

# The North Sea Regional Advisory Council



**Final Position Paper**

**April 2012**

**Fisheries management in relation to nature conservation for the combined area of 3 national Natura 2000 sites (SACs) on the Dogger Bank**

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## Table of Contents

1. Introduction.....	3
2. Description of the process.....	4
3. Results of the process.....	8
3.1 NSRAC reflections on the TOR.....	8
3.2 NSRAC consensus areas .....	8
3.3 Outstanding differences .....	11
3.3.1 NGO zoning proposal .....	11
3.3.2 Industry zoning proposal.....	13
4. Conclusion on stakeholder process and recommendations for the future.....	15
Annex 1. Gears currently used on the Dogger Bank.....	18
Annex 2. Mapping exercise by NGOs resulting from the Focus Group workshops .....	20
Annex 3. Fishing sector proposal .....	24

## 1. Introduction

The North Sea's Dogger Bank has historically been - and continues to be - a major trans-boundary fishing ground, particularly for flatfish and sandeels but it has other assets, notably nature conservation value and renewable energy, now being addressed by Natura 2000 designations and wind farm development, respectively.

Dutch, German, UK and Danish fleets, and to a lesser extent vessels from Belgium, France, and Norway, operate freely across the boundaries of the emerging Dogger Bank Natura 2000 complex, comprised of adjoining Special Areas of Conservation (SAC) designations. The current status is Site of Conservation Importance (SCI) for, respectively, the Netherlands and Germany; and candidate SAC in the case of the UK. Denmark has no Natura 2000 ambitions for its edge of the Dogger Bank but has major commercial fishing interests in the region.

The NSRAC challenged the Member States to adopt a much-needed cooperative approach. This was finally taken up by the Dutch FIMPAS project (Fisheries Measures in Protected Areas) for the Dutch part of the Dogger Bank, which in January 2011 led to international cooperation, through establishment of the intergovernmental Dogger Bank Steering Group (DBSG). This steering group, with members representing the Netherlands, the UK, Germany, Denmark, and ICES and the EC as observers, oversees a management plan for the international SAC complex.

The DBSG delegated the task of delivering a stakeholder-led plan to the NSRAC, whose Spatial Planning Working Group (SPWG) set up a Focus Group (of industry and NGO representatives<sup>1</sup>) and sought facilitation from the Centre for Marine Policy (Wageningen UR) as part of their EU-funded MASPNOSE Project (EU Preparatory Action on Marine Spatial Planning in the North Sea).

The objective was to submit a zoning plan of fisheries management measures to ICES and ultimately to the European Commission by the end of 2012 to take fisheries management measures for the Dogger Bank under the Common Fisheries Policy (CFP), particularly in relation to managing bottom-contacting gears to improve the conservation status of habitat type H1110-C (sandbanks which are slightly covered by sea water all the time).

Since its inauguration in 2005, a major concern of the North Sea Regional Advisory Council's (NSRAC) Spatial Planning Working Group (SPWG) has been the need to address the Dogger Bank as an entity and thus arrive at common fisheries management measures for the SAC complex to ensure a coherent and harmonised fishing management regime which meets the conservation objectives, as stated by Natura 2000, of the sites.

This first attempt to achieve consensus on a set of fisheries management measures for a mosaic of adjoining offshore Natura 2000 sites proved to be a challenging and complex process. Few fisheries -or any other- measures have been proposed thus far for offshore

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<sup>1</sup> Under the SPWG Chair, the core FG comprised industry representatives of the Danish Fishermen's Association, VisNed, National Federation of Fishermen's Organisations, Deutscher Fischerei Verband, the NGOs WWF and Stichting De Noordzee, and an environmental advisor to Forewind.

Natura 2000 sites in EU waters, far less for such an extensive and complex trans-boundary area as the Dogger Bank.

This report, building on the NSRAC's October 2011 position paper, describes the NSRAC's process for the fisheries management plan in relation to Natura 2000, the areas of consensus reached, the areas where the fisheries sector and NGOs were unable to reach consensus and the justification of each stakeholder group for those (see Annexes 2 and 3), conclusions, reflections on the process, recommendations and lessons learned, including in the wider context of governance and maritime spatial planning.

## 2. Description of the process

NSRAC SPWG involvement in the development of a fisheries management plan, including a zoning proposal, for the Dogger Bank, began in January of 2011. During the course of the subsequent twelve month period the NSRAC was involved in four distinctive Dogger Bank Steering Group (DBSG)-initiated processes:

1. Process 1: May 2011 – October 2011
2. Process 2: October - November 2011
3. Process 3: December 2011 – February 2012
4. Process 4: March 2012 – April 2012

For a better understanding and appreciation of the contents of this report, and for an evaluation of how well the process delivered, it is important to have an overview of all four processes that eventually resulted in this NSRAC position paper. The main characteristics of the four processes are therefore described below with reference to relevant documents.

### 1. Process 1

Period:	May - October 2011
Participants:	NSRAC Focus Group
Terms of Reference (TOR):	NSRAC Focus Group
Facilitation:	MASPNOSE including GIS support
Budget:	MASPNOSE
Objective:	To develop a position paper on fisheries management in relation to nature conservation, including a zoning proposal, for the combined area covered by the 3 national Natura 2000 sites (SACs) of the Dogger Bank
Meetings:	Five meetings in 2011, including two workshops. For details see the October 2011 NSRAC position paper
Result:	NSRAC Position Paper submitted to DBSG (October 2011)
References:	<ul style="list-style-type: none"><li>• NSRAC May 2011. Terms of Reference NSRAC spatial planning focus group's Management position paper for the Dogger Bank.</li><li>• NSRAC May 2011. Script NSRAC Dogger Bank Management Plan.</li></ul>

- NSRAC, October 2011. Position paper on fisheries management in relation to nature conservation for the combined area of 3 national Natura 2000 sites (SACs) on the Dogger Bank.
- Van Moorsel, G., 2011. Species and habitat of the international Dogger Bank, assignment of WWF.

## 2. Process 2

Period: October - November 2011  
 Participants: DBSG, NSRAC FG and other invited stakeholders  
 TOR: Not applicable  
 Facilitation: ICES  
 Budget: DBSG  
 Objective: To reflect on a proposal including three scenarios, developed with the assistance of ICES (led by Hans Lassen), drawing on some of the NSRAC's elements but also including new elements, and –if required- provide input for a scenario four  
 Meeting: DBSG Dublin Stakeholder meeting, November 7th & 8th 2011  
 Result: NSRAC to continue to develop a zoning proposal within strict terms of reference set by the DBSG. NSRAC FG to include DBSG observers (= NSRAC FG+)

### References:

- Invitation to Stakeholders Workshop 7 – 8 November 2011 in Dublin, Ireland, October 2011.
- Agenda, Stakeholder Meeting Dublin, 7-8 November 2011.
- Hans Lassen- ICES Secretariat, 2011. Dogger Bank Fisheries Regime. DBSG-Stakeholder Meeting Dublin, 7-8 November 2011, Paper 2.
- Minutes of the DBSG-Stakeholder Meeting Dublin, 7-8 November 2011.
- The chairs summary of the DBSG-Stakeholder Meeting Dublin, 7-8 November 2011.

## 3. Process 3

Period: December 2011 – February 2012  
 Participants: NSRAC FG+  
 TOR: DBSG, see **Box 1**  
 Facilitation: David Goldsborough (Centre for Marine Policy, Wageningen UR) including GIS support Arjen Koekoek  
 Budget: DBSG Member States and fishing sector (50:50)  
 Objective: To develop a draft proposal, including a joint zoning proposal, for a fisheries management regime for the Dogger Bank  
 Meetings: Scoping Meeting<sup>2</sup> NSRAC FG+ (December 9th 2011)  
 Workshop 1 (January 9th 2012)  
 Workshop 2 (January 23rd 2012)

<sup>2</sup> Meeting where stakeholders come together to discuss, and finalize, the scope (focus) for a process, including activities and task assignment. The outcome of a scoping meeting is recorded in a script.

Result: NSRAC could not agree on joint zoning proposal as elaborated in February, 2012 NSRAC SPWG report

References:

- NSRAC FG December 2012. Script NSRAC FG+ Dogger Bank Management proposal.
- Hans Lassen & Jacob S. Hansen- ICES Secretariat December 8th 2011. Size of Zones: Dogger Bank SAC. Note.
- Hans Lassen-ICES Secretariat December 21st 2011. Benthic Habitats on the Dogger Bank, Note.
- NSRAC SPWG, 2012. NSRAC Report of the Spatial Planning Working Group by the Chair. NSRAC ExCom, London, 7 Feb 2012.

