Department of Energy & Climate Change

RECORD OF THE HABITATS REGULATIONS ASSESSMENT UNDERTAKEN UNDER REGULATION 61 OF THE CONSERVATION OF HABITATS AND SPECIES REGULATIONS 2010 (AS AMENDED) AND REGULATION 25 OF THE OFFSHORE HABITATS REGULATIONS FOR AN APPLICATION UNDER THE PLANNING ACT 2008 (AS AMENDED)

This report includes a transboundary assessment of impacts

***Project Title*: Dogger Bank Teesside A and B Offshore Wind Farm**

Date: **4th August 2015**

CONTENTS

Introduction

Background

1.0 This is a record of the Habitats Regulation Assessment ("HRA") that the Secretary of State ("SoS") for Energy and Climate Change has undertaken under the Conservation of Habitats and Species Regulations 2010 (as amended) (the Habitats Regulations) and the Offshore Marine Conservation (Natural Habitats & c.) Regulations 2007 (as amended) (the Offshore Habitats Regulations) in respect of the Development Consent Order ("DCO") and Deemed Marine Licence ("DML") for the proposed Dogger Bank Teesside A and B Offshore Wind Farm and its associated infrastructure (the 'Project'). For the purposes of these Regulations the SoS is the competent authority.

1.1 The report also contains analysis and assessment of the potential impacts of the Project upon designated sites in other European Union Member States ("transboundary sites"). This is included under the transboundary assessment section of the report.

1.2 Forewind Limited ("the Applicant") has applied to the SoS for a DCO under Section 37 of the Planning Act 2008 (as amended) for the construction and operation of two offshore wind farms each with an installed capacity of up to 1.2GW, and their associated offshore and onshore infrastructure. The wind turbine array would cover an area of approximately 1153km^2; the proposed Project is within the North Sea approximately 165km from the Holderness coast at its nearest point. The proposed Project comprises the construction and operation of up to 400 three bladed, horizontal axis wind turbines and a network of subsea inter-array cables, together with associated development offshore (offshore converter and collector platforms, meteorological stations, accommodation or helicopter platforms and connection works of export cable systems) and onshore associated development (onshore export cable systems; converter station compound; and associated temporary work). The Project application is described in more detail in Section 2.

1.3 In England and Wales, offshore energy generating stations with a capacity greater than 100 MW constitute nationally significant infrastructure projects ("NSIPs") and applications for consent are subject to the requirements of the Planning Act 2008 (as amended). This Project constitutes an NSIP as it has a generation capacity of up to 2.4 GW (each wind farm is up to 1.2 GW).

1.4 The Project was accepted by the Planning Inspectorate ("PINS") on 23rd April 2014 and a three-member Panel of Inspectors ("the Panel") was appointed as the Examining Authority ("ExA") for the application. The examination of the Project application began on 5th August 2014 and completed on 5th February 2015. The Panel submitted its report of the examination, including its recommendation ("the Panel's Report"), to the SoS on 5th May 2015.

1.5 The SoS conclusions on habitats and wild birds issues contained in this HRA report have been informed by the Panel's Report, and further information and analysis, including a Report on the Implications for European Sites ("RIES") and written responses to it.

Habitats Regulation Assessment (HRA)

1.6 Council Directive 92/43/EC on the conservation of natural habitats and of wild fauna and flora ("the Habitats Directive") and Council Directive 2009/147/EC on the conservation of wild birds ("the Birds Directive") aim to ensure the long-term survival of certain species and habitats by protecting them from adverse effects of plans and projects.

1.7 The Habitats Directive provides for the designation of sites for the protection of habitats and species of European importance. These sites are called Special Areas of Conservation ("SACs"). The Birds Directive provides for the classification of sites for the protection of rare and vulnerable birds and for regularly occurring migratory species. These sites are called Special Protection Areas ("SPAs"). SACs and SPAs are collectively termed European sites and form part of a network of protected sites across Europe. This network is called Natura 2000. A Site of Community Importance ("SCI") is a site in the process of receiving approval; it has received approval by the European Commission ("EC") and will be a SCI until the site has been formally designated as a SAC by UK Government.

1.8 The Convention on Wetlands of International Importance 1972 ("the Ramsar Convention") provides for the listing of wetlands of international importance. These sites are called Ramsar sites. UK Government policy is to afford Ramsar sites in the United Kingdom the same protection as European sites.

1.9 In the UK, the Habitats Regulations transpose the Habitats and Birds Directives into national law as far as the 12 nm limit of territorial waters. Beyond territorial waters, the Offshore Habitats Regulations serve the same function for the UK's offshore marine area. The Project covers areas within and outside the 12 nm limit and on shore so both sets of Regulations apply.

1.10 Regulation 61 of the Habitats Regulations provides that:

> *…..before deciding to give consent, permission or other authorisation for, a plan or project which is likely to have a significant effect on a European site (either alone or in combination) and which is not directly connected with or necessary to the management of the site, the competent authority must make an appropriate assessment of the implications for the site in view of the site's conservation objectives.*

1.11 Regulation 25 of the Offshore Habitats Regulations contains similar provisions:

> *…..before deciding to give consent, permission or other authorisation for, a plan or project which is to be carried out on any part of the waters or on or in any part of the seabed or subsoil comprising an offshore marine area or on or in relation to an offshore marine installation and which is likely to have a significant effect on a*

European marine site (either alone or in combination) and which is not directly connected with or necessary to the management of the site, the competent authority must make an appropriate assessment of the implications for the site in view of the site's conservation objectives.

1.12 This Project is not directly connected with, or necessary to, the management of a European site or a European marine site. The Habitats Regulations require that, where the project is likely to have a significant effect ("LSE") on any such site, an appropriate assessment ("AA") is carried out to determine whether or not the project will have an adverse effect on the integrity of the site ("AEoI") in view of its Conservation Objectives. In this document, the assessments as to whether there are LSEs, and, where required, the AAs, are collectively referred to as the HRA.

1.13 The HRA takes account of mitigation measures which are secured by requirements and conditions.

1.14 This report should be read in conjunction with the following documents that provide extensive background information, a fuller list of documents is provided in the References section of this report:

- The Planning Act 2008 (as amended) Dogger Bank Teesside A and B Offshore Wind Farm Examining Authority's Report of Findings and Conclusions and Recommendations to the SoS for Energy and Climate Change. 5 May 2015 "**the Panel's report**".
- Report on the Implications for European Sites Proposed Dogger Bank Teesside A and B Offshore Wind Farm. An examining authority report prepared with the support of the environmental services team, 19 December 2014 – termed **"the RIES"**.
- Forewind's Environmental Statement, 25 April 2014 – termed **"the ES"**.
- Forewind's HRA Screening Report, 24 April 2014.
- Forewind's Information for Appropriate Assessment Report, 24 April 2014 – termed **"IfAA".**
- Forewind's Updated HRA integrity matrices, 12 December 2014.
- Natural England Relevant Representation, 12th June 2014.
- Natural England Written Representation, 3rd September 2014.
- Natural England's final site integrity position statement for the Dogger Bank SCI, 11th December 2014.
- Natural England's full advice on the Applicant's apportioning updates and subsequent Final HRA Ornithology In-combination Tables, 11th December 2014.
- Comments on Appendix 5 to the SoCG between Forewind and Royal Society for the Protection of Birds ("RSPB"), September 2014.
- Answers to First Written Questions (11 August 2014) for the RSPB.
- Forewind correspondence with Scottish Natural Heritage and Marine Scotland Science. October 2014.

- Plus other documents submitted during the Examination, available at http://infrastructure.planningportal.gov.uk/projects/yorkshire-and-the-humber/dogger-bank-teesside-ab/?ipcsection=docs

1.15 The key information in these documents and written representations is summarised and referenced in this report.

The RIES and Statutory Consultation

1.16 Under the Habitats Regulations the competent authority must, for the purposes of an AA, consult the appropriate nature conservation body and have regard to any representation made by that body within such reasonable time as the authority specifies.

1.17 Natural England ("NE") is the Statutory Nature Conservation Body ("SNCB") for England and for English waters within the 12 nm limit. The Joint Nature Conservation Committee ("JNCC") is the SNCB beyond 12 nm however this duty has been discharged to NE following the 2013 Triennial Review of both organisations (Defra, 2013). However, JNCC retains responsibility as the statutory advisor for European Protected sites that are located outside the territorial sea and UK internal waters (i.e. more than 12 nautical miles offshore), in this instance the Dogger Bank Site of Community Importance (SCI) and as such continues to provide advice to NE on the significance of any potential impacts on interest features of the site.

1.18 The ExA prepared a RIES, with support from the Planning Inspectorate Environmental Services Team, based on working matrices prepared by the Applicant. The RIES documented the information received during the examination and presented the ExA's understanding of the main facts regarding the HRA to be carried out by the SoS.

1.19 The RIES was published on PINS planning portal website[1] and circulated to interested parties on 19 December 2014 and comments were sought by 19 January 2015 for the purposes of statutory consultation. The RIES, and the written responses to it, have been taken into account in this assessment.

1.20 The SoS is content to accept the ExA's recommendation that the RIES, and written responses to it, represents an adequate body of information to enable the SoS to fulfil her duties in respect of European sites.

Development Description

2.0 The Dogger Bank zone is located in the North Sea off the coast of Yorkshire. The Project will be roughly 165km offshore and export cables for both windfarms would run to a coastal landing point between Redcar and Marske-by-the-Sea in the Borough of Redcar and Cleveland. From the landfall, underground High Voltage Direct Current ("HVDC") cables would follow an

[1] http://infrastructure.planningportal.gov.uk/wp-content/ipc/uploads/projects/EN010051/2.%20Post-Submission/EIA/Habitat%20Regulations/Report%20on%20the%20Implications%20for%20European%20Sites%20(RIES).pdf

underground onshore transmission alignment to a converter station compound, proposed to be situated within the Wilton Complex industrial site. From here High Voltage Alternating Current ("HVAC") cables would connect to the existing National Grid Electricity Transmission ("NGET") substation at Lackenby.

2.1 Dogger Bank has received approval as a SCI by the EC and will be a SCI until the site has been formally designated as a SAC by UK Government. This does not affect the treatment of the site in this HRA, as domestic policy is to treat such sites as if they are designated. The entirety of the proposed arrays and approximately 25% of the proposed offshore cable corridors are located within the Dogger Bank SCI and candidate SAC ("cSAC").

2.2 Following close of the Examination the SoS has been made aware of a list of sites that may be recommended as draft (d)SACs, one such site is located in the southern North Sea and encompasses part of Dogger Bank. These sites have been recommended as there is evidence that they may support qualifying populations of **Harbour porpoise** (*Phocoena phocoena*). The site is still at the early stages of consideration for possible future designation with approvals and formal consultation to follow. However, the SoS would not wish to take a decision on the Project, without first satisfying herself that it would not damage the possibility of a future cSAC.

2.3 No other part of the area within the Order limits would adjoin, or be within, any other European site. However, the proposal may have indirect effects on European sites some distance away from the area proposed for this project; this includes sites outside the UK which are covered in the transboundary section of this report.

Development Components

2.4 The offshore array is proposed to cover approximately 1,153 km^2, with a maximum installed capacity of up to 2.4GW and up to 400 wind turbines. The Project's offshore work is divided in half for the purposes of the DCO into Project A and Project B. The offshore components of the Project include:

- Up to 400 wind turbines generators (200 in Project A and 200 in Project B);
- Associated foundations and scour protection measures;
- Offshore inter-array and inter-platform cabling;
- Offshore collector and converter stations;
- Offshore operations and maintenance infrastructure, such as accommodation and/or helicopter platforms;
- Offshore meteorological stations;
- Export cabling, carrying power to the onshore grid infrastructure;

2.5 Full details of the infrastructure to be used in the Development are detailed in Schedule 1, Part 1 of the DCO.

Rochdale Envelope

2.6 The Applicant has adopted a 'Rochdale Envelope' approach within their ES. The Rochdale Envelope is a term used in planning to reflect that often a developer will not know all of the details associated with the proposal at the time of application. The Rochdale Envelope allows the Applicant to set out the broad range of options under consideration and then carry out an ES based on the realistic worst case scenario for each of those options. These options are used within the ES to assess the significance of the Project's environmental effects. This allows the Applicant to apply for a DCO that allows some flexibility in the final design of the Project whilst providing certainty that no greater environmental effects than those described in the ES can occur, providing the final project design lies within the options assessed.

2.7 In this case, the Applicant has left flexibility in the design of the wind farm components (such as foundation type, wind turbine type and rated capacity); and the construction process (such as transportation methods and component installation techniques). The Applicant has sought to retain flexibility in the final project design to enable them the ability to place contracts and build the project in the most appropriate manner and the DCO has been framed to allow for multiple design options in accordance with the Rochdale Envelope concept. The ES sets out these multiple options for a number of project components including indicative specifications e.g. maximum number of turbines is 400; maximum height 315m etc.

2.8 The ES is therefore based on the assessment of the realistic worst case scenario in environmental terms. The Project is however, bound by the DCO application boundary, which sets out areas within which the infrastructure can be located, together with various technical restrictions.

Development stages

Construction

2.9 The precise construction programme and sequence of works was not known by the Applicant during the examination. The IfAA estimates the onshore construction period to be up to 36 months for each of the two projects, Teesside A and B. Within the DCO, the following construction options have been maintained for Teesside A and Teesside B in order to provide sufficient flexibility in the programme (from the IfAA):

- The two projects may be constructed at the same time, or at different times;
- If built at different times, either project could be built first;
- Offshore construction will commence no sooner that 18 months post consent, but must start within seven years of consent (which is the timeframe captured within the draft DCO). Therefore if the construction period reaches the maximum six years, the projects will overlap by 6 months; and
- Taking the above into account, the maximum construction period over which the construction for the two projects could take place is 11 years and six months.

Operation and Maintenance

2.10 Once operational, the Project will require regular inspections, service and maintenance throughout its lifetime. This will require a dedicated team of technicians and associated support staff. There are a number of approaches to the operation and maintenance of the wind farm and the final solution will be determined following consideration of factors, such as health and safety issues, transit duration, port location and facilities, weather downtime, turbine selection and the cost-benefit analysis of each option. Given the distance of the Project from shore, it is assumed that, in addition to an onshore base at a suitable port, one or more offshore operations hubs will also be required. The offshore hub could be either a fixed platform at the site (standalone, or associated with one of the substation platforms), or medium to large vessels which are able to travel between port and the project areas. Transport to the offshore areas could be by various means, including some combination of small, medium or large vessels, jack-up vessels and helicopters.

2.11 The proposed transport to the Project will determine if there needs to be a number of pre-installed moorings at intervals around the Project areas to allow vessels to moor while work is ongoing.

Offshore Decommissioning

2.12 Decommissioning for the offshore elements of the project is regulated under the Energy Act 2004. Broadly speaking, under that Act, the SoS has powers to require a person who is responsible for an offshore renewable energy installation to prepare a costed decommissioning programme setting out how the project will be removed and ensure that the programme is carried out. The SoS can approve, modify or reject a decommissioning programme at any point. It is not possible at this stage to predict with any certainty what the European and Ramsar site context of the Project will be in the future as sites may increase or decrease in importance over that time. Decommissioning activities will need to comply with all relevant UK legislation at the time. Separate authorisations will also be required as part of decommissioning, after the preparation of an ES and HRA by the authorising body (including appropriate consultation with the relevant statutory nature conservation bodies). The decommissioning programme is included as Requirement 15 within the DCO for this project. The DCO also allows the SoS to require the restoration of the offshore works in the case of abandonment, decay or removal.

2.13 If the environmental baseline were to be similar to the current situation, then the impacts of decommissioning of the Project could be expected to be similar to the anticipated impacts of construction, without the impacts of piling. There is no reason to suppose that the impacts of decommissioning will cause an adverse effect on site integrity and on this basis, the SoS considers that it is reasonable not to include a detailed discussion on decommissioning impacts in this report. She is satisfied that decommissioning effects will be addressed fully by the relevant authorities, prior to decommissioning and in light of more detailed information on decommissioning processes and environmental conditions at that time.

Development location and designated sites

Location

3.0 The Dogger Bank Zone is located in the North Sea off the east coast of Yorkshire, as can be seen in *Figure 1*. It is the largest of the UK's Round 3 offshore wind zones, with its outer limit broadly coincident with the UK continental shelf limit, as defined by the UK Hydrographic Office.

