Common Standards Monitoring Guidance

for

Generic Introduction for Marine Feature Guidance

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1 Introduction to the marine guidance

The present section provides generic advice on the selection of attributes and the assessment process for marine features. Marine features are divided into two categories: 'simple features' that consider a single, albeit broad habitat type - littoral sediments, littoral rock and inshore sublittoral rock, inshore sublittoral sediments and sea caves, and 'complex features' that are broad physiographic units - estuaries, large shallow inlets and bays, and lagoons. Complex features will normally contain a range of simple features. Specific guidance for assessing the status of attributes for each interest feature is provided in the subsequent sections. For each interest feature the specific guidance identifies a core set of attributes which must be used to define favourable condition on every site, plus a set of additional attributes, from which, some or all can be used to highlight any local distinctiveness. Guidance on setting targets and available methodologies is also available. At this time, it is not possible to provide explicit guidance on the exact methodologies to be used since most are under development; the precise techniques to be used will be subject to specialist advice at the time of assessment. The following generic text must be read in conjunction with the specific feature guidance as it provides an introduction to issues that need to be considered initially when setting objectives and selecting attributes to define favourable condition, and advice on judging condition following the monitoring activities.

1.1 Setting objectives and judging favourable condition

Setting objectives and judging condition requires a clear knowledge and understanding of the conservation interest of the feature at a site. Such information should be drawn from previous surveys and local expert knowledge of the site, together with generic information on trends and/or natural variability in the state of feature gathered from the wider literature.

1.1.1 Sub-features

The marine features are very broadly defined habitats that are often represented by large sites. To describe, monitor and manage such features effectively, it has often been necessary to divide the features into smaller units called *sub-features*. Sub-features are distinctive biological communities (e.g. eelgrass beds, common mussel beds, cockle beds), or particular structural or geographical elements of the feature (see Figure 1). It has often proved helpful, both in the development of conservation objectives and of monitoring programmes, to separate the feature into a number of constituent sub-features, and then to identify attributes and targets for the sub-features. The use of sub-features permits a level of flexibility in the application of the UK's Common Standards Monitoring which has been found necessary when applying the standards at the site level.

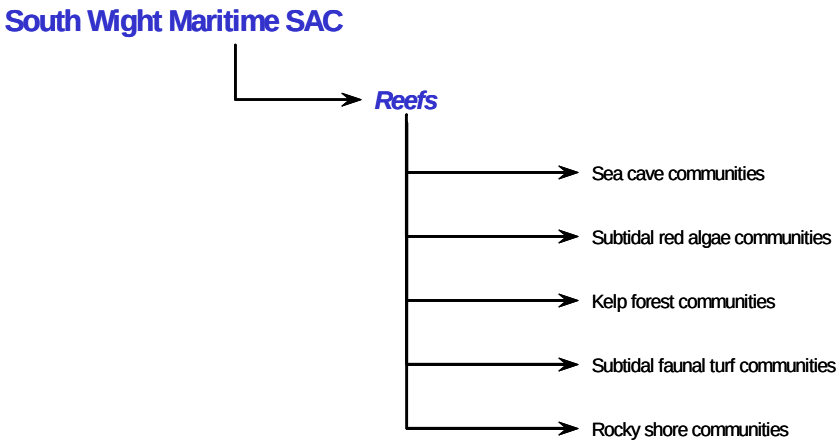


Figure 1. An example of how an Annex I feature (*bold italic*) is divided into sub-features (normal text**) for a large littoral and inshore sublittoral rock feature (Reef) on an SAC**

1.1.2 Selecting attributes

The aim of the attribute selection process is to produce a focussed and prioritised list of attributes for the feature that will most efficiently define its expected condition at a site.

To assist the initial selection process, any attribute must:

- help to define condition
- be capable of clearly identifying a change in condition
- be measurable
- be capable of being monitored practically and economically.

