

North Sea RAC, Aberdeen, October 2010: Background paper on Dogger Bank SAC consultation

The following paper is based on, and is a combination of, the JNCC's consultation and Impact Assessment but is, in the case of the latter, an edited version (the IA alone is 50+ pages, covering all human uses of the area). With cutting and pasting, some of the numbering, footnotes etc are not sequential.

NSRAC ExCom is asked to consider the Questions in the light of the IA which follows, with a view to submitting a formal response by the **12 Nov deadline** (after which submissions will not be accepted by JNCC).

Consultation questions

This section lists specific issues on the site and its associated Impact Assessment on which JNCC requests our feedback. A template for this section (in Microsoft Word format) is available from JNCC's website for us to download and use to format our formal consultation response (www.jncc.gov.uk/marineconsult).

The scientific justification for the site and its boundary

SAC1) Do you support the scientific basis for the Dogger Bank site being put forward in this round of consultation?

Yes/No

SAC2) Please indicate if you have any scientific information, not already referenced in the SAC Selection Assessment document for Dogger Bank site, to support your response to SAC1.

SAC3) Do you have any information additional to that included in the SAC Selection Assessment document about the condition of Annex I habitats within the Dogger Bank site boundary that you would like to share with the JNCC?

SAC4) Do you have any further comments on the scientific selection of the Dogger Bank as SAC?

Socio-economic Impact Assessment

IA1) Do you have any further information on assessing the value of goods and services for European habitats for the Impact Assessment for Option 1: Designate the site?

IA2) Are there any other significant activities at Dogger Bank that the IA has not identified?

IA3) Can you provide any information to inform estimates of what vessels would do in response to closing Dogger Bank or part of it to certain types of fishing methods?

IA4) Can you provide any information to improve the assessment of the costs (and wider impacts) of selecting Dogger Bank?

IA5) Can you provide any information to improve the assessment of benefits of selecting the Dogger Bank?

IA6) In assessing the benefits, we do not take account of the role of the feature (i.e. habitat type) in supporting the wider ecosystem. Can you provide information on the importance of any of the features in supporting the wider ecosystem?

IA7) How much time do you think a business might typically take to familiarise themselves with the implications of offshore SAC designation if implemented? (If you represent a particular sector, please make your answer specific to that sector)

IA8) Are there significant unintended consequences associated with the Options (Baseline: do nothing or Option 1: designate the site) that have not been identified in the IAs?

IA9) Do you agree with the assessments of impacts on small businesses and can you provide any further information?

IA10) Are there any other aspects of the IA on which you would like to comment or where you are able to provide further information?

Conservation objectives of the Dogger Bank pSAC

The conservation objective, based on current evidence, for the management of Dogger Bank is to restore the sandbank to favourable condition. (Dogger Bank SAC: Draft Conservation Objectives and Advice on Operations v5.0 JNCC
http://www.jncc.gov.uk/pdf/DoggerBank_ConservationObjectivesAdviceonOperations_5.0.pdf)

Activities that do not result in pressures to which the feature is sensitive may continue at current levels of spatial and temporal intensity. The management of other activities to which the feature is vulnerable may need to be reviewed by competent authorities responsible. If new information suggests that the condition of the feature at the site is not significantly affected by current activities and assessment indicates the site is in favourable condition, then the conservation objective for the sandbank will be changed to “maintain” the features in favourable condition.

In its current condition a range of non-monetised benefits are obtained from the site. The possible degradation of the site if not designated would potentially decrease each of these values. The baseline levels of activity in relation to the benefits of fisheries and recreation are described below. Other benefits include option and non-use value: benefits from values associated with potential future use, existence and others’ use of the site.

Human activity and regulation

What are the policy objectives and the intended effects of the Dogger Bank designation?

The EC Directive 92/43/EEC on the conservation of natural habitats and wild flora and fauna (the Habitats Directive, 1992) aims to promote biodiversity maintenance. This Directive requires the UK (as a Member State) to propose sites hosting habitat types and species in need of conservation

listed in the Directive, which are eligible for identification as SCIs and designation as Special Areas of Conservation (SAC). The UK is required to establish conservation measures for sites designated as SACs which is achieved by managing potentially damaging activities where the habitats and species are present and in their vicinity. ‘Sandbanks which are slightly covered by seawater all the time’ (Habitat 1110 in Annex I) are habitats of European importance and are the qualifying feature of Dogger Bank SAC.

What policy options have been considered? Please justify preferred option (further details in Evidence Base)

Baseline: Do nothing, that is do not designate the site.

Option 1: Propose the site to the European Commission for designation. This is the preferred option as it will contribute towards conserving habitat of European importance located in UK waters along with its typical species.

The option to search for an alternative site is not been considered further here as there are no known alternative sites. If this site is not designated there is a significant risk that the EC will judge the UK's contribution to the network of SACs for sandbank to be insufficient, which could lead to infraction proceedings. Alternative sites of similar quality and extent are not currently known to exist (known alternatives were considered in the scoping stage but not recommended on scientific grounds). Though the site could be conserved under voluntary agreements or a national designation this would not contribute to fulfilling the requirements of the Habitats Directive.

| | |
|--|-----------------------------|
| When will the policy be reviewed to establish its impact and the extent to which the policy objectives have been achieved? | It will be reviewed 01/2020 |
| Are there arrangements in place that will allow a systematic collection of monitoring information for future policy review? | Yes |

SUMMARY: ANALYSIS AND EVIDENCE POLICY OPTION 1

The assessment considers the minimum and maximum plausible management scenarios to achieve conservation objectives.

The **minimum scenario** requires the smallest change in activities that may be needed compared with the baseline and therefore presents the minimum potential effect on activities.

The **maximum scenario** is at the other end of the scale: it involves the maximum change in activities that may be needed. This is in line with maximum costs. **Table 4.1** (see below) outlines these scenarios for the site. This is an estimate of the measures that may be required for the site to achieve the conservation objective of 'restore' the sandbank feature to favourable condition

Description and scale of key monetised costs by 'main affected groups'

For the minimum scenario: increased monitoring for oil and gas (£48k pa); **loss of revenue for fisheries (£98.5k pa from 2011)**; increased assessment for aggregates (£115k one-off);

increased assessment for renewables (£10m one-off); and enforcement costs (£181k one-off and £38k pa)

Max scenario: increased monitoring for oil and gas (£240k pa for assessment and £52k pa for monitoring); **loss of revenue for fisheries (£656.4k pa from 2011)**; increased assessment in aggregates sector (£574k one-off); renewables (£100m increased assessment and £3.6bn pa from 2019); and enforcement and monitoring costs to authorities (£181k one-off and £1.26m pa).

Other key non-monetised costs by ‘main affected groups’

For the maximum scenario: **some fishermen exit sector, knock-on effect to local economy of costs to fishermen**. Costs if proposals for consent are refused; increased assessment for renewables (unquantifiable but highly significant (>£50bn over ten years)); of assessment and vessel changes in gas sector; long term loss of assets to Crown Estate; increased aggregates screening costs.

