

JOINT NATURE CONSERVATION COMMITTEE

**TOWARDS ACHIEVING A REPRESENTATIVE SUITE OF MARINE HABITAT
SACS FOR UK WATERS: UPDATE ON PROGRESS**

Paper by Caroline Turnbull, Viv Blyth-Skyrme and Charlotte Johnston

1. Introduction

- 1.1 This paper aims to provide to the Joint Nature Conservation Committee a summary of work undertaken to date and future plans which contribute towards JNCC's advice to Defra on achieving a representative suite of Special Areas of Conservation (SACs) for Annex I marine habitats for UK waters.
- 1.2 Since the court judgement in 1999 which accepted Greenpeace's argument that the Habitats and Birds Directives should apply to all UK waters, the JNCC has worked on providing scientific advice to Defra and other government departments on how this should be implemented. As a first step, a report was published by the JNCC in 2002 (Johnston *et al*, 2002) which set out how the Habitats Directive selection criteria could be applied in offshore waters and examined available evidence on relevant habitats in UK offshore waters. Areas where Annex I habitat potentially occurs or was known to be present were identified and mapped. Subsequent to the publishing of Johnston *et al* (2002), a few additional potential SAC areas have been added to the initial list in the report as new information on the offshore benthic environment has become available.

2. Achievements to date

Methodology

- 2.1 In 2003 the Joint Committee were presented with a paper providing the methodology by which areas of Annex I habitat would be identified for recommendation to Defra for selection as SACs (JNCC 03 P01). In summary, the JNCC aims to represent the ecological variation of each Annex I habitat which occurs in UK offshore waters by selecting areas on the basis of:
- i. geographic location of areas of relevant habitat, using ecologically based regional subdivisions (draft Regional Seas as presented in Defra's 2004 Irish Sea Pilot Project report);
 - ii. physical and ecological characterisation of different sub-types of each Annex I habitat (using topographic form, structural character and substratum type, water depth and salinity).
- 2.2 A summary of the methodology as presented in JNCC 03 P01 is provided in Annex B, including the map of Regional Seas. The Joint Committee agreed the methodology subject to public consultation. Public consultation was undertaken in 2004, and upon consideration of responses, no changes to the methodology were required.

Boundary guidance

- 2.3 In 2002, the Joint Committee were presented with draft guidance on defining SAC site boundaries. Upon public consultation and subsequent minor modification the Joint Committee agreed the guidance in 2003 (JNCC 03 P01), which is presented in full in Annex C.

Format for submission of areas suitable for selection

- 2.4 In 2004, the Joint Committee were presented with a process for the submission to Committee of areas suitable for recommendation to Defra for selection as SACs for Annex I or Annex II features. The paper (JNCC04P09) also proposed a format for documentation to be provided in support of such submissions. The Committee approved the process and the documentation but asked for the inclusion of draft management actions for each site.

Areas recommended to Defra

2.5 Areas thus far recommended to Defra as suitable for selection as offshore SACs are summarised in Table 1 below along with their current status.

Table 1: A summary of Areas recommended to Defra as suitable for selection as SACs for Annex I habitat interest features in UK offshore waters

Area/Site name	Date of JNCC approval	Status ¹	Interest feature (sub-type)	General location	Area (using recommended boundary)
Darwin Mounds	June 2002	pSAC	Reefs (biogenic)	Rockall Trough & Bank	152,900 ha/ 1529 km ²
Saturn <i>Sabellaria</i> reef*	June 2004	dSAC	Reef (biogenic)	Southern North Sea	1641 ha/ 16 km ²
Dogger Bank	December 2004	dSAC	Sandbanks which are slightly covered by seawater all the time (sand and gravelly sand sandy mound)	Southern North Sea	1,340,527 ha/ 13,405 km ²
Wyville Thomson Ridge	December 2004	dSAC	Reefs (stony)	Scottish continental shelf	153,324 ha/ 1533 km ²
Haig Fras	December 2004	dSAC	Reefs (bedrock)	Celtic Sea	75,744 ha/ 757 km ²
Scanner Pockmark	December 2004	dSAC	Submarine structures made by leaking gases (carbonate blocks in pockmark)	Northern North Sea	724.9 ha/ 7.25 km ²
North Norfolk Sandbanks	September 2005	dSAC	Sandbanks which are slightly covered by seawater all the time (sand open shelf ridge sandbank)	Southern North Sea	432,651 ha/ 4327 km ²
Stanton Banks	September 2005	dSAC	Reefs (bedrock)	Scottish Continental Shelf	192,380 ha/ 1923 km ²
Braemar Pockmarks	September 2005	dSAC	Submarine structures made by leaking gases (carbonate blocks in pockmark)	Northern North Sea	2134 ha/ 21.34 km ²

* Saturn *Sabellaria* Reef dSAC is now subsumed into North Norfolk Sandbanks since the former is located entirely within the latter.

