

# ICES Manual for Seafloor Litter Data Collection and Reporting from Demersal Trawl Samples

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## I Summary

Multiple seafloor litter monitoring programmes are in place within Europe, during which the litter caught as bycatch in fishing nets from fish stock survey trawls are collected and recorded. This manual provides user-friendly instructions for ships' crew and researchers collecting and recording seafloor litter. Essential information on how to categorize, count, weigh, and measure seafloor litter items is provided. Ambiguous names within litter categories are clarified and guidance is provided on specific issues such as the proper classification of items made up of multiple materials. A supplementary photo guide is provided to facilitate the litter identification and registration process, with clear pictures of example items from every litter subcategory. Finally, the reporting of marine litter data are described, including all required information to obtain a quality assured dataset. The use of this manual will help harmonize litter collection and reporting procedures, enhancing the quality of monitoring data. Adherence to the instructions is mandatory for survey trawls submitting data to the Database of Trawl Samples (DATRAS) and coordinated by the International Council for the Exploration of the Sea (ICES). The use of these instructions is optional for all other research and monitoring surveys.

## II Foreword

Marine litter, as defined by United Nations Environment Programme (UNEP, 2005), “is any persistent, manufactured or processed solid material discarded, disposed of or abandoned in the marine and coastal environment. Marine litter consists of items that have been made or used by people and deliberately discarded into the sea or rivers or on beaches; brought indirectly to the sea with rivers, sewage, storm water or winds; accidentally lost, including material lost at sea in bad weather (fishing gear, cargo); or deliberately left by people on beaches and shores”. Increasing levels of such debris have led to growing worldwide concern regarding its impact on the environment and human welfare (e.g. UNEP, 2016).

Litter on the seafloor has been studied in both coastal and deep-sea waters using a variety of sampling methods (reviewed by Canals *et al.*, 2021). On continental shelves, benthic trawl surveys are a practical way to monitor seafloor litter because they are already coordinated by the International Council for the Exploration of the Sea (ICES) for fish stock assessments (e.g. ICES, 2017), cover a wide area of the seafloor (e.g. ICES, 2017), attempt to standardize methods (e.g. ICES, 2017) and, in practice, appear to sample sufficient litter for analysis (e.g. Maes *et al.*, 2020). Spatially, ICES coordinated benthic trawl surveys cover the European continental shelf from the Shetland Islands to the strait of Gibraltar, including the Baltic sea. The resulting data are publicly available and accessible through the ICES Database of Trawl Samples<sup>1</sup> (DATRAS). DATRAS contains over 45 years of quality-checked continuous time-series of fish survey data. An important feature of ICES surveys is that they are coordinated by expert working groups which have developed standardized procedures, providing consistency across participating nations for many years. The inclusion of seafloor litter recording as part of ICES surveys is more recent, with data available in DATRAS on from 2011.

In 2017, the ICES Working Group on Marine Litter (WGML) was formed, which includes among its remits the development of guidance on seafloor litter monitoring. In 2018, WGML published preliminary seafloor litter data collection guidelines (ICES, 2018), with categorizations based on an earlier standardized litter classification system (OSPAR Commission, 2017). These preliminary guidelines have since been refined by the group, and are published here as the first edition of the manual of mandatory procedures that should be used for all ICES benthic surveys counting and categorizing seafloor litter.

This manual will allow standardized monitoring, which will reduce differences in the collection, classification, and reporting procedures between or even within countries, increasing data comparability and allowing data assessment at regional scale. The procedures within the manual have been developed considering that litter items are collected and recorded during surveys, and can be subject to time constraints and poor weather conditions. Therefore, the categories used here are simpler than those utilized in some recent and more comprehensive schemes (Fleet *et al.*, 2021).

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<sup>1</sup> <https://www.ices.dk/data/data-portals/Pages/DATRAS.aspx> Last accessed October 2022.

# 1 Data collection and processing

## 1.1 Surveys for which procedures are mandatory

The use of the procedures outlined in this manual is mandatory for ICES surveys listed in [Table 1.1](#) and applies to all sampling stations. For all other survey work they are optional.