Description and scale of key monetised benefits by ‘main affected groups’

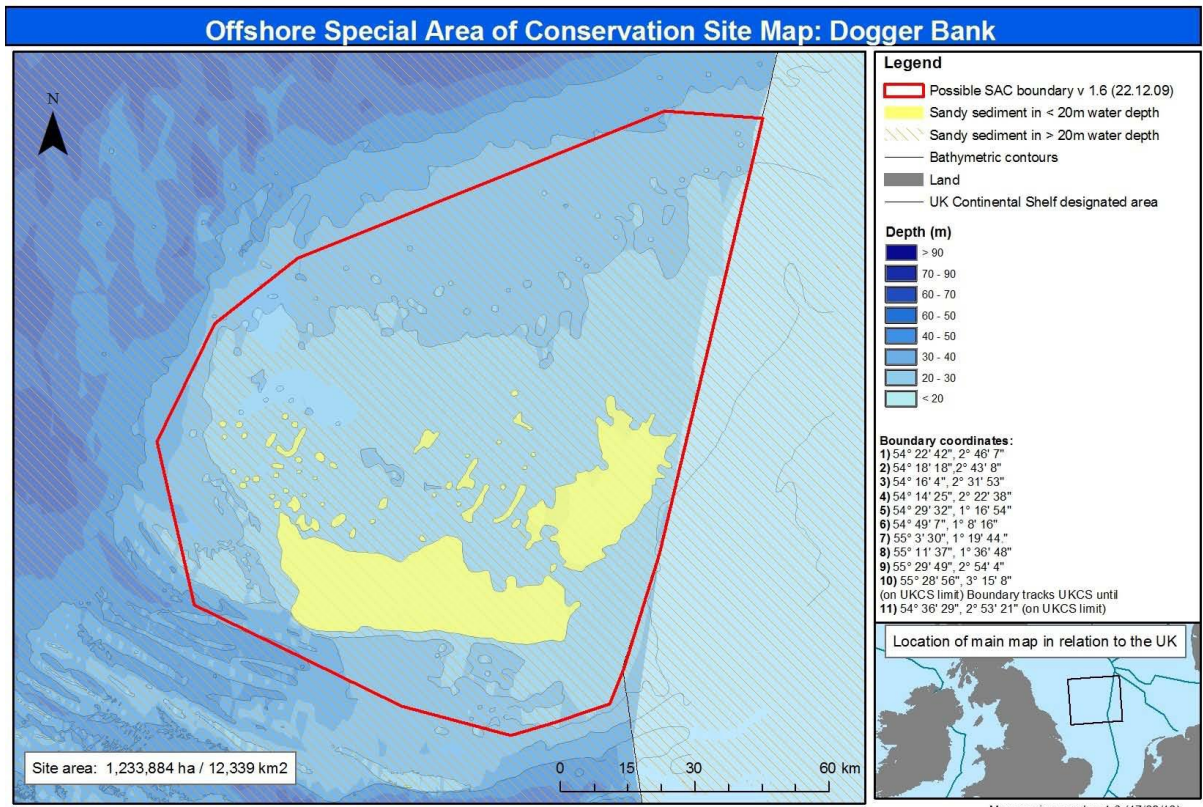
It has not been possible to monetise the benefits because the benefits cannot be readily quantified and most of the benefits are not traded so cannot be easily valued.

Other key non-monetised benefits by ‘main affected groups’

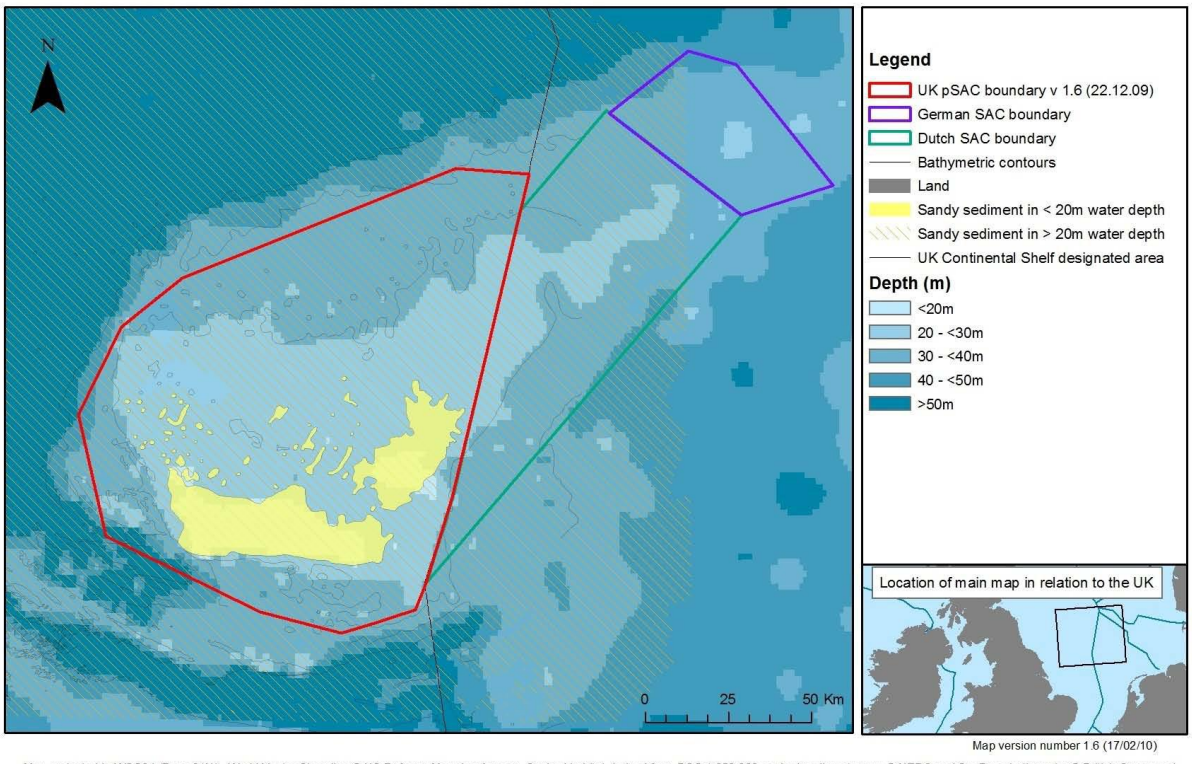
Moderate beneficial impacts on non-use values of natural environment; **benefits to fish; intrinsic value; role of feature in the wider ecosystem; possible increased commercial stocks with designation of site**; and benefits to ecosystem services beyond next 10 yrs.

Key assumptions/sensitivities/risks

Map of Dogger Bank possible SAC (pSAC) showing bathymetry and distribution of sandbanks (next page)



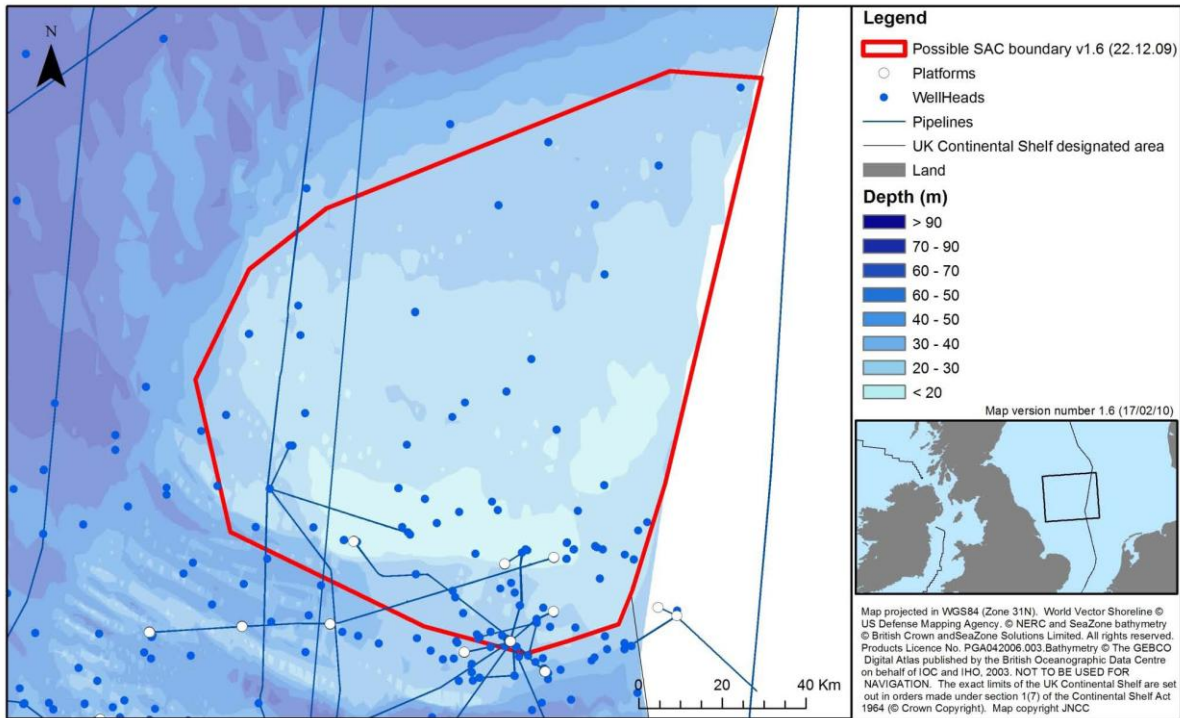
Map projected in WGS84 (Zone 31N). World Vector Shoreline © US Defense Mapping Agency. Seabed habitat derived from BGS 1:250,000 seabed sediment maps © NERC and SeaZone bathymetry © British Crown and SeaZone Solutions Limited. All rights reserved. Products Licence No. PGA042006.003. Bathymetry © The GEBCO Digital Atlas published by the British Oceanographic Data Centre on behalf of IOC and IHO, 2003. NOT TO BE USED FOR NAVIGATION. The exact limits of the UK Continental Shelf are set out in orders made under section 1(7) of the Continental Shelf Act 1964 (© Crown Copyright). Map copyright JNCC



