



**JNCC Report
No: 497**

**Review of marine biodiversity assessment obligations in the UK.
Part II: Identifying similarities and differences between marine biodiversity
assessment obligations**

H. Hinch

March 2014

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ISSN 0963 8901

For further information please contact:

Joint Nature Conservation Committee
Monkstone House
City Road
Peterborough PE1 1JY

www.defra.gov.uk

This report should be cited as:

Hinchen, H. 2014. Review of marine biodiversity assessment obligations in the UK. Part II: Identifying similarities and differences between marine biodiversity assessment obligations, JNCC Report 497, JNCC, Peterborough.

Acknowledgements:

Appendix A of this report was prepared by Rebecca Lowe (JNCC), whose contribution is very gratefully acknowledged. Tables 4 and 5 were taken from a report prepared by Laura Robson (JNCC) and many thanks go to Laura for the use of this work. Thanks also go to Rebecca Lowe and John Weinberg for preparing Table 6 of this report. The author thanks Beth Stoker and Jane Hawkrige (JNCC) for their valuable comments and suggestions throughout the preparation of this report and thanks also go to Neil Ellis and Laura Robson (JNCC) for their editorial contributions. All sources of figures are accredited in the captions.

The purpose of the study

In the context of nature conservation, there are multiple legislative and policy requirements for UK marine biodiversity assessment and reporting at varying geographic scales and covering different aspects of biodiversity. There are also various assessment and reporting requirements that must be met by developers and industry sectors for proposed plans or projects in the marine environment. These requirements include those under the Environmental Liability Directive (ELD¹), Strategic Environmental Assessment (SEA²) Directive, Environmental Impact Assessments (EIAs³) and Appropriate Assessments (AAs⁴). However, the present review considers only the nature conservation requirements for marine biodiversity assessment and reporting.

Currently, there is a large burden (both in terms of time, cost and data collation) associated with carrying out status assessments of marine biodiversity. This has been recently experienced when undertaking assessments such as the UK's Charting Progress 2 and the OSPAR Quality Status Report 2010. One of the consequences of such an approach to assessment and reporting is the need to scale-up staff and financial resources in certain years leading to peaks and troughs in resource requirements. Instead, assessment and reporting should aim for a continuous cycle that fully builds on lessons learnt from previous reporting cycles, and uses non-assessment periods to improve the evidence base and assessment methodologies. This would reduce the time required and potentially the cost during assessment periods. In order to improve the assessment process, and create a more even balance of resource use, it is first necessary to identify and fully understand all the obligations which are driving the need for assessment. Subsequently, it is necessary to analyse if and how their requirements for assessment can be better harmonised and how data collected can deliver against multiple requirements.

This paper is Part II of a series of three that investigates and analyses several national and international legislative and policy instruments, including obligations to assess biodiversity in both Marine Protected Areas (MPAs) and the wider environment. [Part I](#)⁵ is a detailed review and summarises the assessment requirements of each instrument against a standard framework covering 14 aspects (e.g. geographic scope, assessment criteria etc.). The information collated and summarised in [Part I](#) is used to identify areas of similarity and difference between obligations in the present paper. Part II is structured around the standard framework which was used in Part I to summarise the assessment obligations.

Parts I and II together act as reference documents for JNCC, and more widely, to aid the understanding of the overall requirements for marine biodiversity assessment and reporting. They also begin to build a detailed understanding of the relationships between assessment obligations for each of the legislative and policy instruments. Recommendations are subsequently made for streamlining and harmonisation, where possible, in Part III.

The scope of this series of papers does not extend to carrying out a detailed review and analysis of monitoring requirements for each instrument.

¹ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2004:143:0056:0075:EN:PDF>

² <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2001:197:0030:0037:EN:PDF>

³ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2012:026:0001:0021:EN:PDF>

⁴ <http://www.legislation.gov.uk/ukxi/2010/490/contents/made>

⁵ <http://jncc.defra.gov.uk/page-6673>

Executive Summary of Part II

The main conclusions from this document (Part II) are listed below as a high-level summary. Acronyms are spelt out in the glossary, and links to the details of the legislation and policies can be found in [Part I](#)⁶.

- The high-level aspirations of many national and international marine biodiversity assessment obligations broadly aim to achieve clean, safe, productive, healthy and biologically diverse seas and oceans. However, when investigating the detail of these aspirations, the exact environmental quality standards (e.g. GES, FCS) required, the timeframe for achieving them and the primary focus of the instruments (e.g. biodiversity conservation, sustainable use) often differ.
- The geographic scope of the assessment obligations differs considerably, with even the EU Directives covering different parts of the territory of EU Member States and outside (e.g. MSFD marine regions include waters outside the jurisdiction of EU Member States).
- There are issues that need to be resolved in defining the relationships between the reporting scales of several obligations (e.g. Habitats Directive, MSFD, OSPAR and UK Government Vision). The overlap of extended continental shelf areas, MSFD sub-regions, OSPAR regions, UK regional seas and WFD water bodies needs further clarification, as differences can lead to the need to redo assessments and even result in different outcomes for the same species/habitats for the same assessment criteria.
- There are large areas of similarity and difference between the detailed biological scope (in terms of habitats and species) of different obligations. Listed and predominant habitat types show a high degree of congruence across obligations as many habitat types are identified as requiring conservation action/protection at multiple spatial scales. Species covered by various obligations show a lower level of congruence due to the differing focus and scope of many of the obligations (e.g. the EU Birds Directive compared with MSFD).
- Reporting cycles are not well aligned, despite many obligations requiring reporting at intervals of six years.
- The issue of the choice of baseline against which to set environmental targets is vital in the comparison of assessment frameworks for different obligations. Baselines can be set at reference conditions, a past state or current state; obligations use these baselines in a variety of ways. This variation causes issues in defining the relationship between targets across obligations and the level of ambition that is aimed for in marine biodiversity.
- The relationship between status classes in use across obligations is heavily dependent on the choice of baseline. It is not possible to say that status classes are equivalent (e.g. that those for FCS equate to those of GES) without understanding the baseline used to set targets/limits, the spatial scale and the underpinning criteria brought together to make the assessment.

⁶ <http://jncc.defra.gov.uk/page-6673>

- Assessment criteria show numerous similarities across obligations with the most common criteria used to assess habitat status being range, area/extent and condition. The most common criteria used to assess species status are range, population size and condition. However, there are also important differences in assessment criteria (e.g. under MSFD there are 11 descriptors of GES, each with associated criteria, many of which apply to biodiversity components).
- There are a wide range of high- (criterion-) level targets in use across several obligations (e.g. MSFD, HD, OSPAR, CBD, CMS, WFD and the UK Government Vision). These targets are highly varied and are set in relation to a variety of baselines. They reflect aspects of the quality and quantity of biodiversity and pressures that impact it. Differences in spatial scale of targets are also important to consider.
- A range of indicators underpin the criterion level targets of several obligations. However, indicators are often not fully operational or have undefined baselines and targets. Despite this, the indicator systems under OSPAR (EcoQOs) and the WFD are well defined and other systems are currently developing. Indicator availability for benthic habitats is particularly lacking.
- There are few robust targets set for biodiversity indicators across the obligations. Some indicator targets are well established and therefore used across multiple obligations (e.g. 30% of fish in the North Sea should be more than 40cm in length.) Overall, indicator targets are poorly developed at this point, especially for benthic habitat components as long term data which can elucidate natural variability (and therefore allow ecologically meaningful targets to be set) are sparse.
- Different approaches to aggregating data to produce an overall assessment are used across obligations. Aggregation can occur across spatial scales to produce larger scale assessment results (e.g. Habitats Directive and also across the criteria or indicators monitored in order to assess a habitat type or species status (e.g. CMS). Finally, some obligations aggregate across multiple biological components to give an overall assessment at a more integrated level (e.g. WFD).
- The most-common approach for producing an overall assessment of biodiversity status at any spatial scale is the 'one-out, all-out' approach (i.e. the worst assessment results for any criterion or biological component is taken as the overall assessment result). Several obligations are yet to define an overall assessment approach (e.g. MSFD), but it is likely that a more-sophisticated method will be required to assess biodiversity at large spatial scales, and taking into account a wide range of descriptors of status, for example.

Contents

Review of marine biodiversity assessment obligations in the UK.	
The purpose of the study	
Executive Summary of Part II.....	
1 Identifying areas of similarity and difference between obligations	1
1.1. Aspect 1 – High-Level Aspirations	1
1.2. Aspect 2 - Assessment requirement	4
1.3. Aspect 3 – Geographic scope.....	6
1.4. Aspect 4 – Reporting scale.....	9
1.5. Aspect 5 – Biological Scope	16
1.6. Aspect 6 – Reporting cycle frequency	23
1.7. Aspect 7 – Baselines used	24
1.8. Aspect 8 – Assessment status classes	28
1.9. Aspect 9 – Assessment criteria	31
1.10. Aspect 10 – Criterion targets	35
1.11. Aspect 11 – Assessment indicators (attributes)	45
1.12. Aspect 12 – Indicator targets/thresholds.....	50
1.13. Aspect 13 – Aggregation rules.....	55
1.14. Aspect 14 – Overall assessment approach.....	57
2 References	59
3 Glossary	60
Appendix A - Map showing the relationship between different marine region boundaries (interactive pdf, to view and change map layers, click 'layers' icon on left hand side of pdf)	62

1 Identifying areas of similarity and difference between obligations

[Part I](#)⁷ of this JNCC report summarises the assessment obligations of several national and international legislative and policy instruments against a standard framework containing 14 aspects for consideration (see Part I, table 1 therein). The identification of areas of similarity and conflict across the instruments in the present document (Part II) is also based on this standard framework. Part II takes each aspect of the assessment framework in turn and identifies where similarities and differences occur across the legislative and policy instruments. Any discussion of important issues which have arisen during the comparison of obligations is included in the relevant section (i.e. similarities or differences, as appropriate). The starting point for the analysis is the high-level summary table (Table 1) produced for [Part 1](#).

1.1. Aspect 1 – High-Level Aspirations

1.1.1 Similarities

Analysis of the information about high-level aspirations given in the summary table reveals a broad overlap in the biodiversity and environmental quality aspirations of the legislative and policy instruments considered.

At the highest level, the four relevant EU Directives are striving to achieve and maintain a 'good' or 'favourable' status for the marine environment, which is defined in terms of the conservation of habitats, species and a wider range of environmental parameters. The international conventions are concerned with conserving biodiversity, eliminating marine pollution, protecting vulnerable migratory species and ensuring the exploitation of marine resources does not compromise conservation of the environment. UK legislation and policy mechanisms further support these aspirations by articulating goals for the protection of particularly rare, vulnerable or ecologically important species and habitats, making provisions for spatial protection measures and promoting the sustainable use of resources within a framework of robust marine spatial planning.

Having considered the overarching ambitions of the instruments covered by the present review, it is clear that all broadly aspire to achieve clean, healthy, safe, productive and biologically diverse oceans and seas, at their respective spatial scales. The aspirations are also similar in that they are ambitious in their desired quality for the marine environment. Key areas of synergy identified across high-level aspirations have been summarised in Table 1, below.

⁷ <http://jncc.defra.gov.uk/page-6673>

Table 1. Showing which key areas of synergy relating to high-level aspirations are covered by which obligations. References for the various obligations can be found in Part I of this series of three papers.

Obligation	Key area of synergy						
	Maintain biodiversity	Protect specific habitats/species	Achieve environmental quality standard	Prevent pollution	Establish/support MPAs	Recover degraded systems	Achieve sustainable use
Marine Strategy Framework Directive	✓		✓	✓	✓	✓	✓
Habitats Directive	✓	✓	✓		✓	✓	✓
Birds Directive		✓			✓	✓	
Water Framework Directive	✓		✓	✓	✓	✓	✓
Convention on Biological Diversity	✓			✓	✓	✓	✓
OSPAR Convention	✓	✓		✓	✓	✓	✓
Convention on Migratory Species		✓					
UN Convention on the Law Of the Sea				✓			✓
Wildlife and Countryside Act		✓			✓		
Conservation of Seals Act		✓					
Marine and Coastal Access Act					✓		
Marine Scotland Act					✓		
High Level Marine Objectives							✓
UK Government Vision	✓			✓			✓
Marine Policy Statement							✓

1.1.2 Differences

Although the broadly described aspirations of each obligation appear quite similar, differences arise when these aspirations are considered in greater detail. Across the four relevant EU Directives (see Table 1), there are differences in the environmental quality standard which needs to be reached and how this is defined. Additionally, due to the fact that the MSFD and WFD are 'Framework Directives', they act to bring together a wide range of existing environmental legislation and fill any gaps, as required. This can result in differences in breadth of scope across Directives, with Framework Directives often having a broader scope.

Good Environmental Status (GES) under the MSFD is defined as when 'the structure, functions and processes of the constituent marine ecosystems, together with the associated physiographic, geographic, geological and climatic factors, allow those ecosystems to function fully and to maintain their resilience to human-induced environmental change. Marine species and habitats are protected, human-induced decline of biodiversity is prevented and diverse biological components function in balance'. More specifically, GES is articulated in terms of 11 qualitative descriptors identified in Annex I of the Directive. These descriptors cover many aspects of the marine environment (e.g. integrity of the sea floor, contamination, noise levels) and set out high-level qualitative descriptions of what 'good' status looks like for each (e.g. 'Descriptor 1: Biological diversity is maintained. The quality and occurrence of habitats and the distribution and abundance of species are in line with prevailing physiographic, geographic and climatic conditions'). The descriptor framework provides a holistic approach to assessing the marine environment as it covers a very wide range of biodiversity components and pressures which may affect these components.

Conversely, Favourable Conservation Status (FCS) under the Habitats Directive is defined in specific terms relating to the long term maintenance of particular habitats and species of Community interest. There is a requirement for the designation of Special Areas of Conservation (SACs) to enable FCS to be achieved for the listed habitats and species through the Natura 2000 network. This network also comprises the Special Protection Areas (SPAs) designated under the Birds Directive, where a similar concept of FCS for wild bird populations can be said to exist (although it is not explicitly articulated within the Directive).

Furthermore, Good Ecological Status (GEcS) under the Water Framework Directive (WFD) is defined in a very precise way within the Directive. Table 1.2 states that GEcS is achieved when 'the values of the biological quality elements for the surface water body type show low levels of distortion resulting from human activity, but deviate only slightly from those normally associated with the surface water body type under undisturbed conditions'. The WFD framework splits the aquatic environment into its constituent parts (e.g. biological quality elements such as phytoplankton, fish etc.) and addresses each as a separate entity, before bringing the aspects together to assess the ecological status. This is a slightly different approach to that adopted under the MSFD, which strives for a holistic assessment of marine environmental status across entire marine regions, using a set of 11 descriptors which are further broken down into criteria which underpin the assessment of GES.

Therefore, the subtle differences in defining the terms 'good' and 'favourable' across these EU Directives (which will be discussed further as the detailed aspects of the assessment obligations are compared) mean that it is difficult at this stage to identify the exact relationship which exists between them as environmental aspirations (see Figure 1). As the frameworks that underpin these high-level aspirations are further analysed in the sections below; the relationships between them (and the difficulties involved in defining these relationships) will become clearer.

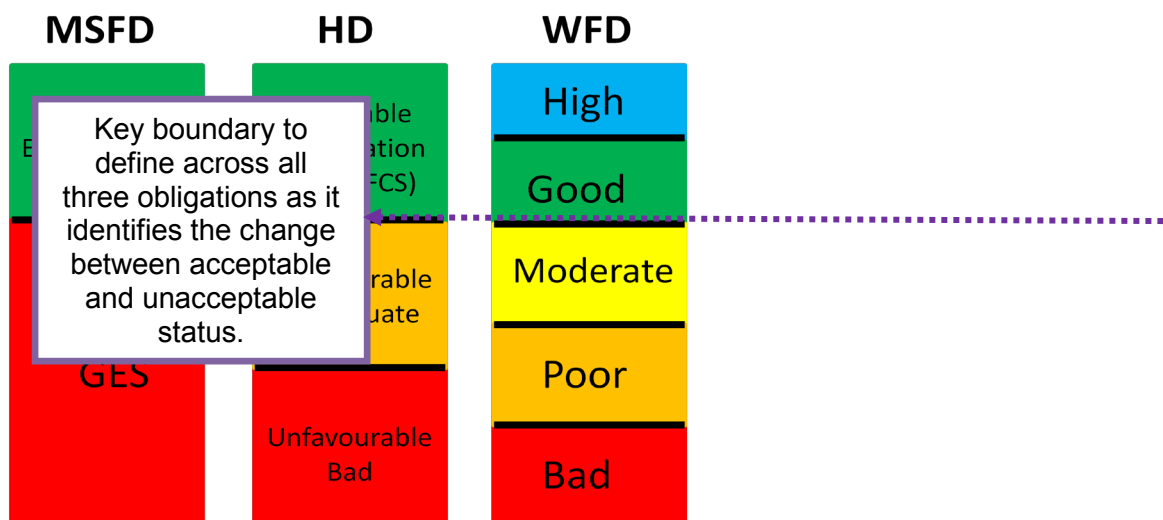


Figure 1. An illustration of the possible equivalency of quality goals and thresholds between ‘good’ and ‘not good’ status across three EU Directives, despite the different numbers of status classes within each.

Looking across all of the obligations, differences in high-level aspirations can be identified when considering the primary focus of the legislation or policy instrument (i.e. biodiversity conservation versus sustainable use of resources). For example, the Habitats Directive, Convention on Migratory species and Conservation of Seals Act are (for various reasons) more firmly focused on the conservation of species and habitats. In contrast, it could be argued that the MSFD, CBD and UK Marine Policy Statement have a stronger focus on planning processes and sustainable use of resources, whilst ensuring that marine ecosystems are not degraded by human activities and pressures. Further interpretation of this kind is often carried out when EU legislation is transposed into the national law of each Member State and implemented (although the transposed national law must comply fully with the objectives and requirements of the EU legislation).

Finally, there are substantive differences in the timescales over which the high-level aspirations of each obligation need to be achieved. Some obligations stipulate that a certain quality standard needs to be achieved by a certain date (e.g. GES under the MSFD by 2020 and GECS under the WFD by 2015). However, no other obligations considered in the review articulate a timeframe by which a required environmental standard needs to be achieved. This may cause discrepancies when a single habitat or species falls under multiple obligations, where these have conflicting timescales for achieving their objectives. Conversely, adhering to the most stringent timescales may provide an impetus for implementing measures which would contribute to reaching the objectives of other obligations that apply to the same feature (e.g. habitats covered by both the MSFD and WFD).

1.2. Aspect 2 - Assessment requirement

1.2.1 Similarities

Almost all of the obligations considered stipulate a requirement for an assessment to be made relating to the relevant biodiversity components. The current exceptions to this are the Conservation of Seals Act and the policy instruments; High Level Marine Objectives (HLMOs), the Marine Policy Statement (MPS) and the EU Biodiversity Strategy (although the EUBS will ultimately have an assessment requirement related to Mapping and Assessment

of Ecosystems and their Services (MAES)). The HLMOs, MPS and EUBS are non-legally binding instruments and therefore do not articulate any formal requirements for assessments to be undertaken by those parties who have agreed to adopt them. The Conservation of Seals Act is a legal instrument but it does not stipulate any requirement for an assessment of seal species or population status, only for advice on management to be provided to Government.

Any formal assessment requirement is often articulated in terms of producing a report (to be submitted to the relevant authority) which describes the actual status of biodiversity (e.g. under the MSFD, OSPAR Convention and UK Government Vision). Alternatively, the requirement is articulated in terms of reporting on the implementation of national provisions taken to meet the obligation (e.g. the Habitats and Birds Directive, CBD, CMS).

However the requirement is articulated, it is clearly important that assessments are made periodically under each obligation in order to report on the effectiveness of the obligation in achieving its aspirations for the marine environment.

