

# Harmonizing Marine Litter Monitoring in the Wider Caribbean Region: A Hybrid Approach

2019



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## Commissioner

The Gulf and Caribbean Fisheries Institute (GCFI) and UN Environment's Caribbean Environment Programme (UNEP-CEP), which also serves as Secretariat of the Cartagena Convention.

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## Glossary of Terms and Abbreviations

|                             |  |
|-----------------------------|--|
| <b>AWS</b>                  | Amazon Web Services, a cloud computing service   |
| <b>Beach cast</b>           | Material that has been deposited on beaches after being washed up by wave action, storm or tidal movement.   |
| <b>Benthic</b>              | On the sea-bed – benthic litter is litter found sitting on or entangled with objects on the seabed.  |
| <b>Cartagena Convention</b> | The Cartagena Convention has been ratified by 26 United Nations Member States in the Wider Caribbean Region. It covers the marine environment of the Gulf of Mexico, the Caribbean Sea and the areas of the Atlantic Ocean adjacent thereto, south of 30 north latitude and within 200 nautical miles of the Atlantic Coasts of the States. The Convention for the Protection and Development of the Marine Environment in the Wider Caribbean Region (WCR) or Cartagena Convention is a regional legal agreement for the protection of the Caribbean Sea. The Convention was adopted in Cartagena, Colombia on 24 March 1983 and entered into force on 11 October 1986. The Convention is supported by three technical agreements or Protocols on Oil Spills, Specially Protected Areas and Wildlife (SPAW) and Land Based Sources of Marine Pollution (LBS). |
| <b>CCB</b>                  | Clean Coast Bonaire - pilot program funded by WWF to bring OSPAR Marine Litter Survey methodology to Bonaire.  |
| <b>CSV file</b>             | In computing, a comma-separated values (CSV) file is a delimited text file that uses a comma to separate values. A CSV file stores tabular data (numbers and text) in plain text. Each line of the file is a data record. Each record consists of one or more fields, separated by commas.   |
| <b>DAD</b>                  | Dive Against Debris – Project AWARE program for benthic marine litter removal and survey by volunteer scuba divers.  |
| <b>Debris</b>               | See Litter – although the words “litter” and “debris” are sometimes used to indicate “rubbish” with different sources in this document the two words are taken to be inter-changeable. Note also that the UN resolution A/60/L.22 and supporting documents used the term “debris” but subsequent UN programmes and documentation have used the term “litter”.  |
| <b>EIHA</b>                 | Environmental Impact of Human Activities committee within OSPAR Biodiversity Strategy  |
| <b>EPA</b>                  | US Environmental Protection Agency   |
| <b>Flux rate</b>            | Flux rate is the amount of litter that accumulates on a given length of beach over a given period of time expressed as [unit quantity of litter] per [unit length of beach] per [unit time]. See also standing crop.   |
| <b>GCFI</b>                 | Gulf and Caribbean Fisheries Institute   |
| <b>GESAMP</b>               | Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection  |



|                                |   |
|--------------------------------|---|
| <b>GPML</b>                    | Global Partnership on Marine Litter   |
| <b>ICC</b>                     | International Coastal Cleanup - Annual event, celebrated on the 3 <sup>rd</sup> Saturday of September. The world's largest volunteer effort for ocean and waterways.  |
| <b>IOC of UNESCO</b>           | Intergovernmental Oceanographic Commission of United Nations Educational, Scientific and Cultural Organization  |
| <b>LBS</b>                     | Land Based Sources of Marine Pollution  |
| <b>Litter Analyst</b>          | A tailor-made software for analysing the results of beach litter surveys  |
| <b>Litter Characterization</b> | System used to classify different types of litter. Many different systems have been used in the literature including grouping litter based on its material composition (e.g. plastic vs wood vs metal), form (e.g. bottles vs crates vs sheets) or source (e.g. recreational activities vs fishing vs commercial transport). In this report a comprehensive litter characterization scheme has been developed that uses both material composition and form.   |
| <b>Litter Monitoring</b>       | Repeated surveys of beaches, sea bed and/or surface waters to determine litter quantities such that information can be compared with baseline data to see if changes occur through time and/or in response to management arrangements.  |
| <b>Litter Survey</b>           | Structured set of procedures to provide a quantitative assessment of the amount of litter in a given location.  |
| <b>Marine Litter</b>           | Waste, discarded or lost material resulting from human activities – marine litter is any such material that has made it into the marine environment, including material found on beaches or material that is floating or has sunk at sea.   |
| <b>MARPOL</b>                  | International Convention for the Prevention of Pollution from Ships   |
| <b>MCS</b>                     | Marine Conservation Society   |
| <b>MDMAP</b>                   | Marine Debris Monitoring and Assessment Project developed by NOAA in the USA.   |
| <b>Microplastics</b>           | Plastic fragments less than 5mm in diameter.<br>Primary Microplastics: Produced for a specific use (i.e. nurdles).<br>Secondary Microplastics: Formed from the breakdown of larger plastic materials (i.e. bottle fragmentation).   |
| <b>MSFD</b>                    | Marine Strategy Framework Directive (of the European Union)   |
| <b>MySQL</b>                   | An open source relational database management system. The MySQL development project has made its source code available under the terms of the GNU General Public License, as well as under a variety of proprietary agreements. MySQL was owned and sponsored by a single for-profit firm, the Swedish company MySQL AB, now owned by Oracle Corporation. For proprietary use, several paid editions are available, and offer additional functionality. MySQL is also used in many high-profile, large-scale websites such as Facebook and YouTube. |
| <b>NGO</b>                     | Non-Governmental Organization   |
| <b>NOAA</b>                    | National Oceanic and Atmospheric Administration   |
| <b>NMDMP</b>                   | National Marine Debris Monitoring Program developed by the Ocean Conservancy in the USA.  |



|                                     |   |
|-------------------------------------|---|
| <b>OC</b>                           | The Ocean Conservancy - A non-profit environmental advocacy group based in Washington, D.C., United States. The organization helps formulate ocean policy at the federal and state government levels based on peer reviewed science. It is an NGO receiving funding from foundations and corporations.  |
| <b>OSPAR</b>                        | The 1992 OSPAR Convention is the current instrument guiding international cooperation on the protection of the marine environment of the North-East Atlantic. It combined and up-dated the 1972 Oslo Convention on dumping waste at sea and the 1974 Paris Convention on land-based sources of marine pollution.  |
| <b>PADI</b>                         | Professional Association of Dive Instructors  |
| <b>Project AWARE</b>                | Registered non-profit organization working with volunteer scuba divers.   |
| <b>RAP</b>                          | Regional Action Plan  |
| <b>RAPMaLi</b>                      | Regional Action Plan for Marine Litter  |
| <b>RCU</b>                          | Regional Coordinating Unit for any of the various UNEP Regional Seas Programmes (see RSP).  |
| <b>RDS</b>                          | Relational Database Service, a cloud based relational database service provided by Amazon.  |
| <b>RSP</b>                          | The UNEP Regional Seas Programme  |
| <b>SDG14</b>                        | Sustainable Development Goal (SDG) 14 - Conserve and sustainably use the oceans, seas and marine resources for sustainable development.   |
| <b>SIDS</b>                         | Small Island Developing States  |
| <b>Standing crop</b>                | Standing crop is a measure of the amount of litter on the beach expressed as the [unit quantity of litter] per [unit length of beach]. See also Flux rate.  |
| <b>TFS</b>                          | Trash Free Seas - program of Ocean Conservancy in charge of ICC, Clean Swell and TIDES database   |
| <b>TIDES</b>                        | Trash Information and Data for Education and Solutions (Ocean Conservancy website <a href="http://www.coastalcleanupdata.org">www.coastalcleanupdata.org</a> )  |
| <b>UNEP/UN Environment</b>          | United Nations Environment Programme  |
| <b>UNEP Regional Seas Programme</b> | The Regional Seas Programme was launched in 1974 in the wake of the 1972 United Nations Conference on the Human Environment held in Stockholm, Sweden. Currently, eighteen regions are covered by the Regional Seas family. In total more than 140 countries participate in regional programmes thus the RSP is one of the most globally comprehensive initiatives for the protection of marine and coastal environments. |
| <b>UNEP-CAR/RCU</b>                 | UNEP's Caribbean Regional Coordinating Unit   |
| <b>UNEP-CEP</b>                     | UNEP's Caribbean Environment Programme  |
| <b>UNESCO</b>                       | United Nations Educational, Scientific and Cultural Organization  |
| <b>WCR</b>                          | Wider Caribbean Region  |
| <b>WWF</b>                          | World Wide Fund for Nature  |



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## Introduction

All around the world, Non-Governmental Organizations are launching a growing number of cleanups as part of awareness raising programs. While people are becoming increasingly aware of the magnitude and risks of the plastic debris found in our oceans, policy development is still at an early stage.

Increased public awareness has helped to drive new policies that are aimed at preventing plastics from entering the ocean. A key question is whether in fact these policy measures, such as bans on certain single-use products or policies aimed at better waste management in ports, are actually working. In order to assess the effectiveness of these measures, policy makers need a new robust monitoring scheme that delivers good quality data.

Apart from monitoring the effectiveness of policies, such a monitoring system could also lead to a better understanding of the amounts, types, sources and potential impacts of marine litter in the Wider Caribbean Region (WCR), thereby enabling the development of targeted measures to reduce plastic and other types of marine litter pollution.

This study aims to contribute to the development of a monitoring scheme for marine litter in the WCR, with a focus on monitoring visible marine litter on the shoreline - litter that derives from rivers, ocean currents, waves and wind, or left behind by tourists. This report aims to assess leading initiatives and provide recommendations to policymakers and experts in the WCR.

On 18 and 19 October 2018, the UN Environment's Caribbean Environment Programme (UNEP-CEP), and the Gulf and Caribbean Fisheries Institute (GCFI), co-hosted a workshop in Miami focused on harmonizing marine litter monitoring in the WCR. The workshop was a direct result from a commitment made by the OSPAR Commission and CEP at a United Nations (UN) Conference held in New York in June 2017, about the implementation of Sustainable Development Goal 14 ([#OceanAction17198](#)). Apart from the direct connection by sea, the Cartagena Convention and OSPAR Commission share several common Contracting Parties including The Netherlands, France and the United Kingdom. A variety of approaches for both the collection of information, as well as the cataloging of data were presented. The participants in the workshop recognized the value of a concentrated number of approaches for collecting and cataloging this information and agreed that the next steps should focus on determining the most appropriate methodology. A pilot project about testing the OSPAR Marine Litter Monitoring methodology, a monitoring scheme used by constituent member countries of the OSPAR Commission, as well as various NGO driven initiatives were presented to participants in the workshop.



This assessment is one of the tasks identified during the workshop and focuses on two priority objectives:

1. Evaluate a hybrid approach to data collection methods employed by OSPAR and Ocean Conservancy for the Wider Caribbean Region. This includes identifying the pros and cons of each methodology by comparing the different survey methods, field forms and databases, as well as governance of the initiatives.
2. Evaluate the technical merits of marine litter data housing by comparing different databases currently used to collect data.

This study compared three initiatives in the Caribbean region and the OSPAR marine litter monitoring methodology against a set of predetermined criteria. These criteria were adapted from a previous assessment made by UNEP in 2009 (UNEP 2009). Furthermore, a case study is described from Bonaire, where the authors initiated and employed a hybrid approach to cleaning the coast and monitoring the litter according to different existing initiatives. A short questionnaire was sent to the initiatives about data management, including data housing and data ownership.

There are significant distinctions between the methodologies employed. One important difference is the aim of the monitoring. Where the OSPAR marine litter monitoring methodology serves to inform policymakers about progress on policy measures in the North East Atlantic Region, most of the other initiatives have as primary aim to raise awareness, engage with citizens and to inform policymakers. There are also differences in the governance of the initiatives.

Regarding the methodology, there are differences in location selection, frequency, items on the field forms and in people who perform the surveys. These aspects have consequences on the type of analyses that can be made from the data gathered. To analyze trends, for example, it is key to have frequent monitoring on the same site over a predetermined distance and preferably surveyed by trained surveyors to avoid bias. While this approach is ideal for monitoring, it may not serve well for engaging citizens and raising awareness. The authors therefore suggest adopting a hybrid approach

## **UNEP 2009 Operational Guidelines for Comprehensive Beach Litter Assessment**

**A comparative analysis of information from around the world on existing experience and methods for surveys, monitoring, reporting protocols and assessment of marine litter.**

- **Objectives**
- **Beach selection & characterization**
- **Sampling units**
- **Sampling frequency**
- **Laying out a typical survey**
- **Litter classification**
- **Data sheets**
- **Quality assurance**
- **Data management platform**
- **Equipment needs**



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that allows for engagement with citizens for monitoring, while ensuring good quality data collection on certain preselected sites.

Regarding the data collection and data housing, the recommendation is not to reinvent the wheel, but to make use of existing IT infrastructure and/or copy databases from successful initiatives. Some capacity and resources would be needed to develop a consistent monitoring program in the Wider Caribbean Region. As a first step, an action plan could be drafted, including the establishment of a three-year pilot program. The pilot would identify potential pilot countries, build on the experience in Bonaire and include a follow-up regional marine litter harmonization workshop.

Section 1 provides background on marine litter in the Wider Caribbean Region, followed by an overview of marine litter monitoring activities in Section 2. Section 3 describes the OSPAR Marine Litter Monitoring program. A description of the method followed during this assessment in Section 4. Sections 5 and 6 give the results of the analysis, resulting in conclusions and recommendations in Section 7.

## 1. Marine Litter in the Wider Caribbean Region

### 1.1 Impact

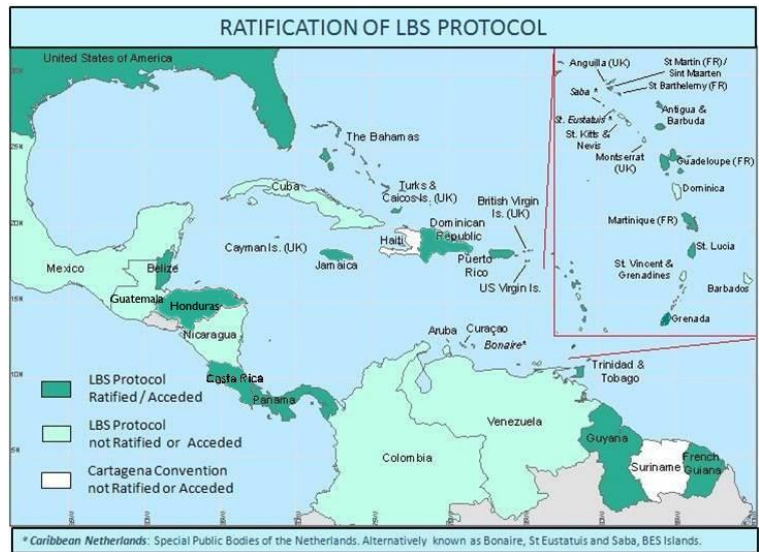
The global issue of marine litter has had a significant impact on countries of the Wider Caribbean Region, in particular on Small Island Developing States. SIDS have a higher proportion of coastline and a significant reliance upon coastal ecosystems for tourism, fishing and transportation than in other regions. The tropical climate is conducive to tropical cyclones in addition to year-round beach and water recreational activities, causing more waste production and potential marine litter. Prevalence of marine litter is detrimental to the economy, human health and safety, habitats and wildlife of SIDS. There is also increasing concern about microplastics and their impact on health.

### 1.2 Governance & Actions

There are many international agreements to address marine litter in place, however, the Cartagena Convention is the only agreement that governs marine litter issues specific to the Wider Caribbean Region. It does this through the Protocol Concerning Pollution from Land-Based Sources and Activities (LBS Protocol). The Caribbean Sea is a Special Area under MARPOL Annex V relating to discharge of ship-generated waste. The Caribbean Node for Marine Litter is co-hosted by GCFI and the Secretariat for the Cartagena Convention as a regional platform for implementing the Regional Action Plan and supporting the objectives of the Global Partnership on Marine Litter. As of July 2018, the Cartagena Convention and its LBS Protocol has been ratified by fourteen (14) WCR countries. The Regional Action Plan for Marine Litter (RAPMaLi) serves to set priorities and achieve the objectives of the LBS Protocol. The RAPMaLi for the Wider Caribbean Region was originally developed in 2007 as a project



Figure 1: Map of WCR with Contracting Parties



under the directive of the United Nations Environment Programme (through its Regional Seas Program).

In 2014, the UNEP-CEP prepared an update to the 2008 RAPMaLi called “CEP Technical Report 72: Regional Action Plan on Marine Litter Management (RAPMaLi) for The Wider Caribbean Region 2014.”

The RAPMaLi concluded that many of the islands in the WCR have programmes to address marine litter. However, there is still the need for the establishment of national marine litter monitoring programmes to provide for a continuous assessment of coastal areas and seas. The following two action points were recommended in RAPMaLi 2014 regarding marine litter monitoring:

The following two action points were recommended in RAPMaLi 2014 regarding marine litter monitoring:

**ACTION 1:** Design and implement a strategy to develop national marine litter monitoring pilot projects in the WCR, including standardised methods for data collection and reporting within the framework of UNEP Regional Seas Global Marine Litter Monitoring Guidelines.

**ACTION 2:** Develop a regional, web-based database as a clearinghouse for marine litter information and research.

## 2. Marine Litter Monitoring in the Caribbean

### 2.1 Ocean Conservancy – Trash Free Seas

Historic reports and online research show that the main data source for marine litter in the WCR is from surveys by the Ocean Conservancy and partners. The Ocean Conservancy is at the forefront of marine litter monitoring in terms of longevity, popularity, accessibility, ease of use and innovation. The volume of litter removed from the environment and amount of awareness raised regarding the subject of marine litter by the OC’s Trash Free Seas program is an enormous contribution to the WCR. There are now three different survey methods managed by the OC with data that is compiled on the TIDES website [www.coastalcleanupdata.org](http://www.coastalcleanupdata.org).

- **International Coastal Cleanups** have been occurring in 32 different countries in the WCR since 1989.



- **Project AWARE Dive Against Debris** survey methodology has been used during underwater clean-ups to remove and record benthic debris in 29 WCR countries since 2011.
- In 2016, the Ocean Conservancy added another useful citizen science tool to collect marine litter data with the development of the **Clean Swell App**.

## 2.2 OSPAR – A recent arrival to the Caribbean

In 2018, a pilot project was initiated by the WWF to test the feasibility of applying the OSPAR Marine Litter Monitoring Survey protocol on the island of Bonaire. The OSPAR protocol is a uniform, high resolution marine litter survey conducted by trained surveyors in the countries of the OSPAR region since 2000 (see Section 3 for more detail). The pilot program was the first time that the OSPAR protocol was tested in the Caribbean. The program was well attended with ample volunteer interest to support the survey needs. It was determined to be successful pilot by the WWF organizers and therefore the pilot continued and is currently ongoing. A few minor modifications and additions were made to the OSPAR protocol to adapt it to the region. Once such modification was to reduce the length of beach required to be cleared due to heat, sun and large volume of debris. An addition to the protocol was to add the presence and volume of sargassum because (while not ‘marine litter’ by definition) it is an issue of concern in the region. A complete case study of the pilot can be found in [Appendix A](#).

## 2.3 Other Marine Litter Survey Methodologies

Other marine litter surveys are used in the WCR, including but not limited to: EPA Trash Free Seas, NOAA MDMAP and Marine Debris Tracker App. However, these methodologies do not appear to be prevalent and were not included in scope of this report.

A list of WCR countries and marine litter monitoring activity can be found in [Appendix C](#).

# 3. OSPAR

## 3.1 The OSPAR Convention

The OSPAR (Oslo Paris) Convention is the legislative instrument regulating international cooperation on environmental protection in the North-East Atlantic (OSPAR 2018). The implementation of the OSPAR Convention is organized through several Committees. Marine Litter is part of the Environmental Impacts of Human Activities Committee (EIHA).



Figure 2: The OSPAR maritime area



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### 3.2 OSPAR Marine Litter Monitoring Protocol

In order to monitor progress on reducing litter entering the marine environment, OSPAR assesses beach litter, seabed litter and plastic particles in Fulmars stomachs indicators. For Beach litter, OSPAR developed a uniform Marine Litter Monitoring protocol from 2000 onwards for all contracting parties. The monitoring programs enable for the abundance, trends and composition of marine litter to be determined.

The monitoring results are used by policymakers to assess the effectiveness and assist in the implementation of policies and measures at regional and national levels, such as the EU's Marine Strategy Framework Directive (MSFD) and OSPAR's Regional Action Plan for Marine Litter (EU, 2008, OSPAR Commission, 2014). The MSFD is an EU Directive aimed at achieving Good Environmental Status in European seas (EU, 2008). Marine Litter is one of the descriptors used to assess whether European seas are in a Good Environmental Status.

By monitoring in a uniform way across the OSPAR region, data can be interpreted and compared throughout the region.

The methodology is developed to enable participation by all OSPAR member countries in a cost-effective manner while considering quality assurance of the data gathered (OSPAR Guideline, 2010).

The method is based on an OSPAR pilot project from 2000 to 2006 and complemented by marine litter monitoring guidelines from UNEP, making the OSPAR method compatible with the UNEP guidelines.

### 3.3 Governance

The OSPAR Marine Litter surveys are done by all countries in the OSPAR region. Every country has a national coordinator, usually a government representative, or this is contracted to a third party. The national coordinator is responsible for a quality check on the data and timely reporting into the OSPAR Marine Litter Database, which is publicly accessible through <https://www.mcsuk.org/ospar/>. The Marine Conservation Society (MCS), a UK based environmental NGO, and member of the OSPAR Intersessional Correspondence Group on Marine Litter, provides the IT infrastructure and ensures the data is safe and backups are being made. The data are owned by the constituent OSPAR member countries, new data becomes publicly available after consideration by the EIHA Committee. Communication between national coordinators and surveyors is done through meetings of the ICGML and through an online platform provided by OSPAR. Coordinators receive notification on milestones for data entering. Furthermore, work in progress as well as information on litter items are shared through the online platform. All surveys are carried out by trained people in order to ensure consistency in the data gathering.



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### 3.4 Data analysis

A tailor-made software package called Litter Analyst was developed to perform the assessments of marine litter (van der Meulen and Baggelaar, 2016). The software provides statistical analysis and delivers evaluation tables and graphs on items, sources, material composition, trends and the significance of trends (P-values). In fall 2018, a new version was developed called LitterR, with more functionalities.

## 4. Evaluation Method

This chapter describes how the different beach litter data gathering, and cleanup initiatives were evaluated.

A variety of approaches for both the collection of information as well as the cataloging of the data were presented. The participants in the workshop recognized the value of a limited number of approaches for collecting and cataloging this information and agreed that the next steps should focus on determining the most appropriate methodology.

This assessment follows from the workshop in October 2018 and focuses on two priority objectives:

1. Evaluate a hybrid approach to data collection methods employed by OSPAR and Ocean Conservancy for the Wider Caribbean Region. This includes identifying the pros and cons of each methodology by comparing the different survey methods, field forms and databases as well as the governance of the initiatives.
2. Evaluate the technical merits of marine litter data housing by comparing different databases currently used to collect the data.

This study compared ICC, Clean Swell, Dive Against Debris and the OSPAR marine litter monitoring methodology against a set of predetermined criteria. These criteria were largely adapted from a previous assessment made by UNEP (UNEP 2009). Furthermore, a case study is described from Bonaire, where the authors initiated and employed a hybrid approach to cleaning the coast and monitoring the litter according to different existing initiatives.

Research data was compiled in the following ways:

- A desk search was carried out in order to gather information on the initiatives to compare.
- Testing all initiatives' field forms, apps and databases in Bonaire.
- Case study OSPAR application in Bonaire.



- 
- A short questionnaire, listed in [Appendix D](#), was sent to all initiatives about the IT infrastructure and the governance of the data gathered.

This experience and information lead to the information presented in Appendices [E-N](#) containing survey summaries, data collection forms and report output. Then, in Appendices [O-V](#) all four surveys were compared to each other using an evaluation matrix. Some criteria from the UNEP 2009 study were found not to be relevant for this evaluation where others were added.

## 5. Comparison of Survey Methodologies

In 2009, the UNEP/IOC Guidelines for Survey and Monitoring of Marine Litter were developed. The objectives were to develop a set of standardized operational guidelines for the conduct of beach, benthic and floating litter assessments.

The UNEP Guidelines identify many key points that provide the basis of comparison between OSPAR, ICC, Dive Against Debris and Clean Swell. To summarize, the criteria have been divided up in the following questions to see the main points of similarity and difference between the surveys by topic.

### 5.1 Key objectives of the surveys

All initiatives aim to gather data on marine debris. A difference is that OSPAR is developed for and by policymakers in order to identify priorities and to track progress of implemented policies, where the other initiatives are primarily used to raise community awareness and engage with citizens and corporations. Side by side comparisons are found in [Appendix O](#).

