Method for Creating a Composite Map of Offshore Habitat Features of Conservation Importance (FOCI)

1 Introduction

1.1 Requirement

JNCC has previously produced a composite dataset concerning habitats of principle importance (HPI) as described in the Natural Environment and Rural Communities (NERC) Act, 2006.

In 2010, these habitats were merged with those from the OSPAR list of threatened and/or declining habitats to form the habitat features of conservation importance[1] (FOCI), used in Defra's marine conservation zone (MCZ) process within secretary of state waters. Whilst the UK submits regular updates to the OSPAR database of threatened and/or declining habitats, it does not provide coverage across all of the habitat FOCI. This dataset brings together the OSPAR database and a range of supplementary sources to provide a current understanding of habitat FOCI within the offshore secretary of state waters.

Compilation of inshore habitat FOCI remains in the jurisdiction of the country agencies.

1.2 Definitions

Definitions for habitat FOCI can be found through JNCC's MCZ Features webpage[1] and are derived from the lists from where the habitats originate.

Due to the amalgamated nature of the habitat FOCI list, there are a small number of differences between the definitions as used for similar habitats within OSPAR and FOCI. These are listed below:

- The habitat FOCI "blue mussel beds" relates to both intertidal and subtidal beds – under OSPAR, only intertidal beds are included;
- The habitat FOCI "seagrass beds" includes beds comprised of both *Zostera* and *Ruppia* species – a wider definition than the comparable OSPAR habitat "*Zostera* beds";
- A threshold value of (0.2 burrows/m^2) is used to determine presence of the habitat FOCI "Sea pen and burrowing megafauna communities" – this additional qualifier is not required under the OSPAR definition.

2 Method

2.1 Data Sources

2.1.1 OSPAR database of threatened and/or declining habitats

The 2015 release of this dataset was used as an initial starting point for compilation as the vast majority of offshore habitat FOCI are contained within this habitat list. Data were extracted by habitat where relevant.

[1] http://jncc.defra.gov.uk/page-4527 [Accessed December 2016]

2.1.2 Marine Recorder[2]

This database application, containing standardised benthic sample point data across the UK contains records held in the UK's submission to the OSPAR database. However, it also contains data relevant to habitat FOCI not captured under OSPAR, and these records were specifically extracted as an input dataset.

2.1.3 MCZ verification surveys

Point and polygon datasets from surveys led by Cefas and JNCC under the Defra MCZ verification projects MB0120/MB0129 were included if not already present within the OSPAR database or Marine Recorder. As part of the contractual process, these GI data products specifically focus on habitat FOCI occurrences.

2.1.4 Natural England evidence base

This dataset holds point and polygon records for habitat FOCI identified by Natural England – primarily in inshore waters, but with records extant in offshore waters, particulary within protected sites spanning the 12nm territorial sea boundary.

2.1.5 EUNIS habitat maps from survey

JNCC's holdings of individual polygon EUNIS habitat maps from survey[3] are used as an input dataset in the UK's submission to the OSPAR database. Similar to Marine Recorder, it also contains data relevant to habitat FOCI not captured under OSPAR. These data were extracted as an additional input dataset.

2.1.6 Regional Environmental Characterisation Surveys

The UK's Regional Environmental Characterisation Surveys (RECs) are commissioned by Defra under the Marine Aggregate Levy Sustainable fund include both large scale geophysical and benthic sampling surveys, producing both point and polygon GI data describing benthic habitats within their areas of interest.

Two outputs of the RECs are used as sources of habitat FOCI data within English offshore water by the JNCC marine protected sites teams, and these have been included here. The Humber REC (MALSF, 2009) produced as part of its analytical outputs a point dataset of the location of ross worm (*Sabellaria spinulosa)* reef in proximity to the Humber estuary. A modelled distribution of Ross worm reef on the east Norfolk coast produced by the East Coast REC has also been included.

2.1.7 JNCC advice

JNCC advice to Defra regarding ross worm reef in the Wash includes the addition of a 500m uncertainty margin around a number of identified locations of reef to account for unknown extent and the ephemeral nature of ross worm reefs (pers comm). These data are included here as potential reef.

2.1.8 JNCC marine habitats correlation database (v2)

JNCC's marine habitats correlation database was used in combination with datasets held in classification systems to allow translation to habitat FOCI incorporating the relationship between the two habitat classes. The database contains correlations between numerous existing habitat classification systems, but here was used to translate EUNIS [4](2007-11) and

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[2] http://jncc.defra.gov.uk/page-1599

[3] Available from EMODnet Seabed Habitats (view on the interactive map).

[4] The European Nature Information System (Habitat types) Available from: http://eunis.eea.europa.eu/index.jsp

the Marine Habitat Classification for Britain & Ireland (v15.03) (JNCC, 2015) into habitat FOCI.

2.2 Method overview

Records from the OSPAR database were ingested into a working database and the attribute table was created with additional or altered fields as in Table 1 below.

Further data were extracted from Marine Recorder and JNCC's EUNIS habitat maps from survey using JNCC' correlation database, extracting biotopes from the Marine Habitat Classification for Britain & Ireland (v15.03) and EUNIS (v2007-11) where the original habitat correlated with a habitat FOCI but *not* with OSPAR. OSPAR habitats were not extracted as these two datasets already form part of the UK's OSPAR submission and as such were incorporated in the initial OSPAR ingestion. During translation to a habitat FOCI, any original habitat information for a record was retained in the "ORIG_HAB" field, providing an audit trail and further information to aid the user in working with this dataset.