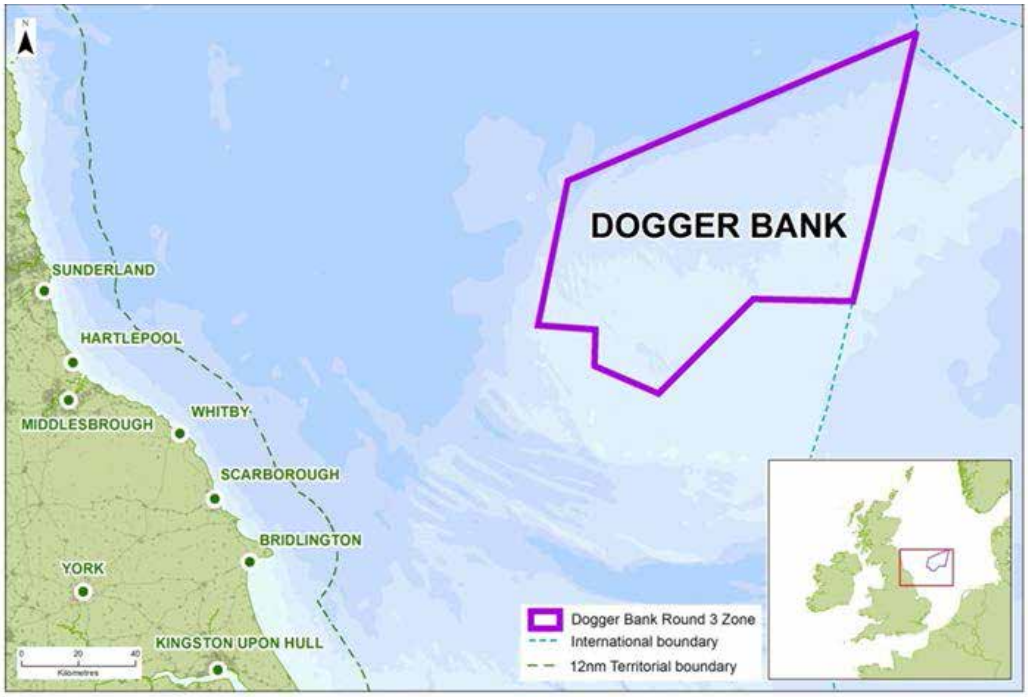

Figure 1 Map of Dogger Bank Offshore wind farm site and cable corridor (from the Applicant's ES)

3.1 The Applicant has proposed a Project made up of two offshore wind farm arrays within the Dogger Bank zone, each with a capacity of up to 1.2GW (a total potential of up to 2.4GW) and their associated infrastructure. A map of the array and offshore export cable is given at *Figure 2* below.

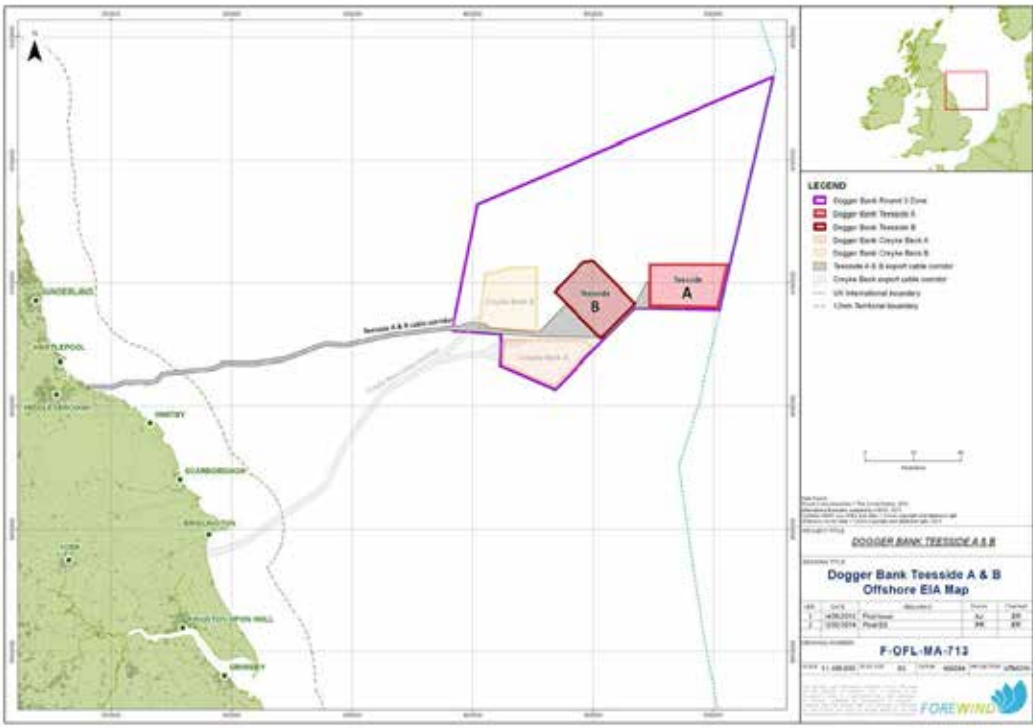

Figure 2 Dogger Bank Teesside A and B Offshore Map

European and International Sites

3.2 The Applicant identified 198 European sites to be considered for assessment within their HRA report. The full list of sites is within Annex A of the RIES. As set out in the Panel Report [ER 5.1.6] the relevant SNCB's did not raise concerns or disputes in relation to the sites that were screened into the Applicant's HRA, nor did they identify any additional sites that the Applicant failed to consider within their assessment. However during the examination Natural England referred to concerns raised by North York Moors National Park Authority in relation to golden plover recorded at the landfall of the cable which may include birds that form part of the North York Moors SPA. Following further information from the Applicant NE confirmed that there was sufficient information to confirm no LSE on the birds associated with North York Moors SPA [REP- 448]. North York Moors National Park Authority also accepted this [REP-250].

3.3 The Panel report notes that Whale and Dolphin Conservation ("WDC") and the Wildlife Trusts queried the consideration of features in relation to the Dogger Bank SCI as harbour porpoise could be a qualifying feature of the UK portion of Dogger Bank in the future. The ExA considered that as the Dogger Bank SCI does not include harbour porpoise as a qualifying feature it does not need to be assessed as part of the HRA process for the Dogger Bank SCI. The Panel report notes that this was agreed with NE [ER 5.1.9]. The Wildlife Trust reiterated their concerns in a letter to the SoS in June 2015. Due to the identification of potential new sites for harbour porpoise the SoS has considered harbour porpoise within this HRA; this is discussed in more detail in section 4.33.

3.4 The SoS notes that the reason for so many sites being identified was due to the highly mobile species potentially affected by the Project rather than the project being very damaging. The SoS agrees with the pragmatic approach to focus on the key concerns, given the large number of sites and features. For reference, all UK European sites identified by the Applicant and considered during examination are listed in Annex A.

3.5 There is significant overlap between SPA and Ramsar designations, so for the purposes of this assessment; the Ramsar designations are considered in parallel with the SPA designation as all relevant species are covered by both designations.

3.6 The Applicant's HRA assessment also identified the potential for the Project to affect an extensive number of European sites located in other countries, known as "transboundary sites". There were:

- 27 sites in Germany,
- 33 in the Netherlands,
- 6 in Belgium,
- 33 in Denmark,
- 28 in Sweden,
- 22 in France, and
- 3 in Norway.

The potential impacts upon these sites are considered within the transboundary section of this report (section 15.0). The main features of concern were marine mammals and sandbanks which are slightly covered by sea water all the time.

3.7 The RIES does not present individual matrices for each UK European site identified in the Applicant's HRA report. This is due to the large number of UK European sites within scope and the fact that the Applicant's conclusion of no LSE in relation to certain sites and no adverse effect on integrity for the majority of sites was not disputed. Instead the RIES focusses only on those sites where the Applicant's conclusion of no adverse effect on integrity was disputed during the examination. As such the six UK European sites listed below and in *Table 1* are the focus of this report:

- Dogger Bank cSAC and SCI. To align with the ExA report, Dogger Bank SCI and cSAC will be referred to throughout the report as "Dogger Bank SCI".
- Farne Islands SPA
- Flamborough Head and Bempton Cliffs SPA
- Flamborough and Filey Coast pSPA
- Forth Islands SPA
- Fowlsheugh SPA

3.8 A number of bodies submitted responses to the RIES and on HRA relevant topics subsequent to the RIES. These were the Applicant, RSPB, NE and The Wildlife Trusts ("TWT").

Likely Significant Effects Test

4.0 Under Regulation 61 of the Habitats Regulations, the SoS must consider whether a development will have a LSE on a European site, either alone or in combination with other plans or projects. A LSE is, in this context, any effect that may be reasonably predicted as a consequence of a plan or project that may affect the conservation objectives of the features for which the site was designated, but excluding trivial or inconsequential effects. An AA is required if a plan or project is likely to have a significant effect on a European site, either alone or in combination with other plans or projects.

4.1 The purpose of this test is to identify LSEs on European sites that may result from the Project and to record the SoS's conclusions on the need for an AA and her reasons for screening activities, sites or plans and projects for further consideration in the AA. For those features where a LSE is identified, these must be subject to an AA. This review of potential implications can be described as a 'two-tier process' with the LSE test as the first tier and the review of effects on integrity (AA) as the second tier.

4.2 This section addresses this first step of the HRA, for which the SoS has considered the potential impacts of the Project both alone and in combination with other plans and projects on each of the interest features of the European sites identified in the RIES (also in Annex A) to determine whether or not there will be a LSE. Where there are predicted LSEs and the Applicant's conclusion of no adverse effect was disputed these sites and the disputed features are described briefly in *Table 1*. All other sites from the RIES where there are predicted LSEs but the Applicant's conclusions of no LSE was not disputed are listed within Annex A of this report. Further details are set out in the Applicant's IfAA and HRA Screening Report.

Likely Significant Effects

4.3 The IfAA report out the potential impacts of each stage of the Project and describes if these could impact on a European site's features. The RIES compiles, documents and signposts information submitted throughout the examination by both the Applicant and Interested Parties. The RIES sets out the UK European sites identified by the Applicant and considered during the examination (also in Annex A).

4.4 Decommissioning impacts are not considered further within this report for the reasons discussed within section 2. Section 6 is the only excepted case where decommissioning of the offshore elements of the Project is referred to in relation to proposed mitigation and restoration of habitat.

4.5 The Applicant's HRA report identified a total of 198 European sites (and their features) located within the UK or within UK waters for inclusion within their screening assessment. These are listed in column 1 of the table in Annex A of this report. The relevant SNCBs did not raise concerns or disputes in relation to the sites that were screened into the Applicant's HRA, nor did they identify any additional sites that the applicant failed to consider within their screening

assessment (although note the text in section 3.2 above in relation to the North York Moors SPA).

4.6 The Applicant concluded that there would be no LSE on 41 European sites and their qualifying features. The RIES reports that Interested Parties did not dispute the Applicant's conclusion of no LSE on these European Sites and their qualifying features and the ExA concluded that there would be no LSE on these sites. The SoS relies on these findings in her conclusion of no LSE for these 41 sites and their features.

4.7 The Applicant identified the potential for LSE on 157 UK European sites. The sites were taken forward by the Applicant to an assessment of AEoI. The ExA report notes that Interested Parties did not dispute the Applicant's screening conclusion of potential for LSE for any of these 157 sites and their qualifying features.

4.8 The full list of the SPAs and Ramsar Sites, together with the designated populations for which a potential LSE has been determined is provided in Section 3 of the IfAA. These sites can be seen on Figure 3 below.

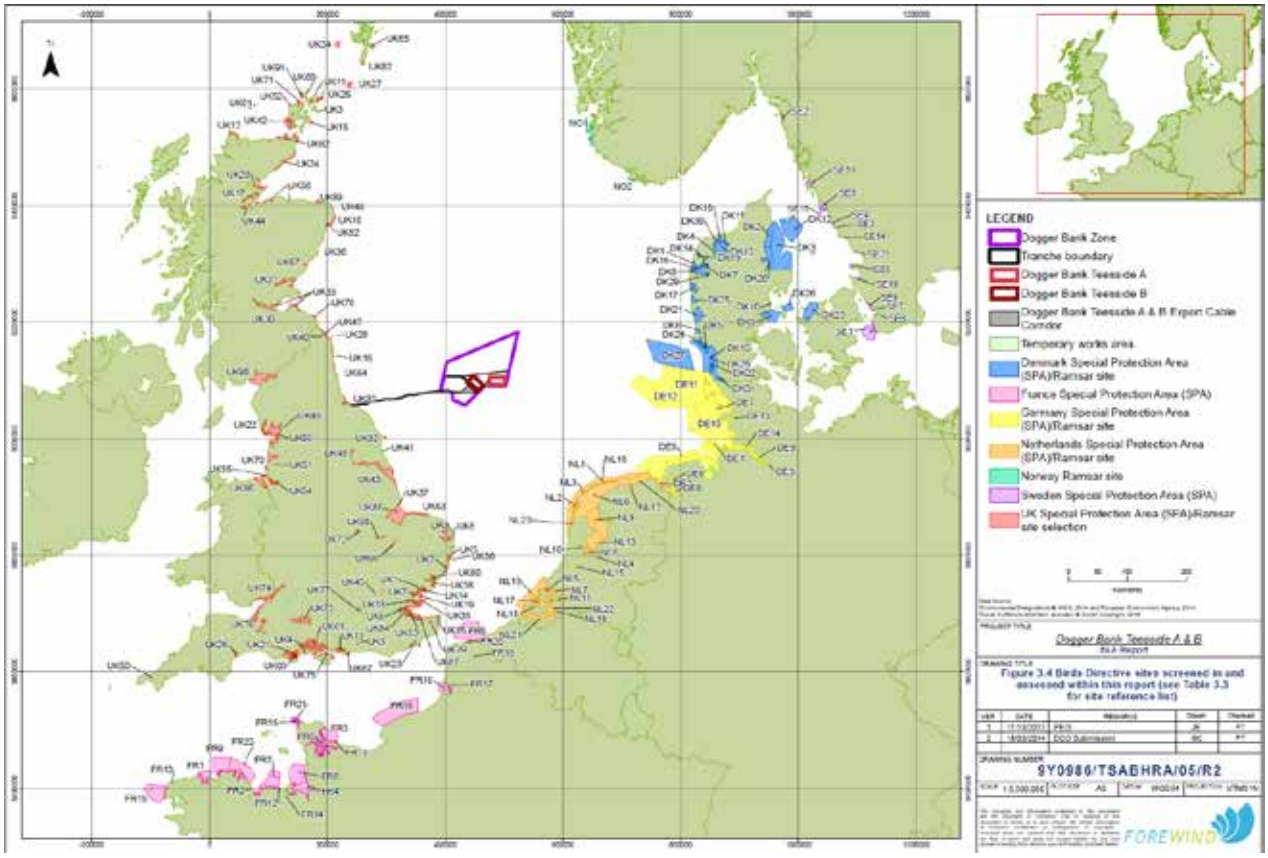

Figure 3 the Birds Directive sites assessed in the HRA

4.9 Following their assessment the Applicant concluded that the project would not have an AEoI on any of the 157 European sites. Interested parties agreed with the conclusions for 151 of these sites as set out in NE's written representations [REP-132] and Statement of Common Ground ("SoCG") [REP-079], RSPB's SoCG [REP-085] and SNH's response to the Panel's first written

questions and requests for information issued on 11 August 2014. Six sites were disputed by NE, RSPB and SNH. These sites are as follows:

- Dogger Bank cSAC and SCI.
- Farne Islands SPA
- Flamborough Head and Bempton Cliffs SPA
- Flamborough and Filey Coast pSPA
- Forth Islands SPA
- Fowlsheugh SPA

4.10 As noted above due to the large number of potential sites affected the SoS has focussed this assessment on the sites and features of those sites where there were disputes about the potential for sites to be affected by the Project. The SoS is satisfied with the decision to exclude an LSE or AEoI from the sites listed within columns 1-4 of the table in Annex A and has adopted these conclusions for the purposes of the HRA. The main body of this report assesses in detail only those sites where there were disputes during the examination about LSE or AEoI.

4.11 The ExA noted that with the exception of Dogger Bank SCI (which is comprised of one qualifying feature), not all qualifying features of the 6 sites were disputed. The sites and disputed features are provided in *Table 1*. Based on the information provided the SoS considers in this report the following features: sandbanks which are slightly covered by sea water all the time, Northern gannet, Black legged kittiwake, Common guillemot, razorbill and puffin.

4.12 The information within the RIES presents the potential interactions of each stage of the Project (construction and operation) with the disputed qualifying features of the 6 sites. The SoS agrees with the ExA that, LSE's cannot be excluded from the 6 sites when the Project is considered alone and in combination with other plans and projects (other plans and projects considered are set out in *Table 2*). The six sites and features shown in *Table 1* have been taken forward to the AA.

Table 1 Sites in the RIES where an LSE could not be ruled out and the Applicant's conclusion of no adverse effect was disputed.

Site	Feature	Effect	Project Alone	Project In combination
Dogger Bank cSAC and SCI	Sandbanks which are slightly covered by sea water all the time.	Physical Effects	Y	Y
Farne Island SPA	Common guillemot (breeding) Atlantic puffin (breeding) Black-legged kittiwake Razorbill	Disturbance/ Displacement Habitat loss/ alteration (prey resource and barrier effect) Collision	Y	Y
Flamborough Head and Bempton Cliffs SPA	Common guillemot Atlantic puffin Black-legged kittiwake (breeding) Razorbill Northern gannet	Disturbance/ Displacement Habitat loss/ alteration (barrier effect & prey resources) Collision	Y	Y

Site	Feature	Effect	Project Alone	Project In combination
Flamborough and Filey Coast pSPA	Common guillemot Black-legged kittiwake (breeding) Razorbill Northern gannet Atlantic puffin	Disturbance/ Displacement Habitat loss/ alteration (barrier effect & prey resources) Collision	Y	Y
Forth Island SPA	Atlantic puffin (breeding) Northern gannet (breeding) Black-legged kittiwake Common guillemot Razorbill	Disturbance/ Displacement Habitat loss/alteration (barrier effect & prey resources) Collision	Y	Y
Fowlsheugh SPA	Black-legged kittiwake (breeding)	Disturbance/ Displacement Habitat loss/alteration (barrier effect & prey resources) Collision	Y	Y

4.13 As noted above the Applicant concluded that the project would not adversely affect the integrity of 157 European sites. NE and SNH, the SNCBs, along with RSPB, agreed with the conclusions for 151 of these sites [ER 5.6.6] and for all the qualifying features of those sites. Only the 6 sites where the Applicant's conclusions were disputed are discussed in detail within this report. **The other sites have been considered by the SoS and she is in agreement with the SNCB's and the ExA's conclusion of no LSE or AEoI for these sites and they are not considered further in this report**.