### 5.2 Survey requirements

The survey requirements were evaluated by looking at the sampling frequency, site selection and sampling unit. OSPAR requires consistent sampling units with respect to site and length of survey, requirement that all litter items are cleared from a survey site (including all small pieces to the extent possible), consistent sampling intervals and supervision. TFS does not have these requirements. OSPAR surveys measure flux rates. This type of information is important as it determines the type of data analysis that can be done. More detail can be found in [Section 5.8](#). Side by side comparison found in [Appendix P](#).

### 5.3 Survey conditions (on the day of sampling)

OSPAR and DAD collect information regarding weather conditions. OSPAR collects date of last clean and other circumstances that could impact the volume of marine litter, TFS does not. TFS collects number of participants, OSPAR does not. Side by side comparisons are found in [Appendix Q](#).



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## 5.4 Site Information

OSPAR collects significantly more information regarding the depositional nature of the beach. For example: topography, prevailing wind/currents, location in relation to litter sources. Side by side comparison found in [Appendix R](#).

## 5.5 Litter Items and Categorization

The main difference is the level of resolution. Regarding source tracing by user group, it should be noticed that in the more detailed list of items in OSPAR, there is a greater ability to differentiate user groups, for example: items that relate to shipping and fishing industry (i.e. injection gun containers, cleaning agents). Side by side comparison found in [Appendix S](#).

## 5.6 Quality assurance

ICC/Clean Swell are easily accessible to recruit the maximum amount of citizen science volunteers. Dive Against Debris requires dive training and recommends a specialty training course. OSPAR requires more supervision, training and quality control, which limits participation but ensures high quality and usability of data. Use of trained personnel allows for higher resolution surveys and has been proven to reduce bias, ensure consistency in data sampling and identification of litter sampling. Side by side comparison found in [Appendix T](#).

## 5.7 Data management

Database housing, management and technology is similar. However, the data entry is restricted to regional coordinators for OSPAR. The significant difference is in the ownership of the data: OSPAR data is owned by the constituent countries of the region; TFS data is owned and controlled by NGOs. Side by side comparison found in [Appendix U](#). All data of the compared initiatives can be accessed by anyone who is interested.

For OSPAR, data can be retrieved through <https://www.mcsuk.org/ospar/survey>. A unit of time, country and area can be selected after which raw data can be downloaded as a csv file. If a country or region is not selected, all data of all countries is given for the selected time period. There is also a possibility to retrieve pie charts (click 'survey data reports') about the material composition and the different sources.

The data of Trash Free Seas can be accessed through <https://www.coastalcleanupdata.org>. This database is user friendly for the general public and provides different options for creating online reports, such as a summary report and a "Top 10" list of most commonly found items. The data for these reports can be downloaded as an xlsx file.



Both OSPAR and TFS provides access to analysed and published online reports and to the actual raw data, either at a national, regional level or even at the survey site level.

### 5.8 Reports and data analysis

All initiatives provide top ten most found items, entanglement and abundance. Because OSPAR also measures flux rates, the data can be used to analyse trends in greater detail using tailor-made software. Side by side comparison found in [Appendix V](#).

### 5.9 Surveys advantages and limitations

All four surveys have inherent benefits and are known to be effective methods of data collection. They are, however, useful in different ways as described by the two different classes of surveys defined comprehensive and rapid by UNEP 2009.

UNEP defines a **comprehensive survey** as a protocol that is targeted at the collection of highly resolved data to support the development and/or evaluation of mitigation strategies in coastal and marine systems. The protocol for these surveys includes a highly structured framework for observations at regional, national and international scales.

UNEP defines a **rapid survey** as a protocol comprised of a simplified version of the comprehensive beach survey, targeted primarily at developing public awareness and education about marine litter issues and is thus not constrained by the need to fit within a broader spatio-temporal comparison framework. Such surveys may be used as a vehicle for broader based community engagement and in building community capacity when working towards inclusion within the comprehensive survey framework. Unfortunately, the rapid survey approach has limited applicability when assessing flux rates.

#### International Coastal Cleanup

**Advantages:** Popularity, longevity, accessibility. Currently established in the WCR as the main source of marine litter

## Flux Rate

**In order to measure flux rates one must calculate the rate at which litter accumulates, i.e., the amount of litter arriving on a given length of beach over a given period of time expressed as [unit quantity of litter] per [unit length of beach] per [unit time], as opposed to standing crop which measures the amount of material on the beach, i.e. [unit quantity of litter] per [unit length of beach]. This distinction between the assessment of flux rate rather than standing crop is one of the fundamental differences between the comprehensive and rapid assessment protocols (UNEP 2009).**



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information. Existing volunteer base. Awareness raising. Fulfils the requirements of a Rapid Beach Assessment by the definition of UNEP 2009.

**Limitations:** One time per year. No consistency in sampling units for assessing flux rate of accumulation. Ownership of data by NGO with funding from corporations (such as The Coca-Cola Foundation) could be construed as conflict of interest.

### **Clean Swell**

**Advantages:** Ease of use, accessibility. Can be used on any coast, by anyone at any time. Existing volunteer base. Awareness raising.

**Limitations:** No consistency in sampling units for assessing flux rate of accumulation. Ownership of data by NGO with funding from private corporations (such as The Coca-Cola Foundation) could be construed as conflict of interest.

### **Dive Against Debris**

**Advantages:** Can be used by volunteer divers to collect benthic debris data at any site at any time. Existing network of PADI dive centers actively recruiting volunteers and organizing events. Awareness raising. Could be adapted as a “Rapid Benthic” as a modified classification of UNEP 2009 (see [Section 6.3](#)).

**Limitations:** No consistency in sampling units for assessing flux rate of accumulation. Cost-prohibitive for all volunteers with respect to scuba tanks, dive equipment, boat transport to dive sites if not accessible from shore.

### **OSPAR**

**Advantages:** Currently established in OSPAR region as the main source of marine litter information. Strict data collection protocol with respect to sampling units, training, supervision and higher resolution of data allows for credible and comprehensive trend analysis. Ownership of data by constituent countries puts data directly in the hands of policy makers, ensures support for action plan, and has no conflict of interest. Proven track record of multi-national network enabling knowledge sharing between countries through regional coordinators. Fulfils the requirements of a Comprehensive Beach Assessment (with a few additions – see [Section 5.10](#)) by the definition of UNEP 2009.

**Limitations:** Requires training and supervision. Time consuming on heavily littered beaches due to level of detail and requirement of total clearance. Higher cost in terms of human and technical resources.

## **5.10 Comparison of OSPAR to UNEP Guidelines**

When the UNEP 2009 standards are reviewed side by side with OSPAR Marine Litter Survey methodology, as outlined in [Appendix W](#), there are a few points that are recommended by UNEP that are not currently present in the OSPAR Survey.



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In summary, by adding the following, OSPAR can be adapted to fulfil the criteria for a Comprehensive Beach Litter Survey as outlined by UNEP 2009:

- additional survey data to collect: weight of all items collected, start/end times, width of beach at time of survey, large items not removed, number of persons
  - divide plastic and polystyrene into two separate categories (OSPAR intends to make this change in the future)
- additional site data to collect: beach curvature, estimated number of person visits, shape of beach profile (horizontal)
- add different litter exposures to site selection criteria
- add low to moderate slope to site selection criteria
- develop workshop/standardized training program for coordinators and surveyors
  - revise OSPAR photo guide for regional items
- establish regional coordinator and location managers

In the interest of consistency, adaptations to the OSPAR forms should be applied before regional implementation and would be accomplished by creating amended forms for site, survey and litter collection (see [Appendix Y](#)).

Achieving the organizational recommendations from UNEP 2009 could be accomplished by designating a regional coordinator to:

- prepare training program
- outreach to stakeholders in constituent countries
- provide training for location managers and volunteers
- assist with selection of appropriate sites
- oversee management of database
- ensure quality control
- network with location managers

## 6. How to Combine Successful Tools

### 6.1 A Hybrid System

Almost 10 years after the UNEP 2009 Guidelines were established, the combination of ICC, Dive Against Debris and Clean Swell have come to the forefront as the most commonly used with respect to popularity and longevity in the WCR. These crowd-sourced programs provide an easily accessible format for volunteers to record and share data regarding beach, benthic and floating marine litter. However, the very nature of their ability to be completed anywhere by any number of people that makes them so popular, widespread and effective in the region, preclude it from being able to fulfil



the requirements of a comprehensive survey. All three surveys are successful tools fitting into the framework of the UNEP 2009 Guidelines as Rapid Assessments.

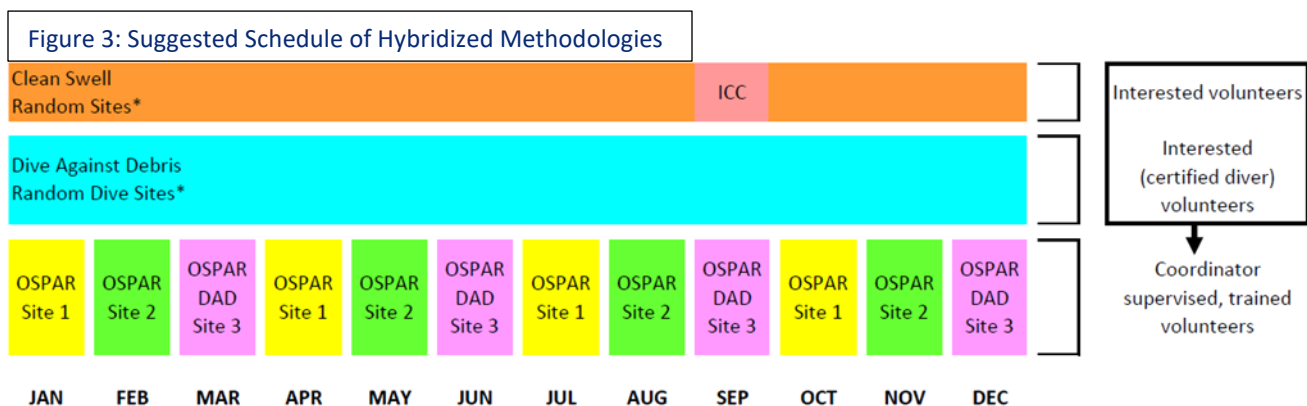
In the interest of incorporating a Comprehensive Beach Litter Assessment to the WCR, the OSPAR method is the recommended method for several reasons.

- Can be fully compliant with UNEP 2009 Guidelines with few modifications
- Proven track record in OSPAR constituent countries
- Better ability to trace sources of marine litter
- Used for 19 years in 9 separate countries
- Tailor-made statistical tools in place that can be applied
- Data is owned and controlled by the national authorities
- Used to monitor policy progress
- Cost effective to copy methodology and IT infrastructure in the Wider Caribbean Region

In the WCR, marine litter is abundant along many kilometres of coastline. While it is not pragmatic to clean and survey every kilometre, by combining successful tools with proven track records in a complimentary manner, it is possible to maximise the volunteer base, the volume of litter collected, and the effectiveness of data collected.

To achieve that goal, the following is recommended:

- Encourage use of ICC/Clean Swell/Dive Against Debris for data collection using beach, benthic and floating litter removal
- Outreach to ICC and other marine litter coordinators and stakeholders in the WCR
- Establish regional manager network similar to OSPAR using existing contacts
- Add the modified OSPAR method ([Appendix Y](#)) at targeted sites
- Develop action plan for implementation, including: timeline, training, regional team development, country capacity and budget needs



\* With the exception of designated OSPAR Survey sites



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## 6.2 Data Collection Differences

In order to generate statistically viable trend analysis reports, consistent data needs to be collected in a consistent manner over a period of time.

In a side by side comparison of litter characterization by item, there are significant differences between the item lists, namely:

- **Level of Resolution** Clean Swell has 20 items, ICC has 42, Dive Against Debris has 100 and OSPAR has 117. In a comprehensive beach litter survey, a higher level of resolution allows for a greater ability to differentiate user group sources, such as fishing, shipping or recreational. It is also important to allow data collection forms to evolve. Commonly listed items in the “Other” Category will be added to the OSPAR Survey Form following periodic reviews.
- **Item Description/Grouping of Items** In many instances, the item descriptions do not match closely enough to allow for combination. For example, on the OSPAR Survey Form, Plastic “Cutlery/Trays/Straws” are grouped together because they are all a source of single use food/beverage consumption. On the ICC Data Form, “Straws/Stirrers” and “Forks/Knives/Spoons” are separate items, but the composition is not noted.

In a side by side comparison of data collection methods, there are significant differences between the methods, namely:

- Supervision
- Requirement of clearance
- Intervals of time between surveys
- Standardized sampling units

While it is conceivable to consolidate the more detailed and numerous OSPAR items into the ICC categories (as shown in Appendices [B](#) & [X](#)), it is inadvisable to combine the datasets because the data has been collected with a different method. To do so would negate the ability to create higher level trend analysis output.

## 6.3 Benthic Data Collection with Scheduled Dive Against Debris Surveys

Many items of marine litter are negatively buoyant or entangled in substrate (i.e. discarded fishing materials). Therefore, it is of interest to remove and record data regarding benthic marine litter. Because of the temperate water and popularity of scuba diving with tourists, the potential for regularly scheduled benthic surveys is higher in the Caribbean than in other regions. There is a network of PADI dive centers in place that are actively organizing Dive Against Debris surveys. Although the Dive Against Debris Survey Guide recommends quarterly surveys to be repeated at



consistent sites, it is not a requirement. Data collected by volunteer divers on any dive can be reported to the Dive Against Debris database (linked to the ICC database via TIDES).

By applying a schedule and consistent sampling unit, the Dive Against Debris survey data could constitute a “rapid benthic” survey and used to evaluate the flux rate accumulation of benthic litter at selected sites. If the OSPAR schedule and sampling unit protocol are applied, then the survey data could be incorporated into the database and analysed for trends. This process is currently being tested in the CCB pilot study.

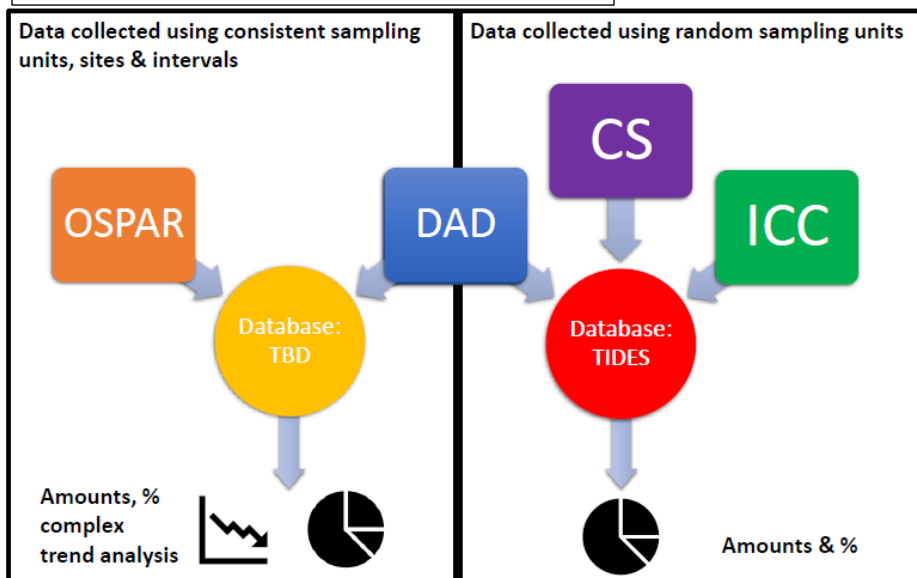
### 6.4 Data Management

The TIDES Database is a privately funded and managed crowd-sourced database. It is a useful database that is accessible online to anyone with an interest. It houses valuable, historic and current data regarding volumes, percentages and volunteers. It provides the cornerstone for marine litter monitoring data in the WCR and should be supported and encouraged.

The higher resolution of OSPAR and some categorization differences make it difficult to convert completely from one to the other without significant changes. (see [Appendix X](#) for a detailed comparison)

Data collected using the modified OSPAR methodology should be housed in a different database. The most cost-effective means of establishing a new database would be to request a copy of existing database currently used by OSPAR and making any necessary modifications and additional data fields. It is compatible with the Litter Analyst software. The host server ownership and control of the data should be managed by the Cartagena Secretariat.

Figure 4: Suggested Data Management Pathways



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## 7. Conclusions & Recommendations

There are significant distinctions between the methodologies employed. One important difference is the objective of the monitoring. Where the OSPAR marine litter monitoring methodology serves to inform policymakers about progress on policy measures in the North East Atlantic Region, the other initiatives have as primary aim to raise awareness, engage with citizens and corporations, and to inform policymakers. There are also differences in the governance of the initiatives. Regarding the methodology, there are differences in location selection, frequency, items on the field forms and in people who perform the surveys. These aspects have consequences on the type of analyses that can be made from the data gathered. For example, in order to generate reliable trend analysis, it is key to have frequent monitoring on the same site over a predetermined distance and preferably surveyed by trained surveyors to avoid bias. While this approach is ideal for monitoring, it may not serve well for engaging with citizens and raise awareness. It also makes combining databases between divergent methodologies inadvisable.

There is a regionally acknowledged need for the establishment of national marine litter monitoring programmes to provide for a continuous assessment of coastal areas and seas. The OSPAR method including database and statistical tool is well established and comprehensive, has political relevance in the EU and can also be applied by the countries in the Wider Caribbean Region.

To achieve the RAPMaLi goals, the authors recommend:

1. A hybrid approach where:
  - a. pre-selected sites are chosen for OSPAR surveys
  - b. existing ICC surveys are encouraged to continue with increased interaction with UN Environment or similar enabling agency
2. Data are cataloged within database structure that is robust to the specific outputs generated by the OSPAR and ICC surveys. This may require a relational structure to the database. Ideally, data would be electronically aggregated from existing sources of data in formats that require no further editing.
3. Analyses and reports are generated automatically with the technical assistance of OSPAR.
4. Raw data are made publicly available after quality control process has been completed.



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We further recommend adopting a hybrid approach that allows for engagement with citizens for monitoring while ensuring good quality data collection on certain pre-selected sites. Continue support of the Trash Free Seas programs and actively promote them in the WCR. Introduce the modified OSPAR Marine Litter Monitoring Methodology throughout the region on selected, targeted sites.

Regarding the data collection and data housing, the recommendation is not to reinvent the wheel but to make use of existing IT infrastructure by adapting and modifying databases from successful initiatives.

Some capacity and resources would be needed to develop a consistent monitoring program in the WCR. As a first step, an action plan could be drafted. The Cartagena contracting parties could consider adopting a concrete action plan with a step wise approach towards developing a consistent monitoring scheme. The action plan should entail:

- make efficient use of existing initiatives and capacity
- identify and inventory potential participating countries
- develop a pilot plan for a period of 3 years
- appoint a national representative who is responsible for implementing the pilot
- estimate extra capacity, budget and resources needed
- outreach to experts
- create training program for national experts
- organize regional monitoring workshop
- identify reference sites
- appoint surveyors
- adapt and modify the database format from OSPAR
- create a database space
- establish a governance structure where constituent members of the Cartagena convention have ownership and control of the data that is managed by the Cartagena Secretariat
- establish a regional manager network similar to OSPAR (building on relations through ICC and Dive Against Debris)
- continue to build trans-national collaboration between OSPAR and Cartagena through visiting each others' meetings, the ICGML Basecamp Platform and frequent communication with OSPAR to stay up to date with updates to the program

Achieving the goal of an effective and harmonized approach to marine litter monitoring in the Wider Caribbean Region is feasible. The tools are already here. Adopting a hybrid approach will be the most cost effective and efficient means of harmonizing data collection and maximizing litter removal. This will take us one step closer to our unified goal of reducing marine debris worldwide.



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## Websites

Marine Debris Tracker <http://www.marinedebris.engr.uga.edu/>

NOAA Marine Debris Monitoring and Assessment Project <https://mdmap.orr.noaa.gov/>

The Ocean Conservancy (Trash Free Seas) <https://oceanconservancy.org/trash-free-seas/>

The Ocean Conservancy (ICC) <https://oceanconservancy.org/trash-free-seas/international-coastal-cleanup/>

The Ocean Conservancy (Clean Swell) <https://oceanconservancy.org/trash-free-seas/international-coastal-cleanup/cleanswell/>

The Ocean Conservancy (TIDES) <https://www.coastalcleanupdata.org/>

Project AWARE (Dive Against Debris) <https://www.projectaware.org/diveagainstdebris>

US EPA Trash Free Waters <https://www.epa.gov/trash-free-waters/international-initiatives-address-marine-debris>





## Appendix A – Case Study: Clean Coast Bonaire

### Bonaire Facts

Governance: Special Municipality of the Kingdom of the Netherlands

Population: 19,000+ (from 2016 survey)

Languages: Papiamentu, Dutch, English, Spanish

Size: 288 square kilometres (38.8km long)

Location: Southern Caribbean, 80 kilometres north of Venezuela (12.2019° N, 68.2624° W)

Coastal Management: Stichting Nationale Parken Bonaire (STINAPA)

### Marine Litter Monitoring History on Bonaire

Beach and underwater clean ups are conducted by various organizations and individuals, such as: Sea Turtle Conservation Bonaire, STINAPA, Tene Boneiru Limpi, Selibon, One Hour Clean Up Power, Debris Free Bonaire. However, the focus is mainly on litter clearance rather than data collection. Historic data-sets available were collected using the methodology from the Ocean Conservancy group (ICC/Dive Against Debris). In 2011, there was a baseline assessment of beach debris and tar contamination conducted at 21 sites. (Debrot 2013)

### Project Objectives

- Determine feasibility of application of OSPAR Marine Litter Monitoring Survey methodology in the Wider Caribbean Region
- Remove litter from coastline
- Identify litter sources
- Evaluate the amount and type of litter present
- Establish long-term, systematic and consistent data collection protocol to determine regional trends
- Raise island-wide awareness regarding marine litter

### Project Description

Clean Coast Bonaire was initiated in August 2018 to implement the OSPAR Marine Litter Monitoring survey protocol on Bonaire. The project is currently funded by The World Wide Fund for Nature in the Netherlands and supported by a local organization on Bonaire called Boneiru Duradero.

### Expected Results

The expected results of this program were to:



1. Implement a standardized protocol for use in marine litter surveys.
2. Build partnerships with community groups and obtain their commitment to participate in marine litter surveys.
3. Select beaches for monitoring and delimit monitoring areas for continuity.
4. Ensure the proper use of the OSPAR Marine Litter Monitoring Survey by training groups in data collection.
5. Conduct ongoing monitoring activities at selected beaches.
6. Collect and share data.
7. Identify problems to be resolved for continued development of the program.

## Project Activities

Stakeholders including the public, government, NGOs and community groups were invited to training workshops. The workshops consisted of a classroom session to explain the OSPAR purpose and methodology followed by a hands-on beach clean-up and survey.

Three geographically disparate sites were selected and designated as survey sites. Two of the sites are on the eastern, windward coast where the debris is beach-cast, drifting in from off-shore. Site #1 - Boka Onima, to the north-east, is a low-slope, sandy pocket beach. Site #2 - Piedra Pretu is on the south-east coast and has a medium-slope with a mix of gravel and sand. Site #3 - Te Amo Beach is on the western, leeward coast and is a low-slope, sandy beach. It is a popular, recreationally used beach. Surveys are scheduled once a month, with each site being surveyed every three months.

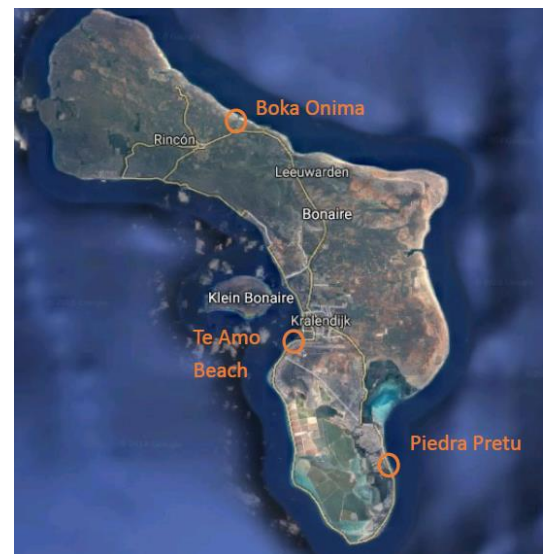
During the stakeholder meetings, two additional data items were suggested and incorporated.

- Due to an increase in events, it was suggested that collection of regular data regarding sargassum presence would be useful. The OSPAR data collection forms have been modified to include if sargassum is present, and if so the depth of the accumulation and distance from the high-water mark.
- A stakeholder also requested that the width of the beach be recorded. A measurement from the waterline to the designated back of the beach will be taken at each survey.

## Results

Training workshops were well attended, with over 30 participants from various organizations. Subsequent surveys have had turnouts ranging between 12 to 16 volunteers. The most prevalent

Figure 5: Map of Bonaire with survey sites



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items on the two windward sites were pieces of plastic/polystyrene under 2.5cm. On the leeward, recreational site, cigarette butts were the most common item. Government supported action to raise awareness regarding improper cigarette butt disposal has been initiated due to the survey results. Surveys are ongoing. Survey data is compiled into Excel spreadsheets (with cloud-based backup) for future use. Survey results are posted via social media and using a GDPR compliant mailing list. Thus far, insufficient data has been collected to determine trends.

