Methodology for monitoring MACROLITTER on the seafloor with visual surveys with scuba/snorkeling (shallow coastal waters, 0–30m)

Regional Training on harmonized ML monitoring protocols – October 12-14, 2021

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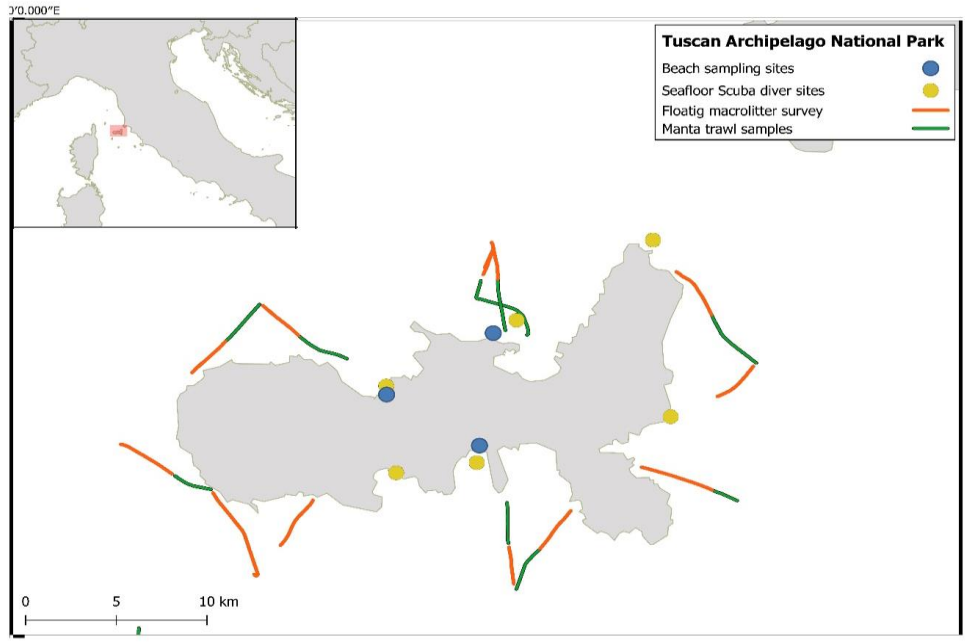
Site selection

Sites should be selected to ensure that they:

- ✓ Consider areas that might accumulate litter;
- ✓ Avoid areas of risk (presence of hazardous waste), sensitive areas;
- ✓ Do not exert impacts on any endangered or protected species;
- ✓ Avoid areas with strong currents or waves;
- ✓ Avoid navigation routes of vessels that might put divers in danger.



Sites should be chosen following a two-fold approach: (i) selecting sites that meet certain criteria (e.g. are close to ports, river mouths, cities, etc.); (ii) choosing randomly from a large number of sites.

At least two surveys, one in autumn and one in spring should be carried out.
If surveys are also implemented in the summertime these should be carried out from mid-June to mid-July.

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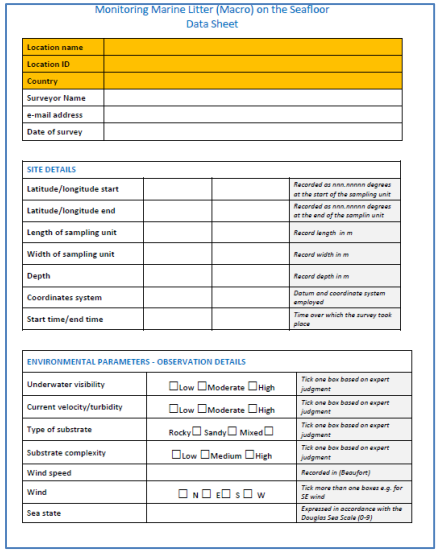
Materials & Equipment

The following items are necessary to carry out seafloor litter surveys:

- ✓ Scuba gear and equipment: diving suit, buoyancy control device, regulator, air tank, pressure gauge, fins, etc.;
- ✓ Supplies: mesh sack, rope, ruler, cutter, dive flag, dive slate, float tube, and pelican float;
- ✓ Underwater digital camera;
- ✓ Lift bag;
- ✓ Floating fence;
- ✓ GPS;
- ✓ Comprehensive first-aid kit;
- ✓ Recording sheets and pencils.