Priority should be given to measuring attributes that:

- also indicate a likely anthropogenic pressure that may affect the feature's condition
- provide information to more than one component of the management regime – e.g. where a measurement could provide data to be used both to assess the feature's condition and assess compliance with a management action (possibly by another regulatory agency)
- provide as much information about the feature as a whole as possible
- have a baseline already adequately quantified
- are already measured at the site, e.g. by another regulatory authority as part of a compliance monitoring programme
- are more readily measured, technically and/or cheaply, than alternative attributes providing similar information, e.g. species that are more easily identified than other species, or
- contribute to other nature conservation initiatives such as BAP.

In refining any list of attributes also note:

- The need to avoid duplication between attributes. For example, seagrass and maerl beds may both be important sub-features of a sandbank feature. However, measuring the depth distribution as a priority attribute for both because it also indicates water quality, would probably be an unnecessary duplication of effort.
- Selecting a combination of attributes some of which are to be measured both in the short-term and some in the long-term may collectively provide more valuable information than several attributes that are all measured only once during a reporting cycle.

As further information is gathered about features and more experience gained on the assessment process, it is possible that a list of attributes will be further refined to incorporate measures that are more informative or most cost-effective.

A target state should be defined for each attribute specifically selected for the feature on a given site. While the list of possible attributes that could be selected are generic across all features on all sites the targets are, and must be, site-specific to highlight local distinctiveness. Therefore, while examples of targets are given, these are for illustrative guidance only. Conservation agency staff must define a target condition as appropriate to their sites, based on local knowledge and information normally gathered from the site or its immediate environs.

It is important to note that not all attributes may be applicable to all parts of a feature at any one time, particularly in larger sites. Before undertaking condition assessment, the applicability of attributes and targets to the whole site or to just a few restricted areas should be considered and tailored accordingly. For example, if a *Species composition* attribute is used to monitor the condition of a specific 5 ha. *Zostera* sp. bed (a sub-feature) within a 300-hectare littoral sediment system (the feature), then this attribute's target condition is specific to that bed and not necessarily the entire littoral sediment system. Nevertheless, if the species composition of the 5 ha. *Zostera* sp.

bed does not meet the target condition; the whole littoral sediment feature will be classed as unfavourable.

1.1.3 Selecting attributes for complex features

Selecting the attributes to define the condition of a complex marine feature (estuary, large shallow inlet and bay, lagoon) is often complicated by the fact that such a feature may contain habitats and species that are notified features in their own right. For example, a large shallow inlet and bay will often contain subtidal sediments and inshore rocky habitats that will be separately notified for their individual conservation interest. It must be emphasised however, that the condition of these individual features does not automatically relate to the condition of the broader complex feature in which they are located. For example, the presence and extent of a notified saltmarsh feature may be one of the integral habitats of an estuary ecosystem, whereas the biological composition of that saltmarsh is less important to the estuary's overall condition. If that saltmarsh is deemed unfavourable due to its biological composition being adversely affected by overgrazing, then this should not render the estuary feature as unfavourable. If however the saltmarsh is deemed unfavourable due to changes in the dynamics of the estuary causing the saltmarsh to erode and thereby be classed in unfavourable condition, the functioning of the estuary system may be compromised and thus the estuary should be classed as unfavourable.

It is important to establish the relationship between the condition of these 'simple' features and the 'complex' feature prior to selecting the attributes to assess that complex feature's condition. Establishing this relationship requires a clear understanding of the key conservation interest of the complex feature. In basic terms, where the condition of the 'simple' feature is an integral part of the complex feature's condition, all the attributes assessing the 'simple' feature should form part of the wider assessment. For other circumstances, it will be necessary to select the most appropriate attribute from a 'simple' feature that best relates to the key conservation interest of the complex feature. Furthermore, there may be other habitats and species that are integral to the condition of the complex feature but are not themselves notified features, which should nevertheless contribute to the condition assessment.

Figure 2 outlines a decision process to evaluate the contribution of 'sub-features' to setting a list of attributes to assess the condition of a complex feature.

Note – this selection process should only apply to complex features, not to sites that have multiple simple features.