## Challenges and resolutions

**Challenge:** The level of detail involved in the OSPAR survey combined with the volume of debris and requirement for complete clearance, made it difficult for volunteers to complete the 100m survey within a reasonable amount of time. Clean Coast Bonaire surveys are scheduled to take place in the morning for approximately two hours in order to avoid the mid-day heat and sun and prevent volunteers from becoming exhausted.

**Resolution:** During the pilot program training, it was determined that 50m can be cleared within two hours, so the sampling unit was reduced. Although a minimum of 100m is recommended in the UNEP/IOC Guidelines to ensure diversity of litter items, surveys of 50m are yielding between 55 to 72 unique litter items. This is above average when compared to other recorded surveys.

**Challenge:** There is an extremely high volume of small plastics on the windward sites. There are many pieces of secondary microplastic and polystyrene that are discernable to the eye, yet difficult to collect and remove.

**Resolution:** Sieves were constructed and tested for assistance in collection of the items. In a 2018 consultation with Willem van Loon (one of the developers of the Litter Analyst program that was designed to develop standard statistical methods and software for the analysis of beach litter data), a strategy was created to simplify data collection regarding small plastic items. The strategy is to designate three, square 50cm collection areas per survey site. All small plastics within each square are to be collected, counted and weighed at each survey. Weight could be considered equal value of total abundance. If a strong correlation will be found between weight and counts within sample areas, just weighing the items would be sufficient data for the survey. The data will be recorded for trend analysis, but not extrapolated for total beach coverage.

**Challenge:** Not all trained volunteers attend every survey session. New volunteers and visiting tourists also want to participate.

**Resolution:** The CCB coordinator is present at every survey to supervise. Untrained volunteers are given a detailed briefing and paired up with more experienced surveyors. The 50m beach area also makes it so the coordinator is immediately accessible for any questions from volunteers.



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**Challenge:** Organizations with a current involvement in beach and/or underwater surveys are supportive, but not inclined to change from ongoing efforts.

**Resolution:** Incorporate existing programs, as follows:

International Coastal Clean Up Day is celebrated by Selibon, Bonaire’s privatized waste management organization, as a day to raise awareness and conduct clean-ups all around the island. In September, Clean Coast Bonaire partnered with Selibon and Sea Turtle Conservation Bonaire so that the scheduled OSPAR survey of Te Amo Beach would coincide with ICC. Although the debris data was collected by volunteers using the OSPAR methodology, the data was also recorded as an ICC clean up event and entered into the ICC database. This process involved condensing the data from 2,422 total items collected as 60 separate item types on the OSPAR survey form into their corresponding 35 separate item types on the ICC survey form. There were 25 item types (148 pieces in total) that did not have a corresponding type and were entered at “Items of Local Concern” in lieu of an “Other” category. (see [Appendix B](#) for side by side item comparison) When generating a summary report of the survey from the Ocean Conservancy TIDES online database, those 148 items are not counted as part of the total. (See [Appendix J](#) for TIDES generated report)

Dive Against Debris is a popular activity offered by several dive shops as part of their eco-campaigns. There is a solid volunteer base and a high level of awareness. Several public piers that allow fishing have a large volume of line that need to be removed on a regular basis in order to prevent marine life entanglement. Dive Against Debris surveys are conducted on a quarterly basis as well as sporadically at various other sites around Bonaire. Of the three CCB sites, the two on the windward coast do not normally have safe diving conditions, but Te Amo Beach is an easy and popular site for divers. CCB is incorporating a Dive Against Debris underwater survey at Te Amo Beach to coincide with the regularly scheduled beach survey.

**Challenge:** The perception that marine litter should be removed from coastal areas whenever possible. This opinion has a positive outcome of frequent beach clean ups around Bonaire by various organizations and individuals. However, it can be difficult to explain why litter should be allowed to accumulate at survey sites for 3 months and why clean-up efforts are focused only on those specific sites.

**Resolution:** Providing an alternative citizen science program that is easily accessible to all and can be completed on any beach at any time. Encouraging volunteers to install the Clean Swell App on their mobile devices to use for other clean-ups around the island serves this purpose. Use of the app keeps the momentum going, collects data, raises awareness and recruits potential volunteers. For example, the STINAPA Junior Rangers have adopted a beach called Lagun for regular clean-ups. It was evaluated as a potential site for OSPAR surveys in collaboration with the Jr. Rangers. However, due to the level of detail and requirement for complete clearance it was decided that the Lagun site would not be used as a designated OSPAR survey site. The Clean Swell App has been recommended for data collection.



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## Conclusion

On Bonaire, there is currently a great deal of awareness regarding marine litter. Volunteer momentum is high and there are successful and established citizen science programs in place that are mutually beneficial to Clean Coast Bonaire. Clean Coast Bonaire supports, advertises and encourages island residents and visitors to participate in ICC, Dive Against Debris and Clean Swell. These three programs raise awareness and recruit potential volunteers for Clean Coast Bonaire. The beaches are cleaned, and data is collected in a variety of ways. The number of volunteers and debris removal is maximized.

The OSPAR survey methodology was easily incorporated to the requirements of the region with only a few small modifications:

- Shortened beach length
- Special procedure for plastic/polystyrene under 50cm
- Addition of sargassum presence and beach width

The OSPAR data collection forms were revised to:

- reflect the above mentioned modifications
- show corresponding Dive Against Debris litter classification numbers
- incorporate additional information recommended by the UNEP 2009 Comprehensive Beach Litter Assessment

The support of the WWF has been a crucial part of the program. The program has been relatively low-budget, but there are several expenses, including: training workshop, supplies and reimbursement of the CCB coordinator. The CCB coordinator supervises every survey for quality control, compiles the survey data, conducts volunteer outreach and communication with stakeholders. A minimum of three years of data needs to be collected in order to be useful for trend analysis using the Litter Analyst software. Therefore, continued funding and support for the project is required.

Due to the data collected by CCB regarding cigarette butts, a government supported plan is already in place to install awareness raising signs on several beaches to address the issue of improper disposal. In short, implementing the OSPAR method on Bonaire is feasible (and existing) and endorsed by local stakeholders. It can be used as an example to scale up in the region.



## Appendix B – Entry of items collected using OSPAR survey into ICC/TIDES

| <u>OSPAR Items</u>  | <u>Total</u> | <u>TIDES Item</u>                         | <u>Total</u> |
|---|--------------|---|--------------|
| Cigarette butts   | 1345         | Cigarette Butts                           | 1345         |
| Crisp/sweet packets and lolly sticks                      | 24           | Food Wrappers                             | 54           |
| Foil wrappers   | 28           |   |              |
| Other paper items * <i>food wrapper - 2</i>               | 2            |   |              |
| Food containers incl. fast food containers                | 1            | Take Out/Away Containers (Foam)           | 1            |
| Caps/lids (Plastic)                                       | 119          | Bottle Caps (Plastic)                     | 119          |
| Bottle caps (Metal)                                       | 358          | Bottle Caps (Metal)                       | 358          |
| Cutlery/trays/straws                                      | 107          | Straws, Stirrers                          | 50           |
|   |              | Forks, Knives, Spoons                     | 57           |
| Drinks (bottles, containers and drums)                    | 2            | Beverage Bottles (Plastic)                | 2            |
| Bottles   | 13           | Beverage Bottles (Glass)                  | 13           |
| Drink cans  | 10           | Beverage Cans                             | 10           |
| Bags (e.g. shopping)                                      | 11           | Grocery Bags (Plastic)                    | 11           |
| Small plastic bags, e.g., freezer bags                    | 1            | Other Plastic Bags                        | 1            |
| Bags (Paper)  | 1            | Paper Bags                                | 1            |
| Cups (Paper)  | 1            | Cups, Plates (Paper)                      | 1            |
| Cups (Plastic)  | 6            | Cups, Plates (Plastic)                    | 6            |
| Nets and pieces of net > 50 cm                            | 1            | Fishing Net & Pieces                      | 4            |
| Tangled nets/cord/rope and string                         | 3            |   |              |
| Fishing line (angling)                                    | 5            | Fishing Line (1 yd/m = 1 piece)           | 5            |
| Rope (diameter more than 1 cm)                            | 3            | Rope (1 yd/m = 1 piece)                   | 13           |
| String and cord (diameter less than 1 cm)                 | 10           |   |              |
| 4/6-pack yokes  | 3            | 6-pack holders                            | 3            |
| Industrial packaging, plastic sheeting                    | 2            | Other Plastic/Foam Packaging              | 2            |
| Cleaner (bottles, containers and drums)                   | 1            | Other Plastic Bottles (oil, bleach, etc.) | 2            |
| Other bottles, containers and drums                       | 1            |   |              |
| Strapping bands   | 12           | Strapping Bands                           | 12           |
| Cigarette packets   | 2            | Tobacco Packaging/Wrap                    | 2            |
| Balloons, including plastic valves, ribbons, strings etc. | 4            | Balloons                                  | 4            |



|   |    |                            |     |
|---|----|----------------------------|-----|
| Cigarette lighters  | 1  | Cigarette Lighters         | 1   |
| Construction material e.g. tiles  | 1  | Construction Materials     | 1   |
| Other plastic/polystyrene items <i>firework cartridge - 1</i>   | 1  | Fireworks                  | 1   |
| Tyres and belts   | 1  | Tires                      | 1   |
| Toys & party poppers  | 5  | Toys                       | 6   |
| Other rubber pieces <i>ball - 1</i>   | 1  |                            |     |
| Condoms   | 1  | Condoms                    | 1   |
| Tampons and tampon applicators  | 2  | Tampons/Tampon Applicators | 2   |
| Plastic/polystyrene pieces 0 - 2,5 cm   | 91 | Foam Pieces                | 45  |
|   |    | Plastic Pieces             | 46  |
| Other glass items <i>*unidentifiable</i>  | 94 | Glass Pieces               | 94  |
| Other plastic/polystyrene items<br><i>*watering nozzle - 1; electrical tape - 2; birthday candle - 1; tie wraps - 2</i> | 6  | Items of local concern     | 148 |
| Other rubber pieces <i>* rubber band - 2; o-ring - 3; scuba mask strap - 1; snorkel keeper -1</i>                       | 7  |                            |     |
| Pens  | 4  |                            |     |
| Light sticks (tubes with fluid)   | 1  |                            |     |
| Shoes/sandals   | 1  |                            |     |
| Foam sponge   | 3  |                            |     |
| Plastic/polystyrene pieces 2,5 cm > < 50 cm   | 33 |                            |     |
| Clothing  | 1  |                            |     |
| Other textiles <i>* hair tie - 11; piece of cloth - 1; shoe lace -1</i>   | 13 |                            |     |
| Cardboard   | 1  |                            |     |
| Cartons e.g. tetrapak (milk)  | 2  |                            |     |
| Newspapers & magazines  | 2  |                            |     |
| Corks   | 5  |                            |     |
| Pallets   | 1  |                            |     |
| Ice lolly sticks / chip forks   | 14 |                            |     |
| Other wood < 50 cm ( <i>please specify in other item box*</i> )   | 6  |                            |     |



|  |      |                  |      |
|--|------|------------------|------|
| Other wood > 50 cm * <i>unidentifiable</i> - 1;<br><i>clothes peg</i> - 2; <i>kebab skewer</i> - 3   |      |                  |      |
| Wire, wire mesh, barbed wire   | 7    |                  |      |
| Other metal pieces < 50 cm ( <i>please specify in other item box*</i> ) <i>unidentifiable</i> - 7; <i>kebab skewer</i> - 1; <i>jewelry</i> - 3 | 11   |                  |      |
| Other metal pieces > 50 cm * <i>unidentifiable</i> - 4; <i>metal pipe</i> - 1  | 5    |                  |      |
| Sanitary towels/panty liners/backing strips  | 10   |                  |      |
| Other sanitary items * <i>wet wipes</i> - 6  | 6    |                  |      |
| Containers / tubes   | 1    |                  |      |
| Other medical items (swabs, bandaging etc.) * <i>plaster</i> - 4; <i>disposable contact lens package</i> - 1                                   | 5    |                  |      |
| Other paper items <i>unidentifiable</i>  | 3    |                  |      |
|  | 2422 |                  | 2422 |
| <b>Types: 60</b>   |      | <b>Types: 35</b> |      |



## Appendix C – List of WCR Countries & Survey Methods

|                                | ICC<br>2006-<br>2013 | ICC/Clean<br>Swell 2016-<br>present | DAD<br>2011-<br>present | OSPAR | NOAA<br>MDMAP | Marine<br>Debris<br>Tracker | EPA Trash<br>Free<br>Waters |
|--------------------------------|----------------------|-------------------------------------|-------------------------|-------|---------------|-----------------------------|-----------------------------|
| Anguilla (UK)                  | X                    |                                     |                         |       |               |                             |                             |
| Antigua & Barbuda              |                      |                                     |                         |       |               |                             |                             |
| Aruba (NL)                     | X                    |                                     | X                       |       |               |                             |                             |
| Bahamas                        | X                    | X                                   | X                       |       | X             |                             |                             |
| Barbados                       | X                    | X                                   | X                       |       |               |                             |                             |
| Belize                         | X                    | X                                   | X                       |       |               |                             |                             |
| Bonaire (NL)                   | X                    | X                                   | X                       | X     |               |                             |                             |
| British Virgin Islands<br>(UK) | X                    | X                                   | X                       |       |               |                             |                             |
| Cayman Islands (UK)            | X                    | X                                   | X                       |       |               |                             |                             |
| Colombia                       | X                    | X                                   | X                       |       |               |                             |                             |
| Costa Rica                     | X                    | X                                   |                         |       | X             |                             |                             |
| Cuba                           | X                    | X                                   | X                       |       |               |                             |                             |
| Curacao (NL)                   | X                    | X                                   | X                       |       |               |                             |                             |
| Dominica                       | X                    |                                     | X                       |       |               |                             |                             |
| Dominican Republic             | X                    | X                                   | X                       |       |               |                             |                             |
| Grenada                        | X                    | X                                   | X                       |       |               |                             |                             |
| Guadeloupe (FR)                |                      |                                     |                         |       |               |                             |                             |
| Guatemala                      | X                    |                                     |                         |       |               |                             |                             |
| Guyana                         | X                    | X                                   |                         |       |               |                             |                             |
| Haiti                          |                      |                                     | X                       |       |               |                             |                             |
| Honduras                       | X                    |                                     | X                       |       |               |                             |                             |
| Jamaica                        | X                    | X                                   | X                       |       |               |                             | X                           |
| Martinique (FR)                |                      |                                     |                         |       |               |                             |                             |
| Mexico                         | X                    | X                                   | X                       |       |               |                             |                             |
| Montserrat (UK)                | X                    |                                     | X                       |       |               |                             |                             |
| Nicaragua                      | X                    | X                                   | X                       |       |               |                             |                             |
| Panama                         | X                    | X                                   | X                       |       |               |                             | X                           |
| Puerto Rico (US)               | X                    | X                                   | X                       |       |               | X                           |                             |
| Saba (NL)                      | X                    | X                                   |                         |       |               |                             |                             |



|                                  |           |           |           |          |          |          |          |
|----------------------------------|-----------|-----------|-----------|----------|----------|----------|----------|
| St. Barthelemy (FR)              |           | <b>x</b>  |           |          |          |          |          |
| St. Eustatius (NL)               | <b>x</b>  | <b>x</b>  |           |          |          |          |          |
| St. Kitts & Nevis                | <b>x</b>  | <b>x</b>  | <b>x</b>  |          |          |          |          |
| St. Lucia                        | <b>x</b>  |           | <b>x</b>  |          |          |          |          |
| Saint Martin (FR)                |           | <b>x</b>  |           |          |          |          |          |
| Saint Maarten (NL)               | <b>x</b>  |           | <b>x</b>  |          |          |          |          |
| St. Vincent & Grenadines         | <b>x</b>  | <b>x</b>  |           |          |          |          |          |
| Suriname                         |           | <b>x</b>  |           |          |          |          |          |
| Turks & Caicos                   |           |           | <b>x</b>  |          |          |          |          |
| Trinidad & Tobago                | <b>x</b>  | <b>x</b>  | <b>x</b>  |          |          |          |          |
| U.S. Virgin Islands (US)         | <b>x</b>  | <b>x</b>  | <b>x</b>  |          |          |          |          |
| Venezuela                        |           | <b>x</b>  | <b>x</b>  |          |          |          |          |
| <b>Total Number of Countries</b> | <b>32</b> | <b>28</b> | <b>28</b> | <b>1</b> | <b>2</b> | <b>1</b> | <b>2</b> |



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## Appendix D – Questionnaire about IT infrastructure & governance

1. What type of database is used, and why? (sql, etc)
2. Who has access to the data?
3. Is there a form of quality control on data submitted in place?
4. Please briefly explain the data entry process
5. What type of output does the database generate?
6. How is made sure the data is secured? Are backups being made?
7. How is the data analyzed?
8. Who has ownership over the data?



## Appendix E – OSPAR Summary

|   |   |
|---|---|
| <b>Survey Name</b>                      | <b>OSPAR Marine Litter Monitoring Survey</b>  |
| <b>Developed By</b>                     | Commission for the Protection of the Marine Environment of the North-East Atlantic (OSPAR Commission)   |
| <b>Partners</b>                         | Cartagena Convention  |
| <b>Key Objectives</b>                   | -Allow the abundance, trends & composition of marine litter in the OSPAR Maritime Area to be determined<br>-Inform policymakers on amounts, types, sources and trends over time in beach litter   |
| <b>Description</b>                      | A guideline for monitoring marine litter on beaches has been developed by OSPAR as a tool to collect data on litter in the marine environment. This tool has been designed to generate data on marine litter according to a standardized methodology.   |
| <b>Active Since Year</b>                | 2000  |
| <b>No. of Countries Using in Region</b> | 1   |
| <b>Regional Languages Available</b>     | English, Spanish, French, Dutch   |
| <b>Sites</b>                            | Marine  |
| <b>Schedule</b>                         | 4x per year (minimum) per site  |
| <b>Sampling Frequency</b>               | Flux accumulation   |
| <b>Sampling Unit</b>                    | Fixed sites/length  |
| <b>Clearance</b>                        | Required  |
| <b>Site Selection Criteria</b>          | <ul style="list-style-type: none"> <li>- composed of sand or gravel</li> <li>- exposed to the open sea</li> <li>- be accessible to surveyors all year round</li> <li>- be accessible for ease of marine litter removal</li> <li>- be a minimum length of 100 metres &amp; if possible over 1 km in length</li> <li>-be free of 'buildings' all year round</li> <li>-ideally not be subject to any other litter collection activities</li> </ul> |
| <b>Groups/Individuals</b>               | both  |
| <b>Website</b>                          | <a href="https://www.mcsuk.org/ospar/">https://www.mcsuk.org/ospar/</a>   |
| <b>Registration</b>                     | contact OSPAR to request Login credentials  |
| <b>Data Entry Access</b>                | Registration for data entry is granted by MCS, through OSPAR and approved by the constituent countries, to surveyors, national coordinators, policy officers and NGOs participating in the monitoring.  |
| <b>Data Entry Procedure</b>             | direct input and by csv file upload   |
| <b>Quality Control</b>                  | <ul style="list-style-type: none"> <li>- Professional surveyors, appointed coordinators or national authority submit the data in the online database</li> <li>- Field forms are kept and stored</li> <li>- Limit on number of items submitted to avoid errors</li> <li>- Check on the data by the national authority when drafting national annual reports and OSPAR intermediate assessment</li> </ul>   |



|  |  |
|--|--|
| <b>Data Access</b>                                     | public (after data has signed off by OSPAR EIHA committee)   |
| <b>Data Ownership</b>                                  | OSPAR  |
| <b>Database Type</b>                                   | MySQL  |
| <b>Data Security</b>                                   | System access by registered user/password  |
| <b>Data Backup</b>                                     | <ul style="list-style-type: none"> <li>- Data backups are taken by an IT /Technical team</li> <li>- Some countries are also storing data in national databases</li> <li>- Original field forms are kept in hard copy</li> </ul>  |
| <b>Output format</b>                                   | csv files, reports and on screen data  |
| <b>Reports Generated</b>                               | <ul style="list-style-type: none"> <li>- Material types by amount/percentage</li> <li>- Material sources by amount/percentage</li> <li><b>Trend analysis via Litter Analyst:(trends &amp; significance)</b></li> <li>-average total abundance of litter items per 100m of coast</li> <li>-average composition of litter items per 100m of coast</li> <li>-trends in the abundance of litter items per 100m of coast</li> </ul> |
| <b>Source Tracing (point of manufacture or origin)</b> | no   |
| <b>Source Tracing (user group)</b>                     | yes  |
| <b>Training</b>  | training & participation in surveys with experienced surveyors (recommended workshop)  |
| <b>Training Materials</b>                              | Guideline for Monitoring Marine Litter on the Beaches in the OSPAR Maritime Area   |
| <b>Name of Data Collection Form</b>                    | OSPAR Marine Litter Monitoring Survey Form   |
| <b>Survey Data</b>                                     | <ul style="list-style-type: none"> <li>- Date</li> <li>- Beach Name</li> <li>- OSPAR Beach ID</li> <li>- Country</li> <li>- Was litter collected</li> <li>- Date of last beach clean</li> <li>- Weather conditions affecting data of survey</li> <li>- Other circumstances or events</li> </ul>  |
| <b>Surveyor Data</b>                                   | Names & contact info of coordinators   |
| <b>Supervision</b>                                     | Coordinator  |
| <b>Site Location</b>                                   | GPS coordinates  |



|                                    |  |
|------------------------------------|--|
| <b>Site Characterization</b>       | <ul style="list-style-type: none"> <li>- Beach width at mean low/high spring tide</li> <li>- Total length- Composition of back of beach</li> <li>- Prevailing currents</li> <li>- Prevailing winds</li> <li>- Direction facing</li> <li>- Type of beach material</li> <li>- Topography/gradient</li> <li>- Objects influencing currents</li> <li>- Beach usage</li> <li>- Access to beach</li> <li>- Distance to nearest town &amp; population</li> <li>- Development of beach</li> <li>- Food/drink outlets on beach</li> <li>- Distance to nearest shipping lane/harbour/river mouth/discharge of waste water</li> <li>- Cleaning schedule/method/responsibility</li> <li>- Comments/observations</li> <li>- Map of beach/local surroundings/region</li> </ul> |
| <b>Litter Characterization</b>     | Categorized by: Composition/Source<br>Number of Categories: 11   |
| <b>Number of Items</b>             | 117  |
| Plastic/Polystyrene                | 54   |
| Rubber                             | 4  |
| Cloth                              | 5  |
| Paper/Cardboard                    | 9  |
| Wood (machined)                    | 9  |
| Metal                              | 15   |
| Glass                              | 3  |
| Pottery/Ceramics                   | 3  |
| Sanitary waste                     | 6  |
| Medical waste                      | 3  |
| Faeces                             | 1  |
| Other pollutant                    | 5  |
| <b>Litter Quantification</b>       | Counted by item  |
| <b>Entanglement Data Collected</b> | <ul style="list-style-type: none"> <li>- Species or description</li> <li>- Amount</li> <li>- Alive/Dead</li> <li>- Age</li> <li>- Gender</li> <li>- Nature of entanglement and type of litter</li> </ul>   |
| <b>Additional Info</b>             | collected with survey data   |
| <b>Photos</b>                      | submit via email   |



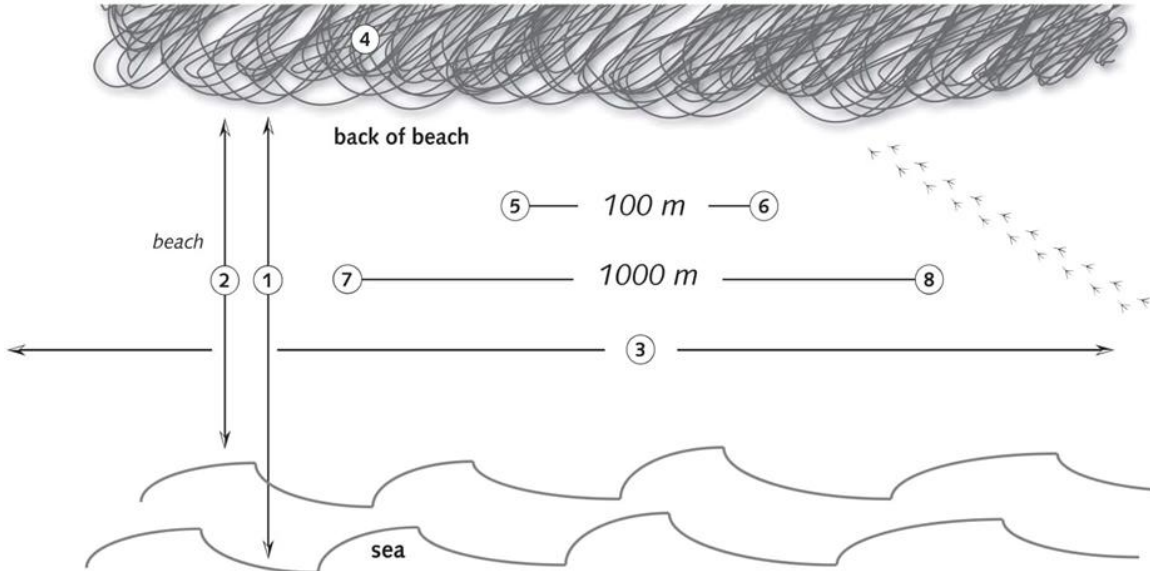
**Appendix F – OSPAR Marine Litter Monitoring Survey Form**

 **OSPAR Marine Litter Beach Questionnaire**

Name of beach: .....

