BEACH LITTER SURVEY IN ITALY

May 2016
The Beach Litter survey was conducted by Legambiente for the third year, within «Spiagge e Fondali puliti – Clean Up the Med 2016». In May 2016, 47 Italian beaches were studied with the aim of sampling the quantity and types of waste on shore. Recording the most common sorts of waste, the possible origin, and other parameters, this survey analyzes a dangerous phenomenon for environment, tourism, and local economy.

It’s necessary to implement programs for waste reduction in seas and on coastal strips, as indicated by European Directive Marine Strategy.

Approximately 70% of marine litter sinks and only 15% floats on surface.

So, beaches survey’s outcome must be intended as the tip of the iceberg.
Marine Strategy is the European directive 2008/56/ce that focuses on marine environment strategy. The Marine Directive aims to achieve Good Environmental Status (GES) of the EU’s marine waters by 2020, based on 11 descriptors, one of which is related to sea and beach waste: “Descriptor 10.” “Properties and quantities of marine litter do not cause harm to the coastal and marine environment.”

To achieve a good environmental status it’s essential to implement policies and interventions to reduce sea and coastal waste and, consequently, their impact on ecosystems. Our precious marine environmental heritage must be protected and preserved in order to maintain the biodiversity, health, and productiveness of our waters.
Sources of Marine Litter

1. Sewage Related Debris
2. Litter dropped in towns and cities
3. Poorly managed bins and landfill sites near the coast
4. Lost fishing equipment
5. Shipping materials lost overboard
6. Poorly managed industries
7. Litter dropped at the beach
**FAUNA**

Sea turtles, birds, and marine mammals may be trapped in fishing nets/tools or die by suffocation due to accidental ingestion of waste traded for food. According to some studies, 79.6% of sea turtles die as a result of waste ingestion. Additionally, micro-plastics ingested by aquatic organisms are also the main cause of the introduction of plastics in biota and of the imbalance in the marine food chain.

**EFFECT OF MARINE LITTER**

**ECONOMY**

The economic impact is calculated by mechanical damage to boats, fishing tools, and fish stock. It is also calculated in quality and quantity, by the cost for cleaning dump areas, and the reduction of touristic appeal.

**TOURISM**

The economic impact on tourism is remarkable, due to reduction of aesthetic value of the environment.
Legambiente's volunteers studied the samples collected from 47 Italian beaches during the month of May 2016. All studies were conducted following the official monitoring protocol developed by Legambiente, based on the protocol released by the Ministry of Environment and Ispra in 2014.

The areas of investigation are mainly dirty beaches. 36 of 47 beaches are close to the mouth of a river, with the intent to monitor waste transported by rivers and canals, and in particular the waste from unappropriate purification.
The main indicators are waste composition, quality and size. To identify the type of waste, Legambiente used OSPAR waste categories as a reference.

The studies were conducted on a beach running perpendicular to the coastline. We used a sample space of approximately 2 meters by 100 meters (ex. yellow lines in the photo) and recorded all items found on the surface (without digging).
<table>
<thead>
<tr>
<th>Region</th>
<th>Beaches</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lazio</strong></td>
<td>Fiumicino (spiaggia Coccia di Morto) – Ostia (spiaggia di Capocotta) – Anzio (Lido di Marechiaro) – Latina (Spiaggia di Terracina)</td>
</tr>
<tr>
<td><strong>Sicily</strong></td>
<td>Santa Flavia (spiaggia Olivella) – Trappetto (spiaggia di San Cataldo) – Siracusa (spiaggia dell’Arenella) – Priolo Gargallo (spiaggia della Marina) – Pachino (punta delle Formiche) – Barcellona Pozzo di Gotto (spiaggia Cantone) – Agrigento (spiaggia di Babbaluciara)</td>
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<tr>
<td><strong>Tuscany</strong></td>
<td>Orbetello (spiaggia della Giannella)</td>
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<tr>
<td><strong>Marche</strong></td>
<td>Ancona (spiaggia Torrette) – Montemarciano (spiaggia della Marina) – Senigallia (spiaggia di Marzocca) – San Benedetto del Tronto (spiaggia nella riserva naturale della Sentina) – Fermo (lido San Tommaso) – Porto Sant’Elpidio (spiaggia Faleriense)</td>
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<tr>
<td><strong>Puglia</strong></td>
<td>Taranto (spiaggia sul Mar Piccolo) – Ginosa (spiaggia libera)</td>
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<tr>
<td><strong>Basilicata</strong></td>
<td>Matera (lido di Policoro) – Pisticci (lido San Teodoro) – Scanzano Jonico (lido Onda Libera)</td>
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<tr>
<td><strong>Liguria</strong></td>
<td>Genova (spiaggia di Voltri)</td>
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<tr>
<td><strong>Campania</strong></td>
<td>Castelvolturno (spiaggia libera in località Bagnara) – Pozzuoli (spiaggia delle Monachelle e spiaggia della Riserva naturale Costa di Lisca) – Castellammare di Stabia (l’arenile della marina) – Vico Equense (spiaggia del Pezzolo alla Marina di Seiano) – Forio (spiaggia di Cava) – Salerno (spiaggia di Mercatello – spiaggia di Pioippi) – Montecorice (spiaggia di Agnone Cilento) – Ascea (Piano di Velia) – Agropoli (spiaggia di Trentova – Lido Venere) – Paestum (Oasi dunale Torre di Mare) – Pontecagnano (spiaggia di località Magazzino) – Battipaglia (spiaggia libera) – Eboli (area protetta dunale)</td>
</tr>
<tr>
<td><strong>Calabria</strong></td>
<td>Reggio Calabria (spiaggia presso il lungomare Italo Falcomatà) – Cutro (spiaggia di Steccato)</td>
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<tr>
<td><strong>Emilia-Romagna</strong></td>
<td>Comacchio (spiaggia Vascello d’oro)</td>
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<tr>
<td><strong>Veneto</strong></td>
<td>Eraclea (Laguna del Mort)</td>
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<tr>
<td><strong>Friuli-Venezia Giulia</strong></td>
<td>Duino Aurisina (Canovella de’ Zoppoli)</td>
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</tbody>
</table>
The survey, conducted on 47 Italian beaches, monitored a total area of 106,245 mq. We found 33,540 pieces of litter, of which 88% was smaller than 25 cm. In an average area, we found 714 waste items every 100 square mt. The most common material found was plastic, around 76.3%; in total there was an amount of 25,517 objects.