#### 4. Process 4

Period: March 2012 – April 2012

Participants: NSRAC FG+<sup>3</sup> and chair NSRAC

TOR: DBSG (**Box 1**) plus additional requirements (letter chair DBSG, see references)

Facilitation: MASPNOSE

Budget: MASPNOSE

Objective: To develop a draft proposal for a fisheries management regime for the Dogger Bank. This was a continuation of the objective of the third process.

Meetings: Scoping Meeting NSRAC FG with chair and vice-chair NSRAC (March 12th 2012)<sup>4</sup>  
Workshop NSRAC FG working group (March 22nd 2012)

Result: Final position paper on fisheries management in relation to nature conservation for the combined area of 3 national Natura 2000 sites (SACs) on the Dogger Bank, including two annexes explaining the rationale behind the NGO and industry zoning proposals.

References:

- Letter chair DBSG to NSRAC FG and NSRAC chair detailing terms and requirements of continuation, March 5 2012.

**In addition to the joint NSRAC position paper both stakeholder groups will send in stakeholder input papers to inform the DBSG on their visions, findings and mapping exercises.**

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<sup>3</sup> The DBSG was invited to participate in a scheduled workshop, but the NSRAC could not reach full agreement on a joint mapping procedure at the scoping meeting. Consequently the scheduled workshop was cancelled and the DBSG did not play a role in this process.

<sup>4</sup> The scoping meeting resulted in a compromise: a joint NSRAC report would be written with two annexes elaborating the different zoning views.

### **DBSG's invitation (TOR) to NSRAC for developing a draft proposal for a fisheries management regime for the Dogger Bank**

The Dogger Bank Steering Group (DBSG) invites the NS RAC Focus group to develop a draft proposal for a fisheries regime on the Dogger Bank – implementing the Natura 2000 programme - within the following parameters:

- The aim of the draft proposal is that the conservation objectives<sup>5</sup> will be delivered;
- Use a zoning concept with two zones :
  - Free Zone: all legal gears within the CFP are allowed;
  - Management Zone: Fishing is limited to fishing gears that do not cause deterioration of the natural habitats for which the site has been designated;
- Develop a fisheries management zone covering 25%-55% of the total SAC area;<sup>6</sup>
- Ensure representation of all (five) benthic communities;<sup>7</sup>
- Take a perspective of the entire Dogger Bank, rather than the portions belonging to individual member states;<sup>8</sup>
- Take into account the German proposal;<sup>9</sup>
- Take into account the Chair's conclusions of the Dublin stakeholders meeting;<sup>10</sup>
- Avoid a patchy pattern of the fisheries management zones in light of enforceability;
- Use the existing data;<sup>11</sup>
- Develop a preferred method for weighing economic and socio economic considerations.

#### **Timeline**

DBSG invites the NS RAC Focus group to provide its proposal to the DBSG by 7 February 2012 at the latest.

#### **Responsibilities**

DBSG invites NS RAC Focus Group to develop the proposal within the parameters outlined above. DBSG requests the NS RAC Focus Group to explicitly communicate its acceptance of this invitation. Representatives of the 4 member states of the DBSG will attend the NS RAC Focus Group meetings as observers. This constitutes the NS RAC Focus Plus Group. DBSG will, after receiving the proposal, take a decision on the NS RAC proposal (accept, amend or reject).

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<sup>5</sup> as described in the Dublin discussion document by ICES.

<sup>6</sup> ICES will develop further scientific information for this range

<sup>7</sup> as described in the Dublin discussion document by ICES.

<sup>8</sup> this is conditional on clarity to be provided by the EC on member states' legal obligations in this respect

<sup>9</sup> as contained in the document "Proposed measures for fisheries management in the Natura 2000 sites in the German EEZ of the North Sea and Baltic Sea", d.d. 20 april 2011.

<sup>10</sup> See the conclusions by the chair at the end of the session.

<sup>11</sup> do not wait to incorporate forthcoming data

### 3. Results of the process

#### 3.1 NSRAC reflections on the TOR

The NSRAC FG fundamentally accepted the TOR but relayed a caveat to DBSG (NSRAC FG e-mail to Ton IJlstra, Chair of the DBSG, 7/12/11):

*'It is important that we retain our independence in this process in formulating a proposal and to that end we acknowledge the TOR as guidance and in its representation of views of the different member states.*

*We consider it important, however, that we progress our proposal from the bottom-up, drawing upon the knowledge and of the industry fishing in the area of the bank. It is by going through this process that we can formulate a proposal and consider its merits in the round in the context of the DBSG TOR, and justify it accordingly. This naturally follows on from where the Focus Group had progressed before the Dublin meeting. We cannot guarantee to what extent our proposal will fulfil the TOR in its entirety or in some respects go further, as the full set of implications, particularly with respect to the fact that zonation proposals cannot be evaluated without going through this process of "learning by doing". Our ability to progress this work is dependent upon resources available, in particular to undertake the necessary work with spatial data.'*

Although the NSRAC FG had reservation about the TOR we do not consider that the TOR prevented us from reaching consensus, rather we disagreed about the level and location of area protection within the TOR.

However, the NSRAC FG would have preferred the TOR to give more guidance on:

- a) an evidence based approach which underpins the extent (% of total SAC area) of the fisheries management zone (the range presented in the TOR was very wide);
- b) flexibility of zoning approach, i.e. the possibility of 3 zones rather than two;
- c) allowable gear types in relation to these zoning scenarios.

#### 3.2 NSRAC consensus areas

The NSRAC FG agreed on the concept of a zoning approach to management. Zoning boundaries should be practical (notably not patchy) for facilitating management.

Within a 2-zone approach, reference areas could be incorporated, e.g. experimental closures to defined gear types for monitoring and scientific purposes, as well as areas for investigating the effect of gear adaptations.

Evaluation of the ultimate management plan requires a scientific baseline to be determined for achieving favourable conservation status of each of the five benthic communities on the Dogger Bank Natura 2000 area.

A management plan should actively stimulate and promote gear innovation. For characteristics of gears currently used on the Dogger Bank see **Annex 1**. Development and use of less bottom-impacting gears leads to less impact and also reduced costs (lower fuel consumption) for fishermen.

The NSRAC acknowledges that the zoning measures applied could result in potentially harmful displacement of effort within the Dogger Bank Natura 2000 area and also to ecologically vulnerable areas outside the Bank. But the different stakeholders had divergent views on how this could be mitigated (see 3.3).

The development of windfarms on the Dogger Bank should be taken into account, and the co-existence of fisheries with wind farm development plans (notably Forewind) should be further explored. Due to differing timeframes, the NSRAC was hindered in its scoping by the lack of information available from Forewind. This was not due to any withholding of data but rather the state of advancement of Forewind's environmental assessment in relation to the timing of the NSRAC process; information flow will increase significantly in the coming months as the result of Forewind's monitoring results becoming available, and with increasing clarity on their planning for the first tranche of wind farm projects.

Whereas the NSRAC was asked (as per TOR) to use existing data, we took the responsibility to source additional data (ecological, fisheries, socio-economic etc.) and scientific analysis which we considered necessary to produce a first zoning proposal, and we further consider that this needs to be an on-going process. Our first findings on Economic Impact Assessment can be found in **Box 2**.

### **Adaptive Management**

Current knowledge concerning the conservation status of the Dogger Bank is limited and requires adaptive management, i.e. a structured, iterative process of optimal decision-making in the face of uncertainty, with the aim of reducing uncertainty over time via system monitoring. This would include the promotion of fishing methods that reduce bottom impact.

### **Co-management**

The Dogger Bank fisheries zoning plan should be subject to co-management. Co-management is a process in which, subject to the limitations of the Treaty, Member States share information and decision-making with resource users and other key stakeholders, with each given specific rights and responsibilities. In this regard, the NSRAC should have an on-going, interactive role in, inter alia:

- development and review<sup>12</sup> of a zoning proposal
- design and implementation of a monitoring regime , including identification of experimental areas for research purposes
- fishing sector participation in data collection, towards a mitigation strategy and to encourage compliance and support for the management regime
- design and establishment of a control and enforcement regime

This plea for co-management gains support from the following quote in Paper 2 (from ICES) prepared for the Dublin stakeholders' meeting in Nov 2011: 'It is therefore suggested to take up the challenge and to form an informal group, consisting of state representatives and stakeholders with the assignment to draw up a paper, in collaboration with the EC, which

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<sup>12</sup> Phased implementation of a zoning plan should be linked to a clear time schedule. Periodic review based on monitoring results is crucial and after each cycle the management plan should be evaluated and updated.

can demonstrate how co-management can contribute to a better management of the Dogger Bank’.

