

Rationale and criteria for the identification of nationally important marine nature conservation features and areas in the UK

Prepared for the Review of Marine Nature Conservation

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Prepared by the Joint Nature Conservation Committee, the statutory nature conservation agencies and Wildlife and Countryside Link

This is a working paper

The criteria, particularly the threshold values, and the method of their application remain to be tested and will be adjusted in the light of these tests.

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Contents

1	BACKGROUND.....	3
2	SCOPE OF THE PAPER	3
3	FRAMEWORK	4
4	AIMS AND PRINCIPLES.....	5
4.1	AIMS OF IDENTIFYING NATIONALLY IMPORTANT FEATURES AND AREAS	5
4.2	USE OF THE TERMS ‘NATIONALLY IMPORTANT’, ‘FEATURES’ AND ‘AREAS’	6
4.3	SCALE.....	7
4.4	KEY ENVIRONMENTAL PRINCIPLES TO BE CONSIDERED.....	8
4.4.1	<i>General principles.....</i>	<i>8</i>
4.4.2	<i>Nature conservation principles</i>	<i>8</i>
4.4.3	<i>How much to protect.....</i>	<i>9</i>
5	OVERVIEW OF THE IDENTIFICATION PROCESS.....	10
6	IDENTIFYING BEST REPRESENTATIVE AREAS.....	11
6.1	WORKING WITH MOBILE AND NON-MOBILE FEATURES	11
6.2	BIOGEOGRAPHY	11
6.3	FEATURES TO CONSIDER	11
6.4	CRITERIA	12
7	IDENTIFYING FEATURES OF SPECIAL IMPORTANCE	12
7.1	CRITERIA	13
8	IDENTIFYING FEATURES THAT HAVE DECLINED OR ARE THREATENED.....	14
8.1	CRITERIA	14
9	APPLICATION OF THE CRITERIA	16
10	CONSERVATION MANAGEMENT OPTIONS	16
11	ACKNOWLEDGEMENTS.....	17
12	REFERENCES.....	17
13	ADDENDUM RELATING TO MARINE GEOLOGICAL AND GEOMORPHOLOGICAL FEATURES	18
13.1	INTRODUCTION.....	18
13.2	EXISTING NATIONAL CRITERIA FOR THE SELECTION OF GEOLOGICAL AND GEOMORPHOLOGICAL FEATURES	18
13.3	PURPOSE OF GEOLOGICAL AND GEOMORPHOLOGICAL SSSIs/ASSIs	19
13.4	GEOLOGICAL AND GEOMORPHOLOGICAL FEATURES IN THE MARINE ENVIRONMENT	19
13.5	RELATIONSHIP TO THE IRISH SEA PILOT.....	20

Rationale and criteria for the identification of nationally important marine nature conservation features and sites in the UK

1 Background

This paper has been prepared to contribute to the work of Defra's Review of Marine Nature Conservation (RMNC). At the 11th meeting of the RMNC Working Group in June 2002 it was agreed that the JNCC would take forward the work identified in the RMNC work programme on nationally important sites, habitats and species. This was to be undertaken, in the first instance, as follows:

- Preparation, through a sub-group of the RMNC, of a 'criteria' paper for the identification of nationally important sites, habitats and species, based on the paper submitted to the RMNC by Laffoley *et al.* (2000a). The paper should include guidance on applying the criteria and should be presented to the RMNC working group at its 12th meeting in November 2002.
- The refined criteria would be applied to the Irish Sea as part of the Irish Sea Pilot Scheme, with the aim of mapping nationally important sites, species and habitats for that area by March 2003.
- The Pilot would test the effectiveness of the draft criteria and further refinement would be made to them in the light of lessons learned.

This paper builds upon the approaches given in Laffoley *et al.* (2000a, b), reports for the RMNC that outlined the nature and role of nationally important seascapes, habitats and species in the context of developing a framework for marine nature conservation and outlined criteria for identifying them.

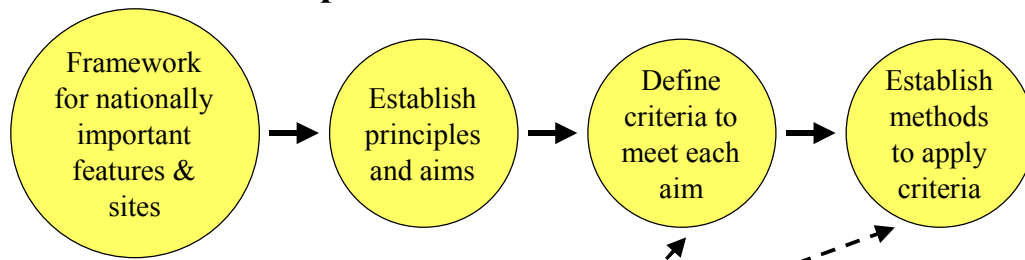
2 Scope of the paper

This paper further elaborates on the purpose of identifying marine features (see section 4.2 regarding use of the term 'feature') and areas of national importance as outlined in Laffoley *et al.* (2000a), providing more detailed criteria and offering an approach to the application of these criteria.

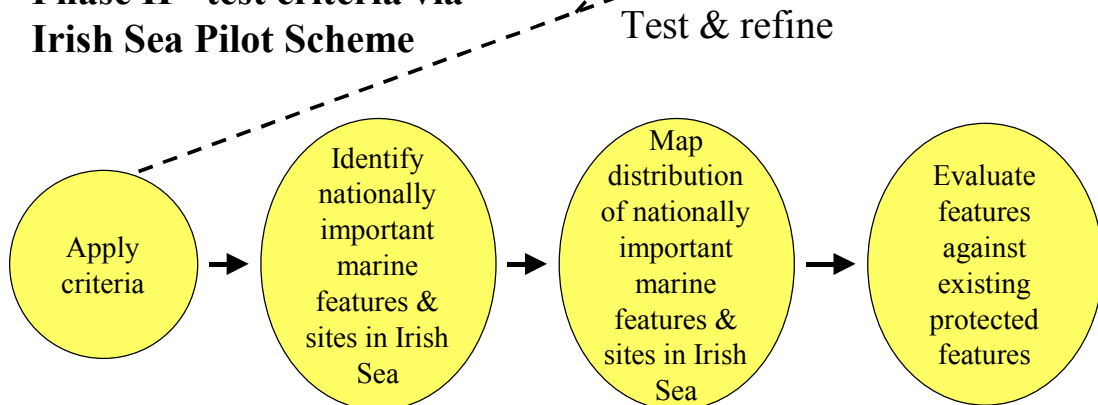
The paper is offered as an outline rationale and suite of criteria, together with indicative threshold values for using these criteria. It has drawn extensively upon existing work in other fora, notably OSPAR, IUCN, SSSI guidelines and the EC Habitats Directive, applying their approaches in a manner considered most suitable for use at national level. Drawing from a variety of sources (both for overarching principles and aims and in the detail of the criteria), aiming to cover the entire range and scale of marine features in the UK, and the need to use assessments at national, regional (i.e. north-east Atlantic) and even global level, mean there inevitably remains some need for further refinement. The approach requires testing to ensure it is appropriate for use at a UK level and across the wide range of marine features it is intended to encompass.