OSPAR beach ID: .....

Country: ..... to be filled in by national coordinators



- ① Beach width at mean low spring tide: ..... (m)
- ② Beach width at mean high spring tide: ..... (m)
- ③ Total length of beach: ..... (m)
- ④ Back of beach (example dunes): .....
- ⑤ GPS coordinates start 100 m: .....
- ⑥ GPS coordinates end 100 m: .....
- ⑦ GPS coordinates start 1 km: .....
- ⑧ GPS coordinates end 1 km: .....

Coordinate system used: ..... Date position measured: ...../...../..... (d/m/y)

Prevailing currents off the beach\*:  N  E  S  W Prevailing winds\*:  N  E  S  W

When you look from the beach to the sea, what direction is the beach facing\*:  N  E  S  W

Type of beach material (% coverage): ..... (e.g. sand 60%, pebbles 40%)

Beach topography: ..... (e.g. slope 20%)

Are there any objects in the sea (e.g. a pier) that influence the currents: .....

**Major beach usage (local people, swimming and sunbathing, fishing, surfing, sailing etc):**

- 1. .... seasonal or whole year round: .....
- 2. .... seasonal or whole year round: .....
- 3. .... seasonal or whole year round: .....

Access to the beach:  Vehicle  Pedestrian  Boats

\*you may tick one or two boxes

OSPAR Beach Questionnaire 2010.010







# OSPAR Marine Litter Beach Questionnaire

**How often is the beach cleaned:** .....

All year round: ..... X  Daily  Weekly  Monthly  Other:.....

Seasonal, please specify in months: .....

..... X  Daily  Weekly  Monthly  Other: .....

What method is used:  Manual  Mechanical

Who is responsible for the cleaning: .....

.....  
.....

**Additional comments and observations about this beach:** .....

.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....

**Please include:**

1. A map of the beach

2. A map of the beach and the local surroundings. When relevant please mark on this map the following:

- Nearest town
- Food/drink outlets
- Nearest shipping lane
- Nearest harbour
- Nearest river mouth
- Discharge or discharges of waste water

3. A regional map

**Is this an amendment to an existing questionnaire:**  Yes  No

Date questionnaire is filled in: ...../...../..... (d/m/y)

Name: .....

Phone number: .....

E-mail: .....





# OSPAR Marine Litter Monitoring Survey Form

Name of beach: ..... Name of surveyor 1: .....

OSPAR beach ID: ..... Phone number: .....

Country: ..... E-mail address: .....

..... Name of surveyor 2: .....

..... Phone number: .....

Date of survey: ...../...../..... (d/m/y) E-mail address: .....

## Additional Information



# 100 m

Was litter collected during this survey:  Yes  No

When was the beach last cleaned: ...../...../..... (d/m/y)

Did you divert from the predetermined 100 metres:  No  Yes, please specify: .....

.....

Did any of the following weather conditions affect the data of the surveys. If so please tick appropriate box:

- Wind  Rain  Snow  Ice  Fog
- Sand storm  Exceptionally high tide

Did you find stranded or dead animals:  Yes  No If so how many: .....

Please describe the animal, or note the species name if known: .....

Alive  Dead

Sex of animal (if known): .....

Age of animal (if known): .....

Is the animal entangled in litter:  Yes  No

If so please describe nature of the entanglement and type of litter: .....

.....

Were there any circumstances that influenced the survey. For example tracks on the beach (cleaning or other), recent replenishment of the beach or other.

Please specify: .....

.....

Were there any events that lead to unusual types and/or amounts of litter on the beach. For example beach events or other.

Please specify: .....

.....





| OSPAR ID                     | Unep ID | Items  | Total |
|------------------------------|---------|--|-------|
| <i>Plastic • Polystyrene</i> |         |  |       |
| 1                            |         | 4/6-pack yokes   |       |
| 2                            |         | Bags (e.g. shopping)   |       |
| 3                            |         | Small plastic bags, e.g., freezer bags   |       |
| 112                          |         | Plastic bag ends   |       |
| 4                            |         | Drinks (bottles, containers and drums)   |       |
| 5                            |         | Cleaner (bottles, containers and drums)  |       |
| 6                            |         | Food containers incl. fast food containers                                       |       |
| 7                            |         | Cosmetics (bottles & containers e.g. sun lotion, shampoo, shower gel, deodorant) |       |
| 8                            |         | Engine oil containers and drums <50 cm   |       |
| 9                            |         | Engine oil containers and drums > 50 cm  |       |
| 10                           |         | Jerry cans (square plastic containers with handle)                               |       |
| 11                           |         | Injection gun containers   |       |
| 12                           |         | Other bottles, containers and drums  |       |
| 13                           |         | Crates   |       |
| 14                           |         | Car parts  |       |
| 15                           |         | Caps/lids  |       |
| 16                           |         | Cigarette lighters   |       |
| 17                           |         | Pens   |       |
| 18                           |         | Combs/hair brushes   |       |
| 19                           |         | Crisp/sweet packets and lolly sticks   |       |
| 20                           |         | Toys & party poppers   |       |
| 21                           |         | Cups   |       |
| 22                           |         | Cutlery/trays/straws   |       |
| 23                           |         | Fertiliser/animal feed bags  |       |
| 24                           |         | Mesh vegetable bags  |       |
| 25                           |         | Gloves (typical washing up gloves)   |       |
| 113                          |         | Gloves (industrial/professional gloves)  |       |
| 26                           |         | Crab/lobster pots  |       |
| 114                          |         | Lobster and fish tags  |       |
| 27                           |         | Octopus pots   |       |
| 28                           |         | Oyster nets or mussel bags including plastic stoppers                            |       |

OSPAR Survey Form 100m:2010.010



# 100 metre area



# OSPAR Marine Litter Monitoring Survey Form

| OSPAR ID      | Unep ID | Items  | Total |
|---------------|---------|--|-------|
| 29            |         | Oyster trays (round from oyster cultures)                                  |       |
| 30            |         | Plastic sheeting from mussel culture (Tahitians)                           |       |
| 31            |         | Rope (diameter more than 1 cm)   |       |
| 32            |         | String and cord (diameter less than 1 cm)                                  |       |
| 115           |         | Nets and pieces of net < 50 cm   |       |
| 116           |         | Nets and pieces of net > 50 cm   |       |
| 33            |         | Tangled nets/cord/rope and string  |       |
| 34            |         | Fish boxes   |       |
| 35            |         | Fishing line (angling)   |       |
| 36            |         | Light sticks (tubes with fluid)  |       |
| 37            |         | Floats/Buoys   |       |
| 38            |         | Buckets  |       |
| 39            |         | Strapping bands  |       |
| 40            |         | Industrial packaging, plastic sheeting                                     |       |
| 41            |         | Fibre glass  |       |
| 42            |         | Hard hats  |       |
| 43            |         | Shotgun cartridges   |       |
| 44            |         | Shoes/sandals  |       |
| 45            |         | Foam sponge  |       |
| 117           |         | Plastic/polystyrene pieces 0 - 2,5 cm                                      |       |
| 46            |         | Plastic/polystyrene pieces 2,5 cm > < 50 cm                                |       |
| 47            |         | Plastic/polystyrene pieces > 50 cm   |       |
| 48            |         | Other plastic/polystyrene items <i>(please specify in other item box*)</i> |       |
| <i>Rubber</i> |         |  |       |
| 49            |         | Balloons, including plastic valves, ribbons, strings etc.                  |       |
| 50            |         | Boots  |       |
| 52            |         | Tyres and belts  |       |
| 53            |         | Other rubber pieces <i>(please specify in other item box*)</i>             |       |
| <i>Cloth</i>  |         |  |       |
| 54            |         | Clothing   |       |

OSPAR Survey Form 100m.2010.010





| OSPAR ID                 | Unep ID | Items   | Total |
|--------------------------|---------|---|-------|
| 55                       |         | Furnishing  |       |
| 56                       |         | Sacking   |       |
| 57                       |         | Shoes (leather)   |       |
| 59                       |         | Other textiles <i>(please specify in other item box*)</i>     |       |
| <i>Paper • Cardboard</i> |         |   |       |
| 60                       |         | Bags  |       |
| 61                       |         | Cardboard   |       |
| 118                      |         | Cartons e.g. tetrapak (milk)                                  |       |
| 62                       |         | Cartons e.g. tetrapak (other)                                 |       |
| 63                       |         | Cigarette packets   |       |
| 64                       |         | Cigarette butts   |       |
| 65                       |         | Cups  |       |
| 66                       |         | Newspapers & magazines  |       |
| 67                       |         | Other paper items <i>(please specify in other item box*)</i>  |       |
| <i>Wood (machined)</i>   |         |   |       |
| 68                       |         | Corks   |       |
| 69                       |         | Pallets   |       |
| 70                       |         | Crates  |       |
| 71                       |         | Crab/lobster pots   |       |
| 119                      |         | Fish boxes  |       |
| 72                       |         | Ice lolly sticks / chip forks                                 |       |
| 73                       |         | Paint brushes   |       |
| 74                       |         | Other wood < 50 cm <i>(please specify in other item box*)</i> |       |
| 75                       |         | Other wood > 50 cm <i>(please specify in other item box*)</i> |       |
| <i>Metal</i>             |         |   |       |
| 76                       |         | Aerosol/Spray cans  |       |
| 77                       |         | Bottle caps   |       |
| 78                       |         | Drink cans  |       |
| 120                      |         | Disposable BBQ's  |       |
| 79                       |         | Electric appliances   |       |
| 80                       |         | Fishing weights   |       |

OSPAR Survey Form 100m, 2010, 010





| OSPAR ID                  | Unep ID | Items  | Total |
|---------------------------|---------|--|-------|
| 81                        |         | Foil wrappers  |       |
| 82                        |         | Food cans  |       |
| 83                        |         | Industrial scrap   |       |
| 84                        |         | Oil drums  |       |
| 86                        |         | Paint tins   |       |
| 87                        |         | Lobster/crab pots and tops   |       |
| 88                        |         | Wire, wire mesh, barbed wire   |       |
| 89                        |         | Other metal pieces < 50 cm (please specify in other item box*)                     |       |
| 90                        |         | Other metal pieces > 50 cm (please specify in other item box*)                     |       |
| <i>Glass</i>              |         |  |       |
| 91                        |         | Bottles  |       |
| 92                        |         | Light bulbs/tubes  |       |
| 93                        |         | Other glass items (please specify in other item box*)                              |       |
| <i>Pottery • Ceramics</i> |         |  |       |
| 94                        |         | Construction material e.g. tiles   |       |
| 95                        |         | Octopus pots   |       |
| 96                        |         | Other ceramic/pottery items (please specify in other item box*)                    |       |
| <i>Sanitary waste</i>     |         |  |       |
| 97                        |         | Condoms  |       |
| 98                        |         | Cotton bud sticks  |       |
| 99                        |         | Sanitary towels/panty liners/backing strips  |       |
| 100                       |         | Tampons and tampon applicators   |       |
| 101                       |         | Toilet fresheners  |       |
| 102                       |         | Other sanitary items (please specify in other item box*)                           |       |
| <i>Medical waste</i>      |         |  |       |
| 103                       |         | Containers / tubes   |       |
| 104                       |         | Syringes   |       |
| 105                       |         | Other medical items (swabs, bandaging etc.)<br>(please specify in other item box*) |       |
| <i>Faeces</i>             |         |  |       |
| 121                       |         | Bagged dog faeces  |       |





| Presence of other pollutants                            |   |  |
|---|---|--|
| Pollutant   | Size of pieces or lumps<br><i>(estimates)</i> | Frequency<br><i>(estimated number per<br/>metre of strandline)</i> |
| <b>Paraffin or wax pieces</b>                           |   |  |
|   | <i>Size range</i>                             |  |
| 108   | 0 - 1 cm                                      |  |
| 109   | 1 - 10 cm                                     |  |
| 110   | > 10 cm                                       |  |
| <b>Other</b> <i>(please specify in other item box*)</i> |   |  |
| 111   |   |  |

Pellets\* (nurdles):  Yes  No

*\*(photo in field guide)*

100 m

\*Special observations and notes (please refer to number!)

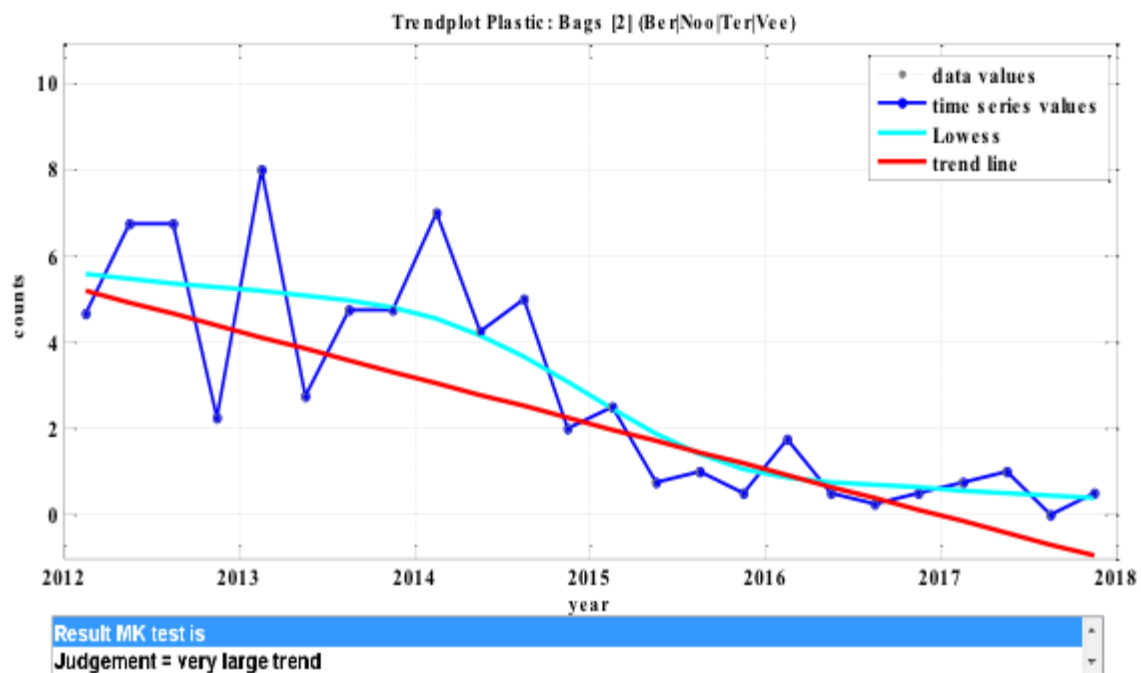
*Other Item Box*



## Appendix G – Sample OSPAR Report

The below trend is from measurements at 4 reference beaches in NL. A ban on plastic bags was introduced in EU in 2016.

*Trend plot Plastic bags in period 2012-2017 with decreasing significant trend (Boonstra & Hougee 2018)*



## Appendix H – ICC Summary

|  |  |
|--|--|
| <b>Survey Name</b>                                     | <b>International Coastal Cleanup®</b>  |
| <b>Developed By</b>                                    | Ocean Conservancy  |
| <b>Website</b>   | <a href="https://www.coastalcleanupdata.org/">https://www.coastalcleanupdata.org/</a>  |
| <b>Partners</b>  | Project AWARE Dive Against Debris<br><a href="https://oceanconservancy.org/trash-free-seas/international-coastal-cleanup/partners/">https://oceanconservancy.org/trash-free-seas/international-coastal-cleanup/partners/</a>   |
| <b>Registration</b>                                    | create account with email & password   |
| <b>Data Entry Access</b>                               | log in and enter via website   |
| <b>Data Entry Procedure</b>                            | direct input into web based database   |
| <b>Quality Control</b>                                 | appear immediately in database, subject to regular checks by TFS staff   |
| <b>Data Access</b>                                     | public - access directly on website  |
| <b>Data Ownership</b>                                  | Ocean Conservancy (NGO)  |
| <b>Database Type</b>                                   | MySQL  |
| <b>Data Security</b>                                   | RDS database instance is currently locked down, only allowing access from the Beaconfire RED offices, the Lambda function that performs the data export the Node server that manages Clean Swell and TIDES itself. External access via IP Address is not currently configured. |
| <b>Data Backup</b>                                     | RDS supports rollback and snapshots. Snapshots are taken of this RDS instance every day (maintaining rolling 8 backups), and database rollback allows user to roll back to a specific minute in time.  |
| <b>Output format</b>                                   | csv and on-screen data   |
| <b>Reports Generated</b>                               | Summary<br>Top Ten<br>Unusual Items People, Pounds, Miles<br>GPS/PPM/Item<br>Items of Local Concern<br>Entangled Animals   |
| <b>Source Tracing (point of manufacture or origin)</b> | no * but might be added in future*   |
| <b>Source Tracing (user group)</b>                     | yes  |



|   |   |
|---|---|
| <b>Active Since Year</b>                | 1986  |
| <b>No. of Countries Using in Region</b> | 29 (see <a href="#">Appendix C</a> for list)  |
| <b>Regional Languages Available</b>     | English, Spanish, French  |
| <b>Key Objectives</b>                   | <ul style="list-style-type: none"> <li>-Raise community awareness</li> <li>-Engage with citizens</li> <li>-Remove debris</li> <li>-Identify most found items</li> <li>-Set agenda for policymakers</li> </ul>   |
| <b>Description</b>                      | In partnership with volunteer organizations around the globe, Ocean Conservancy's International Coastal Cleanup mobilizes individuals to have an immediate and tangible impact on the health of our ocean. Volunteers remove millions of pounds of trash from beaches and waterways worldwide while fostering awareness of the marine debris issue and a sense of stewardship for one of our planet's greatest natural resources. |
| <b>Sites</b>                            | Any (ocean, lake, river, quarry, etc.)  |
| <b>Schedule</b>                         | Once a year (3rd Saturday in September)   |
| <b>Sampling Frequency</b>               | Flux accumulation (if conducted using consistent sampling units) or Standing crop (at random sites)   |
| <b>Sampling Unit</b>                    | Random  |
| <b>Clearance</b>                        | Not required  |
| <b>Site Selection Criteria</b>          | Beaches or waterways that: <ul style="list-style-type: none"> <li>-could be cleaned</li> <li>-safe and accessible</li> </ul>  |
| <b>Groups/Individuals</b>               | Both  |
| <b>Training</b>                         | No formal program requirements but guidelines can be accessed on website <a href="https://oceanconservancy.org/trash-free-seas/international-coastal-cleanup/start-a-cleanup/">https://oceanconservancy.org/trash-free-seas/international-coastal-cleanup/start-a-cleanup/</a>  |
| <b>Training Materials</b>               | ICC Coordinator Handbook  |
| <b>Name of Data Collection Form</b>     | Volunteer Ocean Trash Data Form   |
| <b>Survey Data</b>                      | Date<br>Distance  |



|                                    |   |
|------------------------------------|---|
| <b>Surveyor Data</b>               | Number of Adults<br>Number of Children  |
| <b>Supervision</b>                 | Not required  |
| <b>Site Location</b>               | Location: select on map; click to pinpoint or enter latitude/longitude                      |
| <b>Site Characterization</b>       | Land (beach, shoreline, inland)/Underwater/Watercraft (powerboat, sailboat, kayak or canoe) |
| <b>Litter Characterization</b>     | Categorized by: Prevalence/Composition/Source/Size<br>Number of Categories: 8               |
| <b>Number of Items</b>             | 42  |
| <b>Most Likely to Find Items</b>   | 18  |
| <b>Fishing Gear</b>                | 4   |
| <b>Packaging Materials</b>         | 5   |
| <b>Other Items</b>                 | 8   |
| <b>Personal Hygiene</b>            | 4   |
| <b>Tiny Trash Less than 2.5cm</b>  | Foam Pieces<br>Glass Pieces<br>Plastic Pieces   |
| <b>Items of Local Concern</b>      | open field  |
| <b>Litter Quantification</b>       | Count by Item<br>Weight<br>Number of bags   |
| <b>Entanglement Data Collected</b> | Animal<br>Status<br>Entanglement Debris   |
| <b>Additional Info</b>             | Unusual Items   |
| <b>Photos</b>                      |   |



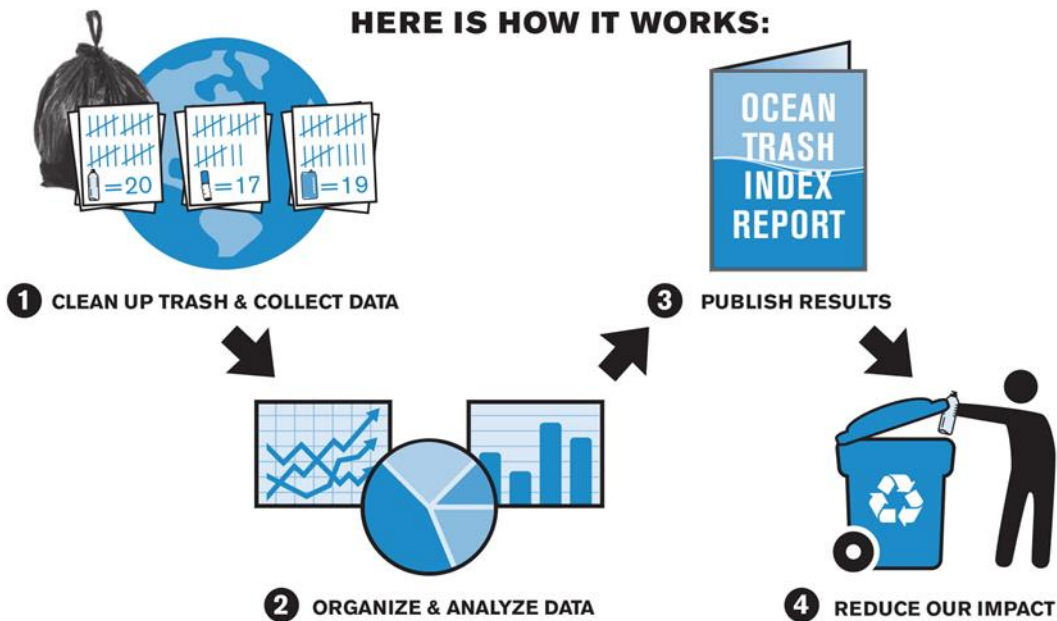
Appendix I – ICC Ocean Trash Data Form

# VOLUNTEER OCEAN TRASH DATA FORM



Ocean and waterway trash ranks as one of the most serious pollution problems choking our planet. Far more than an eyesore, a rising tide of marine debris threatens human health, wildlife, communities and economies around the world. The ocean faces many challenges, but trash should not be one of them. Ocean trash is entirely preventable, and data you collect are part of the solution. The International Coastal Cleanup is the world's largest volunteer effort on behalf of ocean and waterway health.

**HERE IS HOW IT WORKS:**



|  |  |   |  |
|--|--|---|--|
| <b>SITE INFORMATION:</b><br>Cleanup Site Name: <input type="text"/><br>State or Province: <input type="text"/> Zone or County: <input type="text"/><br>Country: <input type="text"/> Nearest Crossroad or Landmark: <input type="text"/> |  | <b>NUMBER OF VOLUNTEERS WORKING ON THIS CARD:</b><br>adults <input type="text"/> children (under 12) <input type="text"/>           |  |
| <b>MOST UNUSUAL ITEM COLLECTED:</b><br><input type="text"/>  |  | <b>TYPE OF CLEANUP:</b><br>Land: <input type="checkbox"/> Underwater: <input type="checkbox"/> Watercraft: <input type="checkbox"/> |  |

Please return this form to your area coordinator.  
If you are unable to do so, please mail or email it to:

Ocean Conservancy  
Attn: International Coastal Cleanup  
1300 19th Street, NW, 8th Floor  
Washington, DC 20036  
cleanup@oceanconservancy.org

Trash Free Seas: [www.oceanconservancy.org/cleanup](http://www.oceanconservancy.org/cleanup)  
Be a Green Boater: [www.oceanconservancy.org/do-your-part/green-boating](http://www.oceanconservancy.org/do-your-part/green-boating)  
Sponsors: [www.oceanconservancy.org/cleanupsponsors](http://www.oceanconservancy.org/cleanupsponsors)



# TRASH COLLECTED

**Citizen scientist:** Pick up all trash and record all items you find below. No matter how small the items, the data you collect are important for Trash Free Seas.<sup>®</sup>

**EXAMPLE:** Plastic Bags:  = **8** **TOTAL #**

Please **DO NOT** use words or check marks. Only **numbers** are useful data.