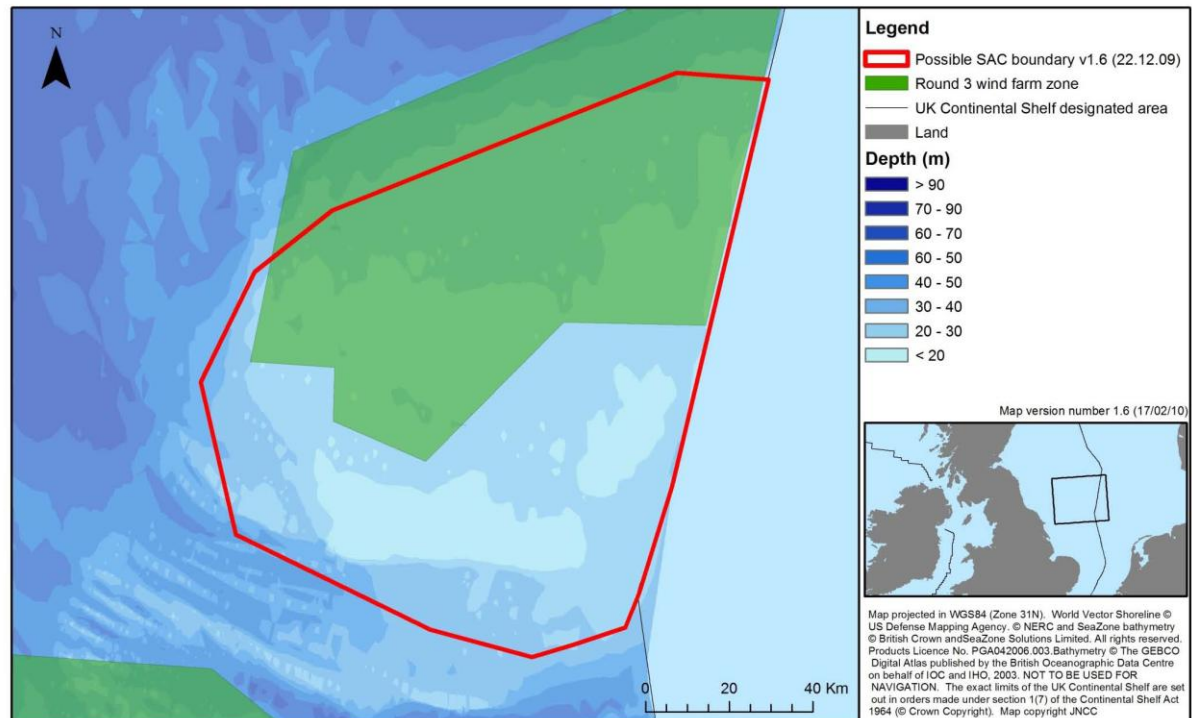
Map projected in WGS84 (Zone 31N). World Vector Shoreline © US Defense Mapping Agency. Seabed habitat derived from BGS 1:250,000 seabed sediment maps © NERC and SeaZone bathymetry © British Crown and SeaZone Solutions Limited. All rights reserved. Products Licence No. PGA042006.003. Bathymetry © The GEBCO Digital Atlas published by the British Oceanographic Data Centre on behalf of IOC and IHO, 2003. NOT TO BE USED FOR NAVIGATION. The exact limits of the UK Continental Shelf are set out in orders made under section 1(7) of the Continental Shelf Act 1964 (© Crown Copyright). Map copyright JNCC

Above: UK Dogger Bank pSAC boundary in relation to neighbouring Member States' (Netherlands, Germany) SAC site boundaries

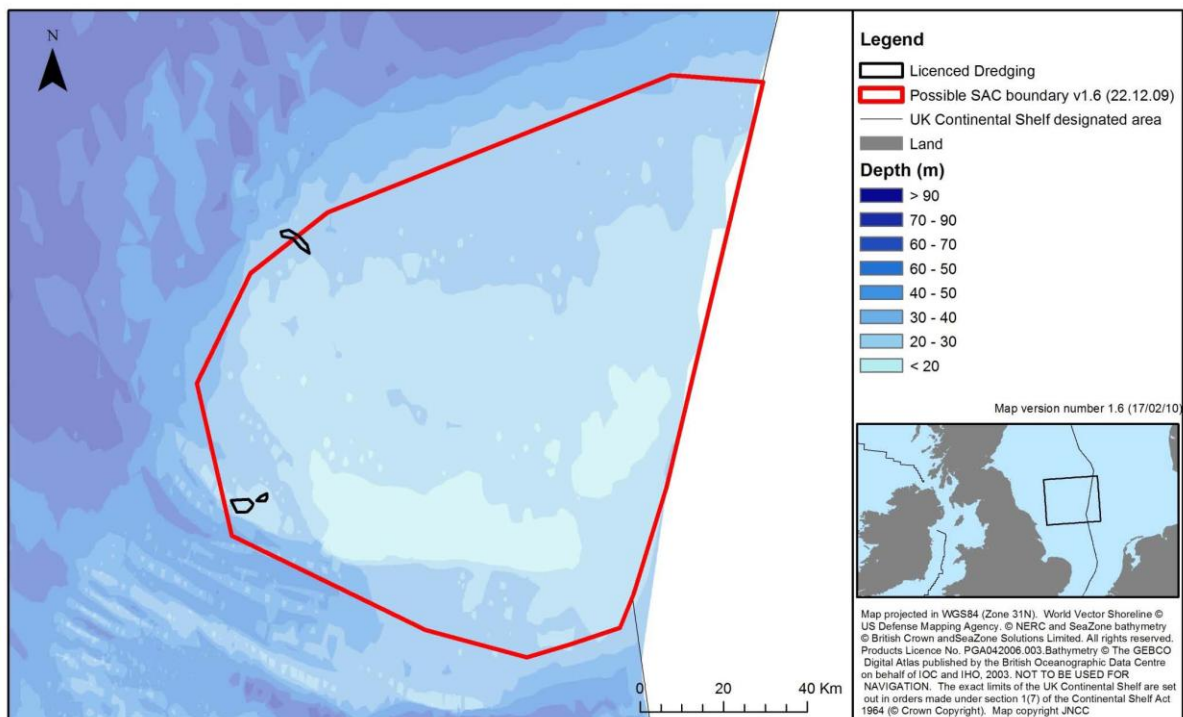
Below: Gas infrastructure around the Dogger Ban pSAC proposal (Seazone 2008)



Above: Round 3 windfarm licensing around the Dogger Bank pSAC (Seazone)



Below: Aggregate extraction within the Dogger Bank pSAC:



Fisheries: Description of known current and future activity relevant to the site

Note that fishing is carried out on a European level, by UK vessels, European and non-European vessels by agreement. Data on location and type of fishing is difficult to obtain comprehensively due to various issues.

