Assessing the scientific confidence in the presence and extent of features in proposed and recommended Marine Conservation Zones (Technical Protocol E)

Guidance on aspects of the practical application of the Protocol E for MPA work.

July 2013

Build status:

Version	Date	Author	Comments
1.0	15.03.13	Nicola Church, Alice Ramsay, (comments from Amy Ridgeway and Laura Cornick)	Initial Draft
1.1	21.03.13	John Bleach, Rob Enever, Jen Ashworth and Sue Wells	Comments
1.2	22.03.13	Alice Ramsay and Nicola Church	Addressed comments
1.3	02.04.13	Rob Enever	Comments
1.4	15.04.13	Alice Ramsay and Nicola Church	Review of comments
1.5	26.04.13	Sue Wells	Comments
1.6	09.05.13	Alice Ramsay	Review of Comments
1.7	15.05.13	Alice Ramsay	Review of text and inclusion of Introduction. Inclusion of additional text to reflect advice from the second JNCC MCZ Evidence QA Group meeting (15.05.13).
1.8	17.05.13	Jon Davies	Saved tracked changes from 1.6, added Background and further edited the text.
1.9	20.05.13	Alice Ramsay and Ollie Payne	Review of text and comments
2.0	28.05.13	Jen Ashworth	Edited text and comments
2.1	29.05.13	Alice Ramsay	Review of text and comments
2.2	31.05.13	Rob Enever	Comments and addition of text
2.3	31.05.13	Alice Ramsay and Ollie Payne	Review of comments
2.4	04.06.13	Alice Ramsay, Jon Davies and Ollie Payne	Review of comments and addition of third column to Annex tables
2.5	05.06.13	Alice Ramsay, Jon Davies and Ollie Payne	Final draft for sign-off by NE and JNCC

2.6	06.06.13	Ollie Payne, Alice Ramsey, Jon Davies, Rob Enever and Jen Ashworth	Final amended draft off version by NE and JNCC
3.0	07.06.13	Ollie Payne	Final signed-off version
3.1	28.06.13	Jon Davies & Rob Enever	Amendment to Annex 1 & Annex 2 to clarify the use of the quality scores for point features & correct ambiguity.
4.0	12.07.13	Jon Davies	Final signed-off version with ambiguities removed.

Distribution list:

Copy	**Version**	**Issue Date**	**Issued To**
Electronic	1.0	15.03.13	Ollie Payne, Sue Wells, Rob Enever, Ian Saunders and John Bleach
Electronic	1.2	22.03.13	Ollie Payne, Sue Wells, Rob Enever, Ian Saunders, John Bleach and Jen Ashworth
Electronic	1.3	09.05.13	Ollie Payne, Sue Wells and Rob Enever
Electronic	1.9	22.05.13	Sue Wells, Rob Enever and Jen Ashworth
Electronic	2.1	30.05.13	Sue Wells, Rob Enever and Jen Ashworth
Electronic	2.4	05.06.13	Rob Enever and Jen Ashworth
Electronic	2.5	06.06.13	Rob Enever and Jen Ashworth
Electronic	2.6	06.06.13	Rob Enever, Jen Ashworth and Jon Davies

Background

JNCC and Natural England published Protocol E in January 2012 to set out the process followed when developing our advice to Defra on the recommended MCZs[1]. It was published for public reference, following external peer review, so the process for making decisions was *transparent and accountable*. The original protocol explicitly states its target audience were JNCC and Natural England staff directly engaged in developing the SNCB advice on recommended MCZs. Furthermore, the document was a *protocol* setting out the broad principles and basic method behind assessing the confidence in the presence and extent of recommended features. It was not a prescription of the steps to follow in the sense of a 'standard operating procedure'. The nature of the task to assess 'scientific confidence' necessitated using data of variable form and resolution that therefore required a level of interpretation and judgment.

Inevitably, the process of actually doing the assessments threw up challenges not anticipated when drafting the protocol, so JNCC and Natural England staff agreed specific approaches to deal with these challenges. These approaches and their underlying rationale were described in the SNCB advice packages (JNCC and Natural England 2012a & b), some albeit buried in the depths of the detailed advice.