## MOST LIKELY TO FIND ITEMS:

|                                     |   |                             |   |
|-------------------------------------|---|-----------------------------|---|
| Cigarette Butts:                    | = | Beverage Bottles (Plastic): | = |
| Food Wrappers (candy, chips, etc.): | = | Beverage Bottles (Glass):   | = |
| Take Out/Away Containers (Plastic): | = | Beverage Cans:              | = |
| Take Out/Away Containers (Foam):    | = | Grocery Bags (Plastic):     | = |
| Bottle Caps (Plastic)               | = | Other Plastic Bags:         | = |
| Bottle Caps (Metal)                 | = | Paper Bags:                 | = |
| Lids (Plastic) :                    | = | Cups & Plates (Paper):      | = |
| Straws/Stirrers:                    | = | Cups & Plates (Plastic):    | = |
| Forks, Knives, Spoons:              | = | Cups & Plates (Foam):       | = |

## FISHING GEAR:

|  |   |
|--|---|
| Fishing Buoys, Pots & Traps:           | = |
| Fishing Net & Pieces:                  | = |
| Fishing Line (1 yard/meter = 1 piece): | = |
| Rope (1 yard/meter = 1 piece):         | = |

## PACKAGING MATERIALS:

|  |   |
|--|---|
| 6-Pack Holders                             | = |
| Other Plastic/Foam Packaging:              | = |
| Other Plastic Bottles (oil, bleach, etc.): | = |
| Strapping Bands:                           | = |
| Tobacco Packaging/Wrap:                    | = |

## OTHER TRASH:

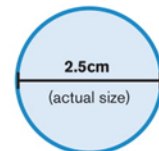
|  |   |
|--|---|
| Appliances (refrigerators, washers, etc.): | = |
| Balloons:                                  | = |
| Cigar Tips:                                | = |
| Cigarette Lighters:                        | = |
| Construction Materials:                    | = |
| Fireworks:                                 | = |
| Tires:                                     | = |

## PERSONAL HYGIENE:

|                             |   |
|-----------------------------|---|
| Condoms:                    | = |
| Diapers:                    | = |
| Syringes:                   | = |
| Tampons/Tampon Applicators: | = |

## TINY TRASH LESS THAN 2.5CM:

|                |   |
|----------------|---|
| Foam Pieces    | = |
| Glass Pieces   | = |
| Plastic Pieces | = |



| DEAD/INJURED ANIMAL | STATUS          | ENTANGLED | TYPE OF ENTANGLEMENT ITEM |
|---------------------|-----------------|-----------|---------------------------|
|                     | Dead or Injured | Yes or No |                           |

## ITEMS OF LOCAL CONCERN:

|    |    |    |
|----|----|----|
| 1. | 2. | 3. |
|----|----|----|

## CLEANUP SUMMARY (circle units)

Number of Trash Bags Filled:  Weight of Trash Collected:  lbs/kgs Distance Cleaned:  miles/km



## Appendix J – TIDES Report (Applies to ICC/Clean Swell/Dive Against Debris)

### Summary — Bonaire, Caribbean Netherlands

| <b>Clean Up Summary</b> | <b>Land</b> | <b>Underwater</b> | <b>Watercraft</b> | <b>Total</b> |
|-------------------------|-------------|-------------------|-------------------|--------------|
| People                  | 14          | 0                 | 0                 | 14           |
| Kilograms               | 19.96       | 0                 | 0                 | 19.96        |
| Kilometers              | 0.05        | 0                 | 0                 | 0.05         |
| Total Items Collected   | 2274        | 0                 | 0                 | 2274         |

| <b>Categorized Items</b>           | <b>Land</b> | <b>Underwater</b> | <b>Watercraft</b> | <b>Total Items</b> | <b>Percentage of Total</b> |
|------------------------------------|-------------|-------------------|-------------------|--------------------|----------------------------|
| <b>Most Likely to Find Items</b>   |             |                   |                   |                    |                            |
| Cigarette Butts                    | 1345        | 0                 | 0                 | 1345               | 59.15%                     |
| Food Wrappers (candy, chips, etc.) | 54          | 0                 | 0                 | 54                 | 2.37%                      |
| Take Out/Away Containers (Plastic) | 0           | 0                 | 0                 | 0                  | 0.00%                      |
| Take Out/Away Containers (Foam)    | 1           | 0                 | 0                 | 1                  | 0.04%                      |
| Bottle Caps (Plastic)              | 119         | 0                 | 0                 | 119                | 5.23%                      |
| Bottle Caps (Metal)                | 358         | 0                 | 0                 | 358                | 15.74%                     |
| Lids (Plastic)                     | 0           | 0                 | 0                 | 0                  | 0.00%                      |
| Straws, Stirrers                   | 50          | 0                 | 0                 | 50                 | 2.20%                      |
| Forks, Knives, Spoons              | 57          | 0                 | 0                 | 57                 | 2.51%                      |
| Beverage Bottles (Plastic)         | 2           | 0                 | 0                 | 2                  | 0.09%                      |
| Beverage Bottles (Glass)           | 13          | 0                 | 0                 | 13                 | 0.57%                      |
| Beverage Cans                      | 10          | 0                 | 0                 | 10                 | 0.44%                      |
| Grocery Bags (Plastic)             | 11          | 0                 | 0                 | 11                 | 0.48%                      |
| Other Plastic Bags                 | 1           | 0                 | 0                 | 1                  | 0.04%                      |
| Paper Bags                         | 1           | 0                 | 0                 | 1                  | 0.04%                      |
| Cups, Plates (Paper)               | 1           | 0                 | 0                 | 1                  | 0.04%                      |
| Cups, Plates (Plastic)             | 6           | 0                 | 0                 | 6                  | 0.26%                      |
| Cups, Plates (Foam)                | 0           | 0                 | 0                 | 0                  | 0.00%                      |
| <b>Category Totals</b>             | <b>2029</b> | <b>0</b>          | <b>0</b>          | <b>2029</b>        | <b>89.2%</b>               |

|                                       |           |          |          |           |              |
|---------------------------------------|-----------|----------|----------|-----------|--------------|
| <b>Fishing Gear</b>                   |           |          |          |           |              |
| Fishing Buoys, Pots & Traps           | 0         | 0        | 0        | 0         | 0.00%        |
| Fishing Net & Pieces                  | 4         | 0        | 0        | 4         | 0.18%        |
| Fishing Line (1 yard/meter = 1 piece) | 5         | 0        | 0        | 5         | 0.22%        |
| Rope (1 yard/meter = 1 piece)         | 13        | 0        | 0        | 13        | 0.57%        |
| Fishing Gear (Clean Swell)            | 0         | 0        | 0        | 0         | 0.00%        |
| <b>Category Totals</b>                | <b>22</b> | <b>0</b> | <b>0</b> | <b>22</b> | <b>0.97%</b> |

|   |    |   |   |    |       |
|---|----|---|---|----|-------|
| <b>Packaging Materials</b>                |    |   |   |    |       |
| 6-Pack Holders                            | 3  | 0 | 0 | 3  | 0.13% |
| Other Plastic/Foam Packaging              | 2  | 0 | 0 | 2  | 0.09% |
| Other Plastic Bottles (oil, bleach, etc.) | 2  | 0 | 0 | 2  | 0.09% |
| Strapping Bands                           | 12 | 0 | 0 | 12 | 0.53% |
| Tobacco Packaging/Wrap                    | 2  | 0 | 0 | 2  | 0.09% |



|   |             |          |          |             |               |
|---|-------------|----------|----------|-------------|---------------|
| Other Packaging (Clean Swell)             | 0           | 0        | 0        | 0           | 0.00%         |
| <b>Category Totals</b>                    | <b>21</b>   | <b>0</b> | <b>0</b> | <b>21</b>   | <b>0.93%</b>  |
| <b>Other Items</b>                        |             |          |          |             |               |
| Appliances (refrigerators, washers, etc.) | 0           | 0        | 0        | 0           | 0.00%         |
| Balloons                                  | 4           | 0        | 0        | 4           | 0.18%         |
| Cigar Tips                                | 0           | 0        | 0        | 0           | 0.00%         |
| Cigarette Lighters                        | 1           | 0        | 0        | 1           | 0.04%         |
| Construction Materials                    | 1           | 0        | 0        | 1           | 0.04%         |
| Fireworks                                 | 1           | 0        | 0        | 1           | 0.04%         |
| Tires                                     | 1           | 0        | 0        | 1           | 0.04%         |
| Toys                                      | 6           | 0        | 0        | 6           | 0.26%         |
| Other Trash (Clean Swell)                 | 0           | 0        | 0        | 0           | 0.00%         |
| <b>Category Totals</b>                    | <b>14</b>   | <b>0</b> | <b>0</b> | <b>14</b>   | <b>0.6%</b>   |
| <b>Personal Hygiene</b>                   |             |          |          |             |               |
| Condoms                                   | 1           | 0        | 0        | 1           | 0.04%         |
| Diapers                                   | 0           | 0        | 0        | 0           | 0.00%         |
| Syringes                                  | 0           | 0        | 0        | 0           | 0.00%         |
| Tampons/Tampon Applicators                | 2           | 0        | 0        | 2           | 0.09%         |
| Personal Hygiene (Clean Swell)            | 0           | 0        | 0        | 0           | 0.00%         |
| <b>Category Totals</b>                    | <b>3</b>    | <b>0</b> | <b>0</b> | <b>3</b>    | <b>0.13%</b>  |
| <b>Tiny Trash Less Than 2.5 cm</b>        |             |          |          |             |               |
| Foam Pieces                               | 45          | 0        | 0        | 45          | 1.98%         |
| Glass Pieces                              | 94          | 0        | 0        | 94          | 4.13%         |
| Plastic Pieces                            | 46          | 0        | 0        | 46          | 2.02%         |
| <b>Category Totals</b>                    | <b>185</b>  | <b>0</b> | <b>0</b> | <b>185</b>  | <b>8.13%</b>  |
| <b>Total Items Collected</b>              | <b>2274</b> | <b>0</b> | <b>0</b> | <b>2274</b> | <b>99.96%</b> |



## Appendix K – Clean Swell Summary

|  |  |
|--|--|
| <b>Survey Name</b>                                     | Clean Swell  |
| <b>Developed By</b>                                    | Ocean Conservancy  |
| <b>Website</b>   | <a href="https://www.coastalcleanupdata.org/">https://www.coastalcleanupdata.org/</a>  |
| <b>Partners</b>  | Ocean Conservancy<br>International Coast Clean Up  |
| <b>Registration</b>                                    | public - download the app by submitting name, email, organization, home country, language  |
| <b>Data Entry Access</b>                               | via App (iOS or Android)   |
| <b>Data Entry Procedure</b>                            | direct input into app  |
| <b>Quality Control</b>                                 | appear immediately in database, subject to regular checks by TFS staff   |
| <b>Data Access</b>                                     | public - access directly on website <a href="https://www.coastalcleanupdata.org/">https://www.coastalcleanupdata.org/</a>  |
| <b>Data Ownership</b>                                  | Ocean Conservancy (NGO)  |
| <b>Database Type</b>                                   | MySQL  |
| <b>Data Security</b>                                   | RDS database instance is currently locked down, only allowing access from the Beaconfire RED offices, the Lambda function that performs the data export the Node server that manages Clean Swell and TIDES itself. External access via IP Address is not currently configured. |
| <b>Data Backup</b>                                     | RDS supports rollback and snapshots. Snapshots are taken of this RDS instance every day (maintaining rolling 8 backups), and database rollback allows user to roll back to a specific minute in time.  |
| <b>Output format</b>                                   | csv and on-screen data   |
| <b>Reports Generated</b>                               | Summary<br>Top Ten<br>Unusual Items People, Pounds, Miles<br>GPS/PPM/Item<br>Items of Local Concern<br>Entangled Animals   |
| <b>Source Tracing (point of manufacture or origin)</b> | no   |
| <b>Source Tracing (user group)</b>                     | yes  |



|   |   |
|---|---|
| <b>Active Since Year</b>                | 2016  |
| <b>No. of Countries Using in Region</b> | 29 (see <a href="#">Appendix C</a> for list)  |
| <b>Regional Languages Available</b>     | English, Spanish  |
| <b>Key Objectives</b>                   | <ul style="list-style-type: none"> <li>-Raise community awareness</li> <li>-Engage with citizens</li> <li>-Remove debris</li> <li>-Identify most found items</li> <li>-Set agenda for policymakers</li> </ul>   |
| <b>Description</b>                      | <p>With Clean Swell, simply “Start Collecting” trash wherever you are around the world and the data you collect will instantaneously upload to Ocean Conservancy’s global ocean trash database. These data deliver a global snapshot of ocean trash, providing researchers and policy-makers insight to inform solutions. Join the thousands of International Coastal Cleanup® volunteers who are working for a cleaner ocean by picking up the millions of pounds of trash that wash onto beaches around the world. Even check out your Cleanup history, so anytime, anywhere you can see the impact you’ve had on making our ocean a cleaner and healthier ecosystem.</p> |
| <b>Sites</b>                            | Any (ocean, lake, river, quarry, etc.)  |
| <b>Schedule</b>                         | Any time  |
| <b>Sampling Frequency</b>               | Standing crop   |
| <b>Sampling Unit</b>                    | Random  |
| <b>Clearance</b>                        | Not required  |
| <b>Site Selection Criteria</b>          | None  |
| <b>Groups/Individuals</b>               | Individuals (Groups with one device per buddy pair, with group name used)   |
| <b>Training</b>                         | No formal program requirements but guidelines can be accessed on website <a href="https://oceanconservancy.org/trash-free-seas/international-coastal-cleanup/cleanswell/">https://oceanconservancy.org/trash-free-seas/international-coastal-cleanup/cleanswell/</a>  |
| <b>Training Materials</b>               | Clean Swell Poster <a href="https://oceanconservancy.org/wp-content/uploads/2017/04/OC-Clean-Swell-Poster-form.pdf">https://oceanconservancy.org/wp-content/uploads/2017/04/OC-Clean-Swell-Poster-form.pdf</a>  |
| <b>Name of Data Collection Form</b>     | Clean Swell App   |



|                                    |   |
|------------------------------------|---|
| <b>Survey Data</b>                 | Date<br>Time Spent Cleaning Up (recorded automatically by device)<br>Distance covered (recorded automatically by GPS in device) |
| <b>Surveyor Data</b>               | Number of participants<br>Group name  |
| <b>Supervision</b>                 | Not required  |
| <b>Site Location</b>               | Location: recorded by GPS location in device  |
| <b>Site Characterization</b>       |   |
| <b>Litter Characterization</b>     |   |
| <b>Number of Items</b>             | 20  |
| <b>Litter Quantification</b>       | Counted by item<br>Pounds of Trash Cleaned Up (estimated by items amounts/types recorded)                                       |
| <b>Entanglement Data Collected</b> |   |
| <b>Additional Info</b>             |   |



Appendix L – Clean Swell App (data entry screen)



Cups, Plates   Lids   Straws   Utensils

1   2   0   0

Plastic/Foam Pieces   Personal Hygiene   Other Packaging   Other Trash

Group

Miami Marine Litter Workshop

ADD ITEM  REMOVE ITEM

Done Collecting

Cancel Collection



# Review Your Cleanup

## Duration

1 hours 06 minutes

## Total Pounds Collected

10.72

## Comments

## — About Your Cleanup

## Date

Oct 3, 2018

## Number of People

1



## Appendix M – Dive Against Debris Data Summary

|  |  |
|--|--|
| <b>Survey Name</b>                                     | <b>Dive Against Debris®</b>  |
| <b>Developed By</b>                                    | Project AWARE  |
| <b>Website</b>   | <a href="https://www.projectaware.org/DiveAgainstDebrisData">https://www.projectaware.org/DiveAgainstDebrisData</a><br><a href="https://www.coastalcleanupdata.org/">https://www.coastalcleanupdata.org/</a>   |
| <b>Partners</b>  | PADI<br>Ocean Conservancy  |
| <b>Registration</b>                                    | create account with email & password   |
| <b>Data Entry Access</b>                               | log in and enter via website or via App (iOS or Android)   |
| <b>Data Entry Procedure</b>                            | direct input into web based database   |
| <b>Quality Control</b>                                 | review by AWARE staff before addition to database  |
| <b>Data Access</b>                                     | public - access directly on website  |
| <b>Data Ownership</b>                                  | Project AWARE (NGO)  |
| <b>Database Type</b>                                   | MySQL  |
| <b>Data Security</b>                                   | RDS database instance is currently locked down, only allowing access from the Beaconfire RED offices, the Lambda function that performs the data export the Node server that manages Clean Swell and TIDES itself. External access via IP Address is not currently configured. |
| <b>Data Backup</b>                                     | RDS supports rollback and snapshots. Snapshots are taken of this RDS instance every day (maintaining rolling 8 backups), and database rollback allows user to roll back to a specific minute in time.  |
| <b>Output format</b>                                   | csv and on-screen data   |
| <b>Reports Generated</b>                               | Composition amounts<br>Entangled Animals<br>Debris Free Sites<br>Adopted Dive Sites<br>Individual Survey Reports <a href="https://www.projectaware.org/debris-survey/south-pier-6">https://www.projectaware.org/debris-survey/south-pier-6</a>                                 |
| <b>Source Tracing (point of manufacture or origin)</b> | no   |
| <b>Source Tracing (user group)</b>                     | yes  |



|   |   |
|---|---|
| <b>Active Since Year</b>                | 2011  |
| <b>No. of Countries Using in Region</b> | 29 (see <a href="#">Appendix C</a> for list)  |
| <b>Regional Languages Available</b>     | English, Spanish, French, Dutch   |
| <b>Key Objectives</b>                   | <ul style="list-style-type: none"> <li>-Raise community awareness</li> <li>-Engage with citizens</li> <li>-Remove underwater debris</li> <li>-Identify most found items</li> <li>-Set agenda for policymakers</li> </ul>                        |
| <b>Description</b>                      | Project AWARE's flagship citizen-science program, Dive Against Debris®, empowers scuba divers to remove marine debris from the ocean and report data on the types, quantities and locations of materials collected.                             |
| <b>Sites</b>                            | Any -Benthic Underwater only (ocean, lake, river, quarry, etc.)   |
| <b>Schedule</b>                         | Any time  |
| <b>Sampling Frequency</b>               | Standing crop   |
| <b>Sampling Unit</b>                    | Random  |
| <b>Clearance</b>                        | Not required  |
| <b>Site Selection Criteria</b>          | <ul style="list-style-type: none"> <li>-can return to regularly</li> <li>-known to have marine debris</li> <li>-within the dive skills and experience of all participants (can include fresh water lakes and rivers)</li> </ul>                 |
| <b>Groups/Individuals</b>               | both  |
| <b>Training</b>                         | recommended diver specialty training (not required)   |
| <b>Training Materials</b>               | Dive Against Debris Survey Guide, AWARE Dive Against Debris Distinctive Specialty   |
| <b>Name of Data Collection Form</b>     | Dive Against Debris Data Card   |
| <b>Survey Data</b>                      | <ul style="list-style-type: none"> <li>Date</li> <li>Debris to report (yes/no)</li> <li>Dive Center/Organization</li> <li>Weather conditions for previous week</li> <li>Survey duration (in minutes)</li> <li>Survey depth (min/max)</li> </ul> |



|                                    |   |
|------------------------------------|---|
|                                    | Survey area m2<br>Wave conditions   |
| <b>Surveyor Data</b>               | Number of participants  |
| <b>Supervision</b>                 | Not required  |
| <b>Site Location</b>               | Location: select on map; click to pinpoint or enter latitude/longitude  |
| <b>Site Characterization</b>       | Ecosystem (coral reef, rocky reef, mangroves, kelp, seagrass, other)<br>Dominant substrate (sand, silt, gravel, rock, coral, seagrass, other)   |
| <b>Litter Characterization</b>     | Categorized by: Composition<br>Number of Categories: 9  |
| <b><u>Number of Items</u></b>      | 100   |
| Plastic Materials                  | 43  |
| Glass & Ceramic Materials          | 8   |
| Metal Materials                    | 21  |
| Rubber Materials                   | 6   |
| Wood Materials                     | 5   |
| Cloth Materials                    | 6   |
| Paper/Cardboard Materials          | 4   |
| Mixed Materials                    | 7   |
| Other Debris Items                 | open field  |
| <b>Litter Quantification</b>       | Counted by item<br>Weight of all debris collected (estimated/measured)  |
| <b>Entanglement Data Collected</b> | Mammals, Birds, Turtles, Sharks/Rays, Other Fishes, Crustaceans, Other Animals<br>Species or common name<br>Number<br>Dead/Injured/Released Unharmmed<br>Type of Debris<br>Comments   |
| <b>Additional Info</b>             | Are you aware of an event that could have contributed to the debris you documented?<br>Most unusual item found<br>What were the most problematic debris items found in your location? |



---

|               |   |
|---------------|---|
|               | Comments/Feedback<br>Additional Information |
| <b>Photos</b> | can be uploaded at end of survey            |



## Appendix N – Dive Against Debris Data Card

# Dive Against Debris®

# Data Card

Dive Against Debris® is a survey of underwater marine debris. Only report debris you find underwater while on SCUBA through Dive Against Debris®. Survey leaders should record all diver findings for the same individual survey dive, onto one Data Card. Then, for all English data submissions report your data online at [www.projectaware.org/DiveAgainstDebrisData](http://www.projectaware.org/DiveAgainstDebrisData), for all other languages, please email your completed Data Card to [diveagainstdebris@projectaware.org](mailto:diveagainstdebris@projectaware.org). See the **Dive Against Debris® Survey Guide** for instructions on using this form.

|   |  |  |
|---|--|--|
| Survey Date (DD/MM/YYYY)  | Survey Site Name   | Organisation/Dive Centre   |
| Survey Site Location (nearest landmark to help verify location i.e. adjacent road name, nearest city/town, state/province, country)   |  | Number of Participants   |
| Survey Site GPS Coordinates<br>Latitude _____ Longitude _____<br><small>(Set your GPS Map Datum to WGS84) (Take your readings in decimal degrees)</small>   |  | Survey Duration (in minutes)   |
| Survey Depth Range (circle one: metres or feet)<br>○ _____ max _____ min  | Area surveyed (circle one: m <sup>2</sup> or ft <sup>2</sup> )<br>○ _____  | Total weight of all Debris Collected (circle one: kg or lb) Estimated: _____ OR Measured: _____<br>OR <input type="checkbox"/> Our Survey Site Was Free Of Debris  |
| Survey Leader Name  |  | Survey Leader Email  |
| Dominant Substrate (circle one)<br>○ Sand      ○ Coral<br>○ Silt      ○ Seagrass<br>○ Gravel    ○ Other (please describe)   | Ecosystem (circle one)<br>○ Coral reef    ○ Mangroves<br>○ Rocky reef    ○ Seagrass<br>○ Kelp          ○ Other (please describe)   | Waves (circle one)<br>○ Calm (0-0.1 metres/0-4 inches high)<br>○ Smooth (0.1-0.5 metres/4-19 inches high)<br>○ Slight (0.5-1.25 metres/19 inches-4 feet high)<br>○ Moderate (greater than 1.25 metres/4 feet high) |
| Weather Conditions from Previous Week   | Did You Find Entangled Animals? Identify animal(s) found<br>Identify debris item<br>Record number of each Entangled Animal<br>Was the animal: dead? <input type="checkbox"/> injured? <input type="checkbox"/> released unharmed? <input type="checkbox"/> |  |
| Are you aware of an event that could have contributed to the debris you have documented? YES <input type="checkbox"/> NO <input type="checkbox"/><br>If so, describe and provide verification – link to the news, etc |  |  |
| Items of Local Concern<br>List the top three debris items you consider a problem in your location and tell us why<br>1. _____<br>2. _____<br>3. _____   |  |  |
| What is the most unusual item found?  | Photos <input type="checkbox"/> Entangled Animals, marine debris impacts, items you cannot identify, items you did not remove, etc. See the Survey Guide for more info.<br>Yes <input type="checkbox"/>  |  |