Habitat loss impact on birds

4.14 Survey data and previous studies referred to in the IfAA show that the Dogger Bank Zone may, at times, support nationally and internationally important numbers of seabirds. The Dogger Bank Zone is also on the flyway of a large number of migratory birds moving to and from breeding and wintering grounds. As such, wind farm development within the Dogger Bank Zone may have implications for a large number of designated SPAs and Ramsar sites around the North Sea and potentially further afield.

4.15 The RIES identified habitat loss as a potential LSE at the five SPA sites listed in Table 1. However, as identified by the IfAA there would be no direct loss of supporting habitat from within any designated SPA screened into the assessment.

4.16 Evidence used by the Applicant also indicates that benthic habitat loss in the offshore marine environment as a result of the installation of wind turbines and other structures would not affect the overall prey resource available to foraging seabirds. No LSE on designated seabird populations from this effect is therefore predicted. **The SoS agrees with NE and the Applicant that habitat loss from the Project will not have a LSE on any SPA.**

4.17 Seabird prey resources (specifically fish) within the development area could be temporarily affected by increased underwater noise levels during construction. However, this effect would be localised to the immediate area of piling works and temporary displacement of the prey resource is predicted rather than loss or decrease in availability. During operation of the wind farm, the turbine structures could act as attractants for some fish species and an overall increase in prey availability within the wind farm could occur. However, the impact of such an increase, were it to occur, on seabird populations is extremely difficult to determine and therefore no potential assessed benefit is attached to this effect. Overall, the Applicant concluded that direct habitat loss and alteration would have no significant impact on designated seabird populations. **The SoS agrees with NE and the Applicant that displacement of sea bird prey from the Project during construction will be temporary and localised and will not have a LSE on any SPA.**

Displacement impact on seabirds

4.18 Displacement of seabirds refers to an impact whereby mortality is caused through an effective loss of foraging resource. If birds are displaced from a wind farm site and the surrounding area through prolonged disturbance, they can suffer from increased mortality as they will need to compete with other birds for scarcer resources. Sensitivity to these effects varies between seabird species and is reflected in a number of sensitivity classifications (e.g. Maclean (2009), Furness and Wade (2012)), these are discussed in the IfAA. It is the predicted magnitude of the displacement induced mortality which will determine whether the project will result in an LSE upon the species. NE agreed with the Applicant that LSE could not be ruled out for kittiwake, gannet, puffin, razorbill and guillemot. **The SoS agrees with NE`s consideration of this matter and only considers LSE as a result of displacement for these particular species.**

Collision Risk impact on seabirds

4.19 The IfAA notes that collision risk modelling indicates for a number of species that only very small numbers of birds would be involved. The number of northern fulmar, Arctic skua, great skua, common guillemot and Atlantic puffin colliding with turbines is predicted to be less than one bird per year. Razorbill similarly has a predicted low risk, with 2 collisions per year predicted. It is considered that the predicted very low number of annual collisions for these species would be highly unlikely to have a discernible effect at the population level, either with regard to individual designated site-based populations or wider North Sea populations. The species are Northern fulmar, Arctic skua, Great skua, Common guillemot, razorbill and Atlantic puffin. This conclusion was not disputed during the examination and it was agreed that there were no LSEs for those species due to collision for any sites where these species are a feature. **The SoS agrees with the conclusion of no LSE as a result of collision for any sites where these species are a qualifying feature given the very low number of collisions compared to population levels.**

Marine Mammals

4.20 The IfAA identifies and assesses the predicted impacts of Dogger Bank Teesside A & B on European sites for which Annex II species are a qualifying feature and that have been screened into the AA stage of the HRA process. The features in question are grey seal and harbour porpoise. The sites considered are listed in table 5.1 of the IfAA.

4.21 The Applicant's screening work identified that the main potential impacts to marine mammals resulting from the Project would relate to:

- potential disturbance and displacement as a result of increased noise levels generated during construction work;
- reduction in prey availability, again due to disturbance and displacement of fish during construction, and
- increased collision risk with vessels during construction and operation.

4.22 The Dogger Bank SCI which forms part of the project zone is not currently designated for supporting any Annex II marine mammal populations. However as noted in paragraph 2.1, following close of the Examination the SoS has been made aware of a list of sites that may be recommended as draft (d)SACs. One such site is located in the southern North Sea and encompasses part of Dogger Bank. These sites have been recommended as there is evidence that they may support qualifying populations of Harbour porpoise (*Phocoena phocoena*). The site is still at the early stages of consideration for possible future designation with approvals and formal consultation to follow. However, the SoS would not wish to take a decision on the Project, without first satisfying herself that it would not damage the possibility of a future cSAC.

4.23 As noted above, the IfAA (table 5.1) sets out European sites surrounding the project where marine mammals (harbour porpoise and grey seal) are a feature and where there was consideration of a LSE. The sites in the UK were: Humber Estuary SAC (194km from the wind farm and 96km from the cable route), Faray and Holm of Faray SAC (546km from the wind farm and 523km from the cable route), Isle of May SAC (311km from the wind farm and 199km from the cable route) and Berwickshire and North Northumberland SAC (221km from the wind farm and 91km from the cable route). The other sites were located within Belgium, Denmark, Germany, France, the Netherlands, Norway and Sweden and are further considered within the transboundary assessment in section 15.0.

Grey Seal

4.24 The IfAA notes that most seals tend to forage within 145 km of their haul-out sites (Thompson *et al*, 1996). Grey seals prey on a wide range of species such as sandeels, whitefish (such as cod and haddock) and flatfish, these species are typically found where the seabed sediment is primarily gravel and sand (DTI, 2001).

4.25 The assessment predicts short-term and temporary minor adverse impacts to fish populations from increased suspended sediment concentrations, seabed disturbance and construction (particularly piling) noise. The Applicant concludes though that the mobility of seals and their flexibility in prey selection means that any short term and localised changes in fish abundance

during construction would not compromise the ability of grey seal present within Dogger Bank Teesside A & B to gain sufficient prey. It is, therefore, concluded that this impact would not have any discernible implications for grey seal populations as a whole or with respect to the designated sites' populations.

4.26 The Applicant notes that given the existing levels of vessel traffic which indicate numbers of around 3,650 a year around Dogger Bank Teesside A & B, it is not expected that the presence and movement of additional vessels during construction or operation would significantly increase underwater noise levels above that of the baseline, such that a measurable behavioural response in grey seal would arise, either from the construction of Dogger Bank Teesside A or Dogger Bank Teesside B alone or concurrently. In addition the IfAA notes that given the agility and manoeuvrability of grey seal, and the relatively large size and slower speeds of construction vessels likely to be used during construction, it is considered unlikely that healthy grey seals would be impacted by vessel collisions during construction, except in extreme circumstances.

4.27 Of the identified effects above it is an increase in underwater noise levels during construction, specifically linked to piling works for turbines, which is considered to pose the greatest potential for impact to marine mammals at the population level. The Applicant therefore undertook modelling of underwater noise levels to inform the assessment of potential behavioural responses of marine mammals during the Project's construction phase. The IfAA notes that only a very small number of the overall reference grey seal population would be at risk of instantaneous injury that would cause a permanent threshold shift ("PTS"). The IfAA calculates <0.0001% in terms of the grey seal population in the worst case scenario. The Applicant demonstrated that given the very small numbers of animals present within the Project area at one time, it is apparent that only a very small number of the overall reference grey seal population would be at risk of PTS. This level of potential impact in respect of PTS in considered negligible.

4.28 The IfAA notes that whilst the piling works are unlikely to injure grey seals, it might still be sufficient to cause displacement over a relatively large area. The Applicant predicts that displacement of grey seals could occur up to 1.7km from the piling works. However, this should not adversely affect the European sites given the large extent of alternative foraging areas available to those populations.

Mitigation Measures

4.29 In order to reduce any impacts to seals within the Project zone mitigation measures have been proposed. To ensure avoidance of potential harm the Applicant has identified a number of mitigation measures (including the application of an effective zone of exclusion, marine mammal observer and soft start piling). The IfAA notes that the final approach to be taken for marine mammal mitigation for Dogger Bank Teesside A & B will be determined during the design and implementation of a project-specific Marine Mammal Mitigation Protocol ("MMMP"). The

development and implementation of this will be secured through condition 16 of the offshore generation DML's and condition 13 of the offshore transmission DML's.

4.30 NE, in their written response on October 23rd 2014, highlight that due to the use of a Rochdale envelope the eventual project design may alter and the proposed mitigation allows them to ensure appropriate mitigation in accordance with final details at a later date.

4.31 **The SoS is satisfied that condition 16 of the offshore generation DML's and condition 13 of the offshore transmission DML's will require the Applicant to follow JNCC Guidelines (JNCC, 2010) and are sufficient mitigation measures to protect grey seals.**

4.32 Furthermore, all cetaceans (including harbour porpoise) are fully protected in UK waters under the EU Habitats Directive, irrespective of whether they are likely to be present within or outside a SAC. The level of protection is high, and enforced by law, and includes the prevention of disturbance that could have an adverse effect on the population and its conservation status. The Applicant will need to obtain a European Protected Species Licence from NE if it is considered that the Project could lead to disturbance of harbour porpoise or any other European protected species.

Harbour Porpoise

4.33 Harbour porpoise (*Phocoena phocoena*) are the most abundant cetacean in UK waters, and the North Sea is considered to be a geographically important area for the species (Reid *et al*, 2003). In the North Sea, the harbour porpoise population is estimated as 227,298 individuals (Hammond *et al*, 2013). Harbour porpoise forage over very large areas (up to 11,289 km^2; Johnstone *et al*, 2005), feeding on a wide range of fish species, typically small shoaling species from demersal or pelagic habitats such as whiting and sand eels (Santos and Pierce, 2003; Santos *et al*, 2006).

4.34 There are currently no SACs in the UK that support qualifying populations of Harbour porpoise. However as noted in paragraphs 2.1 and 4.22, following close of the Examination the SoS has been made aware of a list of sites that may be recommended as draft (d)SACs. One such site is located in the southern North Sea and encompasses part of Dogger Bank. These sites have been recommended as there is evidence that they may support qualifying populations of Harbour porpoise (*Phocoena phocoena*). The site is still at the early stages of consideration for possible future designation with approvals and formal consultation to follow. However, the SoS would not wish to take a decision on the Project, without first satisfying herself that it would not damage the possibility of a future cSAC.

4.35 Paragraph 4.21 details the main potential impacts to marine mammals resulting from the Project which include potential disturbance and displacement as a result of increased noise levels generated during construction work; reduction in prey availability, and increased collision risk with vessels during construction and operation. **The SoS considers that there is an LSE on harbour porpoise, a qualifying feature of the recommended Southern North Sea (d)SAC during both construction and operation of the project due to dredging, piling, noise,**

vibration and loss of foraging habitat. She will consider this further in the appropriate assessment section of this report.

Scope of in combination assessment

4.36 Under the Habitats Regulations, the SoS is obliged to consider whether other plans or projects in combination with the Project might affect European sites. In this case there are a number of other plans and projects which could potentially affect some of the same European sites. These are listed in *Table 2* and include a number of planned and existing offshore wind farms, oil and gas facilities, cables and pipelines and other energy projects within the vicinity of the Project.

Table 2 Plans and projects included within the Applicant's in combination impacts assessment. (Source: ExA report).

Project Type	Project Name
Aggregate Extraction	Areas: 400, 439, 466/1, 483-4, 485/1-2, 492, 493-4, 495/1-2, 512, 514/1, 514/3
Cables and Pipelines	Breagh Pipeline Dudgeon R2 Cable Connection Galloper Cable Connection Greater Gabbard Cable Connection Humber Gateway Cable Connection Kentish Flats Extension Cable Connection Lincs Cable Connection London Array II Cable connection R3 wind farm projects (east coast, phase 1) Cable connection Race Bank cable connection Scottish Territorial Water Sites (east coast) Cable connection Teesside Offshore Windfarm Cable connection Triton Knoll Cable connection Westernmost Rough Cable connection
Offshore wind farms	Beatrice Blyth Demonstration Site Breeveertien II Dogger Bank Creyke Beck A & B Dogger Bank Teesside C & D Dudgeon East Anglia ONE East Anglia THREE and FOUR European Offshore Wind Development Centre (EOWDC) – Aberdeen offshore wind farm Firth of Forth Alpha Firth of Forth Bravo Galloper Greater Gabbard Gunfleet Sands I and II Hornsea Project One Hornsea Project Two Humber Gateway Inch Cape Kentish Flats Extension Lincs London Array II Lynn & Inner Dowsing Moray Firth (Telford, Stevenson and MacColl Offshore wind farm) Navitus Bay Neath na Gaoithe Bürger-windpark Butendiek Race Bank

	Scroby Sands Sheringham Shoal Teesside Offshore Windfarm Thanet Triton Knoll Westernmost Rough
Oil and Gas	Cygnus Gas Field Development (Alpha and Bravo) Ensign Rochelle
Tidal	Cantick Head Westray South
Wave Energy	Brough Head (Aquamarine Power) Costa Head Inner Sound

4.37 The Projects included in the Applicants in combination assessment were disputed by NE who highlighted concerns in their written representations surrounding the exclusion from in combination assessment of those windfarms that were commissioned and operational before the start of the bird monitoring for Dogger Bank Teesside A and B which were included in the baseline rather than the cumulative assessment. By the close of the examination NE had agreed with the Applicant's position that operational wind farms included in the baseline would not affect the outcome of the Cumulative Impact Assessment ("CIA") as 'collisions at all of these sites are negligible and their inclusion would not affect the outcome of the CIA'.

4.38 No LSE was found for habitat loss on sea bird species in combination with other developments. There could be localised impacts on fish from increased underwater noise levels during construction works. However, as this effect would be localised to the immediate area of works (e.g. piling) it is unlikely to be cumulative across projects. Overall temporary displacement of the resource is predicted rather than loss or decrease in availability.

4.39 **The SoS considers that sufficient information has been provided to inform a robust assessment in line with her duties under the Habitats Regulations. The SoS is unable to exclude LSEs from the 6 sites identified in *Table 1*. This is as a result of physical damage, habitat loss, disturbance and collision. It relates to features including sandbanks which are slightly covered by sea water all the time, black-legged kittiwake, Atlantic puffin, northern gannet, common guillemot and razorbill. This is also the view of the ExA, NE and the RSPB.**

Appropriate Assessment

Test for Adverse Effect on Site Integrity

5.0 The requirement to undertake an AA is triggered when a competent authority, in this case the SoS, determines that a plan or project is likely to have a significant effect on a European site either alone or in combination with other plans or projects. Guidance issued by the European Commission states that the purpose of an AA is to determine whether adverse effects on the integrity of the site can be ruled out as a result of the plan or project, either alone or in combination with other plans and projects, in view of the site's conservation objectives (European Commission, 2000).

5.1 The purpose of this AA is to determine whether or not AEoI of those sites and features identified during the LSE test can be ruled out as a result of the Project alone or in combination with other plans and projects in view of the site's conservation objectives and using the best scientific evidence available.

5.2 If the competent authority cannot ascertain the absence of an AEoI within reasonable scientific doubt, then under the Habitats Regulations, alternative solutions should be sought. In the absence of an acceptable alternative, the project can proceed only if there are imperative reasons of overriding public interest ("IROPI") and suitable compensation measures identified. Considerations of IROPI and compensation are beyond the scope of an AA.

Conservation Objectives

5.3 Guidance from the European Commission indicates that disturbance to a species or deterioration of a European site must be considered in relation to the integrity of that site and its conservation objectives (European Commission, 2000). Section 4.6.3 of that guidance defines site integrity as:

> *…the coherence of the site's ecological structure and function, across its whole area, or the habitats, complex of habitats and/or populations of species for which the site is or will be classified.*

5.4 Conservation objectives outline the desired state for a European site, in terms of the interest features for which it has been designated. If these interest features are being managed in a way which maintains their nature conservation value, they are assessed as being in a 'favourable condition'. An AEoI is likely to be one which prevents the site from making the same contribution to favourable conservation status for the relevant feature as it did at the time of its designation (English Nature, 1997).

5.5 There are no set thresholds at which impacts on site integrity are considered to be adverse. This is a matter for interpretation on a site-by-site basis, depending on the designated feature and nature, scale and significance of the impact. Conservation objectives have been used by the SoS to consider whether the Project has the potential for having an AEoI, either alone or in combination. The potential for the Project to have an adverse effect is considered for each site in turn.