Subsequently, the protocol has been used by other organisations to assess confidence in MPA features. These applications have encountered similar challenges and there was some, misinterpretation of the basic premise of the original protocol to assess the features recommended by the MCZ regional projects.

Assessing the scientific confidence in the presence and extent of a habitat or species within an area has application beyond the MCZ process, particularly into other MPA work. Much new information is now available for MCZs from detailed site surveys and public consultation, particularly the sites proposed for designation in 2013. Such new information updates the original knowledge on the presence and extent of the features in proposed and recommended MCZs. JNCC and Natural England are required to assess the confidence in the features proposed for designation in MCZs, and are likely to use similar approaches for other applications in our MPA work and beyond into the future.

It is timely to provide guidance on the application of Protocol E that brings together descriptions of the approaches taken to tackle the challenges faced in its practical application, and document some minor changes to the wording of the protocol to enable its continued use. The current document captures the experience of JNCC and Natural England staff who prepared the original MCZ Advice for the benefit of our staff who may need to use Protocol E for future MCZ or wider MPA applications.

[1] Available from: http://jncc.defra.gov.uk/page-5999

Purpose of guidance

The present document will:

1. Detail clarifications to the text of the original Protocol E to expand its application to new feature extent information (as opposed to the extents recommended by the Regional MCZ Projects) and other MPA work.

2. Describe specific guidance on the practical application of some aspects of the protocol that have proved difficult and/or where the original text is ambiguous.

Introduction

Technical Protocol E[2] offers guiding principles for assessing the scientific confidence in the presence and extent of MCZ features as recommended by the Regional MCZ Projects and focused on assessment at the site recommendation stage in 2012. The type and level of evidence underpinning scientific confidence will change as the MCZ process moves towards through designation, management and monitoring (JNCC and Natural England, 2011). This present paper suggests some minor amendments to Protocol E to accommodate these changes in our evidence base, and provides guidance on its application.

Changing the scope of the Protocol to accommodate new evidence on feature presence and extent introduces a challenging new dimension to the assessment process. We have to decide which dataset(s) should be used to define the new features (across both the new and existing datasets); decide how to utilise point data formats to define feature extent; and accommodate the reality that the best available evidence may reveal that the boundaries between features are indistinct – the features occurring as a fine-scale mosaic within the site.

JNCC and Natural England developed Protocol E and this additional guidance to guide staff through their assessments. Fundamental to any application is the need to apply expert judgement and interpretation on a site by site basis to ensure *sensible* results are forthcoming. We must recognise that the nature of the marine environment and the data available vary significantly between locations, particularly between intertidal and subtidal areas, and between inshore and offshore environments. Consequently, it is necessary to adopt different methods of implementing the protocol's guiding principles to suit the location and the data available. For example, Natural England developed a GIS-based semi-automated approach (with manual quality assurance) to accommodate the more numerous datasets for inshore sites so that the assessments could be completed within a realistic timeframe. JNCC had many fewer data for offshore sites and had to make greater use of modelled information so had to examine each dataset in GIS in a manual feature by feature basis.

Both JNCC and Natural England have established processes for quality assuring their evidence assessment work and these will be summarised in advice packages. Two groups have also been set up; The JNCC MCZ Evidence QA Group and the Natural England MCZ Evidence Panel, which will review some of the decisions made during the evidence

[2] Technical Protocol E

assessment process (e.g. which datasets are suitable for inclusion). Each group has a representative from the other organisation to help achieve consistent solutions to any problems. Discussions held by these Evidence QA Groups will be published alongside the evidence assessment results in the respective JNCC and Natural England advice packages.

The subsequent sections describe some key considerations when defining new feature presence and feature extents, in addition to some further practical guidance for the application of Protocol E, including some explanations of terms, rules for making decisions and a glossary of terms. Annex 1 provides further guidance on the application of the criteria in the assessment tables of Protocol E. Please note that the current paper does not replace the original Technical Protocol E (JNCC and Natural England, 2012b), rather it must be used in conjunction with the Protocol.

