



## ***Plastic Busters for a Mediterranean free from litter***

### **The Mediterranean Sea: one of the most impacted areas by marine litter world-wide**

It is universally recognized that marine litter, in particular plastic litter, poses a global challenge, directly affecting marine and coastal life and ecosystems and potentially also human health as recently underlined by the G7 Summits (2015 and 2016). More than 10 million tons of debris are dumped in oceans across the world from land-based sources, maritime activities and sea-based infrastructures, and these are dispersed over wide areas (Eriksen et al., 2014). Globally, plastic forms the highest percentage of marine litter (~80%) (Thompson et al., 2009). As larger pieces of plastic debris fragment into smaller pieces, the abundance of microplastics (plastic fragments smaller than 5 mm; Thompson et al., 2004) in marine habitats increases, outweighing larger debris. A recognition of the scale of the problem has resulted in a number of initiatives at global (G7), regional (OSPAR, UNEP Regional Seas Programme, UNEP/MAP), European (e.g. MSFD), national and local scales. Until recently, information on amounts, trends, sources and impacts (including human health and socio-economic) of marine litter worldwide was limited, however it is widely accepted that both the levels of marine litter and the rate of input into the oceans are rising.

Plastic debris accumulates in semi-enclosed basins, such as the Mediterranean Sea, to a greater degree than in the open oceans (Cozar et al., 2015, UNEP/MAP, 2015). The Mediterranean, or “*Mare nostrum*” to the Romans, was, for centuries, “the cradle of civilization”, connecting and binding numerous different cultures. Today it has become a dumping ground for the anthropogenic waste generated by the 22 countries (and 450 million people) bordering its shores. As a result of one of the highest levels of per-capita solid-waste production annually (208-760 kg/year), the Mediterranean Sea has become highly polluted (Fossi et al. 2012, Eriksen et al., 2014; Cozar et al., 2015, Fossi et al. 2016, Aliani et al. 2016) and marine litter has recently been confirmed as a critical issue (UNEP/MAP, 2015). The Mediterranean basin has very limited exchanges with other oceans, and the problem of litter is exacerbated by densely populated coastlines; highly developed coastal tourism; busy offshore waters (with 30% of the world’s maritime traffic); and concentrated inputs from urban areas and large rivers. As a result, the Mediterranean also holds the records for the highest densities of marine litter stranded on the sea floor, up to 100,000 items/km<sup>2</sup> (off the French Coast) and the highest densities of floating microplastics, up to 4,680,000 items/km<sup>2</sup> Southern Adriatic)(UNEP/MAP, 2015). Despite some uncertainties and knowledge gaps on exact quantities, fate and biotic impacts, current evidence is more than sufficient to highlight the urgent need to implement mitigation measures across the entire basin (UNEP/MAP, 2015). Such a need has been widely recognized, for example in the Regional Plan on Marine Litter Management of Barcelona Convention (2013). Despite this concern, however, scientists, policy makers and the general public are still grappling with the critical question of *how to approach and mitigate this problem?*

The **Plastic Buster project** described in this position paper seeks to address this challenge with a vision for a Mediterranean free from litter. To achieve this, we will work across the entire basin, combining actions of coverage knowledge gaps, to specific mitigation activities, regulated by a joint Governance on a whole basin scale.

### **What are the main knowledge gaps on Marine Litter in the Mediterranean?**

Until now, only a limited number of Mediterranean-wide studies have been performed to assess the amounts, composition and distribution and effects of plastic and micro-plastics on whole basin scale. Furthermore, Mediterranean countries have yet to build a coherent, harmonised monitoring programme for

marine litter across the region. There has also been no a compressive monitoring of marine litter impacts on biota, although a good scientific and technical basis exists which could support this (UNEP/MAP, 2015). Research to improve monitoring and thus facilitate management actions has now become critical and mandatory in the Mediterranean basin. This research should focus on knowledge gaps relating to: sources and transport patterns and hotspots of marine litter; assessing microplastics in sediments and beaches; assessing the quantity and distribution of abandoned, lost and discarded fishing gear; defining Good Environmental Status; assessing impacts on biota, including sentinel marine species such as turtles and the identification of new indicator species; and finally identified the impact on food chains and risks to human health. A number of points need to be addressed in order to better understand and mitigate the problem of Marine litter in the Mediterranean Sea. Earlier projects and initiatives in the Mediterranean basin have supported a growing understanding, but significant gaps remain.