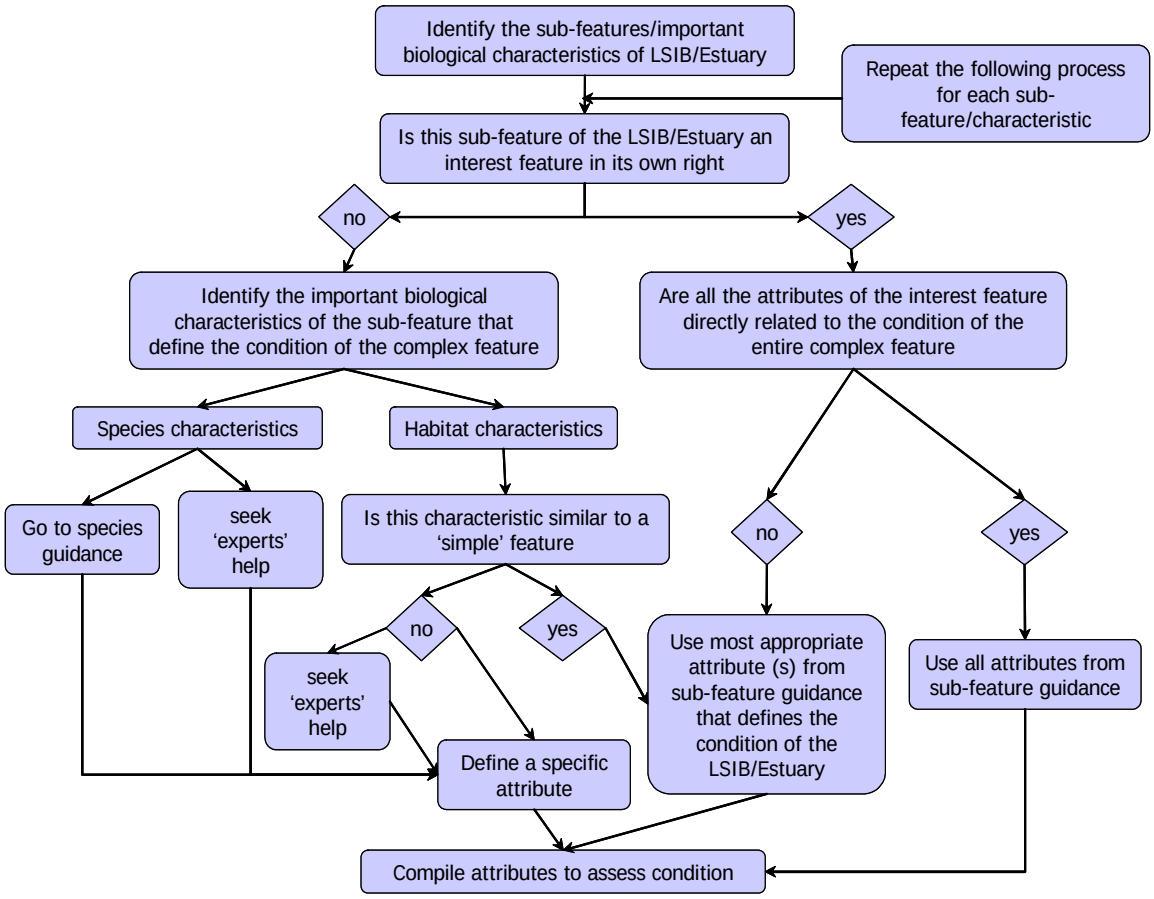


Figure 2 A suggested decision process to select attributes for complex features

1.1.4 Setting a target

A target is intended to reflect the desired condition of the attribute for a feature that we wish to achieve on that designated site, not the management systems or operations that lead to that condition. A target may be a single threshold (upper or lower) beyond which condition is judged unfavourable. For example, the extent of a feature would generally be specified as a numeric value, below which the attribute would be judged unfavourable. Marine ecosystems are, however, characterised by dynamic processes that often manifest through a cyclical change in the prevailing biological communities. In making a decision on the target for favourable condition, it is necessary to encapsulate the likely range of communities and their different stages of transition that may be observed on a feature. A target may therefore be defined as a range within which fluctuations may occur. For example, the target for an attribute describing the biotope composition of a dynamic rocky shore ecosystem may require that a proportion of biotopes are drawn from a list detailing the range of biotopes that could be present, and accepting a degree of cyclical change in the precise composition.