The key stages in the process of identifying marine nature conservation features and areas of national importance are given below:

Phase I - development of rationale and criteria



Phase II - test criteria via Irish Sea Pilot Scheme



This paper covers Phase I of the process. Subject to approval by the RMNC working group, it will be tested and applied at a regional sea level as part of the Irish Sea Pilot Scheme. The RMNC work programme (July 2002) outlines subsequent stages, including more formal consultation and approval for the criteria and their subsequent application nationally.

3 Framework

The role of nationally important marine features and areas is set within the Government's overall vision for the marine environment and its strategic goals.

The Government's Marine Stewardship Report (Defra 2002) identifies the UK's vision for the marine environment as:

“clean, healthy, safe, productive and biologically diverse oceans and seas”

This broad-ranging vision goes much wider than just nature conservation; the RMNC Working Group¹ therefore commended to Government the following strategic goals for the UK's marine environment (subject to further consultation through the marine stewardship process):

1. To conserve and improve the overall quality of our seas, its natural processes and its biodiversity.
2. To use marine resources in a sustainable and ecologically sensitive manner.
3. To sustain economic benefits and growth in the marine environment by enabling and encouraging ecologically sustainable employment.
4. To develop proposals for an integrated and ecosystem-based approach to marine management.
5. To increase our understanding of the marine environment, its natural processes and our cultural marine heritage.

¹ RMNC Strategic goals for the marine environment. February 2002.

6. To promote public awareness, understanding and appreciation of the marine environment.

Within these overall goals, more specific goals for marine nature conservation are currently being developed by the RMNC, particularly centered on the first strategic goal above. Until such goals are agreed, a more specific framework for identifying nationally important features is taken from Laffoley *et al.* (2000a):

3.7 The implications of the general policy to deliver nature conservation in Great Britain for the current Review of Marine Nature Conservation are that conservation and management of seascapes, habitats and species needs to focus on:

- **best examples:** taking a comprehensive and consistent approach towards protecting and managing all the best examples of seascapes, habitats and species throughout the wider sea; and
- **special measures:** taking special conservation, protection or management measures to maintain or restore the conservation status of those seascapes, habitats and species which by virtue of their ecological characteristics or situation require such additional actions.

3.8 In both cases appropriate conservation, protection and management may be achieved through a combination of:

- a network of designated national marine protected areas for seascapes, habitats and species, where nature conservation features may be localised and subject to pressures arising from comparatively localised activities;
- a suite of wider measures for more wide ranging species and more widely distributed seascapes and habitats subject to the consequences of more widespread human impacts; and
- wider environment protection and management to maintain overall ecosystem health and productivity of the sea, through initiatives such as pollution control and integrated approaches to planning and management, such as EIAs.

4 Aims and principles

4.1 Aims of identifying nationally important features and areas

A clear statement of the aims of identifying nationally important marine features and areas is necessary, both to enable appropriate criteria to be established and to relate the national series to wider principles of marine environmental management, government responsibilities and existing nature conservation mechanisms.

Building upon those identified in Laffoley *et al.* (2000a), and in the light of the outcomes of WSSD (Johannesburg, 2002), the overall approach centres on full representation of our marine biodiversity, with additional attention being focussed on particular features. This can be expressed as the following three discrete aims:

- A. Identification of areas that best represent the range of seascapes, habitats and species present in the UK – the UK's marine biodiversity heritage.
- B. Identification of those seascapes, habitats and species for which we have a special responsibility in a national, regional or global context.
- C. Identification of those seascapes, habitats and species that have suffered significant decline in their extent or quality, or are threatened with such decline, and can thus be defined as being in poor status.

Identification of these nationally important features responds to management of the UK's nature conservation interest in the following way:

- Proactive – to protect features and areas in good condition as a contribution to the long-term sustainability of the marine environment, promoting wherever possible non-extractive use of the features.
- Reactive – to respond to situations where features have declined in quality or extent, or are threatened with decline in the foreseeable future, and require positive conservation measures to halt their decline and to promote recovery.
- Celebratory – to recognise the very best aspects of the UK's biodiversity and those features in the UK which are particularly special in a regional or global context, to promote enjoyment and understanding of the UK's marine environment.

This identification process serves the following purposes:

- To provide a comprehensive framework and assessment process that includes all marine features and areas occurring in UK waters. Existing mechanisms (e.g. Habitats & Birds Directives, SSSIs) cover only parts of the UK's biodiversity or extend to only part of the UK's marine waters.
- To provide criteria that enable a consistent assessment of the importance of marine features and areas at a UK scale, leading to improved assessment of conservation value and conservation needs (such improved consistency should allow a more comparable assessment of importance between features and between existing conservation mechanisms).
- To more clearly articulate to policy makers, managers and users of the marine environment and to the public the value of our marine features and areas of highest importance so that the need for their protection receives wider support.
- To provide an approach to nature conservation that fully encompasses the key principles of sound environmental management to which the Government has committed itself through global conventions. As such it is broader in scope than traditional nature conservation approaches, and provides a framework within which existing conservation mechanisms, such as BAP, the W&C Act, [the CROW Act,] and the EC Habitats and Birds Directives, can be encompassed.

4.2 Use of the terms 'nationally important', 'features' and 'areas'

The term '**nationally important**' is used here to distinguish features and areas of importance in a UK context. Whilst all habitats and species have inherent value in their contribution to the nation's biodiversity and ecosystem functioning, it is possible to recognise amongst these specific features that merit special recognition at a national level. Such a national-level assessment fits within similar approaches to nature conservation assessment at global (e.g. IUCN red lists), regional (e.g. Habitats Directive), country (e.g. Scotland's Marine Consultation Areas) and local levels (e.g. local BAPs).

The term '**areas**' refers to geographically discrete locations. They contain a variety of features, some of which may be of national importance. The term 'areas' is used in preference to 'sites' to avoid confusion with protected sites. The management of such areas, including the possibility of their designation as protected sites, is a process subsequent to their identification and not part of the present paper's considerations. Some 'nationally important areas' may already be designated as protected sites (such as SACs, SPAs, MNRs and SSSIs).