### *Box 2. Note on Economic Impact Assessment*

It is suggested that the key to providing a detailed understanding of the impacts of fisheries management measures lies in firstly identifying the fleet métiers affected and their home ports and/or principal landing ports. Once this is completed for each métier/port grouping the following analysis may be undertaken:

- Extent to which those vessels will be able to relocate to alternative grounds and fish viably. Such an assessment should take into account cumulative and in-combination effects of existing and known planned spatial planning interventions e.g. other sandbank SACs.
- Extent to which vessels would need to convert fishing operations in order to access grounds and the costs associated with such a transition.
- The above would then feed into an assessment of the significant residual impacts on the viability and/or profits forgone as a result of measures which can then be translated into downstream assessments upon home/landing ports and supply chains. This should take into account multiplier effects and not only first sale values of fish.

Quantitative data derived from VMS positioning and ICES rectangle landings / effort data can be used to inform this analysis. Sufficiently disaggregated data sets will facilitate analysis that addresses local/distributional impacts.

It would be possible to supplement this, however, with knowledge on the fleets affected by the measures and qualitative information on expected responses to those measures.

Imares and LEI for example have models to define value of fishing with model using combination of logsheet and VMS. Where available multipliers and input-output analysis can be used to evaluate supply chain effects, see for example Fraser of Allander Institute for Research on the Scottish Economy (2002).

Monetary values are relevant measures but quantitative assessment of numbers of businesses and jobs are also relevant and more meaningful at local scales of analysis.

#### **Literature on impact assessment:**

Defra / JNCC (2011). Dogger Bank Special Area of Conservation: Impact Assessment.

DG Employment and Equal Opportunities (2009). Guidance for assessing Social Impacts within the Commission Impact Assessment system.

European Commission (2009). Impact Assessment Guidelines.

Fraser of Allander Institute for Research on the Scottish Economy (2002). Input-Output multiplier study of the UK and Scottish Fish Catching and Fish Processing sectors, University of Strathclyde.

Fujiwara and Campbell (2011). Valuation Techniques for Social Cost Benefit Analysis: Stated Preference Revealed Preference and Subjective Well-Being Approaches.

HM Treasury (2003). The Green Book: Appraisal and Evaluation in Central Government.

Lee, J, A. South, C. Darby & P. Robinson and N. Hintzen (2009). Spatial and temporal analysis of VMS data to provide standardised estimates of fishing effort in consultation with the fishing industry: Case Study: Fishing activity within proposed UK Natura 2000 area on Dogger Bank.

MCZ Projects (2011). MCZ Technical Methods: Commercial Fishing.

Poseidon (2011). The Value of Irish Sea Marine Conservation Zones to the Northern Irish Fishing Industry.

Danmarks Fiskeriforening (2012). The economic importance of sandeel fisheries at the Dogger Bank.

### 3.3 Outstanding differences

During the whole Dogger Bank process the stakeholders worked jointly on mapping exercises, but the construction of a joint map appeared complex, mainly due to the differences in criteria and stakes in the SAC area. While the main driver of the industry was considering the locations of fishing grounds and implications of zones for fishing activity, both socio-economic and ecological, the NGOs mainly focused on ecological considerations. The maps represent these differences between the stakeholders.

In Process 3 (see page 4) of this Dogger Bank stakeholder process, the stakeholders were explicitly asked to translate their considerations into a zoning map, showing specifics on locations and sizes of areas. The stakeholder groups did not manage to draw up one joint map, but worked with their constituencies and presented their findings, with the intention to work towards similar maps. Figure 1 and figure 2 are the last versions of the maps made - respectively - by the NGOs and by the fishing industry.

During several sessions, efforts were made to create a joint working map<sup>13</sup>, but at the latter meetings it became clear that the gap between the visions of the fishing sector and the NGOs was too large: not only on sizes of areas, but also on locations, and this before the actual management constraints of the Fisheries Management Zones were jointly agreed.

Therefore beyond this report, the NSRAC Focus Group decided to work on separate stakeholder input papers including maps, to advise the DBSG in their decision-making process on the zoning of the Dogger Bank SAC complex.

#### 3.3.1 NGO zoning proposal

During the third Dogger Bank process, emphasis was put on producing a joint zoning proposal. At the second workshop, 23rd of January 2011, the NGOs suggested additional areas on a working map, see Figure 1. In this working map industry proposed areas are shown in green, NGO proposed additional areas are shown in red and in yellow, and Member States representatives suggested ideas for 2 areas that are shown in purple. These purple areas were suggested to meet, respectively, a German stated preference for 50% coverage (no. 599) and a UK request to cover additional area (no. 527) on the top of the Bank representing the “original” designated sandbank habitat type H1110 (classified as sandbanks which are slightly covered by sea water all the time, and typically at depths of less than 20m ).

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<sup>13</sup> for details see: NSRAC SPWG, 2012. NSRAC Report of the Spatial Planning Working Group by the Chair. NSRAC ExCom, London, 7 Feb 2012.

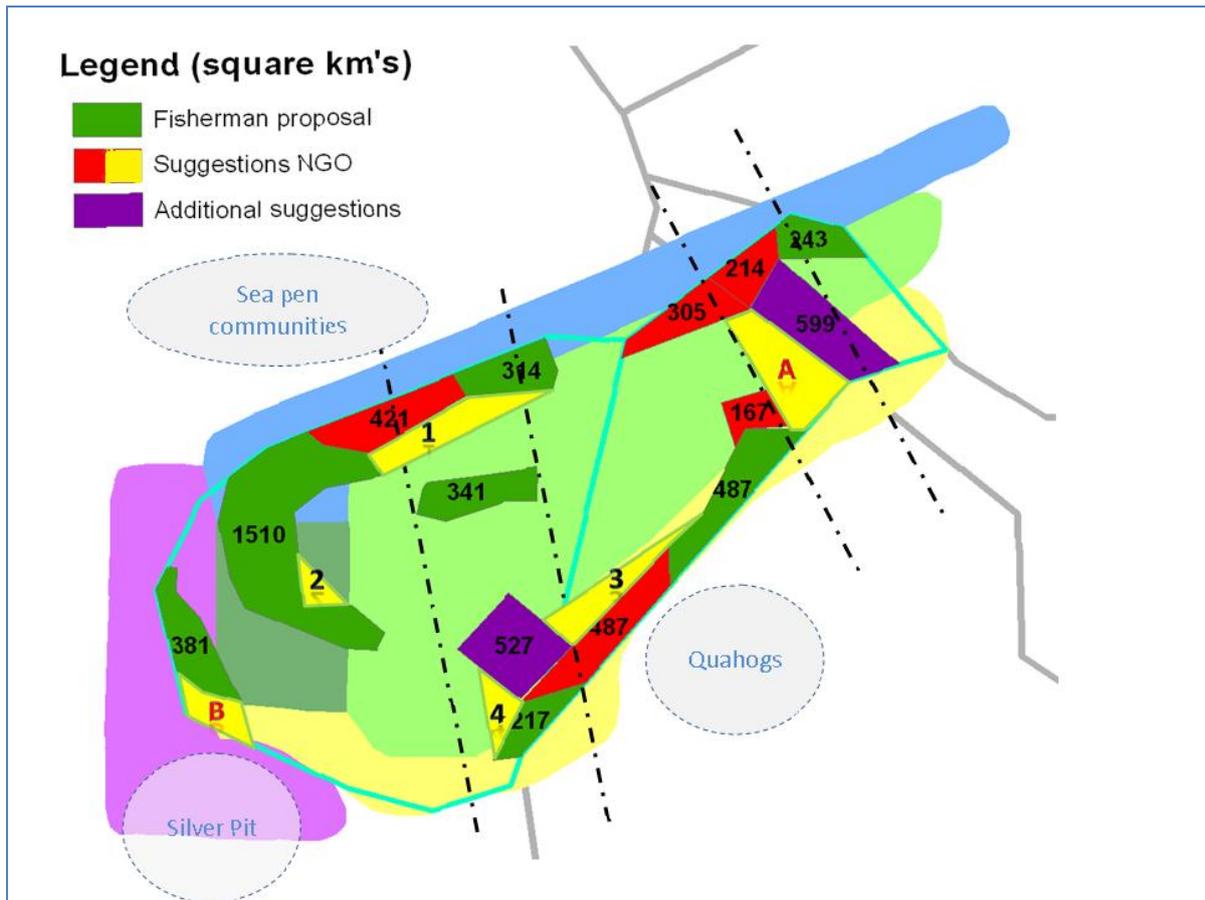


Figure 1. NGO proposed additional areas, January 23<sup>rd</sup> 2012

The NGOs built their map on the building blocks presented by the fishing sector (green areas) and the Member States (purple areas) and identified additional areas (red and yellow) to reach their objectives.