Where data conflicted or overlapped, these conflicts were handled in the method used to compile the UK's submission to OSPAR (Ellwood & Duncan, 2015). Offshore data from within Natural England's evidence base was further added in where these data related to non-OSPAR habitats that were not derived from any of the previously included sources.

An iterative process was then set up with marine protected site leads within JNCC; interim versions of the dataset were distributed to the site leads, allowing site leads to provide comments, criteria and identify further data sources both within and outside of their respective sites.

Alongside a value for identified habitat FOCI, a value was retained for a correlating OSPAR habitat of a record to allow for subsetting by the user at a later date if required.

Certainty values for records were attributed as in section **Error! Reference source not found.** below.

2.3 Certainty

Two levels of certainty were attributed to records within the dataset, using naming consistent with the UK Annex I layers produced by JNCC. Records were given confidence values of "High" or "Potential".

For records originating in the OSPAR database, values of "Certain" were mapped to "High" and "Uncertain" to "Potential". A small number of records with values "Unknown" were left with their original values.

For records originating from Marine Recorder or JNCC's EUNIS habitat maps from survey holdings, certainty was calculated using the same method as in the UK's OSPAR submission. Marine Recorder's "Qualifier" field was used to dermine certainty, with a "U" flag denoting uncertain records, and data derived from the EUNIS habitat maps from survey were attributed certainty values on a 3-step method (Ellwood & Duncan, 2015).

For smaller datasets, certainty was derived on a per-record basis using expert judgment from habitat staff and site leads within JNCC.

3 Results

The GIS layer output from this work contains details of the source and underlying information for each feature and the attributed confidence value. For a description of all of the layer attributes, see Table 1.

Table 1: Attribute descriptions for the offshore habitat FOCI layer.

Field name	Description
GUI	Unique identifier for the originating map/dataset.
Recordkey	Unique identifier for the record within the dataset.
HabStatus	The status of the habitat (“Present” / ”Absent”).
Certainty	Level of certainty in habitat record (“High” / “Potential” / “Unknown”).
Determiner	Name of person/organisation who original determined the FOCI.
DetDate	Date when the FOCI was originally determined.
SurveyKey	Carried from OSPAR, originator linking to the initial survey or dataset of the data.
StartDate	Date the habitat was first recorded at this location.
EndDate	Date the habitat was last recorded at this location.
DateType	A one or two character code that identifies the type of dates used in StartDate and EndDate. One of: • **D** Dates specified to the nearest day. • **DD** Dates specified to a number of days. • **O** Dates specified to the nearest month (first day of the month to the last day of the month). • **OO** Dates specified to a range of months (first day of the start month to the last day of the end month). • **Y** Dates specified to the nearest year (first day of the year to the last day of the year). • **YY** Dates specified to a range of years. • **-Y** Only EndDate to the nearest year known. • **ND** or **U** ‘No date’ or ‘unknown’.
PlaceName	Common Name of place referred to in reference to the feature e.g. on a chart or in a report.
DataOwner	Name of person or organisation that own the data.
Accuracy	Accuracy in meters of record, if known.
FOCI	Name of the FOCI represented by the data.
FOCI_SUB	Subtype of FOCI represented by the data if known
FOCI_REL	Relation of the original habitat to the data
OSPAR	Name of OSPAR habitat represented by the data if applicable.
OSPAR_SUB	Name of OSPAR habitat subtype represented by the data if applicable.
OSPAR_REL	Relation of the original habitat to the OSAR Habitat
Source	Original source of data
HABORIGIN	(Points only) Origin of data point if know. E.g. still image, video tow.
ORIG_HAB	Original habitat as described in initial.
HAB_TYPE	EUNIS habitat if described/applicable.

TRAN_COM	Comments on translation of habitat into FOCI
VAL_COMM	Comments on validation of FOCI data.

4 References

JNCC (2015) The Marine Habitat Classification for Britain and Ireland Version 15.03 [Online]. [Accessed December 2016]. Available from: jncc.defra.gov.uk/MarineHabitatClassification [Accessed December 2016]

Ross LK, Ross RE, Stewart HA, Howell KL (2015) The Influence of Data Resolution on Predicted Distribution and Estimates of Extent of Current Protection of Three 'Listed' Deep-Sea Habitats. PLoS ONE 10(10): e0140061. doi:10.1371/journal.pone.0140061

Ellwood, H. & Duncan, G. (2015) Creating a composite OSPAR threatened and/or declining habitat map for the UK. Available from: http://jncc.defra.gov.uk/page-1583 [Accessed December 2016]

5 Annex I: Version Control

BUILD STATUS:

Version	Date	Author	Reason/Comments
1.0	06/12/2016	Graeme Duncan	Final amendments and certainty.
0.1	01/12/2016	Graeme	To describe the method used and data sources in collating a UK offshore habitat FOCI layer.

DISTRIBUTION:

Copy	Version	Issue Date	Issued To
Electronic	1.0	06/12/2016	Distributed to JNCC staff and CNCBs