The term '**marine features**' comprises seascapes, habitats and species that can be identified as nationally important throughout their range in the UK. Each of these represents a different scale for defining elements of the marine ecosystem (see below).

4.3 Scale

The marine environment can be defined at a number of different scales, each contributing to the overall functioning, productivity and quality of the marine ecosystem. The scale ranges from ocean-level processes through to those that occur at species and genetic level:

- Oceans
- Seas
- Seascapes
- Habitats
- Species
- Populations

The meaning of each of these terms, excepting seascapes, is generally well understood. The term **seascape**² was outlined by Laffoley *et al.* (2000a), as based on Day & Roff (2000). Seascapes are features defined on the basis of their physiographic and hydromorphological characteristics but which have ecological relevance; consequently they comprise a suite of habitats/biotopes that consistently occur together in a particular geomorphological structure, for example an estuary. Seascapes are further explained in Appendix 1.

An ecosystem-based approach to management of the marine environment needs to recognise these differing scales and to manage them in an integrated manner, so that the principles of sustainable use can be fully implemented. The key issues for management and consequently the response mechanisms vary according to the different scales. The broader levels of oceans and seas can only sensibly be protected through management policies and practices which apply widely across the area, whilst at the scale of seascape and below it is possible to apply traditional conservation mechanisms as well (i.e. targeted at specific features or areas). The following table illustrates these various scales, showing their relative importance to different ecological processes, some key human pressures and the way in which such pressures are tackled:

Scale	Examples	Examples of main processes	Examples of key pressures	Major response mechanisms
Ocean	Atlantic Ocean	Global currents Climate change	Global warming	Kyoto WSSD
Sea	Irish Sea North Sea	Nutrient recycling	Heavy metal contamination Eutrophication	OSPAR Annexes I, II & III (contaminants) UNEP Regional Seas Programmes North Sea Conference Irish Sea Pilot Scheme
Seascape	Seamount Estuary Sealoch	Inter-habitat dependencies and structure – ‘mini-ecosystem’	Offshore – fisheries; oil & gas Inshore – development	Habitats Directive Annex I ICZM WFD (out to 1 nm)

² The term ‘seascape’ is maintained here, as it is the one currently in use by the RMNC Working Group, having been introduced in Laffoley *et al.* (2000). However the term is also used, by CCW and others, in the context of visual concepts of land-to-sea and sea-to-land surface views. The term ‘ecological unit’ is currently being used in the Irish Sea Pilot Scheme. Adoption of an alternative term is desirable to avoid continued confusion.

Habitat	Seagrass bed Maerl bed Sandy beach	Inter-species competition	Various	OSPAR Annex V proposals BAP priority habitats (Habitats Directive Annex I) W&C Act (SSSIs)
Species	Grey seal Common skate Seafan	Population dynamics	Various	OSPAR Annex V proposals BAP priority species (Habitats Directive Annex II) W&C Act Schedules
Population	Wild salmon & trout	Genetics	Translocation of stocks Genetic modification and fish farming	IMO/ICES ballast water controls JNCC translocations policy

4.4 Key environmental principles to be considered

4.4.1 General principles

The following principles are recalled as they have particular relevance to either the identification of nationally important marine features or to the conservation and management actions that may be needed once identified.

Sustainable use is now a well-established principle that is being integrated into a wide variety of management practices. It is defined in Article 2 of the Convention on Biological Diversity as follows:

“Sustainable use means the use of components of biological diversity in a way and at a rate that does not lead to the long-term decline of biological diversity, thereby maintaining its potential to meet the needs and aspirations of present and future generations.”

It’s successful application provides a powerful means of ensuring generations to come can continue to benefit from the sea’s plentiful resources, such as fish stocks, and will help maintain a balance in the trophic structure of the marine ecosystem.

The ecosystem-based approach lies at the core of the Convention on Biological Diversity and provides a means of integrating conservation of biodiversity needs with principles of sustainable use. The ecosystem-based approach is a prominent aspect of the recent Bergen Declaration of the North Sea Ministerial Conference (March 2002) and is central to Government’s implementation of the Marine Stewardship Report (Defra 2002).

The precautionary principle calls for action to safeguard the environment where specific evidence of damage is not available but where there is reasonable justification to act to prevent damage. It provides an “insurance” mechanism to avoid always trying to recover from damage after the event.

The data available for marine nature conservation features is often still very limited. There are either a lack of baseline information on the distribution and extent of habitats and species, or if present, limited time-series data to effectively define the status of these features. Consequently criteria need to be applied in the expectation that detailed/precise data will not always be available and that, in many instances, a precautionary approach should be adopted, especially where the feature is considered to be under threat.

4.4.2 Nature conservation principles

Network design. For certain highly mobile species, notably seabirds and some other marine vertebrates, the species aggregate in different places for various parts of their life cycle (such as

breeding areas, nursery grounds, feeding areas and resting places). In establishing adequate protection mechanisms for such species, consideration needs to be given to protecting all the critical stages in their life history, reflected in a network of areas most appropriate to meet this need. This may entail protection of areas in other countries (e.g. for certain seabirds). In some circumstances, use of the ecological corridors concept may be appropriate.

Ecological coherence issues. Protection of nationally important features should be undertaken in a manner that reflects the ecological needs of the features and ecosystem functioning. Consideration therefore needs to be given to the size of features necessary to maintain ecological structure and function and to the interdependence of features.

Role within wider measures. The conservation and protection of nationally important marine features and areas provides an important contribution to the wider protection of the marine environment. As such it needs to accompany and complement other aspects of sound environmental management (such as integrated spatial and strategic planning, sustainable uses of marine resources, management of human activities to minimize any adverse effects on the environment) and not be seen as the only requirement of marine nature conservation.