The main rationale supporting these NGO suggested areas are in **Box 3**. A detailed explanation of the status and justification for the working map is included in Annex 2.

Box 3. Rationale of NGO proposed additional areas, see Figure 1

**How do these areas support the NGOs' vision and conservation objectives?**

- Protect representative areas of a reasonable size, which also have a scientific purpose (599, 217, 487, 527, 341, 421, A, 1, 3)
- Ensure conservation of the blue community which accommodates the specific Northern North Sea species (large species) with a high biodiversity (1510, 421, 314, 1)
- Enlarge the purple community, which surprisingly has many northern species. Expansion to south or north (381, B)
- Prevent fringing shapes for management reasons (2)
- Ensure inclusion of the coarse gravel structures within the contours (1510, 2)
- Conservation of Quahogs (305, 214, 167)
- Include shallow areas in conservation zone (527, 4)

### 3.3.2 Industry zoning proposal

The most recent industry zoning proposal that was discussed in the NSRAC FG proposes 8 management areas within the notified Dogger Bank SAC, see Figure 2.

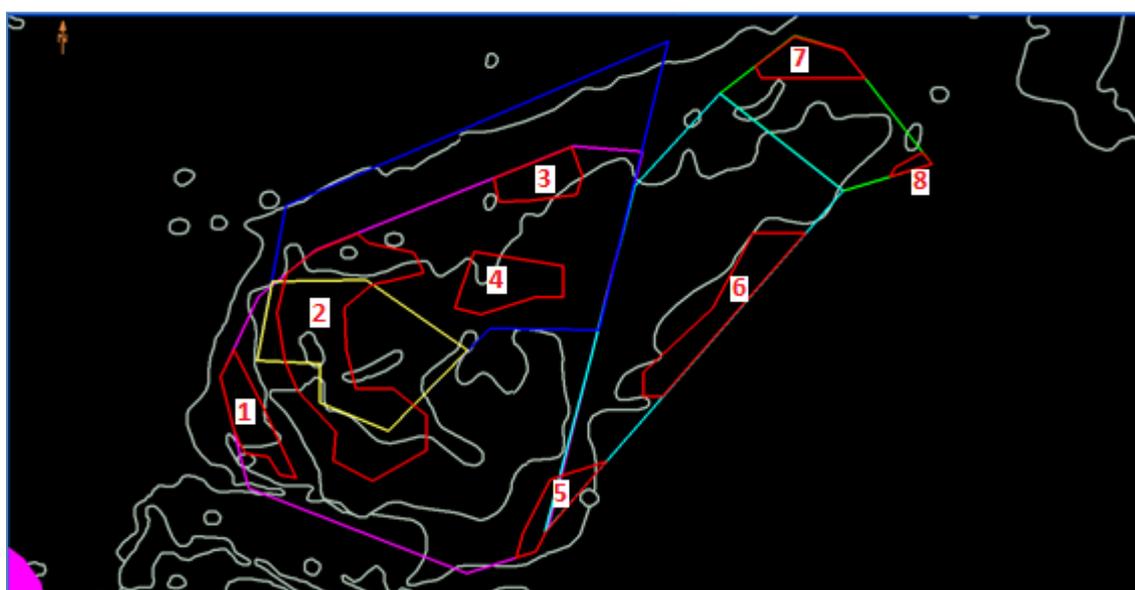


Figure 2. Representation of industry Zonation Proposals. Boundary key: red = fisheries management zones; pink = SAC UK sector; turquoise = SAC Dutch sector; Green = SAC German Sector; Blue/yellow = Dogger Bank Round 3 planning zone and tranche 1 projects area

The main rationale supporting the industry suggested areas is shown in **Box 4**. A detailed explanation of the status and justification for this map is included in Annex 3.

*Box 4. Rationale of industry proposed areas, see Figure 2*

**Area 1 West UK**

This area adjacent to the western boundary of the Dogger Bank SAC covers a large part of the Western benthic community (about 50%) and also part of the South West benthic community. The boundary of the area is primarily determined by the sandeel fishery, as the broader area contains the most important fishing grounds, in particular between areas 1 and 2..

**Area 2 West 2 UK**

This large area also situated in the western end of the Dogger Bank contains 3 different benthic communities (North-eastern, Bank, and South-west). It also contains a large area where the depth is less than 20 metres, which is the specific habitat mentioned in the Habitats Directive. This zone has high biodiversity due to the variety of sub-habitats it contains. The western boundary is defined around an important sandeel fishing ground. To the east, important beam, twin rig seine fisheries are conducted.

**Area 3 North UK**

This area to the north of UK part of the SAC covers, together with area 2, the North-eastern and the Bank benthic community. Local ecological knowledge suggests this area has relatively high biodiversity value within the north eastern habitat. The area between 2 and 3 is a particularly important beam trawl fishing ground.

**Area 4 Central Bank UK**

This area in the middle of the Dogger Bank covers the Bank benthic community. It has been highly fished in recent years but it covers some of the habitat most subject to wave action on the Bank. The area is fished by beam, twin rig trawlers and seine netters.

**Area 5 South UK/Netherlands**

This area in the southern part of UK and Dutch waters on the Dogger Bank covers the southern community. North of this area are shallower waters that are very important fishing grounds for plaice where beam and twin rig trawling and seine netting are conducted.

**Area 6 South Netherlands**

This area in the southern part of Dutch waters on the Dogger Bank covers the Southern community. Sandeel fishing grounds in Dutch waters lie immediately north west of the area .

**Area 7 North Germany**

This area in the northern part of German waters on the Dogger Bank covers the North-eastern and the Bank benthic community. The German area is one of the most important areas for beam trawl and twin rig fishery. The highest diversity in the area is found in the most northern part.

**Area 8 South Germany**

This area in the southern part of German waters on the Dogger Bank covers the Southern community. Sandeel fishing grounds on the German section of the SAC are to the west and northwest of this area.

#### **4. Conclusion on stakeholder process and recommendations for the future**

The stakeholders in the NSRAC Focus Group benefited in its work, and succeeded largely in joint working, by establishing clear terms of reference for itself from the outset, including:

- Fully transparent working and knowledge-sharing
- Having ownership of and responsibility for the process
- Building trust by good communication and regular face-to-face meetings
- Focussing dialogue on content rather than negotiation

Under these conditions, the NSRAC found the process challenging and complex but still succeeded in scoping and finding significant areas of consensus (see 3.2), notably in terms of creating a good knowledge base, defining the framework for debate, and generating valuable visualisations of options for zoning scenarios.

However, quantitative consensus between the industry and the NGOs was not achieved on fisheries management measures because the Focus Group was unable to bridge a significant gap in vision due to some fundamentally different perspectives. Each stakeholder group also assembled additional information and argument in support of these perspectives but as these go beyond the scope of this report, they will be submitted separately to the Dogger Bank Steering Group as position papers from industry and the NGOs, respectively (see 3.3).

A significant challenge to the Focus Group's working was the ability of stakeholder representatives to represent their constituencies at the table. This slowed the pace of progress when representatives had to consult their constituencies at each step of the way in a time-pressured process, and this in turn challenged the ability of the group to work cohesively and in a transparent way. This highlights a broader challenge for marine spatial planning where there exist complex distributions of over-lapping uses in a marine area involving multiple interests.

Notwithstanding the NSRAC Focus Group's own internal challenges, external factors also had a significant influence on its work and outcome. Contingent factors which hindered the delivery of a consensual result include, from the outset:

- The lack of a more joined up approach of all parties (NSRAC, DBSG, ICES)
- Other stakeholders not at the table (notably windfarm developers)
- Lack of clarity in the TOR from the DBSG to the Focus Gp
- Poor knowledge base (it grew iteratively, with important input from the stakeholders themselves, while ICES tabled late in the process)
- Lack of a budget up-front/lack of clarity on its sourcing (notably Member States versus EC)

- Imposition of unrealistic timelines (exacerbated by budgetary constraints)

Thus, while acknowledging the strength and legitimacy of a bottom-up (NSRAC) approach, the development of the Dogger Bank zoning proposal suffered from the NSRAC's isolation, at least in the critical early phase, from the deliberations of the DBSG and ICES. In retrospect, the disjunct, twin-track approach of the DBSG and the NSRAC has not been conducive to a timely and consensual result. Critically in this regard, for example, the NSRAC did not receive the DBSG's draft TOR until 7 December 2011, one month after the Dublin meeting, with the invitation (see TOR) to deliver a final proposal in just two months by 7 February 2012 at the latest, and struggled with the imprecision of the TOR in several key respects, this in turn reflecting the variability in the objectives of different Member States. Under the pressure of these constraints, the stakeholders' ability to work to its own TOR was stretched to the limit such that joint working broke down at critical stages, notably during Process 3.