Applying Technical Protocol E

1. Accommodating new data on features within proposed MCZs, or applying the Protocol to other MPAs

The original protocol focussed on assessing the features recommended by the regional MCZ projects both in terms of presence (in the 'recommended' location) and extent (of the 'recommended' shape). The basic principles defining confidence set out in the protocol could be applied to any feature proposed within a MPA although specific feature confidence assessments in protocol E that are specific to MCZ features would need to be tailored for features from other designation types . Information collected more recently has updated our evidence base for the recommended MCZs, noting both the presence of new features within the site boundary and updating the spatial distribution of the original features. To enable the protocol to be used by JNCC and Natural England when re-assessing the features in MCZs (or other MPAs), the term *recommended MCZ features* should be interpreted as *MPA features.* The word 'recommended' no longer applies to MCZ feature assessments since we now have to use best available evidence of the distribution of features within the entire MCZ boundary as the basis for our assessment ahead of designation.

2. Best available evidence (Introduction, Protocol E)

All evidence that is considered when assessing feature presence and extent should be listed by data source, as described in Section 1i of Protocol E (Evidence sources - Evidence sources for recommended features in section 'Detailed protocol methodology'). A justification must be given if a data source is excluded from the assessment. In some cases, it may be necessary to exclude datasets (e.g. those that are less reliable than data collected during recent surveys), to ensure that the 'best available evidence' is used to inform confidence in feature presence and extent. The rationale for excluding datasets from the assessment process should be audited and published alongside the confidence assessment results.

A Quality Assurance (QA) process will review any case that arises for exclusion of data on a dataset/feature/site basis, to ensure that the 'best available evidence' is used to inform confidence in feature presence and extent. All data considered by the JNCC MCZ Evidence QA Group and the Natural England MCZ Evidence Panel for inclusion/exclusion will be documented, including any decisions made relating to the use of individual datasets. The

rationale for excluding any datasets from the assessment process will be audited and published alongside the confidence assessment results.

3. Accommodating new data on feature extent (Section 3i, Protocol E):

New feature polygon data are available for some recommended MCZs, often replacing modelled maps. Where the MESH confidence score for the new mapping study is higher than previous maps, the new feature polygons can be used as the feature boundaries against which to apply Protocol E. The assessment outcomes would therefore relate to confidence in the newer feature extent polygons, assuming it is of higher quality.

It is vital to note that the MESH confidence score provides an assessment of the quality of the mapping study, **NOT** a measure of the accuracy of the map in depicting the actual feature present on the seabed. At any location, maps with a lower MESH confidence score may actually more accurately depict the feature present on the seabed. It is for this reason that the protocol makes specific reference to whether feature polygons actually contain ground validation samples when assessing feature confidence.

4. *Role of percentage agreement in assessing confidence in presence of habitat features in a MCZ (Section 2i & 2ii, Protocol E) (see Tables 2, 3 and 5 in Annex 1)*

Tables 2 and 3 of Protocol E (see Annex 1) set out the criteria for judging confidence in the presence of a habitat feature within a MCZ. The original protocol was drafted to assess the *recommended* feature within the MCZ, based on a polygon showing its location within the site. The text states that the judgement requires 'verifiable evidence to demonstrate presence of [the] feature' either a map with associated ground-truthing data, or samples/ direct observations of the seabed. There is a further qualification added to cover the quality of a map in terms of its accuracy in predicting the seabed: ground samples need to have >90% agreement with the habitat type, especially for maps based on habitat models.

Moving beyond *recommended* features, the focus shifts to 'quantifiable or verifiable evidence to demonstrate the presence of a feature' within the MCZ (or other area). Having five or more ground-truth samples that clearly demonstrate presence in the site are sufficient evidence to have 'high confidence' that the feature is present in the MCZ. Note that 2-3 samples showing the presence of the feature or five or more ground-truthed samples that clearly demonstrate the presence of parent feature are sufficient for moderate confidence. There is no requirement to consider the percentage agreement of sample points in the basic judgement.

If however, there is a requirement to understand the likelihood of a feature being present at a specific location using a map from survey, it will be important to consider the accuracy of that map in predicting feature presence. A determination of percentage agreement will then be necessary to assess our confidence in whether a feature is present at a specific mapped location. For example, where a map polygon showing an area of coarse sand has 10 ground samples, 9 of which were coarse sand, we would have 'high confidence' that the seabed would be coarse sand at any other point within the polygon. In contrast, if a coarse sand polygon had 6 samples of coarse sand and 4 samples of gravel, we would have high confidence that coarse sand is present in the area (we have actual records) but we would have less confidence that coarse sand is present at any specific mapped location within the

polygon due to its co-occurrence with gravel. In such a situation as above, the confidence in the presence of coarse sand in the site would be high.