4.4.3 How much to protect

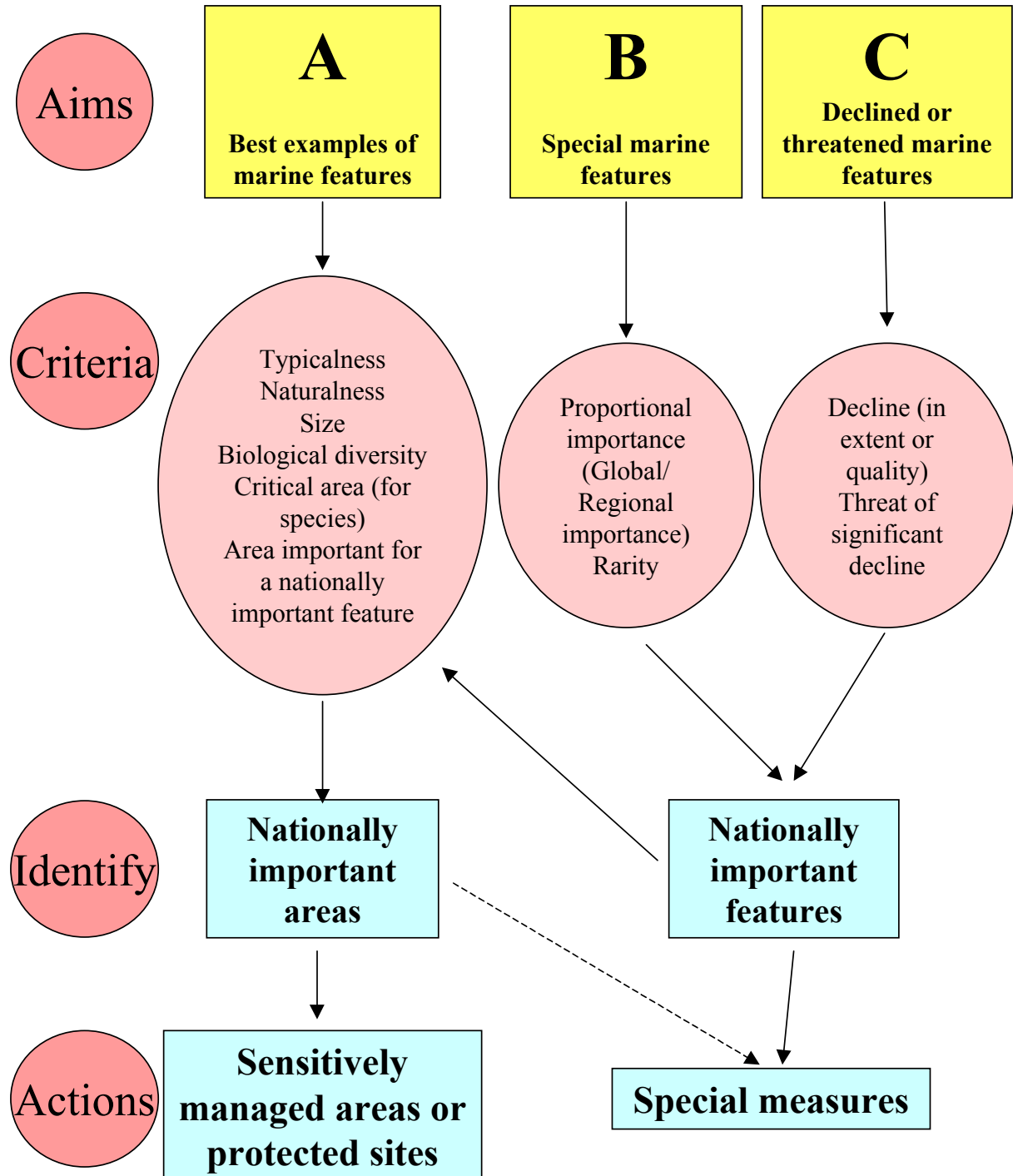
It is difficult to apply sound scientific principles as to how much of a seascape, habitat or species should fall under specific conservation measures. Rather it is a matter of judgement and social acceptance, striking a balance between socio-economic needs and the maintenance of biodiversity and ecosystem health, through sustainable management practices and the use of non-extractive use approaches.

It is necessary to recognise that, at least for some features, a proportion will already have been significantly altered or destroyed, and emphasis needs to be placed on a combination of sustainable use and protection for the remainder. The balance between these three aspects should depend on the importance of the feature, as follows:

- Best representative areas – lowest proportion necessary to ensure an example of each feature is protected in each biogeographical area.
- Special features – a greater proportion is protected, reflecting the special responsibility of the UK for these features or their importance to the UK's biodiversity and ecosystem functioning.
- Declined or threatened features – the highest proportion is protected, recognizing that these features are already under significant threat and should not be subjected to further decline.

5 Overview of the identification process

The overall process can be summarized in the following flow diagram:



6 Identifying best representative areas

6.1 Working with mobile and non-mobile features

Marine features can be broadly categorized into three types for the purposes of identifying best representative examples:

- Features that are essentially fixed or not highly mobile, e.g. seascapes, seabed habitats, benthic species. The best examples of such features can be readily identified as discrete areas, and afforded specific protection measures in such areas.
- Highly mobile species that aggregate in discrete places. This relates to certain seabirds, marine mammals and fish, where they variously aggregate for breeding, feeding, resting or other stages in their life history. Where these aggregations are important, areas can be identified for the protection of critical stages of the life cycle. Issues of network design may need to be addressed here.
- Species that are highly mobile and tend to be widely dispersed, e.g. certain seabirds, cetaceans, marine mammals and fish. Populations of such species can sometimes be identified but these tend to be rather diffuse and large, e.g. for a cetacean. It is usually inappropriate or impossible to identify areas for such populations.

6.2 Biogeography

Biogeographical differences around the UK coast are marked, such that the species composition of habitats changes in a north-south and east-west perspective, dependent to a large extent on different temperature (water and air) ranges. To best represent the range of ecological character within habitats, it is therefore important to reflect such biogeographic variation.

This marked biogeographical change in character of the UK's marine biodiversity is best reflected by sub-dividing the UK waters into biogeographic regions and identifying examples of each feature within each region. This approach is analogous to the well-established 'Area of Search' system used to select terrestrial SSSIs (Nature Conservancy Council 1989); areas of search are already defined for intertidal SSSIs (Joint Nature Conservation Committee 1996).

Appendix 2 provides further information on biogeographic regions within the UK.

6.3 Features to consider

Best representative examples should reflect the full range of seascapes, habitats and species that occur within UK waters (excepting certain widely dispersed species as noted above).

For seascapes there is no comprehensive classification system yet available. However, this will emerge from a combination of a draft OSPAR list (see Table 2 of Laffoley *et al.* 2000b), current work within the Irish Sea Pilot Scheme and a water-body typology for the Water Framework Directive, both due early in 2003.

For habitats the national biotope classification (Connor *et al.* 1997 a, b) provides a comprehensive list of inshore biotopes. This classification is currently being revised and the latest version (available shortly at www.jncc.gov.uk) should be used. There will be a need to add additional biotopes for offshore areas, some of which are reflected in the developing European EUNIS classification. The Irish Sea Pilot Scheme will determine the most appropriate level in the classification hierarchy to adopt.

For species, the national checklist is given in Howson and Picton (1997). Not all species need to be specifically addressed here. Habitats are best used as a surrogate for the majority of non-highly mobile (i.e. benthic) species. This not only ensures all such species should be more effectively considered than if addressed individually, but it significantly reduces the need for assessment at species level. In addition, the range of seascapes can be used as a surrogate for habitats; this is likely to be particularly

effective in offshore waters where information on habitats and species is likely to be sparse (see Day & Roff 2000).