Count all debris items as one, regardless of size. See **Too Small to Count** in the **Dive Against Debris® Survey Guide** for counting large quantities of small pieces. Debris items are listed under the main material of construction. List items that do not fit into a category here:

| Other Debris Items (Identify Material) | Tally (### I = 6) |
|--|-------------------|
|  |                   |
|  |                   |
|  |                   |
|  |                   |
|  |                   |



| Plastic Materials                                     | Tally (### I = 6) |
|---|-------------------|
| 01. bags: grocery/retail (plastic)                    |                   |
| 02. bags: trash (plastic)                             |                   |
| 03. bait containers/packaging                         |                   |
| 04. balloons  |                   |
| 05. balls   |                   |
| 06. baskets, crates                                   |                   |
| 07. beverage bottles: less than 2 litres (plastic)    |                   |
| 08. beverage bottles: 2 litres or more (plastic)      |                   |
| 09. bottles: bleach, cleaner                          |                   |
| 10. bottles: oil/lube                                 |                   |
| 11. buckets, drums & jerry cans: 2 litres or more     |                   |
| 12. buoys & floats (plastic & foamed)                 |                   |
| 13. caps & lids (plastic)                             |                   |
| 14. carpet (synthetic)                                |                   |
| 15. cigarette filters                                 |                   |
| 16. cigarette lighters                                |                   |
| 17. cigar tips  |                   |
| 18. containers: fast food, lunch boxes & similar      |                   |
| 19. cotton bud sticks                                 |                   |
| 20. cups, plates, forks, knives, spoons (plastic)     |                   |
| 21. diapers/nappies                                   |                   |
| 22. fishing: line                                     |                   |
| 23. fishing: lures, rods/poles                        |                   |
| 24. fishing: nets & pieces of nets                    |                   |
| 25. fishing: traps & pots                             |                   |
| 26. foam insulation & packaging                       |                   |
| 27. food wrappers (plastic)                           |                   |
| 28. furnishings (plastic)                             |                   |
| 29. gloves (latex)                                    |                   |
| 30. light sticks/cyalumes                             |                   |
| 31. mesh bags: fruit, vegetable, shellfish            |                   |
| 32. pipes (plastic/PVC)                               |                   |
| 33. rope (plastic/nylon)                              |                   |
| 34. scuba & snorkel gear, masks, snorkels, fins       |                   |
| 35. sheeting: tarpaulin, plastic sheets, palette wrap |                   |
| 36. six-pack rings, ring carriers                     |                   |
| 37. strapping bands (plastic)                         |                   |
| 38. straws, stirrers                                  |                   |
| 39. syringes (plastic)                                |                   |
| 40. tampon applicators                                |                   |
| 41. tobacco packaging & wrappers                      |                   |
| 42. toothbrushes                                      |                   |
| 43. plastic fragments                                 |                   |
| <b>Glass &amp; Ceramic Materials</b>                  |                   |
| 44. beverage bottles (glass)                          |                   |
| 45. buoys (glass)                                     |                   |
| 46. cups, plates, tableware, dishes (glass & ceramic) |                   |
| 47. fluorescent light tubes                           |                   |
| 48. jars: food (glass)                                |                   |
| 49. light globes: bulbs, etc                          |                   |
| 50. syringes (glass)                                  |                   |
| 51. glass & ceramic fragments                         |                   |

| Metal Materials                                     | Tally (### I = 6) |
|---|-------------------|
| 52. aerosol/spray cans                              |                   |
| 53. appliances: household                           |                   |
| 54. batteries: AA, AAA, C & D, 6V, 9V, etc          |                   |
| 55. batteries: car or boat                          |                   |
| 56. beverage cans (aluminium)                       |                   |
| 57. cans: food, juice, other (tin)                  |                   |
| 58. caps & lids (metal)                             |                   |
| 59. cars & car parts                                |                   |
| 60. cups, plates, tableware, dishes (metal)         |                   |
| 61. drums: 55 gallon                                |                   |
| 62. fishing: sinkers, lures, hooks                  |                   |
| 63. fishing: traps & pots                           |                   |
| 64. forks, knives, spoons (cutlery)                 |                   |
| 65. gas bottles/cylinder, drums: more than 4 litres |                   |
| 66. pipes & rebar                                   |                   |
| 67. pull tabs: beverages                            |                   |
| 68. scuba weights                                   |                   |
| 69. strapping bands (metal)                         |                   |
| 70. wire, wire mesh, barbed wire                    |                   |
| 71. wrappers (foil/metal)                           |                   |
| 72. metal fragments                                 |                   |
| <b>Rubber Materials</b>                             |                   |
| 73. condoms   |                   |
| 74. gloves (rubber)                                 |                   |
| 75. inner-tubes & rubber sheets                     |                   |
| 76. rubber bands                                    |                   |
| 77. tires/tyres                                     |                   |
| 78. rubber fragments                                |                   |
| <b>Wood Materials</b>                               |                   |
| 79. fishing: traps & pots                           |                   |
| 80. furnishings (wood)                              |                   |
| 81. lumber (processed or cut/milled wood)           |                   |
| 82. pallets   |                   |
| 83. wood fragments                                  |                   |
| <b>Cloth Materials</b>                              |                   |
| 84. bags (burlap/hessian)                           |                   |
| 85. bags (cloth)                                    |                   |
| 86. gloves (cloth)                                  |                   |
| 87. rope & string (cloth)                           |                   |
| 88. towels, rags                                    |                   |
| 89. cloth fragments                                 |                   |
| <b>Paper/Cardboard Materials</b>                    |                   |
| 90. bags (paper)                                    |                   |
| 91. cardboard: packaging & cartons                  |                   |
| 92. paper: books, newspapers, magazines, etc        |                   |
| 93. paper/cardboard fragments                       |                   |
| <b>Mixed Materials</b>                              |                   |
| 94. bricks, cinderblocks, chunks of cement          |                   |
| 95. clothing  |                   |
| 96. computer equipment & other electronic devices   |                   |
| 97. fireworks                                       |                   |
| 98. shoes, flip flops, sandals, tennis, etc         |                   |
| 99. tampons   |                   |
| 100. toys   |                   |

Having trouble identifying a debris item?  
Refer to the **Dive Against Debris® Marine Debris Identification Guide**  
for images of all debris items.



## Appendix O – Key objectives of the surveys

What are the key objectives of the survey? ([Section 5.1](#))

|   | Trash Free Seas   |   |  |
|---|---|---|--|
| OSPAR   | ICC   | Clean Swell   | Dive Against Debris  |
| <ul style="list-style-type: none"> <li>-Allow the abundance, trends &amp; composition of marine litter in the OSPAR Maritime Area to be determined</li> <li>-Inform policymakers on amounts, types, sources and trends over time in beach litter</li> </ul> | <ul style="list-style-type: none"> <li>-Raise community awareness</li> <li>-Engage with citizens</li> <li>-Remove debris</li> <li>-Identify most found items</li> <li>-Set agenda for policymakers</li> </ul> | <ul style="list-style-type: none"> <li>-Raise community awareness</li> <li>-Engage with citizens</li> <li>-Remove debris</li> <li>-Identify most found items</li> <li>-Set agenda for policymakers</li> </ul> | <ul style="list-style-type: none"> <li>-Raise community awareness</li> <li>-Engage with citizens</li> <li>-Remove underwater debris</li> <li>-Identify most found items</li> <li>-Set agenda for policymakers</li> </ul> |



## Appendix P- Survey Requirements

What are the survey requirements? ([Section 5.2](#))

|  |   | Trash Free Seas  |               |   |
|--|---|--|---------------|---|
|  | OSPAR   | ICC  | Clean Swell   | Dive Against Debris   |
| <b>Sampling Schedule</b>                           | 4x per year   | 1x per year  | Random        | Random  |
| <b>Sampling Units - Site</b>                       | Fixed site(s)   | Random   | Random        | Random  |
| <b>Sampling Units - Beach Length/Area surveyed</b> | Fixed length  | Random   | Random        | Random  |
| <b>Sampling Unit Clearance</b>                     | Required  | Not required   | Not required  | Not required  |
| <b>Sampling Frequency</b>                          | Flux accumulation   | Standing crop*   | Standing crop | Standing crop   |
| <b>Site Selection Criteria</b>                     | <ul style="list-style-type: none"> <li>- composed of sand or gravel</li> <li>- exposed to the open sea</li> <li>- be accessible to surveyors all year round</li> <li>- be accessible for ease of marine litter removal</li> <li>- be a minimum length of 100 metres &amp; if possible over 1 km in length</li> <li>-be free of 'buildings' all year round</li> <li>-ideally not be subject to any other litter collection activities</li> </ul> | Beaches or waterways that: <ul style="list-style-type: none"> <li>-could be cleaned</li> <li>-safe and accessible</li> </ul> | none          | <ul style="list-style-type: none"> <li>-can return to regularly</li> <li>-known to have marine debris</li> <li>-within the dive skills and experience of all participants (can include fresh water lakes and rivers)</li> </ul> |
| <b>Supervision</b>                                 | Coordinator   | Not required   | Not required  | Not required  |

*\*Note: due to its regularly scheduled intervals, if conducted at the same site yearly, ICC could be classified as Flux Accumulation*



## Appendix Q – Survey conditions on the day of sampling

What data is collected about the survey? ([Section 5.3](#))

|                      |   | Trash Free Seas  |   |   |
|----------------------|---|--|---|---|
|                      | OSPAR   | ICC  | Clean Swell   | Dive Against Debris   |
| <b>Survey Data</b>   | <ul style="list-style-type: none"> <li>- Date</li> <li>- Beach Name</li> <li>- OSPAR Beach ID</li> <li>- Country</li> <li>- Was litter collected</li> <li>- Date of last beach clean</li> <li>- Weather conditions affecting data of survey</li> <li>- Other circumstances or events</li> </ul> | <ul style="list-style-type: none"> <li>- Date</li> <li>- Distance</li> </ul>                       | <ul style="list-style-type: none"> <li>- Date</li> <li>- Time Spent</li> <li>Cleaning Up</li> <li>- Distance covered</li> </ul> | <ul style="list-style-type: none"> <li>- Date</li> <li>- Debris to report</li> <li>- Dive Center/Organization</li> <li>- Weather conditions for previous week</li> <li>- Survey duration (in minutes)</li> <li>- Survey depth (min/max)</li> <li>- Survey area m2</li> <li>- Wave conditions</li> </ul> |
| <b>Surveyor Data</b> | Names & contact info of coordinators  | <ul style="list-style-type: none"> <li>- Number of Adults</li> <li>- Number of Children</li> </ul> | <ul style="list-style-type: none"> <li>- Number of participants</li> <li>- Group name</li> </ul>                                | Number of participants  |



## Appendix R – Site information

What data is collected about the site? ([Section 5.4](#))

|                              |  | Trash Free Seas   |   |   |
|------------------------------|--|---|---|---|
|                              | OSPAR  | ICC   | Clean Swell   | Dive Against Debris   |
| <b>Site Characterization</b> | <ul style="list-style-type: none"> <li>- Beach width at mean low/high spring tide</li> <li>- Total length</li> <li>- Composition of back of beach</li> <li>- Prevailing currents</li> <li>- Prevailing winds</li> <li>- Direction facing</li> <li>- Type of beach material</li> <li>- Topography/gradient</li> <li>- Objects influencing currents</li> <li>- Beach usage</li> <li>- Access to beach</li> <li>- Distance to nearest town &amp; population</li> <li>- Development of beach</li> <li>- Food/drink outlets on beach</li> <li>- Distance to nearest shipping lane/harbour/river mouth/discharge of waste water</li> <li>- Cleaning schedule/method/responsibility</li> <li>- Comments/observations</li> <li>- Map of beach/local surroundings/region</li> </ul> | <ul style="list-style-type: none"> <li>- Land (beach, shoreline, inland)</li> <li>- Underwater</li> <li>- Watercraft (powerboat, sailboat, kayak or canoe)</li> </ul> | <ul style="list-style-type: none"> <li>- Land (beach, shoreline, inland)</li> <li>- Underwater</li> <li>- Watercraft (powerboat, sailboat, kayak or canoe)</li> </ul> | <ul style="list-style-type: none"> <li>- Ecosystem (coral reef, rocky reef, mangroves, kelp, seagrass, other)</li> <li>- Dominant substrate (sand, silt, gravel, rock, coral, seagrass, other)</li> </ul> |
| <b>Site Location</b>         | GPS coordinates  | Location: select on map; click to pinpoint or enter latitude/ longitude   | Location: recorded by GPS location in device  | Location: select on map; click to pinpoint or enter latitude/ longitude   |



## Appendix S – Litter items & categorization

What data is collected about the litter? ([Section 5.5](#))

|  |                                | Trash Free Seas                           |  |   |
|--|--------------------------------|---|--|---|
|  | OSPAR                          | ICC                                       | Clean Swell  | Dive Against Debris                       |
| <b>Litter Classification</b>                           | Resolution: High<br>Items: 117 | Resolution: Medium<br>Items: 42           | Resolution: Medium<br>Items: 20  | Resolution: High<br>Items: 100            |
| <b>Litter Quantification</b>                           | count                          | count & weight<br>(measured or estimated) | count (app generates approximate weight based on amount & items collected) | count & weight<br>(measured or estimated) |
| <b>Source Tracing (point of manufacture or origin)</b> | no                             | no  | no   | no  |
| <b>Source Tracing (user group)</b>                     | yes                            | yes                                       | yes  | yes                                       |
| <b>Composition</b>                                     | yes                            | yes                                       | no   | yes                                       |
| <b>Entanglement</b>                                    | yes                            | yes                                       | no   | yes                                       |



## Appendix T – Quality Assurance

How is the quality of the data ensured? ([Section 5.6](#))

|                           |   | Trash Free Seas  |  |   |
|---------------------------|---|--|--|---|
|                           | OSPAR   | ICC  | Clean Swell  | Dive Against Debris   |
| <b>Quality Control</b>    | <ul style="list-style-type: none"> <li>- Professional surveyors, appointed coordinators or national authority submit the data in the online database</li> <li>- Field forms are kept and stored</li> <li>- Limit on number of items submitted to avoid errors</li> <li>- Check on the data by the national authority when drafting national annual reports and OSPAR intermediate assessment</li> </ul> | appear immediately in database, subject to regular checks by TFS staff   | appear immediately in database, subject to regular checks by TFS staff   | review by AWARE staff before addition to database                                 |
| <b>Training</b>           | training & participation in surveys with experienced surveyors  | No formal program requirements but guidelines can be accessed on website | No formal program requirements but guidelines can be accessed on website | recommended diver specialty training (not required)                               |
| <b>Training Materials</b> | Guideline for Monitoring Marine Litter on the Beaches in the OSPAR Maritime Area  | ICC Coordinator Handbook & website                                       | Clean Swell Poster & website   | Dive Against Debris Survey Guide, AWARE Dive Against Debris Distinctive Specialty |



## Appendix U – Data management

How is the data managed? ([Section 5.7](#))

|                              |  | Trash Free Seas  |   |  |
|------------------------------|--|--|---|--|
|                              | OSPAR  | ICC  | Clean Swell                                   | Dive Against Debris                                    |
| <b>Governance/ Ownership</b> | OSPAR  | OC (NGO)   | OC (NGO)                                      | Project AWARE (NGO)                                    |
| <b>Data Housing</b>          | Marine Conservation Society  | TIDES website  | TIDES website                                 | TIDES & AWARE websites                                 |
| <b>Type of Database</b>      | MySQL  | MySQL  | MySQL   | MySQL ??   |
| <b>Access to reports</b>     | public (after data has signed off by OSPAR EIHA committee)   | public   | public  | public   |
| <b>Data Entry Access</b>     | Registration for data entry is granted by MCS, through OSPAR and approved by the constituent countries, to surveyors, national coordinators, policy officers and NGOs participating in the monitoring. | public (after registering with email address/password) | public (after registering with email address) | public (after registering with email address/password) |
| <b>Data Entry Procedure</b>  | direct input and by csv file upload  | direct input into web based database                   | direct input into app                         | direct input into web based database                   |
| <b>Output format</b>         | csv files, reports and on screen data  | csv and on-screen data                                 | csv and on-screen data                        | csv and on-screen data                                 |



|                      |   |   |   |   |
|----------------------|---|---|---|---|
| <b>Data Security</b> |   | Locked down. External access via IP Address is not currently configured.    | Locked down. External access via IP Address is not currently configured.    | Locked down. External access via IP Address is not currently configured.    |
| <b>Data Backups</b>  | Data backups are taken by an IT / Technical team. Some countries are also storing data in national databases. Original field forms are kept in hard copy. | daily snapshots with 8 rolling backups allowing rollback to specific minute | daily snapshots with 8 rolling backups allowing rollback to specific minute | daily snapshots with 8 rolling backups allowing rollback to specific minute |



## Appendix V – Reports and data analysis

What reports/analysis can be generated with the data? ([Section 5.8](#))

|   |   | Trash Free Seas   |  |   |
|---|---|---|--|---|
|   | OSPAR   | ICC   | Clean Swell  | Dive Against Debris   |
| <b>Amounts</b>  | yes   | yes   | yes  | yes   |
| <b>Percentages of total</b>   | yes   | yes   | yes  | yes   |
| <b>Trends over time and significance of trends with P-value</b>               | yes   | no  | no   | no  |
| <b>Reports Generated (see <a href="#">Appendix G &amp; J</a> for samples)</b> | <ul style="list-style-type: none"> <li>- Material types by amount/percentage</li> <li>- Material sources by amount/percentage</li> </ul> <b>Trend analysis via Litter Analyst: (trends &amp; significance)</b> <ul style="list-style-type: none"> <li>-average total abundance of litter items per 100m of coast</li> <li>-average composition of litter items per 100m of coast</li> <li>-trends in the abundance of litter items per 100m of coast</li> </ul> | <ul style="list-style-type: none"> <li>- Summary</li> <li>- Top Ten</li> <li>- Unusual Items</li> <li>- People, Pounds, Miles</li> <li>- GPS/PPM/Item</li> <li>- Items of Local Concern</li> <li>- Entangled Animals</li> </ul> | <ul style="list-style-type: none"> <li>- Summary</li> <li>- Top Ten</li> <li>- Unusual Items</li> <li>-People, Pounds, Miles</li> <li>-GPS/PPM/ Item</li> <li>- Items of Local Concern</li> <li>- Entangled Animals</li> </ul> | <ul style="list-style-type: none"> <li>-Composition amounts</li> <li>- Entangled Animals</li> <li>- Debris Free Sites</li> <li>- Adopted Dive Sites</li> <li>- Individual Survey Reports</li> </ul> |



## Appendix W – Comparison of OSPAR to UNEP Guidelines

Note: When the UNEP 2009 standards are reviewed side by side with OSPAR Marine Litter Survey methodology, as outlined below, there are a few points that are recommended by UNEP that are not currently present in the OSPAR Survey. These points have been underlined.

|                          | <b>OSPAR Marine Litter Monitoring Survey</b>   | <b>UNEP Beach Litter Comprehensive Survey Operational Guidelines</b>  |
|--------------------------|--|---|
| <b>Data Entry Access</b> | Registration for data entry is granted by MCS, through OSPAR and approved by the constituent countries, to surveyors, national coordinators, policy officers and NGOs participating in the monitoring.   | Data collation should be undertaken through an online, relational database management system under the control and direction of the local managers. Responsibility for review and approval of uploaded data should be undertaken by the regional/country coordinator who will clarify any issues with local managers. This would ensure a high level of consistency within each region as well as create a hierarchy of quality assurance on data acquisition. The use of such a system will also support comprehensive analysis of the data providing the opportunity to undertake statistically robust comparisons through time and between survey locations. |
| <b>Quality Control</b>   | Professional surveyors, appointed coordinators or national authority submit the data in the online database. Field forms are kept and stored. Limit on number of items submitted to avoid errors. Check on the data by the national authority when drafting national annual reports and OSPAR intermediate assessment. | Organization of the survey, collation and transfer of the datasheets, quality control sampling and liaison with regional coordinators should be conducted through the location manager.   |
| <b>Key Objectives</b>    | -Monitor implementation of policies of MSFD and measures from OSPAR RAP.<br>-Inform policymakers on amounts, types, sources and trends over time in beach litter.  | 1. Quantification and characterization of marine litter for the purposes of developing & evaluating the effectiveness of management, control, enforcement and/or mitigation strategies in particular integration with solid waste management.<br>2. Understanding the level of threat posed by marine litter to biota and ecosystems.<br>3. Providing comparable datasets to support national, regional and global assessments of marine litter.  |
| <b>Sites</b>             | Marine   | Marine  |



|                                | <b>OSPAR Marine Litter Monitoring Survey</b>   | <b>UNEP Beach Litter Comprehensive Survey Operational Guidelines</b>  |
|--------------------------------|--|---|
| <b>Schedule</b>                | 4x per year (minimum) per site   | Minimum 1x year, recommended 4x year  |
| <b>Sampling Frequency</b>      | Flux accumulation  | Flux accumulation   |
| <b>Sampling Unit</b>           | Fixed sites/length   | Fixed sites/length  |
| <b>Clearance</b>               | Required   | Required  |
| <b>Site Selection Criteria</b> | <ul style="list-style-type: none"> <li>- composed of sand or gravel</li> <li>- exposed to the open sea</li> <li>- be accessible to surveyors all year round</li> <li>- be accessible for ease of marine litter removal</li> <li>- be a minimum length of 100 metres &amp; if possible, over 1 km in length</li> <li>-be free of ‘buildings’ all year round</li> <li>-ideally not be subject to any other litter collection activities</li> </ul> | <ul style="list-style-type: none"> <li>- Minimum length of 100 m</li> <li>- <u>Low to moderate slope (15 – 45°)</u></li> <li>- Clear access to the sea (not blocked by breakwaters or jetties) such that marine litter is not screened by anthropogenic structures</li> <li>- Accessible to survey teams year round</li> <li>- Ideally the site should not be subject to any other litter collection activities</li> <li>- Survey activities should be conducted so as not to impact on any endangered or protected species</li> <li>- <u>Location of sampling sites within each zone should be stratified such that samples are obtained from beaches subject to different litter exposures, including:</u></li> <li>- <u>Urban coasts (i.e. mostly terrestrial inputs);</u></li> <li>- <u>Rural coasts (i.e. mostly oceanic inputs);</u></li> <li>- <u>Within close distance to major riverine inputs</u></li> <li><u>Beach selection and sampling unit layout should be undertaken or ratified by the regional and/or country coordinator who will recruit (and work with) a series of local managers</u></li> </ul> |
| <b>Training</b>                | training & participation in surveys with experienced surveyors   | Quality assurance and quality control should be primarily targeted at education of the field teams to ensure that litter collection and characterization is consistent across surveys. <u>Investment in communication and the training of the country/regional and local survey coordinators and managers is thus critical to survey integrity.</u>   |
| <b>Surveyor Data</b>           | Names & contact info of coordinators   | <u>Number of persons on the survey team</u>   |
| <b>Supervision</b>             | Coordinator  | Each survey location will require a location manager who is responsible for liaison with the regional coordinator as well as for recruiting survey volunteers, organising field   |



|                              |  |   |
|------------------------------|--|---|
|                              |  | operations, data collation and quality assurance sampling for each survey.  |
| <b>Training Materials</b>    | Guideline for Monitoring Marine Litter on the Beaches in the OSPAR Maritime Area   | The use of a laminated pictorial field guide with examples of each litter type will assist survey team members (particularly volunteers) to be consistent in litter characterization. Such pictorial guides may also be published as field guides and made available over the web to increase consistency between survey teams working at more distant (remote) locations.  |
| <b>Survey Data</b>           | <ul style="list-style-type: none"> <li>-Date</li> <li>-Beach Name</li> <li>-OSPAR Beach ID</li> <li>-Country</li> <li>-Was litter collected?</li> <li>-Date of last beach clean?</li> <li>-Weather conditions affecting data of survey?</li> <li>-Other circumstances or events?</li> </ul>  | <ul style="list-style-type: none"> <li>- Date</li> <li>- <u>Start and end times</u></li> <li>- Date on which the transect was last cleaned</li> <li>- Distance along beach covered by the survey – this should be fixed for each location</li> <li>- <u>Width of the beach at the time of the survey (which should be as close to low tide as is practicable) from the current water level to the back of the beach</u></li> <li>- <u>Any large litter items that cannot be safely moved by the survey group</u></li> <li>- Data on events that may not directly relate to the survey site (i.e. offshore storms, shipwrecks, shipping container losses) or alternatively land based activities that may result in litter such as festivals, car races, fishing competitions etc.</li> <li>- Conditions at the time of the survey that might affect the litter collection (e.g. cold, hot, rain, snow, high winds) through impacting on staff performance.</li> </ul> |
| <b>Site Location</b>         | GPS coordinates  | GPS coordinates   |
| <b>Site Characterization</b> | <ul style="list-style-type: none"> <li>-Beach width at mean low/high spring tide</li> <li>-Total length</li> <li>-Composition of back of beach</li> <li>-Prevailing currents</li> <li>-Prevailing winds</li> <li>-Direction facing</li> <li>-Type of beach material</li> <li>-Topography/gradient</li> <li>-Objects influencing currents</li> <li>-Beach usage</li> <li>-Access to beach</li> <li>-Distance to nearest town &amp;</li> </ul> | <p>Data relating to the depositional environment &amp; proximity to litter sources including:</p> <ul style="list-style-type: none"> <li>- Aspect</li> <li>- Prevailing wind (from meteorological data)</li> <li>- <u>Beach curvature</u></li> <li>- Total beach length</li> <li>- Nearest river – name, distance, direction and whether or not it inputs directly to the beach</li> <li>- Nearest town – name, distance and direction</li> <li>- <u>Estimated number of person visits per year (based on a 10n scale i.e. &lt;10, &lt;100, &lt; 1,000 etc)</u></li> <li>- Main beach usage (i.e. recreational, swimming and sunbathing, fishing, surfing)</li> </ul>   |



|                                |   |   |
|--------------------------------|---|---|
|                                | population<br>-Development of beach<br>-Food/drink outlets on beach<br>-Distance to nearest shipping lane/harbour/river mouth/discharge of waste water<br>-Cleaning schedule/method/responsibility<br>-Comments/observations<br>-Map of beach/local surroundings/region | - Access (vehicular, pedestrian and/or boat only)<br>Beach slope should be measured at the start and end point of each transect.<br><u>The shape of the beach profile should be described at transect start and end points. A beach can be linear, concave, convex or sinusoidal/tiered in shape.</u> |
| <b>Litter Characterization</b> | Categorized by:<br>Composition/Source<br>Number of Categories: 11   | Categorized by: Composition<br>Number of Categories: 9  |
| <b><u>Number of Items</u></b>  | 117   | 77  |
| Plastic/<br>Polystyrene        | 54  | <u>Plastic (24) / Foamed Plastic (5)</u>  |
| Rubber                         | 4   | 8   |
| Cloth                          | 5   | 6   |
| Paper/<br>Cardboard            | 9   | 5   |
| Wood<br>(machined)             | 9   | 6   |
| Metal                          | 15  | 10  |
| Glass                          | 3   |   |
| Pottery/<br>Ceramics           | 3   | 8   |
| Sanitary waste                 | 6   | 0   |
| Medical waste                  | 3   | 0   |
| Faeces                         | 1   | 0   |
| Other<br>pollutant             | 5   | 5   |
| <b>Litter Quantification</b>   | Counted by item   | count & weight  |