2.6 For each of the dSACs advised to Defra thus far, conservation objectives and draft management advice have subsequently been approved by the Joint Committee. Updated standard format ‘dossiers’ have been prepared for each site incorporating both the site recommendation details, conservation objectives and draft management advice. Dossiers for each site approved by

¹ A site has the status of pSAC (possible SAC) when it has been subject to public consultation by Defra. A site has the status of dSAC (draft SAC) when it has been recommended by the JNCC to Defra but has not been subject to public consultation.

Committee so far were presented to a meeting of Defra, Devolved Administrations and Government Departments on 25th September 2006 for their consideration. The meeting approved the eight dSACs for public consultation as soon as possible after the Offshore Habitats Regulations come into force, currently anticipated to be March 2007. Further consideration of the boundary of the Stanton Banks dSAC (to see if the area of the site could be reduced while still including the reef feature) was recommended, and it was accepted that existing data for defining the boundary for Dogger Bank dSAC are sparse, and that new survey to better define the boundary may be required subsequent to the public consultation. Subsequent to the meeting in September, new survey of the Wyville Thomson Ridge under DTI's Strategic Environmental Assessment programme for oil and gas identified some very interesting and diverse communities on the ridge outside the current recommended dSAC boundary, so we recommend that the boundary for this site be reconsidered to include these areas once the data are analysed (due early 2007), and before the site is consulted upon.

Areas no longer being considered for recommendation as offshore SACs to Defra

- 2.7 Since identifying the initial areas of potential Annex I habitat presented in the 2002 Offshore Natura report, further information has become available to enable elimination of some areas from further consideration as potential offshore SACs. These are listed in Table 2 below along with the reason for their exclusion.

Table 2: Areas of potential Annex I habitat no longer under consideration as potential offshore SACs for Annex I habitat

Area of Search	Reason for exclusion
Median Deep	Not Annex I reef habitat (seabed mainly composed of gravel less than 64 mm in diameter with only sparse occurrence of cobbles).
Dogger Gravel	Not Annex I reef habitat (sediment analysis indicates that the maximum grain size in the Area is 50 mm with the majority of the sediment being between 25 and 12 mm).
Humber Gravel	Not Annex I reef habitat (substratum is mainly composed of gravel with a grain size less than 64 mm diameter with only patchy incidence of cobbles).
Outer Dowsing	Not Annex I reef habitat (substratum is mainly composed of gravel with a grain size less than 64 mm in diameter and sand).
Silver Pit	Not Annex I sandbank habitat (entire area is deeper than 20 m)
Potential Reef in Oil and Gas licensing block 205/24	Not Annex I reef habitat (substratum primarily of coarse gravel with only occasional cobbles and epifauna indicative of gravel substratum).
Cardigan Bay	Not Annex I reef habitat (substratum composed of sandy gravel with no cobbles or boulders present).
Pockmark in Oil and Gas licensing block 21/1a	Not Annex I habitat submarine structure made by leaking gases (no carbonate structure present in pockmark).
Swithin	Not Annex I reef habitat (rock feature covered by sediment).
<i>Sabellaria</i> in southern North Sea (BBL)	Probably not Annex I reef habitat, poor example of type.
Pockmark in Oil and Gas licensing block 13/22	Although carbonate structures may be present in the pockmark they are not substantial or extensive and this habitat is better represented by the features in the other two areas already

Area of Search	Reason for exclusion
	recommended to Defra.
Race Bank	No longer being considered independently but will be examined as part of the North Sea Sandy Mounds Area of Search.
King William Bank	Bank is almost entirely within Isle of Man Territorial Waters, other sandbanks are represented in the list of areas under consideration for this Regional Sea.
Judd Deeps	Feature is almost entirely within Faeroese waters.

