

# Data Exchange Formats (DEFs)

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## Introduction

This document describes the Data Exchange formats that are to be used when supplying habitat map data to EMODnet Seabed Habitats.

A standardised attribute table format simplifies the process of combining multiple habitat maps and increases the ease of use for the end user. We call this the Data Exchange Format (DEF).

For the purpose of EMODnet Seabed Habitats, data are required to be submitted as an ESRI shapefile (.shp) in an updated version of the MESH DEFs as they provide a tried and tested method of standardising maps for collation and conflation. The MESH DEFs were originally published in 2005 as part of the EU funded MESH project.

For habitat maps, the type of DEF required depends on the habitat map itself:

- If the map cannot be translated into the EUNIS classification system, the GIS data should be supplied in the **Original Habitat DEF**.
- If the map can be translated into the EUNIS classification system, it should be undertaken and the GIS data supplied in the **Translated Habitat DEF**.
- A third type of DEF is required for study area polygons, this is known as the **Study Area DEF**.

**Attention:** Whilst DEF fields that are not marked as mandatory "(M)" are optional and are not required to contain values in the final submission, the fields themselves must still exist in the submitted shapefile in order for the submission to be valid.

## A: Original Habitat DEF

The attribute table for a habitat map to be submitted to EMODnet Seabed Habitats should be converted into the Original Habitat DEF (Table 1). The final attribute table should contain all fields listed below.

If the habitat map can be translated into the EUNIS habitat classification system, the table should be extended into the **Translated Habitat DEF**.

The Original Habitat DEF contains only those fields necessary to display your habitat map on the interactive map, and allows others a simple, standardised format to view and analyse your data. All fields marked “(M)” are mandatory and must be completed for the submission to be accepted.

**Table 1: Original Habitat data exchange format (DEF).**

Field name	Data type	Length/Precision	Description
<b>GUI (M)</b>	Text	8	<p>The globally unique identifier (GUI) of the habitat map.</p> <p>Consists of 2 letter country code (which corresponds to ISO3166-1) plus 6 digits.</p> <p>For example, a dataset from the United Kingdom would be written <b>GB000005</b>.</p> <p>This value can be obtained from your country's project partner and should be the same for all features within a habitat map.</p>
<b>POLYGON (M)</b>	Text	10	<p>Permanent identifier unique for each polygon within a dataset, or polygon group in the case of spatially identical polygons reflecting a composite habitat. For more information, see (Duncan, 2017).</p> <p>Can be created as ascending integers 1,2,3... etc.</p> <p>This label for each polygon is necessary to identify the original polygon because the FID field may change during the processing of datasets.</p>
<b>ORIG_HAB (M)</b>	Text	255	<p>The information identifying the habitat type present in the polygon. This can be either a code or text (the description of the habitat).</p>
<b>ORIG_CLASS</b>	Text	255	<p>A brief description of the habitat classification system in which the map is presented.</p> <p>Whilst not mandatory, this provides the end-user with additional perspective on the habitat described and may increase the potential uses</p>

			of the map itself.
<b>COMP (M)</b>	Text	10	<p>A description of the composition of the habitats within polygon groups (Duncan, 2017).</p> <p><b>If the polygon is not within a polygon group, the value should be '1.0'.</b></p> <p>If the polygon forms part of a polygon group, choose from one of the following options:</p> <ul style="list-style-type: none"> <li>• If the proportion of each habitat within the group is known, enter a decimal value in the "COMP" field for each feature within the group, with values ranging from 0-1 determining the proportion of each habitat. Total value for each polygon group must be 1.</li> <li>• If the proportions are unknown but you know which is the predominant (or primary) habitat, enter the value '<b>primary</b>' for the primary habitat polygon, and '<b>secondary</b>' for all other polygons in the group.</li> <li>• If the composition is unknown, enter the value '<b>unknown</b>' in the "COMP" field.</li> </ul>
<b>COMP_TYPE (M)</b>	Text	20	<p>The type of composition for the habitats within the polygon group (Duncan, 2017).</p> <p><b>If the polygon is not within a polygon group, the value should be 'single habitat'.</b></p> <p>If the polygon forms part of a polygon group, choose from one of the following options per group:</p> <ul style="list-style-type: none"> <li>• '<b>heterogeneous</b>'- the habitats contained within the group are both dispersed throughout the described area, but the individual patches have not been delineated.</li> <li>• '<b>transition</b>' - there is a general trend of change from one habitat to the other(s) across the area. However, the threshold where one habitat changes into another cannot be accurately delineated.</li> <li>• '<b>data inconclusive</b>' - based on the available survey data, one or more of described habitats may exist within the area, but cannot be confidently attributed. This may, for example, occur where two habitats are not identifiable from the underlying acoustic data on</li> </ul>

			<p>which a habitat map is based.</p> <ul style="list-style-type: none"><li>• <b>'no information'</b> - no information was provided by the habitat creator as to the composition of the habitats within the area. If this option is chosen, the value in "COMP" must be 'unknown'.</li></ul>
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All irrelevant fields must be deleted from the attribute table before submission to EMODnet Seabed Habitats. If the map is to be converted to the Translated Habitat DEF, fields should be retained until the translation to EUNIS if they are useful for the translation.