**Table 1.1. ICES surveys for which the use of the procedures outlined in this manual is mandatory.**

ICES Survey Name	ICES DATRAS Abbreviation
Baltic International Trawl Survey	BITS
Beam Trawl Survey	BTS
French Channel Ground Fish Survey	FR-CGFS
French Southern Atlantic Bottom Trawl Survey	EVHOE
Inshore Beam Trawl Survey	DYFS
Irish Ground Fish Survey	IE-IGFS
North Sea International Bottom Trawl Survey	NS-IBTS
Portuguese International Bottom Trawl Survey	PT-IBTS
Scottish West Coast Ground Fish Survey	SCOWCGFS
Scottish Rockall Survey	SCOROC
Spanish Porcupine Bottom Trawl Survey	SP-PORC
Spanish North Coast Bottom Trawl Survey	SP-NORTH
Spanish Gulf of Cadiz Bottom Trawl Survey	SP-ARSA

## 1.2 Collection of litter

Litter from a trawl haul is found in both the net and among the catch. The litter from both sources should be recorded, but not attributed to its source when reporting. The observed litter can include items that have been released from the gear (e.g. ties) or the vessel (e.g. flecks of paint) during the trawl, which should not be recorded because they arise from the survey itself. Likewise, items natural to the seafloor are not litter and should not be recorded.

Where possible, all litter larger than 2.5 cm should be removed from the net and placed in a container (of an appropriate size for the amount of litter caught) for identification and registration. Allocate 5-10 minutes for visual inspections between stations with special focus on the codend, and ask the crew for additional checks of the trawl haul. This will minimize the chances of transporting litter from station to station, and will also ensure that the true amount of litter caught in the trawl haul is measured. If possible, all litter should be removed, but the accessibility of all parts of the net will be ship- and net-dependent.

If dual or parallel nets are being used, ensure that collected items are kept in separate, labelled containers to keep the samples distinct. This point should be clearly communicated to all persons handling the net on deck who are not accustomed to seafloor litter monitoring (e.g. crew members).

Try to avoid any loss of materials from the vessel or equipment into the catch, e.g. codend strings, which close the net, should not be put into the catch or included in the litter count.

## 1.3 Processing of litter items on board

The information required from the catch is detailed in the following subsections and is driven by the structure of DATRAS. An optional litter recording log sheet is available in Annex 3, which provides a suitable format for capturing all the required and optional information. The use of the provided log-sheet is not mandatory, but it is highly recommended in order to increase uniformity. A separate log sheet can be filled out for each trawl during a survey, and a zero should be entered if no litter is found. Recording the information in this form, simplifies its eventual transfer into DATRAS.

### 1.3.1 Counting litter items

Litter counts are mandatory for the ICES surveys listed in [Table 1.1](#). Every litter item from the trawl haul must be counted, including those on the conveyor belt and larger items remaining on deck.

- Items natural to the seafloor are not defined as litter and should not be counted.
- A zero must be recorded for a trawl haul when there are no litter items.
- If there are several pieces that without doubt originated from the same item in a haul (catch of a single fish track), these should be counted as one. For example, a glass bottle broken into two pieces counts as one object. However, if it is uncertain that the pieces originated from the same item they should be counted as separate items.
- If two or more items are heavily entangled, all items should still be counted separately, or, if not possible, estimated, with the exception of entangled monofilaments (category A6). When monofilaments are entangled, each tangle should be counted as being one item.
- If it is certain that multiple strings and cords (i.e. monofilaments) originate from the same single litter item, they should be counted as one. However, if it is uncertain that the items originate from the same string/cord, all items should be counted individually.

### 1.3.2 Categorizing litter items

[Table 1.2](#) should be used to categorize each litter item. Categorizing items is difficult. To facilitate this process, a photoguide is provided as a supplementary resource to this report (Suppl. Doc. 1). It is recommended that litter items are sorted before recording. Litter categorizations are mandatory for the ICES surveys listed in [Table 1.1](#). Categorization involves two steps:

1. Identifying the material of which the litter item is composed (e.g. the remains of a plastic bag is made of plastic and should be assigned to material category A). Please note that:
  - The content of a container (e.g. chemicals) is not considered as a distinct litter item. Recording of the content is optional and cannot be uploaded to DATRAS.
  - If the item is made up of different materials, the item should be counted as 1 and classified according to the (visually) dominant material subcategory. For example, a fishing net can have floating boys attached, but if the netting is the dominant material subcategory, this is what determines the category.
2. Identifying a subcategory, broadly related to use, within the material category [e.g. a part of a plastic bag belongs to subcategory A3 (Bag), while the remains of a cotton glove belongs to subcategory F1 (clothing and rags)]. Please note that:



- The subcategories for litter items arising from fishing activities are found in different material categories (e.g. A, B, C, and E).
- The assignment to a subcategory does not require that items are whole or complete [e.g. an item consisting of the top quarter of a plastic bag should be assigned to subcategory A3 (bag), while three fingers of a cotton glove should be assigned to subcategory F1 (clothing and rags)].