Confidence in the presence of a feature at specific locations and accuracy of maps is linked to measures of extent of a feature that will most likely be required when considering the future management of the site. Such considerations are beyond the application of the current protocol and will require further discussions since there are many other mapping issues to consider in such applications.

5. ***Accommodating the use of point data as evidence of feature extent (Section 3i, Protocol E) (see Table 5 in Annex 1 for modified text):***

There may be situations where point data (or a combination of polygon and point data) provide useful information on the extent of features, beyond that provided by polygon data alone. For instance, new point data made available through survey work or through the MCZ public consultation may indicate that the feature extent recommended by the Regional MCZ Projects does not represent the full extent of the feature within the site. In these cases, consideration should be given to either combining the new point data with the existing polygon data or considering the point data in isolation, to provide a more up-to-date representation of the extent of the feature within the site.

When using point data to define feature extent (as opposed to a polygon), consideration needs to be given to the density, spread and distribution of the point data (or distribution of point and/or polygon data) as described in section 3i of the Protocol (Assessing scientific confidence of feature extent - Broad-scale habitat and habitat FOCI extent) and the new assessment should be carried out against the estimated extent.

6. ***Amendment to the assessment of confidence in the presence of species of conservation importance - Table 4, Protocol E (see Annex 1 for modified text in Table 4)***

For the assessment of presence of species of conservation importance, the Protocol specifies that a 'High' confidence score can only be achieved if '...all data are less than 6 years old'. It is possible that the reference to 'all' will create a nonsensical result under some circumstances, particularly for time-series data. For example, once a monitoring study that records the presence of the species each year extends beyond 6 years, the confidence in presence will fall from *high* to *moderate* if 'all' data are considered. We advise that the protocol should require at least 5 or more records[3] (samples not individual species) less than or equal to 6 years old, with ID carried out by a specialist to be accorded 'high'. Similarly, for 'moderate' there are at least 5 records but some are 6-12 yrs or ID by non-specialist.

7. ***Age of data (Section 2ii, 2iii and 3ii)***

The categories for the age of data described in Protocol E will remain unchanged, in order to ensure that the Protocol is applied consistently between assessments. Age should be calculated back from the date of the current assessment. Consequently, if no new data are available since a previous assessment, the confidence judgement may decline[4] where a

[3] 5 records were chosen in order to align with species presence as per Table 4 within Protocol E
[4] Unless expert judgement decrees that this is not sensible following review of evidence with each organisation's Evidence Panel.

datasets that fell within a given age category during the previous assessments, now falls outside that age category cut-off.

8. ***Use and Quality Assurance (QA) of "Expert judgment"***

The section of Technical Protocol E "*Detailed protocol methodology"* explains that it may be necessary to use expert judgment (see Glossary) when assessing confidence in feature presence and extent. A recent review of the use of Expert Judgement in a report commissioned by JNCC identified that the use of Expert Judgement makes an important contribution to scientific assessments and is widely used in science (Barnard and Boyes, 2013). Where expert judgement has been applied, justification for the decision must be detailed alongside the assessment results and the decision making process should undergo quality assurance by Natural England or JNCC specialist staff (the JNCC MCZ Evidence QA Group will QA the expert judgement assessments carried out by JNCC). Section 5.1 of the advice that Natural England and JNCC submitted to Defra (JNCC and Natural England, 2012b) provides examples of how expert judgement was applied in previous assessments (e.g. JNCC evidence assessment for A5.1 Subtidal Coarse Sediment in South-West Deeps (West)).

