Training material online for beached litter monitoring

WP 6 Policy advice & implementation

TASK 6.5 Training, education & policy advice

BONUS Micropoll Milestone No 13

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Milestone No. 13

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Background

The aim of this deliverable was to provide an online training material dedicated for introducing beached marine litter monitoring methods used in the Project.

Organization and the structure

Klaipėda University, in cooperation with other project partners, in the first year agreed on the concept of online material. The available training material was prepared according to the existing publication Haseler et.al. (2017), OSPAR and TSG ML guidelines for beach litter monitoring. The material was tested during the field work exercises of the Coastal Management II Practical student course in Germany (April/May 2017) and Integrated Coastal Zone Management course in Klaipėda University (May 2018).

The training material is provided in a short introductory video (Figure 1), a description of beached litter monitoring methods, applied in the BONUS Micropoll project (See annex 1) and excel protocols for data entry (links provided in the annex 1). The reason behind providing training material in several formats that in order to better understand sampling procedure a written protocol is not always enough. Therefore an introductory video should make sampling exercise and later laboratory analysis more consistent.

E-learning webpage with video and other material:
https://www.io-warnemuende.de/plastic-sampling-7130.html

Annex 1

MATERIALS AND METHODS FOR MARINE LITTER SAMPLING AT THE SANDY BEACHES

1. Rake method

Equipment needed:

- Sand rake (metal sieve with 2 mm mesh size)
- Measuring tape
- Plastic bags for litter collection
- Distance markers (sticks, flags, etc.)

The method covers beach area between the waterline and the start of vegetation zone/dunes. The chosen beach area is divided into 5 m long segments (Fig.1A. segments are indicated as T1, T2, etc.). Depending on the beach width, the amount of parallel sampling stripes in each survey site might be different.

The sampling starts in first stripe segment (T1) followed by T2, T3 and so on. The operational width is 0.5 m (the width of the sand rake (Fig. 1B)). One sampling segment covers an area of 2.5 m^2. At least 20 segments (a total area of 50 m^2) should be sampled in each survey site. If a required sampling area is reached in the middle of the beach, the sampling must continue until full beach width (stripe) is covered. The depth of rake penetration into the surface sediment is approximately 3 cm. The sand collected while dragging a rake is manually sieved out and all litter items within each segment are stored in a separate plastic bag with the corresponding number (T1, T2, T3, etc.). All collected marine litter are visually sorted and documented in the laboratory (see the *collected litter classification and analysis* chapter).

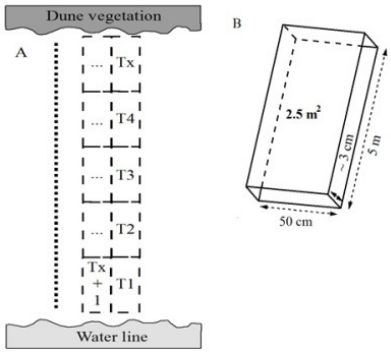

Fig. 1. General sampling scheme using Rake method.

Excel protocol of the Rake method laboratory analysis: Rake method_sheet.xlsx

2. The Tidal (10 m^2) method

Equipment needed

- Sieve (metal sieve with 2 mm mesh size)
- Measuring tape
- Plastic bags for litter collection
- Distance markers (sticks, flags, etc)
- A bucket for water
- Preferably non plastic shovel or metal spatula

The method focuses on sampling in a 1 x 10 meter (10 m^2) transect, in the most recent beach cast/wrack accumulation zone (Fig. 2). This zone refers to the area that collects organic matter after a high tide or a storm surge. The sampling transect is divided into single squares (area of 1 m^2) and numbered from 1 to 10.