Dogger Bank SCI and cSAC

6.0 The Dogger Bank SCI and cSAC is an extensive sandbank which was formed by glacial processes before being submerged through sea level rise. The site supports the Annex 1 '*sandbanks which are slightly covered by sea water all the time'* feature. The site is 12,331km².The site in UK waters adjoins the Dutch and German Dogger Bank SCIs. It is home to a variety of species which live both on and within the sandy sediment (JNCC, 2014[2)]. It is located in the Southern North Sea, approximately 150km north east of the Humber Estuary.

6.1 As noted in the ExA report the designations applicable to the Dogger Bank European site are that it is both a cSAC and an SCI. This was confirmed by NE in their Written Representation which said that the Dogger Bank cSAC is currently undergoing classification by the UK Government as an SAC under the provisions of the EC Directive 92/43 on the Conservation of Natural Habitats and of Wild Fauna and Flora. Dogger Bank is currently both a cSAC and an SCI (following approval as an SCI by the EC) and this will be the case until the site has been formally designated as a SAC by UK Government.

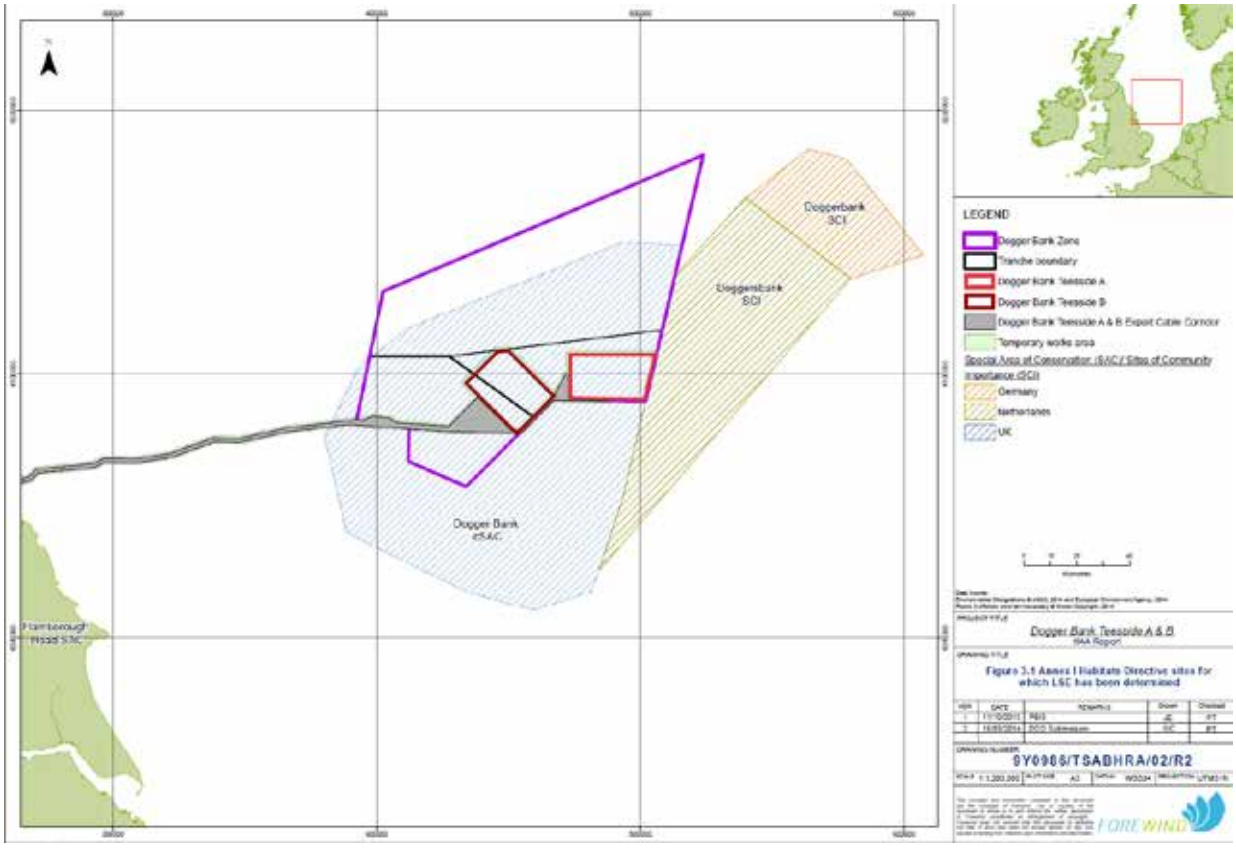

Figure 4 Dogger Bank SCI/ cSAC location extracted from the Applicant's IfAA report.

6.2 The Dogger Bank is an important location for the North Sea harbour porpoise (*Phocoena phocoena)* population which is a non-qualifying feature of the SCI. Grey seals *(Halichoerus grypus*) and common seals (*Phoca vitulina*) are known to visit the Dogger Bank and are also included as non-qualifying features. The sand bank's location in open sea exposes it to substantial wave energy and prevents the colonisation of the sand by vegetation on the shallower parts of the bank. Sediments

[2] *http://jncc.defra.gov.uk/page-6508*

range from fine sands containing many shell fragments on top of the bank to muddy sands at greater depths. These support invertebrate communities, characterised by segmented polychaete worms (Polychaeta), amphipods (Amphipoda) and small clams (Bivalvia) within the sediment, and hermit crabs (*Pagurus bernhardus)*, starfish (Asteroidea)*,* flatfish (Actinopterygii), and brittlestars (Ophinuroidea) on the seabed.

6.3 Silver sand eels are an important prey resource found on the sandbank supporting a variety of species including seabirds, cetaceans and fish. Occasional, discrete areas of coarser sediments (including pebbles) were recorded by JNCC[3] on the bank, dominated by the soft coral (*Alcyonium digitatum)* known as dead man's fingers, the bryozoan sea chervil (*Alcyonidium diaphanum)* and serpulid worms (*Serpula vermicularis)*.

6.4 The SCI's sole feature 'sandbanks which are slightly covered by seawater all the time' is considered to be in an unfavourable condition. The conservation objectives (see *Table 3* below) reflect this by advising that management measures seek to restore this feature to favourable condition (ER 5.7.7).

6.5 JNCC has identified that the Dogger Bank SCI is currently moderately or highly vulnerable to the following pressures (JNCC, 2012):

- Physical loss by obstruction (installation of petroleum and renewable energy industry infrastructure and cables);
- Physical damage by physical disturbance or abrasion (demersal trawling); and
- Biological disturbance by selective extraction of species (demersal trawling).

Table 3 Conservation objectives for Dogger Bank cSAC and SCI (JNCC 2012).

Conservation Objectives	'sandbanks which are slightly covered by seawater all the time'; subject to natural change, restore the sandbanks to favourable condition, such that: Ø The natural environmental quality is restored; Ø The natural environmental processes and the extent are maintained; Ø The physical structure, diversity, community structure and typical species, representative of sandbanks which are slightly covered by seawater all the time, in the Southern North Sea, are restored. The qualifying features to which the conservation objectives refer are: Ø Sandbanks which are slightly covered by sea water all the time

Physical Damage

6.6 During the construction, operation and decommissioning of the Project there could be impacts on the sandbanks which form part of Dogger Bank SCI. These are set out in stage 2 matrix 1 of the RIES.

Construction, Operation & Decommissioning

6.7 The three stages of the Project have the potential to cause effects on the physical structure, processes and benthic communities of the site. The types of impacts include:

- Physical damage (smothering) to habitat feature communities through increased deposition of sediment;

[3] *http://jncc.defra.gov.uk/page-6508*

- Physical damage (contamination) to habitat feature communities through re-suspension and deposition of contaminated sediment;
- Physical damage to habitat feature communities as a result of alteration to hydrodynamic processes, morphology and structural integrity of the sandbank habitat.

6.8 In terms of suspended sediment produced during construction the worst case scenario presented in the IfAA (see table 2.2 for the worst case construction techniques), shows that maximum suspended sediment concentrations are predicted to be greater than 200 mg/l against a background level of 2 mg/l. NE highlighted in their Written Representation that the increase in suspended sediment concentrations above background levels may have negative effect on filter-feeding species and consequently on the overall benthic community composition. The Applicant found that for the Dogger Bank SCI, the effects during construction would be temporary, short-term and negligible in magnitude. The worst case impact means the SCI remains within its current natural environmental range.

6.9 The Applicant noted that the species and communities of the subtidal sandbank feature are adapted to intermittent and relatively rapid changes in suspended sediment concentrations and re-deposition. Where species and communities would be temporarily affected, they have a low to moderate sensitivity to the disturbance impact and relatively quick recovery would be expected.

6.10 The Applicant noted that localised changes to the morphology and structure of the sandbanks feature and the processes that maintain sedimentary features would arise in the immediate vicinity of works to install individual structures. The Applicant concluded that, under the worst case scenario investigated, there would not be an AEoI of the Dogger Bank SCI during construction. Furthermore, any alternative scenario would result in a smaller disturbance 'footprint' and reduction in the spatial extent of any effects.

6.11 The Applicant noted that elevated levels of contaminated sediment concentrations with the potential to result in impacts on marine fauna and communities have not been recorded within tranches A & B and so the Applicant has concluded that there will not be an AEoI.

6.12 The Applicant considers the construction impacts to be temporary. The Project would disturb approximately 0.29% of the SCI during construction.

6.13 During the operational phase, under the worst case scenario for development a long-term reduction in the extent of subtidal sandbank habitat of 0.08% of the total SCI would occur. The Applicant notes that this small, long-term reduction in area is not predicted to compromise the coherence of the ecological structure and function of the SCI, including the morphology of the sandbank feature itself. Apart from long-term habitat loss, the majority of the effects associated with the operation of the Project (e.g. intermittent, temporary disturbance to seabed habitat during maintenance activities) that could affect the Dogger Bank SCI would be temporary, short-term, negligible in magnitude, and remain within the range of variation experienced and to which the species and communities of the subtidal sandbank feature are adapted. It is, therefore, concluded that, under the worst case scenario investigated, there would not be an AEoI of the Dogger Bank SCI during the operational phase. Furthermore, any alternative scenario (i.e. the use of piled

structures as opposed to gravity base structures) would result in a reduction in the extent of subtidal sandbank habitat affected by comparison to that assessed. The IfAA concluded that the favourable condition target (aimed at restoring the sandbanks feature) would not be compromised.

6.14 During the course of the examination, NE provided a Site Integrity Position Statement for the Dogger Bank SCI, developed through discussions with JNCC. This was updated during the course of the examination. NE's Final Site Integrity Position Statement, dated 11th December 2014, is taken in the RIES to supersede NE's previous advice regarding the Dogger Bank SCI. The SoS agrees with this approach. NE made clear in the Site Integrity Position Statement that the current unfavourable condition status of Dogger Bank SCI was a key consideration in the formulation of their advice.

6.15 NE's Site Integrity Position Statement sets out the effects they considered against each of the conservation objectives attributes for the site and associated mitigation measures. These relate to: habitat loss impacting the extent of the site; changes in topography and interaction with physical processes; 'habitat' introduction impacting benthic communities of the site; changes in surface sediments and benthic communities and changes in water quality and potential effects on benthic communities.

6.16 At the Issue Specific Hearing ("ISH") on 3 December 2014, NE advised the ExA that their position was that Dogger Bank SCI site integrity will only be realised if a number of conditions are secured. These are as follows;

- Limiting the quantity of scour prevention and cable protection.
- Using an "Intelligent Scour Management" approach.
- Requiring that the foundation types used and the associated installation impacts are those that may be completely and safely removed, or reduced to a level below the seabed, at the time of decommissioning.
- Use of the most appropriate cable installation tool/technique that reduces impacts to the site. This may involve reducing the amount of cable protection required by using a cutting tool through hard areas of clay.
- Monitoring benthic communities post-construction, including the presence of any invasive non-native species (INNS) and wider community type/structure (i.e. changes extending beyond the extent of the hard infrastructure), to identify changes.

The RIES notes that these are secured through the in-principle monitoring plan. This plan is secured in DML's 1 and 2, as condition 21.

6.17 In addition creation of disposal mounds was identified as a potential effect. It was agreed that to remove any adverse effect mitigation would need to be put in place, as follows;

- Pre-construction monitoring and assessment to identify suitable disposal areas within the project boundaries/order limits (i.e. areas where clay is already exposed at the seabed surface)

- Where it is known in advance that sediment content changes will occur due to disposal material, the arisings are disposed of within agreed areas; and
- Monitoring of the disposal mounds to inform the decommissioning plan including the potential removal of remaining disposal mounds to suitable disposal areas within the site boundary.

6.18 The above are secured through conditions within the DML, including a Disposal Scenario Statement. This is secured through the construction method statement which will detail the disposal arrangements prior to construction (DML's 1 & 2 condition 16(c)(i)).

6.19 The RIES records that AEoI can be excluded for the effects of the proposal alone with mitigation on the integrity of Dogger Bank SCI during the construction and operational phases. NE's Final Integrity Position Statement for the SCI identifies the qualifications that NE considers the SoS needs to be aware of when considering the conclusion of no AEoI for the application alone, 'on the basis that the impacts of the project constitutes a "lasting but reparable disturbance"'. NE advise that the effect of the application alone, with mitigation, on the conservation objective attributes of the SCI, would be "*temporary with recovery of ecology occurring within months/few years after decommissioning, therefore allowing recovery to favourable conservation status to occur*". This is summarised by NE as impacts that may be considered 'lasting (for the duration of the project) but temporary (reparable effect)'.

6.20 The SoS notes that the outline decommissioning statement provided by the Applicant has set out potential methodologies for decommissioning and removal of structures including piled foundations, gravity bases, suction foundations, meteorological monitoring stations, offshore platforms, cables, scour protection and subsea protection.

6.21 The Panel report notes that NE raised that decommissioning of the Project has the potential to result in a range of impacts on the SCI but that these impacts are likely to be temporary and of lesser magnitude than impacts from construction and operation. The ExA report notes that NE concluded that they could exclude an AEoI from decommissioning activities for the project alone. This conclusion is based on the removal of all infrastructure and mitigation measures.

6.22 The ExA note that the entire delivery of the application proposal within the Dogger Bank SCI must ensure the temporary and recoverable nature of the development in order to ensure no AEoI on the SCI from the project alone. This is provided for in:

- DCO requirements 3 -13 (detailed offshore design parameters and layout rules) and associated documents confine the physical works within the SCI to the Rochdale Envelope assessed and ensures that the final design and location of these are all recorded.
- DML 1 and 2 conditions 3 -12 (detailed offshore design parameters and layout rules) 14 (chemicals, drilling and debris - together with the disposal scenario statement) and 16-17 (pre-construction plans and documentation) achieve the same end.

6.23 The key provision in relation to decommissioning is Requirement 15. The Energy Act 2004 gives the SoS the power to require a decommissioning programme. Decommissioning activities will need to comply with all relevant UK legislation at the time. The person(s) responsible for the wind farm will produce and agree a decommissioning programme with the Department of Energy and Climate Change ("DECC") and in consultation with the Marine Management Organisation ("MMO"), SNCBs or their respective successors. The SoS is able to reject a decommissioning programme and, if she does so, may herself prepare a decommissioning programme. In taking decisions, on decommissioning plans, the SoS will be bound by the requirements of the Habitats Directive and other relevant legislation. Any works to decommission offshore infrastructure would also require a Marine Licence. The MMO would also be bound by the requirements of the Habitats Directive when issuing a Marine Licence. The decommissioning programme and Marine Licence would be able to require the removal of all infrastructure on or above the seabed following decommissioning of the Project. Requirement 15, together with the outline decommissioning statement, ensures that before works commence a written decommissioning programme pursuant to s105(2) of the Energy Act 2004 must have been served on the SoS. This process will have a separate HRA and Environmental Impact Assessment ("EIA") process.

6.24 On this basis the ExA recommends that the SoS conclude that for the project alone and subject to construction of the application proposal as provided for in the DCO/DMLs and the delivery of Requirement 15 there is no AEoI.

6.25 **The SoS has considered the information provided including the RIES, the ExA report and information submitted by interested parties and agrees with the ExA recommendation. The SoS considers that subject to mitigation (as noted above) and Requirement 15 there will not be an AEoI of the Dogger Bank SCI as a result of the Project alone. This is also the view of NE.**

In combination

6.26 The RIES includes all the plans and projects that were assessed in combination with this Project. These were discussed and agreed with NE and include those listed in *Table 2*. Also see figure 5.