Monitoring Marine Litter (Macro) on the Seafloor
Data Sheet

Location name	
Location ID	
Country	
Surveyor Name	
e-mail address	
Date of survey	

SITE DETAILS			
Latitude/longitude start			*Recorded as nnn.nnnnn degrees at the start of the sampling unit*
Latitude/longitude end			*Recorded as nnn.nnnnn degrees at the end of the samplin unit*
Length of sampling unit			*Record length in m*
Width of sampling unit			*Record width in m*
Depth			*Record depth in m*
Coordinates system			*Datum and coordinate system employed*
Start time/end time			*Time over which the survey took place*

ENVIRONMENTAL PARAMETERS - OBSERVATION DETAILS		
Underwater visibility	☐Low ☐Moderate ☐High	*Tick one box based on expert judgment*
Current velocity/turbidity	☐Low ☐Moderate ☐High	*Tick one box based on expert judgment*
Type of substrate	Rocky☐ Sandy☐ Mixed☐	*Tick one box based on expert judgment*
Substrate complexity	☐Low ☐Medium ☐High	*Tick one box based on expert judgment*
Wind speed		*Recorded in (Beaufort)*
Wind	☐ N ☐ E☐ S ☐ W	*Tick more than one boxes e.g. for SE wind*
Sea state		*Expressed in accordance with the Douglas Sea Scale (0-9)*

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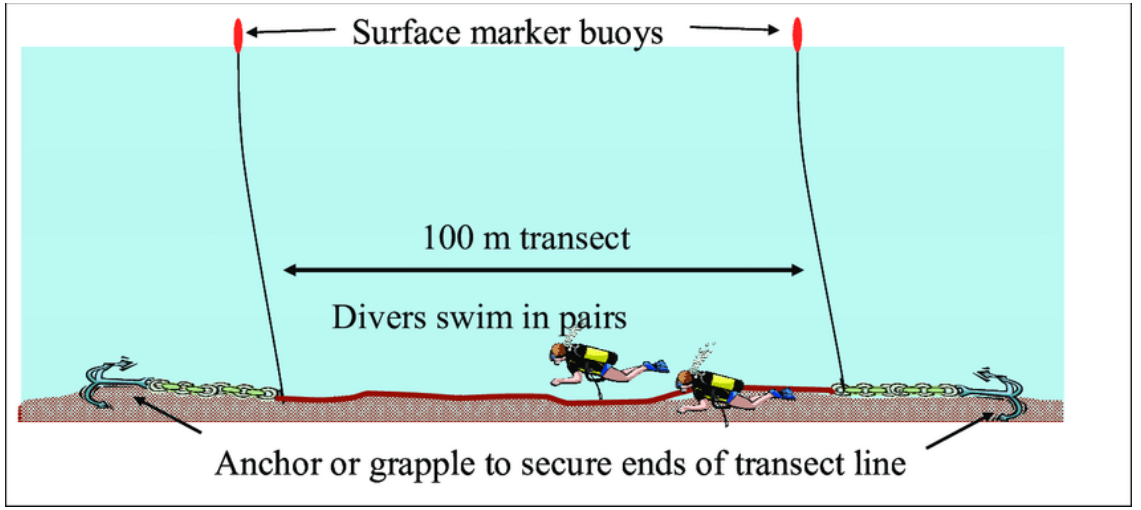
Sampling unit

✓ The survey area is defined by the **transect width** and **length**.

✓ The **start** and **end point** of each transect should be **identified** with **marker buoys** and **recorded using a GPS**.

✓ The **length** of the line transects **could vary** between **50m-100m** and the **width from 4m-8m**, depending on the depth, the depth gradient, the turbidity, the habitat complexity and the litter density.



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Litter classification and quantification I

- ✓ **Digital photos should be taken for all items** with an underwater camera, subsequently, **lighter litter items should be collected and brought ashore,** while **larger items should just be marked**.

- ✓ A **unique identification number** must be given **to each photographed object**.

- ✓ The following **size range classes** should be reported for each recorded litter item:

  M. < 5 cm*5 cm = 25 cm2
  N. < 10 cm*10 cm = 100 cm2
  O. < 20 cm*20 cm = 400 cm2
  P. < 50 cm*50 cm = 2500 cm2
  Q. < 100 cm*100 cm = 10000 cm2 = 1 m2
  R. > 100 cm*100 cm = 10000 cm2 = 1 m2

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Litter classification and quantification II

- ✓ **Each photographed object must be categorized following the Joint List.**
- ✓ Unknown litter, or items that are not on the survey sheet, should be noted in the appropriate “other item box”. A short description of the item should then be included on the survey sheet.
- ✓ The **unit** in which litter should be recorded is **number of items** and it should be **expressed** as counts of litter items per square kilometer (**litter items/km^2**).

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Thank you!

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