It is possible to obtain information on the distribution of fishing effort within the region for UK vessels ($\geq 15\text{m}$) that have vessel monitoring systems (VMS). These provide a vessels position, speed and heading either hourly or every two hours. Such information can be analysed spatially in relation to the site boundary. As vessels fish at characteristic speeds, VMS data can be processed to provide proxy patterns of 'active fishing'. The European Commission has passed a regulation requiring all member states to assure that VMS terminals in use on fishing vessels ($\geq 15\text{m}$) of its national fleet are secure³⁵.

There are no landings data available specifically for the area which is proposed for designation. The Marine Management Organisation's Fisheries Activity Database (hereafter, FAD) compiles various data at the level of ICES rectangle. Catch data encompasses information for UK-registered vessels landing in UK and non-UK ports, and for non-UK registered vessels landing in UK ports. Data includes:

- Year
- Size of vessel
- Type of gear
- Species caught
- Port of landing
- Vessel nationality
- Value of landing
- Tonnage of landing

³⁵ http://ec.europa.eu/fisheries/index_en.htm

Note, the exception is for non-UK vessels that fish within territorial waters, but that land at non-UK ports; it is not possible to obtain weights and values of landings for these vessels. This impact assessment is concerned with the impacts of the UK's potential designation of Dogger Bank on UK businesses. However for fisheries, designations of other areas of the marine environment by other Member States are also relevant as there will also be effects on businesses in other countries. The Dogger Bank habitat feature extends into Dutch and German waters, and therefore the costs or benefits of a closed zone in UK waters are impacted by whether or not these countries also designate their areas of Dogger Bank, and the management options they choose. Germany has already designated the site and Netherlands are in the process of preparing a designation. Work to develop coordinated management measures has already commenced.

Within the LOT 7 EU funded project "Joint data collection between the fishing sector and the scientific community in the North Sea" a collaborative study of VMS data was agreed with the North Sea Regional Advisory Council (NSRAC). Dogger Bank SAC was considered to be a suitable case study and was subsequently the focus of a NSRAC workshop (though this was for the larger 2008 boundary). It was found that, in 2006, there were 30 UK vessels active in the SAC area (21 beam trawlers, 6 otter trawlers and 3 Danish seine netters). In 2007, numbers were similar, with 23 beam trawlers, 8 otter trawlers and 2 Danish seine netters fishing in the area. Fishing effort within the site was greatest between April and September.

Current fishing practices at Dogger Bank were assessed using two years (2006 and 2007) of recent VMS and landings data from 2008 for the ICES rectangles (Table 2.4). **Figure 2.7** shows average fishing effort within the Dogger Bank SAC area for 2006/7 based on VMS data³⁶ within which the draft SAC is sited³⁷. Note that VMS data only cover vessels of over 15m in length, but it is considered unlikely that vessels under 15m in length fish as far offshore as Dogger Bank³⁸.

Table 2.3: Country of registration and destination of catch for vessels fishing in the ICES Rectangles overlapped by Dogger Bank, 2008 (for UK data)

| ICES rect. | UK to UK | | Non-UK to UK | | UK to non-UK | |
|------------|-----------|--|--------------|--|--------------|--|
| | Value (£) | % of catch from rectangle attributable to UK to UK | Value (£) | % of catch from rectangle attributable to non-UK to UK | Value (£) | % of catch from rectangle attributable to UK to non-UK |
| 37F1 | 599,643 | 54.8 | 134,820 | 12.3 | 360,027 | 32.9 |
| 37F2 | 1,077,326 | 58.7 | - | - | 759,449 | 41.3 |
| 38F1 | 170,004 | 36.9 | 126,006 | 27.4 | 164,460 | 35.7 |
| 38F2 | 45,335 | 6.2 | 65,726 | 9.0 | 617,898 | 84.8 |
| 39F1 | 52,371 | 22.1 | 7,630 | 3.2 | 176,890 | 74.7 |
| 39F2 | 13,612 | 2.4 | - | - | 544,348 | 97.6 |
| 39F3 | 2,028 | 0.1 | - | - | 1,949,689 | 99.9 |

³⁶ The International Council for the Exploration of the Sea (ICES) divides seas into rectangles and this system is used to assist monitoring and enforcement of marine activities.

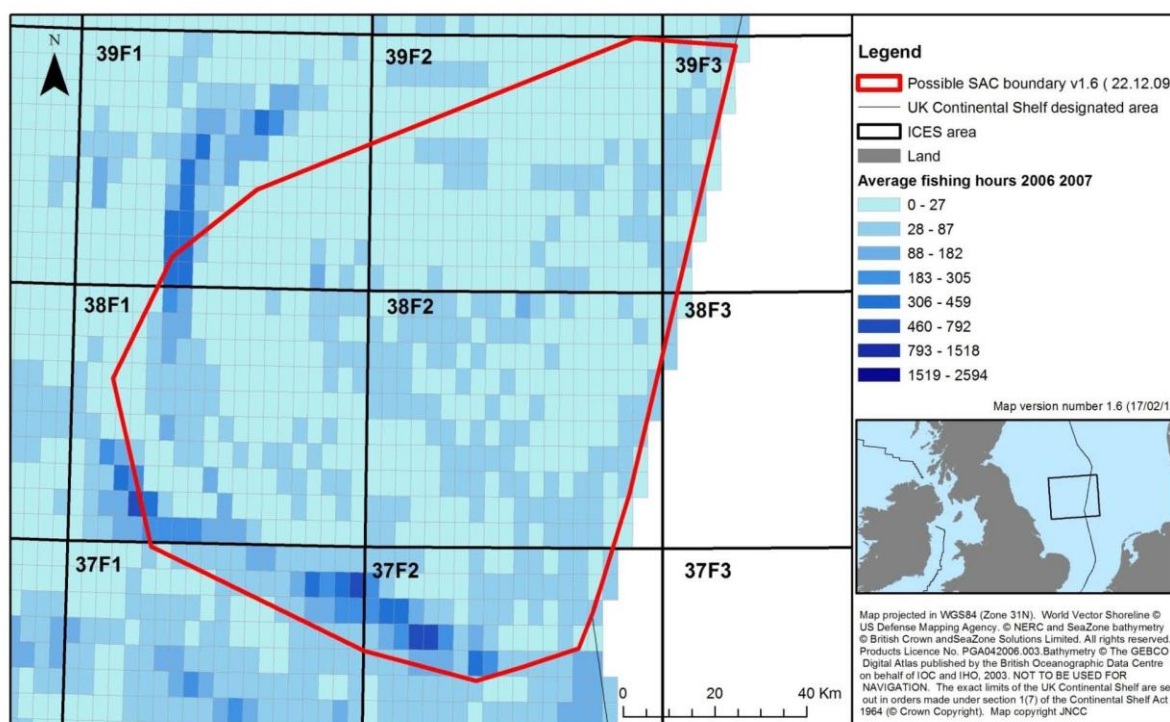
³⁷ MB106 data contract with Cefas - Provision of geo-data on human activities and pressures to support the selection of MCZ sites.

³⁸ Juliette Hatchman, MFA, pers comm., 19/12/09.

³⁹ It is recognised that this figure is derived from a methodology which does not isolate the value of fishing from within the SAC itself. This figure is a proportion of an average value from an activity which is not evenly distributed across the given area assessed. This methodology places significant limitations on the estimated cost of fishing from within the site. Stakeholders are invited to submit in their consultation responses information on gear types used within the site, landings of different species within the site and fluctuations in these over time. This will enable a more accurate description of fisheries within the site in the revised IA that is submitted to government.

The proposed UK SAC overlaps seven ICES rectangles (39F1-3, 38F1-2, 37F1-2) (**Figure 2.7**) to varying degrees. Rectangle 38F3 is not included here as less than 1% is covered by the SAC. In order to estimate the value of landings within the SAC boundary the total landings from within each relevant ICES rectangle were divided by the percentage of the area of that rectangle covered by the SAC boundary (as shown as 'area method' in **Table 2.5**). For 2008, the value of landings from within the site for all vessels was approximately £2.550m³⁹. For UK vessels, the figure is £2.366m or 92.8% of total landings. This is clearly a very rough indication as we do not currently know whether activity within the ICES rectangles is representative of activity within the pSAC.