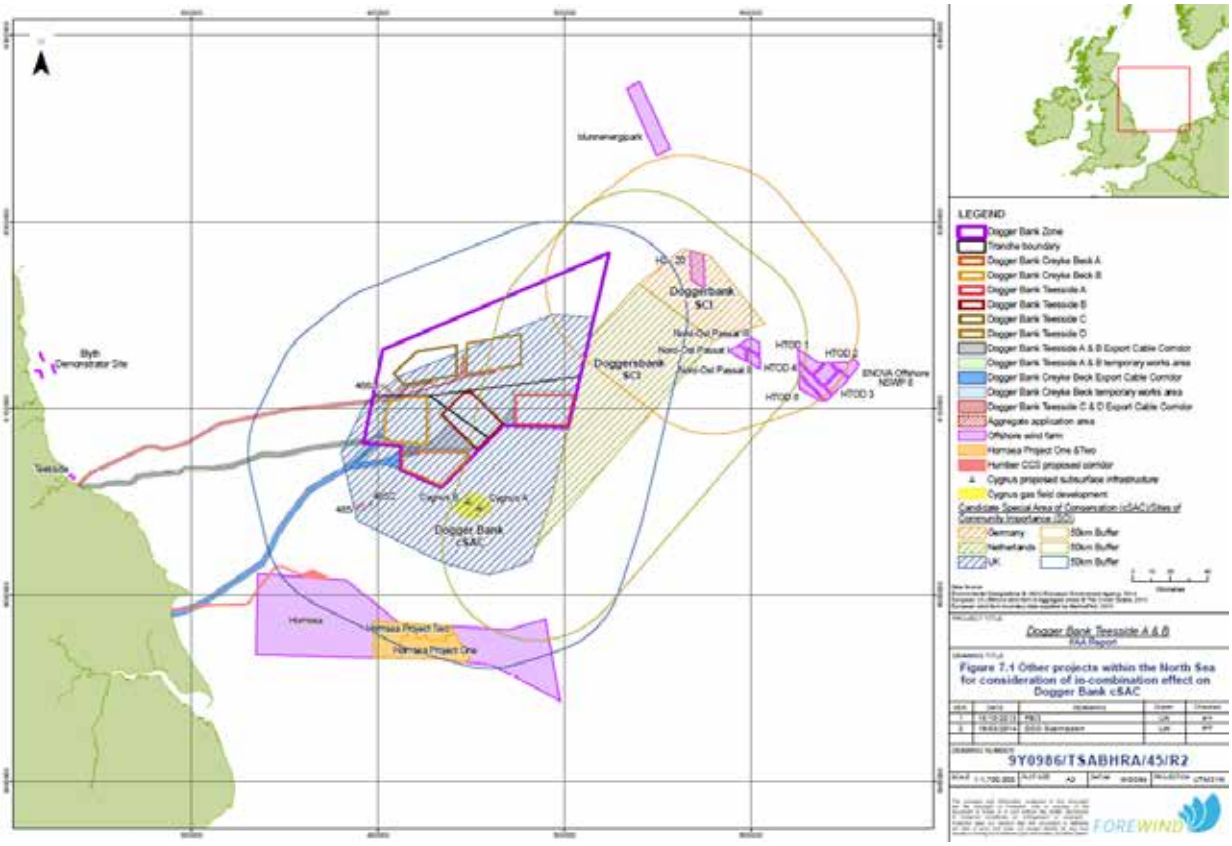

Figure 5 Other projects within the North Sea for consideration of in combination effect on Dogger Bank SCI from the Applicant's IfAA report.

6.27 NE advised that they and JNCC had considered the effect on site integrity from the Dogger Bank Teesside A & B projects in combination with other plans and projects in relation to the following scenarios:

- Construction and operation of the Dogger Bank Teesside A & B project in combination with the Creyke Beck projects, oil and gas industry development only;
- Construction and operation of the Dogger Bank Teesside A & B project in combination with the Creyke Beck projects, oil and gas industry development and aggregate extraction only (but excluding Teesside C and D offshore wind farm projects)**;**and
- Construction and operation of the Dogger Bank Creyke Beck projects, Teesside A & B project in combination with oil and gas industry development, aggregate extraction, and Teesside C and D projects only.

6.28 Based on advice from NE and JNCC the Applicant updated their position statement on Dogger Bank SCI and concluded that the project alone and in combination with other projects, would not have an adverse effect upon site integrity as the conservation objective to restore the sandbank feature of the SCI would not be compromised.

6.29 At deadline VII NE advised that in light of reassessments for cable protection for Dogger Bank Teesside A & B and the mitigation measures secured in the DML they conclude that the in-combination impacts of both Offshore Windfarms [assumed to mean Dogger Bank Creyke Beck and Dogger Bank Teesside A & B] and Cygnus field development would not have an AEoI.

6.30 With regard to the construction and operation of the Dogger Bank Teesside A & B project in combination with the Creyke Beck projects, oil and gas industry development and aggregate extraction NE's final integrity position statement explains that effects on the physical structure associated with the removal of material through aggregate extraction within the Dogger Bank SCI are considered to be lasting. They would result in irreparable loss with limited ability for recovery due to the limited sediment transport within the site due to Dogger Bank being a relict rather than active sandbank with little or no sediment transport into or out of the bank.

6.31 NE and JNCC stated in their submission of the 19th January 2015 that due to the irreparable loss of structure as a result of aggregate extraction they advised that they could not state beyond reasonable scientific doubt that there would be no AEoI. They did note that the anticipated effects from the Dogger Bank Teesside A & B projects are lasting but reparable allowing the site to recover at the time of decommissioning because the volume of the sandbank will not have been altered.

6.32 NE's final integrity position statement on the SCI noted that there are no established 'universal' thresholds for the degree of effect (for example the percentage loss of habitat) that would constitute an adverse effect on site integrity. NE cited work by Hoskin & Tyldesley (2006) who reviewed legal judgements and Inspectors' decisions relating to habitat loss and site integrity for an English Nature research report. The review examined development projects with small scale effects of approximately 1.0% or less of land take or habitat loss. The review concluded that habitat loss of a very small scale, including losses in the order of 0.1% or less of a site, in specific cases has been regarded as an adverse effect on site integrity of a designated site. This has been the case, for example, where the habitat loss is non-reversible or affects the function of the habitat. The DTA's Habitats Regulations Assessment Handbook (2013) reiterates this and points out that in other cases such a loss may not be an adverse effect on site integrity. Both references emphasise that percentage loss is not the only consideration and that ecological function of the area affected should also be assessed in the 'integrity test'.

6.33 The Applicant did not agree with NE's conclusions as they asserted that the effects on the SCI from aggregate extractions are different from the effects from the Project in combination with other plans and projects as aggregate extraction applications would prevent recovery due to loss of sandbank structure. Whereas the other projects would lead to long term but reparable disturbance which allows recovery of the site at the time of decommissioning.

6.34 The RIES notes that NE and JNCC concluded in their submission on the 19th January 2015 that provided that the appropriate mitigation is secured for Dogger Bank Teesside A & B, the biggest contribution to an in combination adverse impact to site integrity comes from the aggregate extraction plans within the Dogger Bank SCI. As the major contributor to the in combination impact on the Dogger Bank SCI, NE believes the onus is on the Aggregates project to adopt mitigation and compensatory measures to reduce the adverse effect on integrity down to an acceptable level or provide appropriate compensation.

6.35 The ExA carefully considered the timing and potential impacts of the extraction areas. The ExA agrees with NE's advice. The ExA noted that the effects of the aggregate proposals are not yet

certain, in the sense that licence applications had not been submitted at the end of the examination and therefore no decision has been made on the HRA process for these proposals. The ExA therefore recommended that the SoS address the application in hand and find that it will be for the aggregates applicants in due course to address the in combination issues that arise.

6.36 The ExA recommended that the SoS consult with the MMO prior to a decision to enable a decision to be made in the light of the progress on the aggregates applications at that time. The SoS has consulted with the MMO who have stated the following;

- Area 466/1 – The applicant is currently determining whether or not to progress with this application and as such it is currently on hold. At this stage the MMO is unable to comment further on this project.
- Areas 485/1 and 485/2 – The applications are still in the pre-application stage and no date has been provided for a potential licence application. The MMO is therefore unable to comment further on these projects.

6.37 Following this response from the MMO the SoS agrees with the ExA that it is appropriate to address the application in hand and that it will be for the aggregates applicants in due course to address the in-combination issues that arise.

6.38 The ExA concluded that for the project with the identified mitigation secured through the DCO/DML, in combination with the Creyke Beck projects, oil and gas industry development and aggregate extraction there is no AEoI of Dogger Bank SCI in view of the site's conservation objectives, for the construction and operational phases. The SoS agrees with this conclusion.

6.39 With regards to Dogger Bank Creyke Beck projects, Teesside A & B project in combination with oil and gas industry development, aggregate extraction, and Teesside C and D[4] projects the RIES records that AEoI cannot be excluded. This is based on advice from NE, in their Final Integrity Position Statement for the Dogger Bank SCI they advised that *"Whilst Natural England and JNCC acknowledge that in principle the Applicant commits to the decommissioning of Teesside C & D projects, the data required to inform the assessment and scale of any impacts and subsequent mitigation measures are currently unavailable".* With the addition of this project to those already included in the in combination assessment NE and JNCC were unable to advise beyond reasonable scientific doubt that there would be no AEoI to the Dogger Bank SCI.

6.40 The Applicant disagreed with NE and JNCC's conclusion and noted that the development within the Dogger Bank Teesside C & D project areas would lead to potential impacts similar to those that have been assessed for Dogger Bank Teesside A & B and Dogger Bank Creyke Beck. The Applicant also stated that they would commit to removing installed infrastructure for Teesside C & D and as such impacts would be of a similar long-term, but temporary, nature and full recovery of affected areas would be expected. Thus, the conservation objective to restore the sandbank feature of the SCI would not be compromised.

[4] Dogger Bank Teesside C & D are the two offshore wind farms proposed by the applicant as the third stage in the development of the Dogger Bank zone. It will comprise two wind farms, each with a maximum installed capacity of 1.2GW. Figure 1.1 of the Applicant's ES illustrates the location of Teesside C & D in relation to the Teesside A & B. Pre-construction, construction and operation is proposed to commence from 2017.

6.41 The ExA concluded based on the information available that it could not exclude AEoI for the in combination effects of this Project with Dogger Bank Creyke Beck, oil and gas industry development, aggregate extraction, and Teesside C and D projects. The ExA noted that it is the Teesside C & D project in-combination which results in this conclusion. The ExA noted that there is, as yet, no application under the Planning Act 2008 for Dogger Bank Teesside C and D and that it would be inappropriate for the ExA to act in a way that would fetter the discretion of the SoS in respect of such a future application. The ExA noted that it will be for the ExA appointed to examine that project and the SoS at the time that application is made to examine and then make that assessment. Consequently the ExA found no reason from that consideration for it to recommend any further change to the application proposal.

6.42 The SoS has considered the views of the Applicant, NE, JNCC and the ExA with regards to the Project in combination with Dogger Bank Creyke Beck, oil and gas industry development, aggregate extraction, and Teesside C and D. The SoS notes that the in-combination conclusion of not excluding adverse effect is as a result of the inclusion of Teesside C and D. The SoS agrees with the ExA that it will be for the ExA appointed to examine that project and the SoS at the time that application is made to examine and then make that assessment. In addition the SoS notes that there is no reason to assume that decommissioning requirements as secured for this Project will not be required and secured for Dogger Bank Teesside C and D.

Fishing

6.43 Natural England advised in their final integrity position statement on Dogger Bank SCI that the site (designated under Article 6(ii) of the Habitats Directive by the UK, Germany and the Netherlands) is considered to be in unfavourable condition, primarily due to the impacts of fishing activities. Fisheries management measures are being developed for the Dogger Bank SCI under the revised Common Fisheries Policy (Articles 11 and 18) (and also for contiguous European member states' SCIs). The proposed fisheries management measures would close one third of the SCI to bottom contacting gear. While the formal approval process is not yet complete, these proposals have been agreed at a technical level by all European member states with SCIs on Dogger Bank but their implementation remains under discussion between relevant member states. Therefore at this time there are no Commission approved fisheries management measures in place and the only management of the conservation interests is through the application of Article 6(3).

6.44 The ExA report notes that initially NE advised the Panel that "recent guidance from Defra has indicated that fishing activity should be considered as if it were a plan or project" and noted that it should be included within the applicant's in combination HRA assessment.

6.45 NE subsequently advised the ExA that on-going fisheries activities should not be considered a plan/project unless they are a new activity. This is a change in position from NE's advice provided for the Dogger Bank Creyke Beck examination. NE confirmed that Defra had indicated that only new fishing activities should be considered as a plan or project. NE confirmed that their advice was that whilst ongoing fisheries activities should not be considered a plan/project unless they

are a new activity, a HRA for a plan or project should consider human/ongoing activities and their implications to the conservation objective attributes of a protected site.

6.46 TWT in response to the RIES [REP-464] highlighted their concern about the change in position taken by NE and referred to case law on Article 6(3) of the Habitats Directive, which in their view had established that the grant of a fishing licence constitutes a 'plan or project' within the meaning of Article 6(3) and consideration of fishing activities beyond 6nm. The RSPB supported this position.

6.47 Following requests from the Panel, NE explained that on-going and new activities are considered through different provisions of the Directive, (6(2) and 6(3)/6(4) respectively). NE explained that within 12nm a regulatory mechanism is available, outside 12nm, there is an absence of any regulatory mechanism through which fishing activities are controlled. On this basis, NE explained that whilst it may be possible to extend the approach taken to assessment of fishing activities within 12nm to outside 12nm, due to the absence of a regulatory mechanism, NE and MMO agreed that such an approach may be premature.

6.48 NE advised the ExA that on-going fishery activities should be used to contextualise the additional effects of the windfarm given that the fisheries activity is ongoing and responsible for the site's unfavourable condition. They advised that as the site is considered to be in unfavourable condition and impacts from ongoing fisheries are influencing the ability of the site to be restored to a more natural state; greater certainty is needed that the Dogger Bank Teesside A and B projects, alone and in combination will not further hinder recovery to favourable condition and thus result in an AEoI.

6.49 TWT re-iterated their concerns and stated that they did not believe that there was adequate justification for treating on-going and new fisheries differently in regards to an in combination assessment. They noted that the legal obligations with respect to the regulation of fishing activities under Article 6 of the Habitats Directive apply throughout the UK's EEZ and not just within 12nm. Therefore the basic duty of the UK to assess fisheries as a plan or project in any in combination assessment still applies in this situation.

6.50 The ExA referred to Defra's "Revised approach to the management of commercial fisheries in European Marine Sites- Overarching Policy and Delivery Document". The ExA also considered the advice from Natural England that outside of 12nm there is an absence of regulatory mechanism through which fishing activities are controlled and noted that as fishing on Dogger Bank is not a defined activity, and nor is it a consented or specifically regulated activity, it makes the concept of a meaningful assessment challenging since it has no definable scope and is not monitored. The ExA notes no 'new' fishing activities have been included in the list of other plans and projects considered in the Applicant's in combination assessment, neither did any Interested Parties identify any 'new' fishing activities which should be considered as a plan or project in the in combination assessment. The ExA therefore concluded that there was no need to include any new fishing activities on the SCI and concluded no AEoI.

6.51 The ExA also considered the advice provided by NE that a HRA for a plan or project should consider human/on-going activities and their implications to the conservation objective attributes of a protected site. The applicant's HRA incorporated fishing activity as part of the baseline to reach a conclusion of no AEoI for the SCI for the project alone and in combination with other plans and projects. The ExA has had regard to the concerns raised by TWT and RSPB regarding NE's recommended approach to consideration of on-going fishing activities. The ExA considered the advice provided by NE that the magnitude of the effects of the on-going fishery activity have been considered alongside the effects of the application proposal and that, subject to agreed DML conditions and mitigation being implemented, they consider that the effects of the application proposal will not impact upon the trajectory of recovery as and when fishery management measures are adopted. In this context, the ExA concludes that the effects of the application proposal have been considered against the on-going fishing activity and the implication of the application proposal to the conservation objective attributes of the SCI and concluded No AEoI.

Conclusion

6.52 NE confirmed that they could conclude no AEoI of the Dogger Bank SCI/ cSAC for the Project alone. The ExA concluded that there would be no adverse impact from the Project alone and in combination with other projects and plans due to the small scale of impact, which would be managed through conditions 3-12, 14, 16 and 17 in DML's 1 and 2 and Requirements 3- 13 and 15 of the DCO. The SoS considers that fishing is an ongoing activity and not something new that may affect the site in future. This impact has therefore been considered as part of the background impact on the site. **The SoS is therefore satisfied that the Project (alone and when considered in combination with all relevant plans and projects) will not have an adverse effect upon the integrity of the Dogger Bank SCI.**

Flamborough and Filey Coast pSPA

7.0 The Flamborough and Filey Coast potential SPA (pSPA) is located on the Yorkshire coast between Bridlington and Scarborough. The cliffs of Flamborough Head rise to 135 metres and are composed of chalk and other sedimentary rocks. The site supports large numbers of breeding seabirds including kittiwake, *Rissa tridactyla,* and auks (guillemot, *Uria aalge;* razorbill, *Alca torda*; and puffin, *Fratercula arctica*), as well as the only mainland-breeding colony of gannet, *Morus bassanus*, in the UK. The seabirds feed and raft in the waters around the cliffs, outside the SPA, as well as feeding more widely in the North Sea. The intertidal chalk platforms are also used as roosting sites, particularly at low water and notably by juvenile kittiwakes. The pSPA covers a total area of 8039.6 ha.

7.1 Between 20 January 2014 and 14 April 2014, NE held a formal public consultation on the designation of the Flamborough and Filey Coast pSPA. Following the public consultation in March 2015, NE submitted its final recommendations for the classification of the Flamborough & Filey Coast pSPA to Defra. This pSPA, if confirmed by the SoS for the Environment, Food and Rural Affairs, would represent a geographical extension to the existing Flamborough Head to Bempton Cliffs SPA and add several species to the formal citation.

7.2 It is Government policy to treat pSPAs as if they were a fully designated European site under the Habitats Regulations. As such, the SoS considers it important to consider the potential impacts of the Development, both alone and in combination with other plans or projects, upon this potential site.