**Table 1.2. Seafloor litter categories (A-F) and respective subcategories. For examples see Suppl. Doc. 1.**

<b>A Plastic</b>		
A 1	Bottle	Container with a narrow neck.
A 2	Sheet	Soft plastic foil, including wrapping material.
A 3	Bag	All types of bags made of plastic, including mesh bags.
A 4	Caps and lids	All types of caps/lids (e.g. bottle caps, sports caps, and pen lids).
A 5	Monofilament	One single strain of plastic, not necessarily fishing related.
A 6	Monofilament (entangled)	Multiple single strains of plastic, entangled together.
A 7	Synthetic rope	Twined filaments made of synthetic fibres.
A 8	Fishing net	Made from synthetic fibres woven into a grid-like structure.
A 9	Cable ties	A thin strip of plastic with ridges on one edge to allow for a tightening and locking mechanism. Also known as zip ties or hose ties.
A 10	Strapping band	Synthetic woven strip used to secure packaging.
A 11	Crates and containers	From small plastic storage boxes, containers, crates, trays, and other storage products or packaging for food and other consumer goods, to larger products such as stack/nest boxes, small parts bins, and storage tanks, including industrial crates (e.g. fish boxes). Also plastic cups.
A 12	Diapers	A type of single use underwear, most commonly used for infants, but can come in adult sizes. Also known as nappies.
A 13	Sanitary towels and tampons	Includes tampon applicators, panty liners, and their plastic strips.
A 14	Other	Unrecognisable items and items not fitting in other categories, including hard plastic pieces.
A 15	Medical masks	Single use medical masks, FFP2, FFP3, and face shields.
A 16	Other fishing related plastic	Plastic items related to fishing and aquaculture activities (e.g. pots and traps). This category does not include fishing nets which are covered in category A8.
<b>B Metal</b>		
B 1	Cans (food)	Metal cans, independent of shape, used for food storage.
B 2	Cans (beverage)	Metal cans, independent of shape, used for beverages. For liquids not meant for human consumption, use category B4.
B 3	Fishing related	Metal items related to fishing activities, such as line fishing and/or trawling (e.g. hooks, shackles, ticklers, and sinkers).
B 4	Drums	Cylindrical or oblong containers and pots (e.g. for oil or paint).
B 5	Appliances	Electric or mechanical devices.
B 6	Car parts	All car related items which mainly consist of metal.

**Table 1.2 (continued)**

TABLE 12 (continued)			
B	Metal (continued)		
	B 7	Cables	Metal cables and electrical wires.
	B 8	Other	Unrecognisable items or items that do not fit in other categories, including metal pieces and screws.
C	Rubber		
	C 1	Boots	A boot made of rubber.
	C 2	Balloons	Thin rubber inflatable object (e.g. used as a toy or decoration).
	C 3	Bobbins (fishing)	Part of the fishing net (a round or tube-shaped object connected by thread, wire, or net to roll over the seafloor). Also known as rockhoppers.
	C 4	Tyre	Thick rubber ring that is fitted around the outer edge of a vehicle wheel.
	C 5	Glove	Piece of clothing that is worn on the hands and wrists made from artificial or natural rubber (e.g. gloves used in fisheries and nitrile rubber laboratory gloves).
	C 6	Other	Unrecognisable items and items that do not fit in any other rubber categories above.
D	Glass and ceramics		
	D 1	Jar	A wide-mouthed container made of glass or pottery.
	D 2	Bottle	A glass container with a narrow neck.
	D 3	Piece	Fragment of a larger item made of glass or ceramics.
	D 4	Other	Unrecognisable items and items that do not fit in other categories (e.g. drinking glasses, cups, ceramic tiles, or bricks).
E	Natural products		
	E 1	Wood (processed)	Processed objects made of wood (e.g. broomstick, planks, or rigging).
	E 2	Rope	Ropes made from natural fibres, such as cotton, sisal, hemp, or coir. For ropes made from synthetic fibres see category A7.
	E 3	Paper and cardboard	For example, newspapers or heavy-duty paper-based products.
	E 4	Pallets	Flat wooden transport structure.
	E 5	Other	Unrecognisable, man-made, processed items and items that do not fit in other categories, such as slate roof tiles, cobbles, concrete, cinder stone, or coal. When the source material is a natural product that has been intentionally heated to produce a man-made material, it belongs to category D (e.g. bricks or things made of glass).
F	Miscellaneous		
	F 1	Clothing and rags	All types of clothing, textile and woven products, except for rubber gloves which belong to subcategory C5.
	F 2	Shoes	All types of footwear, except for rubber boots which belong to subcategory C1.
	F 3	Other	Unrecognisable items and items that do not fit in other categories.