Fig 2.7: Average fishing activity around Dogger bank Sac in 2006/07 from the CEFAS data contract (MB106). Generated by CEFAS from VMS, logbook and EU register data for 2006 and 2007. All vessels (UK and non-UK) are included and fishing is estimated using a simple speed rule of 1-6 knots to represent fishing activity:



As an alternative, an 'effort method', shown in the right hand columns of **Table 2.5**, utilises effort data generated by Cefas to estimate landings from within the Dogger Bank SAC boundary. The effort method assumes that catch is directly proportionate to effort. The percentage of the effort in a given rectangle that occurs within the proposed site boundary was used to estimate the value of the landings from the area of the site in that rectangle. This gave similar values to the area method used above: £2.774m for all countries and £2.575m

for the UK for 2008.

This value is higher than previous estimates made in earlier iterations of this Dogger Bank IA (in 2009), which only considered ICES rectangles that were covered over 50% by the SAC. Those estimates used average landings data over 2000-2008, and resulted in a much lower estimate of the value of catch to UK vessels (£0.58m). However, this estimate only included landings of UK-registered vessels to UK ports and we are confident that the new methods give a more realistic estimate of costs to the UK economy. Much of the landings from Dogger Bank are made by the Anglo-Dutch fleet and were not considered in previous costs.

As with the other marine Natura 2000 sites proposed for designation during 2010, the value calculated from the area method (£2.366m) is used to calculate values in subsequent sections of this IA. As this figure is from 2008, the value is recalculated to 2010 prices (£2.467m).

Table 2.4: Fisheries landings in 2008 by ICES rectangle in the region of the Dogger Bank pSAC

| ICES rect. | | Landings (tonnes) | Value of landings (£) | % area covered by SAC | Catch from within SAC (area method) (£) | % of rectangle effort in SAC boundary | Catch from within SAC (area method) (£) |
|--------------|----------------|-------------------|-----------------------|-----------------------|---|---------------------------------------|---|
| | | | A | B | C= A x B | D | E= A x D |
| 39F1 | Total landings | 2,450 | 236,891 | 0.25 | 59,223 | 0.15 | 35,534 |
| | UK landings | | 229,261 | | 57,315 | | 34,389 |
| 39F2 | Total landings | 1,135 | 557,960 | 0.82 | 457,527 | 0.77 | 429,629 |
| | UK landings | | 557,960 | | 457,527 | | 429,629 |
| 39F3 | Total landings | 1,310 | 1,951,717 | 0.14 | 273,240 | - | 273,240 |
| | UK landings | | 1,951,717 | | 273,240 | | 273,240 |
| 38F1 | Total landings | 578 | 460,469 | 0.79 | 363,771 | 0.65 | 299,305 |
| | UK landings | | 334,463 | | 264,226 | | 217,401 |
| 38F2 | Total landings | 622 | 728,959 | 0.96 | 699,801 | 0.98 | 714,380 |
| | UK landings | | 663,233 | | 636,704 | | 649,968 |
| 37F1 | Total landings | 556 | 1,094,489 | 0.15 | 164,173 | 0.38 | 415,906 |
| | UK landings | | 959,669 | | 143,950 | | 364,674 |
| 37F2 | Total landings | 1,833 | 1,836,775 | 0.15 | 532,665 | 0.33 | 606,136 |
| | UK landings | | 1,836,775 | | 532,665 | | 606,136 |
| TOTAL | Total landings | | | | 2,550,400 | | 2,774,129 |
| | UK landings | | | | 2,365,627 | | 2,575,438 |

NB: UK landings = landings made by UK-registered vessels to UK ports and non-UK ports

39F3, column D: It was not appropriate to use effort data from within 39F3 as the majority of the rectangle by area is outside of the UK EEZ and JNCC only has effort data for UK waters. In the calculation of landings by effort, the area value (£0.273m) was used for this rectangle.

The majority of fishing (by value) in the area is undertaken by boats registered in the UK and landed in the Netherlands (**Table 2.6**)

Table 2.5: Fisheries landings by country of registration in Dogger Bank pSAC region (2008)

| Country of registration | Country of landing | Landing (tonnes) | % of landings (tonnes) | Value of landings (£) | % of landings by value |
|-------------------------|--------------------|------------------|------------------------|-----------------------|------------------------|
| GBE | NLD | 1752.4 | 20.65 | 2,597,277 | 37.82 |
| GBS | NLD | 1056.0 | 12.45 | 1,659,413 | 24.16 |
| GBE | GBE | 831.8 | 9.80 | 1,585,138 | 23.08 |
| GBS | GBE | 127.5 | 1.50 | 236,152 | 3.44 |
| GBS | DNK | 3031.7 | 35.73 | 190,378 | 2.77 |
| DNK | GBE | 97.3 | .15 | 128,760 | 1.87 |
| NLD | GBE | 42.1 | 0.50 | 114,557 | 1.67 |
| GBN | GBE | 44.2 | 0.52 | 79,323 | 1.16 |
| GBS | NOR | 1223.0 | 14.41 | 73,810 | 1.07 |
| NOR | GBS | 220.7 | 2.60 | 62,972 | 0.92 |
| GBE | DNK | 3.1 | 0.04 | 51,883 | 0.76 |
| GBS | GBS | 27.8 | 0.33 | 46,722 | 0.68 |
| FRA | GBE | 20.4 | 0.24 | 27,893 | 0.41 |
| GBN | GBS | 7.0 | 0.08 | 12,985 | 0.19 |

[Countries: DNK = Denmark, FRA = France, GBE = England, GBN = N Ireland, GBS = Scotland, NLD = Netherlands, NOR = Norway]

More specifically, the vast majority (52.29%) of the catch (by value) is landed in the port of Harlingen (NLD), followed by Grimsby (9.31%), Scarborough (8.90%) and Whitby (4.77%) (Table 2.7). The landings at Harlingen represent a mix of the species including plaice (the greatest catch by value), brill, cod, dab, hake, halibut, lemon sole, megrim, monkfish, sole and turbot. Note that these data are only for UK-registered vessels landing in foreign ports.

Table 2.6: destination of fish caught in the Dogger Bank region in 2008 (landings to ports comprising less than 1% of the total landings are not included)

| Landing port | Where | Landings (t) | % of landings (t) | Value of landings (£) | % of landings by value |
|--------------|-------|--------------|-------------------|-----------------------|------------------------|
| Harlingen | NLD | 2324.82 | 27.40 | 3,591,026 | 52.29 |
| Grimsby | GBE | 412.52 | 4.86 | 639,474 | 9.31 |
| Scarborough | GBE | 320.00 | 3.77 | 611,118 | 8.90 |
| Whitby | GBE | 183.31 | 2.16 | 327,404 | 4.77 |

| | | | | | |
|-----------------------|-----|---------|-------|---------|------|
| North Shields | GBE | 161.55 | 1.90 | 315,386 | 4.59 |
| Den Helder | NLD | 234.56 | 2.76 | 298,863 | 4.35 |
| Scheveningen | NLD | 148.34 | 1.75 | 228,548 | 3.33 |
| Bridlington | GBE | 33.31 | 0.39 | 139,908 | 2.04 |
| Hartlepool | GBE | 49.62 | 0.58 | 133,580 | 1.95 |
| Unspecified Danish | DNK | 1867.63 | 22.01 | 120,124 | 1.75 |
| Peterhead | GBS | 229.71 | 2.71 | 78,930 | 1.15 |
| Unspecified Norwegian | NOR | 1223.00 | 14.41 | 73,810 | 1.07 |
| Skaagen | DNK | 1164.08 | 13.72 | 70,254 | 1.02 |

The majority of the catch by weight is caught by unspecified otter trawls but this is largely low value catch (e.g. sandeels) (**Table 2.9**). Beam trawls land the most catch by value, indicating the vessels target more high-value species (e.g. turbot, sole and plaice).