7.3 The pSPA consists of the following proposed changes to the existing Flamborough Head to Bempton Cliffs SPA:

- A landward extension to the north west of the existing site to incorporate important breeding colonies of seabirds.
- Marine extensions out to 2 km to protect the waters which are important to these species of breeding birds.
- Modification of the landward boundary such that the features of the pSPA are protected in the future.
- Addition of the following migratory features to the pSPA citation; northern gannet, common guillemot, razorbill and incorporates an update to the published population figures for migratory black-legged kittiwakes.

7.4 It should be noted that there are currently only draft conservation objectives available for the Flamborough and Filey Coast pSPA. These were provided by Natural England in their Written Representation and are provided in Table 4 below.

Table 4 Draft conservation objectives for the Flamborough and Filey Coast pSPA.

Conservation Objectives	Avoid deterioration of the habitats of the qualifying features, and significant disturbance of the qualifying features, ensuring the integrity of the site is maintained and the site makes a full contribution to achieving the aims of the Birds Directive.

	Subject to natural change, to maintain or restore: Ø The extent and distribution of habitats of the qualifying features Ø The structure and function of the habitats of the qualifying features Ø The supporting processes on which the habitats of the qualifying features rely Ø The populations of the qualifying features Ø The distribution of the qualifying features within the site The qualifying features to which the conservation objectives refer are: Ø Black-legged kittiwake (*Rissa tridactyla*) (breeding) Ø Northern gannet (*Morus bassanus*) Ø Common guillemot Ø Razorbill Ø Seabird assemblage

7.5 An LSE upon the interest features of the site was identified in the RIES because of the potential for the Project, both alone and in combination with other plans and projects, to cause habitat loss, increase collision mortality and displacement mortality rates. The features which were the focus of the examination for this site are:

- Black-legged kittiwake
- Common guillemot
- Northern gannet
- Puffin
- Razorbill

7.6 The site is 55km from the export cable corridor and 163km from the offshore windfarm itself.

7.7 The potential for these impacts to constitute an AEoI are considered for each species in turn.

Gannets

7.8 The Flamborough and Filey Coast pSPA supports an important breeding population of gannets. The population has grown rapidly since the 1980's when only a few hundred breeding pairs were present to 8,469 pairs of 16,938 breeding adults (2008-2012); estimates of numbers in 2012 were 11,061 pairs or 22,122 breeding individuals (JNCC Seabird Colony Register Counts).

7.9 It is estimated that the UK population of gannets is 440,000 individuals (Baker et al, 2006), with a global population of 610,000 (Tucker et al, 2004). In the UK, the gannet population is concentrated in northern Scotland, and whilst they are widely distributed in English seas during winter, the only breeding colony in England is at Bempton Cliffs. The Applicant has used a mean foraging range of 93km, a mean maximum of 230 km and a maximum of 590km for Gannet (Thaxter et al. (2012)).

7.10 A LSE upon gannets was identified due to the potential for the Project to cause habitat loss, increase collision mortality and displacement mortality rates both alone and in combination with other plans and projects.

Operational Collision Risk

7.11 Collision will be an on-going effect through the operational lifetime of the project, varying in frequency through the year according to the species' population size. The size or magnitude of the risk for each receptor depends on a number of factors including its population in the area of the proposed development, the characteristics and behaviour of the species, notably the proportion of time that they spend flying and the heights at which they fly, and their avoidance of the wind farm as a whole, and micro-avoidance of individual turbines (Cook *et al*. (2012)).

7.12 There are two parts to estimating collision mortality. The first is to understand the number of birds passing through the swept area of the turbines within the offshore wind farm. This is determined by calculating the number of birds which are likely to be passing through wind farm and then factoring in the heights above sea level at which various species fly at to determine the numbers of birds at collision risk height. This calculation is done using a mathematical model, the Band model being the most commonly used.

7.13 There are several different versions of the Band model which use bird flight height in different ways to produce different estimates of collision risk. Collision risk analyses for the operational phase of Dogger Bank Teesside A & B have been run using the Band model, updated for the offshore environment (Band 2012). The updated Band model differs from the original (developed for onshore wind farms (Band *et al*. 2007)) in two key ways. Firstly, bird numbers are input as densities rather than raw counts, which better reflects the way in which data is collected in the offshore environment. Secondly, the updated Band model is capable of incorporating three options for considering flight heights:

- Option 1 - using the basic model, i.e. assuming that a uniform distribution of flight heights between lowest and highest levels of the rotors and using the proportion of birds at risk height as derived from site survey;
- Option 2 - using the basic model, but using the proportion of birds at risk height as derived from generic flight height information; and
- Option 3 - using modelled flight height distributions for each of the study species.

7.14 Option 3 allows comparison of the impact of varying the height of turbines and takes account of the fact that collision risk is not distributed evenly within the rotor swept area.

7.15 The second step in estimating collision mortality is to define the percentage of birds that are likely to make a behavioural response to the presence of a wind farm (or to an individual turbine) so as to avoid flying on a path that puts them at risk of collision with the rotating turbine blades. This is known as the avoidance rate ("AR"). The choice of AR has a significant influence on the number of predicted collisions. The overall AR will be the result of a combination of factors including macro-avoidance (of the whole wind farm, by diverting over or around it) and micro-avoidance (ability to avoid collision with a turbine blade once within a wind farm). In practice, the actual AR for any given location will also be affected by site-specific and temporal variations, including the

layout of turbines, weather and visibility, whether the birds are foraging or migrating and also whether they are part of a large flock.

7.16 Whilst collision AR can be generic, where essentially the same rate of turbine blade avoidance is assumed for a wide range of bird species, irrespective of any behavioural assumptions or empirical observations, it can also be tailored to a species or group of species on the basis of qualitative assessments (taking known behaviours including manoeuvrability into account) and empirical data (such as surveys of actual bird behaviours for example blade avoidance, or mortality impacts evidenced by recovered dead bird counts). Species-specific AR have been developed by SNH to take into account factors such as the behaviour patterns, reactions, size and agility of different bird species (Scottish Natural Heritage, 2010).

7.17 On the 25 November 2014, the SNCBs published their responses to the Marine Scotland Science report (Cook *et al*, 2014). The Marine Science Scotland report was commissioned to provide a review of the evidence used to determine ARs for use in Collision Risk Modelling ("CRM") for five priority species (kittiwakes, gannets, herring gulls, lesser black backed gulls and greater black backed gulls) and make appropriate recommendations as to which AR and which version of the Band Model should be used to undertake CRM.

7.18 The SNCBs in general supported the conclusions of the report, agreeing a range of ARs for the various Band models (Joint response from the SNCBs to the Marine Scotland Science avoidance rate review, 2014).

7.19 Once the number of birds expected to collide with the wind turbines has been calculated, the next step is to determine what impact that will have on the species population on a recurring annual basis. There are several methods of doing this; the Applicant has primarily used Potential Biological Removal ("PBR") analysis following work done for Triton Knoll Offshore Wind Farm to calculate this but has used Population Viability Analysis ("PVA") for some European sites where sufficient data was available.

7.20 PBR analysis quantifies the potential level of additional mortality which could occur on an annual basis without resulting in a long term population decline. One of the key parts of the PBR calculation is determining what the recovery factor (f value) for a species is. This value (ranging between 0.1 and 1.0) is intended to compensate for the inherent uncertainties present when making estimates about impacts upon a population. A recovery factor of 0.1 is often used for endangered species/populations where the risks of getting a prediction wrong would have serious consequences for that species/population. Dillingham and Fletcher (2008) proposed using PBR for birds and made the connection between International Union for the Conservation of Nature and Natural Resources criteria (in commas below):

- *F* = 1.0 for populations of '*least concern'* species that are known to be increasing or stable;
- *F* = 0.5 for populations of '*least concern'* species that are declining or of uncertain trend;
- *F* = 0.3 for populations of '*near threatened'* species; and,
- *F* = 0.1 for populations of '*vulnerable*' and '*endangered*' species.

7.21 During the Examination, there was discussion between the Applicant, NE and the JNCC about which version of the Band model was appropriate for use with the Project and which ARs should be used to undertake the CRM. NE (written representation 3rd September 2014) noted disagreement relating to the appropriateness of using the Extended Band (2012) model in collision risk modelling. There was also disagreement regarding the in combination assessment, due to the exclusion of offshore wind farm sites.NE were concerned about the exclusion of windfarms that were commissioned and operational before the start of bird monitoring for Dogger Bank Teesside A & B. NE also raised concerns that the Applicant had been inconsistent with their use of models and parameters which made it challenging for NE to draw conclusions on the significance of the impact from the in combination assessment.

7.22 The IfAA estimated that just over seven adult birds and three non-breeding birds could be lost annually, as a result of collision. This represents 0.03% and 0.01% respectively of the SPA population. In total the loss of adult birds through collision at this SPA would represent an increase in the background mortality of 0.79%, although a PBR value of between 286 and 393 adult birds has been calculated for this species at the Flamborough and Filey coast pSPA. The Applicants view is that losses as a result of the Project fall well below the lowest PBR value and therefore there would be no AEoI.

7.23 In their Written Representation NE outlined concerns in relation to this conclusion. This concern was associated with the Applicant's use of the Extended Band Model. The Applicant provided further information to address these concerns and included updated in combination assessment tables for gannet for this site. This information applied the same methodology developed and agreed between the Applicant and NE during the examination of Dogger Bank Creyke Beck offshore windfarm. The Applicant provided revised figures for the assessment of collision risk; this provided two versions of the modelled output, NE's view (based on NE's guidance and advice) and the Applicant's view. The RIES notes that the Applicant considered the NE approach to be overly precautionary as it required the use of a 98% avoidance rate for all species, the use of the 'basic band model' and the exclusion of consideration of refined designs for some offshore wind farm projects. NE confirmed that it accepted the additional information from the applicant on which to base its advice.

7.24 In a later representation [REP 286 para 1.13] NE accepted the avoidance rate of 99% for gannet and formed its advice on that basis. This is in response to the publication of the Marine Scotland Science paper, as discussed in sections 7.17 and 7.18 above.

7.25 The RIES records the progression of the Applicant's modelling during the examination and the production of the Biologically Defined Minimum Population Scales ("BDMPS") report commissioned by NE. The draft of this report had been used to derive the original apportioning figures and some minor amendments had been made that affected the overall apportioning figures the Applicant provided. The Applicant therefore provided further updates on the finalised report. NE concluded that as the predicted additional mortality is below both the PBR and also the more precautionary PVA figures, the evidence suggests that there would be no AEoI from collision mortality of gannets either alone or in combination.

7.26 The Applicant's updated values calculated adult loss in combination at 177 birds. This is less than the precautionary PBR and PVA thresholds adopted by NE. Further refinement of this collision mortality was undertaken following advice from NE during the examination. The recalculated total adult mortality loss is 179 adult birds. The changes in predicted collisions during the course of the examination can be seen below in Table 5. NE confirmed that these recalculations do not change their advice as noted above in paragraph 7.25.

Table 5 Changes to collision fatalities for gannet attributed to the Flamborough and Filey Coast pSPA throughout the course of the examination (table based on NE submissions) showing final agreed figures.

Report	**Site**	**In combination**	**Dogger Bank Teesside A&B alone**
Deadline IV	Flamborough and Filey Coast pSPA	184 adults	8 adults
Deadline VI update	Flamborough and Filey Coast pSPA	177 adults	7.6 adults
Deadline VII update	Flamborough and Filey Coast pSPA	179 adults	Not included in NE submission.

7.27 In their SoCG with the Applicant, RSPB highlighted concerns over the use of PBR to assess additional mortality effects on a population through collision or displacement. The RSPB stated that the use of PBR is not appropriate and that PVA should be used to assess the likely additional mortality effects arising from collision or displacement. The Applicant responded by stating that PVA and PBR are useful tools for defining thresholds but selection of appropriate model variations and inputs are important when interpreting these values. During the Examination RSPB outlined their position of disagreement with the avoidance rates presented in the Marine Science Scotland paper. The concerns of the RSPB remained outstanding at the end of the examination.

7.28 As noted above, the SNCBs (including NE) have formally endorsed the use of a 98.9%. The SoS accepts that the use of a 99% AR in this AA is less precautionary than has been endorsed by the SNCBs. However as NE confirmed acceptance of 99% AR during the examination the SoS concludes that this was an acceptable figure to use for this AA. In addition given the available evidence which documents greater avoidance of Offshore Wind Farms ("OWF") by gannets than for many other species and estimates an overall avoidance rate of 99.1% for this species (Krijgsveld *et al* 2011), the SoS is of the opinion that the use of an avoidance rate of 99% for gannets is appropriate.

7.29 Following the further submissions from the Applicant to address NE's concerns, NE confirmed in their submission of 20th November 2014 that all previous offshore ornithological disagreement had been agreed. In this submission they went on to state that they agree with the Applicant that if built Dogger Bank Teesside A & B will not cause an AEoI on any SPA/pSPA site and its seabird features, alone and in combination.

7.30 The SoS agrees that there are significant levels of uncertainty associated with both the scale of future projects and their associated impacts. Future projects also could not be lawfully consented should they be unable to demonstrate that they will not result in an AEoI of a European site. The

SoS is therefore satisfied that the in combination impacts of future projects will be fully assessed at a later stage when they are being considered for consent.

7.31 **The SoS, noting the agreement between NE and the Applicant, concludes that the collision risk from the Project alone and in combination with other projects will not have an adverse effect upon the integrity of the Flamborough and Filey Coast site. She considers that a 99% AR is sufficiently precautionary for gannets and this is in line with previous decisions and scientific publications.**

Habitat loss / alteration

7.32 The RIES identifies a LSE as a result of offshore habitat loss affecting prey availability. The Applicant stated in their application documentation that the development would not have any direct effect on supporting habitat features within the designated SPA but that changes in habitat conditions as a result of development could potentially influence prey resources. This means that any impacts on designated bird populations would be indirect. The Applicant identified that a reduction in prey resources from within seabirds' foraging grounds may decrease their ability to derive sufficient energy to maintain reproductive condition and / or raise young.

7.33 In terms of construction the potential effects relate to:

- Changes in water quality due to increased suspended sediment concentrations and the effect that this may have on fish fauna; and
- An increase in underwater noise levels associated with piling works and general construction activity (e.g. vessel movements) and the impact that this may have on fish species of importance as a prey resource to seabirds.

7.34 In this case however the construction activities are temporary albeit occurring over a long period; however the effects that could impact upon habitat utilisation by seabirds would be localised and temporary and occur within a very extensive offshore area meaning an impact on breeding populations is unlikely.

7.35 The IfAA document concluded that the total area over which increased suspended sediment concentration and subsequent sediment deposition may arise is very small in comparison to the wider distribution of the principal fish species. The sediment transport modelling work undertaken indicates that, even for a worst case scenario, increases in suspended sediment concentration would be unlikely to give rise to biologically significant effects. Increased suspended sediment concentration generated during cable laying operations would be of a temporary nature and adult and juvenile fish would be able to avoid any areas of increased suspended sediment and temporarily use undisturbed areas adjacent to the cable corridor. In addition no gannets were identified by the Applicant within the surveys of the intertidal cable landfall area.

7.36 In the case of underwater noise associated with vessel movement, dredging, trenching and rock dumping for cable protection this may lead to some localised behavioural responses such as avoidance reactions. Fish mortality would not be expected given both the mobility of fish and the likely generated noise levels (e.g. in comparison to pile-driving activities). The movement of the

cable-laying vessel and associated activities can be viewed as a slow-moving, point source of potential disturbance. Local avoidance by fish of areas of water that may be subject to increased noise levels during cable-laying, therefore, would not diminish the prey resource available to foraging birds or affect the overall distribution of prey within foraging grounds normally utilised by birds.

7.37 In terms of the operational effects on seabirds a number of matters were assessed by the Applicant as follows;

- Seabed habitat loss and the effect of this on potential prey species abundance and distribution;
- Physical disturbance to seabed habitats through maintenance activities;
- The influence of increased underwater noise levels on prey species;
- The influence of electro-magnetic frequencies ("EMF") on prey species;
- The role that turbine structures on the seabed may have as novel habitats in the offshore ecosystem;
- Potential changes in fishing activity within the footprint of the wind farm and the implications that this may have with respect to prey availability and abundance; and
- The attraction of turbine structures to birds and their use as platforms for perching and roosting.

7.38 For seabed habitat loss and its impact on potential prey species abundance and distribution the Applicant concluded that the loss of seabed habitat would be very small in the context of the distribution of fish and shellfish species. As such, a significant impact on the prey resource and abundance within the offshore area is not predicted.

7.39 With regards to underwater noise the main source of noise from wind turbines during the operation phase originates from the wind turbine's gearbox and generator. In addition, noise would also result from surface vessels servicing the wind farm. The Applicant predicts low noise levels during the operational phase of the windfarm and as such any risk of significant behavioural disturbance on fish would be limited to the local area immediately surrounding the wind turbine, which, in total, would represent a very small proportion of the area of Dogger Bank Teesside A & B. The Applicant concludes that operational noise would be unlikely to have any significant effects such that detrimental changes in fish populations, abundance and distribution would result within Dogger Bank Teesside A & B.