### 1.3.3 Weighing litter items

A balance capable of weighing down to 1 g is required. Recording litter weights is mandatory for the ICES surveys listed in [Table 1.1](#).

The mass of litter items should be recorded as follows:

1. Ideally items should be weighed as soon as possible after a trawl and should not be left to dry.
2. Items should be weighed as found. Do not remove fouling before weighing, or internal contents such as accumulated sand.
3. Preferably, items should be weighed individually. However, items of the same litter type/subcategory and size category from the same trawl haul can be grouped together and reported collectively as the total weight for these multiple items. In this instance, the count should be the total number of the items weighed.
4. Masses should be rounded to the nearest gram and recorded as grams or kilograms. The format for gram masses is an integer to the nearest gram (e.g. an item of mass 1.6 g is recorded as 2 g) and the format for kilogram masses is 4 decimal places (e.g. an item of mass 1.6 g is recorded as 0.0020 kg).
5. Items or groups of items that weigh less than one gram should be reported as 0.1 (for grams) or 0.0001 (for kilograms)
6. Weight does not have to be reported for items that are entangled, except for subcategory A6 [Monofilament (entangled)].

#### 1.3.4 Sizing litter items

Litter objects exist in a variety of complicated three-dimensional structures. The sizing and size categories described in these guidelines are therefore an inevitable simplification of reality. Recording size is mandatory for the ICES surveys listed in [Table 1.1](#).

Size should be recorded as follows:

1. Size categories (A–F) are provided in [Table 1.3](#).
2. The size category is derived from the approximate two-dimensional area of the object (length × width).
3. For three-dimensional items, the two largest sides should be used to assign a size category.
4. Preferably, items should be sized individually. A single size (for each item) can be recorded for a group of items if they are categorized as being in the same litter category and the items are of similar sizes.
5. In the case of monofilaments, the area should still be calculated as described in point 2, taking the two largest sides. For example,  $25\text{ cm} \times 0.2\text{ cm} = 5\text{ cm}^2$ , which corresponds to size category A. For a ball of monofilaments, the same procedure should be applied and escaping filaments should not be balled up before sizing.
6. Size does not have to be reported for items that are entangled, except for subcategory A6 [Monofilament (entangled)].

#### 1.3.5 Describing litter items

Adding descriptive comments for each litter object is good for internal quality control. However, this information cannot be uploaded to DATRAS. As an exception, litter colour and shape, and the presence of attached organisms (which indicate that the litter has been present in the marine environment for an extended period of time) can be included in DATRAS as litter properties in column LTPRP (see [Section 2.1](#)), since they are of interest to many researchers.

**Table 1.3. Size categories for marine litter monitoring.**

Size category	Dimensions	Area
A	$\leq 5 \times 5 \text{ cm}$	$< 25 \text{ cm}^2$
B	$\leq 10 \times 10 \text{ cm}$	$25 - 100 \text{ cm}^2$
C	$\leq 20 \times 20 \text{ cm}$	$100 - 400 \text{ cm}^2$
D	$\leq 50 \times 50 \text{ cm}$	$400 - 2500 \text{ cm}^2$
E	$\leq 100 \times 100 \text{ cm}$	$2500 - 10000 \text{ cm}^2 = 0.25 - 1 \text{ m}^2$
F	$> 100 \times 100 \text{ cm}$	$> 10000 \text{ cm}^2 = > 1 \text{ m}^2$

### 1.3.6 Attached organisms

Organisms attached to the litter item should not be removed prior to weighing and sizing. However, the recording of organisms is optional, and attached organisms can be recorded utilizing the LTPRP field. Researchers also have the option to report in detail on attached species, applying the protocol for opportunistic sampling and using the associated data recording sheet that are under development by ICES Working Group on Introductions and Transfers of Marine Organisms (WGITMO).