9. ***Clarification on the assessment of Geological features (Sections 2i and 3i)***

Section 2i (Assessing scientific confidence in the presence of a feature -Presence of Broad-scale habitats) and Section 3i (Assessing scientific confidence of feature extent – Broad-scale habitat and habitat FOCI extent) of Technical Protocol E should be applied to assess the presence and extent of the Geological and Geomorphological features of interest. The features are predominantly identified on a morphological basis derived from bathymetric and/or seismic information that reveals the shape of geological features (such as glacial erosion and deposition features). Our confidence in the morphology of the seabed depicted on maps and charts is high and therefore we have assumed high confidence in the presence and extent Geological and Geomorphological features of interest.

10. ***Quality of data***

In the marine environment particularly there is considerable variability in how and by whom data may be collected which has ramifications on its quality and applicability. Such issues can affect our confidence in making decisions based on variable data. Data quality issues can be most acute for areas with a long history of investigation by both amateur and professional scientists. Where there are many data of varying provenance, it is important to consider some key elements of studies to gain an understanding of the likely quality of the data. JNCC and Natural England have sought to make use of the most appropriate data for our assessments of confidence.

The MESH Project developed criteria and a tool to assess confidence (or quality) in mapping studies[5]. Protocol E refers to the MESH Confidence when using maps. Part of the MESH confidence assessment specifically relates to evaluating the quality of ground-truth samples. Natural England & JNCC used the relevant criteria for scoring the quality of sample data looking at issues such as how location information is described, how data are quality controlled and how data are assessed and managed. These criteria are described in Annex

[5] See http://www.searchmesh.net/default.aspx?page=1635

2. These criteria were particularly applied where there were many varied datasets available within a MCZ.

General considerations when applying Protocol E

The tables in Technical Protocol E provide summary descriptions only of the various confidence assessments. When undertaking assessments, it is essential to use all the guidance provided in the Protocol, including the narrative accompanying the tables.

JNCC and Natural England developed some *rules of thumb* when making judgements to avoid nonsensical or illogical results, which were described in the SNCB MCZ advice packages in 2012. These rules were:

1. The confidence assessment for a feature's extent could not be assigned a higher rating than its confidence in its presence. For example, 'Moderate' confidence should not be assigned to feature extent where there is 'Low' confidence in feature presence, since we cannot be more confident in the distribution of the feature than we are confident that the feature occurs at the location under consideration.

2. When a feature polygon habitat map (from survey, with a MESH score of >58%) is used to verify the presence or extent of a feature extends outside the site boundary, at least one interpreted ground-truth data point for the feature should lie within that part of the feature polygon falling within the site boundary.

Glossary of terms used in Protocol E

Term	Definition
Habitat Map OR Habitat map (from survey)	Map depicting habitat polygons created directly from survey data (including Acoustic data and ground-truthing data) with a MESH confidence score of >58%. See below for 'modelled' habitat map
Modelled data	Data that predict habitat distribution, normally derived from environmental variables such as depth, energy and seabed substrates (for further information see: http://jncc.defra.gov.uk/page-2117)
Interpreted ground-truth data	Direct observations or samples of the seabed, for example, grab samples, diver surveys, video footage and still images, classified into a biotope or sediment type. Such data must be geo-referenced. Photographic images of a feature constitute a ground-truthing data and do not necessarily require 'interpretation'. Guidance on use of photographic evidence can be found in section 5.1.13 of the SNCB advice
Evidence on distribution (in reference to SOCI)	Describes data which can contribute to our understanding of the distribution of a feature such as the distribution/spread of point data across an area.
≥*XX*% 'agreement across records'	The degree to which the total number of data points used to verify the feature validate the feature. E.g. if there are 10 points across the feature polygon for A5.1 and there are 6 points verifying the proposed habitat type and 4 not, then there would be only a 60% agreement across records.
Expert judgment	Formal systematic processes to obtain quantitative judgements on scientific questions, to the exclusion of personal or social values and preferences (applied by staff engaged in the MCZ Project at JNCC and Natural England) (Barnard and Boyes, 2013.
Multiple records	More than one record

Reference List

Barnard, S. & Boyes, S.J. 2013. Review of Case Studies and Recommendations for the Inclusion of Expert Judgement in Marine Biodiversity Status Assessments - A report for the Joint Nature Conservation Committee, JNCC Report by the Institute of Estuarine and Coastal Studies, University of Hull.