1.2.2 Differences

The exact details of the assessment requirement under each obligation differ considerably. Firstly, there are differences in which body or authority the assessment needs to be submitted to. For example, under the MSFD, reporting to the European Commission is required, whereas reporting under International Conventions tends to be to the Conference of the Parties (COP) to the Convention. Assessments made under UK legislation are reported to the Secretary of State or the appropriate legislator, for example, Scottish Parliament. Policies and policy instruments often have no formal assessment requirement and no legally binding obligation to report to a particular authority.

The details of what is being assessed and reported on also differ across obligations (this will be expanded on further as the aspects of the assessment framework for each obligation are analysed). Several obligations have a more outcome-orientated assessment and reporting requirement (e.g. directly assessing the changing status and trends in marine biodiversity). This can be seen in the requirements of the MSFD, Habitats and Birds Directives, the Wildlife and Countryside Act review of Schedules 5 and 8 and the OSPAR Convention, for example. Conversely, several obligations are more focused on reporting on the measures that have been established for implementation and the link to positive (or negative) changes in the status of biodiversity components is less clear. This approach has been a feature of reporting under the CBD which is now being addressed by the COP with a push towards more outcome orientated reporting. It can also be seen in the assessment requirement of the CMS which states that 'Parties which are Range States for migratory species... should inform the COP... at least six months prior to each ordinary meeting of the Conference, on measures that they are taking to implement the provisions of this Convention for these species'.

Clearly there are also considerable differences in the geographic and temporal scales that are covered by the assessment requirements for each obligation. This can be seen when comparing the regional scale (e.g. North-East Atlantic) assessment requirement of the MSFD with the protected site scale assessments required under the Marine and Coastal Access Act 2009, for example.

1.3. Aspect 3 – Geographic scope

1.3.1 Similarities

There is a clear relationship between the geographic scope of the four European Directives, as they all apply to various parts of the territories of the Member States of the European Union.

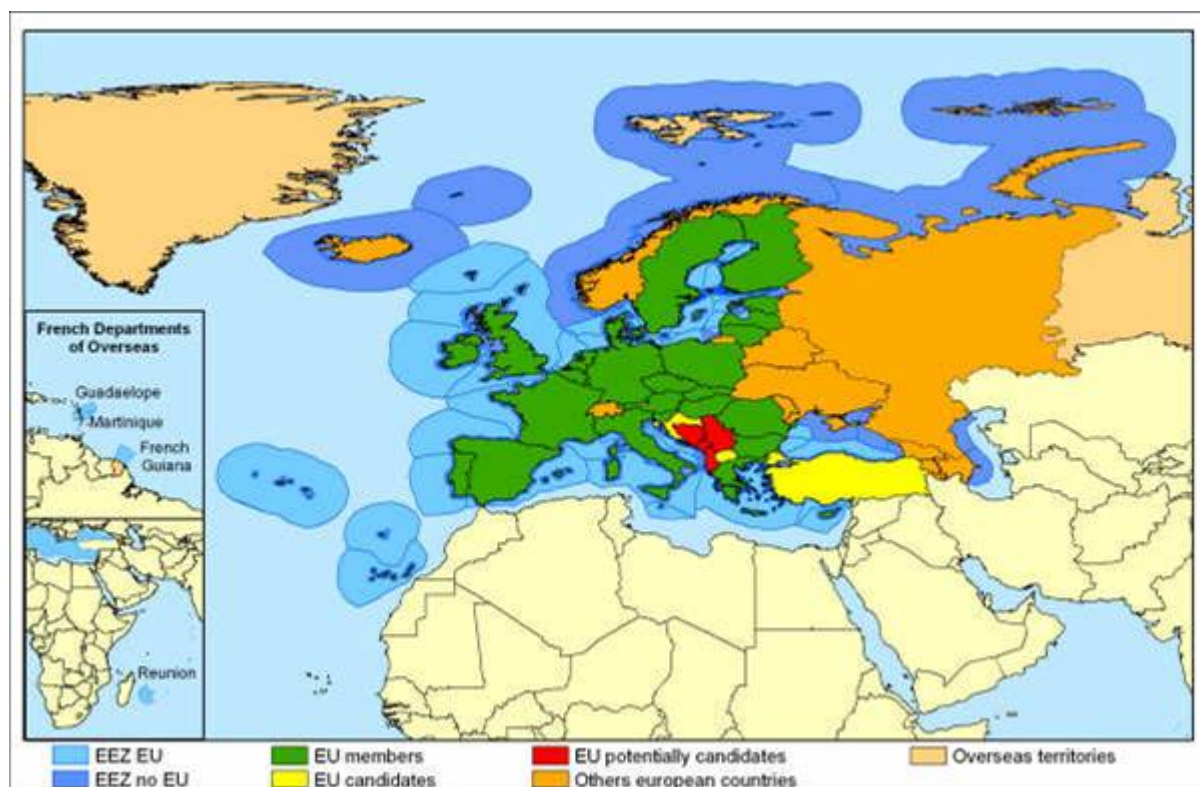


Figure 2. Showing EU Member States and the EU Exclusive Economic Zone (taken from <http://www.eurocean.org>).

The MSFD and Habitats (and Birds) Directive cover similar areas of the European marine environment as they extend from a baseline (which differs, see below) out to the Exclusive Economic Zone (EEZ) and extended continental shelf area (where claimed) of Member States (see Figure 2). Similarly, the EU Biodiversity Strategy covers the entire territory (terrestrial, fresh water and marine) of EU Member States. The OSPAR Convention applies to the North-East Atlantic maritime area; a region falling partly within the EU marine area (see Figure 4, below), although the OSPAR region covers waters outside of EU Member States.

The other international conventions considered have a global scope, applying within the jurisdictional limits of between 116-193 Contracting Parties. For the Convention on Migratory Species, any range state of a migratory species is bound by the provisions of the Convention.

The UK policies and policy instruments considered apply to the entire UK marine area. UK legislative instruments cover various parts of the UK marine area due to the devolved nature of many biodiversity and nature conservation responsibilities.

1.3.2 Differences

Although there is a relationship between the geographic areas covered by the four EU Directives, they each apply to different specific areas within the EU territory.

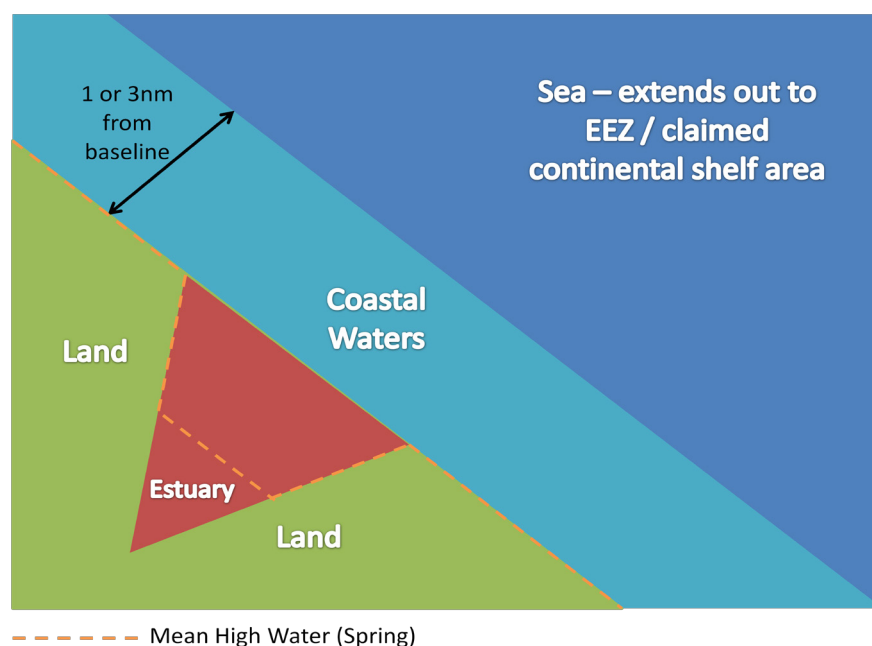


Figure 3. Showing theoretical areas of land (green), estuary (red), coastal waters (light blue) and sea (dark blue) to illustrate the different geographic areas covered by EU legislative instruments.

Using Figure 3 as an illustrative example, the WFD applies to the most-restricted geographical area. Transitional waters are covered by the Directive, that is, estuarine waters (red triangle) that are partly saline, but substantially influenced by freshwater flows. Coastal waters (light blue strip) are also covered by the WFD out to 1nm (3nm in Scotland) from the baseline (and extended, where appropriate up to the outer limit of transitional waters), with chemical status assessed out to 12nm. Transitional and coastal waters are the only marine waters covered by the provisions of the WFD.

In contrast, the MSFD applies only to WFD coastal waters (light blue strip) and the sea area (dark blue triangle) out to the EEZ/extended continental shelf area. Transitional waters are therefore excluded from the provisions of the MSFD. It is also clear within the text of the MSFD that only those aspects of GES that are not already covered by the WFD will be assessed under MSFD in coastal waters. For those aspects which are covered by both WFD and MSFD, relevant WFD targets and indicators should be used to inform both obligations.

The Habitats (and Birds) Directive applies to the entire EU territory, that is, across the land area (green), all transitional waters (red), coastal waters (light blue) and the sea area (dark blue). This is equivalent to the area covered by the EU Biodiversity Strategy.

Compared to the European marine area, the OSPAR Convention applies to the North-East Atlantic Ocean region (see Figure 4), some of which falls within the maritime area of the EU.

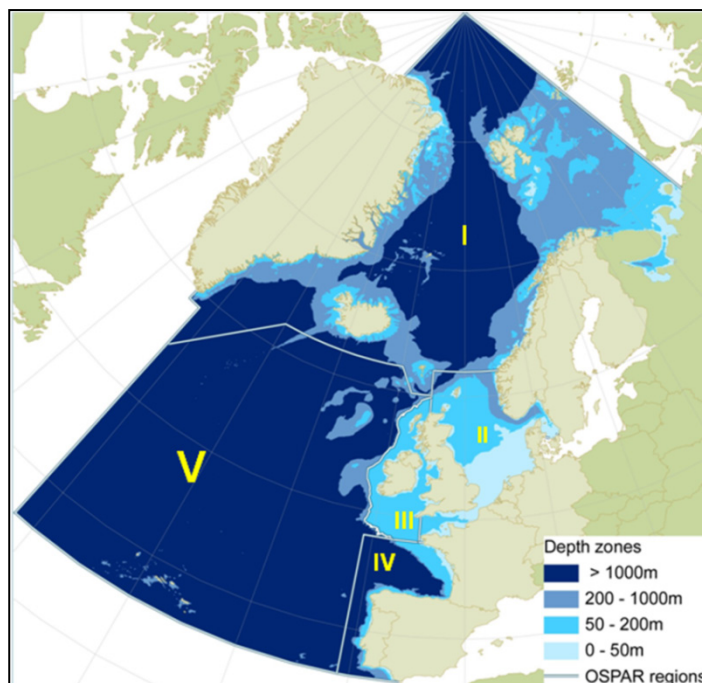


Figure 4. Map showing the five OSPAR regions of the North-East Atlantic. Region I – Arctic Waters, Region II – Greater North Sea, Region III – Celtic Seas, Region IV – Bay of Biscay and Iberian Coast, Region V – Wider Atlantic.

The OSPAR region, however, includes some waters that fall outside the EU marine area (i.e. Norway, Iceland and areas beyond national jurisdiction) as it extends well outside the 200 nm limit. It also excludes some waters which fall within the EU marine area (i.e. the Baltic Sea, the Mediterranean Sea and the Black Sea).

Looking across UK legislative instruments, there are differences in the geographic areas which are covered by each obligation. These differences are summarised in Table 2.

Table 2. Showing that the four UK legislative Acts apply across different geographic areas within the UK marine area.

Obligation	Geographic area covered by obligation				
	Territory of England (out to 12nm)	Territory of Scotland (out to 12nm)	Territory of Wales (out to 12nm)	Territory of Northern Ireland (out to 12nm)	UK Offshore area (12-200nm)
WCA	✓	✓	✓	Wildlife Order 1985	
CSA	✓		✓		
MCAA	✓		✓		✓
MSA		✓			

1.4. Aspect 4 – Reporting scale

1.4.1 Similarities

Both the MSFD and Habitats Directive are applied at the regional scale within the EU marine environment. Four marine regions and several sub-regions are defined in the MSFD (Article 4) with Member States required to develop marine strategies in respect of each marine region or sub-region. The Habitats Directive identifies five marine regions for assessment and reporting to complement the feature scale reporting which is required at the Member State level within each biogeographic region (akin to reporting required under the Birds Directive). The HD marine regions largely correspond to the four marine regions of the MSFD with the exception of the Macaronesian marine region which is treated as a distinct marine region under the Habitats Directive but is incorporated into the Atlantic region under the MSFD (see Table 3). However it should be noted that the regional boundaries do not coincide in the Kattegat area between the North and Baltic Seas, and that other MSFD region and sub-region boundaries remain to be defined so there may be further areas of overlap and conflict. The OSPAR Convention is also applied at the regional scale and has been chosen by Member States as the mechanism for regional coordination of marine strategies in the MSFD North-East Atlantic marine region (see Table 3).

Table 3. The regions and sub-regions defined under the MSFD, HD and OSPAR Convention

MSFD regions and sub regions (precise boundaries have yet to be defined)	Habitats Directive marine regions	OSPAR (Region I – Arctic Waters excluded)
North-East Atlantic Ocean <ul style="list-style-type: none"> - Great North Sea including the Kattegat and the English Channel - The Celtic Seas - The Bay of Biscay and the Iberian coast - In the Atlantic Ocean, the Macaronesian biogeographic region being the waters surrounding the Azores, Madeira and the Canary Islands 	} Atlantic } Macaronesian	North-East Atlantic <ul style="list-style-type: none"> - Greater North Sea (II) - Celtic Seas (III) - Bay of Biscay and Iberian Coast (IV) - Wider Atlantic (V)
Black Sea	Black Sea	N/A
Baltic Sea	Baltic	N/A
Mediterranean Sea <ul style="list-style-type: none"> - The Western Mediterranean Sea - The Adriatic Sea - The Ionian Sea and the Central Mediterranean Sea - The Aegean-Levantine Sea 	} Mediterranean	N/A

Figures 5, 6 and 7, show maps of the regions used for reporting under the Habitats Directive, MSFD and OSPAR Convention (a map of OSPAR regions is shown in Figure 4, above).

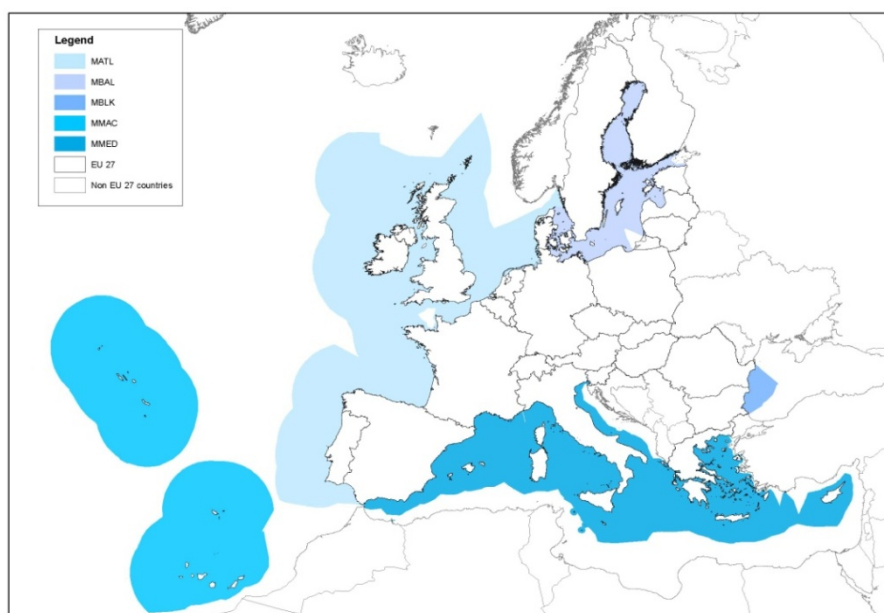


Figure 5. The five EU marine regions defined for Article 17 reporting under the Habitats Directive. From lightest blue to darkest blue: MATL – Atlantic region, MBAL – Baltic region, MBLK – Black Sea region, MMAC – Macronesian region, MMED – Mediterranean region.



Figure 6. Draft map of the regional and sub-regional seas of Europe, according to those specified in the MSFD⁸.

⁸ March 2012 draft map of the MSFD marine regions and sub-regions. For the North-East Atlantic region, outer boundaries are indicated for the sub-regions listed in the Directive, without addressing the remaining parts of the overall marine region (e.g. waters in the Iceland Sea, Norwegian Sea and Barents Sea). For the purpose of this map, all EEZ boundaries shown are indicative only and are subject to an on-going consultation with Member States. The areas currently shown follow the boundaries of EEZ or other maritime zones where MS exercise sovereign rights or jurisdiction (such as fisheries zones). In addition, in relation to the seabed and subsoil, it will

As mentioned above (and from a UK perspective), regional implementation of the MSFD in the North-East Atlantic region is being coordinated through the OSPAR Convention. OSPAR Region I (Arctic waters, see Figure 4) is not covered by the MSFD, however, the sub-regional boundaries under MSFD are broadly similar to those under OSPAR (although there will be significant differences in the boundaries where jurisdictional limits of Member States' waters extend much further west than is covered by MSFD competency – see Figure 7).

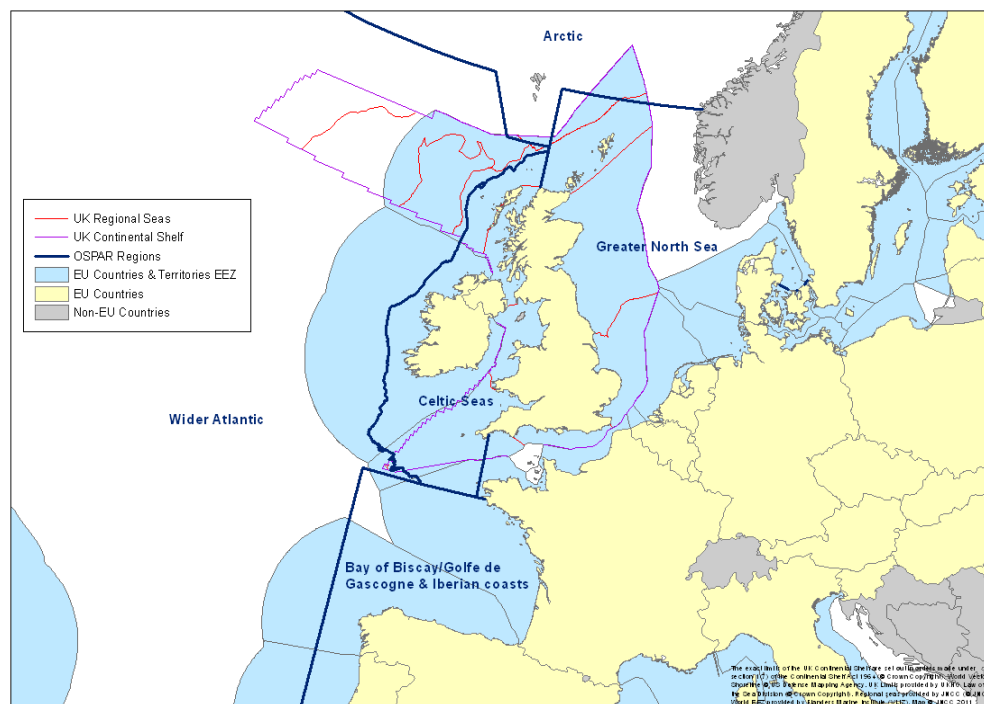


Figure 7. Indicative map showing geographic scope of MSFD for UK waters (Continental Shelf areas) and for other countries (EEZs; in light blue). The MSFD subregions (dark blue text) are likely to broadly equate to the OSPAR Regions (dark blue thick lines) but there are significant differences where the jurisdictional limits (i.e. EEZs, CSs) extend farther west. The OSPAR Arctic sub-region may not be covered by MSFD [boundaries yet to be agreed; subject to change. Map © JNCC, 2011].