### 1.3.7 Picture number

The optional litter recording log sheet (Annex 3) includes a column for a picture number. In the instance where items are photographed, the picture number relates to the unique identifying number assigned to each litter item. This can be a discrete number written on a reusable tile included in the photograph or the picture number embedded in the metadata of the image on the camera used to photograph the litter item(s). The photographing of individual litter items is optional. However, it may be useful for future reference and as a backup if the surveyor is unsure on how best to categorize an item.

## 2 Data submission and extraction

### 2.1 Registration of litter data in ICES DATRAS

Litter data from the surveys listed in [Table 1.1](#) must be submitted to DATRAS ([Figure 2.1](#)). Data from other surveys cannot be submitted to DATRAS, but can be submitted to the ICES Database for the Marine Environment<sup>2</sup> (DOME; see [Section 2.3](#)).

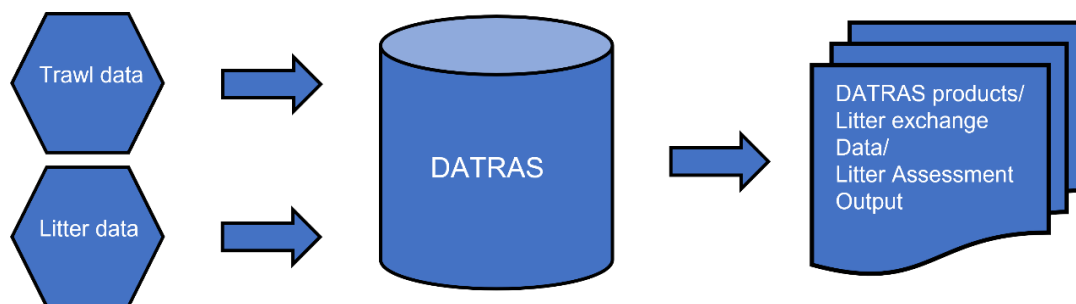


Figure 2.1. The DATRAS data collection and production process.

In practice, DATRAS generates data products by combining two sources of data which are submitted separately to DATRAS: (i) the trawl information, and (ii) the litter data for each of the trawls. The trawl information must be submitted to DATRAS before the litter data.

The information fields for DATRAS are described in [Table 2.1](#).

- Files used to submit litter data for inclusion into DATRAS should use the extension \*.csv or \*.txt.
- Each submitted file must include values for the key fields: Survey, Country, Ship, Gear, Year, and Quarter ([Table 2.1](#)).
- Litter data submissions using the same combination of key values as a previous submission will overwrite the previously submitted litter data. As a consequence, partial litter data submissions for a particular survey are not possible.
- The key fields must have been previously submitted to DATRAS as a haul metadata HH record type ([Table 2.1](#)). The litter data submission will not be accepted into DATRAS until this has been done.

Using the recommended log sheet (Annex 3) to record litter on ship during a survey facilitates the process of submitting data into DATRAS. C-TS-REV-2 should be used as the litter reference code (LTREF) for data submission. In contrast to C-TS-REV, C-TS-REV-2 contains the additional litter categories A15 and A16 ([Table 1.2](#)). Litter data can be submitted to DATRAS as an individual litter item per row or as multiple litter items per row, provided that these are of the same litter type and size and from the same trawl haul. The order of the fields on a row must follow the order given on [Table 2.1](#), with each field separated by a comma (",") consistent with the \*.csv format). Real numbers should be recorded using decimal points (e.g. 0.0090), and not commas. Missing data should be reported as "-9", and empty fields (i.e. two consecutive commas with no intervening data) are not permitted. Hauls containing no litter must be recorded as 0 litter items (LT\_Items = 0, LTREF = RECO-LT, PARAM = LT-TOT). Failing to

<sup>2</sup> <https://www.ices.dk/data/data-portals/Pages/DOME.aspx>

submit trawls containing no litter severely compromises the utility of the data. Information on litter colour and attached organisms can be added using the LTPRP field, with codes separated by '~' (e.g. a red litter item with attached organisms can be recorded as 'CL3~AO'). The submitted file should not contain column headers. LTPRP codes are defined in ICES vocabularies<sup>3</sup>.