3. **Process for completing the identification of areas in UK waters suitable for recommendation as SACs for Annex I habitat**

- 3.1 Identification of areas suitable for recommendation as SACs for Annex I habitat in UK offshore waters cannot be considered in isolation from existing marine SACs and potential Annex I habitat areas in inshore waters. Four Annex I marine habitat types occur in both inshore and offshore waters, and some potential areas straddle the 12nm territorial waters boundary. Since 2004 JNCC's inter-agency Marine Natura Project Group has been considering what may still be required to complete the network of marine SACs across all UK waters. This is not a simple process, partly as selection of inshore SACs for marine Annex I habitats was necessarily conducted by slightly different methodology to that for considering offshore SACs. Building upon the methodology for identification of offshore SACs described above, JNCC and the agencies have developed a process by which to consider representation of different key sub-types of Annex I habitats across the UK for sandbanks and reefs through parameters which influence their ecology. An inter-agency workshop was held in November 2006 at which the key sub-types were substantially agreed. The assessment process is nearing completion, but it is clear at this stage that the current suite of SACs and the offshore dSACs currently recommended to Defra do not yet fully represent the range of relevant Annex I habitats and their main sub-types present in UK waters. Most of the sub-types not yet represented within the SAC and dSAC series are those which occur in UK offshore waters or waters at some distance from the coast.
- 3.2 Geographic distribution and representation of habitat sub-types (using the characterisation process described above) within the existing SAC, pSAC and dSAC series, and including potential Annex I habitat areas, is being analysed. In conjunction with existing SACs and pSACs it is intended that areas in offshore waters and inshore waters away from the coast be considered for SAC selection to complete representation of the range of sub-types in each regional sea. Whilst representativity is the key criterion for selection in offshore waters, it should be noted that other Habitats Directive Annex III selection criteria may come to the fore in some circumstances. This may lead to additional areas recommended for SAC selection, which may replicate sub-types already represented in other sites/areas but add value to the site series in terms of their conservation interest.
- 3.3 Recommendations of offshore dSACs to Defra to date have been principally dependent on pre-existing data obtained through collation of published and unpublished data from 2001 to 2004. Lack of physical and biological data for

other potential SAC areas has hampered progress in completing minimum representation of the habitat sub-types within the SAC series.

4. **Data acquisition and survey**

- 4.1 As discussed in JNCC 03 P01, for JNCC to consider an area of habitat against the SAC selection criteria, determine a boundary for a site, and recommend a site to Defra for selection as an SAC, the following information is required as a minimum:
- i. the extent of the habitat;
 - ii. evidence that the seabed actually consists of the habitat in question; and
 - iii. sufficient biological information to justify selection of the site as an SAC.
- 4.2 Recruitment of an additional staff member in Sept 2004 allowed JNCC to more actively pursue collaborative survey opportunities with the relatively limited funding available. JNCC's Interreg funded MESH project has enabled considerable progress in collection of data on a number of areas of potential SAC Annex I habitat for which we had no or insufficient data (termed *Areas of Search for survey*). We have now obtained new survey data on a number of these *Areas of Search for survey*, and those for which we now have sufficient data will be considered against the SAC selection criteria in 2007. However, in some instances survey opportunities have arisen in Areas of Search which are not highest priority for achieving representativity of habitat sub-types for each Regional Sea. Data from these areas provide valuable contextual information to help in site selection, and could lead to the recommendation of an area as suitable for selection as an SAC to achieve some replication in the suite of sites.
- 4.3 A collaborative approach to survey with a range of partners does restrict JNCC in what it can achieve both in terms of where it can go and what it can do. However, it does provide a value added aspect to each survey in that multiple projects are addressed by each survey cruise, the links between those projects are made as a matter of course, and they provide an early opportunity to involve potential future consultees in the process of identification of future SACs, and therefore to increase their understanding of some of the difficulties involved.
- 4.4 During summer 2006 additional funds for 2006-07 became available from Defra at short notice and, despite the disruption late arrival of funds entailed, enabled funding of targeted surveys of several of the deeper and less accessible *Areas of Search for survey* off western Scotland (Hatton and Lyonesse Banks, George Bligh, Rosemary Bank, Anton Dohrn, Pobie Bank), two areas of potential reef in the Irish Sea, and potential reef areas in the central English Channel. Acoustic remote sensing and biological ground validation survey will be completed for these areas by early 2007. Data

analysis, interpretation and reporting will be completed during 2007 and 2008. For some of the areas surveyed, further survey will still be required (mostly for deeper (>1000m) parts of some *Areas of Search*) to enable consideration of the area against the SAC selection criteria.