The UK Government Vision also takes a regional approach to reporting, identifying eight marine regions within UK waters to assess biodiversity status (see Figure 8).

be necessary to consider the full extension of the continental shelf, in cases where a submission has been submitted to the UN Commission on the Limits of the Continental Shelf for the delimitation of the boundaries of the continental shelf (Source for EEZ: <http://www.vliz.be/vmdcdata/marbound/download.php>).

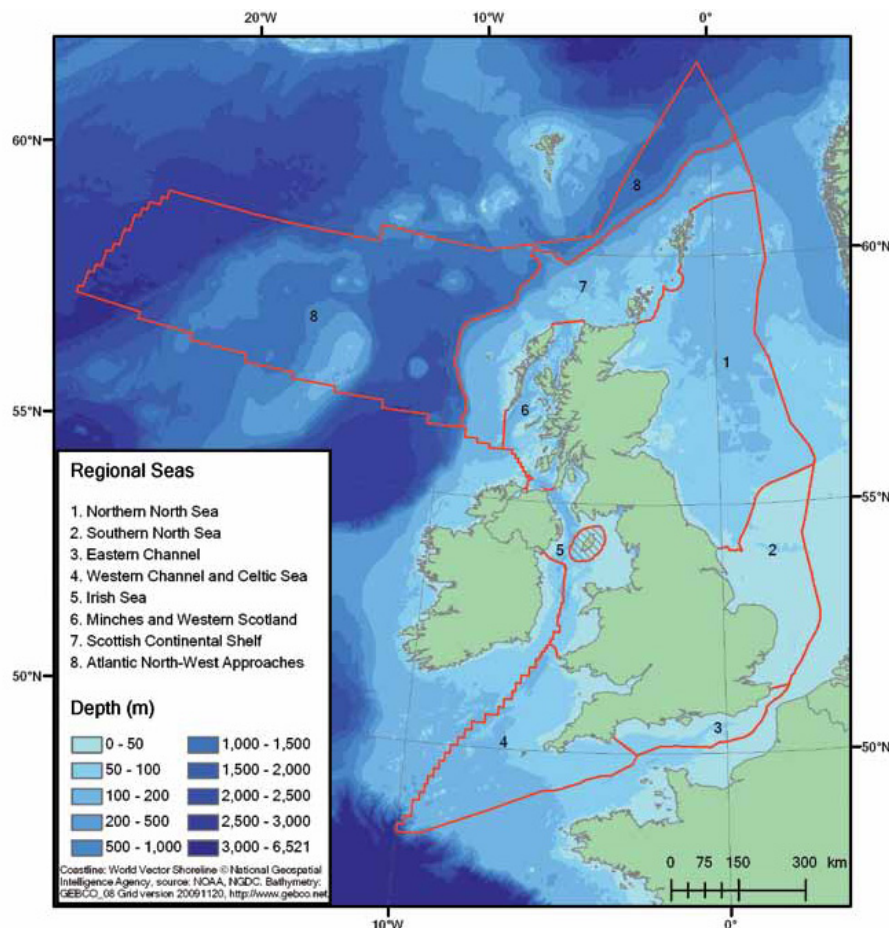


Figure 8. Map showing the eight regional seas used within the Charting Progress 2 assessment process under the UK Government Vision.

Several of the international marine biodiversity assessment obligations are reported at the scale of EU Member States or Contracting Parties, such as the Birds Directive where the European Commission then produces a composite report; the WFD, where reports on status of each water body are produced at Member State level; and the CBD, CMS and UNCLOS.

The WCA, MCAA and MSA all require reporting to be carried out at the protected site level, with the MCAA and MSA also requiring reporting at the scale of the entire protected sites network.

1.4.2 Differences

It is evident that there are significant differences in the reporting regions (and subregions) which have been identified under the MSFD, Habitats Directive and OSPAR Convention. Firstly, the Habitats Directive requires reporting on the conservation status of features (habitats and species) at the scale of each feature within each biogeographic region of the Member State's waters before a composite regional assessment is then produced by the European Commission. This is in contrast to the reporting required under the MSFD, which will be undertaken by Member States but the overall biodiversity assessments will need to be regionally focused. In terms of the marine regions which have been defined, it is evident from comparing Figures 5, 6 and 7 that the Habitats Directive identifies large scale EU marine regions only, whereas the MSFD and OSPAR define subregions⁹. This can be seen

⁹ All regions and subregions under MSFD, HD and OSPAR are defined based on biogeographic factors

more clearly in Table 3 (above), which also highlights the difference in the North-East Atlantic region between the MSFD and Habitats Directive, with respect to the Macaronesian marine area.

Furthermore, the MSFD marine regions and subregions shown in Figure 6 also include those areas which go beyond EU Member State waters. The boundaries have been set in this way because Article 4(1) of the Directive states that Member State marine waters ‘form an integral part’ of the marine region (but it is not restricted to them). It also fits with the general approach to co-operate across the region/sub-region to achieve the aims of the Directive. Therefore, the MSFD marine regions cover a greater area of sea than the Habitats Directive marine regions.

For MSFD purposes, the subregional boundaries have been set (where possible) at the existing boundaries of the relevant Regional Seas Conventions (e.g. Barcelona Convention for the Mediterranean Sea¹⁰). However, for the North-East Atlantic region, the OSPAR Convention boundaries are somewhat different to those set under MSFD (see Figure 7). Outer boundaries for the North-East Atlantic under the MSFD (shown in Figure 6) are indicated only for the sub-regions listed in the Directive, without addressing the remaining parts of the overall OSPAR marine region (e.g. Region I waters in the Iceland Sea, Norwegian Sea and Barents Sea). The MSFD regions currently shown in Figure 6 follow the boundaries of EEZ or other maritime zones where MS exercise sovereign rights or jurisdiction (such as fisheries zones). In addition, in relation to the seabed and subsoil, it will be necessary to consider the full extension of the continental shelf, in cases where a submission has been submitted to the UN Commission on the Limits of the Continental Shelf for the delimitation of the boundaries of the continental shelf. The final MSFD regional and subregional boundaries are subject to further change and agreement (e.g. Ireland are yet to submit a set of boundaries for their waters), however, in the North-East Atlantic region, there will be significant differences where OSPAR regions extend much farther west than MSFD competency.

Under the UK Government Vision, the Charting Progress II assessment (2010¹¹) defined eight UK marine regions for reporting purposes. These eight regions (see Figure 8) were used to report against the requirements of the MSFD initial assessment in July 2012. However, UK marine region 8 extends across the entire claimed UK continental shelf area, which currently extends farther west than the MSFD Celtic Seas subregion. This discrepancy will need to be addressed in the final delineation of the MSFD regions (as mentioned above). The eight UK regional seas will also be aggregated to produce assessments that are relevant at the scale of the Greater North Sea and Celtic Seas for MSFD purposes (see Figure 9). Figure 10 shows the relationship between several marine regions which are relevant to UK waters. The MSFD region and sub-region boundaries are not yet finalised and so are not included in Figure 10. Appendix A contains an interactive pdf of this map which allows the layers to be manipulated so that the relationships and overlaps between boundaries can be seen more easily.

¹⁰ http://europa.eu/legislation_summaries/environment/water_protection_management/l28084_en.htm

¹¹ <http://chartingprogress.defra.gov.uk/report/CP2-OverviewReport-screen.pdf>

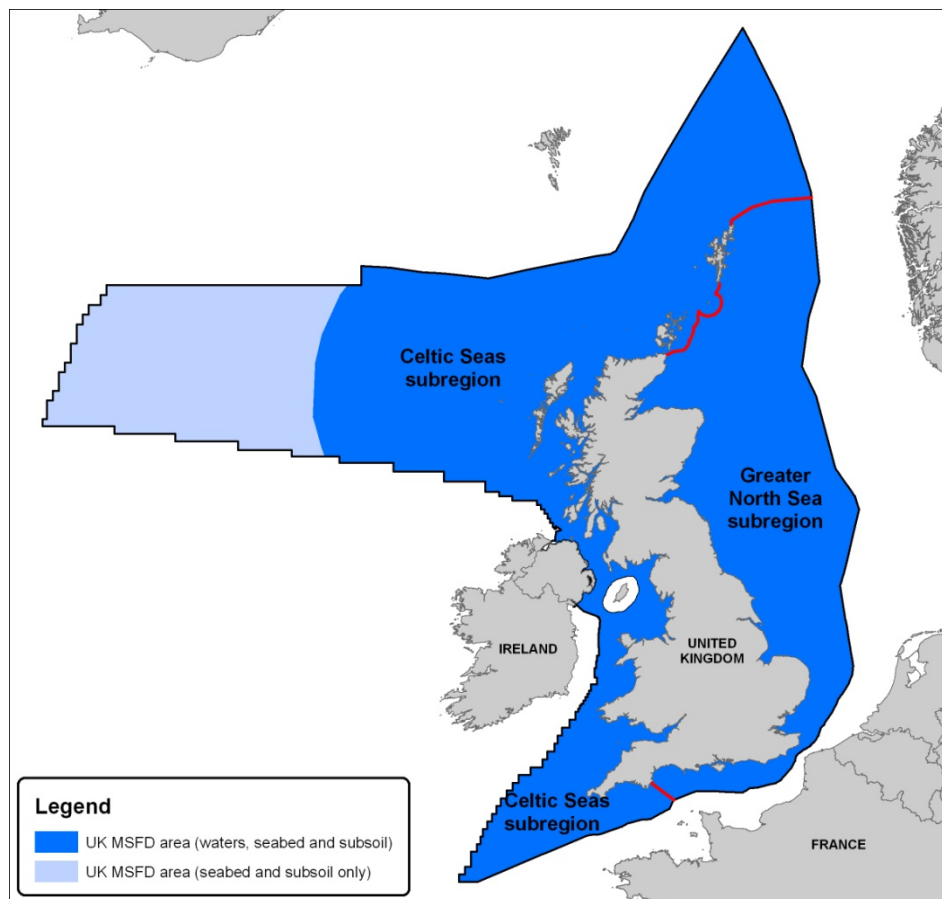


Figure 9. Showing the MSFD subregions that will be assessed as part of UK waters. CP2 regions which contribute to the Greater North Sea subregion are CP2 areas 1, 2 and 3. Those contributing to the Celtic Seas subregion are CP2 areas 4, 5, 6, 7 and 8. Figure taken from HM Government 2012.

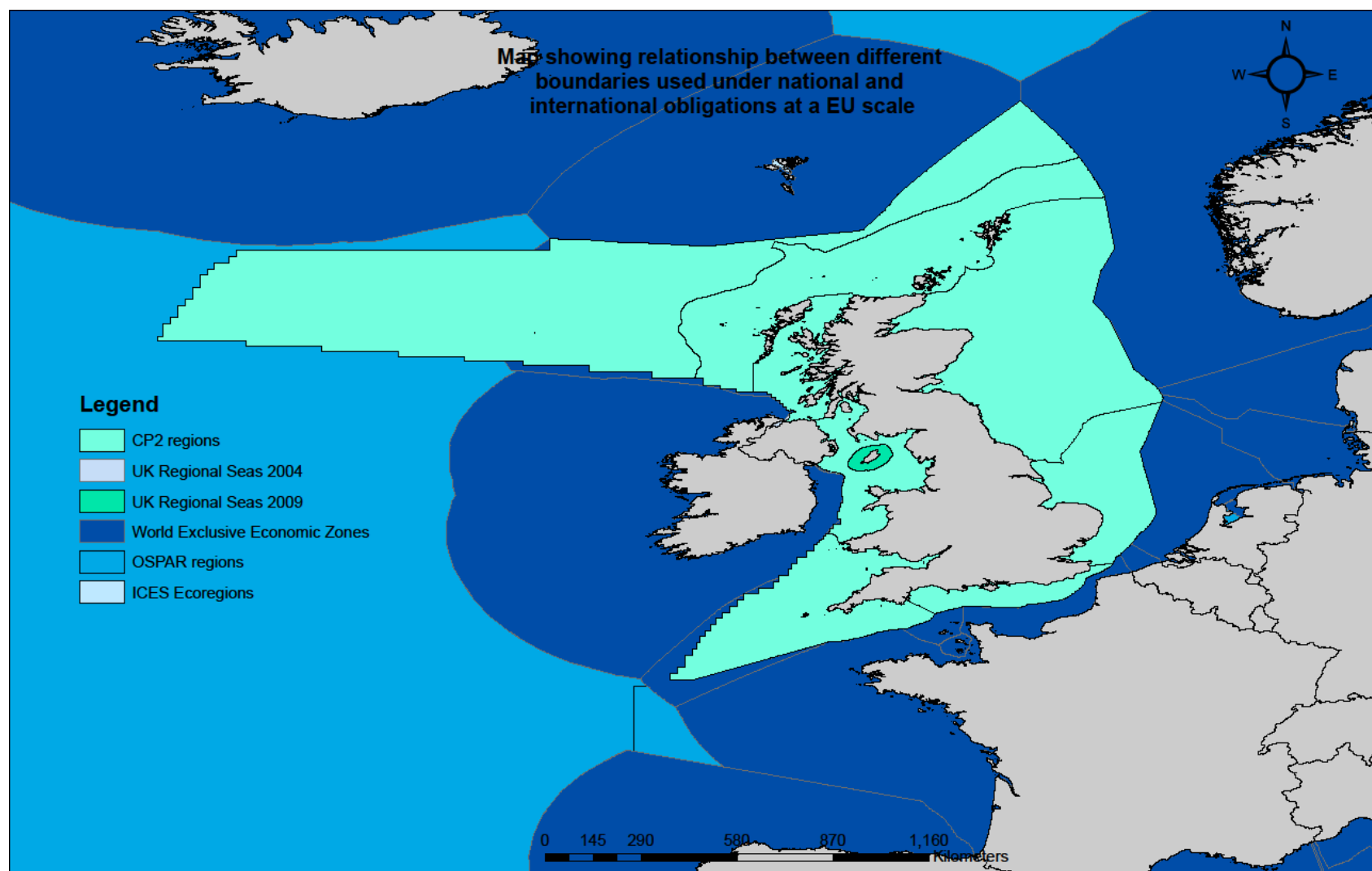


Figure 10. Map showing the relationship between different marine region boundaries used under different national and international obligations at an EU scale (for an interactive pdf version of this map, please see Appendix A).

Reporting under the WFD is carried out for each individual water body within each River Basin District of the Member State. For the purposes of this review, the WFD waters of interest are those in the transitional and coastal categories. As illustrated in Figure 3 above, WFD transitional waters are excluded from MSFD consideration but are covered by the Habitats Directive (e.g. estuaries are a listed marine physiographic feature under the Habitats Directive). WFD reporting scales are therefore much smaller than for the MSFD, Habitats Directive and the OSPAR Convention. In order for WFD assessments to feed into larger-scale assessments, waterbody assessment results will be integrated (through an aggregation process) into assessments of the same, or equivalent, features (or more broadly defined features of which they form a constituent part) which need to be produced at larger spatial scales. It is noted in the WG-DIKE paper(2012), DIKE 5/2012/08 that the European Environment Agency (EEA) will align river-basin catchment areas to the final MSFD region/subregion boundaries.

The various UK legislative instruments require reporting at different spatial scales, for example, individual protected site (i.e. SSSI, MCZ or MPA); national waters (e.g. English territorial waters); protected sites network; UK waters. These instruments divide UK waters into various spatial scales for reporting (e.g. the MCAA covers only English inshore waters and UK offshore waters and will form a network of MPAs across this marine area). This is due to the devolved nature of many nature conservation responsibilities within the UK (see Table 2, above).

Finally, some UK and international instruments do not require any formal reporting at the current time. For example, details of the scale and regions for reporting under the UN regular process are not yet defined and regions for reporting within the EU for the EU Biodiversity Strategy are also currently undefined.

1.5. Aspect 5 – Biological Scope

1.5.1 Habitat Similarities

There are many similarities across the obligations in terms of the specific habitat types and species that they cover. This section presents these similarities separately for habitat types and species, highlighting where a particular habitat or species is covered by multiple obligations. Table 4 shows how different habitat types are listed under different legislative instruments.

Table 4. UK marine habitats listed, and therefore assessed, under current legislative instruments (from JNCC, work in prep.). FOCI refers to the Features of Conservation Importance identified within the Ecological Network Guidance (ENG¹²) produced to support implementation of the MCAA.

✓* indicates a habitat FOCI which was excluded from the Ecological Network Guidance because they were known to be sufficiently conserved under the EC Habitats Directive, or were not known to occur in the area covered by the regional MCZ projects.

✓** indicates a Habitat of Principal Importance or Priority Habitat which is country-specific and therefore not on every national list.

Listed habitat name	EC Habitats Directive Annex I ¹³	Habitats of Principal Importance ¹⁴	OSPAR	ENG FOCI	MSFD Special Habitat	Scottish Priority Marine Feature	Scottish MPA Search Feature	Broad-scale Habitat	Predominant Habitat
Annual vegetation of drift lines	✓				✓				
Atlantic salt meadows	✓				✓				
Blue mussel (<i>Mytilus edulis</i>) beds		✓		✓		✓	✓		
Intertidal <i>Mytilus edulis</i> beds on mixed and sandy sediments			✓	✓	✓				
Carbonate mounds and associated communities		✓	✓	✓*	✓	✓	✓		
Coastal/Saline lagoons	✓	✓		✓*	✓				
Coastal saltmarsh		✓		✓*					
Cold water coral reefs/ <i>Lophelia pertusa</i> reefs		✓**	✓	✓	✓	✓			

¹² http://jncc.defra.gov.uk/pdf/100705_ENG_v10.pdf

¹³ Some listed habitats detailed here are also sub-types of Annex I habitats. The sub-types have not been identified here due to the complexity of these relationships, but it should be noted that these relationships exist.

¹⁴ Habitats of principal importance are updates to the UKBAP habitats under the Natural Environment and Rural Communities Act 2006 in England and Wales, and the Nature Conservation (Scotland) Act 2004 in Scotland. Priority Habitats are the equivalent for Northern Ireland under the Wildlife and Natural Environment Act (Northern Ireland) 2011. These do not have a timetabled assessment and reporting cycle, but there are requirements to keep these lists under review and update lists as appropriate.