Data should be submitted to the following link: <https://datras.ices.dk/Data%20submission/Default.aspx>. Instructions are available on the submission site and log-in information and other assistance can be obtained by e-mailing: [accessions@ices.dk](mailto:accessions@ices.dk)

## 2.2 Data download from DATRAS

Litter data downloads are publicly available from the following link: [https://datras.ices.dk/data\\_products/download/download\\_data\\_public.aspx](https://datras.ices.dk/data_products/download/download_data_public.aspx). A menu leads you through the download process:

Litter data can be extracted for analysis using two formats ([Figure 2.1](#)):

1. Litter exchange data. Unmerged trawl information and litter data for specific surveys, provided within a single \*.csv file. All the available data can be downloaded per year and per quarter. The data are continuously updated as new records are submitted. The user will need to merge the litter information and litter data prior to analysis.
2. Litter assessment output. Merged trawl information and litter data for specific surveys, provided within a single \*.csv file. All the available data for a specific survey or, alternatively, a specific quarter for a specific year for the specific survey can be downloaded. Web services for specific downloads and extractions are available at: <https://datras.ices.dk/WebServices/Webservices.aspx>

## 2.3 Data submission to and download from DOME

Litter data that are not collected during the surveys listed in [Table 1.1](#) can be submitted to the ICES DOME database. These data are used by the Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR), the Baltic Marine Environment Protection Commission (HELCOM), the Working Group of the Arctic Council (AMAP) and expert groups in the management of chemical and biological data for regional marine assessments.

Submissions require an ICES user name (which can be requested at [accessions@ices.dk](mailto:accessions@ices.dk)) and can currently be made at: [www.ices.dk/data/data-portals/Pages/DOME.aspx](http://www.ices.dk/data/data-portals/Pages/DOME.aspx)

Data must be reported according to the Environmental Reporting Format version 3.2 so that they can be quality controlled and entered into the database. Submissions of data may be made at any time. Data files must be organized so they consist of one data type per one monitoring year and from one reporting laboratory. The files must be screened for errors before submission which is automatically done by the ICES Data Screening Utility (Datsu). Each submission receives an accession number, which allows tracking of the status of the submission and obtaining summaries. Once accepted into the database, files can be found via the DOME portal and the data are made available on the ICES Data Portal. The information fields for DOME are described in [Table 2.2](#).

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<sup>3</sup> <http://vocab.ices.dk/?ref=1403>

**Table 2.1. DATRAS marine litter fields. LT: litter, HH: haul; StNo: station number; HaulNo: haul number.**

Field Name	Data Type	Mandatory	Code List <sup>1</sup>	Comment
Record Type	char(2)	Yes		Always LT
Quarter	int(1)	Yes		Report Quarter as in the trawl submission (HH)
Country	char(3)	Yes	<a href="https://vocab.ices.dk/?ref=337">https://vocab.ices.dk/?ref=337</a>	Report Country as in the trawl data submission (HH)
Ship	char(4)	Yes	<a href="https://vocab.ices.dk/?ref=315">https://vocab.ices.dk/?ref=315</a>	Report Ship as in the trawl data submission (HH)
Gear	char(6)	Yes	<a href="https://vocab.ices.dk/?ref=2">https://vocab.ices.dk/?ref=2</a>	Report Gear as in the trawl data submission (HH)
Survey	char(20)	Yes	<a href="https://vocab.ices.dk/?ref=102">https://vocab.ices.dk/?ref=102</a>	Report Survey as in the trawl data submission (HH)
Reserved1	char(10)	No		Report -9
Reserved2	char(10)	No		Report -9
StNo	char(6)	Yes		Report StNo as in the trawl data submission (HH)
HaulNo	int(6)	Yes		Report HaulNo as in the trawl data submission (HH)
Year	char(4)	Yes		YYYY
LTREF	char(10)	Yes	<a href="https://vocab.ices.dk/?ref=1381">https://vocab.ices.dk/?ref=1381</a>	Litter reference list. Use LTREF= C-TS-REV (Revised CEFAS trawl litter survey parameters (2013))
PARAM	char(20)	Yes	**	**Parameter code depends on the LTREF, check <a href="https://vocab.ices.dk/">https://vocab.ices.dk/</a> for more information
LTSZC	char(4)	No	<a href="https://vocab.ices.dk/?ref=1380">https://vocab.ices.dk/?ref=1380</a>	Litter size. Use categories A to F shown in <a href="#">Table 1.3</a> .
UnitWgt	char(15)	Yes	<a href="https://vocab.ices.dk/?ref=1421">https://vocab.ices.dk/?ref=1421</a>	Kg per haul or g per haul
LT_Weight	decimal4(10)	Yes		Weight
UnitItem	char(15)	Yes	<a href="https://vocab.ices.dk/?ref=1422">https://vocab.ices.dk/?ref=1422</a>	Use items per haul only
LT_Items	int(10)	Yes		Number of items
LTSRC	char(5)	No	<a href="https://vocab.ices.dk/?ref=1382">https://vocab.ices.dk/?ref=1382</a>	Litter source
TYPPL	char(5)	No	<a href="https://vocab.ices.dk/?ref=1385">https://vocab.ices.dk/?ref=1385</a>	Type of polymer
LTPRP	char(20)	No	<a href="http://vocab.ices.dk/?ref=1403">http://vocab.ices.dk/?ref=1403</a>	Litter properties