It is important to remember that the target/target range represents a threshold that should be considered a trigger for further action. When an attribute fails to meet the target condition for a feature, this will require further investigation to ascertain if any management response is needed to ensure the feature returns to favourable condition at future date.

1.1.5 Summary

A summary of the approach used to define favourable condition for an interest feature is as follows:

1. identify and define any sub-features that are important components of the feature
2. identify the attributes for the interest feature, and any sub-features, which are considered on best judgement to be essential to assess its condition
3. set site specific targets for those attributes.

These aggregated targets then provide the evidence from which we judge favourable condition for the entire feature on a site.

1.2 Assessment process

It is important to note that the process of condition assessment of marine features is an almost entirely new activity within the conservation agencies at this time (Spring 2003). There is limited experience to draw upon to develop unambiguous guidance on condition assessment and thus it will be necessary to apply a high level of expert judgement during the next few years.

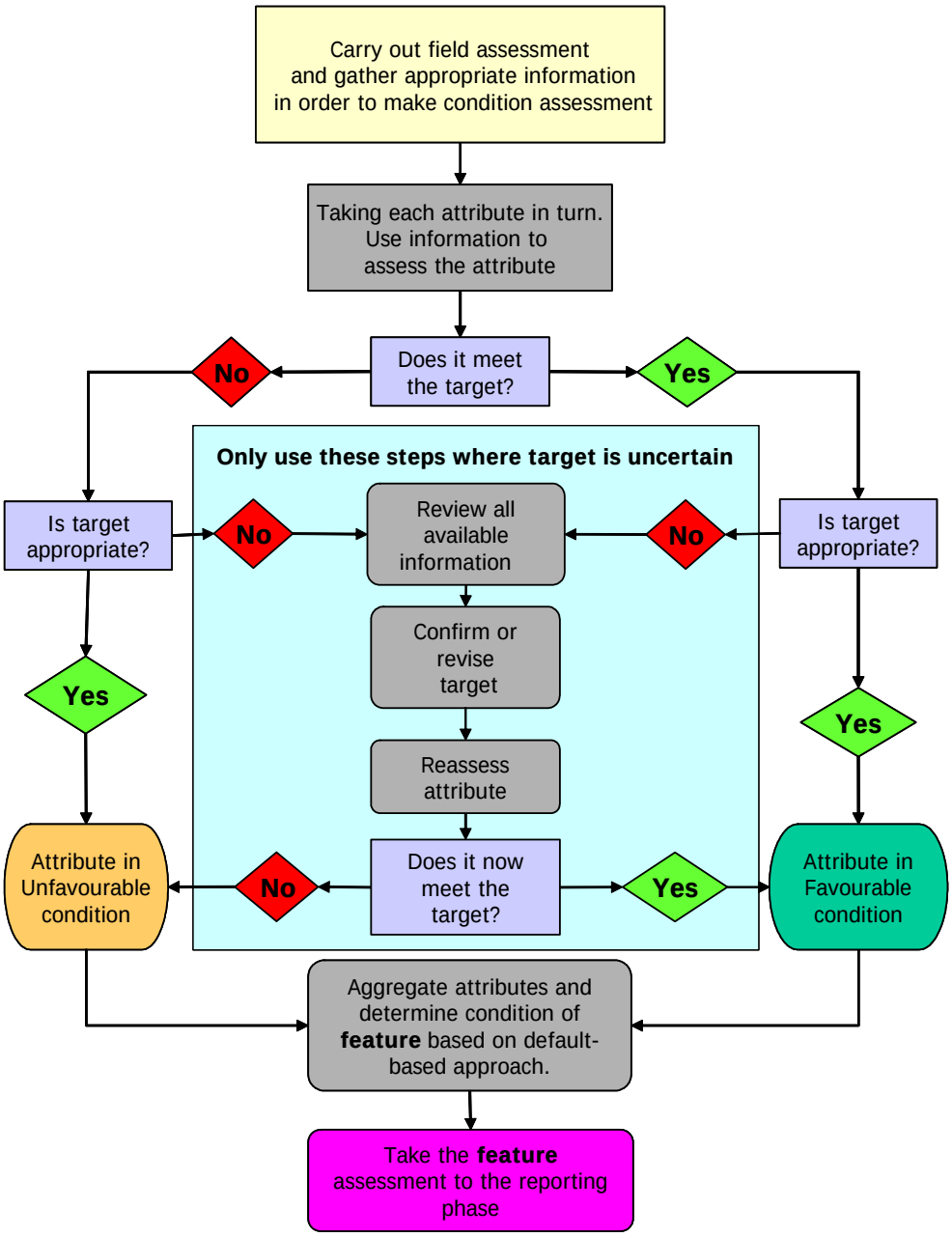
The basic philosophy for judging whether a feature on a site is at favourable condition is that all the attributes are judged to be favourable; this is a *default-based approach* to assessment. That is, failure of any one attribute to meet its target condition at the end of the assessment process dictates that the whole feature should be classed as unfavourable; For features subject to dynamic natural processes, it may be appropriate to use a *weighted approach* based on expert judgement to determine each attribute's relative contribution to the overall assessment in relation to the specific conservation interest of the feature at that site. For example, a diverse range of biotopes is the key conservation interest of a littoral sediment flat on a designated site. An assessment of the feature indicates that the biotope diversity is maintained but the overall extent of sediment flat has decreased due to the prevailing sediment transport processes. The key conservation interest remains, albeit over a reduced area. A *weighted approach* could be adopted whereby the relative value of the attribute measuring extent is reduced and the feature may be judged *favourable.* If however, the biotope diversity had also declined below the target condition, the feature would be judged *unfavourable* since this is the key conservation interest. If the extent continued to decline over future monitoring events without any reduction to the biotope diversity, at some point expert judgement (common sense) must dictate that the conservation value of the feature has reduced below an acceptable level and the feature judged *unfavourable, partially destroyed* or even *destroyed*. It is extremely difficult to provide explicit, unambiguous guidance on weighting attributes and therefore the default-based approach should be used wherever possible.