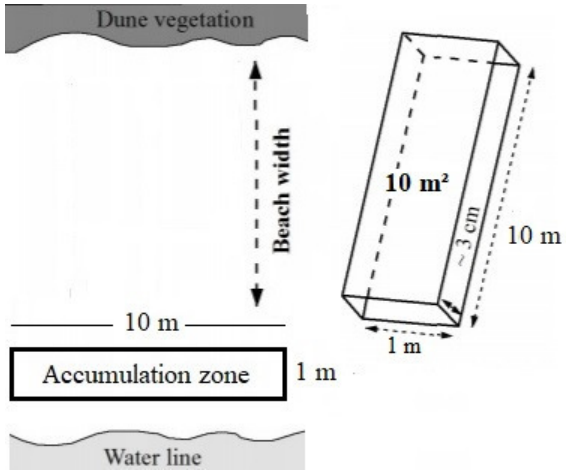

Fig. 2. Sampling scheme of Tidal method

Top 3 cm of beach/coast sediment is collected with metal spatula and placed in a metal sieve. Sieve is carefully (not to completely submerge) placed in a bucked half full of water and manually shacked until all the sand is sieved out. The procedure is repeated until all the surface sand form sampling square is sieved. All litter items (left after sieving) from the metal sieve are placed in a plastic bag. The bag is marked: name of sampling location, No. of transect (T1, T2, etc.) and sealed. All collected marine litter are visually sorted and documented in the laboratory (see the *collected litter classification and analysis* chapter).

Excel protocol of the 10 m^2 method laboratory analysis: 10sq_meter_sheet.xlsx

3. 100 m – method (OSPAR monitoring)

Equipment needed:

- **Distance markers (sticks, flags, etc.)**
- **Measuring tape**
- **Garbage bags**
- **Protocol – TSG ML Master list for beach liter monitoring**
- **GPS device**

The survey methodology followed guidelines and protocols provided by OSPAR.

At least two persons are needed to implement a proper survey. The sampling starts from the shoreline with direction towards the beginning of the dunes/ vegetation zone (Fig. 3.). The items found by seeing with the naked eye. Each item that has been seen is picked up and marked in the official TSG ML Master list. A systematic walking trajectory should be kept in order not to overlap previously surveyed stripe (Fig. 3). Once the vegetation zone is reached people are heading back towards the water line with a distance of 1 meter from the previous walking path. The OSPAR photo guide is a great assist when identifying and classifying of litter items is not mastered.

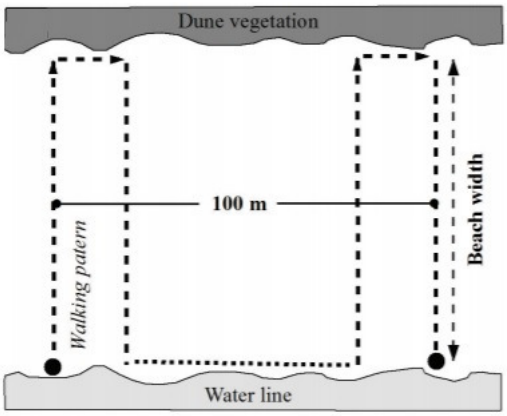

Fig. 3. Sampling scheme of 100 meters method

Excel protocol of the TSG ML Master List of Categories of Litter Items: Master list for beached macro-litter.xlsx

4. Collected litter classification and analysis

There is classification defined for the items, found at the beach. The main material types are categorized as:

- artificial polymers
- paper
- glass
- metal
- rubber
- textile
- other (for unrecognized items)

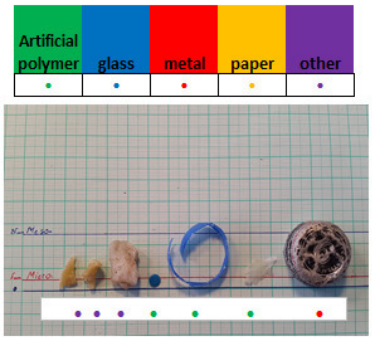

Fig. 4. Documentation of the items found

All litter items collected using Rake or Tidal methods are analysed in the laboratory. Litter size class dividing lines (micro (<0.5 cm), mezzo (0.5-2.5 cm), macro (>2.5cm)) are drawn on the millimeter paper (Fig. 4). Items from each sampling transect are documented by the picture taken. After a visual survey, a material type color is assigned to each of the found items picture. More precise description about the items, and sampling location, sampling conditions are indicated in excel sheet assigned for each sampling location separately.