Coral gardens			✓	✓	✓	✓	✓		
Deep-sea sponge aggregations/communities		✓**	✓	✓	✓	✓	✓		
Estuaries	✓								
Estuarine rocky habitats		✓		✓					
File/flame shell beds		✓**		✓		✓	✓		
Fragile sponge and anthozoan communities on subtidal rocky habitats		✓		✓					
Horse mussel (<i>Modiolus modiolus</i>) beds		✓	✓	✓	✓	✓	✓		
Inshore deep mud with burrowing heart urchins						✓	✓		
Intertidal chalk/Littoral chalk communities		✓	✓	✓	✓				
Intertidal mudflats		✓	✓	✓*	✓	✓			
Intertidal underboulder communities		✓		✓					
Kelp and seaweed communities on sublittoral sediment						✓	✓		
Large Shallow Inlets and Bays	✓				✓				
Low or variable salinity habitats						✓	✓		
Maerl beds		✓	✓	✓	✓	✓	✓		
Maerl or coarse shell gravel with burrowing sea cucumbers						✓	✓		
Mediterranean and thermo-Atlantic <i>halophilous</i> scrubs	✓				✓				
Mudflats and sandflats not covered by seawater at low tide	✓				✓				
Mud habitats in deep water/ offshore deep sea muds		✓		✓		✓	✓		
<i>Musculus discors</i> beds		✓**							
Northern seafan and sponge communities						✓	✓		
Oceanic ridges with hydrothermal vents/fields			✓	✓*					
<i>Ostrea edulis</i> beds			✓	✓	✓	✓	✓		
Peat and clay exposures (with piddocks)		✓		✓					
Reefs	✓				✓				
<i>Sabellaria alveolata</i> reefs		✓		✓					

<i>Sabellaria spinulosa</i> reefs		✓**	✓	✓	✓				
<i>Salicornia</i> and other annuals colonising mud and sand	✓				✓				
Sandbanks which are slightly covered by sea water all the time	✓				✓				
Seagrass beds / <i>Zostera</i> beds		✓	✓	✓		✓	✓		
Sea loch egg wrack beds						✓	✓		
Seamounts/ Seamount communities		✓**	✓	✓*	✓	✓	✓		
Seapen and burrowing megafauna communities/ Burrowed mud			✓	✓	✓	✓	✓		
Serpulid reefs		✓**		✓*		✓			
Shallow tideswept coarse sands with burrowing bivalves						✓	✓		
Sheltered muddy gravels		✓		✓					
<i>Spartina</i> swards	✓				✓				
Submarine structures made by leaking gases	✓				✓	✓			
Submerged or partially submerged sea caves	✓				✓				
Subtidal chalk		✓		✓					
Subtidal mixed muddy sediments		✓**							
Subtidal sands and gravels		✓		✓					
Offshore subtidal sands and gravels						✓	✓		
Tide-swept algal communities						✓	✓		
Tide-swept channels		✓		✓					

In addition to the listed habitats presented in Table 4, several obligations also cover more broadly defined and spatially wide ranging habitats known as 'broadscale, or predominant habitats'. The relationship between these (sometimes differently divided) broadscale habitats is shown in Table 5 below.

Table 5. Showing the relationship between the broadscale habitat types which are covered under several national and international obligations

Habitat name	MSFD Predominant habitat	OSPAR QSR broadscale habitat	Charting Progress 2 – broadscale habitat	MCAA (ENG Broad-scale habitat)
Abyssal rock and biogenic reef	✓			
Abyssal sediment	✓			
Bathyal (slope/upper) rock and biogenic reef	✓			
Bathyal (slope/upper) sediment	✓			
Bathyal (mid/lower) rock and biogenic reef	✓			
Bathyal (mid/lower) sediment	✓			
High energy circalittoral rock				✓
Moderate energy circalittoral rock				✓
Low energy circalittoral rock				✓
Coastal saltmarshes and saline reedbeds				✓
Deep-sea bed		✓	✓	✓
High energy infralittoral rock				✓
Moderate energy infralittoral rock				✓
Low energy infralittoral rock				✓
High energy intertidal rock				✓
Moderate energy intertidal rock				✓
Low energy intertidal rock				✓
Intertidal coarse sediment				✓
Intertidal sand and muddy sand				✓
Intertidal mud				✓
Intertidal mixed sediments				✓
Intertidal sediments dominated by aquatic angiosperms				✓
Intertidal biogenic reefs				✓
Littoral rock and biogenic reef	✓		✓	
Littoral sediment	✓		✓	

Habitat name	MSFD Predominant habitat	OSPAR QSR broadscale habitat	Charting Progress 2 – broadscale habitat	MCAA (ENG Broad-scale habitat)
Rock and biogenic reef habitats		✓		
Shallow sublittoral rock and biogenic reef	✓		✓	
Shallow sublittoral coarse sediment	✓	✓ (Shallow sediment)	✓	
Shallow sublittoral sand	✓			
Shallow sublittoral mud	✓			
Shallow sublittoral mixed sediment	✓			
Shelf sublittoral rock and biogenic reef	✓		✓	
Shelf sublittoral coarse sediment	✓	✓ (Shelf sediment)	✓	
Shelf sublittoral sand	✓			
Shelf sublittoral mud	✓			
Shelf sublittoral mixed sediment	✓			
Subtidal coarse sediment				✓
Subtidal sand				✓
Subtidal mud				✓
Subtidal mixed sediments				✓
Subtidal macrophyte-dominated sediment				✓
Subtidal biogenic reefs				✓

1.5.2 Habitat Differences

There are clearly differences in the listed and broadscale habitat types that are covered under the assessment frameworks of the different obligations. These can be most clearly seen by examining Tables 4 and 5. Differences in biological scope arise due to the varying focuses of the different legislative and policy instruments, their priorities for protection/conservation action and the different spatial scales at which they are acting. For example, the OSPAR QSR assesses broadscale habitat types, which are defined at a much higher level of classification (e.g. littoral sediment) than those broadscale habitat types identified for the purposes of implementing the protected sites provisions of the UK Marine and Coastal Access Act. The broad habitat types under MSFD (predominant habitats) and the OSPAR QSR aim to cover the whole range of habitats for purposes of assessment or MPA selection. Listed types tend to be more-narrowly defined and address habitats considered to be under specific threat and hence in need of more-specific protection measures. There are many similarities across the obligations in terms of the specific habitat types which they cover, with some habitats covered by multiple obligations. Alignment can therefore be made through the overlapping monitoring and assessment requirements for these habitats. However, there are also differences across the obligations, with different levels of biological and physical classification being used to define the listed habitat types. For example, under the Habitats Directive, the feature '*Estuaries*' is listed for protection, but this habitat is physiographic in nature and represents a habitat complex which may contain other physiographic or biologically defined habitat types such as *Intertidal mudflats* or *Seagrass beds*, which are listed under other obligations. In this way, many of the listed habitat types are nested within others (e.g. *Sabellaria spinulosa* reefs are a component of the Annex I habitat type '*Reefs*'). Therefore, this nesting of habitat types may mean that an assessment of the more broadly defined habitats can be completed as a result of the aggregation of assessment results from their component habitat types.

Several obligations do not have a list of habitat types that are covered; they merely apply to all biodiversity (i.e. the CBD and EU Biodiversity Strategy). Although this does not mean that all aspects of marine biodiversity must be assessed in order to meet the requirements of the obligations, it does mean that no priority list of habitats exists for assessment, and it is the integrity, functioning and sustainable use of the ecosystem as a whole which is important. In contrast, whilst the WFD does not have a list of habitats to which it applies or which must be assessed, the specifically defined biological quality elements that need to be assessed to determine ecological quality status (where they occur) include angiosperms (i.e. saltmarsh for transitional waters and seagrass in coastal waters) and macroalgae. These are therefore important habitat types/biotopes indicative of good ecological status for transitional and coastal waterbodies. Also, bottom fauna and plankton are in effect addressing all habitat types as part of the WFD.

1.5.3 Species Similarities

Table 6. Comparing UK marine species listed, and therefore assessed, under different national and international legislative and policy instruments. This worksheet is arranged and grouped by taxonomic group (i.e. fish, marine mammals, birds, reptiles, invertebrates and plants). It shows how various species are listed under multiple instruments (and also where there are listings under only a single obligation).

[Comparing Listed Species – Excel spreadsheet](#)

1.5.4 Species Differences

There are clearly significant differences in the species which are covered by each of the instruments, as shown in Table 6 (embedded Excel file). As with habitats, these differences arise due to the varying focuses of the different legislative and policy instruments, their priorities for protection/conservation action and the different spatial scales at which they are acting. For example, the Birds Directive covers all wild bird species within the EU, whereas the Wildlife and Countryside Act covers species which occur in inshore waters of England, Scotland and Wales and which are considered threatened or vulnerable). Additionally, species listed under obligations that are driving the designation of marine protected areas (e.g. MCAA and MSA) will be those that will benefit most from such spatial protection measures. The benthic invertebrate species covered by MSFD (e.g. *Ostrea edulis*) will most likely be assessed as part of the habitat type of which they are a constituent part, as opposed to being assessed as single species. The national and EU policy instruments considered do not cover a specific set of species as they are primarily tools to drive overall sustainable use and ecosystem protection at their relevant scales; for example, the EU Biodiversity Strategy covers all EU biodiversity and promotes conservation of biodiversity and sustainable use at a large scale.

1.6. Aspect 6 – Reporting cycle frequency

1.6.1 Similarities

Reporting under several marine biodiversity assessment obligations is required at six year intervals (e.g. under MSFD, Habitats Directive, Birds Directive, WFD, MCAA and MSA). Recently, the Birds Directive has altered its reporting cycle frequency to align fully with the Habitats Directive. Table 7 shows how reporting under the various obligations falls from 2012 to 2025.

Table 7. Reporting required under the obligations considered until 2025

Year	Reporting required
2012	MSFD initial assessment, 1st reporting under MCAA and MSA
2013	HD, BD, WCA Schedules 5 and 8 review, CSA
2014	CBD 5 th National Report, CMS, 1st report under UNCLOS Regular Process, CSA
2015	WFD river basin management plan review/update, CSA
2016	CSA
2017	CMS, CSA
2018	MSFD, WCA Schedules 5 and 8 review, CSA, MCAA, MSA, Possibly OSPAR QSR
2019	HD, BD, CSA
2020	Possibly MSFD, CMS, CSA
2021	WFD, CSA
2022	CSA
2023	CMS, WCA Schedules 5 and 8 review, CSA
2024	MSFD, CSA, MCAA, MSA
2025	HD, BD, CSA

1.6.2 Differences

As mentioned above, reporting under the EU Directives is required at six-yearly intervals, although the starting year for these intervals is often different and therefore the cycles are not fully aligned. Reporting under the International Conventions is less prescriptive and is often determined by the Conference of the Parties (COP) (e.g. under CBD and OSPAR). However, reporting under the Convention on Migratory Species is required every three years. Reporting frequency under UK legislation is varied, with the WCA requiring a review of Schedules 5 and 8 every five years, reporting under the Conservation of Seals Act on an annual basis and reporting under the MCAA and MSA required every six years (which will align well with MSFD requirements). The reporting intervals for the national and international policies and policy instruments are not well defined and in some cases, not required at all (e.g. for the HLMOs¹⁵ and Marine Policy Statement¹⁶).

1.7. Aspect 7 – Baselines used

1.7.1 Similarities

Within the context of a biodiversity assessment framework, a 'baseline' is defined here as the state/condition against which subsequent values of state/condition are compared and against which environmental targets are set. Figure 11 illustrates three different baseline states that can be chosen within an assessment framework. The black arrow at the top of the figure illustrates that the state of the marine environment can be described as a gradient of quality from unimpacted conditions to a destroyed/irrecoverable condition.

The first baseline example (i.e. first of the three coloured arrows) illustrates that a baseline of 'reference conditions' can be chosen (i.e. reflecting a state where impacts from human pressures are absent or negligible; OSPAR Commission, 2011). A target can then be set in relation to this baseline, accommodating a degree of deviation from the reference conditions. The second baseline example illustrates that a baseline of some 'past state' can be chosen reflecting a state at which data began to be collected, for example. Similarly, a target can then be set in relation to this baseline, accommodating a degree of deviation, allowing for sustainable use. The third baseline example illustrates that a baseline of 'current state' can be chosen reflecting the state at which the relevant environmental policy instrument (i.e. the reason for defining an assessment framework) came into force etc.. The target can then be set in relation to this current baseline, either to maintain the current condition or improve the trend in biodiversity in relation to the current state.

In all the baseline examples, a 'limit/threshold' (as opposed to a target) can be set in relation to the chosen baseline which reflects a point of degradation beyond which it is not desirable to go. This is more often used to describe the level of human pressure that can be tolerated by the ecosystem, but which should not be exceeded.

¹⁵ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/182486/ourseas-2009update.pdf

¹⁶ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69322/pb3654-marine-policy-statement-110316.pdf

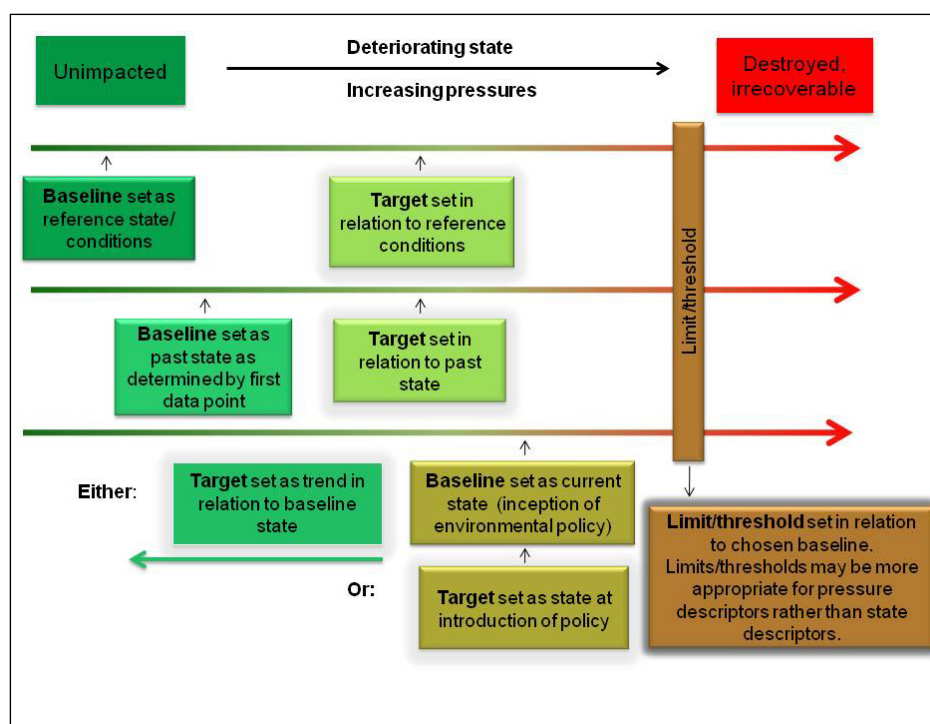


Figure 11. The conceptual relationship between various baseline conditions, targets and limits which are set in relation to these baselines. Figure from Moffat *et al.*, 2011.

Several of the legislative and policy instruments considered in this review use a baseline within their assessment framework that falls into one of the above baseline categories (see Table 8).

Table 8. Showing which baseline is used within the assessment framework of which instruments.

Baseline used	Instruments
Reference conditions	MSFD (ideally), WFD, OSPAR QSR
Past state	Birds Directive (1979)
Current state	Habitats Directive (no deterioration from when Directive came into force)

However, a greater proportion of the instruments considered have either no clearly defined baseline or use various baselines across different biodiversity components or to fulfil different aspects of the instrument (see Table 9 e.g. OSPAR EcoQOs and the OSPAR Threatened and Declining habitats and species lists use different baseline types).

Table 9. Showing which instruments have undefined baselines or use varied baselines.

Baseline used	Instruments
None clearly defined	CMS, UNCLOS, WCA, MCAA, MSA, EUBS
Varied baselines used	OSPAR EcoQOs, OSPAR Threatened and Declining lists, CBD, CSA, Government Vision

1.7.2 Differences

There are numerous differences in the detailed baselines used (or proposed) within the assessment frameworks of the instruments considered here.

At this point in its implementation, the baseline to be used within the MSFD assessment process is not fully defined or agreed. GES Descriptor 1 of the MSFD states that ‘the quality and occurrence of habitats and the distribution and abundance of species are in line with prevailing physiographic, geographic and climatic conditions’. This is interpreted by Cochrane *et al.* (2010) as the expected state where impacts from human pressures are negligible and allowing for the consequences of climate change. GES Descriptor 4 also states that ‘all elements of marine food webs... occur at normal abundances and diversity...’. Therefore the ideal baseline against which to set environmental targets for GES would be one of reference conditions i.e. the state at which impacts from anthropogenic pressures are absent or negligible (OSPAR Commission, 2011). However, it is also noted in OSPAR, 2011 that the identification of reference conditions, especially for mobile species, may not currently be feasible and other baseline approaches may be required.

This is in slight contrast to the baselines identified for use under the WFD and for the OSPAR QSR assessment process (i.e. reference conditions and former natural conditions, respectively). The WFD states that ‘type-specific biological reference conditions shall be established, representing the values of the biological quality elements...for that surface water body type at high ecological status...’ High status is defined as when ‘the values of the biological quality elements for the surface water body reflect those normally associated with the type under undisturbed conditions, and show no, or only very minor, evidence of distortion’. This is similar to the definition of former natural conditions which is used to assess current marine biodiversity status under the OSPAR QSR, that is, ‘the generic baseline is the population/habitat range and extent (of the component) prior to industrialisation and a description of condition in pristine condition (for example types of features/species that would be expected)’ (OSPAR Commission, 2009).

The conceptual basis for this choice of baseline differs to that employed within the assessment framework of the Habitats Directive. The European Commission Final Guidance ‘Assessment and reporting under Article 17 of the Habitats Directive – Explanatory Notes and Guidelines for the period 2007-2012’ (July 2011) describes the concept of ‘favourable reference values’ as a baseline for assessment. As an example of this, ‘favourable reference range’ is defined as the ‘range within which all significant ecological variations of the habitat/species are included for a given biogeographical region and which is sufficiently large to allow the long term survival of the habitat/species; favourable reference value must be at least the range (in size and configuration) when the Directive came into force (1994 in the UK); if the range was insufficient to support a favourable status the reference for favourable range should take account of that and should be larger (in such a case information on

historic distribution may be found useful when defining the favourable reference range); best expert judgement may be used to define it in absence of other data.’

Therefore, the main concept underlying the Habitats Directive baselines/reference values is ‘viability’. If the range, population size or area of the habitat or species was considered ‘viable’ in the long-term at the date when the Directive came into force (this date differs across Member States), then this would be a suitable favourable reference value against which to set a target (although this is a more difficult concept to apply to marine habitats than species). Therefore, the baseline against which current status is assessed is most likely to be the value of range, area or population size as at 1994 (in the UK, although for marine habitats, no assessment of viability was made in 1994, i.e. no deterioration against a

baseline of 1994). However, historical data can be used to define these favourable reference values where appropriate (e.g. if the range, area or population size at 1994 is not considered to be viable).

The baseline in use under the Birds Directive is the state at 1979 (or as close to 1979 as data is available). This baseline has been agreed across Member States as it reflects a state in the past for which there is reliable data against which to assess current wild bird populations.

Under the OSPAR Convention, several different types of baseline are employed depending on which of the four elements of the Biological Diversity and Ecosystems Strategy the assessment falls under. The Ecological Quality Objectives (EcoQO) system within OSPAR (North Sea only) uses different baselines depending on the particular ecological quality issue under consideration. For example, the baseline for the EcoQO on plastic particles in the stomachs of fulmars is the reference condition of zero particles found in fulmar's stomachs. This is in contrast to the EcoQO on changes in the proportion of large fish, which uses a baseline of 1982 as this reflects a state of sustainable use of fish communities in the North Sea and data on pristine state is not available.

Under the requirements of the OSPAR Species and Habitats element, the Texel-Faial criteria are used to assess whether or not a species or habitat should be listed as threatened and/or declining. It is stated that decline (in numbers, extent or quality) may be 'historic, recent or current' using a baseline of reference conditions against which the limit for the amount of acceptable 'decline' will be set (a decline of 15% warrants listing as threatened and/or declining).

Baselines used under the CBD, Conservation of Seals Act and UK Government vision are highly varied across the biodiversity components (species and habitats) being considered. For example, Table 10 summarises the baselines that were used under CP2 due to the practical constraints of data availability and ecological understanding as of 2010.

Table 10. Summary of the baselines used for different ecosystem components within CP2.