47 MONITORED BEACHES.

OVER 33,000 WASTE ITEMS

714 WASTE/100 SQUARE MT

76.3% PLASTIC
Plastic has the highest percentage (76.3%) in waste materials, followed by cigarette butts (7.9%). Right after we can find paper with 5.5% and metal with 3.6%. The category of glass and pottery which also includes construction materials (such as flake of plaster) has an impact on the total amount of garbage of the 3.4%. Next we can find wood waste (processed wood), textile waste (clothing and shoes) and rubber waste.

* Ospar classification includes cigarette butts in the category of «artificial polymer» along with plastic.
# TOP TEN LIST OF WASTE

<table>
<thead>
<tr>
<th>Waste Type</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plastic pieces and polystyrene</td>
<td>22.3%</td>
</tr>
<tr>
<td>Cotton buds</td>
<td>13.2%</td>
</tr>
<tr>
<td>Cigarette butts</td>
<td>7.9%</td>
</tr>
<tr>
<td>Top e covers (plastic and metal)</td>
<td>7.8%</td>
</tr>
<tr>
<td>Plastic bottles</td>
<td>7.5%</td>
</tr>
<tr>
<td>Fishing litter</td>
<td>3.7%</td>
</tr>
<tr>
<td>Disposable dish</td>
<td>3.5%</td>
</tr>
<tr>
<td>Construction material</td>
<td>2.3%</td>
</tr>
<tr>
<td>Glass bottles (and pieces)</td>
<td>1.9%</td>
</tr>
<tr>
<td>Bottles for detergents</td>
<td>1.8%</td>
</tr>
</tbody>
</table>
Plastic pieces and polystyrene, smaller than 50 centimetres, are the most founded items, representing almost a quarter of the total garbage. On second position, with a percentage of 13% we can find cotton buds, which are the classical refuses derived from the lack of purification systems. In fact, cotton buds arrive on beaches directly from our toilets through rivers, canals and drains. On third position there are cigarette butts (8%). This survey counted 2642 cigarette butts, an amount equivalent to 132 packs of cigarettes, 3% more respect 2015 ranking.

TOP TEN LIST OF WASTE

1. PIECES OF PLASTIC AND POLYSTYRENE: ALMOST A QUARTER OF ALL WASTE FOUND

2. COTTON BUDS: THEY ARE MORE THAN 4000

3. CIGARETTE BUTTS: THE EQUIVALENT OF 132 PACKS OF CIGARETTES
TOP TEN WASTE LIST

TOPS and LIDS
INCREASE 2% FROM 2015.

FISHING NETS 3,7%. 900
MUSSELS NETS FOUND ON
THE BEACHES

MORE THAN 1000
PLASTIC FLATWARE (3,5%).

The presence of caps and lids increased
2% from 2015, ranking 4° position of the
top ten waste list, with 2.600 pieces and
an overall percentage of 7,8%. Followed
by plastic bottles (7,5%), fishing nets and
aquaculture litter (3,7%), in particular
the so called «socks» for mussels, found
in more than 900 units. More than 1000
plastic flatware with a percentage of
3,5%. Then construction material (2,3%)
and bottles and glass pieces, together
with detergent boxes (2%).
The most frequent waste are pieces of plastic and polystyrene (smaller than 50 centimeters).
These wastes aren’t harmless. In fact, the gradual fragmentation of plastic waste abandoned in the environment beget an irreversible and incalculable pollution. By the effects of waves, flows, UV radiation and other factors, the waste is destined to fragment into millions of micro particles that are dispersed in the marine and coastal ecosystem. These micro particles are ingested by marine fauna. Their bodies absorb the plastic’s toxic substances. Through the food chain, the plastic arrives on our tables with its harmful substances.
The second category of most found objects are the cotton buds (13.2%), for a total of 4412 pieces.