## B: Translated Habitat DEF

If a habitat map is detailed enough to be translated into the EUNIS classification, it is converted into the Translated Habitat DEF (Error! Reference source not found.). The final attribute table must contain all fields listed below.

The Translated Habitat DEF contains only those fields necessary to display your habitat map on the interactive map, and allows others a simple, standardised format to view, analyse and compare your data with other European submissions.

All fields marked “(M)” are mandatory and must be completed for the submission to be accepted.

**Table 2: Translated Habitat data exchange format (DEF).**

Field name	Data type	Length/ Precision	Description
GUI (M)	Text	8	As in Table 1
POLYGON (M)	Text	10	As in Table 1
ORIG_HAB (M)	Text	255	As in Table 1
ORIG_CLASS	Text	255	As in Table 1
HAB_TYPE (M)	Text	20	This is the code assigned to the polygon after translation. It must be a habitat code existing in the current form of the EUNIS habitat classification system and must contain no comments. An example of a valid value for this field is "A4.2".
VERSION (M)	Text	50	Translated habitat classification version (e.g "EUNIS 2007-11")
DET_MTHD	Text	255	Enter a short description of the method used to translate the original habitat map. Examples include: <ul style="list-style-type: none"> <li>• <b>Manual translation:</b> Each EUNIS habitat within the map was manually determined and entered by an expert.</li> <li>• <b>Correlation table:</b> The translation was performed automatically using known correlations between the original and EUNIS classification systems.</li> </ul>
DET_NAME (M)	Text	255	The name of the individual and/or organisation who determined the EUNIS habitat from the original habitat.
DET_DATE (M)	Date	-	Date that the EUNIS habitat was

			determined/translated from the original habitat.
<b>TRAN_COM</b>	Text	255	<p>Any comments on the translation from original habitat type to the target habitat type.</p> <p>For example, include brief information from survey reports which justifies the translation decision (especially pertinent if the relationship between the data in the ORIG_HAB field and in the HAB_TYPE field is not clear).</p> <p>Also include reasons for assignment of a particular target habitat type, such as the volume and type of additional data used, and use of expert judgement.</p>
<b>T_RELATE (M)</b>	Text	1	<p>Define the relationship between the original habitat and the translated (EUNIS) habitat. This information is potentially helpful to a user viewing the map, to determine the exact nature of the habitat relationship, especially if the translation is inexact (any symbol other than "=" or "S").</p> <p>The relationship <i>must</i> be described by a one-character symbol chosen from <b>Table 3</b>.</p>
<b>VAL_COMM</b>	Text	255	<p>Record any polygon specific comments resulting from the validation of the translated map using an independent dataset; for example you may judge that there are spatial errors within the map (sublittoral habitat types appearing in the littoral zone and vice versa).</p> <p>Where possible, all translated maps should be validated with independent additional dataset(s). It is not possible to know whether inconsistencies are due to errors in the validation data, the original map, or the translation process. However, any suspected errors or disagreements between different datasets should be highlighted.</p>
<b>COMP (M)</b>	Text	10	<b>As in Table 1</b>
<b>COMP_TYPE (M)</b>	Text	20	<b>As in Table 1</b>
<b>SUM_CONF (M)</b>	Short integer	-	This is the value of the "Total" MESH confidence score given to the polygon or map during the data submission process.

All irrelevant fields must be deleted from the attribute table once translation is complete.

**Table 3: Translation relationship codes.**

T_RELATE symbol	Translation relationship	Example
=	Original habitat is the same as translated habitat.	<b>Original Habitat:</b> "Circalittoral rock in a high energy environment" <b>Translated Habitat:</b> <a href="#">A4.1</a>
~	Original habitat is nearly the same as translated habitat.	<b>Original Habitat:</b> "Circalittoral rock in an energetic environment" <b>Translated Habitat:</b> <a href="#">A4.1</a>
>	Translated habitat is contained within original habitat (i.e. original habitat has a broader definition).	<b>Original Habitat:</b> "Saltmarsh" <b>Translated Habitat:</b> <a href="#">A2.5</a>
<	Original habitat is contained within translated habitat (i.e. translated habitat has a broader definition).	<b>Original Habitat:</b> "High energy circalittoral rock with faunal communities" <b>Translated Habitat:</b> <a href="#">A4.1</a>
#	The definition of the original habitat partially overlaps with that of the translated habitat.	<b>Original Habitat:</b> "Potamogeton pectinatus community" <b>Translated Habitat:</b> <a href="#">A5.542</a>
S	Original habitat is the source of the translated habitat.	<i>Similar to "=". Use when the translated EUNIS habitat was created as a result of a successful submission of the original habitat.</i>

Please see "Converting maps" section of the archived MESH Mapping Guide ([www.emodnet-seabedhabitats.eu/Default.aspx?page=1698](http://www.emodnet-seabedhabitats.eu/Default.aspx?page=1698)) for further guidance about how to translate habitat maps into the EUNIS classification.

