



International Workshop

“MONITORING MARINE LITTER IN ENVIRONMENT AND BIODIVERSITY”

COMMON and Plastic Busters CAP projects - Manfredonia (Italy), 13th - 14th July 2022

The PB-MPAs Toolkit on marine litter monitoring: Beach macrolitter and microlitter

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Site selection

The methodologies for monitoring beach macro- and micro-litter have been compiled based on the related methodology developed within the IPA-Adriatic DeFishGear project and the 2022 MSFD TGML Updated Guidance on Monitoring of Marine Litter in European Seas, while taking into account the results from the Plastic Busters MPAs testing phase

The survey sites should fulfill the following characteristics:

- Have a minimum length of 100m;
- Be characterized by a low to moderate slope;
- Have clear access to the sea (not blocked by breakwaters or jetties);
- Be accessible to survey teams throughout the year;
- Ideally, not be subject to cleaning activities. In case they are subjected to litter collection activities, the timing of non-survey related beach cleaning must be known so that litter flux rates (the amount of litter accumulation per unit time) can be determined.



Site selection

In addition, the location of the survey sites should be spatially stratified to reflect:

- different pressures and different levels of exposure to litter (e.g. close to river mouths, close to harbours/marinas, presence of touristic facilities nearby, etc.);
- different development and urbanisation levels, including a balanced mix of urban, semi-urban, and remote/natural beaches.

It should be highlighted that all necessary precautions should be taken to ensure that surveys will not pose any threat to endangered or protected species such as sea turtles, shorebirds, marine mammals or sensitive beach vegetation/habitats.



Frequency and timing of surveys

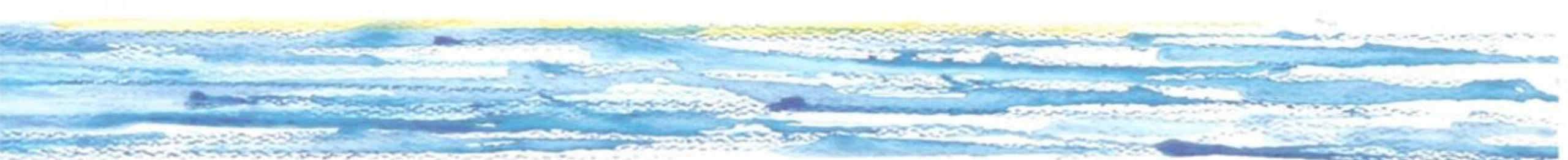
**At least four surveys should be carried out in winter, summer, spring and autumn.
The optimum survey periods are:**