The 83% of these cotton buds was found in Coccia di Morto beach (Fiumicino), close to the mouth of the Tiber river. Among the waste that arrived to the beach through the drains of our homes and, therefore, through the waterways we can find: blisters of medicines, sanitary napkins and toilet deodorizers (the total waste from inappropriate purification are 14%). These waste types were monitored especially in Capocotta beach - Ostia (Rm) with 33% incidence on the total amount and in Cava dell’Isola beach (Forio d’Ischia) where they represent 34% of the total amount of waste of the entire beach.

3. CIGARETTE BUTTS

The third category of the found waste is cigarette butts with 7.9% presence, an amount equal to 132 cigarette packets. More than double of previous year.

This problem is the result of a bad habit that is hard to stop (and not only on the beaches), the cigarette butts are litter full of toxic substances that interact badly with marine fauna and the whole ecosystem. In particular, the butts are 60% of the total waste found on the Lido Venus beach (Agropoli), 46% in Genoa Voltri beach and 35% in Mercatello beach (Salerno).
Regarding the different types of waste that we have monitored, 30% is packaging, whereof 26% is food packaging (eg. bottles, containers, dishes), and 4% from other packaging (eg. boxes).

It's interesting to note that 71% of the food packaging is plastic disposable packaging. The second place goes to the inappropriate purification waste, almost 5000, and the third, the waste originated from smoke.

More than 2,000 waste items are related with the fishing activities (in particular networks and "stockings" mussel), 6% of the total amount. With 3% we find the building materials.
EXPANSE OF WASTE

SPECIFIC FOCUS
Coccia di Morto’s beach (Fiumicino) is the beach with the highest number of waste: over 5500 rubbish in 100 meters.

This result is influenced by the Tevere’s mouth and by the drifts that accumulate waste from the river.

67% of waste is attribute to bad purification systems, with no fewer than 3716 cotton buds and many others articles (WC deodorants and blisters)

67% of waste is plastic

550 waste each meter of beach

67% of waste is represented by cotton buds

Emblematic case of the accumulation of waste transported by the river and from the lack of purification systems.
FIUMICINO (RM)  COCCIA DI MORTO
The beach Olivella in the municipality of Santa Flavia (PA) is the second beach for number of waste: 1252 in 100 meters of beach.

Three quarters of waste is formed by caps and lids (plastic and metal), 16% by bottles, plastic containers and plastic disposable dishes. 8% is formed by construction materials and 6% by fishing waste. The 68% of the total waste is plastic.

Unfortunately the massive presence of waste in not the only problem of this bay; in fact this bay in also surrounded by unstable cement artifacts.
FISHING WASTE IS RANKED IN 4TH PLACE: 6% OF THE TOTAL.

THE LARGEST PART ARE NETS AND SHEATH FOR MUSSEL: BESIDE THE MOST AFFECTED BEACH

The highest amount of fishing waste was registered in Canovella de' Zoppoli beach in Duino Aurisina, Trieste. In this beach 65% of the waste found are attributable to fishing. In particular, it was recorded a large amount of nets for mussel farming: well 684 stockings, mussel, probably released by the close mussels farm. A high percentage of fishing waste (44%) was found also on the Mar Piccolo beach in Taranto, near the Park Cimino, characterized by the highest amount of the category "networks and network pieces". Due to its particular conditions this beach is the only case of the survey where the totality of the waste found is 100% plastic.
According to a study commissioned by the European Union, the EU marine litter costs well 476.8 million euro per year*. This figure takes into account only tourism and fishing sectors, because it is not possible to quantify the impact on all economic sectors. In particular, the total estimated cost for all EU beaches cleaning is 411.75 million euros and the impact on the fishing industry is estimated around 61.7 million euro per year. It is demonstrated, how by the adoption of EU goals, adoption of a single evaluation standard, increasing recycling percentage and packaging waste reduction, decreasing and closure of landfill waste, we will have the highest percentage reduction of marine litter (less then 35.45%) and a revenue on operating cost of 168.45 million of euro per year. In particular, increasing waste recycling in the municipalities, there would be a reduction of 7.4% of marine litter and revenues for 35.16 million euro per year. The increase in packaging recycling (between 80 % and 90 % ) would decrease the marine litter of 18,41 % and revenues would increase to 87.48 million euro per year.

*data source Arcadis, processed by Legambiente “Marine litter study to support the establishment of an initial quantitative headline “. By European Commission – DG Environment. (2013)
www.legambiente.it/beachlitter

Interactive map for each beach
Beach Litter Survey 2016 was carried out thanks to the volunteers of Legambiente circles. The processing of the data, the drafting of the dossier and the implementation of the map are organized by the headquarter of Legambiente Onlus.
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