JNCC and Natural England (2012a). SNCB MCZ Advice Project – Assessing the scientific confidence in the presence and extent of features in recommended Marine Conservation Zones (Technical Protocol E). Peterborough and Sheffield.

JNCC and Natural England (2012b). Marine Conservation Zone Project; JNCC and Natural England's advice to Defra on recommended Marine Conservation Zones - Amendments Report. Peterborough and Sheffield.

JNCC and Natural England (2011). Marine Conservation Zone Project; Levels of evidence required for the identification, designation and management of Marine Conservation Zones. Peterborough and Sheffield.

Annex 1 – Guidance on the application of Tables 2 – 5, in Protocol E

The following sections show the content of the tables in the original Protocol E, together with accompanying advice on how the criteria outlined in the tables may be applied. This advice is based on our practical experience of applying the Protocol, particularly trying to address common problems encountered with the available data. Please note that this Annex is not designed to replace the original Technical Protocol E (JNCC and Natural England, 2012b), rather it must be used in conjunction with the narrative text which accompanies the original tables in the Protocol. See Glossary of Terms for further information relating to specific words/phrases.

Table 2 (*as per Protocol E table numbering*) Descriptions of confidence categories for broad-scale habitat presence assessment

Original text in Protocol E	Original text in Protocol E	Advice on applying the Protocol
High confidence	Quantifiable or verifiable evidence to demonstrate presence of feature, including: • Presence of feature shown by a habitat map with polygons containing biological validation samples; OR • Presence of feature supported by interpreted ground-truthing data (e.g. video, still image, grab, diver survey). For ground-truthing data multiple records should be available, and most records should be in agreement with respect to the habitat type with greater than 90% agreement in habitat type across records.	For a habitat map with ground-truthing samples, we have taken "multiple records" to mean >=2 ground-truth samples. Where only point data are available, we have taken 'multiple records' to mean ≥5 point samples that clearly demonstrate presence of the feature within the site is sufficient evidence to have 'high confidence' that the feature is present in the MCZ (see Section 4 of the main text of this guidance). Where multiple data sets are available, Annex 2 (see below) may be used to consider the quality of the data records available to the assessment. For 'High confidence' ≥5 feature point records with a quality score of 3 OR any combination of quality 2 and 3 feature point records totalling a quality score ≥15 (must however include a minimum of ≥2 survey points with a quality score of 3). Note that the percentage agreement in habitat type across

Original text in Protocol E	Original text in Protocol E	Advice on applying the Protocol
		records refers to ≥90% agreement.
Moderate confidence	Quantifiable or verifiable evidence to demonstrate presence of feature, including: • Presence of feature supported by interpreted ground-truthing data (e.g. video, still image, grab, diver survey, etc.). For ground-truthing data multiple records should be available, and many records should be in agreement with respect to the habitat type with greater than 50% agreement in habitat type across records; OR Quantifiable or verifiable evidence to demonstrate presence of 'parent' feature within EUNIS classification hierarchy (e.g. EUNIS Level 2 Circalittoral rock, rather than EUNIS Level 3 High Energy Circalittoral rock): • Presence of 'parent' feature shown by a habitat map; OR • Presence of 'parent' feature supported by interpreted ground-truthing data (e.g. video, still image, grab, diver survey, etc.). For ground-truthing data multiple records should be available, and many records should be in agreement with respect to the habitat type with greater than 90% agreement in parent type across all records.	For a habitat map with ground-truthing samples, we have taken "multiple records" to mean >=2 ground-truth samples. Where only point data are available, either 2-5 samples showing the presence of the feature, or ≥5 samples that clearly demonstrate the presence of parent feature are sufficient to have moderate confidence that the feature is within the site (see Section 4 of the main text of this guidance). Where multiple data sets are available, Annex 2 (see below) may be used to consider the quality of the data records available to the assessment. 'Moderate confidence' can be achieved with ≥5 parent feature point records with a quality score of 3 OR any combination of quality 2 and 3 parent feature point records totalling a quality score ≥15 (must however include a minimum of ≥2 survey points with a quality score of 3). If <5 point records of the feature are available, they should have a quality score totalling ≥6. Note in reference to 'parent' feature: Information on seabed type from the geological or hydrographic seabed samples could be used to verify whether the habitat type is rock based or sediment based. It may not always be possible to verify the type of sediment or energy level