Winter: January

Spring: April

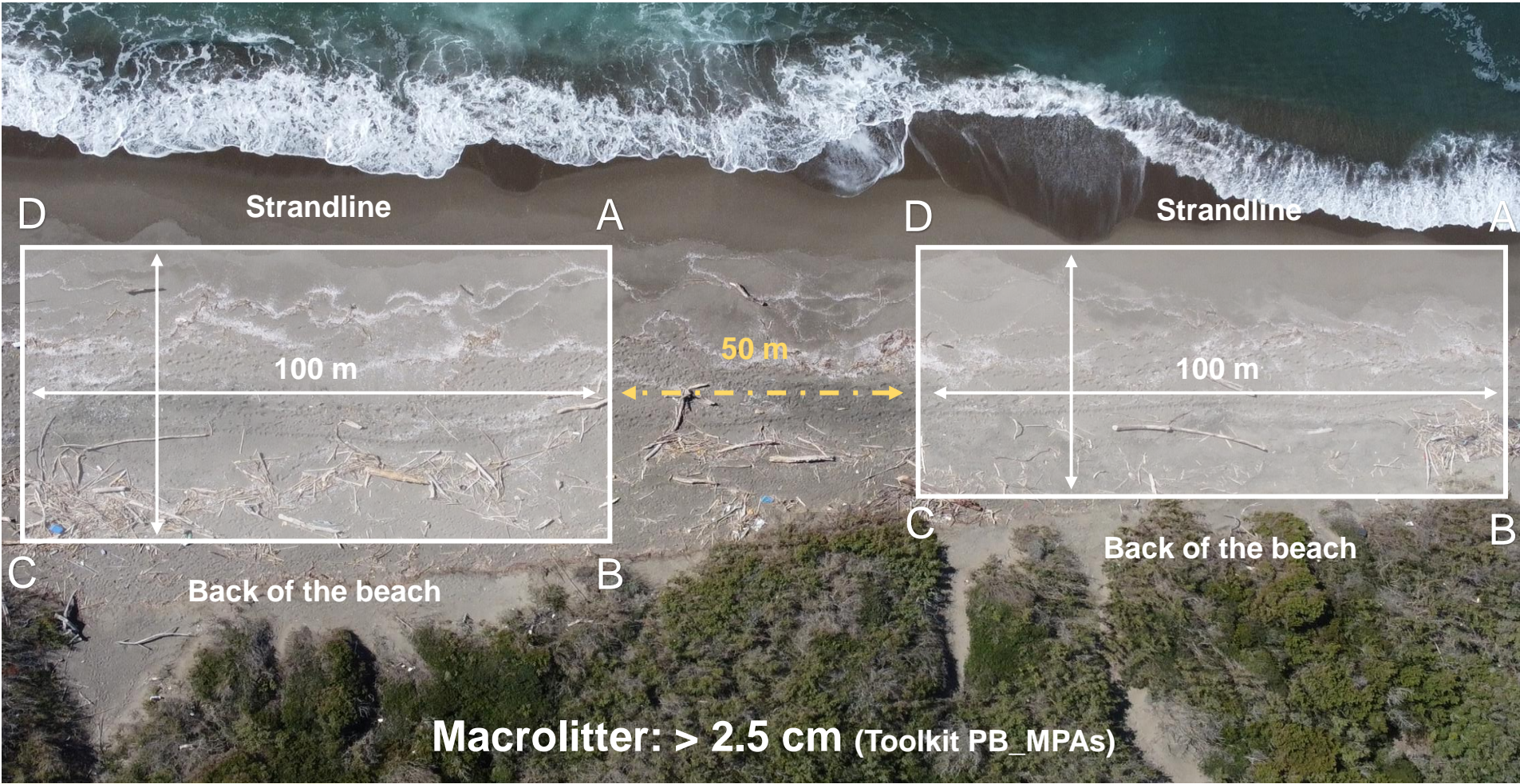
Summer: July

Autumn: October



Sampling unit

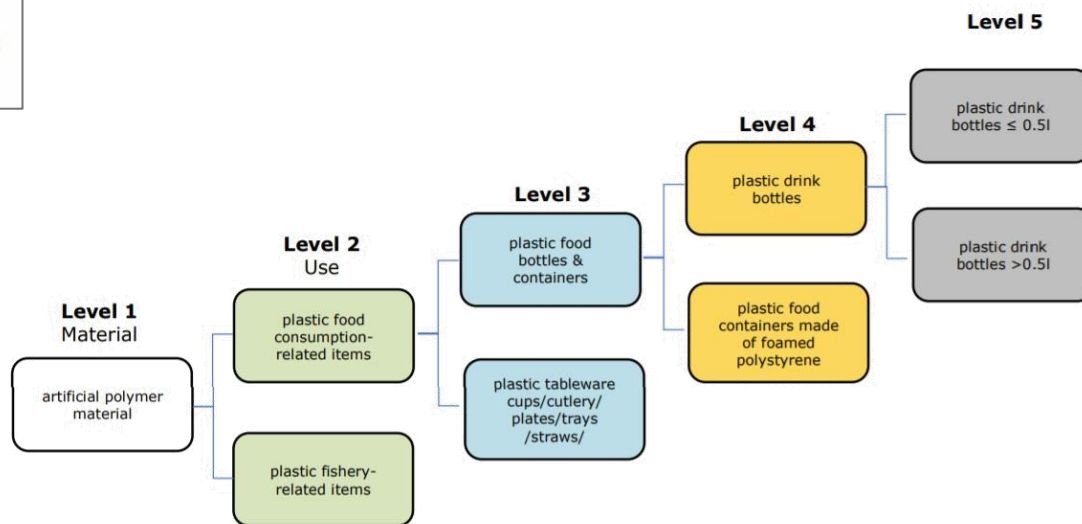
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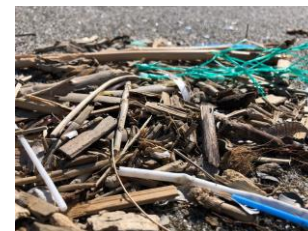
Monitoring of Beach Macro-Litter