For many marine attributes, there are insufficient data to establish certain, unambiguous target conditions. In particular, there are insufficient time series studies to assess fully the extent of the underlying background variation (due to environmental and/or biological factors) against which the magnitude of an impact from a known anthropogenic pressure may be judged. It is anticipated that the certainty of target conditions will increase over future monitoring cycles, and with additional data gathered from surveillance programmes. Consequently, there are two distinct phases in the assessment process: a field assessment followed by a reporting phase.

The two phases comprise:

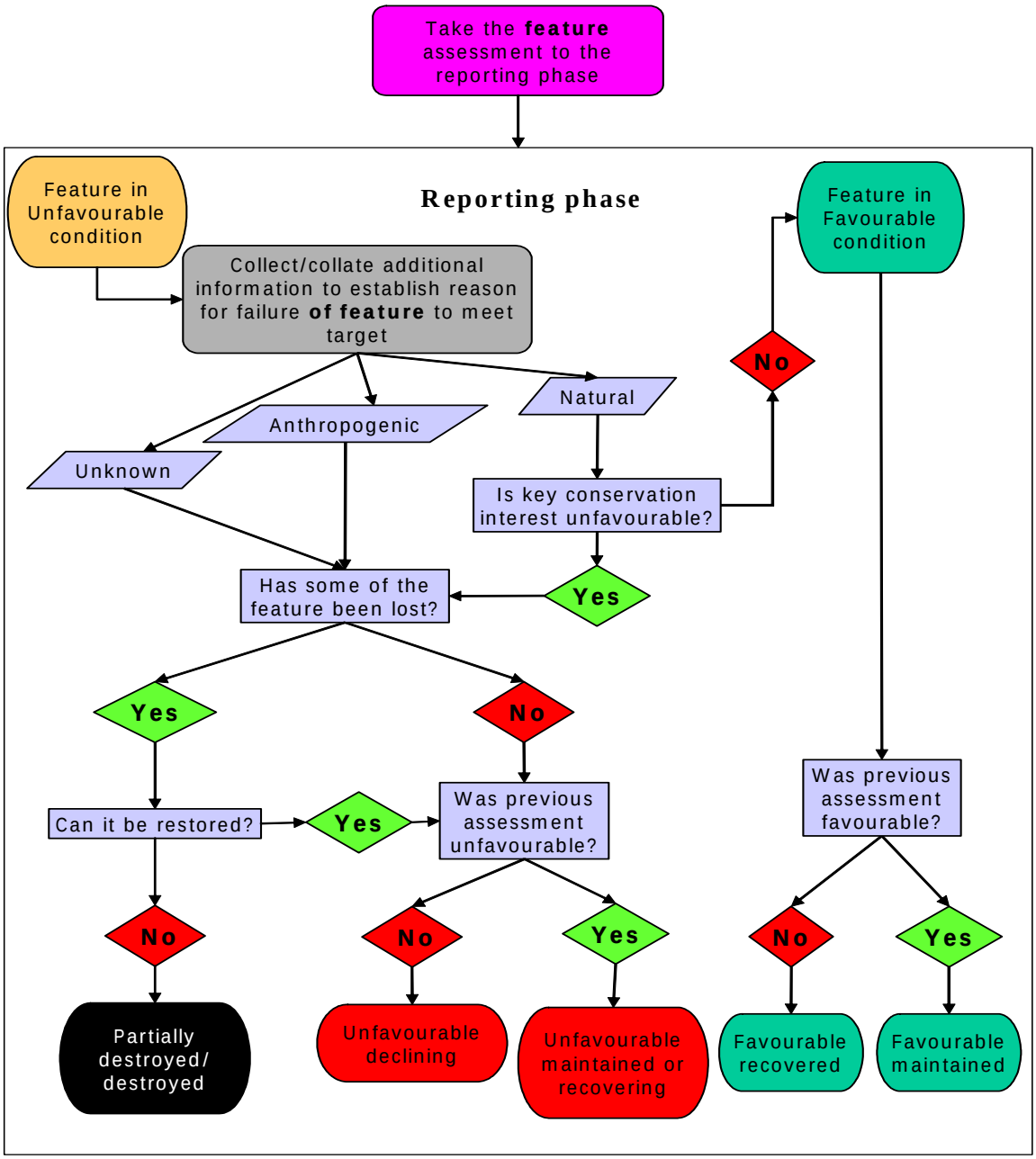
1. **Field Assessment**: Information gathering (from field work & other reviews) to assess the status of an attribute against the target condition to give its 'field status'. This stage can include a review and possible revision of the target condition where there is uncertainty over the validity of the current target, particularly where information from more contemporary studies suggests the original target may be incorrect. Such a revision should help reduce the uncertainty around a target condition. At the end of this stage the attribute condition is aggregated to ascertain the basic condition of the feature as a whole, the "field status", as either favourable or unfavourable. This should be based on the worst attribute assessment or the "default" approach. This process is outlined in the flow diagram (Figure 3).

Figure 3 A suggested decision process to assess the field status of a feature. This field assessment step should be repeated for all attributes that define feature condition.



2. **Reporting**: This next stage takes the process further, whereby the 'field status' is reviewed against previous assessments and other relevant evidence to identify any trend, and/or other information gathered to identify the source of any unfavourable condition to initiate an appropriate management response if necessary. If the reason for judging the field status as unfavourable is clearly demonstrated to be due to natural events adversely influencing one or more attributes, the feature could be declared favourable where the officer is certain that the conservation interest of the feature is not compromised. If one or more attributes were judged unfavourable due to anthropogenic factors then the feature would be declared unfavourable. Once these stages are completed, a final assessment may be completed to establish the 'reporting status'. This process is outlined in the flow diagram (Figure 4).

Figure 4 A suggested decision process to determine the status of the interest feature for reporting.