Original text in Protocol E	Original text in Protocol E	Advice on applying the Protocol
		classification of the rock with this approach. Note that the percentage agreement in parent type across records refers to ≥90% agreement.
Low confidence	Modelled data only to indicate the presence of a feature; OR Local knowledge information but ground-truthing sources to support it not available; OR Only one ground-truthing record available: OR Less than 50% agreement in habitat type suggested by ground-truthing records	No further guidance required.
No confidence	Available evidence is conflicting with respect to habitat type	Conflicting data alone will not be considered to imply no confidence in feature presence.

Table 3 (*as per Protocol E table numbering*) Descriptions of confidence categories for habitat of conservation importance presence assessment

Original text in Protocol E	Original text in Protocol E	Advice on applying the Protocol
High confidence	Quantifiable or verifiable evidence to demonstrate the presence of the feature including: • Presence of feature shown by a habitat map with	For a habitat map with ground-truthing samples, we have taken “multiple records” to mean >=2 ground-truth samples. Where only point data are available, we have taken

Original text in Protocol E	Original text in Protocol E	Advice on applying the Protocol
	polygons containing biological validation samples; OR • Presence of feature supported by biotope-translated ground-truthing data (e.g. video, still image, grab, diver survey, etc.). For ground-truthing data, multiple records should be available and most records should be in agreement with respect to the habitat type with greater than 90% agreement in habitat type across records. Note that for those habitats that can show high temporal variability (e.g. ephemeral) the evidence should be less than 6 years old.	'multiple records' to mean ≥5 point samples that clearly demonstrate presence of the feature within the site is sufficient evidence to have 'high confidence' that the feature is present in the MCZ (see Section 4 of the main text of this guidance). Where multiple data sets are available, Annex 2 (see below) may be used to consider the quality of the data records available to the assessment. For 'High confidence' ≥5 feature point records with a quality score of 3 OR any combination of quality 2 and 3 feature point records totalling a quality score ≥15 (must however include a minimum of ≥2 survey points with a quality score of 3). Note that the percentage agreement in habitat type across records refers to ≥90% agreement.
Moderate confidence	Quantifiable or verifiable evidence to demonstrate the presence of the feature including: • Presence of feature supported by biotope-translated ground-truthing data (e.g. video, still image, grab, diver survey, etc.) and records should be in agreement with respect to the habitat type with greater than 50% agreement in habitat type across all records). Note that for those habitats that can show high temporal variability (e.g. ephemeral) the evidence should be less than 12 years old.	For a habitat map with ground-truthing samples, we have taken "multiple records" to mean >=2 ground-truth samples. Where only point data are available, either 2-5 samples showing the presence of the feature or ≥5 samples that clearly demonstrate the presence of parent feature are sufficient to have moderate confidence that the feature is within the site (see Section 4 of the main text of this guidance). Where multiple data sets are available, Annex 2 (see

Original text in Protocol E	Original text in Protocol E	Advice on applying the Protocol
		below) may be used to consider the quality of the data records available to the assessment. 'Moderate confidence' can be achieved with ≥5 parent feature point records with a quality score of 3 OR any combination of quality 2 and 3 parent feature point records totalling a quality score ≥15 (must however include a minimum of ≥2 survey points with a quality score of 3). If <5 point records of the feature are available, they should have a quality score totalling ≥6. The percentage agreement in habitat type across records refers to ≥50% agreement.
Low confidence	Modelled data only to demonstrate presence of the feature; OR Only one record available to demonstrate presence; OR Evidence is older than 12 years for those habitats that can show high temporal variability (e.g. ephemeral).	In reference to modelled data, this includes habitat mapping studies with limited validation or unprocessed acoustic data.
No confidence	Available evidence is conflicting with respect to habitat type.	Conflicting data alone will not be considered to imply no confidence in feature presence.