6.4 Criteria

The following criteria, based largely on the OSPAR MPA selection criteria but also reflected in other conservation mechanisms, should be used to identify the best representative examples:

Typicalness³: the area contains examples of seascapes, habitats and ecological processes or other natural characteristics that are typical of their type in their natural state.

Naturalness⁴: the area has a high degree of naturalness, resulting from the lack of human-induced disturbance or degradation; seascapes, habitats and populations of species are in a near-natural state. This is reflected in the structure and function of the features being in a near-natural state to help maintain full ecosystem functioning.

Size⁵: the area holds large examples of particular seascapes and habitats or extensive populations of highly mobile species. The greater the extent the more the integrity of the feature can be maintained and the higher the biodiversity it is likely to support.

Biological diversity⁶: the area has a naturally high variety of habitats or species (compared to other similar areas).

Critical area⁷: the area is critical for part of the life cycle (such as breeding, nursery grounds/area for juveniles, feeding, migration, resting) of a mobile species.

Area important for a nationally important marine feature: Features that qualify as special features or which are declined or threatened should contribute to the selection of these areas. The assessment should consider whether such features are present in sufficient numbers (species), extent (habitat) or quality (habitats, seascapes) to contribute to the conservation of the feature.

The criteria relate to seascapes, habitats and species as follows:

Criterion	Seascape	Habitat	Species
Typicalness	X	X	
Naturalness (structure & function)	X	X	
Size	X	X	Of population
Biological diversity (habitats)	X		
Biological diversity (species)	X	X	
Critical area (part of life cycle of a species, e.g. breeding, nursery grounds/area for juveniles, feeding, migration, resting)			X
Area important for a nationally important marine feature	X	X	X

7 Identifying features of special importance

The distribution of seascapes, habitats and species varies across the world. Some are focused on the UK, where the UK may host a particularly high proportion in a regional or global context. As such, we

³ From the OSPAR MPA selection guidelines, where it is termed 'representivity'.

⁴ From the OSPAR MPA selection guidelines.

⁵ From the OSPAR MPA selection guidelines.

⁶ From the OSPAR MPA selection guidelines, where it is termed 'high natural biological diversity'.

⁷ Reflects part of the OSPAR MPA selection criterion 'ecological significance'.

have special responsibility for these as our contribution to the protection of the world's biodiversity and should recognise these as seascapes, habitats and species of national importance.

Additionally, within the UK certain features are worthy of special recognition because of their rarity.

Features for which the UK has particular international responsibilities should be reflected here. However, in certain circumstances assessments in some international conventions may not follow the principles, aims and rigorous assessment processes adopted here. Consequently it may not always be desirable to adopt them as features of national importance, although the UK should continue to deliver its international obligations.

There is relatively little assessment available of marine features at the global or even the regional level. However, the concept is included here because of its importance to the rationale of identifying special features. Whilst data availability may currently be low, this should improve over time.

7.1 Criteria

The criteria to identify those seascapes, habitats and species that are of special importance in the UK are:

Proportional importance⁸: A high proportion of the seascape, habitat, or population of a species (at any time of its life cycle) occurs within the UK. This may be related to either the global or north-east Atlantic/European extent of the feature, with global importance being of greater significance.

Features may be categorized as follows:

Globally important: a high proportion of the global extent of a seascape or habitat or a high proportion of the global population of a species (at some stage in its life cycle) occurs within the UK. 'High proportion' is considered to be more than 50%, when known.

Regionally important: a high proportion of the regional (north-east Atlantic) extent of a seascape or habitat, or a high proportion of the regional population of a species (at some stage in its life cycle) occurs within the UK. 'High proportion' is considered to be more than 50%, when known.

Rarity⁹: Seascapes, habitats and species that are sessile or of restricted mobility (at any time in their life cycle) are considered rare if their distribution is restricted to a limited number of locations. Rarity can be assessed at global, regional or national level as follows:

Globally rare: No guidelines available.

Regionally rare: 'The 'limited number of locations' is set at 2% of the 50 km by 50 km UTM grid squares for each of the following three bathymetric zones in the north-east Atlantic:

- a. littoral (intertidal zone and splash zone)
- b. sublittoral (down to 200 m depth)
- c. bathyal / abyssal (below 200 m depth)

Nationally rare¹⁰: recorded in 1-8 of the 10 km x 10 km squares in GB (i.e. less than 0.5% of the total numbers of squares - based on the numbers of 10 km squares in which the feature is recorded in comparison with the total number of squares within the 3 nm limit). [Needs modifying to extend to NI and offshore].

In the case of a mobile species, the total population size will determine rarity [needs further guidance].

The assessment should be dependent on scientific judgement regarding natural abundance, range or extent and the adequacy of recording.

⁸ A combination of the OSPAR Texel-Faial criteria 'global importance' and 'regional importance'.

⁹ From the OSPAR Texel-Faial criteria.

¹⁰ From Sanderson (1996).

8 Identifying features that have declined or are threatened

Traditional conservation mechanisms have usually been developed following an assessment of the status of the marine features being considered. Such assessments can be broadly categorized as Good, Moderate or Poor (although various conservation mechanisms use different scales). Features in poor status, reflecting those that have significantly declined in extent or quality or are under threat of such decline, have to date provided the main focus for taking conservation action. Such action is through a variety of management mechanisms, most notably designating protected areas and the listing of species and habitats for full or partial protection on conservation instruments.

This reactive approach to nature conservation needs to continue as an essential part of the conservation framework, drawing attention to those features that continue to be in such poor status that particular strict conservation management mechanisms are required to halt their decline and to promote their recovery. Promoting the recovery of degraded areas needs to consider the relative merits of such action against other conservation priorities.

For a significant proportion of the marine environment, effective assessment of status will not be possible due to lack of knowledge; in such cases this should not unduly hinder the identification of best representative examples. Whilst every attempt should be made to assess status in a sound and rigorous manner, for many marine features detailed assessments of status are not yet available. In some cases a precautionary approach should be adopted where there are strong indications that the status is poor or is likely to become poor. In such circumstances, if actions are not taken, the status of the feature may deteriorate to an unacceptable level before detailed assessments become available.

There is a need for a quality grading for status and to define a suitable threshold before listing. Current status ranges from near pristine through to critically endangered or even totally destroyed (extirpated or extinct). Those features that are listed should have suffered a significant decline in quality or extent or be under threat of such decline; the determination of what constitutes significant will vary according to the nature of the feature and be dependent on the sensitivity of the feature to damage from human activities and its ability to recover from such damage. Where there is an expectation that significant decline is likely to occur due to forthcoming or ongoing human activities, a precautionary approach should be adopted and the feature listed.