The reporting phase may take a number of years depending upon the timing of the field studies for the data assessment in the overall six-year reporting cycle. A number of distinct activities are anticipated:

1. Where the field status is deemed *favourable*, the current status should be compared with the previous assessment to establish whether there is any evidence of a trend in the feature's condition. For the first assessment, the current condition should be compared to the most recent information available from other field studies at the site (such as a baseline survey) to determine whether there is any change in the condition. For example, a feature was known to be subject to an adverse anthropogenic activity prior to notification/designation and would have most likely been considered in unfavourable condition. Management action after notification reduced the level of the adverse activity and at the time of the first monitoring cycle the feature was judged as *favourable,* it should be reported as *favourable recovered.*

2. Where the field status is deemed *unfavourable,* additional information must be gathered, or if available analysed to identify the likely cause of the failure and to determine any subsequent management action.

3. Expert judgement must be applied to determine whether the 'default approach' to aggregating the judgements on multiple attributes to give a feature assessment (i.e. one attribute is deemed unfavourable so the entire feature is unfavourable) applies.

4. Where the cause of an *unfavourable* field assessment is linked to a known anthropogenic pressure and appropriate management action has been established to redress this, with evidence of recovery in the feature's condition, the feature should be reported as *unfavourable recovering*.

5. Where the cause of an *unfavourable* field assessment is clearly attributable to an extreme natural event (such as a storm), or a natural dynamic process including climate change, the final assessment will require expert judgement to determine the reported condition. Where there is evidence of recovery towards the target condition following an extreme event, the feature should be reported as *unfavourable recovering.*

6. Assessing the final status of a feature when an attribute was deemed *unfavourable* due to a natural dynamic process will be more complex and it is difficult to give clear, unambiguous guidance at this time. Where a target condition was predicted, for example using a theoretical model (e.g. of estuary hydrodynamics), the current '*unfavourable'* condition might be a function of an imprecise prediction due to a previous lack of data. Reviewing the target condition in the light of new information may assist the final assessment.

7. Where the field status is deemed *unfavourable* and there is a clear loss of the conservation interest from the feature and no hope of its recovery, the feature should be reported as *partially destroyed*. For example, the extent of a saline lagoon is much reduced due to the landward movement of its isolating barrier caused by a change in climatic conditions and reinstatement is not possible.

Applying expert judgement to circumstances where dynamic processes have rendered an attribute unfavourable will undoubtedly create problems with quality assurance and suggestions that judgements are 'fudged' for political reasons. In particular, the departure from the default-based approach to a weighted approach must not be used as an 'opt out' to ignore the *unfavourable condition* of an attribute. Good quality assurance dictates that the decision to use a weighted approach must be fully documented and include the relevant evidence that underpins the down-weighting of an attribute in relation to the conservation interest of the feature.

1.3 Contextual information

The interpretation of evidence from the condition monitoring activity may require access to contextual information, perhaps from a wider geographical area, or over longer time scales. It is important to ascertain that an observed change is a local phenomenon resulting from an activity on a site, and not inherent variability or a nation-wide trend due to some other factor. Although condition assessment will look at the attributes derived from the tables listed at the end of each individual interest feature section, in some cases these may be difficult to interpret without some evidence on supporting processes such as weather or sea temperatures. Information on these factors is often readily available from the Met Office, or other organisations monitoring such factors under other initiatives: see the review of marine observations prepared by the Inter-Agency Committee for Marine Science and Technology (Portmann, 2001). Biological data for similar habitats within the biogeographic region may be available from other surveillance programmes (e.g. National Marine Monitoring Programme) and can be derived from a search of the NBN gateway (**http://www.searchnbn.net**)

Contextual information on factors and other biological surveillance programmes will increase our confidence in the attributes we have identified, confirm that the targets we have set are appropriate and take full account of natural variation. It will also allow us to compare site based trends with national trends, to allow us to understand changes and ensure consistency of judgements at the national level.

2 References

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Portmann, J. E. 2001. *Review of current UK marine observations in relation to present and future needs*. IACMST Information Document No 7. (See http://www.marine.gov.uk)