- 4.5 Defra have indicated that increased funds are likely to be available for offshore surveys in 2007-08 and 2008-09 to enable completion of the SAC series for UK waters. JNCC have recruited a Survey Programme Manager to help in coordinating the additional work involved. Extension of JNCC's MESH work (recently approved by Interreg) using some of the additional funds will enable the *Area of Search for survey* for reef on the continental shelf edge in south west UK waters to be surveyed in 2007.
- 4.6 Table 4 provides a summary of surveys (collaborative and directly commissioned) of *Areas of Search for survey* over the last two years. It is important to note that in some cases, the data acquired so far may not yet be sufficient to enable the assessment of the area against the selection criteria or to define a site boundary. 'High priority' in this table refers to the need to include the habitat sub-type thought to be present in this *Area of Search for survey* within the SAC series to ensure minimum representation of Annex I habitats across all UK waters. This assessment has not yet been fully completed, so the entries in this column may change.

Table 4: Recent surveys and surveys in progress in *Areas of Search for survey* in UK offshore waters

Area of Search	High priority Area	Surveys and data	Further data required for assessment against SAC selection criteria?
East Shetland Shelf & Pobie Bank	Yes	Collaborative survey Oct 2006 with DTI Oil & Gas Strategic Environmental Assessment.	Not yet known
Bassurelle sandbank	No	Collaborative survey funded by Aggregate Levy Sustainability Fund in 2005 and 2006	No
Eastern English Channel Reef	Yes	Collaborative survey funded by Aggregate Levy Sustainability Fund in 2005 and 2006	No
Western English Channel Reef	Yes	Data from Defra funded survey with CEFAS in 2006.	Probably not
South West Approaches Shelf Break	Yes	Collaborative project with MESH extension planned for 2007.	
Isle of Man Sandy Mound	Yes	Collaborative survey with AFBI (formerly DARD) (NI) in 2004, '05 and '06.	No (data on Isle of Man section of bank required)
North West Irish Sea Mounds	Yes	Acoustic surveys in 2003 and 2006 with AFBI. Biological survey planned January 2007.	Probably not
North Anglesey Reef	Yes	Collaborative survey with CCW, NMW and Irish academic institutions in 2005 and 2006	Probably not

Area of Search	High priority Area	Surveys and data	Further data required for assessment against SAC selection criteria?
West Hebrides Reef	No	Data from collaborative survey with SNH, AFBI and QUB in 2004.	Yes
Rockall Bank	Yes	Some data acquired through collaborative survey with FRS in 2005 and 2006. Possible collaborative survey opportunity with FRS in 2007.	Not yet known
Turbot, Otter & Papa Banks	No	Collaborative survey Oct 2006 with DTI Oil & Gas Strategic Environmental Assessment.	Probably yes
Iceberg ploughmarks on the northern continental shelf breaks	No	Data from 1997 and '98 surveys and collaborative survey Oct 2006 with DTI Oil & Gas Strategic Environmental Assessment..	Probably yes
Rosemary Bank	Yes	Collaborative survey Oct 2006 with DTI Oil & Gas Strategic Environmental Assessment, and data from SEA7 in 2005.	Yes
Anton Dohrn Seamount	Yes	Collaborative survey Oct 2006 with DTI Oil & Gas Strategic Environmental Assessment, and data from SEA7 in 2005.	Yes
George Bligh Bank	Yes	Collaborative survey Oct 2006 with DTI Oil & Gas Strategic Environmental Assessment.	Yes
Hatton Bank and Lyonesse	Yes	Collaborative survey Oct 2006 with DTI Oil & Gas Strategic Environmental Assessment, and data from SEA7 in 2005 and Spanish surveys in 2005 & 06.	Probably not

- 4.7 The substantial increase in survey effort over the last two years should enable the recommendation of at least two offshore sites per year as SACs in the next three years, and should enable significant progress towards the completion of the network of marine SACs by the European Commission's 2008 deadline.

Annex A

Areas of potential Annex I habitat for consideration as SACs, (October 2006)

The following list contains all areas of known or possible Annex I habitat (reefs, sandbanks slightly covered by seawater all the time, submarine structures made by leaking gases) in UK offshore waters. Areas which have been progressed to recommended sites (dSACs) are no longer listed here. Very small areas of known or possible Annex I reef or sandbank habitat have not been included in the list.