There is a dynamic tension between the desire for primacy of a stakeholder-led approach, capitalising on first-hand stakeholder knowledge, and the legal responsibility of Member States to lead under the nature conservation Directives. During the process of trying to develop a Dogger Bank zoning proposal, this tension was not well resolved and translated into excessive incoherence. The Focus Group believes that these elements should be reconciled under a co-management system.

Taking these considerations into account, a stakeholder-led approach on fisheries in relation to Natura 2000 can succeed but the process must:

- Be well designed, including realistic timelines
- Involve all relevant stakeholders from the outset (in this case including also the Member States, ICES and the EC, with the participation of both DG Mare and DG Envi)
- Begin with a presumption of dialogue on agreed content, first assure a good knowledge base, rather than negotiation e.g. on conservation objectives and impacts of gears
- Be well resourced and facilitated (with advance budget agreed and sourced)

In further detailing the management plan and zoning proposal, respected experts (notably on GIS) should be involved. In collaboration with all stakeholders, well justified decisions can then be made on the exact location and size of areas, and the management constraints applied within them.

In addition, the decision-making process needs to be well informed. As knowledge on the current status of the Dogger Bank and other marine ecosystems is limited and the location of areas of (potentially) higher ecological value is not always clear, it is essential to address this issue in the management plan. This can be achieved by:

- Agreeing on a scientific baseline for evaluating the ecological status of the area
- Setting up a monitoring system that will enable learning over time

- Within the 6-year review cycle under the Habitats Directive, reporting on an integrated, international management plan (rather than each Member State working to its own timeline, depending on time of designation)
- Within this review cycle, the DBSG updating the NSRAC annually on progress on the international plan and its efficacy.

## **Annex 1. Gears currently used on the Dogger Bank**

### **Sandeel trawl**

Weight of doors:	about 2.5 tons each
Weight of trawl:	2.5 to 3 tons
Spread of trawl:	70-80 meters
Spread of doors:	110-140 meters
Total length of ground gear:	159 meters
Length of central section:	20 meters spread 15 meters
Materials for ground gear:	- arms: Taifun 32 mm -central: Rubber disks 70 mm and zinc Towing Speed: about 3 knots
Mesh	12.8 meters to 16 mm

### **Fly shooter (on sand)**

Weight of seine:	about 1200 kilo
Rope used to fish:	40-50 mm
Length of rope arm:	3000-3500 meter * 2
Spread of gear:	40-45 meters
Total length of ground gear:	60 meters.
Length of central section:	12 meters spread 7 meters.
Materials for ground gear:	- arms: Taifun 14 mm, red and white rope around + zinc (max 60 kilo) -central: Rubber disks 125 mm and 50 mm + zinc (max 20 kilo)
Mesh:	120-140 mm

### **Danish seine (on sand)**

Anchor:	about 150 kilo
Weight of seine:	about 500-600 kilo
Rope used to fish:	22-32 mm
Length of rope arm:	3500-4000 meter *2
Spread of gear:	about 25 meters
Total length of ground gear:	38 meters.
Length of central section:	6 meters spread 4 meters.
Materials for ground gear:	- arms: Taifun 10 mm, red and white rope around + zinc (max 40 kilo) -central: Rubber disks 125 mm and 50 mm + zinc (max 20 kilo)
Mesh:	120-140 mm

<b>Beam trawler 1500 KW (on sand)</b>	<b>Sole</b>	<b>Plaice</b>
Beam width:	12 meter	12 meter
Beam weight:	4.5 ton	4.5 ton
Tickler chains number:	8	10
Tickler chains weight:	1.3 ton	2 ton
Number of net ticklers (small/light):	17	11
Rubber Disk Roller diameter:	24 cm	30 cm
Ground rope:	35 meter	35 meter
Mesh Size front:	240/100 mm	260/150 mm
Mesh Size Cod end:	80 mm	100 mm
Towing Speed:	6.0 – 7.0 knots	6.0 – 6.5 knots

### **Twin Rig**

Weight of doors:	0.8 to 1.8 ton
Weight of Roller clump:	0.8 to 1.8 ton
Weight of trawl:	about 2.5 ton each
Spread of trawl:	about 30 meter * 2
Spread of doors:	200-250 meter
Total length of ground gear:	about 42 meter * 2
Length of central section:	about 10 meter * 2
Materials for ground gear:	-arms: 20-22 mm steel wire 70 mm rubber disks with some 150 mm -central: 18 mm steel wire 150-200 mm rubber disks
Towing Speed:	about 2.8 to 3.2 knots
Mesh:	minimum 120 mm up to 140 mm

*Note: Weights are land based measurements and do not directly translate into pressures upon the seabed.*

## **Annex 2. Mapping exercise by NGOs resulting from the Focus Group workshops**

*April 2012 - North Sea Foundation, Bird Life International, World Wildlife Fund*

This annex explains the status of and justification for the working map (see page 11) for a zoning proposal for the Dogger Bank, which the NGOs presented during the NSRAC SPWG Focus Group meeting on 23th January 2012 . During the process of the NSRAC SPWG Focus Group, a large body of knowledge, insights and stakeholder strategies that potentially form the basis for an effective nature conservation plan for the Dogger Bank was produced. The working map we refer to is a result of this process of cooperation, discussion and negotiation. Next to this explanation, the NGOs will separately send a stakeholder input paper to the Member States to provide them with detailed information generated in the last year regarding ecological values of the Dogger Bank Special Area of Conservation (SAC) and the vision of the NGOs on nature conservation in this SAC.

### **Objectives**

The NGOs have the main objective of creating “a healthy marine ecosystem that is resilient and vital” for both the Dogger Bank and the wider North Sea. Together with the protection of other Natura2000 designated areas, protection of the Dogger Bank is a means to help deliver nature conservation for the North Sea. Although the Dogger Bank represents only about 2.3% of the total North Sea basin, it is a vital, centrally located, submerged sandbank, accommodating habitat and species characteristic of both the southern (with its smaller, mobile species) and the northern (with typically larger, sessile species) North Sea. The biodiversity on and around the Dogger Bank is higher than the surrounding area, due to differences in depth between the Dogger Bank and its surroundings and related water mixing.

According to the NGOs, the conservation objectives go beyond those stated by the Habitats Directive which is not designed to protect the larger marine environment, and therefore falls short of delivering sound nature protection of the Dogger Bank. Nature conservation should not be restricted to protecting habitats, but should also protect the ecosystem goods and services of the region.

However, in this Dogger Bank stakeholder process we confined ourselves to the Natura2000 conservation objectives assigned to the Dogger Bank: to improve the quality of Habitat type H1110 C. In addition, the Dogger Bank Steering Group formulated a Terms of Reference, setting a framework for the NSRAC SPWG Focus group to produce a joint zoning proposal for the Dogger Bank. In the mapping exercises done during the stakeholder meetings in December 2011, and January - February 2012, the NGOs have worked faithfully within these constraints.

### **The indicative zoning map of the NGOs**

Figure 1, on page 12 of this report (reproduced as Fig B, below) is the working map of the NGOs. By producing this map the NGOs worked towards an approach that we considered justifiable and acceptable to all stakeholders. Although we are in favour of a 100% protection of the Dogger Bank - meaning exclusion of bottom-touching gear and partial permission of low impact gear over the whole SAC area - we see the need to collaborate and form consensus with the fisheries sector and Member States to achieve a workable conservation

management plan. Therefore, the NGOs agreed to allow some use of bottom-touching gear in the central areas of the Dogger Bank that are more resilient to trawling impacts.

### Preferred measures for N2000 sites in the North Sea: vision of the NGOs

- Limit overall fisheries in Natura2000 areas:
  - Create areas where only low-impact gear is allowed
  - Exclude bottom trawling in Natura2000 areas
- Guarantee long-term economic use, include socio-economic considerations
- Create areas where no human activities are allowed
- Include cetaceans in Natura2000 management plans

The study by Godfried van Moorsel (2011) shows that the Dogger Bank accommodates 5 main benthic communities, that the slopes have the highest biodiversity, that the central part of the Dogger Bank is less vulnerable to fisheries activities and that some specific locations require extra attention, because of sessile species or type of substrate. The NGOs aim to protect those areas that furthermore are representative of both the northern as well as the southern North Sea, including both common and unique species.