Table 4 (*as per Protocol E table numbering)* Descriptions of confidence categories for species of conservation importance presence assessment

Original text in Protocol E	Original text in Protocol E	Advice on applying the Protocol
High confidence	Species presence supported by multiple records at one or more locations, all data are less than 6 years old AND information was collected using ground-truthing techniques appropriate for the assessment of the species and undertaken by specialists. At least five records will be required to demonstrate the presence of the feature.	Rather than requiring 'all' data to be less than 6 years old, high confidence should require only 5 or more records (samples not individual species) ≤6 years old, with ID carried out by a specialist (see Section 6, in the main body of the guidance).
Moderate confidence	Species presence supported by multiple records, with at least one record from between 6 and 12 years old, using ground-truthing techniques as described above; OR All records collected using ground-truthing techniques not specific, or designed for, the assessed species and undertaken without supervision by specialists AND data are less than 12 years old.	Moderate confidence requires at least 5 records with some being 6-12 yrs or identified by non-specialist (see Section 6, in the main body of the guidance).
Low confidence	Species presence supported by single record, OR Records older than 12 years; OR Only anecdotal information available	No further guidance required.
No confidence	Available information indicates the species have been identified at the wrong location.	In Protocol E this category related to confidence in the presence of species at locations recommended by the Regional MCZ Projects. Confidence in species presence should now reflect confidence in presence of the feature within the site boundary. A score of no confidence will only be applied where no species records fall within the boundary

Original text in Protocol E	Original text in Protocol E	Advice on applying the Protocol
		of the site.

Table 5 (*as per Protocol E table numbering)* Descriptions of confidence categories for the broad-scale habitats and habitats FOCI extent assessment

Original text in Protocol E	Original text in Protocol E	Advice on applying the Protocol
High confidence	Habitat extent supported by a habitat map (from survey)* covering more than 50% of the recommended feature; OR Sample data well distributed across more than 50% of the recommended feature: OR Combination of both types of data covering more than 50% of the recommended feature	The percentage coverage refers to greater than ≥ 50% of the feature. See Glossary of Terms for further information on the meaning of specific words/phrases.
Moderate confidence	Habitat extent supported by a habitat map (from survey)* covering less than 50% of the recommended feature; OR Parent feature extent support by a map covering more than 50% of the recommended feature; OR Sample data covering less than 50% of the recommended feature Combination of data covering less than 50% of the	The percentage coverage refers to <50% of the feature. Where multiple data sets are available, Annex 2 (see below) may be used to consider the quality of the data records available to the assessment. Note that these criteria apply only where point data (rather than polygon data) are being used to define feature extent (see Section 5). For 'Moderate confidence' ≥5 parent feature point records with a quality score of 3 OR any combination of quality 2 and 3 parent feature point records totalling a

Original text in Protocol E	Original text in Protocol E	Advice on applying the Protocol
	recommended feature	quality score ≥15 (must however include a minimum of ≥2 survey points with a quality score of 3). If <5 point records of the feature itself are available, they should have a quality score totalling ≥6.
Low confidence	No habitat map (from survey) available; OR Single sample data record: OR Only modelled map.	No further guidance required.

Annex 2 – Assessing the quality of ground-truth records

The following table sets out the basic criteria to assess the quality of point feature records, primarily to help select the best data for the confidence assessment when there are multiple data available. It has been developed using some of the principles set out in the MESH Confidence Assessment (for further details, see the guide document at http://www.searchmesh.net/default.aspx?page=1635) but it is intended to be applied as a rapid assessment of data quality rather than an exhaustive analysis. It is also important to consider the context of the data within each site, both with respect to biological and spatial elements.

Quality Score	Criteria
3*	Data records were collected using approved standards and interpreted by an appropriate specialist with quality standards applied and documented. Photographic evidence has location stamped into the image, has undergone validation and interpretation by an appropriate specialist.
2*	Data records have been collected by documented methods and interpreted by an appropriate specialist but limited evidence on quality standards applied. Limited information in the methods used for data interpretation, particularly for records collected in a linear fashion such as video tows or diver observation records.
1	Limited information on how data were collected, verified or interpreted; data identified by non-specialists. Data based on local knowledge or anecdotal information with no supplementary verification.

**Where the spatial accuracy of a data record is important (e.g. for feature records in close proximity to a critical boundary) then the quality value may be downgraded to reflect any spatial uncertainty in the record. Such spatial uncertainty may place the record outside a site boundary and therefore would question the feature's presence in the site.*