Area of Search	Relevant habitat	Biogeographic division (Regional Sea)
East of Shetland reef	Reefs	Northern North Sea
Carbonate structures in Block 23/16	Submarine structures made by leaking gases	Northern North Sea
Haddock Bank	Sandbank slightly covered by seawater all the time	Southern North Sea
Haisborough Tail, Hewett Ridges, Hammond Knoll & Smiths Knoll	Sandbank slightly covered by seawater all the time	Southern North Sea
North Sea sandy mounds	Sandbank slightly covered by seawater all the time	Southern North Sea
Galloper	Sandbank slightly covered by seawater all the time	Southern North Sea
Outer Gabbard	Sandbank slightly covered by seawater all the time	Southern North Sea
Inner Gabbard	Sandbank slightly covered by seawater all the time	Southern North Sea
North and South Falls	Sandbank slightly covered by seawater all the time	Southern North Sea
Bassurelle sandbanks	Sandbank slightly covered by seawater all the time	Eastern English Channel
Eastern English Channel reef	Reefs	Eastern English Channel
Western English Channel reef	Reefs	Western Channel & Celtic Sea
South West Approaches Shelf Break	Reefs	Atlantic South West Approaches
Mid Irish Sea Reef	Reefs	Irish Sea
NW Irish Sea mounds	Reefs	Irish Sea
North Anglesey Reef	Reefs	Irish Sea
Isle of Man sandy mound	Sandbank slightly covered by seawater all the time	Irish Sea
Texel 11	Submarine structures made by leaking gases	Irish Sea
Blackstones Bank	Reefs	Minches & West Scotland
West Hebrides reef	Reefs	Scottish Continental Shelf

Area of Search	Relevant habitat	Biogeographic division (Regional Sea)
Iceberg ploughmarks on northern shelf breaks	Reefs	Scottish Continental Shelf
Turbot, Otter & Papa Banks	Reefs	Scottish Continental Shelf
Solan Bank & Rona	Reefs	Scottish Continental Shelf
Flannan ridge	Reefs	Rockall Trough & Bank
Hebrides Terrace seamount	Reefs	Rockall Trough & Bank
Rockall Bank	Reefs	Rockall Trough & Bank
Anton Dohrn	Reefs	Rockall Trough & Bank
Rosemary Bank	Reefs	Rockall Trough & Bank
George Bligh Bank	Reefs	Rockall Trough & Bank
Hatton Bank (including Lyonesse)	Reefs	Atlantic North West Approaches
Mammal	Reefs	Atlantic North West Approaches
Sandastre	Reefs	Atlantic North West Approaches

Annex B

Summary of the working methodology for identifying habitat SACs in UK waters (adopted March 2003)

1. Offshore habitat SACs selection criteria, and guiding principles for selecting sites and site assessment

Selection criteria and guiding principles for selecting sites

- 1.1 Site selection criteria for Annex I habitats are prescribed by Annex III of the Habitats Directive, and are listed in Table 1 below along with guiding principles in the Directive's text and agreed at the 1994 Atlantic Biogeographical Region meeting.

Table 1: Summary of site assessment criteria and additional principles used for site selection in the UK (from McLeod *et al*, 2002)

Site assessment criteria (Annex I habitats)	Reference
Representativity	Annex III Stage 1A(a); Article 1e; Conclusions of 1994 Atlantic Biogeographical Region Meeting (para.4)
Area of habitat (Relative surface)	Annex III Stage 1A(b); Article 1e; Conclusions of 1994 Atlantic Biogeographical Region Meeting (para.4)
Conservation of structure and functions	Annex III Stage 1A(c); Article 1e
Global assessment	Annex III Stage 1A(d)
Additional principles	
Priority/non-priority status	Article 1d; Annex III Stage 1D; Conclusions of 1994 Atlantic Biogeographical Region Meeting (para. 3)
Geographical range	Article 1e and 3.1
Special UK responsibilities	Article 3.2; Conclusions of 1994 Atlantic Biogeographical Region Meeting (para. 6)
Multiple interest	Annex III Stage 2.2(d); Conclusions of 1994 Atlantic Biogeographical Region Meeting (para. 2)
Rarity	Conclusions of 1994 Atlantic Biogeographical Region Meeting (para. 5)

Assessing areas of Annex I habitat against the selection criteria and principles

1.2 *Representativity and geographical range*

- i. A suite of sites for each Annex I habitat should, ideally, cover the geographical and ecological range of variation present in the territory of the Member States. This can be achieved by looking at prospective sites, firstly in terms of the geographic location of areas of habitat in UK waters, and secondly in terms of their physical and ecological characterisations.

- ii. Assessment in terms of geographic location can be assisted by reference to the biogeographic regions being developed under Defra's Review of Marine Nature Conservation (RMNC) in their work on 'Regional Seas'. The most recent version of these 'Regional Seas' (published in Defra's 2004 Irish Sea Pilot report) is shown in Figure 1 as Sea Areas.
- iii. Assessment in terms of physical and ecological characteristics can utilise topographic form, structural character and substratum type, as is most appropriate to the habitat under consideration.