Figure A. Map of Van Moorsel, 2011 (based on Wieking & Kröncke, 2001)  
Red = Quahogs  
Grey = Coarse gravel  
Dotted line = Sandeel  
Purple Circles = Pock marks  
Purple Triangles = Sea pen

The zoning contours of the NGOs are based on the following elements:

- Two zone approach, following the Terms of Reference of the DBSG
- Include all benthic communities in the zoning areas
- Focus on the slopes of the Dogger Bank, with their high biodiversity
- Avoid patchy patterns, better a few large areas instead
- Ensure connectivity and large size of areas; the larger the protected zone, the more effective they are likely to be in meeting the conservation objectives
- Include areas where specific species are located (quahogs, sandeels, etc.)

This has resulted in a zoning working map (Figure B below). In this map we included all introduced building blocks by fisheries (green areas) and Member States (purple), because the NGOs see the added value of creating a map that agrees with the other stakeholders' wishes.

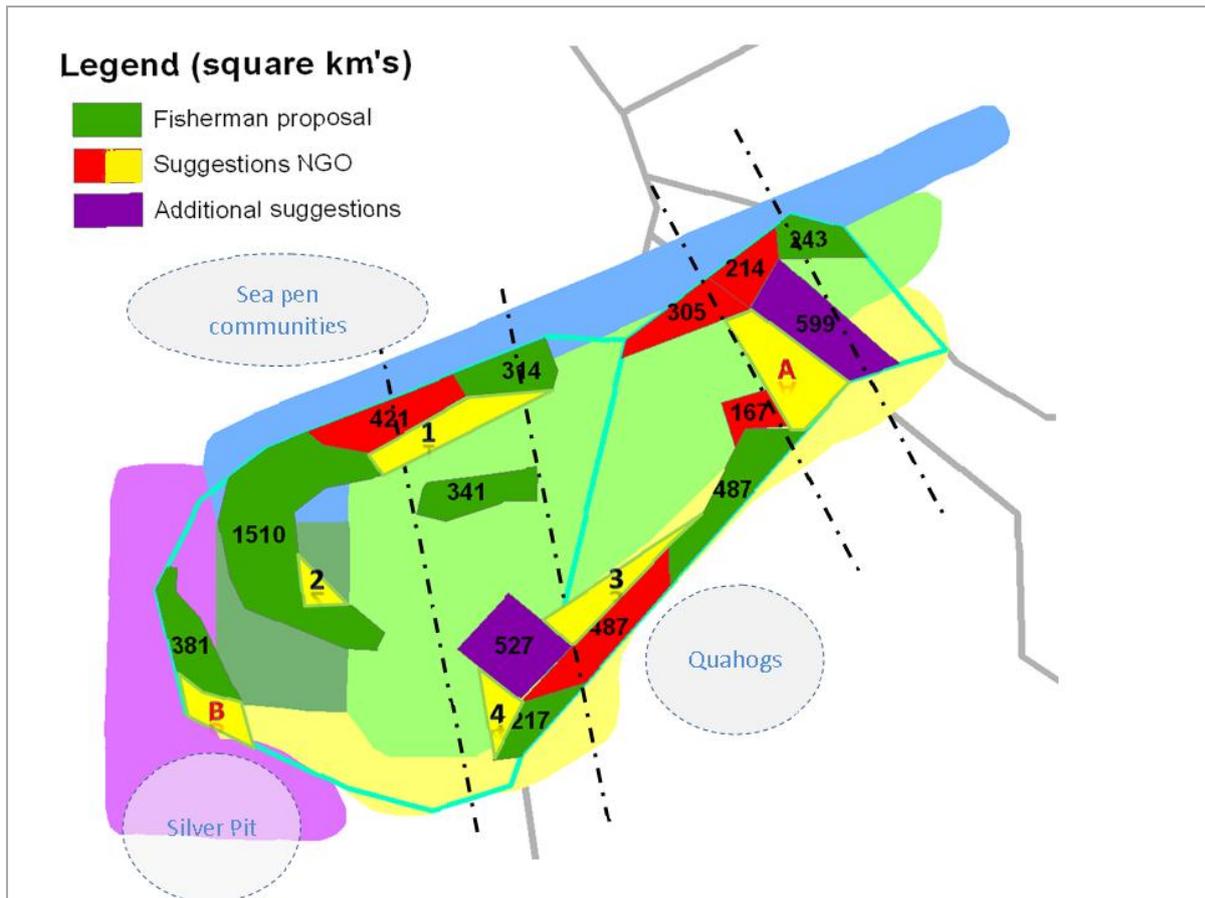


Figure B. NGO proposed additional areas, January 23<sup>rd</sup> 2012

Rationale of NGO proposed additional areas, see Figure B

**How do these areas support the NGOs' vision and conservation objectives?**

- Protect representative areas of a reasonable size, which also have a scientific purpose (599, 217, 487, 527, 341, 421, A, 1, 3)
- Ensure conservation of the blue community which accommodates the specific Northern North Sea species (large species) with a high biodiversity (1510, 421, 314, 1)
- Enlarge the purple community, which surprisingly has many northern species. Expansion to south or north (381, B)
- Prevent fringing shapes for management reasons (2)
- Ensure inclusion of the coarse gravel structures within the contours (1510, 2)
- Conservation of Quahogs (305, 214, 167)
- Include shallow areas in conservation zone (527, 4)

The dotted lines in the NGO zoning working map indicate two potential main areas for research, perpendicular to the Dogger Bank stratification, allowing for accurate monitoring and future adaptive management as appropriate.

However, regarding the working map, there are some issues that explain why this map is not optimal yet, according to the NGOs:

- The map is a composition of areas selected by the fisheries sector, the Member States and the NGOs: we would like to add areas along the slopes, increase the connectivity where possible and enlarge some of the areas
- The NGOs have a preference for a 3-zone approach, allowing for no take zones, excluding all fisheries. The Fisheries Management Zone can be subdivided into a no take zone and a low impact gear zone
- At this stage it has not yet been discussed which gear types would be allowed in the Fisheries Management Zone. ICES proposed to include seines and fly shooters, but as these are bottom contacting gears, it is highly disputable whether they should be allowed in the Fisheries Management Zone.
- The NGOs would like to see scientific input to this map, to confirm the locations of specific species and habitat/substrate
- It was outside the ToR to discuss protection of marine mammals, but some of them are actually protected under the Habitats Directive, so the NGOs stress the need to include them in the Dogger Bank nature conservation plans, or at least to refer to how they should be protected.

## **Conclusion**

The mapping exercise as conducted by all stakeholders in the NSRAC SPWG Focus Group process, was a highly interesting and valuable experience. Although it did not result in a joint zoning proposal for the Dogger Bank, elements of the produced maps can be used to design a zoning proposal by the Member States. Beyond that the NGOs advise a broader scope than the current ToR, in order to produce a sound protection plan for the Dogger Bank. That protection plan should be the basis for reaching the conservation objectives for the Dogger Bank, namely improvement of the quality of habitat type H1110C and species associated with this habitat.

### **Annex 3. Fishing sector proposal**

*April 2012 - Danish Fishermen's Association, VisNed, National Federation of Fishermen's Organisations, Deutscher Fischerei Verband*

#### **Introduction**

This paper forms a position response at the end of the NSRAC Focus Group process derived from a separate more detailed paper to be submitted to Member States.

As part of the NSRAC Spatial Planning Focus group, industry members attempted to apply the Terms of Reference (TOR) set by the DBSG in order to develop this zonation proposal. The proposal was developed through an iterative process undertaken during a series of industry meetings in the Netherlands, Denmark and UK.

As evidence on the spatial distribution of fishing activity shows (e.g. IMARES, 2011), the Dogger Bank is mainly of interest to the Dutch, UK, German and Danish fleet mainly fishing for flatfish (plaice, turbot, lemon sole) and semi-pelagic species (sandeel). The area is less frequently visited by other fleets (e.g. Belgian and French). The main fisheries for flatfish are from March until November and sandeel from April until August. The main elements of the fleet are:

- 30 Dutch and Anglo-Dutch vessels gradually transitioning from beam trawl to twin rig and fly shoot vessels. Fleet fishing pressure has substantially declined since 2000.
- Around 10 Danish Seine vessels (Danish and UK) using the Dogger Bank as their main fishing ground.
- Around 40 Danish sandeel vessels. Fleet fishing effort has also declined substantially since 2000 and is presently managed according to MSY.