Ecosystem component	Baseline used for assessment
Benthic Habitats	Former natural conditions (i.e. absence of human pressures)
Plankton	1940s (beginning of wide scale monitoring)
Fish (demersal)	1980s (sustainable use state) but also refers to status of fish in relation to historic baselines (i.e. 100 years ago) within the supporting feeder report
Harbour Seals	1980s
Grey Seals	1960s in Scotland, 1980s elsewhere in the UK
Cetaceans	Depending on the species - 1994 (SCANS), 2003 (Cetacean Atlas ¹⁷), 2005 (SCANS II ¹⁸), or 2007 (CODA ¹⁹) – survey dates
Waterbirds	1975/76
Seabirds	1969 for whole UK assessment

It is noted in the CBD (Decision X/2) that 'the need for baselines should be reflected in the technical rationales of several targets' of the 2011-202 Strategic Plan. Furthermore, several obligations do not have clearly defined baselines against which to make assessments of current biodiversity status (e.g. CMS, UNCLOS Regular Process, WCA, MCAA, MSA and

¹⁷ http://jncc.defra.gov.uk/PDF/cetaceansAtlas_web.pdf

¹⁸ <http://biology.st-andrews.ac.uk/scans2/inner-finalReport.html>

¹⁹ http://biology.st-andrews.ac.uk/coda/documents/CODA_Final_Report_11-2-09.pdf

the EUBS). These differences in baseline create one of the most important issues to be addressed within the field of biodiversity status assessment in the marine environment. The choice of baseline is integral to determining the level of ambition for the marine environment and underpins the definition of what is assessed as ‘good’ or ‘favourable’ and so on, under each obligation. The baseline functions as a starting point from which to set acceptable deviation levels or targets (i.e. an improvement against current state). The use of reference conditions or past state baselines should act as a guide to what future state might look like (i.e. in the absence or reduction of human pressures). It should help to define how close a target should aim to get to an ‘unimpacted’ state, recognising that biodiversity will never return fully to any ‘past’ state due to the effects of ongoing climate change and past ecosystem dynamics.

1.8. Aspect 8 – Assessment status classes

1.8.1 Similarities

Several obligations have the same number of status classes identified within their assessment frameworks. Figure 12 shows the status classes that have been defined (where an instrument or relevant guidance has actually defined such classes) for the obligations considered here. The most common number of classes used to categorise the assessment of marine biodiversity is three (such as ‘Good’, ‘Moderate’ or ‘Poor’). The definition of the classes is primarily based either around the direct status of the biodiversity aspects (i.e. a reflection of the biodiversity state), the trend in state (e.g. improving/deteriorating) or the amount of human pressures/impacts which are affecting biodiversity state (e.g. few/some/many problems).

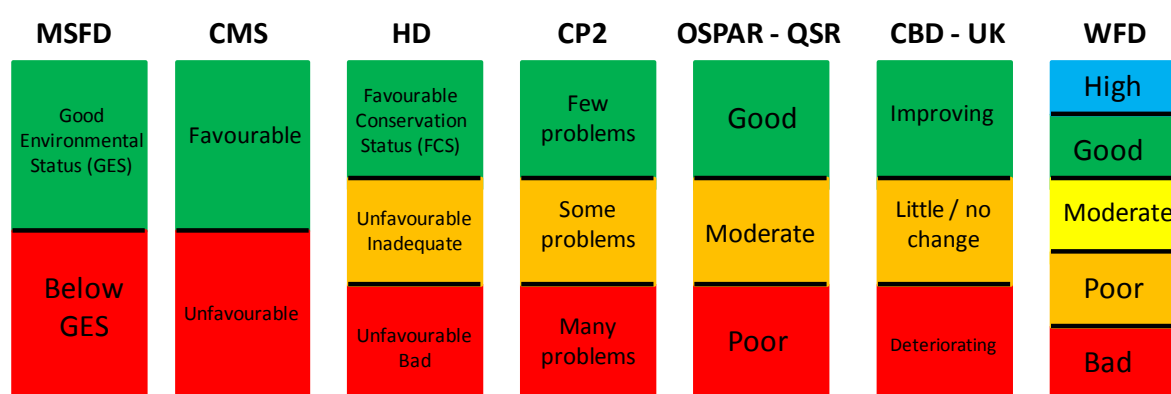


Figure 12. Identifying the assessment status classes used under different national, EU and global instruments. The position of the boundaries between classes and across the instruments do not signify any relationship or equivalence between classes.

It is also useful to see where these status classes have been identified as part of the actual text of the instrument (e.g. Directive or Act) and where they have been identified as part of internationally or nationally produced guidance (see Table 11).

Table 11. Identifying where assessment status classes are defined for each obligation (e.g. within the text of the Directive or within EU/UK level guidance).

Instrument	Where are the status classes defined?
MSFD	Directive text (Article 3(5))
CMS	Convention text (Article 1)
HD	EU Guidance (Article 17 reporting)
CP2	UK Guidance (CP2 assessment methodology)
OSPAR	OSPAR Guidance (QSR assessment methodology)
CBD	UK Guidance (UK biodiversity indicators)
WFD	Directive text (Annex V, section 1.4.2)

As well as meeting the necessary reporting requirements, defining status classes within the respective assessment frameworks aims to be an effective means of identifying those biodiversity components (and geographic areas) which most urgently require conservation action (e.g. establishing management measures), those for which no change in conservation action (if any exists) is required and those that may require further investigation.

1.8.2 Differences

As Figure 12 shows, there are clear differences in the number and definition of status classes used across the different assessment frameworks. The MSFD, Habitats Directive, WFD, OSPAR QSR and CMS have a varying number of classes that an assessment of a particular biodiversity component can be categorised as. However, they all define such classes using a similar (if not equally divided) scale, that is, they identify whether the structure and functioning of biodiversity is acceptable (i.e. High, Good, Favourable) or unacceptable (i.e. Below Good, Unfavourable, Moderate, Poor, Bad). These categorisations all reflect the actual status of the biodiversity elements being assessed, whereas the classes used under CP2 and the CBD (UK implementation) reflect either the pressures/impacts which are experienced by the biodiversity components (CP2) or simply the trend in their condition (CBD).

The relationship and potential equivalence between status classes is heavily dependent on the specific baselines (see Section 1.7) used, against which targets are set and subsequent status class boundaries are identified. As is shown in Section 1.7, there are significant differences in the baselines used across different marine biodiversity assessment obligations and this causes some difficulty when trying to identify the relationship between overall assessment classes and aspirations for the marine environment. Despite the fact that various obligations use three assessment status classes, these classes may not be comparable. For example, an assessment framework which uses a baseline of former natural conditions and sets a target at a deviation from this baseline to achieve a status of class of 'Good' may be far more ambitious than an assessment framework which uses a baseline of current conditions (which may be impacted by current and historic human pressures) and sets a target to maintain that current condition to achieve a status class of 'Good'. Therefore, the status of a marine bird population may be assessed as being either 'moderate' or 'favourable' depending on which of the two different assessment frameworks it is assessed under. This is due to the choice of baseline and target (see Figure 13, for example).

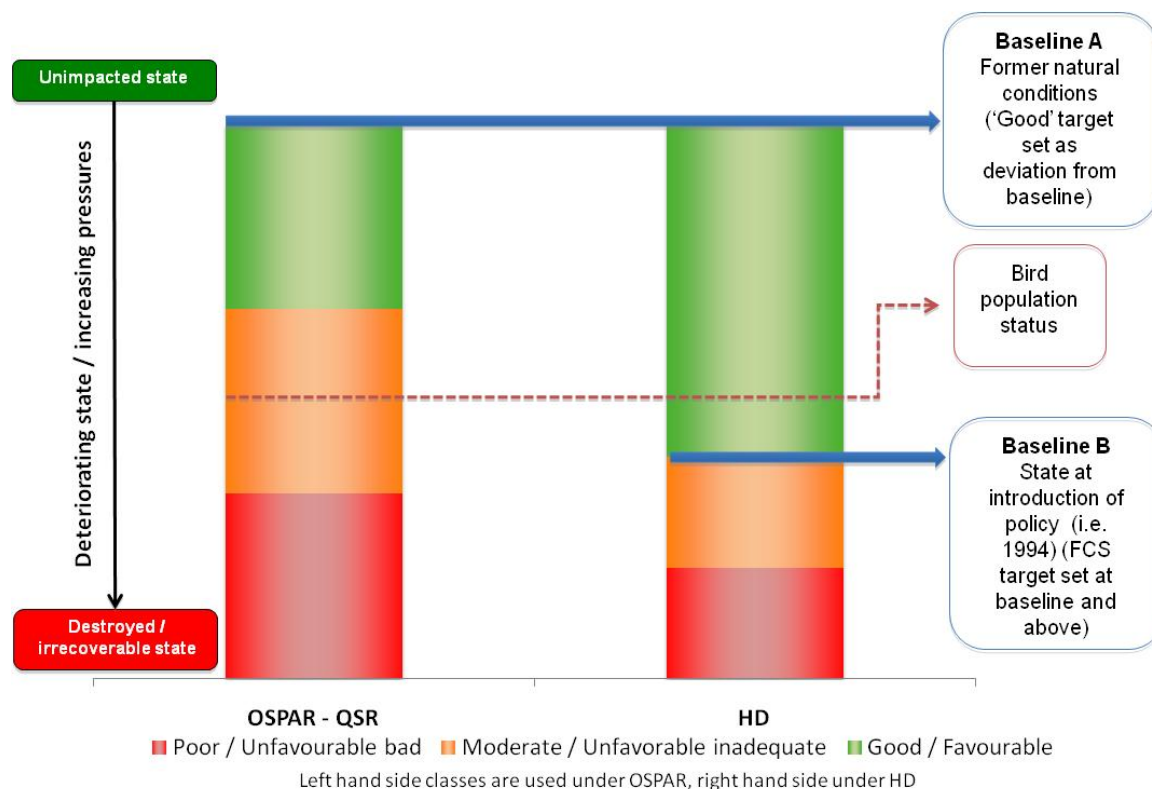


Figure 13. Illustrating that obligations may have the same number of assessment status classes (i.e. OSPAR QSR and Habitats Directive each use three status classes. On the left hand side of the diagram, class descriptions are used under OSPAR; on the right hand side, class descriptions are from the Habitats Directive) but due to differences in the chosen baseline (blue arrows, and boxes showing baselines A and B), these classes may not be equivalent. The vertical black arrow illustrates that marine environmental state can be thought of as a gradient from unimpacted state to a destroyed or irrecoverable state, and that baselines can be chosen at various points along this continuum which will affect the position of the status class boundaries.

For example, the status of a particular marine bird population (pink dashed arrow and box) may be assessed as either 'moderate' or 'favourable' depending on the framework used to assess it. In addition, it is not possible to say that 'many problems' as assessed under CP2 is equivalent to 'Below GES' under the MSFD, for the same feature. These assessments do not have the same framework and are not carried out in the same way. CP2 did not use the structure of criteria, indicators and targets that are defined within the assessment framework of the MSFD.

Furthermore, although there is clearly a relationship between GES under MSFD and FCS under the Habitats Directive, the two cannot be said to be equivalent. The Habitat Directive aims to conserve particular listed habitats and species of Community interest whereas the MSFD aims to achieve GES for the entire EU marine region in a more holistic manner. The scope, scale and ambition of these two obligations is clearly different. If MSFD assessments were undertaken at the scale of habitat types and species, it is possible that GES could be equivalent to FCS for those features covered by both obligations. However, if MSFD assessments are aggregated up to cover species groups or biodiversity as a whole, then clearly the same units are not being compared. Therefore, not only must baselines be comparable to allow status classes to be equivalent, the components and scale of the assessment must also be comparable. Details of the relationship between each of these

status classes will become clearer as the underpinning aspects (e.g. assessment criteria, indicators and associated targets) are analysed further in the following sections.

Finally, several of the obligations (e.g. the Birds Directive and Conservation of Seals Act), have no defined status classes as such and some have yet to define the status classes that will be employed for reporting (e.g. EUBS, UN 'Regular Process', MCAA and MSA). Despite this, it is clear that implementation of legislation such as the MCAA and MSA (in designating protected areas for various habitats and species) will contribute to the achievement of the desired status classes under other obligations (e.g. GES under the MSFD).

1.9. Aspect 9 – Assessment criteria

1.9.1 Similarities

There are numerous similarities between the high-level criteria used to assess the status of biodiversity components across the obligations. Table 12 shows how some of the criteria used to assess marine habitats and species are common across multiple assessment obligations. It is evident that for habitats, the most common criteria are habitat range, extent and condition (including condition of the benthic community). For species the most common criteria are species range, population size and condition.

1.9.2 Differences

Despite the important similarities identified above, there are also significant differences between the high-level criteria used to assess biodiversity status across the obligations. Firstly, there are some notable differences in assessment criteria across the four relevant EU Directives. The main difference between the assessment criteria of the MSFD (for Descriptor 1) and the Habitats Directive is the inclusion of 'future prospects' as a criterion for the assessment of habitat and species status under the Habitats Directive. This criterion is not included in the assessment of current status under the MSFD as it was considered important by Cochrane *et al.* (2010) to separate the assessment of current status from any past or future trend assessments and this has been carried through to MSFD reporting.

There is also a requirement under the Habitats Directive to assess the criterion of 'habitat for the species' as part of a species assessment, whereas under the MSFD there is only an informal need for an integrated understanding of the habitat as part of a species assessment (MSFD Decision). Under MSFD descriptor 1, there is also a requirement to assess 'ecosystem structure' (criterion 1.7) that covers aspects of ecosystem processes and functions. This criterion is currently relatively poorly developed from a practical implementation perspective and will require further work at the regional level to define it, although it is likely to be interpreted and measured using community level metrics such as the Large Fish Indicator (LFI) or an index of species diversity.

Table 12. Showing the overlap in assessment criteria across several national and international obligations (not all criteria which are used to assess the status of habitats and species are shown here, only those which show a high level of congruence across obligations).

Obligation	Habitats criteria					Species criteria				
	Habitat Range/ Distribution	Habitat Area/ Extent	Habitat Condition (including benthic community)	Future Prospects	Physical damage	Species Range/ Distribution	Population Size	Population Condition	Habitat for the species	Future Prospects/ Population viability
MSFD (D1&6 only)	✓	✓	✓		✓	✓	✓	✓		
HD	✓	✓	✓	✓		✓	✓	✓	✓	✓
BD						✓	✓			
WFD		✓	✓					✓		
OSPAR (QSR)	✓	✓	✓			✓	✓	✓		
CMS						✓	✓		✓	✓
CSA							✓	✓		
Gov Vision (CP2)		✓		✓	✓ (extent of all impacts)	✓	✓	✓	✓	✓

Furthermore, descriptors 2 and 4 under MSFD identify biodiversity relevant assessment criteria for which there are no equivalents articulated under other obligations. For example, under descriptor 2 (non-native species), criteria for assessment cover:

- 'Abundance and state characterisation of non-indigenous species' (criterion 2.1)
- 'Environmental impact of invasive non-indigenous species' (criterion 2.2)

Under descriptor 4 (marine food webs), criteria for assessment cover:

- 'Productivity (production per unit biomass) of key species or trophic groups' (criterion 4.1)
- 'Proportion of selected species at the top of food webs' (criterion 4.2)
- 'Abundance/distribution of key trophic groups/species' (criterion 4.3).

These D4 criteria attempt to describe and provide a mechanism for assessing the functioning of EU marine food webs. However, understanding of these aspects is currently relatively poor and further work will be required at a regional scale to develop effective food web indicators and targets which can operationalise the above criteria (4.1, 4.2 and 4.3) and robustly inform Member States about the functioning of marine ecosystems.

Under the Birds Directive there are no assessment criteria formally identified within the Directive itself, however, new guidance agreed across Member States has identified the criteria which will form the basis of wild bird population assessments. They are:

- Population size
- Population trend
- Breeding distribution and range size
- Breeding range trend
- Progress on implementation of action/management plans
- Main pressures and threats
- SPA coverage and conservation measures taken.

Therefore, these criteria cover a mixture of outcome orientated aspects of the status of wild bird populations (e.g. population size and trend) and aspects of practical implementation of provisions of the Directive e.g. SPA coverage and conservation measures taken.

Under the WFD, the biological quality elements which are assessed in transitional and coastal waters are very specifically defined and the assessment criteria used to assess these elements are shown in Table 13.

Table 13. Showing, for each biological quality element, the criteria which need to be assessed as part of an ecological status assessment under the WFD.

Quality Element	WFD Assessment Criteria for biological quality elements					
	Composition	Abundance	Biomass	Diversity	Sensitive taxa	Pollution indicator taxa
Phytoplankton	✓	✓	✓			
Angiosperms	✓	✓				
Macroalgae	✓	✓				
Benthic inverts	✓			✓	✓	✓
Fish fauna (Transitional waters only)	✓	✓				

The WFD assessment criteria identified here are at a slightly more detailed level than the other EU Directive criteria. However, they can all be said to be contributing to assessing the ecological ‘condition’ of the aquatic environment, either by assessing aspects of the water column (e.g. phytoplankton), the benthos (e.g. benthic invertebrates) or more-highly mobile species (e.g. fish fauna). The WFD criteria cover pure aspects of ecological state, for example, abundance and biomass of organisms as well as aspects of state that are more strongly linked to particular pressures (e.g. presence of taxa which are indicative of pollution).

Under the UK Government Vision, the high-level criteria used to assess the status of the different biodiversity components as part of the CP2 assessment process were highly variable. This reflects the different type, amount and quality of data available for different components of the marine ecosystem and any methods that already existed to undertake assessments at that time. Table 14 shows the criteria used within CP2 to assess the status of various biodiversity components. The difference in criteria across the species components is most evident here. For benthic habitats the assessment criteria chosen reflect the methodology used to undertake the assessment (i.e. overlaying habitat extent data with human pressures extent data to quantify the extent of the overlap and therefore, impact).

Table 14. Criteria employed for the assessment of different biological components in CP2.

Biological component	Criteria used
Cetaceans	Range Population Habitat for the species Future prospects } Same as under Habitats Directive
Seals	Trends in population size i.e. numbers of individuals
Marine birds	Trends in population size i.e. numbers of individuals
Plankton	No assessment criteria identified
Fish	Structure of fish assemblage Functioning of fish assemblage
Benthic habitats	Current status (assessed using human pressures data) Recent trends Future prospects (20 years into the future)

Under the UK legislative instruments, there are no formal criteria for assessing the status of protected areas such as SSSIs, MCZs or Scottish MPAs. The primary objective for marine protected areas within the UK is to achieve a ‘favourable’ condition for the features within the site and across the network of sites for which the features have been designated. Protected sites tend to be designated for benthic habitats or sessile species, as these are the biodiversity components which benefit most from such spatial protection measures. Further guidance will be required to identify the criteria for assessment of those sites which have

been designated to meet the requirements of the MCAA and MSA. This is also the case under the UNCLOS Regular Process and the EUBS.

1.10. Aspect 10 – Criterion targets

1.10.1 Similarities

Criterion targets for the different obligations have been presented below (Tables 15-21) and are grouped by biodiversity component. For example, for marine birds, the applicable targets which apply under the various obligations have been grouped by the criterion to they apply and are described together so that similarities can be identified more easily. It should be noted that the identified targets have been defined for the implementation of obligations at various scales (e.g. at the UK, OSPAR region or EU marine area scale, or for listed and non-listed habitats and species, or groups of habitats and species). Where more than one known target applies (e.g. under the Habitats Directive) the EU-level targets as well as the UK implementation level targets apply. Under the MSFD, where there are multiple options presented for benthic habitat components (as part of UK implementation), this has been identified. Finally, it should also be noted that the targets represent only the threshold to achieve 'good' or 'favourable' status and so on, and do not reflect targets that are set for defining the lower (or higher, in the case of WFD) class boundaries (e.g. between 'moderate' and 'poor').