7.40 The Applicant has considered electromagnetic effects on prey species. Most fish species are able to sense EMFs. For Dogger Bank Teesside A & B, where feasible, cables will be buried. While cable burial does not completely mitigate the influence of EMFs, it reduces exposure of electromagnetically sensitive species to the strongest EMFs. In instances where adequate burial cannot be achieved, alternative protection, such as concrete mattresses, will be used. Fish would, therefore, not be directly exposed to the strongest EMFs as a result of the physical barrier that burial and cable protection would constitute. The Applicant concluded that EMF related effects on sensitive fish would be limited to the immediate vicinity of the cables and, therefore, the magnitude of the effect of EMFs is considered to be small. It is expected that EMFs would only result in short term, temporary behavioural effects to sensitive species, and effects at the level of individual species populations or the fish assemblage would not be expected. In respect of the

species of seabirds that occur with regularity in Dogger Bank Teesside A & B, it should be noted that elasmobranchs and migratory fish would be unlikely to make up a significant component of their diet, which largely comprises small pelagic and demersal fish species (e.g. sand eel, herring). The available evidence, therefore, suggests that fish populations and assemblages would not be affected to any significant degree such that prey resource availability to seabirds would be diminished.

7.41 In relation to turbine structures as novel habitats in the offshore environment the Applicant notes that given the soft seabed environment within Dogger Bank Teesside A & B, subsurface turbine towers and foundations may require scour protection material, requiring hard substrate introduction. Based on evidence from other windfarms the Applicant concludes that the structures would be unlikely to have an adverse effect upon fish populations and the availability of fish as a prey resource to foraging birds. The findings of the monitoring studies suggest there may, in fact, be the potential for subsea structures within Dogger Bank Teesside A & B to be used as nursery and spawning area and/or provide shelter and increased feeding opportunities to some fish, thus potentially increasing the overall availability of prey to seabirds.

7.42 During the operation phase, turbines may provide platforms for perching and roosting birds (Leopold *et al*. 2010) and could also extend foraging ranges by allowing birds to rest. It is possible that if the bases of the structures attract foraging birds there could be a small increase in collision risk. At present, although there is limited quantitative evidence of any effects of micro-habitat creation or alteration, the extent of such benefits or adverse impacts for seabirds are likely to be negligible compared to the size of Dogger Bank Teesside A & B and the wider Dogger Bank Zone.

7.43 NE did not raise habitat loss or alteration during construction or operation as a significant ornithological issue. The RIES notes that the Applicant's conclusions in terms of no AEoI have not been disputed during the examination. In addition in their submission of the 20th November 2014 NE stated that they agree with the Applicant that Dogger Bank Teesside A & B will not cause an adverse effect on any SPA/pSPA site and its seabird features. **The SoS, agrees with the Applicant and NE's conclusions that the prey resource available to foraging seabirds within and adjacent to the Project site would not be adversely affected due to the very small, localised and temporary impact from construction within an extensive offshore area. Therefore, she concludes that habitat loss will not have an AEoI of the Flamborough and Filey coast site**. This impact is not considered further within this report.

Disturbance/ displacement – alone and in combination

7.44 The main sources of disturbance and displacement identified in the IfAA during operation would be associated with the presence of the wind turbines and regular maintenance (for example vessel movement).

7.45 The IfAA notes that for northern gannet, the species may show strong macro-avoidance of offshore wind farms (Krijgsveld *et al*. 2010 and 2011). Hence, following recent JNCC/Natural England (2012) guidance, a 75% displacement rate is applied in the assessment.

7.46 The northern gannet breeding season foraging ranges and the species' wintering range are large meaning the impacts on designated populations of the loss of habitat associated with any one project in the Dogger Bank zone are expected to be minimal (Furness, 2013). However, while the amount of habitat from which birds may be displaced by a single project might be considered minimal for this species, the impacts of cumulative developments may be significant if many are located in high quality habitat.

7.47 The Applicant proposed for gannet a potential displacement related mortality rate of 0% for the Project alone and 5% for their assessment of the cumulative impacts of the project in combination with other wind farm projects. In their Written Representation NE highlighted concerns about the conclusion of no AEoI due to collision mortality of gannets at Dogger Bank Teesside A & B acting jointly with displacement mortality.

7.48 The SoS notes that the RIES states that NE did not raise this concern following submission of their Written Representation. In order to ensure that this issues has been sufficiently assessed the SoS has referred to the information provided for the Dogger Bank Creyke Beck project. For that project NE in their final supplementary ornithological expert report found as a precautionary worst case, an estimated mortality of five and four gannets per annum for the Creyke Beck Project and Teesside respectively. This identified an additional nine gannets to the predicted collision total of 342.7 (351.7) but would not exceed the PBR threshold at $F = 0.4$.

7.49 **The SoS agrees with NE and the Applicant in this matter and concludes that gannet mortality due to displacement will not have an AEoI of the Flamborough and Filey coast pSPA site when considered in combination with collision effects as the PBR thresholds would not be reached by the total mortalities.**

Kittiwake

7.50 As with gannets, a LSE upon the kittiwake interest feature was identified because of the potential for the Project, both alone and in combination with other plans and projects, to increase the risk of collision mortality, habitat loss and disturbance. Regarding habitat loss and the impact on prey resource the impact assessment is the same as for gannets (7.32- 7.43 above) and this is not considered further.

7.51 Displacement could occur to kittiwake in a similar manner to that discussed above for gannet. The RIES records that the Applicant has predicted no displacement impacts on kittiwake during construction and operation. Neither NE nor RSPB raised this as a species of concern with regards to the possible impact of displacement during the examination. The RIES reports that the Applicant's conclusions in terms of no AEoI have therefore not been disputed during the examination. It is therefore not considered further within this report.

Operational Collision Risk

7.52 The mean maximum foraging range estimate for kittiwake is 60km; the Applicant suggests a maximum foraging range of 230km. The location of the Project proposed is at least 130km from the pSPA, which is the closest kittiwake breeding colony.

7.53 The RIES reports the Applicant's apportioning of the annual collision estimate during the breeding season of 54.5 adults representing 0.06% of the pSPA population. For non-breeding birds (summer and winter), 12.6 birds lost through collision are attributed this pSPA, representing 0.01% of the designated pSPA population. In total the loss of adult birds through collision to this pSPA would represent an increase in the background mortality of 1.34%. A PBR of between 400 and 800 adult birds has been calculated by the Applicant for this species.

7.54 The RIES reports that the Applicants view is that losses as a result of Dogger Bank Teesside A and B fall well below the lowest PBR value and therefore there would be no AEoI.

7.55 NE's Written Representation outlined concerns in relation to this conclusion of no AEoI (both for the project alone and in combination) for collisions for this species from the pSPA. This was in relation to which version of the Band model was appropriate for use with the Project and the exclusion of windfarms that were commissioned and operational before the start of bird monitoring for Dogger Bank Teesside A & B. NE also raised concerns that the Applicant had been inconsistent with their use of models and parameters which made it challenging for NE to draw conclusions on the significance of the impact from the in combination assessment.

7.56 The Applicant provided further information to address these concerns and included updated in combination assessment tables for kittiwake for this site. This information applied the same methodology developed and agreed between the Applicant and NE during the examination of Dogger Bank Creyke Beck offshore windfarm. The Applicant provided revised figures for the assessment of collision risk; this provided two versions of the modelled output, NE's view (based on NE's guidance and advice) and the Applicant's view. The RIES notes that the Applicant considered the NE approach to be overly precautionary as it required the use of a 98% avoidance rate for all species, the use of the 'basic band model' and the exclusion of consideration of refined designs for some offshore wind farm projects. NE confirmed that it accepted the additional information from the applicant on which to base its advice.

7.57 In a later representation [REP 286 para 1.13] NE accepted the avoidance rate of 99% for kittiwake and formed its advice on that basis. This is in response to the publication of the Marine Scotland Science paper, as discussed in sections 7.17 and 7.18 above.

7.58 The Applicant updated values used for the kittiwake population at Flamborough Head and Filey Coast pSPA. The calculated adult loss in combination was 372 birds. This is less than the precautionary PBR and PVA thresholds adopted by NE. The changes in predicted collisions during the course of the examination can be seen below in Table 6.

Table 6 Changes to collision fatalities for kittiwake attributed to the Flamborough and Filey Coast pSPA throughout the course of the examination (table based on NE submissions) showing final agreed figures.

Report	**Site**	**In combination**	**Dogger Bank Teesside A&B alone**
Deadline IV	Flamborough and Filey Coast pSPA	206.5 adults	20 adults
Deadline VI update	Flamborough and Filey	372 adults	42 adults

	Coast pSPA		

7.59 The concerns raised by RSPB in relation to gannet in section 7.27 are also applicable here.

7.60 In respect of kittiwake the RIES notes that NE concluded that, accepting an avoidance rate of 99%, there would be no AEoI on kittiwake arising from mortality alone. This conclusion was reached on the basis of both the PBR and PVA analyses available.

7.61 Following the further submissions from the Applicant to address NE's concerns, NE confirmed in their submission on the 20th November 2014 that all previous offshore ornithological disagreement had been agreed. In this submission they went on to state that they agree with the Applicant that if built Dogger Bank Teesside A & B will not cause an AEoI on any SPA/pSPA site and its seabird features, alone and in combination.

7.62 The SoS agrees that there are significant levels of uncertainty associated with both the scale of future projects and their associated impacts. Future projects also could not be lawfully consented should they be unable to demonstrate that they will not result in an adverse effect upon the integrity of a European site. The SoS is therefore satisfied that the in combination impacts of future projects will be fully assessed at a later stage when they are being considered for consent.

7.63 **The SoS, noting the agreement between NE and the Applicant, concludes that the collision risk from the Project alone and in combination with other projects will not have an adverse effect upon the integrity of the Flamborough and Filey Coast site. She considers that a 99% AR is sufficiently precautionary for kittiwakes and this is in line with previous decisions and scientific publications.**

Guillemot and Razorbill

Alone and in combination

7.64 The latest (2013) bird counts at the Flamborough and Filey Coast pSPA were recorded as being 41,607 common guillemots (16,150 breeding pairs) and 10,570 razorbills (5,133 pairs). The RIES notes that a particular focus of dispute during the examination was the predicted mortality/displacement figures for these two species during the operation of the proposed development, both alone and in combination with other projects. Furness *et al* (2013) reported that guillemots and razorbills are relatively prone to disturbance/displacement effects in comparison with other seabirds. Other LSEs listed within the RIES such as habitat loss and prey resource have already previously been discounted by this report.

7.65 The RIES notes that in relation to razorbill and guillemot at the Flamborough and Filey coast pSPA, the Applicant does not predict significant effects in terms of collision risk. In response to a question by the ExA relating to bird species of concern for collision risk these species were not raised by Interested Parties (including NE and RSPB) and the conclusion of no AEoI have not been disputed during the examination. The SoS accepts this position and does not consider this further in this section of the AA.

7.66 Displacement during construction can be viewed as the beginning of the displacement impact for the entire lifecycle of the project, the magnitude of the impact may vary as construction

progresses through to operation. The Applicant assessed the displacement impact for species and SPAs (or pSPAs) solely for the operational phase of the project. NE confirmed at the first ISH that they accepted this approach as construction effects are predicted to be smaller than those predicted during the operational phase and over a smaller period of time.

7.67 In respect of common guillemot and razorbill, displacement of these birds could cause significant mortality by causing an effective loss of foraging resource. Those auks that are displaced from the wind farm site and the surrounding area are likely to suffer from increased mortality as they will need to compete with other birds for scarcer resources. It is the magnitude of that mortality which will determine whether the project will result in an adverse effect upon the species.

7.68 There is a two-stage process to evaluating the magnitude of the displacement effects. First, it must be determined what proportion of the site's population which will be displaced. Then secondly; the proportion of those individuals that will suffer mortality as a result of density-dependent effects needs to be calculated.

7.69 Based on information from Furness and Wade (2012) the Applicant has identified sensitivity scores for species and assigned displacement rates from 0% - 100% to use in the assessment. This is shown below in *Table 7*.

Vulnerability to disturbance	**Species/Species Group**	**Displacement rate based on relative sensitivity (%)**
Very High	Common scoter, velvet scoter, red-throated diver, great northern diver, black throated diver.	100
High	Common goldeneye, great cormorant, greater scaup.	75
Medium	Common elder, long-tailed duck, great-crested grebe, slavonian grebe, shag, razorbill, black guillemot, common guillemot.	50
Low	Northern gannet, herring gull, great black-backed gull, little tern, little auk, black-headed gull, common gull, lesser black-backed gull, black-legged kittiwake, sandwich tern, common tern, roseate tern, artic tern, atlantic puffin.	25
Very Low	Great skua, northern fulmar, sooty shearwater, manx shearwater, European storm petrel, Leach's storm-petrel, arctic skua, little gull.	0

Table 7 *Species Sensitivity to disturbance and rates of disturbance for seabirds in relation to operational windfarms taken forward in the IfAA assessment.*

7.70 As can be seen from *Table 7* both common guillemot and razorbill have been identified as having a displacement rate of 50%. For these species, a 2km buffer has been used in calculating the displacement effect on birds that may be present outside of the developed area. This is in line with the recommended approach set out in JNCC/NE (2012). The Applicant's approach included variable displacement rates in two bands of distance from the wind farm: 0-1km, 75% of the displacement rate for the wind farm; and 1km-2km, 25% of the displacement rate.

7.71 NE raised concern in their relevant representation over displacement effects on common guillemot and razorbill associated with the development, particularly in relation to the use of a variable displacement rate across the windfarm development zone and buffer and advised that

displacement effects should be assessed at a constant rate within the defined buffer area until such a time that evidence suggests otherwise.

7.72 NE also disagreed with the Applicant's assertion that displacement effects should be viewed as a one off loss and would not be repeated annually. NE's view is that displacement and associated mortality should be considered as a year on year effect and hence the impacts from different projects should be added together and compared against thresholds derived from models such as PBR and PVA.

7.73 The Applicant provided further information to address these concerns and included updated in combination assessment tables for common guillemot and razorbill for this site. This information applied the same methodology developed and agreed between the Applicant and NE during the examination of Dogger Bank Creyke Beck offshore windfarm.

7.74 The Applicant provided revised figures which allowed NE to consider the predicted mortality figures as a year–on-year comparison to potential biological removal (PBR) thresholds, in addition they produced revised calculations based on a fixed level of displacement throughout the 2km buffer zone (this was agreed with NE).

7.75 The RIES records that in NE's final advice, they conclude that there would be no AEoI for the project alone or in combination under all scenarios. These scenarios include assumptions of 70% displacement and 10% mortality that are the upper end of the range of effects NE advise that can be considered. For common guillemot in the worst case in combination scenario the calculated mortality of 1,052 adults exceeds the PBR, for razorbill the calculated mortality of 383 adults also exceeds the PBH, however NE confirmed for both species that as this threshold is exceeded only under the worst case scenario they could conclude on balance no AEoI alone and in combination.

7.76 The Applicant updated the apportioning values following the finalisation of the BDMPS report. For the most precautionary displacement mortality and the most recent update scenario a total loss of 622 adult common guillemot is predicted. This is less than the PBR threshold of 970 birds (at f=0.3) which NE use to judge the potential displacement impact. For the most precautionary displacement mortality and the most recent update scenario a total loss of 128 adult razorbill is predicted.

7.77 The concerns raised by RSPB in section 7.27 are also applicable here.

7.78 **The SoS has reviewed all this evidence and agrees with the SNCB, the Applicant and the ExA and has found no AEoI from the project alone on this SPA.**

7.79 The projects included in the Applicant's in combination assessment were disputed by NE. NE were concerned about the exclusion of windfarms that were commissioned and operational before the start of bird monitoring for Dogger Bank Teesside A & B. NE also raised concerns that the Applicant had been inconsistent with their use of models and parameters which made it challenging for NE to draw conclusions on the significance of the impact from the in combination assessment.

7.80 Following agreement with NE, the Applicant updated the in combination assessment to reflect the revised apportioning approach (for the sites and species of concern) developed during examination of the Dogger Bank Creyke Beck. The Applicant used this approach to provide updated in combination tables for the key sites and species of concern identified and agreed with NE. At this time the Applicant included an additional windfarm project, Navitus Bay.

7.81 Following these submissions, NE confirmed in their submission on the 20th November 2014 that all previous offshore ornithological disagreement had been agreed. In this submission they went on to state that they agree with the Applicant that if built Dogger Bank Teesside A & B will not cause an AEoI on any SPA/pSPA site and its seabird features, alone and in combination. In addition the Panel report noted that NE clarified in their submission of the 11th December 2014 that they could advise that AEoI can be excluded with regard to guillemot and razorbill.

7.82 The SoS agrees that there are significant levels of uncertainty associated with both the scale of future projects and their associated impacts. Future projects also could not be lawfully consented should they be unable to demonstrate that they will not result in an AEoI of a European site. The SoS is therefore satisfied that the in combination impacts of future projects will be fully assessed at a later stage when they are being considered for consent.

7.83 **In agreement with NE, the ExA and the Applicant, the SoS concludes that predicted guillemot and razorbill mortality due to displacement will not have an AEoI of the Flamborough and Filey coast site.**

Puffin

7.84 Stroud et al (2004) recorded 3,473 pairs of breeding bird at this site; however NE data from 2013 suggests the site now supports only 490 pairs. This section of the AA considers displacement effects on puffin. Other LSEs listed within the RIES such as habitat loss and prey resource have already been discounted by this report.