Fisheries management zones were identified on the basis of restricting access to bottom towed gears. Other gears, like different types of seining, and static nets are not considered to cause significant pressures that would undermine favourable conservation status, and have therefore not been considered. This is in line with the FIMPAS process and Lassen (2011). Consequently, many of the proposed zones lie in areas that form important seine and netting grounds.

This proposal does not reflect unfished areas, but the areas in which fishermen consider the Natura 2000 objectives for H1110C will be achieved. This process required the detailed examination of trawl routes for these fisheries and fleets, together with the application of fishermen's local ecological knowledge before boundaries were identified. This allows the application of the DBSG TOR together with detailed fine scale knowledge of fishermen operating on the bank to derive a proposal, which for a given percentage target of fisheries management area, seeks to minimise socio-economic impacts and limit the potential detrimental ecological effects of fisheries displacement.

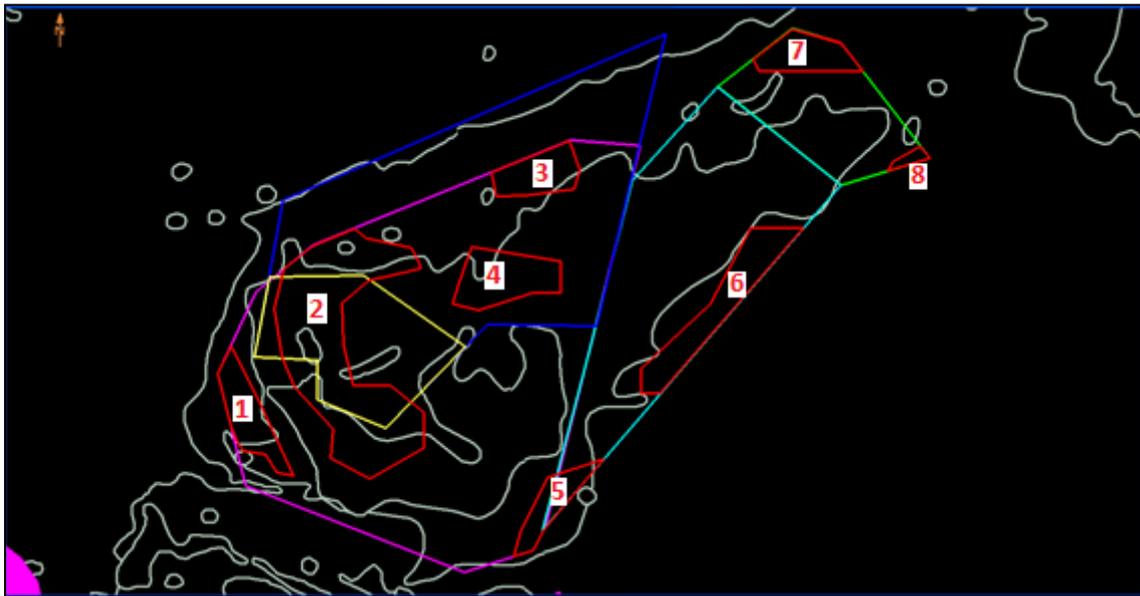
Socio-economic considerations were also taken into account, so the areas identified cover a variety of different fishing grounds. The sandeel fishery has been given particular focus given that it is highly habitat specific and therefore limited in its distribution.

The developing zonation proposal iterations from the industry meetings were fed into the NSRAC Focus Group process so that a total of 3 iterations were completed in order to produce the final output detailed in Figure C. As part of this process the industry also reflected upon additional suggestions from both NGOs and DBSG representatives attending the focus group meeting on 23<sup>rd</sup> January 2012.

## Results

### Proposed zoned closures:

The industry proposes 8 management areas within the notified Dogger Bank SAC:



*Figure C. Representation of industry Zonation Proposals. Boundary key: red = fisheries management zones; pink = SAC UK sector; turquoise = SAC Dutch sector; Green = SAC German Sector; Blue/yellow = Dogger Bank Round 3 planning zone and tranche 1 projects area – refer to more detailed paper for boundary coordinates.*

Rationale for industry proposed areas, see Box below. Note: named benthic communities refer to the 5 Dogger Bank habitats identified in van Moorsel, 2011)

*Rationale of industry proposed areas, see Figure 2*

**Area 1 West UK**

This area adjacent to the western boundary of the Dogger Bank SAC covers a large part of the Western benthic community (about 50%) and also part of the South West benthic community. The boundary of the area is primarily determined by the sandeel fishery, as the broader area contains the most important fishing grounds, in particular between areas 1 and 2..

**Area 2 West 2 UK**

This large area also situated in the western end of the Dogger Bank contains 3 different benthic communities (North-eastern, Bank, and South-west). It also contains a large area where the depth is less than 20 metres, which is the specific habitat mentioned in the Habitats Directive. This zone has high biodiversity due to the variety of sub-habitats it contains. The western boundary is defined around an important sandeel fishing ground. To the east, important beam, twin rig seine fisheries are conducted.

**Area 3 North UK**

This area to the north of UK part of the SAC covers, together with area 2, the North-eastern and the Bank benthic community. Local ecological knowledge suggests this area has relatively high biodiversity value within the north eastern habitat. The area between 2 and 3 is a particularly important beam trawl fishing ground.

**Area 4 Central Bank UK**

This area in the middle of the Dogger Bank covers the Bank benthic community. It has been highly fished in recent years but it covers some of the habitat most subject to wave action on the Bank. The area is fished by beam, twin rig trawlers and seine netters.

**Area 5 South UK/Netherlands**

This area in the southern part of UK and Dutch waters on the Dogger Bank covers the southern community. North of this area are shallower waters that are very important fishing grounds for plaice where beam and twin rig trawling and seine netting are conducted.

**Area 6 South Netherlands**

This area in the southern part of Dutch waters on the Dogger Bank covers the Southern community. Sandeel fishing grounds in Dutch waters lie immediately north west of the area .

**Area 7 North Germany**

This area in the northern part of German waters on the Dogger Bank covers the North-eastern and the Bank benthic community. The German area is one of the most important areas for beam trawl and twin rig fishery. The highest diversity in the area is found in the most northern part.

**Area 8 South Germany**

This area in the southern part of German waters on the Dogger Bank covers the Southern community. Sandeel fishing grounds on the German section of the SAC are to the west and northwest of this area.

Fishing Industry Zone level responses to additional suggestions from NGO / DBSG representatives (Figure 1 on page 12, and Fig C on p. 21)

<b>Name of Fisheries Management Zone (see Figs 1 and C)</b>	<b>Ecological features in the zone, where known</b>	<b>Zone level responses and displacement significance e.g. to other parts of the Dogger, outside of the Dogger (to be read in conjunction with Discussion)</b>
<b>305</b>	Sand, with grit structure	Extremely important fishing grounds for beamers and twin riggers. Closing will have high levels of economic effects and will lead to major displacement of effort. Cannot be supported by the industry, although location specific details on the presence quahog could allow for further examination - These were not available to examine.
<b>167</b>	Sand, with grit structure	Extremely important fishing grounds for beamers and twin riggers. Closing will have high levels of economic impacts and will lead to major displacement of effort. Unacceptable spot.
<b>487</b>	Sand	Important fishing ground for twin riggers, closing will lead to displacement. Parts on the eastern and western sides have been added to adjacent fishery proposed areas.
<b>421</b>	Muddy sand/silt with grit	Extremely important fishing grounds for beamers and twin riggers. Closing will have high levels of economic impacts and will lead to major displacement of effort.
<b>B</b>		Unacceptable for sandeel fishery. Redeployment of effort would risk undermining the sustainable yield from other sandeel grounds.
<b>2</b>	Coarse sand	Extremely important fishing grounds for beamers and twin riggers. Closing will have high levels of economic impacts and will lead to major displacement of effort.
<b>1</b>	Sand and clay	Extremely important fishing grounds for beamers and twin riggers. Closing will have large scale economic effects and will lead to major displacement of effort.
<b>3</b>	Muddy sand	Extremely important fishing grounds for

		beamers and twin riggers. Closing will have large scale economic effects and will lead to major displacement of effort.
<b>4</b>	Sand	Extremely important fishing grounds for beamers and twin riggers. Closing will have large scale economic effects and will lead to major displacement of effort.
<b>A</b>	Sand	Extremely important fishing grounds for beamers and twin riggers. Closing will have high levels of economic impact and will lead to major displacement of effort.
<b>214</b>	Gritty sand	Extremely important fishing grounds for beamers and twin riggers. Closing will have high levels of economic impacts and will lead to major displacement of effort.
<b>599</b>	Sand	Extremely important fishing grounds for beamers and twin riggers. Closing will have high levels of economic impacts and will lead to full displacement of effort. An alternative proposal is identified to the south eastern corner of the German zone (see Fig C: zone 8).
<b>527</b>	Sand	Extremely important fishing grounds for beamers and twin riggers. Closing will have high levels of economic impacts and will lead to major displacement of effort.