Table 15. Criterion targets applicable to marine birds

Criterion	Obligation	Target
Species distribution/range	MSFD (1.1)	No major shifts or shrinkage in the population distribution of marine birds in 75-90% of species monitored
	Habitats Directive	Species range is stable or increasing and not smaller than the 'favourable reference range' baseline
	Birds Directive	Maintain the population of the species... at a level which corresponds in particular to ecological, scientific and cultural requirements, while taking account of economic and recreational requirements, or to adapt the population of these species to that level
	OSPAR - QSR	Less than 10% of species have a greater than 10% decrease in range
	CMS	The range of the species is neither currently being reduced, nor is likely to be reduced, on a long-term basis. The distribution of the species approaches historical coverage and levels to the extent that potentially suitable ecosystems exist and to the extent consistent with wise wildlife management
Population size	MSFD (1.2 and 4.3)	Changes in abundance of marine birds should be within individual target levels in 75-90% of species monitored
	Habitats Directive	Population(s) size is not lower than the 'favourable reference population'
	Birds Directive	Maintain the population of the species... at a level which corresponds in particular to ecological, scientific and cultural requirements, while taking account of economic and recreational requirements, or to adapt the population of these species to that level
	OSPAR - QSR	Less than 10% of species have a greater than 25% decline in population size
	CMS	The abundance of the migratory species approaches historic coverage and levels to the extent that potentially suitable ecosystems exist and to the extent consistent with wise wildlife management
	UK	Stable or increasing trend in population size. Pressure impact -

Criterion	Obligation	Target
	Government vision (CP2)	<10% change in abundance
Population condition	MSFD (1.3 and 4.1)	Annual breeding success of black-legged kittiwakes should not be significantly different, statistically, from levels expected under prevailing climatic conditions; widespread seabird colony breeding failures should occur rarely (i.e. at <5-15% of colonies in no more than three years out of six); and mortality of marine birds due to fishing bycatch and aquaculture should be sufficiently low to not inhibit population size targets being met
	Habitats Directive	Reproduction, mortality and age structure of the population is not deviating from normal (if data available)
	OSPAR - QSR	Less than 10% of the population is damaged
Habitat for the species	Habitats Directive	Area of habitat is sufficiently large (and stable or increasing) and habitat quality is suitable for the long term survival of the species
	CMS	There is, and will be in the foreseeable future, sufficient habitat to maintain the population of the migratory species on a long-term basis
Future prospects	Habitats Directive	Main pressures and threats to the species not significant; species will remain viable in the long-term
	CMS	Population dynamics data indicate that the migratory species is maintaining itself on a long-term basis as a viable component of its ecosystems

Table 16. Criterion targets applicable to marine mammals (cetaceans and seals)

Criterion	Obligation	Target
Species distribution/range	MSFD (1.1)	There should be no statistically significant contraction in the distribution of marine mammal species
	Habitats Directive	Species range is stable or increasing and not smaller than the 'favourable reference range'
	OSPAR - QSR	Less than 10% of species have a greater than 10% decrease in range
	CMS	The range of the species is neither currently being reduced, nor is likely to be reduced, on a long-term basis. The distribution of the species approaches historic coverage and levels to the extent that potentially suitable ecosystems exist and to the extent consistent with wise wildlife management
	UK Government vision (CP2)	Species range is stable or increasing and not smaller than the 'favourable reference range' (cetaceans only)
Population size	MSFD (1.2 and 4.3)	There should be no statistically significant decrease in abundance of marine mammals
	Habitats Directive	Population(s) size not lower than 'favourable reference population'
	OSPAR - QSR	Less than 10% of species have a greater than 25% decline in population size
	CMS	The abundance of the migratory species approaches historic coverage and levels to the extent that potentially suitable ecosystems exist and to the extent consistent with wise wildlife management
	CSA	No target identified
	UK Government vision (CP2)	Population(s) size not lower than 'favourable reference population' (cetaceans only) Stable or increasing trend in population size (Seals only)
Population condition	MSFD (1.3 and 4.1)	There should be no statistically significant decline in seal pup production and bottlenose dolphin calf production; and there should be no adverse health effects from contaminants and biotoxins; and

Criterion	Obligation	Target
		mortality of marine mammals due to fishing bycatch should be sufficiently low to not inhibit population size targets being met.
	Habitats Directive	Reproduction, mortality and age structure of the population not deviating from normal (if data available)
	OSPAR - QSR	Less than 10% of the population is damaged
	CSA	No target identified
	UK Government vision (CP2)	Reproduction, mortality and age structure of the population not deviating from normal (if data available, cetaceans only)
Habitat for the species	Habitats Directive	Area of habitat is sufficiently large (and stable or increasing) and habitat quality is suitable for the long term survival of the species
	CMS	There is, and will be in the foreseeable future, sufficient habitat to maintain the population of the migratory species on a long-term basis
	UK Government vision (CP2)	Area of habitat is sufficiently large (and stable or increasing) and habitat quality is suitable for the long term survival of the species (cetaceans only)
Future prospects	Habitats Directive	Main pressures and threats to the species not significant; species will remain viable in the long-term
	CMS	Population dynamics data indicate that the migratory species is maintaining itself on a long-term basis as a viable component of its ecosystems
	UK Government vision (CP2)	Main pressures and threats to the species not significant; species will remain viable on the long-term (cetaceans only)

Table 17. Criterion targets applicable to fish & fish communities

Criterion	Obligation	Target
Species distribution/range	MSFD (1.1)	The geographic and depth distribution of fish should meet individual indicator targets in a statistically significant proportion of species monitored
	Habitats Directive	Species range is stable or increasing and not smaller than the 'favourable reference range'
	OSPAR - QSR	Less than 10% of species have a greater than 25% decline in population size
	CMS	The range of the species is neither currently being reduced, nor is likely to be reduced, on a long-term basis. The distribution of the species approaches historic coverage and levels to the extent that potentially suitable ecosystems exist and to the extent consistent with wise wildlife management
Population size	MSFD (1.2)	The population abundance density and population biomass density of fish should meet individual indicator targets in a statistically significant proportion of species monitored
	Habitats Directive	Population(s) size not lower than 'favourable reference population'
	WFD (transitional waters)	The abundance of disturbance-sensitive species shows slight signs of distortion from type-specific conditions attributable to anthropogenic impacts on physicochemical or hydromorphological quality elements
	OSPAR - QSR	Less than 10% of species have a greater than 25% decline in population size
	CMS	The abundance of the migratory species approaches historic coverage and levels to the extent that potentially suitable ecosystems exist and to the extent consistent with wise wildlife management
	UK	Improving trend in population size

Criterion	Obligation	Target
	Government vision (CP2)	
Population condition	MSFD (1.3)	Target under development
	Habitats Directive	Reproduction, mortality and age structure of the population not deviating from normal (if data available)
	WFD (transitional waters)	The abundance of disturbance-sensitive species shows slight signs of distortion from type-specific conditions attributable to anthropogenic impacts on physicochemical or hydromorphological quality elements
	OSPAR - QSR	Less than 10% of the population is damaged
	UK Government vision (CP2)	Weighted average scores indicating change in the composition, structure and functioning of the fish community should be greater than 2.35 (demersal fish only)
Habitat for the species	Habitats Directive	Area of habitat is sufficiently large (and stable or increasing) and habitat quality is suitable for the long-term survival of the species
	CMS	There is, and will be in the foreseeable future, sufficient habitat to maintain the population of the migratory species on a long-term basis
Future prospects	Habitats Directive	Main pressures and threats to the species not significant; species will remain viable in the long-term
	CMS	Population dynamics data indicate that the migratory species is maintaining itself on a long-term basis as a viable component of its ecosystems
Proportion of species at the top of food webs	MSFD (1.7, 4.2) and OSPAR EcoQO (LFI)	A specified proportion (by weight) of fish in any defined marine region should exceed a stipulated length threshold (e.g. >30% of fish in the Greater North Sea and >40% of fish in the Celtic Seas exceed a length of 40cm and 50cm respectively)

Table 18. Criterion targets applicable to pelagic habitats (phytoplankton, zooplankton and microbes)

Criterion	Obligation	Target
Habitat Range/Distribution	MSFD (1.4)	Distribution of plankton community not significantly influenced by anthropogenic drivers
	UK Government vision (CP2)	Distribution of plankton community not significantly altered by human pressures and is experiencing few or no problems
Habitat condition (including benthic community condition)	MSFD (1.6)	Condition of plankton community not significantly influenced by anthropogenic drivers
	MSFD (6.2)	Condition of the meroplanktonic (plankton with benthic life phase) community not significantly influenced by anthropogenic drivers
	WFD (transitional coastal waters)	The composition and abundance of phytoplankton taxa show slight signs of disturbance. There are slight changes in biomass compared to the type-specific conditions. Such changes do not indicate any accelerated growth of algae resulting in undesirable disturbance to the balance of organisms present in the water body or to the quality of the water. A slight increase in the frequency and intensity of the type specific planktonic blooms may occur.
	UK Government vision (CP2)	Condition of plankton community not significantly altered by human pressures and is experiencing few or no problems
Ecosystem structure	MSFD (1.7)	Structure of plankton community not significantly influenced by anthropogenic drivers
Abundance/distribution of key	MSFD (4.3)	Abundance/distribution of plankton community not significantly influenced by anthropogenic drivers

Criterion	Obligation	Target
trophic groups/species	WFD (transitional coastal waters)	The composition and abundance of phytoplankton taxa show slight signs of disturbance. There are slight changes in biomass compared to the type-specific conditions. Such changes do not indicate any accelerated growth of algae resulting in undesirable disturbance to the balance of organisms present in the water body or to the quality of the water. A slight increase in the frequency and intensity of the type-specific planktonic blooms may occur.

Table 19. Criterion targets applicable to rock and biogenic reef habitats

Criterion	Obligation	Target
Habitat Range/Distribution	MSFD (1.4)	Range and distribution is stable or increasing and not smaller than the baseline value (Favourable Reference Range for HD habitats)
	Habitats Directive	Range is stable (loss and expansion in balance) or increasing AND not smaller than the 'favourable reference range'
	OSPAR - QSR	Range is stable and not smaller than former natural conditions
Habitat area/extent	MSFD (1.5)	Area is stable or increasing and not smaller than the baseline value (Favourable Reference Area for HD habitats)
	Habitats Directive	Area is stable or increasing AND not smaller than the 'favourable reference area' AND without significant changes in distribution pattern within range (if data available)
	CBD – Aichi targets	By 2020, 10% of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures
	OSPAR – QSR	Area lost is <1%
	UK Government Vision – CP2	Area of habitat lost + impacted ≤ 10%
Habitat condition (including benthic community condition and physical damage)	MSFD (1.6, 6.1 and 6.2)	Area of habitat below GES (i.e. unacceptable impact/unsustainable use) as defined by condition indicators must not exceed 5% of the baseline value (Favourable Reference Area for HD habitats)
	Habitats Directive	Structures and functions (including typical species) in good condition and no significant deteriorations/pressures. Current UK target – Area of habitat in unfavourable condition <5%
	WFD (coastal waters)	Most disturbance-sensitive macroalgal and angiosperm taxa associated with undisturbed conditions are present. The level of macroalgal cover and angiosperm abundance show slight signs of disturbance. The level of diversity and abundance of invertebrate taxa is slightly outside the range associated with the type-specific conditions. Most of the sensitive taxa of the type-specific communities are present
	OSPAR – QSR	Area of habitat damaged is <10%
	UK Government Vision – CP2	Area of habitat lost + impacted ≤ 10%

Future prospects	Habitats Directive	The habitats prospects for its future are excellent/good, no significant impact from threats expected; long-term viability assured
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Table 20. Criterion targets applicable to sediment habitats

Criterion	Obligation	Target
Habitat Range/Distribution	MSFD (1.4)	<p>Option 1: Predominant habitat types - No target proposed All listed (special) habitat types - Range and distribution is stable or increasing and not smaller than the baseline value (Favourable Reference Range for Habitats Directive habitats)</p> <p>Option 2: All listed (special) and predominant habitat types - Range and distribution is stable or increasing and not smaller than the baseline value (Favourable Reference Range for Habitats Directive habitats)</p>
	Habitats Directive	Range is stable (loss and expansion in balance) or increasing AND not smaller than the 'favourable reference range'
	OSPAR - QSR	Range is stable and not smaller than former natural conditions
Habitat area/extent	MSFD (1.5)	<p>Option 1: Predominant habitat types – No target proposed All Listed (special) habitat types: Area is stable or increasing and not smaller than the baseline value (Favourable Reference Area for Habitats Directive habitats). WFD extent targets for saltmarsh and seagrass should be used within WFD boundaries as appropriate.</p> <p>Option 2: Predominant habitat types - area of habitat lost, plus area of habitat below GES (as defined by condition indicators) is $\leq 15\%$. All Listed (special) habitat types: Area is stable or increasing and not smaller than the baseline value (Favourable Reference Area for Habitats Directive habitats). WFD extent targets for saltmarsh and seagrass should be used within WFD boundaries as appropriate.</p>
	Habitats Directive	Area is stable or increasing AND not smaller than the 'favourable reference area' AND without significant changes in distribution pattern within range (if data available)
	CBD – Aichi targets	By 2020, 10% of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures
	OSPAR – QSR	Area lost is $< 1\%$
	UK Government Vision – CP2	Area of habitat lost + impacted $\leq 10\%$
Habitat condition (including benthic community condition and physical damage)	MSFD (1.6, 6.1 and 6.2)	<p>Option 1: Predominant habitat types – Improve the condition of benthic habitats, taking action to reduce impacts where these have been identified as unacceptable. All Listed (special) habitat types: Area of habitat below GES (i.e. unacceptable impact/unsustainable use) as defined by condition indicators must not exceed 5% of baseline value (favourable reference area for Habitats Directive habitats). WFD targets (km^2 thresholds) for area of unacceptable impact for benthic invertebrates, macroalgae, saltmarsh and seagrass should be</p>

Criterion	Obligation	Target
		used within WFD boundaries as appropriate. Option 2: Predominant habitat types - area of habitat lost, plus area of habitat below GES (as defined by condition indicators) is ≤15%. All Listed (special) habitat types: Area of habitat below GES (i.e. unacceptable impact/unsustainable use) as defined by condition indicators must not exceed 5% of baseline value (favourable reference area for Habitats Directive habitats). WFD targets (km ² thresholds) for area of unacceptable impact for benthic invertebrates, macroalgae, saltmarsh and seagrass should be used within WFD boundaries as appropriate.
	Habitats Directive	Structures and functions (including typical species) in good condition and no significant deteriorations/pressures. Current UK target – Area of habitat in unfavourable condition <5%
	WFD (coastal waters)	Most disturbance-sensitive macroalgal and angiosperm taxa associated with undisturbed conditions are present. The level of macroalgal cover and angiosperm abundance show slight signs of disturbance. The level of diversity and abundance of invertebrate taxa is slightly outside the range associated with the type-specific conditions. Most of the sensitive taxa of the type-specific communities are present.
	OSPAR – QSR	Area of habitat damaged is <10%
	UK Government Vision – CP2	Area of habitat lost + impacted ≤ 10%
Future prospects	Habitats Directive	The habitats prospects for its future are excellent/good, no significant impact from threats expected; long-term viability assured

Table 21. Criterion targets applicable to non-indigenous species

The following criterion targets which relate to non-indigenous species are applicable across all of the above biodiversity components.

Criterion	Obligation	Target
Abundance and state characteristics of non-indigenous species	MSFD (2.1)	Reduction in the risk of introduction and spread of non native species through improved management of the main pathways and vectors
	CBD (Aichi targets ²⁰) and EUBS	By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment
Environmental impact of invasive non-indigenous species	MSFD (2.2)	Species specific action plans are developed for key high risk marine non indigenous species by 2020

In addition, the EU Biodiversity Strategy high level targets support full implementation of the Habitats and Birds Directive and all associated targets under these obligations. It also sets a target to restore 15% of degraded ecosystems by 2020.

²⁰ <http://www.cbd.int/sp/targets/>

Targets at this high level are often quite vaguely articulated, using terms such as ‘...not significantly impacted...’, ‘...habitat is sufficiently large...’ etc.. These terms need to be defined quantitatively against a baseline if an assessment against them is to be made. Criterion-level targets will often be underpinned by a suite of indicators with associated targets and it will be dependent on whether a species (or group of species) or habitat type meets these indicator targets, as to whether the criterion target is achieved (e.g. under MSFD there is a target for fish which states ‘the geographic and depth distribution of fish should meet individual indicator targets in a statistically significant proportion of species monitored’). Similarly, a target for benthic habitats under Habitats Directive is for the ‘area of habitat in unfavourable condition (as defined by indicators and targets for structure and function (condition), including typical species) <5%’.

1.10.2 Differences

There are important differences between the criterion-level targets for biodiversity across the obligations. These high-level targets are vital in actually defining what is meant by Good Environmental Status (GES) and Favourable Conservation Status (FCS), for example. The targets define the status class boundaries and the lower threshold of what is considered to be ‘good’ or ‘favourable’ in the marine environment. The overall status classification that is assigned to any habitat or species is a product of the assessment criteria, targets, baselines and assessment scale. The main differences (and reasons for these differences) across the criterion-level targets are discussed below.

Firstly, there are (as identified in Section 1.1) differences in the high-level aspirations of the obligations, for example, the Habitats Directive is primarily focused on conservation and protection of habitats and species of Community interest whereas the MSFD is primarily focused on achieving coordination and sustainable use of all marine biodiversity across the entire EU marine area, whilst also achieving GES. Therefore, high-level criterion targets may seem to be conflicting in their level of ambition.

However, the issue of the choice of baseline against which to set the targets again becomes critical here. A target which aims to reach/maintain 95% of an area of habitat compared to the baseline would appear to be more ambitious than a target which aims to reach/maintain 80% of an area of habitat compared to the baseline to achieve ‘good’ status. However, if the 80% area target is set in relation to a baseline of reference conditions for habitat area and the 95% target is set in relation to a current baseline for habitat area, the 80% target could very well be much more ambitious (see Figure 14).

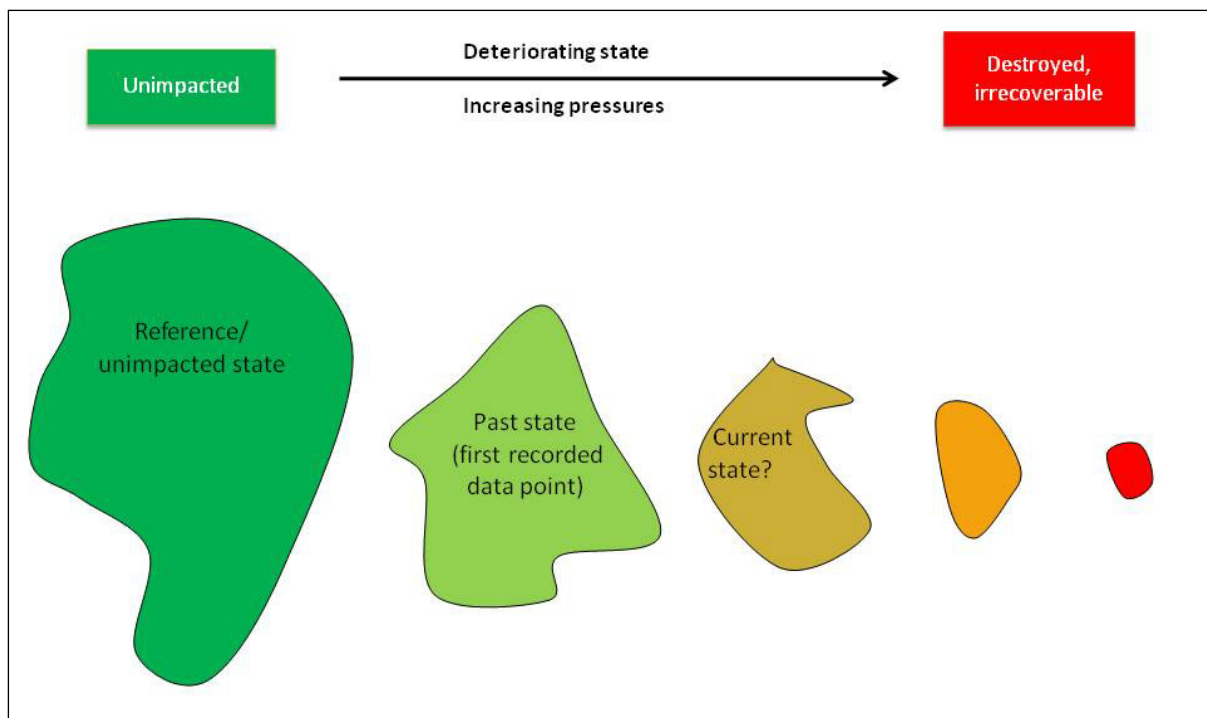


Figure 14. Illustration of how a deterioration in state over time, associated with increases in pressures and impacts, can include changes in both quality (e.g. of a habitat or population of a species) and quantity (e.g. habitat extent, population size) of a biodiversity component. Setting the baseline as 'current state' represents a very different scenario to using 'past state' or 'reference state'. (Figure from Moffat *et al.* 2011.)