Table 2.7: Types of fishing gear used in the Dogger Bank pSAC region in 2008

| Gear | Landings (t) | % of landings (t) | £ Value of landings | % of landings by value |
|------------------------------|--------------|-------------------|---------------------|------------------------|
| Beam trawls | 1876.02 | 22.11 | 3,035,934 | 44.21 |
| Otter trawls (not specified) | 989.13 | 11.66 | 1,432,726 | 20.86 |
| Nephrops trawls | 396.47 | 4.67 | 738,543 | 10.75 |
| Otter trawls – bottom | 4479.43 | 52.79 | 645,045 | 9.39 |
| Danish seines | 303.22 | 3.57 | 481,049 | 7.00 |
| Otter twin trawls | 141.25 | 1.66 | 235,563 | 3.43 |
| Pots | 58.04 | 0.68 | 197,671 | 2.88 |
| Otter trawls – midwater | 220.69 | 2.60 | 62,972 | 0.92 |
| Set gillnets (anchored) | 9.22 | 0.11 | 23,848 | 0.35 |
| Pair trawls - bottom | 10.40 | 0.12 | 12,846 | 0.19 |

Of the landings, the vast majority came from towed bottom gear (beam, otter and Nephrops trawls). Of the estimated £2.366 of UK landings from within the pSAC boundary, £2.098m (88.7%) came from towed bottom gear (**Table 2.8**). Note that unspecified otter trawls were also included in these calculations (£2.188m in 2010 costs).

Table 2.8: Demersal landings in 2008 by ICES rectangle in the Dogger Bank pSAC region

| ICES rectangle | Demersal landings (t) from UK vessels using towed gear | Value of demersal landings (£) | % area covered by pSAC | Demersal catch from within pSAC (area) (£) |
|----------------|--|--------------------------------|------------------------|--|
| | | A | B | C = A x B |
| 39F1 | 2436 | 215,374 | 0.25 | 53,844 |
| 39F2 | 1129 | 548,086 | 0.82 | 449,431 |
| 39F3 | 1303 | 1,932,034 | 0.14 | 270,485 |
| 38Fi | 210 | 190,317 | 0.79 | 150,350 |
| 38F2 | 529 | 580,919 | 0.96 | 557,682 |
| 37F1 | 436 | 756,131 | 0.15 | 113,420 |
| 37F2 | 1787 | 1,735,346 | 0.29 | 503,250 |
| TOTAL | 7830 | 5,958,207 | | 2,098,461 |

The most valuable catch in the region is plaice (55.55%, followed by Nephrops, (13.62%), turbot (6.36%) and lemon sole (4.48%) (**Table 2.9**). Sandeels caught primarily with otter trawls represent by far the largest catch by weight (50%) but are a low catch value.

Table 2.9: Dominant target species in the Dogger Bank region in 2008

| Species | Landings (t) | % of landings (t) | Value of landings (£) | % of landings (£) |
|------------|--------------|-------------------|-----------------------|-------------------|
| Plaice | 2823.07 | 33.28 | 3,813,563 | 55.55 |
| Nephrops | 454.33 | 5.36 | 934,773 | 13.62 |
| Turbot | 66.01 | 0.78 | 436,674 | 6.36 |
| Lemon sole | 116.92 | 1.38 | 307,459 | 4.48 |
| Cod | 146.37 | 1.73 | 289,719 | 4.22 |
| Sandeel | 4249.08 | 50.09 | 256,438 | 3.74 |
| Sole | 27.97 | 0.33 | 235,522 | 3.43 |
| Lobster | 15.96 | 0.19 | 154,254 | 2.35 |
| Dab | 144.35 | 1.70 | 99,261 | 1.46 |
| Herring | 220.69 | 2.60 | 62,972 | 0.92 |
| Crab | 50.19 | 0.59 | 52,706 | 0.77 |

Likely future regulation of activity following designation

The UK must seek management measures for an MPA in offshore waters through the proposal of fisheries management measures under the CFP by the European Commission.

The CFP is currently undergoing reform and a revised regulation will come into effect in January 2013. The Green Paper currently (October 2009) sets out some of the areas that the Commission would like to review; at this stage it is however impossible to predict which, if any, of those proposed measures will come into effect.

The UK will consider, in collaboration with the Dutch and German authorities, applying to the EC for controls to close parts or all of the Dogger Bank (across UK, Dutch and German SACs) to some forms of fishing in order to reduce the impacts of fishing on benthic communities and target and non-target fish and shellfish species. Experimental closures may be considered, to inform future management measures based on their relative success.

COSTS AND BENEFITS OF OPTION 1: DESIGNATE THE SITE

4.1 Implications of designation

Once sites have been submitted to the EC, Competent Authorities have obligations to consider the likely significant effect of plans or projects they undertake or consent on the integrity of the site. Consequently, effects of the site on offshore industries operating near the site are not yet known.

In order to be able to assess the range within which the true costs and benefits are likely to fall, scenarios have been developed to identify the minimum and maximum potential management measures that might be required at the site. Development of these was informed by Table 2.1 and the potential environmental impacts of activities if the site was not designated. The minimum scenario requires the smallest change in activities that may be needed compared with the baseline and therefore presents the minimum potential effect on activities.

The maximum scenario is at the other end of the scale: it involves the maximum change in activities that may be needed. This is in line with maximum costs. **Table 4.1** outlines these scenarios for the site. **This is an estimate of the measures that may be required for the site to achieve the conservation objective of 'restore' the sandbank feature to favourable condition.**

Table 4.1

| <i>"Minimum" scenario</i> | <i>"Maximum" scenario</i> |
|--|--|
| <u>Existing activities</u> Experimental closures of ecologically representative areas of sandbanks. Closures may be to all activity and some to a selection (e.g. just towed gear). Closures should be sufficiently large, and kept in place for adequate time, to be able to clearly demonstrate effects of such closures. | <u>Existing activities</u> Ban on all forms of towed, demersal fishing over the whole site. |

| | |
|---|---|
| <p><u>Proposed activities</u></p> <p>Plans or projects which are likely to have a significant effect on the offshore SAC will be subject to Appropriate Assessment (AA).</p> <p>In response to a perception of more rigorous consideration of proposals – and on the advice of authorities and statutory advisers - businesses may make adjustments to projects proposed relative to baseline to ensure no significant effects. Businesses are also likely to invest more in assessment (+10%).</p> <p>It is possible that there may be some wind farm and/or aggregates applications that will not be consented if it cannot be ascertained that there will be no adverse effect on the integrity of the site.</p> | <p><u>Proposed activities</u></p> <p>Offshore industry plans or projects which are likely to have a significant effect on the offshore SAC will be subject to AA.</p> <p>More adjustments to project proposals are made to minimise interference with features e.g. prohibition of rock dumping on features, detours in pipelines to avoid feature, reduction of scour protection or cable armouring where windfarms are on sandbanks. Businesses are also likely to invest more in assessment (+50%).</p> <p>It is possible that some applications will not be consented if it cannot be ascertained that there will be no adverse effect on site integrity. Under a stricter set of management measures, it is likely that more projects would not pass the test of 'no adverse effect'</p> |
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4.2 Costs

f) Fisheries

The impact on fishermen of closing areas to certain types of fishing is complex and difficult to predict. It will depend on what individual fishermen do as a result of restrictions and the cost implications of changes. Current fishing practice at Dogger Bank is assessed here using 2006-7 Vessel Monitoring System (VMS)⁶² and landings data for the ICES rectangles⁶³ within which the possible SAC is sited.

Without further analysis, it is uncertain whether the fishing activity within areas closed to fishing will be partly or wholly displaced to other fishing grounds or whether there will simply be less fishing in global terms. To provide an indication of the maximum direct effect of designation, the impact on the UK economy of foregoing the landings from towed demersal gear from within the entire SAC is considered. As discussed above (see Section 2), the value of annual landings from UK vessels using towed demersal gear - at UK and non-UK ports - within the boundaries of the proposed Dogger Bank SAC has been estimated at approximately £2.188m in 2010 prices.

Using input-output multipliers based on this data allows analysis of the impact on the UK economy. However, it should be noted that multipliers are limited to a static reflection of economic linkages and will change over time and with differences in the economic structure of different areas. The multipliers used to determine these effects were recommended by Sea Fish Industry Authority (SeaFish, 2007) as the best available and account for landings in UK ports by UK- and foreign-registered vessels. Loss of £2.188m of landings could lead to a reduction in:

- UK Employment by 149 FTE jobs; and
- UK GDP by £4.24 million.