1.3 *Area of habitat, conservation of structure and function, and global assessment*

These selection criteria are currently much harder to apply in the offshore marine environment due to uncertainty about the extent of the habitat across prospective sites and the relationships between the habitat and adjacent areas of seabed. In Sections 2 to 4 below, the methodology used to apply the selection criteria and guiding principles is summarised for the three Annex I habitat types occurring in the offshore environment.

1.4 *Priority/non-priority status, UK responsibility and rarity*

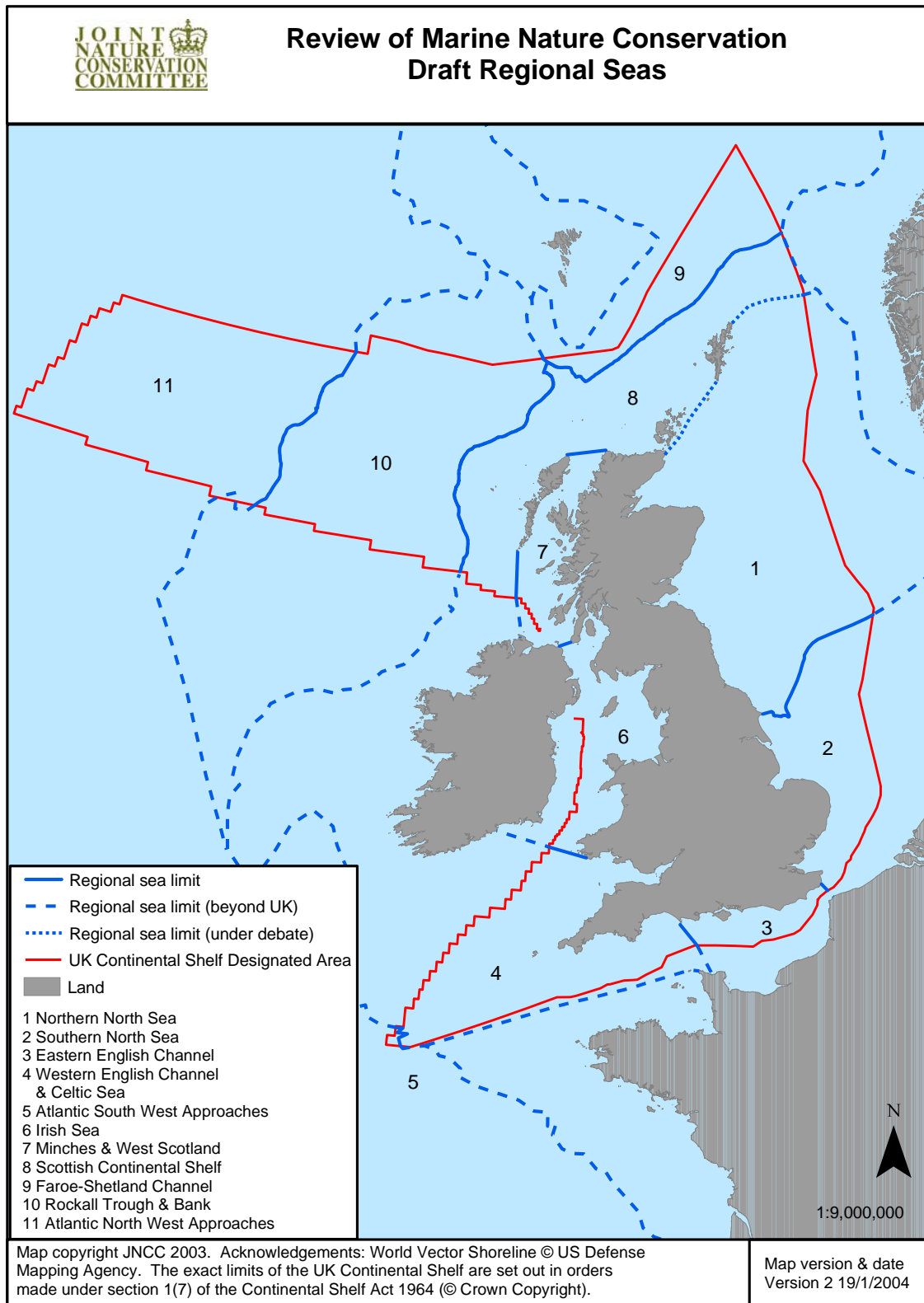
None of the Annex I habitats occurring in the offshore environment is a priority habitat, and neither the special UK responsibilities nor the rarity principles apply to the *Sandbanks which are slightly covered by seawater all the time* or to *Reefs* habitats. The UK may have special responsibility for the *Submarine structures made by leaking gases* habitat, as this habitat may be considered rare. This statement may need to be amended following EU 'marine expert group' discussions on the definitions of Annex I habitats.