Reflecting the importance of both quality and quantity aspects²¹ of biodiversity, some targets articulate the desired quality or condition of habitats and species (quality targets) and some targets articulate the desired amount of each habitat or species that should be at this level of quality (quantity targets or 'proportion of assessment area'). This is an important distinction to make when discussing targets because under some obligations the target quality is required across the entire habitat or species (e.g. Habitats Directive/WFD) and under others, the target quality is only required to be achieved across a proportion of the feature (e.g. MSFD/OSPAR/CP2). Obligations that cover a wide geographic area and the full range of biodiversity components often require a balance of areas of good quality and areas of poorer quality as a single level of quality cannot be achieved everywhere for all aspects of biodiversity.

Several targets are articulated in terms of the state of the biodiversity that is desired under that particular obligation (e.g. the abundance of a migratory species should approach historical levels under the Convention on Migratory Species). Conversely, some targets are articulated in terms of the level of pressure(s) which will be tolerated under a particular obligation (e.g. pressures and threats to the species should not be significant under the Habitats Directive). The ability to set ecologically meaningful pressure-based targets relies on a good understanding of the relationship between the human pressure(s) impacting the habitat or species and the subsequent change in biodiversity state (e.g. change in extent or condition).

²¹ Quality aspects relate to the state or condition of biodiversity. Quantity aspects relate to the amount of biodiversity that needs to be at a certain level of quality or simply describe the area or size of the component, e.g. population range or habitat area.

Criterion-level targets are also set at different geographic scales across different obligations. For example, under the WFD, targets for the condition of the biological quality elements only apply across type-specific water bodies in the transitional and coastal zones (for marine purposes). This geographic scale is very different to the scale of assessment required under the MSFD, for example. Therefore, a particular coastal habitat type which is being assessed against the targets under the WFD may be assessed as failing to meet Good Ecological Status due to local impacts on a small, water-body relevant scale. Conversely, at the regional scale under MSFD, the same habitat type may be assessed as achieving Good Environmental Status if there is a large enough quantity of habitat reaching a sufficient quality across the region as a whole. However, the definition of 'good' status for biodiversity should not differ between instruments as this causes problems, not least, for the delivery of the requirements of each instrument.

Additionally, some targets are agreed at a regional or EU level and some are only applicable at the UK scale. For example, the criterion targets under the MSFD will be agreed at the regional scale (e.g. across the North-East Atlantic (OSPAR) region) and the high-level targets under the WFD are agreed across the EU as they are articulated within the Directive itself. In contrast, criterion-level targets under the Habitats Directive are articulated within EU level guidance but are implemented at the Member State level and therefore UK targets may differ from those set in other Member States. Targets set under the UK Government Vision will also only be applicable at the UK scale (or regional sea within UK waters).

Obligations that do not have an assessment framework that is structured in a similar way as several of the EU Directives have differently described high-level targets. For example, the Wildlife and Countryside Act sets a limit for species in order to identify those which could be listed on Schedules 5 and 8 and therefore covered by special protection measures. The limit identified is for a 50% decline in population, number of localities or range over 20 years or a projected/inferred decline of 50%. If this limit is met or exceeded, the species may be listed on Schedule 5 or 8 of the Act. Therefore, a target could be described for this obligation as 'no species should experience a 50% (or more) decline in population, number of localities or range over 20 years'. This is in contrast to the OSPAR threatened and declining species and habitats limits which describe when a sufficient level of decline has occurred in order to warrant inclusion on the threatened and declining list. For species, this limit is one of severe decline or extirpation and for habitats this limit is 'where there is a high probability of decline that is linked directly or indirectly to human activity and that will reduce the extent of the habitat by 15% or more'.

As another example of differently described high level targets, the MCAA and MSA set targets for the network of protected sites which they make provisions for in both Acts. These shared targets are:

- a) the network contributes to the conservation/improvement of the marine environment in the UK marine area;
- b) the features which are protected by the sites comprising the network represent the range of features present in the UK marine area;
- c) the designation of sites comprised in the network reflects the fact that the conservation of a feature may require the designation of more than one site

Finally, it is useful to identify where criterion level targets have been defined within the text of the obligation itself and where they have been defined in other guidance, or indeed not at all (Table 22).

Table 22. Identifying where criterion level targets are defined (if at all) for each obligation.

Obligation	Where are criterion targets defined?
MSFD	None formally agreed (except achieving MSY for commercial fish and shellfish). Should be agreed across region/subregion.
Habitats Directive	EU guidance defines high-level targets for 'parameters' which are then implemented at a Member State level
Birds Directive	High-level target defined in Directive (Article 2)
WFD	Definitions of High/Good status given in Directive (Annex V)
CBD	20 Aichi biodiversity targets defined in CBD Strategic Plan
OSPAR	Pilot regional assessment targets defined in OSPAR workshop report (2009) Threatened and declining targets defined in Texel-Faial criteria
CMS	Criterion targets defined in Convention (Article 1)
UNCLOS	No criterion targets currently defined
WCA	Limit for species to be listed on schedule 5/8 defined in Section 22 of the Act
CSA	No targets formally defined
MCAA	Targets for the network of MCZs defined within the Act
MSA	Targets for the network of MPAs defined within the Act
HLMOs	No targets formally defined
Government Vision	Criterion level targets (where relevant) defined within the CP2 assessment
Marine Policy Statement	No targets formally defined
EU Biodiversity Strategy	High level targets for biodiversity defined within the Strategy

1.11. Aspect 11 – Assessment indicators (attributes)

1.11.1 Similarities

Indicators or attributes (of state, pressure or impact on biodiversity) that exist under the different obligations are presented below (Tables 23-29) and are grouped by biodiversity component. For example, for marine birds, the applicable indicators under the various obligations have been grouped by the criterion to which they apply, and are described together. It should be noted that under the MSFD, only those 'indicators' that are described within the 2010 Commission Decision on criteria and methodological standards for GES (2010/477/EU) are presented here. A common set of indicators for use in the North-East Atlantic region is currently being agreed at an OSPAR level (and will most likely incorporate the OSPAR EcoQOs currently adopted; see OSPAR Commission 2011 and 2012). In addition, UK MSFD implementation indicators were consulted on during 2012 via Defra. Indicators selected by Member States to meet the requirements of the Commission Decision (including 'supporting indicators' to make those indicators described within the Commission Decision operational) were submitted to the European Commission and further clarity on the MSFD indicators has been emerging since that time.

Table 23. Indicators applicable to marine birds.

Criterion	Obligation	Indicators
Species distribution/range	MSFD (1.1)	Distributional range (1.1.1) Distributional pattern within the latter, where appropriate (1.1.2)
Population size	MSFD (1.2)	Population abundance and/or biomass, as appropriate (1.2.1)
	CBD	Changes in the population size of breeding seabirds
	OSPAR	Seabird population trends EcoQO
	Gov Vision	Trends in seabird population size
Population condition	MSFD (1.3)	Population demographic characteristics (e.g. body size, sex ratio) (1.3.1) Population genetic structure, where appropriate (1.3.2)
	OSPAR	Proportion of oiled common guillemots EcoQO Levels of hazardous substances in seabird eggs EcoQO Levels of plastic particles in fulmar stomachs EcoQO
Productivity of key species or trophic groups	MSFD (4.1)	Performance of key predator species using their production per unit biomass (4.1.1)
Abundance/distribution of key trophic groups/species	MSFD (4.3)	Abundance trends of functionally important selected groups/species (4.3.1)

Table 24. Indicators applicable to marine mammals.

Criterion	Obligation	Indicators
Species distribution/range	MSFD (1.1)	Distributional range (1.1.1) Distributional pattern within the latter, where appropriate (1.1.2)
Population size	MSFD (1.2)	Population abundance and/or biomass, as appropriate (1.2.1)
	OSPAR	Seal population trends EcoQO
	CSA	Grey seal pup production Harbour seal numbers
	Gov Vision	Abundance of cetaceans and seals
Population condition	MSFD (1.3)	Population demographic characteristics (e.g. body size, sex ratio) (1.3.1) Population genetic structure, where appropriate (1.3.2)
	OSPAR	By-catch of harbour porpoise EcoQO
	CSA	Grey seal and harbour seal female age structure Grey seal adult female survival Pup survival rates in Orkney and Scottish West Coast Individual fecundity
	Gov Vision	Incidence of cetacean stranding Cetacean by-catch
Productivity of key species or trophic groups	MSFD (4.1)	Performance of key predator species using their production per unit biomass (4.1.1)
Abundance/distribution of key trophic groups/species	MSFD (4.3)	Abundance trends of functionally important selected groups/species (4.3.1)

Table 25. Indicators applicable to fish and fish communities.

Criterion	Obligation	Indicators
Species distribution/range	MSFD (1.1)	Distributional range (1.1.1) Distributional pattern within the latter, where appropriate (1.1.2)
Population size	MSFD (1.2)	Population abundance and/or biomass, as appropriate (1.2.1)
	CBD	Sustainable fish stocks indicator (16 stocks)
	OSPAR	Spawning stock biomass of commercial fish stocks EcoQO
	Gov Vision	Biomass Abundance
Population (or community) condition	MSFD (1.3)	Population demographic characteristics (e.g. body size, sex ratio) (1.3.1) Population genetic structure, where appropriate (1.3.2)
	WFD	Fish UK multi-metric
	Gov Vision (demersal fish only)	Daily growth production Daily production to biomass ratio Mean weight of fish Species count Margalef's species richness Pielou's evenness Hill's N1 diversity Hill's N2 dominance Mean ultimate body length Mean growth coefficient Mean length at maturity Mean age at maturity
	Deep-sea species	Species diversity indices Weight distribution
Proportion of selected species at the top of food webs	MSFD (4.2 and 1.7)	Proportion of large fish (by weight) (4.2.1)
	CBD	Proportion of large fish (by weight) in the Northern North Sea
	OSPAR	Proportion of large fish in the community EcoQO
	Gov Vision	Large Fish Indicator
Abundance/distribution of key trophic groups/species	MSFD (4.3)	Abundance trends of functionally important selected groups/species (4.3.1)

Table 26. Indicators applicable to pelagic habitats.

Criterion	Obligation	Indicators
Habitat Range/Distribution	MSFD (1.4)	Distributional range (1.4.1) Distributional pattern (1.4.2)
Habitat condition (including benthic community condition)	MSFD (1.6 & 6.2)	Condition of the typical species and communities (1.6.1) Relative abundance and/or biomass, as appropriate (1.6.2) Multi-metric indexes assessing benthic community condition and functionality (6.2.2)
	WFD	Phytoplankton toolbox: a) Chlorophyll biomass index b) Seasonal succession index c) Elevated taxa count index
	OSPAR	Occurrence of eutrophication EcoQO
	Gov Vision	Climate change indicator Invasive species indicator Ecosystem health indicator Plankton, fish and wildlife interactions indicator
Ecosystem structure	MSFD (1.7)	Composition and relative proportions of ecosystem components (1.7.1)
Abundance/	MSFD (4.3)	Abundance trends of functionally important selected

Criterion	Obligation	Indicators
distribution of key trophic groups/species		groups/species (4.3.1)
	WFD	Phytoplankton toolbox: a) Chlorophyll biomass index b) Seasonal succession index c) Elevated taxa count index
	Gov Vision	Total abundance of copepods Abundance of <i>Calanus finmarchicus</i> Ratios of <i>Calanus finmarchicus</i> and <i>Calanus helgolandicus</i> Phytoplankton Colour (index of phytoplankton biomass) Seven species assemblage indicator based on calanoid copepods

Table 27. Indicators applicable to rock and biogenic reef habitats.

Criterion	Obligation	Indicators
Habitat Range/Distribution	MSFD (1.4)	Distributional range (1.4.1) Distributional pattern (1.4.2)
Habitat extent/area	MSFD (1.5)	Habitat area (1.5.1) Habitat volume (where relevant) (1.5.2)
Habitat condition (including benthic community condition)	MSFD (1.6 & 6.2)	Condition of the typical species and communities (1.6.1) Relative abundance and/or biomass, as appropriate (1.6.2) Physical, hydrological and chemical conditions (1.6.3)
	WFD	Macroalgae reduced species list Fucoid extent tool (transitional waters only) The Vans Deferens Sequence Index (VDSI) Imposex in dogwhelks (TBT specific)
	OSPAR	Level of imposex in dogwhelks and other marine gastropods EcoQO
	Gov Vision	Extent of habitat type impacted by all human pressures
Physical damage	MSFD (6.1)	Type, abundance, biomass and areal extent of relevant biogenic substrate (6.1.1) Extent of the seabed significantly affected by human activities for the different substrate types (6.1.2)
	Gov Vision	Extent of habitat type impacted by all human pressures

Table 28. Indicators applicable to sediment habitats.

Criterion	Obligation	Indicators
Habitat Range/Distribution	MSFD (1.4)	Distributional range (1.4.1) Distributional pattern (1.4.2)
Habitat extent/area	MSFD (1.5)	Habitat area (1.5.1) Habitat volume (where relevant) (1.5.2)
	WFD	Seagrass extent Saltmarsh extent
Habitat condition (including benthic community condition)	MSFD (1.6 & 6.2)	Condition of the typical species and communities (1.6.1) Relative abundance and/or biomass, as appropriate (1.6.2) Physical, hydrological and chemical conditions (1.6.3)
	WFD	Seagrass tool Saltmarsh tool Infaunal quality index (IQI) Opportunistic algae tool
	Gov Vision	Extent of habitat type impacted by all human pressures
Physical damage	MSFD (6.1)	Extent of the seabed significantly affected by human activities for the different substrate types (6.1.2)
	Gov Vision	Extent of habitat type impacted by all human pressures

The following invasive species indicators are applicable across all components of marine biodiversity.

Table 29. Indicators applicable to non-indigenous species.

Criterion	Obligation	Indicators
Abundance and state characteristics of non-indigenous species	MSFD (2.1)	Trends in abundance, temporal occurrence and spatial distribution in the wild of non-indigenous species, particularly invasive non-indigenous species, notably in risk areas, in relation to the main vectors and pathways of spreading of such species (2.1.1)
	CBD	Change in number and proportion of invasive species in the marine environment
Environmental impact of invasive non-indigenous species	MSFD (2.2)	Ratio between invasive non-indigenous species and native species in some well studied taxonomic groups (e.g. fish, macroalgae, molluscs) that may provide a measure of change in species composition (e.g. further to the displacement of native species) (2.2.1) Impacts of non-indigenous invasive species at the level of species, habitats and ecosystem, where feasible (2.2.2)

1.11.2 Differences

The use of indicators across obligations is highly varied. For species, the main instruments that employ indicators within their assessment frameworks are the MSFD, CBD, OSPAR and UK Government Vision. For habitats, the main instruments are the MSFD, WFD, OSPAR and UK Government Vision. These obligations identify indicators of the state of the biodiversity component, and/or the pressures acting on the biodiversity component and/or the impact(s) that these pressures have on biodiversity in order to effectively detect change in the status of biodiversity and attribute this change, where possible, to a human or natural cause. The use of different types of indicators can be illustrated by the following examples:

1. Under the Government Vision, the abundance of cetaceans is a direct indication of the state of these species (state indicator).
2. Under the OSPAR EcoQO system in the North Sea, the proportion of oiled guillemots is a direct indicator of the pressure of oil contamination on seabirds (pressure indicator).
3. Under the WFD, the occurrence of imposex in dog whelks is a direct indicator of the biological impact of TBT contamination on gastropods (impact indicator).

The most effective ecological indicators are those which describe the state of biodiversity and have a strong link to a human pressure, that is, those that show a change in metric/parameter in response to a change in pressure (i.e. reflect a biological impact - ICES, 2001). These indicators are most able to inform environmental management and decision making.

Some components of biodiversity have a long history in the development and use of indicators to assess status and trends (e.g. fish populations and communities). The result of this extensive work on developing and validating indicators is that there are several operational indicators that are able to describe the structure and functioning of fish communities in UK waters, particularly for demersal species. The CP2 assessment completed in 2010 to fulfil the requirements of the UK Government Vision included 15 fish community and ecosystem indicators for demersal species that described the changes in status over the past 20 years. In contrast, indicators describing the condition of populations and communities of marine birds and mammals are less well developed. In order to assess the criterion of population condition for marine mammals and birds, it is often necessary to select indicators of pressure (e.g. bycatch of cetaceans and proportion of oiled guillemots to act as a proxy for population condition). Furthermore, indicators of benthic habitat condition

are particularly underdeveloped at this point. Despite this, there are some effective and operational indicators in use under WFD, such as the Infaunal Quality Index (IQI) used to monitor the condition of soft sediment habitats. In addition, spatially based indicators of pressure and impact are proposed to meet the need to assess physical damage and provide large scale assessments of habitat condition where monitoring of direct condition indicators may not be possible.

WFD indicators (tools) are identified through an intercalibration process across Member States within each Geographic Intercalibration Group (GIG) to ensure that the assessment frameworks are comparable across the EU. This type of regional co-operation is also required in order to develop and adopt OSPAR EcoQOs within the North-East Atlantic, although the scale and purpose of these indicators differs to that of the WFD. EcoQOs function as objectives, indicators and thresholds, describing the desired state of the marine environment and a way in which to monitor progress towards achieving this state. The EcoQO system attempts to construct a suite of marine biodiversity indicators that respond closely to changes in human pressures on the marine environment (e.g. the Large Fish Indicator, LFI). This suite of indicators will contribute towards being able to undertake an ecosystem level assessment of the impacts of human pressures on the marine environment in the North Sea (and eventually, the North-East Atlantic as a whole).

Several proposed OSPAR EcoQOs are still under development (e.g. the EcoQO on seabird population trends). This is also the case with many of the indicators proposed at the UK level for implementation of the EU MSFD. The majority of the indicators put forward by UK experts to meet the requirements of the 2010 MSFD Commission Decision²² (especially for benthic habitats) are not yet operational, tested or validated. These indicators will need a considerable amount of work before they can become effective tools for the monitoring and assessment of the status of marine biodiversity across the subregion. Some indicators, however, are currently fully operational and are providing data on ecosystem health and functioning at a range of spatial scales e.g. WFD phytoplankton toolbox and large scale phytoplankton indicators of climate change (as produced by SAHFOS).

In contrast, several obligations do not define indicators for use within their assessment framework (e.g. the Birds Directive). Similarly, the Habitats Directive does not identify any indicators that should be used to assess the parameters identified within the EU Guidance. In order to determine whether the parameters (criteria) for habitats and species have met favourable conservation status, some Member States have developed methods for the evaluation of the conservation status of features at a local site scale, often using an indicator based assessment (European Commission 2011). The significant differences in scale of indicator application are important to note here, since obligations that require large-scale assessments (e.g. MSFD, EUBS) may require the selection of generic indicators that can be made regionally operational with the identification of particular indicator species, habitats or metrics.

1.12. Aspect 12 – Indicator targets/thresholds

1.12.1 Similarities

The only instruments which have identified indicator level targets for biodiversity at this time are the WFD, CBD (UK implementation), OSPAR Convention (EcoQO system) and the UK Government Vision (CP2 assessment). Therefore, the majority of obligations have not defined indicator level targets for the biodiversity components that they cover. Those that

²² <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2010:232:0014:0024:EN:PDF>

have set indicator targets form part of an adaptive and evolving process of target setting which will continue as ecological understanding improves.