Although it does not yet take account of some of the potential indirect effects, these estimates give an indication of the scale of the potential maximum economic impact from changes in fishing activity as a result of designation. The 'further analysis' section below

discusses the data needed to undertake a fuller analysis. The necessary data to understand the employment and profit impacts from landings in foreign ports on the UK economy is complex and has not been scrutinised for this IA. An estimate of the value of other Member States fishing effort on the site was not available in time for completion of this IA, and will be sought during the consultation process.

The economic impacts of the potential closure of Dogger Bank are estimated as the loss of profitability of fishing effort at the site. This is informed by data from the Marine Management Organisation on potential activity within the area and from the 2005 survey (*Economic Survey of the UK fishing fleet*. Seafish Industry Authority, 2006) on the profitability of fishing, which show that the net profit ratio does not exceed around 30% for any segments of the industry with most segments having much lower ratios.

Table 4.5 Summary of “minimum” and “maximum” management scenarios and assumptions made in estimating costs for the fisheries sector of designating the pSAC compared with not designating.

| “Minimum” scenario | Assumptions | Change in costs |
|---|--|------------------------|
| Experimental closure of up to 15% of site to towed demersal fishing ⁶⁵ | Loss of 15% of total net profit (profit estimated at 30% of UK landings (£2.188m)) | £98.5k pa from 2011 |
| “Maximum” scenario | Assumptions | Change in costs |
| Closure of the whole site to towed demersal fishing | Loss of total net profit (at 30% of landings from UK vessels (£2.188m)) | £656.4kpa from 2011 |

⁶⁵ This is an arbitrary figure; the estimate depends on which areas are selected for the experimental closures, and whether alternative fishing grounds within or outside the SAC can be found.

Further analysis

The analysis carried out to inform this consultation IA was intended to provide an indication of economic impacts and their scale resulting from changes in fishing activity within the draft SAC. Further analysis would be needed to understand more precisely how vessels would respond to measures and the impacts of responses. The majority of the necessary data for the desired level of detail were not available to include in the consultation IA. Information that would be desirable to add to this analysis for presentation in the final IA, and therefore requested through consultation, includes:

- Identification of the number and types of UK vessel businesses that fish at Dogger Bank, including home port and fishing days within the SAC;
- How changes in landings at foreign ports might impact the UK economy;
- Views on how fishermen will respond to closure;
- Where activity is displaced, difference in steam time, fuel costs, fishing levels and any other cost/profit information associated with displacement alternatives;
- Costs to not fish if site was designated and there were no suitable alternative sites such that site designation made some vessels unprofitable;

- Potential seasonal effects of designation;
- Any other data that would improve comparison of costs, earnings and profits for vessel businesses under the different scenarios; and
- Other sites for plaice catch, as well as level of catch at those sites and their sensitivity and importance for overall plaice stocks.

Whether fishermen are able to fish at alternative sites will depend on a number of considerations, a key factor being the availability of suitable grounds. There may also be weather and other seasonal constraints to moving to alternative areas.

Where fishermen do find alternative grounds there may be implications on costs and profitability such as increased fuel and labour costs and potentially a higher proportion of time spent steaming rather than fishing and therefore reduced profitability. Alternative grounds may also be less productive and mean that fishing days are less productive and therefore less profitable.

In some cases, particularly where moving to an alternative ground would become unprofitable, individual fishermen may stop fishing. This may not necessarily mean that total income to the sector will reduce, given fixed quotas for many stocks and if other vessels are able to draw on quota foregone, for example through co-operative arrangements. However, in many cases this will not happen. Quotas are often not fully used in any case and some stocks are not subject to quota. Where individual fishermen stop fishing then there may also be implications to the fishermen themselves wider than foregone revenue, such as: the need to dispose of a vessel, potential decline in the market value of vessels and potential decline in the value of quotas.

Given the issues above, it is very difficult to predict how individual fishermen will respond to closures and the cost implications. At this stage the best that can be done for most of the closures is to provide an indication of the profitability of fishing within the area and suggest that the direct effect of a closure would be to reduce the profitability of the area by some margin.

A further important issue is that any closures, even if undertaken unilaterally by the UK, would have to be agreed with other Member States of the European Union through the CFP. It is assumed that this process may take a minimum of a year to carry out and therefore that closures would not be in place until 2011. Although it may take longer than this to actually put measures in place, by using the minimum timeframe it ensures that the costs are not underestimated.

4.3 Benefits of designating the site

Discussion is provided below of the impact of designating the site based on specific ecosystem services. The site feature 'Sandbanks which are slightly covered by seawater all the time' has been graded as II for 'Degree of conservation of structure' which indicates that the feature is not in pristine condition. As outlined, further information will be required to assess and monitor the condition of the interest feature on the pSAC (JNCC 2009).

a) Provisioning services

A habitat to a wide variety of marine species, the Dogger Bank is also important as a spawning ground for a number of species, including plaice. Plaice spawn on these (and other) shallow water sandbanks and the eggs then drift and hatch as larvae that are 'seeded' to shallow water juvenile areas (e.g. major estuaries and the Wadden Sea (ICES-Fishmap Plaice). Later the fish migrate into deeper water where they are exploited generally over

much of the North Sea. Reduction of demersal fishing would protect breeding fish stocks particularly during the spawning season. The UK portion of this site is particularly important as it is the south-western portion of Dogger Bank where large concentrations of plaice (and cod) eggs are located (Munka et al 2002). The region around Dogger Bank supports a number of fisheries targeting cod, haddock, plaice, sole, dab and sand-eel (**Table 2.9**).

The process through which fish recruit to fisheries is complex and, with many other variables to be taken into consideration, it is impossible to predict whether reduction in demersal fish catches on Dogger Bank would result in increased recruitment to stocks as a whole. Thus, while the possibility of increased catches must be considered, it is not possible to predict the scale of any economic benefits that may accrue.

Extraction of fish that are both targeted by fisheries and caught as bycatch may be affected by designation, with the potential for both positive and negative effects. On the one hand, if fisheries are controlled within the site to conserve the sandbanks and their typical species then this could reduce the amount of fish caught from the site. These controls could contribute to sustainable management of some fish stocks at the site and as a result the abundance of fish may increase. On the other hand, controls could cause fishing effort to be displaced to other areas outside of the site, increasing pressure on the stocks in these areas, but not overall.

The control of commercial fishing on the site may extend the longevity of shellfish, and there may be greater numbers of larger individuals that can produce more young. This may contribute to a potentially larger population of fish in the future.

d) Types of value

Option Values

Some people will gain from having the option to benefit in future from conservation of a good example of sandbank habitat, even if they do not currently plan to benefit from it (option value). This arises because if the site is not protected now there may not be good examples of sandbank habitat still available to conserve in future. Also, some will gain from knowing that it is conserved in case future information reveals that the sandbank habitat provides important benefits that we are not currently aware of (quasi-option value).

Non-use Values

Most people who benefit from knowing the site is being conserved are unlikely to use it or get tangible benefits from it. This is known as the existence value of conserving the site. Some people will also gain satisfaction from knowing that the sandbank habitat is being conserved for others in the current generation (altruistic value) and for future generations (bequest value).

There is reliable evidence in the UK and elsewhere that the general population has significant positive non-use values associated with rare species (see for example Christie et al, 2004 for general discussion or White, et al, 2001 for examples of value of conservation of specific mammal species). Additionally, Beaumont et al (2006) estimate the non-use value of biodiversity of the UK marine environment at £0.5-1.1 billion per year across the UK population.