### **Why Plastic Busters? The need of a project on basin scale**

**“Plastic Busters for a Mediterranean free from litter project”** is an initiative led by the University of Siena (Mediterranean–SDSN - <http://www.sdsn-mediterranean.unisi.it/>), being coordinated with fifteen other partner institutions from the Mediterranean region (<http://plasticbusters.unisi.it/>). The overall goal of the project is to contribute to pollution-reduction across the Mediterranean Sea through the promotion and the implementation of the Regional Plan on Marine Litter Management in the Mediterranean (Barcelona Convention - IG.21/9). A crucial aspect of the marine litter issue, underlined by the Barcelona Convention within the Regional Plan for Marine Litter (Istanbul 2013) is that: "Marine pollution knows no border, pollution in one country affects all other 21 countries, hence there is a need for a regional approach". **Plastic Busters** is the **first project** at basin scale that binds the **Southern and Northern Mediterranean countries** on the issue of Marine Litter under the umbrella of UNEP/MAP and UfM, with 10 countries already involved in the project and 12 countries endorsing the project. The project was presented to the **Union for the Mediterranean (UfM)** and labelled by the 43 UfM Member countries at the Senior Officials' Meeting (SOM) on February 17, 2016 (<http://ufmsecretariat.org/plastic-busters-for-a-mediterranean-free-from-litter/>). The project is fully in line with the recommendations of the UfM Ministerial Meeting on Environment and Climate Change (May 2014), and with the UfM Ministerial on Blue Economy (November 2015).

### **The Plastic Busters approach**

Plastic Busters represents a comprehensive, new approach which can complete our understanding of the challenges and move the entire Mediterranean basin towards net declines in marine litter. The main objectives and activities of the project focus on:

- a) addressing marine litter related knowledge gaps via monitoring and assessment of both micro and macroplastics in the environment (abundance, characterization and identification of hot spot areas) and the biota (presence and effect on bioindicator species), working at a basin scale with a standardised methodology,
- b) Developing and implementing concrete mitigation actions to prevent, reduce, identify convergence areas and reduce/remove marine litter at basin scale;
- c) Developing actions to enhance the awareness of stakeholders and catalyse change in their perceptions and attitudes towards waste at basin scale under the umbrella of UNEP/MAP and UfM;
- d) Enforce the governance of the mitigation and reduction of marine litter, under the umbrella of UNEP/MAP Marine Litter Action Plan, at basin scale in a harmonize way.

### **The Plastic Busters Promoters and networking**

The success of the project will be guaranteed by the consortium strength. Project promoters have a strong and highly complementary set of skills and experience which are key for the success of the project (15 Partners from 7 Countries). *Lead promoter: University of Siena (Mediterranean SDSN) (IT)*

On April 14 and 15, 2016, the University of Siena (Italy) hosted a meeting of the 15-member Plastic Busters Project consortium to evaluate past success and plan future work. Project highlights to date include receiving financial support from GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit), the unanimous endorsement of the initiative by the Union for the Mediterranean (UfM), and achieving the prestigious UfM label in February 2016. The label qualifies the project as a viable initiative with distinct benefits for the citizens of the Euro-Mediterranean region. The University of Siena, *Mediterranean SDSN* and the Plastic Busters Consortium fully agree that is an essential step for the project, which comes at a critical moment in the fight against marine litter, a high priority issue on both the Mediterranean and International stages. All the consortium members and the Regional Director UNEP/MAP have strongly underlined the importance of the project, and their own commitment to it, noting that it offers a unique opportunity on basin scale to cover the existing gaps on this emerging threat. All have fully endorsed their desire to move, as rapidly as possible, towards an implementation phase. The key objective and take-home message from this Paper is to raise the visibility of this issue and the Plastic Busters project to a wide audience and to generate greater cohesion among the countries around the Mediterranean to achieve the goal of the reduction of plastic at sea.

**More information of the Project on the Web Site <http://plasticbusters.unisi.it/>**

*Prof. Maria Cristina Fossi*

*Dipartimento di Scienze Fisiche, della Terra e dell'Ambiente*

*Università di Siena*

*Via P.A. Mattioli, 4*

*53100 Siena*

*Italy*

*email: [fossi@unisi.it](mailto:fossi@unisi.it)*

*Tel: +39 0577 232913*

*Siena 21, 03, 2017*