Table 30 shows the indicator targets that exist for each biodiversity component. Only those indicators which have an associated target are identified here (i.e. there are indicators identified under the CSA but no targets are articulated, therefore, these indicators have been excluded from this section for brevity). It should also be noted that targets under the WFD identified here define the boundary to achieve 'Good' ecological status, and not the boundary to achieve 'High' status. Any proposed targets at the indicator level under MSFD have been excluded at this stage as they are not yet defined and agreed for UK biodiversity and in some cases require agreement across the OSPAR region (i.e. OSPAR common indicator set, see OSPAR Commission 2011).

Table 30. Showing those indicator targets that exist under four national and international obligations for various biodiversity components.

Biodiversity component	Obligation and relevant indicator targets			
	WFD	CBD	OSPAR EcoQO (North Sea only)	UK Government Vision
Marine Birds		Positive change in trend of breeding seabird populations of >5% since 1970	Changes in breeding seabird abundance should be within target levels for 75% of the species monitored in any of the OSPAR regions or their sub-divisions	Increasing trend in seabird population size
			Average proportion of oiled common guillemots in all winter months should be 20% or less by 2020 and 10% or less by 2030 of the total found dead or dying in each of 15 areas of the North Sea over a period of at least 5 years	
			Mercury – average concentrations in 10 eggs of common tern and Eurasian oystercatcher in certain estuaries should not exceed that of eggs from same species in non-industrial habitats. Organochlorines – average concentrations in 10 eggs of common tern and Eurasian oystercatcher should not exceed 20 ng/g PCBs; 10 ng/g DDT and metabolites; and 2 ng/g HCB and HCH	
			<10 % of northern fulmars have >0.1 g plastic particles in the stomach in samples of 50-100 beach-washed fulmars found from each of 4-5 areas of the North Sea over a period of at least 5 years	
Marine mammals			No decline in pup production of grey seals of ≥ 10 % as represented in a 5 year running mean or point estimates (separated by up to five years) within any of a set of defined sub-units of the North Sea	Increasing abundance of cetacean and seal populations
			Annual by-catch of harbour porpoises should be reduced to <1.7 % of best population estimate	Annual by-catch of harbour porpoises should be reduced to <1.7 % of best population estimate
Fish	Fish UK multi-metric target (excluding coastal waters)	Positive change in trend of percentage of fish stocks harvested sustainably since 1990	Maintain the Spawning Stock Biomass (SSB) above precautionary reference points for commercial fish stocks where agreed by the competent authority for fisheries management	Trends observed in 15 univariate community metrics (demersal fish only) do not differ by more

Biodiversity component	Obligation and relevant indicator targets			
	WFD	CBD	OSPAR EcoQO (North Sea only)	UK Government Vision
				than 1 standard deviation either side of the mean value determined for the reference period
		+ve change in trend of proportion of large fish ($\geq 40\text{cm}$) in Northern North Sea since 1982	At least 30% of fish (by weight) should be greater than 40cm in length	At least 30% of fish (by weight) should be greater than 40cm in length
Pelagic habitats	Phytoplankton biomass (chlorophyll a) = ≥ 0.33 or 0.44 EQR ²³		Eutrophication does not occur in the marine environment	Change in plankton indicators should only be caused by natural variation
	Seasonal succession index = ≥ 0.49 EQR			
	Elevated taxa count index = ≥ 0.43 EQR			
Rock and biogenic reef habitats	Macroalgae reduced species list = ≥ 0.60 EQR		Average level of imposex in a sample of ≥ 10 female dogwhelks (<i>Nucella lapillus</i>) should be consistent with exposure to TBT concentrations below the environmental assessment criterion for TBT. Where <i>Nucella lapillus</i> does not occur naturally or where it has become extinct, other species may be used	Extent of each habitat type impacted by human pressures $\leq 10\%$
	Fucoid extent tool (transitional waters only) = ≥ 0.60 EQR			
	The Vans Deferens Sequence Index (VDSI) ≥ 0.33 (EQR)			
Sediment habitats	IQI = ≥ 0.64 (EQR)			
	Opportunistic macroalgae tool = ≥ 0.60 EQR			
	Seagrass tool = ≥ 0.70 EQR			
	Seagrass extent = ≥ 0.70 EQR			
All biodiversity		Stable or declining trend in number of highly invasive species established across $>10\%$ of UK area		

²³ EQRs are a means of expressing class boundaries on a common scale from zero to one. The boundary EQR values represent particular degrees of deviation from the corresponding reference values (reference condition baseline). High status is represented by values relatively close to one (i.e. little or no deviation) and bad status by values relatively close to zero (i.e. substantial deviation).

For marine birds there is similarity across indicator targets in that all three of the obligations which set targets at the indicator level address the aspect of population size. For marine mammals, both the EcoQO system under OSPAR and the UK Government Vision CP2 assessment use the target relating to the level of bycatch of harbour porpoise against which to assess the pressure of removal of non-target species on cetacean populations. For fish species and communities, there are similarities in the use of a target for spawning stock biomass (SSB) of commercial fish species, as this is an effective reflection of the sustainable exploitation of these species. There is also commonality in the use of the target for the Large Fish Indicator across the North Sea, that is, more than 30% (by weight) of fish should be at a length of greater than 40cm.

For habitats there are a variety of indicator level targets and due to the early developmental nature of many benthic habitat targets, similarities are few.

Under the UK legislative instruments there are several targets articulated for protected sites such as SSSIs, MCZs and Scottish nature conservation MPAs. Although generic targets for these obligations are not defined (targets will be feature and site specific), they are similar in that the target is to achieve the specific conservation objectives that have been defined for the site and designated features.

Indicator targets for invasive species apply across all components of biodiversity and the current UK indicator target under CBD is for a decline in the establishment of highly invasive species across the UK terrestrial and marine area. It is likely that future targets for invasive non-native species will also take this approach (e.g. for MSFD GES indicator 2.1.1).

1.12.2 Differences

There are significant differences in the scale at which the indicator targets identified in Table 30 apply. Whilst the targets under WFD apply to specific, small-scale water body types, the OSPAR EcoQO targets apply across the entire North Sea sub-region. Conversely, the UK CBD targets and the UK Government vision targets apply across all UK waters (apart from the proportion of large fish target). This larger spatial scale is reflected in the fact that some of the targets are spatially based (e.g. the CP2 target of 'Extent of each habitat type impacted by human pressures $\leq 10\%$ '). It is difficult to detect change in condition of habitats at this large spatial scale using direct state indicator monitoring data as it is very costly and time consuming to collect over such large areas. In response to this, there is ongoing work to develop proxy pressure maps to enable large-scale assessments of habitat condition.

It is evident in Table 30 that some indicator targets reflect a desired state of a marine biodiversity component (e.g. positive change in trend of breeding seabird populations of $>5\%$ since 1970; UK CBD target). In contrast, some indicator targets reflect a desired level of pressure on the marine environment (e.g. the EcoQO $<10\%$ of northern fulmars have >0.1 g plastic particles in stomach samples). Finally, some indicator targets reflect a desired level of impact on the biological components, such as the WFD target 'The Vans Deferens Sequence Index (VDSI) ≥ 0.33 ' (indicating the level of impact of TBT contamination on dog whelks). This difference in targets relates to the different indicator types that are used within the assessment frameworks (described in Section 1.11). Those targets that are of most use in informing management and decision making are those that describe a desired state of biodiversity that is strongly linked to (and therefore responds tightly to) a change in a human pressure on the marine environment, for example, the spawning stock biomass of commercial fish stocks should be maintained above precautionary reference points (this state indicator is very tightly linked to the human pressure of removal of target species through fishing activity).

1.13. Aspect 13 – Aggregation rules

1.13.1 Similarities

Similarities in the application of aggregation rules are identified in Table 31. Aggregation rules can be developed in order to bring together assessments at smaller spatial scales to produce an assessment across a larger geographic area (here, these are termed 'spatial aggregation rules'). Additionally, aggregation of different biological aspects or 'criteria' to produce an assessment of a single habitat type or species can also be undertaken (these are termed 'criteria aggregation rules'), for example, aggregating range, extent, structure and function and future prospects criteria under the Habitats Directive to produce an assessment of a listed habitat type (e.g. a biogenic reef). Finally, aggregation rules can be applied in order to bring together assessments of different, nested biological components to produce an assessment at a higher level of biological organisation (these are termed 'biological aggregation rules'), for example, as an extreme, all components of marine biodiversity (habitats plus species) could be aggregated together to produce an assessment of the status of marine biodiversity as a whole across a certain geographic area.

Table 31. Showing the use of spatial, criteria and biological aggregation rules across different obligations. Where (?) has been used, this reflects uncertainty around whether or not spatial and/or biological aggregation rules will be required to produce assessments under this obligation due to its current state of development/implementation e.g. the assessment process and methods under the MSFD are not yet finalised.

	MSFD	HD	BD	WFD	CBD	OSPAR	CMS	UNCLOS	WCA	CSA	MCAA	MSA	HLMOs	UK Gov Vision	MPS	EUBS
Spatial aggregation	?	X	✓	X	X	X	X	?	✓ (SSSIs)	X	?	?	X	✓	X	?
Criteria aggregation	?	✓	X	✓	X	✓	✓	?	✓ (SSSIs)	X	?	?	X	X	X	?
Biological aggregation	?	X	X	✓	X	✓	X	?	X	X	?	?	X	✓	X	?

Those obligations that require reporting at (relatively) large geographic scales (e.g. Habitats Directive, Birds Directive and the UK Government Vision), tend to have developed (or are developing) spatial aggregation rules in order to systematically integrate assessment results produced at a smaller spatial scale. For example, under the Habitats Directive, assessments of feature condition may be made initially at a protected site level (e.g. SAC). This assessment would then need to be integrated with those made of the condition of the same feature at other protected sites and subsequently a status assessment is required for the feature across the entire waters of each Member State. This assessment is then aggregated into an assessment of the status of the feature at the EU biogeographic region. The method used to produce biogeographic scale

assessments is that Member State assessments are weighted according to the proportion of that species or habitat found within the national territories. The results are then aggregated to give a single, integrated assessment for each bio-geographical region using the following rules:

1. If the proportion of a habitat/species reported as 'Unfavourable – Bad' is greater or equal than 25% the habitat/species is considered 'Unfavourable – Bad' for the region.
2. If the proportion of a habitat/species reported as 'Favourable' is greater or equal than 75% the habitat/species is considered 'Favourable' for the region.
3. If the proportion of a habitat/species reported as 'Unknown' is greater or equal than 25% the habitat/species is considered 'Unknown' for the region.
4. Any other combination is considered as 'Unfavourable – Inadequate'

Several obligations (e.g. Habitats Directive, OSPAR and SSSI assessment under the WCA) apply criteria aggregation rules in order to bring together the assessments of individual criteria, such as population size, condition and habitat in order to make an overall assessment of a species, for example. In addition, some obligations also bring together different biological components to produce a more-integrated assessment of marine environmental status. For example, under the WFD, different biological quality elements (e.g. benthic invertebrates, fish, and phytoplankton) are aggregated in order to assess the ecological status of a water body (where appropriate). Both the OSPAR QSR assessment and CP2 use the aggregated assessment results of nested sub-components of habitats in order to produce an assessment of those habitats that are defined at the broad-scale (e.g. subtidal rock).

1.13.2 Differences

Differences arise when investigating the detail of the aggregation rules that are applied under each obligation, if any. Differences result from the fact that each obligation covers a different geographic area, different assessment criteria and different aspects of marine biodiversity. Therefore, the specific aspects that need to be aggregated vary across the obligations.

Specifically, under the Habitats Directive, aggregation occurs across the criteria that are used to assess any particular listed habitat or species. These produce assessment results at the scale of the Member State and these results are subsequently aggregated to produce assessments for the features at the scale of the relevant EU biogeographic region. Spatial aggregation rules are also often required to aggregate assessment results at a small scale within Member State waters to produce the overall Member State feature assessments. These rules, however, are not formally defined. Similarly, under the Birds Directive it is acknowledged that spatial aggregation rules will be required in order to produce EU scale reports.

No formal spatial aggregation rules are required under the WFD as assessments are undertaken at the individual water body scale (i.e. a scale much smaller than the Habitats and Birds Directive reporting scale). Results from monitoring stations across waterbodies are usually averaged in order to determine if the waterbody has achieved the required biological quality standard. However, UK TAG guidance (2007) does state that if 1.5km² or 15% (unless 15% is less than 1.5km²) of the waterbody area fails to meet the required 'good' ecological standard, the waterbody assessment can be downgraded. Under WFD, aggregation does however also occur across the biological quality elements that are measured for each water body. These are brought together to produce an overall ecological quality status for the water body.

As part of the regional assessment of species and habitats for the OSPAR QSR 2010, ecosystem components were grouped at very broad ecological levels (e.g. 'seabirds' or 'deep sea habitats'). Therefore, the assessment was based on the aggregated response of the component to the particular pressure. This was done by taking account of the status of a component based on the majority response (e.g. >50% by area for habitats). As an example, when assessing the effect of the pressure 'habitat structure changes – abrasion' on the subtidal rock; the aggregated response would be based on the majority response of all sub-components (infralittoral and circalittoral rock, and subtidal biogenic reef habitats) in the region being assessed.

In order to assess the status of benthic habitats as part of CP2 and under the requirements of the UK Government Vision, it was necessary to apply spatial aggregation rules. As a result of the methodology used to assess habitat status (i.e. the overlap of habitat extent with extent of human pressures and calculating the overall area impacted), it was necessary to employ a rule that 'where two or more pressures were known to overlap, it was assumed that they completely overlapped such that the largest percentage was used to account for all pressures'. This avoided double counting of pressures that were caused by the same activity (e.g. physical abrasion and removal of non-target species). Spatial aggregation rules were also required in order to convert the assessment results produced for 11 regional seas for benthic habitats into the eight regional seas used for the overall assessment.

Finally, under the WCA, SSSI features are assessed at the individual site scale. Spatial aggregation rules will be applied (by SNCBs) where the site has been divided into units to make assessment and management more effective and efficient. These rules are, however, not formalised. Biological aggregation will be required across the attributes that are chosen to assess the condition of the feature on the site.

1.14. Aspect 14 – Overall assessment approach

1.14.1 Similarities

Across the obligations considered within this review, there are several common assessment approaches. Table 32 shows the assessment methodologies that are used across the obligations, including where there is no method currently defined and where no approach is required due to the nature of the assessment framework of the obligation. The most commonly used overall assessment approach is to apply the 'one-out, all-out' rule (i.e. if one parameter/criterion/quality element achieves an unfavourable/poor/bad assessment, this is taken as the overall assessment for the habitat type, water body or species). This is also known as the worst case or precautionary approach (i.e. the lowest assessment result is taken as the overall result for the biodiversity component).

Table 32. Showing the different assessment approaches (including ‘none required’) applied across obligations.

	Assessment approach			
	One-out-all-out	Extent of impacts	Currently undefined	None required
Obligations adopting approach	<ul style="list-style-type: none"> Habitats Directive WFD OSPAR - QSR Convention on Migratory Species WCA – SSSIs 	<ul style="list-style-type: none"> UK Government Vision – CP2 	<ul style="list-style-type: none"> MSFD Birds Directive CBD UNCLOS Marine & Coastal Access Act Marine Scotland Act EU Biodiversity Strategy 	<ul style="list-style-type: none"> Conservation of Seals Act High Level Marine Objectives Marine Policy Statement

1.14.2 Differences

It is evident from Table 32 that the majority of assessment obligations that have a defined assessment approach use the one-out, all-out rule. For the Habitats Directive, the lowest assessment across the parameters is taken as the overall assessment. This is akin to the assessment approach under the OSPAR QSR and also the Convention on Migratory Species which both take the worst assessment across the criteria as the overall assessment result. For the WFD, the lowest assessment across the quality elements is taken as the overall assessment. Assessment of SSSIs under the WCA takes the lowest assessment of the feature attributes as the overall assessment result, in line with Common Standards Monitoring guidance for protected sites monitoring and assessment.

In contrast, the assessment method used under CP2 was based on determining the extent of the impacts on various marine biodiversity components, therefore assessing whether there were few or no, some or many problems caused by such human impacts.

An overall assessment method will need to be defined for those obligations that require some type of integrated assessment to be made but currently have no mechanism for integrating different types of information across criteria to produce an assessment result. For the Conservation of Seals Act, UK High Level Marine Objectives and Marine Policy Statement, no assessment approach is required as an overall status assessment is not stipulated within the obligation.

2 References

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3 Glossary

ACAP	Agreement on the Conservation of Albatrosses and Petrels
AEWA	Agreement on the Conservation of African-Eurasian Migratory Waterbirds (also known as the African-Eurasian Waterbird Agreement)
ASCOBANS	Agreement on the Conservation of Small Cetaceans of the Baltic, North-East Atlantic, Irish and North Seas
ASSI	Area of Special Scientific Interest [in Northern Ireland]
BAP	Biodiversity Action Plan
BD	Birds Directive
CBD	Convention on Biological Diversity
CCW	Countryside Council for Wales [now Natural Resources Wales, NRW]
Cefas	Centre for Environment, Fisheries and Aquaculture Science
CMS	Convention on Migratory Species
CO	Conservation Objective
COP	Conference of Parties (of the CBD)
CS	Continental Shelf/Conservation Status [according to context]
CSA	Conservation of Seals Act
D	Descriptor
DA	Devolved Administration
Defra	Department for Environment, Food and Rural Affairs
EA	Environment Agency
EcoQO	Ecological Quality Objective
EEA	European Environment Agency
EEZ	European Economic Zone
ENG	Ecological Network Guidance
EQR	Ecological Quality Ratios
EQS	Environmental Quality Standard
EU	European Union
EUBS	European Union Biodiversity Strategy
FCS	Favourable Conservation Status
GEcS	Good Ecological Status
GES	Good Environmental Status
Gov Vision	UK Government Vision for the marine environment
HBDSEG	Healthy and Biologically Diverse Seas Evidence Group (of the UK)
HD	Habitats Directive
HLMOs	UK High-level Marine Objectives
ICES	International Council for the Exploration of the Sea
ICG-COBAM	OSPAR's Inter-sessional Correspondence Group on the Coordination of Biodiversity Assessment and Monitoring
IQI	Infaunal Quality Index
JNCC	Joint Nature Conservation Committee
JRC	European Commission Joint Research
LFI	Large Fish Indicator
MCAA	Marine and Coastal Access Act
MCZ	Marine Conservation Zone
MNR	Marine Nature Reserve
MPA	Marine Protected Area
MPS	UK Marine Policy Statement
MS	Member States
MSA	Marine (Scotland) Act
MSFD	Marine Strategy Framework Directive
Natura 2000	An ecological network of protected areas in the territory of the EU, brought about through BD and HD
NERC	Natural Environment Research Council
NIEA	Northern Ireland Environment Agency

OSPAR	Convention for the protection of the marine environment of the North-East Atlantic
QSR	Quality Status Report
SAC	Special Area of Conservation [under the HD]
SAHFOS	Sir Alister Hardy Foundation for Ocean Science
SBSTTA	Subsidiary Body on Scientific, Technical and Technological Advice
SCANS	Small Cetacean Abundance in the North Sea and Adjacent waters
SEPA	Scottish Environment Protection Agency
SMRU	Sea Mammal Research Unit
SNCB	Statutory Nature Conservation Body [e.g. Natural England, JNCC]
SNH	Scottish Natural Heritage
SPA	Special Protection Area [under the BD]
SSSI	Site of Special Scientific Interest [in Great Britain]
UK TAG	UK Technical Advisory Group (of the WFD)
UNCLOS	United Nations Convention on the Law of the Sea
TBT	Tributyl tin
WCA	Wildlife and Countryside Act
WFD	Water Framework Directive

Appendix A - Map showing the relationship between different marine region boundaries (interactive pdf, to view and change map layers, click 'layers' icon on left hand side of pdf)

UK obligations boundaries EU scale

UK obligations boundaries UK scale