---

|  |   |   |
|--|---|---|
| <b>Entanglement<br/>Data Collected</b> | -Species or description<br>-Amount<br>-Alive/Dead<br>-Age<br>-Gender<br>-Nature of entanglement and type<br>of litter | Information on any entangled fauna encountered during<br>the survey (details of the organism, nature of entrapment,<br>live or dead). |
|--|---|---|



## Appendix X – Side by Side Item Comparison

Note: Clean Swell and ICC do not assign reference numbers to items. For reference purposes of this report, they were assigned by the author. Items in this table are organized by how the items would be entered into that survey in order of least to highest resolution.

|  | CS        | ICC       | DAD                                 | OSPAR                         |
|--|-----------|-----------|-------------------------------------|-------------------------------|
| <u>Item Description</u>  | <u>ID</u> | <u>ID</u> | <u>Category</u>                     | <u>ID</u>                     |
| <b>Cigarette butts</b>   | CS1       |           |                                     |                               |
| Cigarette butts - OSPAR, ICC<br>cigarette filters - DAD                                  |           | ICC1      | Most likely to find items<br>DAD 15 | Plastic Materials<br>OSPAR 64 |
| <b>Balloons</b>  | CS2       |           |                                     |                               |
| Balloons, including plastic valves, ribbons, strings etc. - OSPAR<br>Balloons - ICC, DAD |           | ICC29     | Other trash<br>DAD 4                | Plastic Materials<br>OSPAR 49 |
| <b>Toys</b>  | CS3       |           |                                     |                               |
| Toys & party poppers - OSPAR<br>Toys - DAD   |           |           | DAD 100                             | Mixed Materials<br>OSPAR 20   |
| Balls  |           |           | DAD 5                               | Plastic Materials             |
| <b>Fishing gear</b>  | CS4       |           |                                     |                               |
| Fishing Buoys, Pots & Traps:   |           | ICC19     | Fishing Gear                        |                               |
| Fishing: traps & pots  |           |           | DAD 25                              | Plastic Materials             |
| Crab/lobster pots  |           |           |                                     | OSPAR 26                      |
| Fishing: traps & pots  |           |           | DAD 63                              | Metal Materials               |
| Lobster/crab pots and tops   |           |           |                                     | OSPAR 87                      |
| Fishing: traps & pots  |           |           | DAD 79                              | Wood Materials                |
| Crab/lobster pots  |           |           |                                     | OSPAR 71                      |
| Fishing Net & Pieces - ICC<br>Fishing: nets & pieces of net - DAD                        |           | ICC20     | Fishing Gear<br>DAD 24              | Plastic Materials             |
| Nets and pieces of net < 50 cm   |           |           |                                     | OSPAR 115                     |



|   |  |       |              |        |                           |           |                         |
|---|--|-------|--------------|--------|---------------------------|-----------|-------------------------|
| Nets and pieces of net > 50 cm  |  |       |              |        |                           | OSPAR 116 | Plastic/<br>Polystyrene |
| Rope (diameter more than 1 cm) - OSPAR<br>Rope (1 yard/meter = 1 piece) - ICC<br>rope (plastic/nylon) - DAD |  | ICC22 | Fishing Gear | DAD 33 | Plastic Materials         | OSPAR 31  | Plastic/<br>Polystyrene |
| Tangled nets/cord/rope and string   |  |       |              |        |                           | OSPAR 33  | Plastic/<br>Polystyrene |
| String and cord (diameter less than 1 cm)   |  |       |              |        |                           | OSPAR 32  | Plastic/<br>Polystyrene |
| Rope & string (cloth)   |  |       |              | DAD 87 | Cloth Materials           |           |                         |
| Fishing line (angling) - OSPAR<br>Fishing Line (1 yard/meter = 1 piece) - ICC<br>fishing: line - DAD        |  | ICC21 | Fishing Gear | DAD 22 | Plastic Materials         | OSPAR 35  | Plastic/<br>Polystyrene |
| Fish boxes  |  |       |              |        |                           | OSPAR 34  | Plastic/<br>Polystyrene |
| Fish boxes  |  |       |              |        |                           | OSPAR 119 | Wood (machined)         |
| Bait containers/packaging   |  |       |              | DAD 3  | Plastic Materials         |           |                         |
| Floats/Buoys - OSPAR<br>buoys & floats (plastic & foamed) - DAD   |  |       |              | DAD 12 | Plastic Materials         | OSPAR 37  | Plastic/<br>Polystyrene |
| Buoys (glass)   |  |       |              | DAD 45 | Glass & Ceramic Materials |           |                         |
| Lobster and fish tags   |  |       |              |        |                           | OSPAR 114 | Plastic/<br>Polystyrene |
| Fishing weights - OSPAR<br>fishing: sinkers, lures, hooks - DAD   |  |       |              | DAD 62 | Metal Materials           | OSPAR 80  | Metal                   |
| Fishing: lures, rods/poles  |  |       |              | DAD 23 | Plastic Materials         |           |                         |
| Octopus pots  |  |       |              |        |                           | OSPAR 27  | Plastic/<br>Polystyrene |



|   |            |       |                           |           |                   |              |                         |
|---|------------|-------|---------------------------|-----------|-------------------|--------------|-------------------------|
| Octopus pots  |            |       |                           |           |                   | OSPAR<br>95  | Pottery/Ceramics        |
| Oyster nets or mussel bags including plastic stoppers   |            |       |                           |           |                   | OSPAR<br>28  | Plastic/<br>Polystyrene |
| Oyster trays (round from oyster cultures)   |            |       |                           |           |                   | OSPAR<br>29  | Plastic/<br>Polystyrene |
| Plastic sheeting from mussel culture (Tahitians)  |            |       |                           |           |                   | OSPAR<br>30  | Plastic/<br>Polystyrene |
| <b>Plastic bags</b>   | <b>CS5</b> |       |                           |           |                   |              |                         |
| Bags (e.g. shopping) - OSPAR<br>Grocery Bags (Plastic) - ICC<br>Bags: grocery/retail (plastic) - DAD                      |            | ICC13 | Most likely to find items | DAD 1     | Plastic Materials | OSPAR<br>2   | Plastic/<br>Polystyrene |
| Other Plastic Bags:   |            | ICC14 | Most likely to find items |           |                   |              |                         |
| Bags: trash (plastic)   |            |       |                           | DAD 2     | Plastic Materials |              |                         |
| Small plastic bags, e.g., freezer bags  |            |       |                           |           |                   | OSPAR<br>3   | Plastic/<br>Polystyrene |
| Mesh vegetable bags - OSPAR<br>mesh bags: fruit, vegetable, shellfish - DAD   |            |       |                           | DAD<br>31 | Plastic Materials | OSPAR<br>24  | Plastic/<br>Polystyrene |
| Fertiliser/animal feed bags   |            |       |                           |           |                   | OSPAR<br>23  | Plastic/<br>Polystyrene |
| Plastic bag ends  |            |       |                           |           |                   | OSPAR<br>112 | Plastic/<br>Polystyrene |
| <b>Food wrappers</b>  | <b>CS6</b> |       |                           |           |                   |              |                         |
| Crisp/sweet packets and lolly sticks - OSPAR<br>Food Wrappers (candy, chips, etc.) - ICC<br>food wrappers (plastic) - DAD |            | ICC2  | Most likely to find items | DAD<br>27 | Plastic Materials | OSPAR<br>19  | Plastic/<br>Polystyrene |
| Foil wrappers - OSPAR<br>wrappers (foil/metal) - DAD  |            |       |                           | DAD<br>71 | Metal Materials   | OSPAR<br>81  | Metal                   |



|  |             |       |                           |        |                   |          |                         |
|--|-------------|-------|---------------------------|--------|-------------------|----------|-------------------------|
| <b>Containers (plastic)</b>  | <b>CS7</b>  |       |                           |        |                   |          |                         |
| <b>Containers (foam)</b>   | <b>CS8</b>  |       |                           |        |                   |          |                         |
| Food containers incl. fast food containers                                       |             |       |                           |        |                   | OSPAR 6  | Plastic/<br>Polystyrene |
| Take Out/Away Containers (Plastic)   |             | ICC3  | Most likely to find items |        |                   |          |                         |
| Containers: fast food, lunch boxes & similar                                     |             |       |                           | DAD 18 | Plastic Materials |          |                         |
| Take Out/Away Containers (Foam)  |             | ICC4  | Most likely to find items |        |                   |          |                         |
| <b>Beverage Cans</b>   | <b>CS9</b>  |       |                           |        |                   |          |                         |
| Drink cans - OSPAR<br>Beverage Cans - ICC<br>beverage cans (aluminium) - DAD     |             | ICC12 | Most likely to find items | DAD 56 | Metal Materials   | OSPAR 78 | Metal                   |
| <b>Bottle caps (Plastic)</b>   | <b>CS10</b> |       |                           |        |                   |          |                         |
| Caps/lids - OSPAR<br>caps & lids (plastic) - DAD<br>Bottle Caps (Plastic) - ICC  |             | ICC5  | Most likely to find items | DAD 13 | Plastic Materials | OSPAR 15 | Plastic/<br>Polystyrene |
| <b>Bottles (plastic)</b>   | <b>CS11</b> |       |                           |        |                   |          |                         |
| Beverage Bottles (Plastic):  |             | ICC10 | Most likely to find items |        |                   |          |                         |
| Drinks (bottles, containers and drums)   |             |       |                           |        |                   | OSPAR 4  | Plastic/<br>Polystyrene |
| Beverage bottles: less than 2 litres (plastic)                                   |             |       |                           | DAD 7  | Plastic Materials |          |                         |
| Beverage bottles: 2 litres or more (plastic)                                     |             |       |                           | DAD 8  | Plastic Materials |          |                         |
| Other Plastic Bottles (oil, bleach, etc.):                                       |             | ICC25 | Packaging Materials       |        |                   |          |                         |
| Cleaner (bottles, containers and drums)  |             |       |                           |        |                   | OSPAR 5  | Plastic/<br>Polystyrene |
| Bottles: bleach, cleaner   |             |       |                           | DAD 9  | Plastic Materials |          |                         |
| Cosmetics (bottles & containers e.g. sun lotion, shampoo, shower gel, deodorant) |             |       |                           |        |                   | OSPAR 7  | Plastic/<br>Polystyrene |



|   |             |       |                           |        |                           |          |                      |
|---|-------------|-------|---------------------------|--------|---------------------------|----------|----------------------|
| Other bottles, containers and drums                                     |             |       |                           |        |                           | OSPAR 12 | Plastic/ Polystyrene |
| Bottles: oil/lube   |             |       |                           | DAD 10 | Plastic Materials         |          |                      |
| <b>Bottles (glass) - CS</b>   | <b>CS12</b> |       |                           |        |                           |          |                      |
| Bottles - OSPAR Beverage Bottles (Glass) - ICC, DAD                     |             | ICC11 | Most likely to find items | DAD 44 | Glass & Ceramic Materials | OSPAR 91 | Glass                |
| <b>Lids</b>   | <b>CS14</b> |       |                           |        |                           |          |                      |
| Lids (Plastic) :  |             | ICC7  | Most likely to find items |        |                           |          |                      |
| Bottle caps - OSPAR Bottle Caps (Metal) - ICC caps & lids (metal) - DAD |             | ICC6  | Most likely to find items | DAD 58 | Metal Materials           | OSPAR 77 | Metal                |
| <b>Cups/plates</b>  | <b>CS13</b> |       |                           |        |                           |          |                      |
| <b>Straws</b>   | <b>CS15</b> |       |                           |        |                           |          |                      |
| <b>Utensils</b>   | <b>CS16</b> |       |                           |        |                           |          |                      |
| Forks, Knives, Spoons:  |             | ICC9  | Most likely to find items |        |                           |          |                      |
| Cutlery/trays/straws  |             |       |                           |        |                           | OSPAR 22 | Plastic/ Polystyrene |
| Cups, plates, forks, knives, spoons (plastic)                           |             |       |                           | DAD 20 | Plastic Materials         |          |                      |
| forks, knives, spoons (cutlery)   |             |       |                           | DAD 64 | Metal Materials           |          |                      |
| Cups & Plates (Plastic):  |             | ICC17 | Most likely to find items |        |                           |          |                      |
| Cups & Plates (Foam):   |             | ICC18 | Most likely to find items |        |                           |          |                      |
| Cups  |             |       |                           |        |                           | OSPAR 21 | Plastic/ Polystyrene |
| Cups & Plates (Paper):  |             | ICC16 | Most likely to find items |        |                           |          |                      |
| Cups  |             |       |                           |        |                           | OSPAR 65 | Paper/ Cardboard     |



|  |             |       |                            |        |                           |           |                      |
|--|-------------|-------|----------------------------|--------|---------------------------|-----------|----------------------|
| Cups, plates, tableware, dishes (glass & ceramic)                          |             |       |                            | DAD 46 | Glass & Ceramic Materials |           |                      |
| Cups, plates, tableware, dishes (metal)                                    |             |       |                            | DAD 60 | Metal Materials           |           |                      |
| Straws/Stirrers  |             | ICC8  | Most likely to find items  | DAD 38 | Plastic Materials         |           |                      |
| Ice lolly sticks / chip forks  |             |       |                            |        |                           | OSPAR 72  | Wood (machined)      |
| <b>Plastic/foam pieces</b>   | <b>CS17</b> |       |                            |        |                           |           |                      |
| Plastic/polystyrene pieces 0 - 2,5 cm - OSPAR<br>Plastic Pieces - ICC      |             | ICC41 | Tiny trash less than 2.5cm |        |                           | OSPAR 117 | Plastic/ Polystyrene |
| Plastic/polystyrene pieces 2,5 cm > < 50 cm                                |             |       |                            |        |                           | OSPAR 46  | Plastic/ Polystyrene |
| Plastic/polystyrene pieces > 50 cm   |             |       |                            |        |                           | OSPAR 47  | Plastic/ Polystyrene |
| Plastic fragments  |             |       |                            | DAD 43 | Plastic Materials         |           |                      |
| Foam Pieces  |             | ICC39 | Tiny trash less than 2.5cm |        |                           |           |                      |
| Foam sponge  |             |       |                            |        |                           | OSPAR 45  | Plastic/ Polystyrene |
| <b>Personal hygiene</b>  | <b>CS18</b> |       |                            |        |                           |           |                      |
| Condoms  |             | ICC35 | Personal hygiene           | DAD 73 | Rubber Materials          | OSPAR 97  | Sanitary Waste       |
| Diapers - ICC<br>diapers/nappies - DAD                                     |             | ICC36 | Personal hygiene           | DAD 21 | Plastic Materials         |           |                      |
| Syringes - OSPAR, ICC  |             | ICC37 | Personal hygiene           |        |                           | OSPAR 104 | Medical Waste        |
| Syringes (plastic)   |             |       |                            | DAD 39 | Plastic Materials         |           |                      |
| Syringes (glass)   |             |       |                            | DAD 50 | Glass & Ceramic Materials |           |                      |
| Tampons and tampon applicators - OSPAR<br>Tampons/Tampon Applicators - ICC |             | ICC38 | Personal hygiene           |        |                           | OSPAR 100 | Sanitary Waste       |



|   |             |       |                        |           |                      |              |                         |
|---|-------------|-------|------------------------|-----------|----------------------|--------------|-------------------------|
| tampons   |             |       |                        | DAD<br>99 | Mixed<br>Materials   |              |                         |
| tampon applicators  |             |       |                        | DAD<br>40 | Plastic<br>Materials |              |                         |
| Sanitary towels/panty<br>liners/backing strips  |             |       |                        |           |                      | OSPAR<br>99  | Sanitary Waste          |
| Toilet fresheners   |             |       |                        |           |                      | OSPAR<br>101 | Sanitary Waste          |
| Toothbrushes  |             |       |                        | DAD<br>42 | Plastic<br>Materials |              |                         |
| Combs/hair brushes  |             |       |                        |           |                      | OSPAR<br>18  | Plastic/<br>Polystyrene |
| Cotton bud sticks   |             |       |                        | DAD<br>19 | Plastic<br>Materials | OSPAR<br>98  | Sanitary Waste          |
| Other sanitary items<br><i>(please specify in<br/>other item box*)</i>                      |             |       |                        |           |                      | OSPAR<br>102 | Sanitary Waste          |
| <b>Other packaging</b>  | <b>CS19</b> |       |                        |           |                      |              |                         |
| 4/6-pack yokes -<br>OSPAR<br>6-Pack Holders - ICC<br>six-pack rings, ring<br>carriers - DAD |             | ICC23 | Packaging<br>Materials | DAD<br>36 | Plastic<br>Materials | OSPAR<br>1   | Plastic/<br>Polystyrene |
| Other Plastic/Foam<br>Packaging   |             | ICC24 | Packaging<br>Materials |           |                      |              |                         |
| Foam insulation &<br>packaging  |             |       |                        | DAD<br>26 | Plastic<br>Materials |              |                         |
| Industrial packaging,<br>plastic sheeting   |             |       |                        |           |                      | OSPAR<br>40  | Plastic/<br>Polystyrene |
| Sheeting: tarpaulin,<br>plastic sheets, palette<br>wrap                                     |             |       |                        | DAD<br>35 | Plastic<br>Materials |              |                         |
| Engine oil containers<br>and drums <50 cm   |             |       |                        |           |                      | OSPAR<br>8   | Plastic/<br>Polystyrene |
| Engine oil containers<br>and drums > 50 cm  |             |       |                        |           |                      | OSPAR<br>9   | Plastic/<br>Polystyrene |
| Jerry cans (square<br>plastic containers with<br>handle)                                    |             |       |                        |           |                      | OSPAR<br>10  | Plastic/<br>Polystyrene |
| Buckets - OSPAR<br>buckets, drums &<br>jerry cans: 2 litres or<br>more - DAD                |             |       |                        | DAD<br>11 | Plastic<br>Materials | OSPAR<br>38  | Plastic/<br>Polystyrene |



|   |             |       |                                 |           |                                  |              |                         |
|---|-------------|-------|---------------------------------|-----------|----------------------------------|--------------|-------------------------|
| Crates - OSPAR<br>baskets, crates - DAD   |             |       |                                 | DAD 6     | Plastic<br>Materials             | OSPAR<br>13  | Plastic/<br>Polystyrene |
| Strapping Bands   |             | ICC26 | Packaging<br>Materials          |           |                                  |              |                         |
| Strapping bands -<br>OSPAR<br>strapping bands<br>(plastic) - DAD  |             |       |                                 | DAD<br>37 | Plastic<br>Materials             | OSPAR<br>39  | Plastic/<br>Polystyrene |
| Strapping bands<br>(metal)  |             |       |                                 | DAD<br>69 | Metal<br>Materials               |              |                         |
| Cigarette packets -<br>OSPAR<br>Tobacco<br>Packaging/Wrap -ICC<br>tobacco packaging &<br>wrappers - DAD |             | ICC27 | Packaging<br>Materials          | DAD<br>41 | Plastic<br>Materials             | OSPAR<br>63  | Paper/ Cardboard        |
| Food cans - OSPAR<br>cans: food, juice,<br>other (tin) - DAD  |             |       |                                 | DAD<br>57 | Metal<br>Materials               | OSPAR<br>82  | Metal                   |
| Pull tabs: beverages  |             |       |                                 | DAD<br>67 | Metal<br>Materials               |              |                         |
| Gas bottles/cylinder,<br>drums: more than 4<br>litres   |             |       |                                 | DAD<br>65 | Metal<br>Materials               |              |                         |
| Drums: 55 gallon  |             |       |                                 | DAD<br>61 | Metal<br>Materials               |              |                         |
| Oil drums   |             |       |                                 |           |                                  | OSPAR<br>84  | Metal                   |
| Cartons e.g. tetrapak<br>(milk)   |             |       |                                 |           |                                  | OSPAR<br>118 | Paper/ Cardboard        |
| Cartons e.g. tetrapak<br>(other)  |             |       |                                 |           |                                  | OSPAR<br>62  | Paper/ Cardboard        |
| Jars: food (glass)  |             |       |                                 | DAD<br>48 | Glass &<br>Ceramic<br>Materials  |              |                         |
| <b>Other trash</b>  | <b>CS20</b> |       |                                 |           |                                  |              |                         |
| Bags - OSPAR<br>Paper bags - ICC<br>bags (paper) - DAD  |             | ICC15 | Most<br>likely to<br>find items | DAD<br>90 | Paper/Cardb<br>oard<br>Materials | OSPAR<br>60  | Paper/ Cardboard        |
| Electric appliances -<br>OSPAR<br>Appliances<br>(refrigerators,<br>washers, etc.) - ICC                 |             | ICC28 | Other<br>trash                  | DAD<br>53 | Metal<br>Materials               | OSPAR<br>79  | Metal                   |



|  |  |       |                                  |           |                      |             |                         |
|--|--|-------|----------------------------------|-----------|----------------------|-------------|-------------------------|
| Appliances:<br>household - DAD   |  |       |                                  |           |                      |             |                         |
| Computer equipment<br>& other electronic<br>devices                            |  |       |                                  | DAD<br>96 | Mixed<br>Materials   |             |                         |
| Cigar tips   |  | ICC30 | Other<br>trash                   | DAD<br>17 | Plastic<br>Materials |             |                         |
| Cigarette Lighters   |  | ICC31 | Other<br>trash                   | DAD<br>16 | Plastic<br>Materials | OSPAR<br>16 | Plastic/<br>Polystyrene |
| Construction material<br>e.g. tiles - OSPAR<br>Construction<br>Materials - ICC |  | ICC32 | Other<br>trash                   |           |                      | OSPAR<br>94 | Pottery/Ceramics        |
| Bricks, cinderblocks,<br>chunks of cement                                      |  |       |                                  | DAD<br>94 | Mixed<br>Materials   |             |                         |
| Lumber (processed or<br>cut/milled wood)                                       |  |       |                                  | DAD<br>81 | Wood<br>Materials    |             |                         |
| Pipes & rebar  |  |       |                                  | DAD<br>66 | Metal<br>Materials   |             |                         |
| Pipes (plastic/PVC)  |  |       |                                  | DAD<br>32 | Plastic<br>Materials |             |                         |
| Industrial scrap   |  |       |                                  |           |                      | OSPAR<br>83 | Metal                   |
| Fibre glass  |  |       |                                  |           |                      | OSPAR<br>41 | Plastic/<br>Polystyrene |
| Wire, wire mesh,<br>barbed wire  |  |       |                                  | DAD<br>70 | Metal<br>Materials   | OSPAR<br>88 | Metal                   |
| Fireworks  |  | ICC33 | Other<br>trash                   | DAD<br>97 | Mixed<br>Materials   |             |                         |
| Tyres and belts -<br>OSPAR<br>Tires - ICC<br>tires/tyres - DAD                 |  | ICC34 | Other<br>trash                   | DAD<br>77 | Rubber<br>Materials  | OSPAR<br>52 | Rubber                  |
| Inner-tubes & rubber<br>sheets   |  |       |                                  | DAD<br>75 | Rubber<br>Materials  |             |                         |
| Glass Pieces   |  | ICC40 | Tiny trash<br>less than<br>2.5cm |           |                      |             |                         |



|   |  |       |  |        |                           |          |                      |
|---|--|-------|--|--------|---------------------------|----------|----------------------|
| Glass & ceramic fragments   |  |       |  | DAD 51 | Glass & Ceramic Materials |          |                      |
| Items of Local Concern  |  | ICC42 |  |        |                           |          |                      |
| Light bulbs/tubes   |  |       |  |        |                           | OSPAR 92 | Glass                |
| Light globes: bulbs, etc  |  |       |  | DAD 49 | Glass & Ceramic Materials |          |                      |
| Fluorescent light tubes   |  |       |  | DAD 47 | Glass & Ceramic Materials |          |                      |
| Other glass items<br><i>(please specify in other item box*)</i>           |  |       |  |        |                           | OSPAR 93 | Glass                |
| Other ceramic/pottery items<br><i>(please specify in other item box*)</i> |  |       |  |        |                           | OSPAR 96 | Pottery/Ceramics     |
| Shoes/sandals - OSPAR shoes, flip flops, sandals, tennis, etc - DAD       |  |       |  | DAD 98 | Mixed Materials           | OSPAR 44 | Plastic/ Polystyrene |
| Shoes (leather)   |  |       |  |        |                           | OSPAR 57 | Cloth                |
| Boots   |  |       |  |        |                           | OSPAR 50 | Rubber               |
| Cardboard   |  |       |  |        |                           | OSPAR 61 | Paper/ Cardboard     |
| Cardboard: packaging & cartons  |  |       |  | DAD 91 | Paper/Cardboard Materials |          |                      |
| Paper/cardboard fragments   |  |       |  | DAD 93 | Paper/Cardboard Materials |          |                      |
| Paper: books, newspapers, magazines, etc                                  |  |       |  | DAD 92 | Paper/Cardboard Materials |          |                      |
| Newspapers & magazines  |  |       |  |        |                           | OSPAR 66 | Paper/ Cardboard     |
| Other paper items<br><i>(please specify in other item box*)</i>           |  |       |  |        |                           | OSPAR 67 | Paper/ Cardboard     |