## Discussion

The zonation proposal has the following ecological attributes:

- I. The 8 areas combined cover approximately 25 % of the whole designated area.
- II. They cover the 5 characteristic habitats of the bank with a greater coverage of slope communities.
- III. Areas of known biodiversity importance have been included.
- IV. Sites are well distributed across the entire site and well balanced in terms of facilitating connectivity. The distance between zones fall well within connectivity guidelines of 40-80km spacing for the planning of MPAs as part of the English MPA network (Natural England and JNCC, 2010).
- V. Some zones cover a range of sub-habitat types found on the bank, thereby accounting for localised biodiversity.
- VI. Areas are likely to be the most pristine areas given the tendency to avoid the most highly fished areas.
- VII. Recognising that the first gear pass tends to cause greater impact than subsequent passes (Jennings and Kaiser, 1998; Hiddink et al. 2006b; Jennings, 2009), this has the additional advantage, for a given percentage coverage of closures, of reducing fishing pressure per unit area of closure in the most efficient way by maintaining the

- patchiness of effort (Kaiser et al., 2002; Dinmore et al., 2003), and by minimising the risk of potentially damaging effects of fisheries displacement both within the bounds of the SAC and external to the site through:
- VIII. the inducement of search behaviour to find alternative grounds in the short term (cf. Dinmore et al., 2003; Rijnsdorp, et al., 2001)
  - IX. displacement from prime fishing ground to areas that require greater fishing effort to achieve equivalent levels of catch or a dispersal of activity which leads to greater net impact per unit of fishing effort or area (Hiddink et al., 2006a).
  - X. displacement to deeper waters where habitats are more biologically productive and vulnerable to impact (Hiddink et al., 2006a), recognising that the Dogger Bank is prone to this problem due to the relative resilience of the habitat of the bank compared to the broader region/North Sea.
  - XI. This proposal therefore represents an optimisation approach where closures on relatively lower fished areas minimise these risks. It follows, therefore, that higher percentages of closure would expect to generate diminishing returns to conservation from the contribution of extra coverage of area, due to increasing the risk of inducing damaging effects noted above, either within or external to the site.
  - XII. The proposal therefore strikes a balance between meeting the DBSG TOR and implementing measures that will reduce fishing pressures within the SAC, with:
  - XIII. the scientific uncertainty and incomplete knowledge over the potential anthropogenic effects upon ecology, when set within the context of:
  - XIV. high natural variability of ecology especially for habitats exposed above the wave base (Wieking and Kröncke, 2003)
  - XV. rapid recovery rates of less than 100 days for such habitat (Dernie et al., 2003)
  - XVI. indicative evidence that trawling sweep rates per unit area are likely to fall below these stated recover rates (cf. Queirós et al. 2006, Natural England and JNCC, 2011).
  - XVII. the potential risk of ecologically damaging effects of fisheries displacement that becomes more likely with the increasing extent of closures or inclusion of relatively more intensively fished areas.
  - XVIII. The areas identified would enable a science and monitoring programme to be developed to provide evidence to determine whether such closures are appropriate for conservation purposes.

In addition, the proposal has the following attributes:

- I. Efforts to limit fisheries displacement will help to ensure that the fisheries on the Dogger Bank, which are characterised for having low discard rates, can continue to operate so that fleet discard rates do not increase due to shifts to less “clean” fishing grounds.
- II. The distribution of areas include corridors for safe fishing passage, so vessels can transfer between closed areas without the need of taking on board fishing gear during bad weather which would risk the safety of ship and crew.
- III. The boundaries of the zones are readily enforceable against potential transgression. Many existing SAC sites / management areas have more complex boundaries.

## Conclusion

The zonation proposal represents the application of the DBSG ToR with detailed deliberation with skippers fishing on the bank and affected by the implied management measures. The

locations of zones within the proposal therefore reflect an in-depth body of local knowledge that is not available outside of the fishing industry.

This proposal is advanced on a provisional basis given that analysis of evidence justifying management measures remains incomplete and given that plans for a Dogger Bank wind farm complex, if implemented, are likely to add additional areas which effectively become de-facto closures to most fishing operations on the Dogger Bank. It is therefore necessary to further optimise fisheries management zones with wind-farm proposals and conservation considerations, which could not be achieved during the NSRAC Focus Group process. We estimate that an area equivalent to about 10% of the entire SAC will be required in order to deliver 9GW generating capacity and would represent de-facto no fishing zones. We estimate that due to overlap with our zonation proposals these areas would likely add up to 4-5% net additional area. There remains the possibility that total generating capacity from the Dogger Bank Wind Farm Zone may eventually be as high as 13GW which would increase these estimates further.

In addition to this zonation proposal we wish to see management initiatives focus on the following:

- Supporting a transition to reduced impact gears by building on current transition away from beam trawl to twin rig and fly shooter and industry initiatives to trial alternative gears such as the Dutch sumwing / pulse trawl and a Danish proposal to adapt sandeel trawls so that the doors do not contact with the seabed.
- Establishing a regime to enable marine science and monitoring within the management zones which also allow gear innovations to be trialled. This should include a suitable baseline survey before measures are implemented.

## References

- Dernie, K.M., Kaiser, M.J. and Warwick, R.M. (2003) Recovery rates of benthic communities following physical disturbance. *Journal of Animal Ecology*, 72: 1043–1056.
- Dinmore, T.A., Duplisea, D.E., Rackham, B.D., Maxwell, D.L., Jennings, S., (2003) Impact of a large-scale area closure on patterns of fishing disturbance and the consequences for benthic communities. *ICES Journal of Marine Science*. 60, 371–380.
- Hiddink, J.G., Hutton, T., Jennings, S., and Kaiser, M. J. (2006a) Predicting the effects of area closures and fishing effort restrictions on the production, biomass, and species richness of benthic invertebrate communities. *ICES Journal of Marine Science*, 64: 453–463.
- Hiddink, J.G., Jennings, S., Kaiser, M.J., Queirós, A.M., Duplisea, D.E., Piet, G.J., (2006b) Cumulative impacts of seabed trawl disturbance on benthic biomass, production and species richness in different habitats. *Canadian Journal of Fisheries and Aquatic Science*, 63: 721-736.
- Jennings, S., Kaiser, M.J., (1998) The effects of fishing on marine ecosystems. *Advances in Marine Biology*, 34, 201–352.
- Jennings, S. (2009) The role of marine protected areas in environmental management. *ICES Journal of Marine Science*, 66: 16–21.
- Kaiser, M. J., Collie, J. S., Hall, S. J., Jennings, S., and Poiner, I. R. (2002) Modification of marine habitats by trawling activities: prognosis and solutions. *Fish and Fisheries*, 3: 114–136.
- IMARES (2011) Maps of the fishing effort in the Dutch part of the North Sea 2006-2008.
- Lassen, H. (2011) Dogger Bank Fisheries Regime.

- Natural England and JNCC (2010) MCZ Project Ecological Network Guidance.
- Natural England and JNCC (2011) Advice from the Joint Nature Conservation Committee and Natural England with regard to fisheries impacts on Marine Conservation Zone habitat features.
- Queirós, A.M., Hiddink, J.G., Kaiser, M.J., Hinz H. (2006) Effects of chronic bottom trawling disturbance on benthic biomass, production and size spectra in different habitats, *Journal of Experimental Marine Biology and Ecology*. 335, 91–103.
- Rijnsdorp, A. D., Piet, G. J., and Poos, J. J. (2001) Effort allocation of the Dutch beam trawl fleet in response to a temporarily closed area in the North Sea. ICES CM 2001/N: 01.
- Van Moorsel, G.W.N.M. (2011) Species and habitats of the international Dogger Bank. ecosub, Doorn.
- Wieking, G., Kröncke, I. (2003) Macrofauna communities in the Dogger Bank (Central North Sea) in the late 1990s: spatial distribution, species composition and trophic structure. *Helgol. Mar. Res.* 57, 34–46