8.1 Criteria

Decline¹¹: an observed, estimated, inferred or suspected¹² significant decline¹³ in numbers, extent or quality of a seascape, habitat or a species (for species, quality refers to life history parameters). The decline may be historic, recent or current and may be throughout UK waters, or at a regional or global level.

	Extent	Quality
Seascapes and habitats	A seascape or habitat that has declined in extent to 90% or less of its former natural extent in the UK, or its distribution within the UK has become significantly reduced (e.g. lost from several sub-regions).	A seascape or habitat for which quality, based on change from natural conditions caused by human activities, is negatively affected by: (1) a change of its typical or natural components over almost the entire UK, or (2) the loss of its typical or natural

¹¹ From the OSPAR Texel-Faial criteria; threshold values adjusted.

¹² Follows the IUCN approach, which accounts for uncertainty.

¹³ Two further levels of decline (severe and extirpated or extinct) are defined by OSPAR; these can be used to further define the severity of the decline and hence linked to the priority for remedial action. These categories are broadly similar to the IUCN categories Extinct, Critically endangered, Endangered and Vulnerable.

		components in several sub-regions. Such judgement is likely to include aspects of biodiversity, species composition, age composition, productivity, biomass per area, reproductive ability, non-native species and the abiotic character of the habitat.
Species	A population of a species occurring in the UK is defined as significantly declined: <ul style="list-style-type: none"> • if numbers of individuals show an extremely high and rapid decline in the area over an appropriate time frame, or the species has already disappeared from the major part of its former range in the area. • or if numbers of individuals are at a significantly low level due to a long, continuous and distinct general decline in the past. [Needs further detail; adapt IUCN criteria?]	The species has suffered a significant decline in one or more of the following: <ul style="list-style-type: none"> • Loss of genetic diversity • Loss of fecundity • Reduction in the number of mature individuals Fragmentation of the population

Assessments of decline should be those that occur beyond what is known about long-term natural variability and resilience, as well as in an appropriate time frame for that feature.

Lesser degrees of decline than Significantly Declined will occur but will not qualify under this criterion. Evidence for decline can be based on actual evidence or reasonable expert judgement. The percentages suggested for categorizing habitat decline reflect the fact that habitats are far less likely to recover from even a small percentage loss compared to most species.

Threat of significant decline¹⁴: – the feature is expected to suffer significant decline in the foreseeable future due to its expected high level of exposure to damaging activities and to its inherent sensitivity to those activities. Where such potential decline is inferred or estimated, a precautionary approach should be adopted.

The following table offers a way of integrating relative sensitivity and the degree of exposure to damaging activities to give a threat of significant decline rating (equates to vulnerability) (Gilliland 2001).

Degree of exposure	Sensitivity			
	High	Moderate	Low	None detectable
High	High	High	Moderate	N/A
Medium	High	Moderate	Low	N/A
Low	Moderate	Low	Low	N/A
None	N/A	N/A	N/A	N/A

¹⁴ From the OSPAR Texel-Faial criteria, where it is termed ‘probability of significant decline’.

Sensitivity accounts for both the ease of damage to the feature by the activity and to its ability to recover from that damage. Sensitivity is therefore assessed against particular activities rather than applied once to a feature.

9 Application of the criteria

Application of the criteria needs to be undertaken in two phases:

- Identification of special features and those in decline or threatened leads to a list of such features (i.e. not area specific). Application of criteria in this case needs to be against some sort of threshold mechanism to enable features to be included or excluded. This approach should ensure the quality of the assessment is maintained at the desired level.

Case reports for each feature, outlining their justification for inclusion on the list of nationally important features, should be prepared and include information on how the feature meets each of the criteria. This ‘case report’ approach has been adopted within OSPAR.

The presence of features that qualify as special features and those in decline or threatened should contribute to the selection of best representative areas.

- Identification of areas that best represent the ecological character of the UK’s marine environment. The application of the criteria needs to be a comparative assessment of the range of features within each biogeographic area, leading to the identification of the best examples. The MNCR assessment protocol (Connor & Hill 1998) provides a model for identifying best representative examples and should be adapted (streamlined) for use here. It provides a rigorous comparative assessment procedure targeted at the seascape level, and uses similar criteria to those given here.

[This section requires expansion to define [more precisely the application processes – draw from IUCN OSPAR, SPECS & IBA. Also consider issues about identifying networks where appropriate and issues concerning prioritising the criteria for identifying areas, e.g. greater emphasis on those with nationally important features.].

10 Conservation management options

Conservation and management of features identified as of national importance will vary considerably, depending on the nature of the feature. It will be important to evaluate where:

- Features are already effectively protected – relates to species and habitats already listed for protection, to those features where management practices in place are sufficient to prevent deterioration and to site protection mechanisms where the features concerned have adequate protection.
- Features requiring additional protection – where there is an identified need to improve the protection currently received or where the feature has no current protection.
- No specific management or protection is necessary – where the feature is under no threat or where positive conservation measures are inappropriate, e.g. certain rare species.

There are two main types of conservation mechanism:

- Use of marine protected areas, where varying degrees of protection can be applied, ranging from strict protection of the features and use of ‘no-take’ zones through to broader management approaches. In some cases, there may be new opportunities to integrate such areas with other uses in a way that benefits both industry and conservation.
- Use of special measures, ranging from modified management practices that aim to reduce damaging effects through to strict protection of certain species and habitats.

There is a need to evaluate effectiveness and completeness of the existing nature conservation mechanisms at national and international level. Table 1 in Laffoley *et al.* (2000a) provides a provisional assessment of the adequacy of the main conservation mechanisms.

11 Acknowledgements

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13 Addendum relating to marine geological and geomorphological features

Prepared by Malcolm Vincent, JNCC

13.1 Introduction

The RMNC Working Group has not, in its earlier deliberations, considered the issue of the conservation of marine geological and geomorphological features, as opposed to habitat types supporting marine biological features. However, the desirability of considering geological and geomorphological features within the context of the RMNC's discussion on nationally-important areas, habitats and species, has been raised with the RMNC Secretariat. This Addendum gives preliminary consideration to this issue.

13.2 Existing national criteria for the selection of geological and geomorphological features

National criteria for the selection of geological and geomorphological sites in Great Britain have been developed as part of the Geological Conservation Review (GCR) carried out by the former Nature Conservancy Council between 1979-1990. These criteria were published in Ellis, NV (Ed) (1996) *An introduction to the Geological Conservation Review*. GCR Series No1, Joint Nature Conservation Committee, Peterborough. Similar criteria are in use in Northern Ireland for their Earth Science Conservation Review (ESCR), and were published in Enlander, I. (2001). *The Earth Science Conservation Review: conserving the Earth heritage resource of Northern Ireland*. Irish Journal of Earth Science, p103-12).