|   |  |  |  |           |                      |              |                         |
|---|--|--|--|-----------|----------------------|--------------|-------------------------|
| Furnishing  |  |  |  |           |                      | OSPAR<br>55  | Cloth                   |
| Furnishings (plastic)   |  |  |  | DAD<br>28 | Plastic<br>Materials |              |                         |
| Furnishings (wood)  |  |  |  | DAD<br>80 | Wood<br>Materials    |              |                         |
| Cloth fragments   |  |  |  | DAD<br>89 | Cloth<br>Materials   |              |                         |
| Clothing  |  |  |  | DAD<br>95 | Mixed<br>Materials   | OSPAR<br>54  | Cloth                   |
| Towels, rags  |  |  |  | DAD<br>88 | Cloth<br>Materials   |              |                         |
| Sacking   |  |  |  |           |                      | OSPAR<br>56  | Cloth                   |
| Other textiles ( <i>please<br/>specify in other item<br/>box*</i> ) |  |  |  |           |                      | OSPAR<br>59  | Cloth                   |
| Bags (burlap/hessian)   |  |  |  | DAD<br>84 | Cloth<br>Materials   |              |                         |
| Bags (cloth)  |  |  |  | DAD<br>85 | Cloth<br>Materials   |              |                         |
| Carpet (synthetic)  |  |  |  | DAD<br>14 | Plastic<br>Materials |              |                         |
| Gloves<br>(industrial/profession<br>al gloves)                      |  |  |  |           |                      | OSPAR<br>113 | Plastic/<br>Polystyrene |
| Gloves (typical<br>washing up gloves)                               |  |  |  |           |                      | OSPAR<br>25  | Plastic/<br>Polystyrene |
| Gloves (latex)  |  |  |  | DAD<br>29 | Plastic<br>Materials |              |                         |
| Gloves (rubber)   |  |  |  | DAD<br>74 | Rubber<br>Materials  |              |                         |
| Gloves (cloth)  |  |  |  | DAD<br>86 | Cloth<br>Materials   |              |                         |
| Hard hats   |  |  |  |           |                      | OSPAR<br>42  | Plastic/<br>Polystyrene |
| Aerosol/Spray cans  |  |  |  | DAD<br>52 | Metal<br>Materials   | OSPAR<br>76  | Metal                   |
| batteries: AA, AAA, C<br>& D, 6V, 9V, etc                           |  |  |  | DAD<br>54 | Metal<br>Materials   |              |                         |
| Batteries: car or boat  |  |  |  | DAD<br>55 | Metal<br>Materials   |              |                         |



|  |  |  |  |        |                   |           |                      |
|--|--|--|--|--------|-------------------|-----------|----------------------|
| Car parts - OSPAR cars & car parts - DAD                                     |  |  |  | DAD 59 | Metal Materials   | OSPAR 14  | Plastic/ Polystyrene |
| Disposable BBQ's   |  |  |  |        |                   | OSPAR 120 | Metal                |
| Metal fragments  |  |  |  | DAD 72 | Metal Materials   |           |                      |
| Other metal pieces < 50 cm ( <i>please specify in other item box*</i> )      |  |  |  |        |                   | OSPAR 89  | Metal                |
| Other metal pieces > 50 cm ( <i>please specify in other item box*</i> )      |  |  |  |        |                   | OSPAR 90  | Metal                |
| Rubber bands   |  |  |  | DAD 76 | Rubber Materials  |           |                      |
| Rubber fragments   |  |  |  | DAD 78 | Rubber Materials  |           |                      |
| Other rubber pieces ( <i>please specify in other item box*</i> )             |  |  |  |        |                   | OSPAR 53  |                      |
| Light sticks (tubes with fluid) - OSPAR light sticks/cyalumes - DAD          |  |  |  | DAD 30 | Plastic Materials | OSPAR 36  | Plastic/ Polystyrene |
| Scuba & snorkel gear, masks, snorkels, fins                                  |  |  |  | DAD 34 | Plastic Materials |           |                      |
| Scuba weights  |  |  |  | DAD 68 | Metal Materials   |           |                      |
| Pens   |  |  |  |        |                   | OSPAR 17  | Plastic/ Polystyrene |
| Other plastic/polystyrene items ( <i>please specify in other item box*</i> ) |  |  |  |        |                   | OSPAR 48  | Plastic/ Polystyrene |
| Paint brushes  |  |  |  |        |                   | OSPAR 73  | Wood (machined)      |
| Paint tins   |  |  |  |        |                   | OSPAR 86  | Metal                |
| Injection gun containers   |  |  |  |        |                   | OSPAR 11  | Plastic/ Polystyrene |
| Shotgun cartridges   |  |  |  |        |                   | OSPAR 43  | Plastic/ Polystyrene |
| Containers / tubes   |  |  |  |        |                   | OSPAR 103 | Medical Waste        |



|  |  |  |  |        |                |           |                 |
|--|--|--|--|--------|----------------|-----------|-----------------|
| Other medical items (swabs, bandaging etc.) <i>(please specify in other item box*)</i> |  |  |  |        |                | OSPAR 105 | Medical Waste   |
| Other wood < 50 cm <i>(please specify in other item box*)</i>                          |  |  |  |        |                | OSPAR 74  | Wood (machined) |
| Other wood > 50 cm <i>(please specify in other item box*)</i>                          |  |  |  |        |                | OSPAR 75  | Wood (machined) |
| Wood fragments   |  |  |  | DAD 83 | Wood Materials |           |                 |
| Crates   |  |  |  |        |                | OSPAR 70  | Wood (machined) |
| Pallets  |  |  |  | DAD 82 | Wood Materials | OSPAR 69  | Wood (machined) |
| Corks  |  |  |  |        |                | OSPAR 68  | Wood (machined) |
| Bagged dog faeces  |  |  |  |        |                | OSPAR 121 | Faeces          |
| Paraffin or Wax Pieces > 10 cm   |  |  |  |        |                | OSPAR 110 | Other Pollutant |
| Paraffin or Wax Pieces 0-1 cm  |  |  |  |        |                | OSPAR 108 | Other Pollutant |
| Paraffin or Wax Pieces 1-10 cm   |  |  |  |        |                | OSPAR 109 | Other Pollutant |
| Other (please specify in other item box*)  |  |  |  |        |                | OSPAR 111 | Other Pollutant |
| Pellets (nurdles)  |  |  |  |        |                | OSPAR     | Other Pollutant |



# Appendix Y – Modified OSPAR Survey Forms Used by CCB

Modified OSPAR Survey Data Form

## Survey Data Form (to be filled in by survey coordinator)

Coordinator: \_\_\_\_\_ Date: \_\_\_\_\_

Site: \_\_\_\_\_ Number of Volunteers: \_\_\_\_\_

Survey Start Time: \_\_\_\_\_ Survey End Time: \_\_\_\_\_

Total weight of all litter items collected: \_\_\_\_\_ kg/lbs

### Count & Weight of All Plastic & Polystyrene Pieces <2.5cm

Quadrat 1: Total Weight \_\_\_\_\_ kg/lbs

Total Amount Plastic \_\_\_\_\_ Total Amount Polystyrene \_\_\_\_\_

Quadrat 2: Total Weight \_\_\_\_\_ kg/lbs

Total Amount Plastic \_\_\_\_\_ Total Amount Polystyrene \_\_\_\_\_

Quadrat 3: Total Weight \_\_\_\_\_ kg/lbs

Total Amount Plastic \_\_\_\_\_ Total Amount Polystyrene \_\_\_\_\_

**Sargassum:** \_\_\_\_\_ Yes\* \_\_\_\_\_ No

\* If yes, note depth & meters of coverage from shoreline to back of beach

**Width of beach (waterline to designated back of beach):** \_\_\_\_\_ meters/feet

Was litter collected during this survey? \_\_\_\_\_

When was the beach last cleaned? \_\_\_\_\_

Did any of the following weather conditions effect the data of the survey? \_\_\_\_\_

Wind \_\_\_\_\_

Rain \_\_\_\_\_

Exceptionally High Tide \_\_\_\_\_

Large/unmovable objects present on beach (describe): \_\_\_\_\_

Did you find stranded or dead animals? \_\_\_\_\_

If so, how many? \_\_\_\_\_

Please describe the animal or note the species name, if known: \_\_\_\_\_

Alive or dead? \_\_\_\_\_

Sex of animal (if known): \_\_\_\_\_

Age of animal (if known): \_\_\_\_\_

Is the animal entangled in litter? \_\_\_\_\_

If so please describe nature of the entanglement and type of litter: \_\_\_\_\_

Were there any circumstances that influenced the survey, for example, tracks on the beach (cleaning or other), recent replenishment of the beach or other? Please specify: \_\_\_\_\_

Were there any events that lead to unusual types and/or amounts of litter on the beach, for example beach events or other. Please specify: \_\_\_\_\_



Date: \_\_\_\_\_ Site: \_\_\_\_\_

Surveyor: \_\_\_\_\_

**OSPAR** **DAD**

| <b>ID</b>                  | <b>ID</b> | <b>Items</b>   | <b>Total</b> |
|----------------------------|-----------|--|--------------|
| <b>Plastic/Polystyrene</b> |           |  |              |
| 2                          | 1         | Bags (e.g. shopping)   |              |
| 3                          | 1         | Small plastic bags, e.g., freezer bags   |              |
| 23                         | Other     | Fertiliser/animal feed bags  |              |
| 24                         | 31        | Mesh vegetable bags  |              |
| 112                        | 1         | Plastic bag ends   |              |
| 4                          | 7/8       | Drinks (bottles, containers and drums)   |              |
| 5                          | 9         | Cleaner (bottles, containers and drums)  |              |
| 7                          | 9         | Cosmetics (bottles & containers e.g. sun lotion, shampoo, shower gel, deodorant) |              |
| 12                         | 9         | Other bottles, containers and drums  |              |
| 1                          | 9         | 4/6-pack yokes   |              |
| 15                         | 13        | Caps/lids  |              |
| 6                          | 18        | Food containers incl. fast food containers                                       |              |
| 19                         | 27        | Crisp/sweet packets and lolly sticks   |              |
| 21                         | 20        | Cups   |              |
| 22                         | 20/38     | Cutlery/trays/straws   |              |
| 16                         | 16        | Cigarette lighters   |              |
| 17                         | Other     | Pens   |              |
| 18                         | Other     | Combs/hair brushes   |              |
| 20                         | 100       | Toys & party poppers   |              |
| 31                         | 33        | Rope (diameter more than 1 cm)   |              |
| 32                         | 33        | String and cord (diameter less than 1 cm)  |              |
| 115                        | 24        | Nets and pieces of net < 50 cm   |              |
| 116                        | 24        | Nets and pieces of net > 50 cm   |              |
| 33                         | 24        | Tangled nets/cord/rope and string  |              |
| 34                         | 25        | Fish boxes   |              |
| 35                         | 22        | Fishing line (angling)   |              |
| 26                         | 25        | Crab/lobster pots  |              |
| 114                        | Other     | Lobster and fish tags  |              |
| 27                         | Other     | Octopus pots   |              |
| 28                         | Other     | Oyster nets or mussel bags incl. plastic stoppers                                |              |
| 29                         | Other     | Oyster trays (round from oyster cultures)  |              |
| 30                         | Other     | Plastic sheeting from mussel culture (Tahitians)                                 |              |
| 36                         | 30        | Light sticks (tubes with fluid)  |              |
| 37                         | 12        | Floats/Buoys   |              |



**OSPAR DAD**

| <b>ID</b>                  | <b>ID</b> | <b>Items</b>   | <b>Total</b> |
|----------------------------|-----------|--|--------------|
| <b>Plastic/Polystyrene</b> |           |  |              |
| 38                         | 11        | Buckets  |              |
| 39                         | 37        | Strapping bands  |              |
| 40                         | 35        | Industrial packaging, plastic sheeting                                       |              |
| 8                          | 11        | Engine oil containers and drums <50 cm                                       |              |
| 9                          | 11        | Engine oil containers and drums > 50 cm                                      |              |
| 10                         | 11        | Jerry cans (square plastic containers with handle)                           |              |
| 11                         | Other     | Injection gun containers   |              |
| 13                         | 6         | Crates   |              |
| 14                         | 59        | Car parts  |              |
| 41                         | Other     | Fibre glass  |              |
| 42                         | Other     | Hard hats  |              |
| 25                         | 74        | Gloves (typical washing up gloves)   |              |
| 113                        | 29        | Gloves (industrial/professional gloves)                                      |              |
| 43                         | Other     | Shotgun cartridges   |              |
| 44                         | 98        | Shoes/sandals  |              |
| 45                         | Other     | Foam sponge  |              |
| 117                        | 43        | Plastic pieces 0 - 2,5 cm  |              |
| 117.1                      | 43        | Polystyrene pieces 0 - 2,5 cm  |              |
| 46                         | 43        | Plastic pieces 2,5 cm > < 50 cm  |              |
| 46.1                       | 43        | Polystyrene pieces 2,5 cm > < 50 cm  |              |
| 47                         | 43        | Plastic pieces > 50 cm   |              |
| 47.1                       | 43        | Polystyrene pieces > 50 cm   |              |
| 48                         | Other     | Other plastic/polystyrene items ( <i>please specify in other item box*</i> ) |              |
| Other:                     |           |  |              |

**Presence of other pollutants**

**Pollutant**      **Size of pieces or lumps (estimates/size range)**

*Paraffin or wax pieces*

|     |       |         |  |
|-----|-------|---------|--|
| 108 | Other | 0-1 cm  |  |
| 109 | Other | 1-10 cm |  |
| 110 | Other | > 10 cm |  |

**Other (please specify in other item box\*)**

|     |       |       |  |
|-----|-------|-------|--|
| 111 | Other | Other |  |
| 111 | Other | Tar   |  |

Pellets (nurdles): \_\_\_ Yes \_\_\_ No



**OSPAR DAD**

| <b>ID</b>                | <b>ID</b> | <b>Items</b>   | <b>Total</b> |
|--------------------------|-----------|--|--------------|
| <b>Metal</b>             |           |  |              |
| 76                       | 52        | Aerosol/Spray cans   |              |
| 77                       | 58        | Bottle caps  |              |
| 78                       | 56        | Drink cans   |              |
| 120                      | Other     | Disposable BBQ's   |              |
| 79                       | 53        | Electric appliances  |              |
| 80                       | 62        | Fishing weights  |              |
| 81                       | 71        | Foil wrappers  |              |
| 82                       | 57        | Food cans  |              |
| 83                       | Other     | Industrial scrap   |              |
| 84                       | 61        | Oil drums  |              |
| 86                       | Other     | Paint tins   |              |
| 87                       | 63        | Lobster/crab pots and tops                                     |              |
| 88                       | 70        | Wire, wire mesh, barbed wire                                   |              |
| 89                       | Other     | Other metal pieces < 50 cm (please specify in other item box*) |              |
| Other:                   |           |  |              |
| 90                       | Other     | Other metal pieces > 50 cm (please specify in other item box*) |              |
| Other:                   |           |  |              |
| <b>Paper • Cardboard</b> |           |  |              |
| 60                       | 90        | Bags   |              |
| 61                       | 91        | Cardboard  |              |
| 118                      | Other     | Cartons e.g. tetrapak (milk)                                   |              |
| 62                       | Other     | Cartons e.g. tetrapak (other)                                  |              |
| 63                       | 41        | Cigarette packets  |              |
| 64                       | 15        | Cigarette butts  |              |
| 65                       | Other     | Cups   |              |
| 66                       | 92        | Newspapers & magazines   |              |
| 67                       | Other     | Other paper items (please specify in other item box*)          |              |
| Other:                   |           |  |              |
| <b>Glass</b>             |           |  |              |
| 91                       | 44        | Bottles  |              |
| 92                       | 49        | Light bulbs/tubes  |              |
| 93                       | Other     | Other glass items (please specify in other item box*)          |              |
| Other:                   |           |  |              |



| O                     | D     | Cloth   |  | O                         | D     | Wood (machined)   |  |
|-----------------------|-------|---|--|---------------------------|-------|---|--|
| 54                    | 95    | Clothing  |  | 68                        | other | Corks   |  |
| 55                    | other | Furnishing  |  | 69                        | 82    | Pallets   |  |
| 56                    | 85    | Sacking   |  | 70                        | other | Crates  |  |
| 57                    | 98    | Shoes (leather)   |  | 71                        | 79    | Crab/lobster pots   |  |
| 59                    | other | Other textiles (please specify in other item box*)        |  | 119                       | other | Fish boxes  |  |
| Other:                |       |   |  | 72                        | other | Ice lolly sticks / chip forks   |  |
| <b>Sanitary waste</b> |       |   |  | 73                        | other | Paint brushes   |  |
| 97                    | 73    | Condoms   |  | 74                        | other | Other wood < 50 cm (please specify in other item box*)                          |  |
| 98                    | 19    | Cotton bud sticks   |  | 75                        | other | Other wood > 50 cm (please specify in other item box*)                          |  |
| 99                    | other | Sanitary towels/panty liners/backing strips               |  | Other:                    |       |   |  |
| 100                   | 99    | Tampons and tampon applicators                            |  | <b>Pottery • Ceramics</b> |       |   |  |
| 101                   | other | Toilet fresheners   |  | 94                        | other | Construction material e.g. tiles  |  |
| 102                   | other | Other sanitary items (please specify in other item box*)  |  | 95                        | other | Octopus pots  |  |
| Other:                |       |   |  | 96                        | other | Other ceramic/pottery items (please specify in other item box*)                 |  |
| <b>Faeces</b>         |       |   |  | Other:                    |       |   |  |
| 121                   | other | Bagged dog faeces   |  |                           |       |   |  |
| <b>Rubber</b>         |       |   |  | <b>Medical waste</b>      |       |   |  |
| 49                    | 4     | Balloons, including plastic valves, ribbons, strings etc. |  | 103                       | other | Containers / tubes  |  |
| 50                    | 98    | Boots   |  | 104                       | 39/50 | Syringes  |  |
| 52                    | 77    | Tyres and belts   |  | 105                       | other | Other medical items (swabs, bandaging etc.) (please specify in other item box*) |  |
| 53                    | other | Other rubber pieces (please specify in other item box*)   |  | Other:                    |       |   |  |
| Other:                |       |   |  | Other:                    |       |   |  |



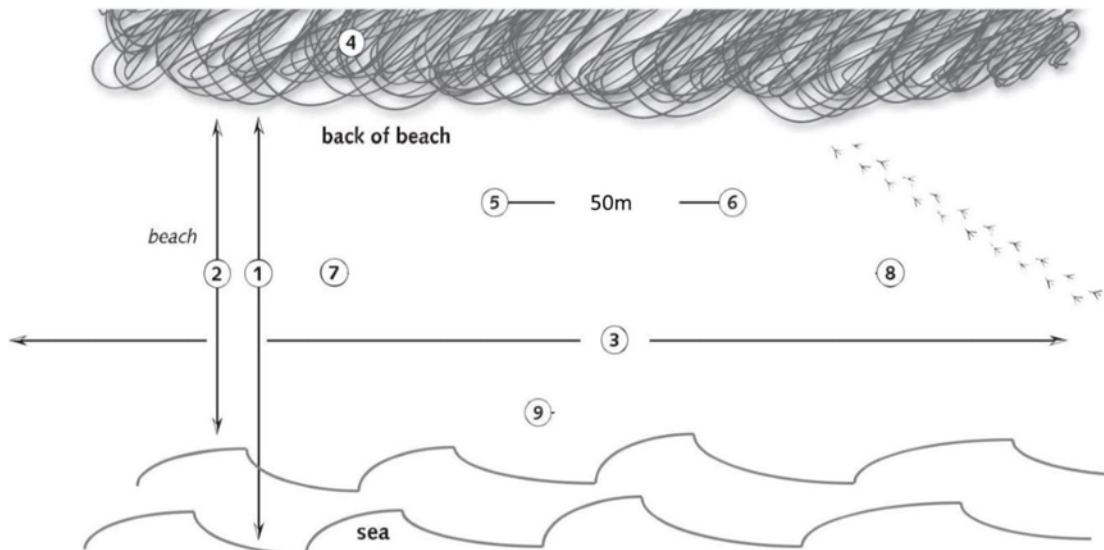
## Modified OSPAR Marine Litter Beach Questionnaire

Name of beach: .....

Beach ID: .....

Country: .....

to be filled in by national coordinators



1 Beach width at mean low spring tide: ..... (m)      2 Beach width at mean high spring tide: ..... (m)

3 Total length of beach: ..... (m)      4 Back of beach (example dunes): .....

5 GPS coordinates start 50 m: .....

6 GPS coordinates end 50 m: .....

7 GPS coordinates quadrant 1: .....

8 GPS coordinates quadrant 2: .....

9 GPS coordinates quadrant 3: .....

Coordinate system used: .....      Date position measured: .../.../..... (d/m/y)

Prevailing currents off the beach\*: N E S W

Prevailing winds\*: N E S W

When you look from the beach to the sea, what direction is the beach facing\*: N E S W

Type of beach material (% coverage): .....(e.g. sand 60%, pebbles 40%)

Beach topography: .....(e.g. slope 20%)

Beach curvature:    concave    convex    sinusoidal    straight

Horizontal profile (horizontal shape of the beach): linear    concave    convex    mixed

Are there any objects in the sea (e.g. a pier) that influence the currents: .....

Major beach usage (local people, swimming and sunbathing, fishing, surfing, sailing etc.):

1. .... seasonal or whole year round: .....

2. .... seasonal or whole year round: .....

3. .... seasonal or whole year round: .....

\*you may tick one or two boxes



## Modified OSPAR Marine Litter Beach Questionnaire

**Estimated number of person visits per year:** ..... (based on a 10n scale i.e. <10, <100, < 1,000 etc)

Access to the beach:  Vehicle  Pedestrian  Boats

### Please use official data only for the following questions

**What is the distance to nearest town:** .....

What is the position of town in relation to survey area: .....

What is the (seasonal) population size of this town

Residential: .....

|   |              |                                   |              |
|---|--------------|-----------------------------------|--------------|
| <input type="checkbox"/> Residential and tourist: | winter ..... | <input type="checkbox"/> Tourist: | winter ..... |
|   | spring ..... |                                   | spring ..... |
|   | summer ..... |                                   | summer ..... |
|   | autumn ..... |                                   | autumn ..... |

**Is there any development behind the beach:**  No  Yes, please describe:

.....

**Are there food and/or drink outlets on the beach:**  No  Yes

What is the distance from the survey area to the food and/or drink outlet: ..... (km)

Present all year round:  Yes  No, please specify in month: .....

Position of food and/or drink outlet in relation to the survey area e.g.\*:  N  E  S  W

**What is the distance from the beach to the nearest shipping lane:** ..... (km)

What is the estimated traffic density: ..... (number of ships/year)

Is it used mainly by merchant ships, fishing vessels or all kinds: .....

Position of shipping lane in relation to survey area\*:  N  E  S  W

**What is the distance from the beach to the nearest harbour:** ..... (km)

What is the name of the harbour: .....

Position of harbour in relation to survey area\*:  N  E  S  W

Type of harbour: .....

Size of harbour (number of ships): .....

**What is the distance from the beach to the nearest river mouth:** ..... (km)

What is the name of the river: .....

Position of river mouth in relation to survey area\*:  N  E  S  W

**Is the beach located near a discharge or discharges of waste water:** .....

What is the distance from the beach to the discharge points: ..... (km)

Position of discharge points in relation to survey area\*:  N  E  S  W

\*you may tick one or two boxes



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## Modified OSPAR Marine Litter Beach Questionnaire

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**How often is the beach cleaned:** .....

All year round: ..... X     Daily     Weekly     Monthly     Other .....

Seasonal, please specify in months: .....

..... X     Daily     Weekly     Monthly     Other .....

What method is used:         Manual     Mechanical

Who is responsible for the cleaning: .....

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**Additional comments and observations about this beach:** .....

.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....

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**Please include:**

1. A map of the beach

2. A map of the beach and the local surroundings.

When relevant please mark on this map the following:

Nearest town

Food/drink outlets

Nearest shipping lane

Nearest harbor

Nearest river mouth

Discharge or discharges of waste water

3. A regional map

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Is this an amendment to an existing questionnaire:     Yes     No

Date questionnaire is filled in: ...../...../..... (d/m/y)

Name: .....

Phone number: .....

E-mail: .....

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