Availability of data for habitat identification and assessment

- 1.5 Potential Annex I habitat has been identified using the British Geological Survey (BGS) seabed sediment dataset which has been modelled from point surveys, bringing an inherent level of uncertainty to the areas identified. In some areas, further survey has been conducted which can 'ground truth' the BGS data and confirm the presence of Annex I habitat.
- 1.6 In some cases, survey has also provided biological information about the areas of Annex I habitat, although such biological information is patchy. JNCC has spent considerable effort collating biological information about these areas from the range of available sources. The European Seminar on offshore Natura 2000 sites hosted by Defra in June 2002 concluded that 'the need for biological data for SAC identification was widely recognised', but did not reach a conclusion on the level of biological data needed to select a site.

- 1.7 In this paper, the test for whether there is sufficient biological information to make an assessment against the selection criteria has been set at whether biological data is sufficient to provide a picture of the community present on the Annex I feature, while information which is confined to a few easily-observed species is deemed insufficient to make an evaluation.

Figure 1: Sea areas used to determine a representative suite of sites for Annex I habitat interest features



2. Sandbanks which are slightly covered by sea water all the time

2.1 This habitat is defined in the Interpretation manual (EC, 1999) and is clearly orientated towards inshore waters. In offshore waters, the habitat type has been taken to include areas of sandy sediment (according to the Folk classification used by BGS) in less than 20 metres of water which are elevated from the surrounding seabed, together with the seabed around these areas necessary to preserve structure and function of the unit.

2.2 *Representativity and geographical range*

- i. The first step in achieving a representative suite of sandbank sites in UK waters is to identify where Annex I sandbank habitat is present within each sea area. This has been done using the areas of sandy sediment identified from BGS seabed sediment maps (Johnston *et al*, 2002).
- ii. The second step is to identify, within each sea area, sandbanks of different topographic types. The following topographic types have been identified as being present in UK waters:

- sandy mounds; and
- the following tidal current sandbank types (from Dyer & Huntley, 1999):
 - Type 1 open shelf ridge sandbanks
 - Type 2 estuary mouth sandbanks
 - Type 3 headland associated banks

Of these topographic forms, only sandy mounds and Type 1 tidal current sandbanks are found in UK offshore waters (the outer banks in the Thames estuary were Type 2 but have been sufficiently modified by open shelf currents to be considered as Type 1, Dyer & Huntley, 1999).

- iii. The third step is to sub-divide the sandbanks by gross sediment type of the bank. Sediment composition (according to the modified Folk classification used by BGS) is known for each bank using the 1:250,000 BGS seabed sediment data (Graham *et al*, 2001a). Sediments in Annex I sandbank habitat can range from gravelly sand to muddy sand (Johnston *et al*, 2002).

2.3 Areas identified as being within the scope of this Annex I habitat have been assigned to sea area, topographic type and gross sediment type.

3. Reefs

3.1 *Representativity and geographical range*

- i. The first step in achieving a representative suite of reef sites in UK waters is to identify where Annex I reef habitat is present within each sea area. This has been done using the areas of gravel and rock identified from BGS seabed sediment maps and other information gained from scientific research (Johnston *et al*, 2002).
 - ii. The second stage in achieving a representative suite of sites for reef, is to clarify which sub-types of the habitat occur in each area. Reef sub-types in the offshore include: bedrock (including different topographical forms, e.g. bedrock outcrops, seamounts, pinnacles and banks), stony reef (boulder and cobble mounds and iceberg ploughmarks) and biogenic reefs (cold water coral thickets and banks, Ross worm *Sabellaria spinulosa* reef and horse mussel *Modiolus modiolus* reef) (Johnston *et al*, 2002).
- 3.2 Areas identified as being within the scope of this Annex I habitat have been assigned to sea area and structural type.
4. **Submarine structures made by leaking gases**
- 4.1 Only two examples of the pockmark variant of this habitat are currently known in UK waters. Both of these examples occur within the same sea area - northern North Sea. The UK may be regarded as having special responsibility for this habitat type. Further sites may need to be selected if they are discovered. Both of the known sites for this habitat have sufficient data to be assessed against Annex III selection criteria and can be included in Group 1.