The effects of designation of the Dogger Bank for the provision of each of the ecosystem services described above is summarised in **Table 4.6** below as the difference due to site designation in comparison to the baseline (no designation). There are four additional columns of information in the table to clarify our understanding of the qualitative changes in ecosystem services arising from (non-) designation:

- **Relevance** Relating to the amount of ecosystem good or function arising from site
- **Value weighting** Categorisation of how valuable the amount of ecosystem good or function from the site is in providing benefits to human population
- **Scale of benefits** Consideration of actual potential to deliver benefits (for example considering leakage, delivery to human population, etc)
- **Confidence** Level of confidence in our current knowledge of all other categories (in other words, scale of benefit, level of improvement, etc.)

Based on the above categories, an overall level of each ecosystem service is defined with its own confidence level. Following, an overall level of total benefits is also defined. The parameters are assigned a level for each service from a menu, defined as:

- **Nil** Not present/none.
- **Minimal** Present at a very low level, unlikely to be large enough to make a noticeable impact on ecosystem services.
- **Low** Present/detectable, may have a small noticeable impact on ecosystem services, but unlikely to cause a meaningful change to site’s condition.
- **Moderate** Present/detectable, noticeable incremental change to site’s condition.
- **High** Present/detectable order of magnitude impact on sites condition.

Table 4.6 Potential significance of ecosystem services improvements for Dogger Bank pSAC

| Services | Relevance to site | Option 1 Decline | Option 2 Min improvement | Option 2 Max improvement | Value weighting | Scale of benefits | Confidence |
|---------------------------------------|--|--|--|---|--|---|--|
| <i>Fish for human consumption</i> | High. Spawning and nursery ground for commercially significant fish species | Mod. Interruption of lifecycle processes could mean significant decline | Low. Improvement on site likely to support species of human interest. | Mod. Improvement on site likely to support species of human interest, especially plaice stocks in North Sea. | Mod. Sandbanks are of high value for N Sea fish, but relative importance of Dogger Bank is hard to judge. | Low - Mod Increase in stocks likely to be offset by declines elsewhere, but conservation of this spawning ground could improve plaice stocks throughout N Sea. | Moderate. Possible that taking same catch level outside site is not neutral on stocks overall |
| <i>Fish for non-human consumption</i> | including North Sea plaice. Important for shellfish. | Low. Probably not demersal spp, but could experience indirect decline. | Limited by fewer management measures and risk enforcement does not succeed. | | | | |

e) Benefits to economic activity

Designation of sites may assist the different sectors that make use of the marine environment in the context of marine spatial planning and a more strategic consideration of available resources. This would mean that sectors can undertake future plans and applications for their operations (for example applications for licenses) with the better knowledge of a) the nature conservation significance of different parts of the marine environment, and b) the added costs of these applications within or adjacent to a site boundary, as opposed to outside it. This may result in a focus of activity away from a site. This will be dependent upon appropriate marine resources being available within the region but outside of any site(s).

4.4 Summary of costs and benefits

Table 4.7 below summarises the potential costs and benefits of the site analysed in this section. The costs are analysed over a period of 10 years from designation in 2010, and are discounted at 3.5%. There are uncertainties in the assessment of costs, and some costs have not been quantified.

Table 4.7 Summary costs and benefits table for Option 1: Designate the site

| Minimum management scenario | | Maximum management scenario | |
|--|--|--|--|
| Costs | Benefits | Costs | Benefits |
| Fisheries: direct costs of £98.5k pa. after 2011 | Low: possible impacts on archaeological, scientific and non-use values. | Fisheries: direct costs of £656.4k pa after 2011 | Moderate: beneficial impacts on values of archaeological, scientific and non-use natural environment. |

a) Risk of unintended consequences

The main risks of unintended consequences are assessed to be the following:

Designation might prevent further investment from oil and gas industry into area and prevent maximum returns on existing investment.

- Strategic impact on the UK's energy security and response to climate change, both in relation to development of renewables capacity and carbon and capture and storage.

- In the long term, the designation could prevent the implementation of gas storage, or Carbon Capture and Storage, at the site. However, both these technologies would be cheaper, and therefore more likely, to be implemented at available sites closer to the shore.

- Fishermen may seek compensation for moving grounds.
- Displacement of fishing effort to alternative grounds may intensify fishing at those grounds to unsustainable levels, causing net damage to fish stocks overall.

- Increased requirements for assessment may potentially slow down development of offshore wind farms and hinder the delivery of UK targets on climate change.

- The proposed designation may significantly affect several important sources of income to the UK economy, the Treasury and The Crown Estate. It is assumed that revenues to the Treasury are displaced to alternative sources (e.g. of energy) with very low marginal impact. If the Crown Estate do not receive royalties from the specific natural assets, it would normally be expected that companies would seek alternative exploitation areas or that market demand would be met by other sources. This would be considered a transfer in the economy rather than a cost, and this is presumed to be the case over the next 10 years. If, however, total resources are constrained in the longer term then it may mean less income to the Crown Estate and UK plc. Should this happen it is assumed to be beyond the 10 year timescale of the assessment. For these reasons any risk of not being able to realise assets is not quantified in this assessment.

Each of these risks is greater under the maximum scenario, and when considered cumulatively with other SAC designations and marine planning restrictions (e.g. MoD activity, shipping, fishing). Some of these risks can be mitigated by involving stakeholders in the process of designation through public consultation, and by early and thorough consideration of the cumulative effects of designations on the scale appropriate to the industry concerned. The cumulative effects of marine Natura 2000 sites proposed for designation during 2010 are considered in a separate paper⁷⁴.

Under the Offshore Habitats Regulations (which transpose the Habitats Directive), and following an AA, a Competent Authority can agree to a plan or project for imperative reasons of overriding public interest (IROPI), notwithstanding its adverse effect on site integrity, if there are no alternative solutions. It would be for the Competent Authority to decide whether to agree to a plan or project on IROPI grounds using guidance from the EU. The more strategically important the risks above are, the greater the likelihood of plans or projects being consented on IROPI grounds. Assessing such grounds would entail additional costs.

5. CONCLUSIONS

The purpose of this impact assessment is to provide information about the impacts of the designation of Dogger Bank SAC and is carried out in order to inform stakeholders and government about the options for the site. This is done by considering the impacts of Option 1 (designating the site) relative to the baseline (to not designate the site). The requirement for the UK to designate sufficient sandbank habitat to comply with the Habitats Directive makes pursuit of the baseline unlikely.

⁷⁴ This paper was annexed to the recent consultation by Natural England, CCW and JNCC (<http://www.naturalengland.org.uk/ourwork/marine/sacconsultation/default.aspx>) and will be updated once the impact assessments for the tranche of sites have been updated.

As the potential management measures for the site will only be known in detail after the site has been designated, it is necessary to make assumptions about what measures might be required for this site. This assessment analysed a range of impacts, relative to the baseline, defined through minimum and maximum management scenarios. Not designating the site would risk infraction proceedings, and potentially total fines in the region of £9.4m - £17.1m.

The minimum scenario involves the smallest change in activities that may be needed compared with the baseline and therefore presents the minimum potential effect on activities. The maximum scenario is at the other end of the scale: it entails the largest change in activities that may be needed compared with the baseline and thereby presents the maximum potential effect on activities.

As Table 4.3 above shows [NB: *not shown in edit of JNCC report for NSRAC*], under Option 1 (for the 10 years of impact assessment framework):

- For the minimum management scenario costs are relatively low (one-off costs of £10.30m and average annual costs of £0.175m) for such a large site, but expected benefits are also low; and
- There are potentially significant costs under the maximum management scenario (one-off costs of £100.76m and average annual costs of up to £362.14m), but this scenario also brings moderate expected benefits in relation to: conservation of fish spawning grounds; non-use values of the environment, such as in relation to charismatic marine mammals (e.g. cetaceans); scientific research and knowledge; and archaeological interests

In addition, a range of costs and benefits are possible through wider network and strategic effects. In terms of network benefits, designation of the proposed site will prevent degradation of areas of the marine environment and enable restoration where damage has occurred over the next ten years and beyond, which could potentially be of benefit to the wider ecosystem and enable increases in fish stocks. It has not been possible to assess these benefits. It should be noted that establishment of a network of protected sites is a key purpose of the policy (the Habitats Directive) stimulating the possible designation. This makes it important to consider the benefits of this site in the context of the value of the network of sites.