The criteria set out in the GCR can be summarised as:

1. *Sites of International Importance*

These include geological or time interval stratotypes; type localities for particular rock types, minerals or fossils; localities where rock or time units were first described, or where advances in geological theory were made, or where geological phenomena, principles or concepts were first conceived or demonstrated.

2. *Sites showing Exceptional Features*

Sites having unique, rare or other outstanding features.

3. *Representative sites which demonstrate a key aspect of Britain's geological heritage*

Sites of national importance which are selected as part of a network of sites within the following main groupings: stratigraphy, palaeontology, Quaternary geology, geomorphology, igneous petrology, structural and metamorphic geology, and mineralogy.

About 3,000 GCR sites were identified throughout Great Britain, and protected using SSSI legislation, being consolidated into some 2,000 SSSIs. There are some 300 ESCR sites that will be protected as ASSIs.

13.3 Purpose of geological and geomorphological SSSIs/ASSIs

The purpose of SSSIs/ASSIs for geological and geomorphological sites is:

- a. to ensure that special sites are appropriately conserved and managed, and/or
- b. to ensure that these sites are made available for teaching, study and research.

To avoid geological or geomorphological SSSIs coming under excessive visitor pressure (e.g. for educational purposes), a second-tier of 'Regionally Important Sites' has also been identified, and protection is afforded to these, so far as possible, through planning controls and non-statutory mechanisms.

Because the purpose of the conservation of geological and geomorphological sites is, at least in part, to ensure their availability for education, study and research, the site series has, to date, confined itself to areas above low water mark. There are, currently, no GCR sites below low water mark.

13.4 Geological and geomorphological features in the marine environment

Intertidal areas

The national series of geological and geomorphological sites includes sites within the intertidal zone. Whether there is any need to extend these sites below low water mark has not yet been fully discussed and considered, and the extent of any need for it uncertain. However, there could be benefit in extending site boundaries for those coastal sites that have features (such as shingle barrier beaches) that are dependent upon offshore sediment 'stores' or on geomorphological processes operating below low water mark - see below.

Subtidal areas

Potentially, there are nationally-important geological or geomorphological sites below low water mark. These are most likely to fall in the 'Representative sites' category referred to in Section 2.2 above, and are most likely to relate to geological or geomorphological features which also contribute to the seabed topography (e.g. igneous sea mounts, banks formed from morainic deposits, iceberg plough marks, kettle holes, submerged beaches, sand 'volcanoes' etc), or which complement terrestrial sites in furthering knowledge of the sediment accumulations of different ages (especially for more recent sediment piles such as Tertiary and Quaternary deposits). Other types of site might be those which are contributing to ongoing geomorphological processes (e.g. supply of sediment to coastal geomorphological features, sand waves, gas seeps etc).

We are unaware of a national inventory of such subtidal geological and geomorphological features as yet, although a substantial body of relevant information exists, and the collation of such information, and the application of the Section 2 criteria to it, is a realistic proposition, although possibly quite expensive to carry out. A limited exercise to trial out a site identification methodology over a modest area of seabed might be a way forward here.

In the paper on the '*Rationale and criteria for the identification of nationally-important nature conservation features*', consideration of the conservation of such sites is treated principally within the proposals relating to '**Seascapes**'. It is probable that many of the important geological and geomorphological features will be encompassed by this approach, but the 'physiographic' features intended to be part of this concept were intended to be biologically-related, rather than related to Earth science, and the extent to which this approach would secure the conservation of the UK's Earth heritage is currently uncertain.

13.5 Relationship to the Irish Sea Pilot

In the Irish Sea Pilot, it is intended a) to treat intertidal geological and geomorphological SSSIs/ASSIs in the same way as their biological counterparts (e.g. to map them and set conservation objectives for them), and b) to endeavour to encompass subtidal geological and geomorphological features by incorporating them in the exercise to identify Ecological Units (Ecological Units being the practical expression of the '**Seascape**' concept within the Pilot), and to map and set objectives for them.

If resources allowed, a trial of the type suggested in paragraph 4.3 above could be undertaken on the Irish Sea to check the extent to which the 'Seascape' concept is likely to meet the needs of marine Earth heritage conservation.

Appendix 1 - Seascapes

Additional information on seascapes:

By way of an example, estuaries are seascapes as they can readily be defined both from a geomorphological perspective and because they consistently support a certain range of habitats, e.g. saltmarsh, mudflats. Seascapes represent a scale of feature often better suited to the needs of conservation management than the individual habitats and species, of which they comprise. For instance, management is often better focused at the whole estuary level than at specific habitats within an estuary. This provides for a much more ecosystem-based approach to management. Additionally identification of best representative examples, if applied firstly at the seascape level, provides a significantly more efficient approach to the identification of nationally important features, as they should embrace the majority of non-mobile habitats and species and a significant proportion of mobile species.

Whilst the term seascapes has not been used widely within the UK, the concept and its application have been applied in various forms. For example, the Annex I types Estuaries, Large shallow inlets and bays, and Lagoons of the Habitats Directive are now well established units for site selection and management. The JNCC published a classification of physiographic features as part of its MNCR biotope classification (Connor *et al.* 1997). A typology for water bodies to implement the Water Framework Directive is currently being development, and these are likely to be comparable to seascapes. A series of 'ecological units' is being developed as part of the Irish Sea Pilot Scheme.

Terms used in various fora that equate to the seascape concept:

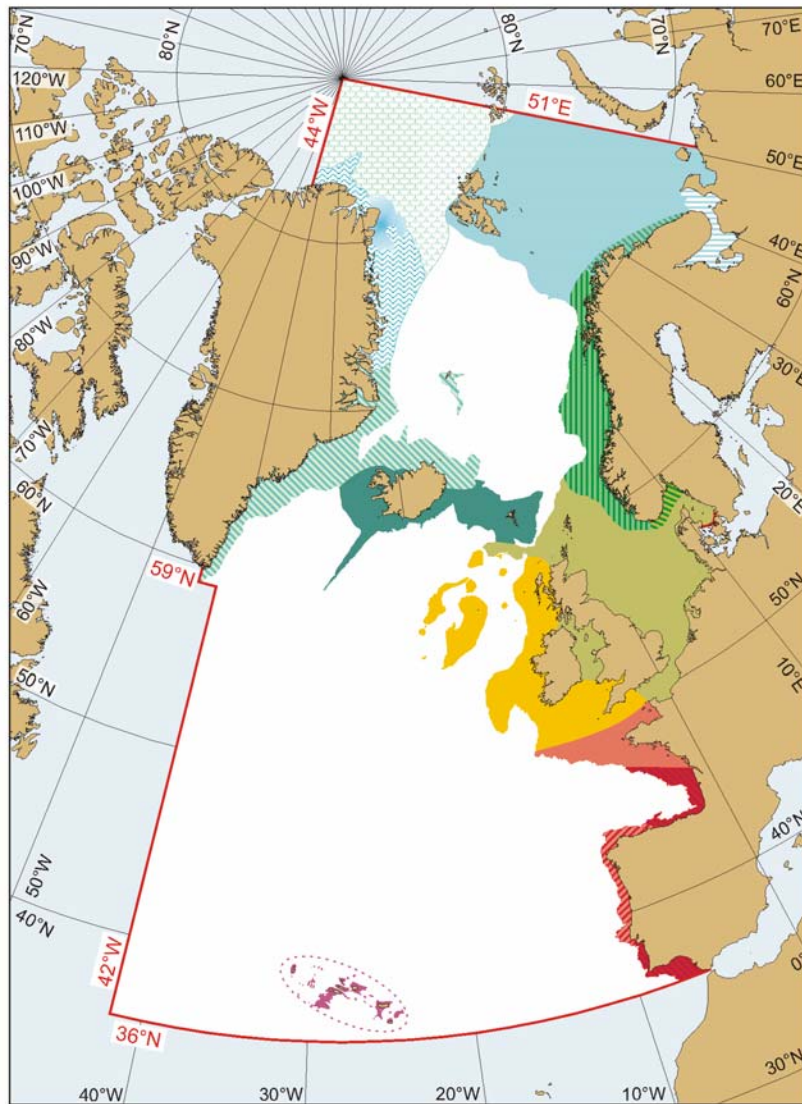
Term	Source
Habitat complex	EUNIS habitat classification – note conflicts with JNCC use of term as higher-level unit in MNCR habitat classification
Physiographic feature	MNCR habitat classification
Water body type	Water Framework Directive
Seascape	Laffoley <i>et al</i> (2000a) paper to RMNC – note conflicts with CCW use of term for surface views
Marine landscape	Laffoley <i>et al</i> (2000b) paper to RMNC
Marine landform	
Ecological units	Irish Sea Pilot Scheme

Appendix 2 – Biogeographic regions

Marine biogeographic regions in the UK can be based firstly in a north-east Atlantic context, in which the UK falls into two main biogeographic regions, according to a study undertaken recently for OSPAR (Dinter 2001):

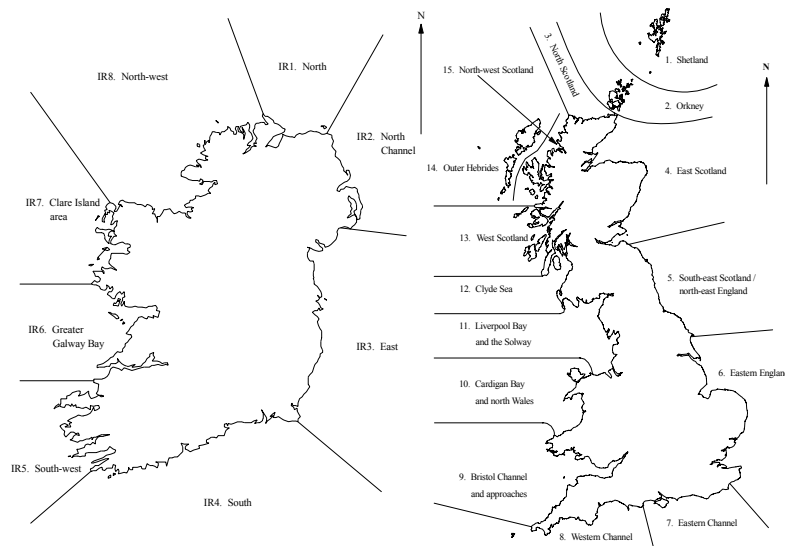
Biogeography of the OSPAR maritime area

Shelf & Upper Continental Slope (~<1000 m) with Neritopelagial, and Ice-cover related units

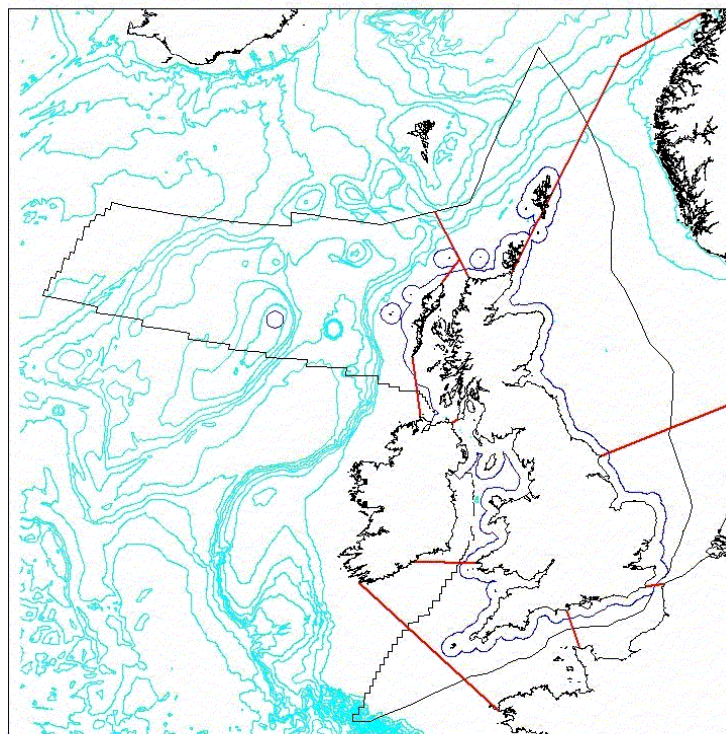


However this provides a very coarse biogeographic separation (the SSSI system is based on about 80 vice-counties) and subdivision of these two main regions is necessary to reflect biogeographic differences at a UK scale. For inshore waters, consider adapting the 15 MNCR sectors by merging these into broader regions (such as Northern Isles, North & east Scotland, Eastern England, South-west, Irish & Clyde Seas, West Scotland). For offshore waters, follow regional seas, provisionally defined as: Irish Sea, south-western approaches, English Channel, southern North Sea, northern North Sea, West of Scotland. It would be sensible to adopt similar boundaries of inshore and offshore use.

The following three maps illustrate the current inshore MNCR/BioMar sector boundaries and possible offshore regions:



(Possible) Regional Seas



UK Continental Shelf Designated Area and Territorial Waters
Map created on 19.10.01 by CT