References

- Dyer, K.R., & Huntley, D.A. (1999). *The origin, classification and modelling of sand banks and ridges*. Continental Shelf Research 19, 1285-1330.
- EC (1999). *Interpretation manual of European Union habitats*. Version EUR 15/2. European Commission (DG Environment), Brussels, 121 pp.
<http://europa.eu.int/comm/environment/nature/hab-en.htm>
- Graham, C., Campbell, E., Cavill, J., Gillespie, E., & Williams, R. (2001a). *JNCC Marine Habitats GIS Version 3: its structure and content*. British Geological Survey Commissioned Report, CR/01/238, 45 pp.
- Johnston, C.M., Turnbull, C.G., & Tasker, M.L. 2002. *Natura 2000 in UK Offshore Waters: Advice to support the implementation of the EC Habitats and Birds Directives in UK offshore waters*. JNCC Report, No. 325, Peterborough.

Annex C

UK guidance on defining boundaries for marine SACs for Annex I habitat sites fully detached from the coast (adopted March 2003)

1. Introduction

Previous UK guidance on defining SAC boundaries states that 'as a general principle, site boundaries have been drawn closely around the qualifying habitat types ... for which the sites have been selected, taking into account the need to ensure that the site operates as a functional whole for the conservation of the habitat type ... and to maintain sensible management units'. Further 'the seaward boundaries of the sites have been drawn as straight lines, to ensure ease of identification on charts and at sea' (Brown *et al.*, 1997, McLeod *et al.*, 2002). The guidance presented below is an expansion of previous guidance on defining boundaries for marine SACs, specifically for sites which are not connected to the coastline, and which may be in deep water (200m to more than 1000m).

2. Guidance

Actual site boundaries will be determined on a site specific basis, following the general guidance set out below:

- 2.1 The habitat area of interest will be identified and mapped. In many cases in waters away from the coast, this will involve some form of modelling, such as use of seabed geological data (interpolated from seismic tracks and samples), interpreted sidescan sonar, acoustic and/or bathymetric data.

The minimum area necessary in order to ensure the essential level of protection for the habitat of interest will be defined. Boundaries should be as simple as possible, drawn using defined latitude/longitude co-ordinates (degrees and minutes to two decimal places) and a minimum number of straight lines. Where practical, sites should be square or rectangular, and aligned vertically/horizontally with latitude/longitude. However, other simple shapes and alignments may also be used where necessary to avoid inclusion of unreasonably large areas not containing SAC interest.

- 2.2 The area defined under 2.1 above may then be extended if necessary in the following circumstances:
 - i. to ensure an essential level of protection from potentially damaging activities at the site, taking into account water depth at the site and possible location of mobile gear on the seabed in relation to location of a vessel at the sea surface. Activities which are location specific, always subject to prior consent and have clear reliable methods of enforcement are already controlled under existing procedures such as

licensing of these activities. Mobile activities which may affect seabed habitats, such as fishing and anchoring, are not subject to prior consent procedures and therefore need special consideration. The length of warp used by boats when trawling is largely determined by water depth. The following table gives the appropriate distance beyond the seabed extent of the habitat by which the site boundary at the sea surface may be extended (based on generalised trawl warp lengths, SERAD 2001):

Water depth	Ratio warp length: depth	Approx. length of trawl warp	Boundary extension to be added to the habitat area of interest
Shallow waters (≤ 25 m)	4:1	100 m at 25 m depth	4 x actual depth
Continental shelf (25-200 m)	3:1	600 m at 200 m depth	3 x actual depth
Deep waters (200 to over 1000 m)	2:1	2000 m at 1000 m depth	2 x actual depth

- iii. For mobile habitats (for example, sandbanks), to ensure the minimum area necessary to allow conservation of the structure and functions of the habitat. Such extension will be determined on scientific understanding of the structure and functions of the habitat.

References

Brown, A.E., Burn, A.J., Hopkins, J.J., & Way, S.F. (eds.) (1997). *The Habitats Directive: selection of Special Areas of Conservation in the UK*. Joint Nature Conservation Committee Report 270, Peterborough, 295pp.

McLeod, C.R., Yeo, M., Brown, A.E., Burn, A.J., Hopkins, J.J., & Way, S.F. (eds.) (2002). *The Habitats Directive: selection of Special Areas of Conservation in the UK*. 2nd edn. Joint Nature Conservation Committee, Peterborough. www.jncc.gov.uk/SACselection

SERAD (2001). *A fishing industry guide to offshore operators*. Scottish Executive, Edinburgh, 28 pp.