<sup>1</sup>All links were last accessed in October 2022.

**Table 2.2. DOME marine litter fields. Under valid value, any character means 0–9, A–Z, etc.**

Field Code	Field Name	Mandatory	Valid value
RECID	Record identifier	Yes	
CRUIS	Cruise identifier (series of sampling occasions; must be unique for file)	Yes	
STNNO	Station identification /Sampling event ID (must be unique for CRUIS)	Yes	
TRANS	Transect ID	Yes, if transect data	Any character
SMPNO	Sample identification (for each sediment core, each sediment grab, each water bottle, each transect section or point)	Yes	Any character
SUBNO	Subsample identification (for each piece of litter; ID number from the lab or a running number)	Yes	
MNDEP	Minimum depth of sample (metre). For litter on seafloor, use upper depth of gear	No	Any character For transects, sequential numbering should be used from transect start beginning with 1
MXDEP	Maximum depth of sample (metre). For litter on seafloor, use lower depth of gear - will often be sounding depth	No	Any character
MATRX	Matrix analysed	Yes	0–9
LTREF	Litter reference list	Yes	0–9
PARAM	Parameter code	Yes	cf. MATRX ( <a href="https://vocab.ices.dk/?ref=55">https://vocab.ices.dk/?ref=55</a> )
LTSZC	Litter size	No	cf. LTREF ( <a href="https://vocab.ices.dk/?ref=1381">https://vocab.ices.dk/?ref=1381</a> )
MUNIT	Measurement unit	Yes	cf. parameters listed in pargroup “LT” or parameters in LTREF lists
QFLAG	Qualifier flag	No	cf. LTSZC ( <a href="https://vocab.ices.dk/?ref=1380">https://vocab.ices.dk/?ref=1380</a> )
VALUE	Value measured	Yes	cf. MUNIT ( <a href="https://vocab.ices.dk/?ref=155">https://vocab.ices.dk/?ref=155</a> )
LTSRC	Litter source	No	cf. QFLAG ( <a href="https://vocab.ices.dk/?ref=180">https://vocab.ices.dk/?ref=180</a> )



**Table 2.2 (continued)**

Field Code	Field Name	Mandatory	Valid value
TYPPL	Type of polymer	No	Any format
LTPRP	Litter properties (including polymer shapes and colours)	No	cf. LTSRC ( <a href="https://vocab.ices.dk/?ref=1382">https://vocab.ices.dk/?ref=1382</a> )
AMLNK	Analytical method link (unique for file)	No	cf. TYPPL ( <a href="https://vocab.ices.dk/?ref=1385">https://vocab.ices.dk/?ref=1385</a> )
RSRVD	Reserved	No	cf. LTPRP ( <a href="https://vocab.ices.dk/?ref=1403">https://vocab.ices.dk/?ref=1403</a> ); multiple flags possible (separate multiple entries with “~” (ascii 126))
DCFLG	Data centre flag - Reserved	No	1-999

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## **Annex 2: List of abbreviations**

DATRAS	Database of Trawl Samples
DOMÉ	Database for the Marine Environment
ICES	International Council for the Exploration of the Sea
UNEP	United Nations Environment Programme
WGML	ICES Working Group on Marine Litter
WGITMO	ICES Working Group on Introductions and Transfers of Marine Organisms (WGITMO)

