	G91	Plastic	Biomass holder from sewage treatment plants	0.04 %	0.00 %	0.01 %	0.00 %
212	G92	Plastic	Bait containers / packaging	0.00 %	0.00 %	0.00 %	0.00 %
213	G93	Plastic	Cable ties	0.01 %	0.00 %	0.03 %	0.00 %
214	G95	Plastic	Cotton bud sticks	0.24 %	0.00 %	4.59 %	4.01 %
215	G95-G98/G144	Sanitary waste	Sanitary (nappies, cotton buds, tampon applicators, toothbrushes)	0.16 %	0.00 %	0.00 %	0.00 %
216	G96	Plastic	Sanitary towels / panty liners / backing strips	0.08 %	0.00 %	0.23 %	1.07 %
217	G97	Plastic	Toilet fresheners	0.03 %	0.00 %	0.04 %	0.02 %
218	G98	Plastic	Diapers / nappies	0.03 %	0.00 %	0.02 %	0.00 %
219	G99	Plastic	Syringes / needles	0.02 %	0.24 %	0.12 %	0.02 %
220	x_a	Plastic	Other (eg diapers, toilet paper, tissue paper, shaving razors)	0.05 %	0.00 %	0.03 %	2.01 %
221	x_j	Metal	Old oildrums old	0.00 %	0.00 %	0.00 %	0.00 %
222	x_k	Organic	Old human faeces	0.00 %	0.00 %	0.00 %	0.00 %
223	x_l	Organic	Old animal faeces	0.00 %	0.00 %	0.00 %	0.00 %
224	x_m	Cloth/textile	Old cloth rope	0.00 %	0.00 %	0.00 %	0.00 %
225	x_n	Foamed Plastic	Cups and food packs	0.23 %	0.00 %	0.00 %	0.00 %
226	x_o	Foamed Plastic	Foam buoys	0.04 %	0.00 %	0.00 %	0.00 %
227	x_p	Foamed Plastic	Other (specify)	0.32 %	0.00 %	0.00 %	0.00 %
228	x_q	Metal	Fragments	0.13 %	0.00 %	0.00 %	0.00 %
230	x_r	Organic	Snuff, swedish snus	0.15 %	0.00 %	0.00 %	0.00 %
231	x_b	Pollutants	Wax_small	0.00 %	0.00 %	0.00 %	0.06 %
232	x_s	Organic	Feces (excrement)	0.29 %	0.00 %	0.00 %	0.00 %
233	x_t	Organic	Fruit, food, pastry, candy and ice cream	0.60 %	0.00 %	0.00 %	0.00 %
234	x_u	Organic	Other (specify)	0.15 %	0.00 %	0.00 %	0.00 %
235	x_c	Pollutants	Other	0.00 %	0.00 %	0.00 %	0.01 %
236	x_d	Plastic	Old rope small	0.00 %	0.00 %	0.00 %	0.00 %
237	x_e	Plastic	Old rope large	0.00 %	0.00 %	0.00 %	0.00 %
238	x_f	Plastic	Old plastic pieces	0.00 %	0.00 %	0.00 %	0.00 %
239	x_g	Plastic/Rubber	Old gloves	0.00 %	0.00 %	0.00 %	0.00 %
240	x_h	Paper & cardboard	Old cartons	0.00 %	0.00 %	0.00 %	0.00 %
241	x_i	Metal	Old oildrums new	0.00 %	0.00 %	0.00 %	0.00 %

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