## C: Habitats Directive DEF

The Habitats Directive DEF should be used if a habitat map concerns features described in Annex I of the Habitats Directive, it contains the minimum fields necessary to provide information regarding the extent of Annex I features.

All fields marked "(M)" are mandatory and must be completed for the submission to be accepted.

**Table 4: Habitats Directive Data Exchange Format (DEF).**

Field name	Data type	Length/ Precision	Description
GUI (M)	Text	8	As in Table 1
POLYGON (M)	Text	10	As in Table 1
ANNEXI (M)	Text	4	Code of habitat, as listed in the official <a href="#">interpretation manual</a> .
SUBTYPE	Text	254	Subtype of habitat, as listed in the official <a href="#">interpretation manual</a> if applicable.
CONFIDENCE (M)	Text	10	Confidence in presence and extent of habitat described by the data.  Use only one of the following: <ul style="list-style-type: none"> <li>• High</li> <li>• Potential</li> </ul>

Habitat maps submitted in the Habitats Directive Data Exchange Format must be accompanied by a Study Area Polygon. The "SUM\_CONF" field of the Study Area Data Exchange Format does not require completion in scenario.



## D: Study Area DEF

Study Area shapefiles – rectangular bounding boxes describing the extent covered by habitat maps – should be supplied in the Study Area DEF.

The Study Area DEF contains only four fields, linking the study area to its respective habitat map and supplying the map's calculated MESH confidence score. All fields are mandatory, although "UUID" may be filled in by your country's partner.

**Table 4: Study Area data exchange format (DEF).**

Field name	Data type	Length/ Precision	Description
<b>GUI (M)</b>	Text	8	<p>Unique reference for the study.</p> <p>This must match the GUI of the habitat map to which the study area relates.</p>
<b>UUID (M*)</b>	Text	36	<p>UUID of ICES Geonetwork metadata record in the form of:</p> <p>xxxxxxxx-xxxx-xxxx-xxxx-xxxxxxxxxxxx</p> <p>If the habitat map already has valid metadata on the <a href="#">ICES Geonetwork portal</a> then the "UUID" value should be entered. This value can be found in two ways:</p> <ol style="list-style-type: none"> <li>1. The value after "uuid=" in the URL of the permanent link to the metadata record, for example <a href="#">the UUID of this record is 26f527ac-41f2-4c86-a443-3f655723efdf</a>.</li> <li>2. The value of "File identifier" within the ICES Geonetwork metadata itself.</li> </ol> <p><b>Warning:</b> The UUID must be entered exactly as stated in the metadata and must conform to the pattern xxxxxxxx-xxxx-xxxx-xxxx-xxxxxxxxxxxx (including all dashes) to pass validation.</p>
<b>AVAILABLE (M)</b>	Text	13	<p>Availability of habitat data.</p> <p>The value must be one of the three options :</p> <ul style="list-style-type: none"> <li>• View/Download</li> <li>• View only</li> <li>• Not available</li> </ul> <p>If you wish your data to be fully available to the public, please enter the value of "View/Download".</p>

			<p>If you do not wish users to be able to download your data, but wish to allow them to view your data on our interactive map or Web Map Service (WMS), please enter the value of "View only".</p> <p>The value of "Not available" should be used if you are not intending to supply habitat data itself but would like to inform the public of its existence.</p> <p>If this is the case, users will be able to see the study area bounding box, but will be directed to the data owner (via email) for access to the data itself.</p>
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\*If the habitat map does not yet have valid metadata entered on the ICES Geonetwork portal, then your country's partner will upload your metadata and enter the UUID value as required as part of the ingestion process.

## References

**Duncan, G. 2017.** Conforming to EMODnet and INSPIRE feature overlap rules in 'Habitat maps from survey' data submissions. *EMODnet Seabed Habitats*. [Online] 14 12 2017. [Cited: 14 12 2017.] [https://www.emodnet-seabedhabitats.eu/media/1671/step2\\_guidance\\_dealingwithoverlaps\\_v1\\_2.pdf](https://www.emodnet-seabedhabitats.eu/media/1671/step2_guidance_dealingwithoverlaps_v1_2.pdf)