Litter items classification and quantification

Based on a **hierarchical system**, litter items are characterised by different levels of detail



Fleet et al., 2021



[Online Photo Catalogue of the Joint List of Litter Categories](https://mcc.jrc.ec.europa.eu/main/photocatalogue.py?N=41&O=457&cat=all)

<https://mcc.jrc.ec.europa.eu/main/photocatalogue.py?N=41&O=457&cat=all>

The unit in which macrolitter will be assessed on the beach will be 'number of items' and it will be expressed as counts of litter items per 100 metre stretch (**litter items/100m**).

Monitoring of Beach Micro-Litter

The sampling area should be defined by marking out a 100-metre transect in width, parallel to the strandline, using a measuring tape and taking note of the GPS coordinates on each side of the transect (A and B).

The transect will define the sampling area i.e. from the shoreline (low tide, AC1) to above the strandline (accumulation zone, AC2). It should be highlighted that in many beaches the second tideline might not be always visible on the shore. Depending on the width of the beach, the sampling area can be extended to the back of the beach.



Processing and size classification

AC1

low tide accumulation area

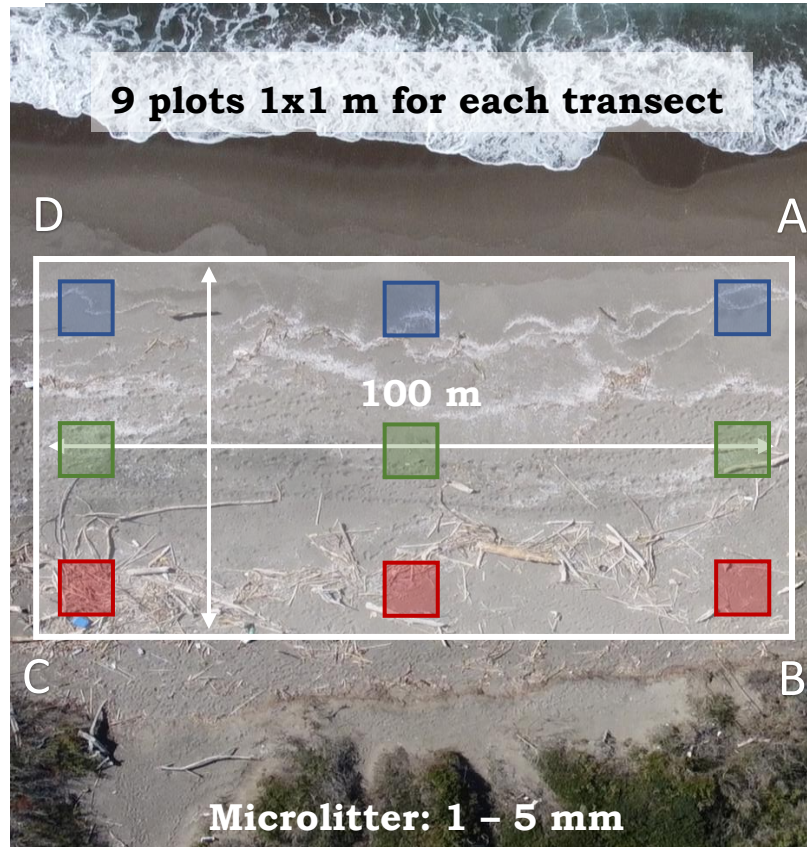
OAC off accumulation area

AC2

high tide accumulation area

Frias et al, 2018

Top 5 cm of sand, weighted
(kg) and sieved, (1-5 mm)



Isolation, characterization and polymer analysis (20% out of the total)

The proposed reporting units for microplastics retrieved from sediment samples are:

- no. MPs per area (items/m²)
- no. MPs per mass (items/kg dry sediment).
- mass of MP per area (g MP/m²)
- mass of MP per mass (g MP/kg dry sediment)



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Thank you!

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