7.85 The RIES notes that in relation to puffin at the Flamborough and Filey coast pSPA, the Applicant does not predict significant effects in terms of collision risk. In response to a question by the ExA relating to bird species of concern for collision risk this species was not raised by Interested Parties (including NE and RSPB) and the conclusion of no AEoI has not been disputed during the examination. The SoS accepts this position and does not consider this further in this section of the AA.

7.86 Displacement during construction can be viewed as the beginning of the displacement impact for the entire lifecycle of the project, the magnitude of the impact may vary as construction progresses through to operation. The Applicant assessed the displacement impact for species and SPAs (or pSPAs) solely for the operational phase of the project. NE confirmed at the first ISH that they accepted this approach as construction effects are predicted to be smaller than those predicted during the operational phase and over a smaller period of time. NE concluded the construction phase will have no significant effect on atlantic puffin.

7.87 In respect of puffin, displacement of these birds could cause significant mortality by causing an effective loss of foraging resource. Those auks that are displaced from the wind farm site and the surrounding area are likely to suffer from increased mortality as they will need to compete with other birds for scarcer resources. It is the magnitude of that mortality which will determine whether the project will result in an adverse effect upon the species.

7.88 As noted above in section 7.68, there is a two-stage process to evaluating the magnitude of the displacement effects. As noted in *Table 7* puffin are considered to have low vulnerability to disturbance. A precautionary displacement rate of 25% and mortality rate of 5% were identified by the Applicant. For puffin, a 2km buffer has been used in calculating the displacement effect on birds that may be present outside of the developed area. This is in line with the recommended approach set out in JNCC/NE (2012). The Applicant's approach included variable displacement rates in two bands of distance from the wind farm: 0-1km, 75% of the displacement rate for the wind farm; and 1km-2km, 25% of the displacement rate.

7.89 NE raised concern in their relevant representation over displacement effects on common puffin associated with the development, particularly in relation to the use of a variable displacement rate across the windfarm development zone and buffer and advised that displacement effects should be assessed at a constant rate within the defined buffer area until such a time that evidence suggests otherwise.

7.90 NE also disagreed with the Applicant's assertion that displacement effects should be viewed as a one off loss and would not be repeated annually. NE's view is that displacement and associated mortality should be considered as a year on year effect and hence the impacts from different projects should be added together and compared against thresholds derived from models such as PBR and PVA.

7.91 The RIES notes that NE/JNCC highlighted puffin at the Flamborough and Filey coast pSPA as a species of concern for the HRA. However NE did not raise puffin as a species of concern in HRA terms in their written representation or response to questions raised by the ExA. The RIES notes that NE stated at the 3rd ISH on natural environment and biodiversity that puffin is neither a named feature nor an important component of the Flamborough and Filey coast pSPA and as such is not a HRA concern. In addition the RIES notes that RSPB did not highlight puffin as a species of concern in terms of displacement mortality.

7.92 The SoS notes the advice from NE with regards to puffin not being a species of concern for HRA. The SoS concludes in agreement with NE, the ExA and the Applicant, that predicted puffin mortality due to displacement will not have an AEoI of the Flamborough and Filey coast pSPA. **The SoS is therefore satisfied that there will not be an adverse effect on the integrity of Flamborough and Filey coast pSPA for species of auk.**

Flamborough Head and Bempton Cliffs SPA

8.0 In July 2013, NE were granted approval to begin formal consultation on an extension of the Flamborough Head and Bempton cliffs SPA. The revised SPA is referred to and discussed above as Flamborough Head and Filey Coast pSPA. The revised site is intended to include the Flamborough Head and Bempton cliffs SPA plus additional areas supporting seabird colonies. The RIES notes that the pSPA is based on a revised site boundary, revised interest features and new reference populations. The pSPA is still waiting for confirmation.

8.1 The ExA noted that the current Natura 2000 form for Flamborough Head and Bempton Cliffs SPA includes black legged kittiwake as the only qualifying feature of the SPA, the ExA noted that it also included a seabird assemblage of international importance. The designated interest features of the SPA which were the focus of the examination are:

- Kittiwakes
- Breeding assemblage (gannet, guillemot, razorbill, puffin)

Table 8 Conservation objectives for the Flamborough Head and Bempton Cliffs SPA.

Conservation Objectives	Avoid the deterioration of the habitats of the qualifying features, and significant disturbance of the qualifying features, ensuring the integrity of the site is maintained and the site makes a full contribution to achieving the aims of the Birds Directive. Subject to natural change, to maintain or restore: Ø The extent and distribution of habitats of the qualifying features Ø The structure and function of the habitats of the qualifying features Ø The supporting processes on which the habitats of the qualifying features rely Ø The distribution of the qualifying features within the site The qualifying features to which the conservation objectives refer are: Ø Black-legged kittiwake (*Rissa tridactyla*) (breeding) Ø Northern gannet (*Morus bassanus*) Ø Seabird assemblage

8.2 The RIES summarises NE's advice on how this site should be assessed. NE confirmed that pSPAs are to be dealt with in exactly the same manner as SPAs. NE explained that the Flamborough and Filey Coast pSPA, supersedes the Flamborough Head and Bempton Cliffs SPA and the Applicant was instructed by NE to use the pSPA qualifying features as the basis of their assessment. The Applicant provided separate screening and integrity matrices for the Flamborough Head and Bempton Cliffs SPA and the Flamborough and Filey Coast pSPA. NE confirmed that it is necessary, under the Habitats Regulations, to consider both the designations of the original SPA and the new pSPA in the assessment. The pSPA is considered above.

8.3 The assessment for the Flamborough and Filey Coast pSPA (in Section 7.0) has considered in detail all of the impacts expected to affect the interest features for the original Flamborough Head and Bempton Cliffs SPA.

8.4 Given the overlap of interest features between the 2 sites, there is no requirement to repeat the assessment of the impacts of the Project for the features of the Flamborough Head and Bempton Cliffs SPA. For a detailed assessment of the impacts, please refer to section 7.

8.5 **On the basis of the analysis and conclusions reached in section 7, the SoS is satisfied that the Project, when considered both alone and in combination with other plans and projects, will not have an AEoI of the Flamborough Head and Bempton Cliffs SPA. This conclusion is in line with advice from both the ExA and NE as noted in the ExA report.**

Farne Islands SPA

9.0 The Farne Islands are a group of rocky offshore islands located between 2-6 km off the Northumberland coast. The site's citation[5] describes them as islands formed of quartz dolerite, the most easterly outcropping of the Great Whin Sill, with some capping of boulder clay or peaty soils on certain islands. Vegetation is poor and mostly limited to pioneer communities. The islands are an important nesting area for birds, especially terns, gulls and auks. The seabirds feed outside the SPA in the nearby waters, as well as more distantly in the North Sea.

Table 9 Conservation objectives for the Farne Islands SPA.

Conservation Objectives	**Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring (Subject to natural change, to maintain or restore);** Ø The extent and distribution of habitats of the qualifying features. Ø The structure and function of the habitats of the qualifying features. Ø The supporting processes on which the habitats of the qualifying features rely. Ø The population of each of the qualifying features, and, Ø The distribution of the qualifying features within the site. The qualifying features to which the conservation objectives refer are: Ø Sandwich tern *Sterna sandvicensis* (Breeding) Ø Common tern *Sterna hirundo* (Breeding) Ø Arctic tern *Sterna paradisaea* (Breeding) Ø Seabird assemblage

9.1 The ExA noted that the current Natura 2000 form for the Farne Islands SPA (dated 1985) includes common tern, Arctic tern, and sandwich tern as the qualifying features of the SPA. The UK SPA review (dated 2001) also includes guillemot and puffin as qualifying features, together with a seabird assemblage of international importance. The seabird assemblage includes kittiwake and razorbill. The Applicant considered the UK SPA review species in addition to the qualifying species.

9.2 The features which were the focus of the examination for this site are:

- Puffin (breeding)
- Common guillemot (breeding)
- Black legged kittiwake
- Razorbill

[5] http://publications.naturalengland.org.uk/file/5184544386842624 *&* http://jncc.defra.gov.uk/page-1990-theme=default

9.3 The RIES indicated that there was an LSE on this site because of increases in collision risk, habitat loss and disturbance as a result of the Project alone and in combination with other plans and projects.

9.4 The RSPB did not raise concerns in relation to the Farne islands SPA, this was agreed within their SoCG with the Applicant.

9.5 It should be noted that the discussion and conclusions on habitat loss /alteration in sections 7.32 to 7.43 above are applicable to this site and as such are not discussed here.

9.6 The RIES notes that the conclusion of no AEoI in terms of barrier effects has not been disputed during the examination in relation to any European sites or qualifying features. The SoCG between NE and the Applicant notes that there are no outstanding concerns regarding the assessment of barrier effects at a project alone and cumulative or in combination level. As such this is not considered further.

Kittiwake

9.7 Kittiwakes were identified as part of the assemblage at this SPA by the 2001 SPA review (Stroud *et al*. 2001). The Dogger Bank Teesside A&B project is outside the maximum foraging range for kittiwake (230km) that could derive from the Farne Islands SPA.

9.8 The Applicant did not predict any displacement impact associated with the proposed development for kittiwake. In response to questions from the ExA relating to species of concern in terms of displacement mortality, NE did not list kittiwake as such a species. RSPB's response to the same question also did not list kittiwake as a species of concern. The Applicant's conclusion of no AEoI has therefore not been disputed during the examination.

9.9 Using a 98% avoidance rate, collision risk modelling analysis by the Applicant provided an estimate of 107 (56 during the breeding season and 52 outside the breeding season) collisions per year attributable to SPA designated populations of this species.

9.10 The IfAA notes for SPAs located outside of the maximum foraging range of Dogger Bank Teesside A & B, the apportioned collision losses (involving non-breeding birds only) would represent 0.01% of the designated populations. The IfAA notes that whilst black-legged kittiwake populations at many SPAs have declined significantly in the past couple of decades, these estimated losses are not considered to be significant at the population level. The IfAA states that for all of the SPAs where collision losses would affect non-breeding birds only, the estimated increase in the rate of background mortality is calculated as 0.17%, again indicating that the calculated collision losses are not significant.

9.11 The RIES notes that in relation to this SPA in particular, apportioning of the annual collision estimate during the breeding season attributes a collision loss of 1.12 adults (0.01% of the SPA population). In total the loss of adult birds through collision at this SPA would represent an increase in the background mortality of 0.17%.

9.12 NE's Written Representation outlined concerns in relation to the conclusion of no AEoI (both for the project alone and in combination) for collisions for this species from the SPA. This was in relation to which version of the Band model was appropriate for use with the Project. The Applicant provided further information to address these concerns and included updated in combination assessment tables for kittiwake for this site. This information applied the same methodology developed and agreed between the Applicant and NE during the examination of Dogger Bank Creyke Beck offshore windfarm. The Applicant provided revised figures for the assessment of collision risk; this provided two versions of the modelled output, NE's view (based on NE's guidance and advice) and the Applicant's view. The RIES notes that the Applicant considered the NE approach to be overly precautionary as it required the use of a 98% avoidance rate for all species, the use of the 'basic band model' and the exclusion of consideration of refined designs for some offshore wind farm projects. NE confirmed that it accepted the additional information from the applicant on which to base its advice.

9.13 In a later representation [REP 286 para 1.13] NE accepted the avoidance rate of 99% for kittiwake and formed its advice on that basis. This is in response to the publication of the Marine Scotland Science paper, as discussed in sections 7.17 and 7.18 above.

9.14 NE's submission of the 11th December sets out how the collision fatalities attributed to this site has changed during the examination as shown below in Table 10.

Table 10 Changes to collision fatalities for kittiwake attributed to the Farne Islands SPA throughout the course of the examination (table based on NE submissions) showing final agreed figures.

Report	Site	In combination	Dogger Bank Teesside A&B alone
Deadline IV	Farne Islands SPA	19.7 adults	2.18 adults
Deadline VI update	Farne Islands SPA	30 adults	3.14 adults

9.15 In respect of kittiwake the RIES notes that NE concluded that there would be no AEoI on kittiwake arising from mortality alone or in combination. This conclusion remained following further work carried out by the Applicant in line with the BDMPS report (discussed further in section 7.25 above) which provided a figure of 30 adult birds lost in combination. This is less than the precautionary PBR threshold adopted by NE.

9.16 **The SoS agrees with the ExA, NE and the Applicant in relation to this matter and concludes that predicted Kittiwake mortality due to collision will not have an AEoI of the Farne Islands SPA.**

Guillemot and Razorbill

9.17 The RIES notes that Razorbill is not a qualifying feature of the Farne islands SPA. The ExA note that it is not identified on the JNCC website for this site (or on the Natura 2000 data form). However it was listed as a feature of concern in terms of the Applicant's conclusion of no AEoI for the Farne islands SPA by NE in their written representation. The SoS has decided to consider

razorbill alongside guillemot due to the species similarity in terms of potential effects as a result of the Project.

9.18 The JNCC website notes that during the breeding season there are 23,499 pairs of guillemot representing at least 1.0% of the breeding East Atlantic population.

9.19 The RIES notes that in relation to guillemot and razorbill at the Farne islands SPA, the Applicant does not predict significant effects in terms of collision risk. In response to a question by the ExA relating to bird species of concern for collision risk these species were not raised by Interested Parties (including NE and RSPB) and the conclusion of no AEoI have not been disputed during the examination. The SoS accepts this position and does not consider this further.

9.20 Displacement during construction can be viewed as the beginning of the displacement impact for the entire lifecycle of the project, the magnitude of the impact may vary as construction progresses through to operation. The Applicant assessed the displacement impact for species and SPAs solely for the operational phase of the project. NE confirmed at the first ISH that they accepted this approach as construction effects are predicted to be smaller than those predicted during the operational phase and over a smaller period of time.

9.21 In respect of common guillemot and razorbill, displacement of these birds could cause significant mortality by causing an effective loss of foraging resource. Those auks that are displaced from the wind farm site and the surrounding area are likely to suffer from increased mortality as they will need to compete with other birds for scarcer resources. It is the magnitude of that mortality which will determine whether the project will result in an adverse effect upon the species.

9.22 There is a two-stage process to evaluating the magnitude of the displacement effects, as discussed above in section 7.68. As listed in *Table 7* both guillemot and razorbill have been identified as having a displacement rate of 50%. The mortality rate has been identified at 5%. For these species, a 2km buffer has been used in calculating the displacement effect on birds that may be present outside of the developed area. This is in line with the recommended approach set out in JNCC/NE (2012). The Applicant's approach included variable displacement rates in two bands of distance from the wind farm: 0-1km, 75% of the displacement rate for the wind farm; and 1km-2km, 25% of the displacement rate.

9.23 Natural England raised concern in their relevant representation over displacement effects on common guillemot and razorbill associated with the development, particularly in relation to the use of a variable displacement rate across the windfarm development zone and buffer and advised that displacement effects should be assessed at a constant rate within the defined buffer area until such a time that evidence suggests otherwise.

9.24 NE also disagreed with the Applicant's assertion that displacement effects should be viewed as a one off loss and would not be repeated annually. NE's view is that displacement and associated mortality should be considered as a year on year impact.

9.25 The Applicant provided further information to address these concerns and included updated in combination assessment tables for common guillemot and razorbill for this site. This information

applied the same methodology developed and agreed between the Applicant and NE during the examination of Dogger Bank Creyke Beck offshore windfarm.

9.26 The Applicant provided revised figures which allowed NE to consider the predicted mortality figures as a year–on-year comparison to potential biological removal (PBR) thresholds, in addition they produced revised calculations based on a fixed level of displacement throughout the 2km buffer zone (this was agreed with NE).

9.27 These scenarios include assumptions of 70% displacement and 10% mortality that are the most precautionary displacement mortality scenarios provided by the Applicant following publication of the BDMPS report (as discussed in section 7.25 above). For common guillemot this gives a calculated mortality of 400 adults, this is less than the PBR threshold of 782 birds. For razorbill the calculated mortality was 3.6 adult birds was predicted, this value is less than the PBR threshold of 13 birds. The RIES records that NE concluded that there would be no adverse effect for the project alone from displacement for these species.

9.28 **The SoS has reviewed the evidence and agrees with the SNCB, the Applicant and the ExA and has found no AEoI from the project alone on these features of this SPA.**

9.29 The projects included in the Applicant's in combination assessment were disputed by NE. NE were concerned about the exclusion of windfarms that were commissioned and operational before the start of bird monitoring for Dogger Bank Teesside A & B. NE also raised concerns that the Applicant had been inconsistent with their use of models and parameters which made it challenging for NE to draw conclusions on the significance of the impact from the in combination assessment.

9.30 Following agreement with NE, the Applicant updated the in combination assessment to reflect the revised apportioning approach (for the sites and species of concern) developed during examination of the Dogger Bank Creyke Beck offshore windfarm project. The Applicant used this approach to provide updated in combination tables for the key sites and species of concern identified and agreed with NE. At this time the Applicant included an additional windfarm project, Navitus Bay.

9.31 Following these submissions, NE confirmed in their submission of the 20th November 2014 that all previous offshore ornithological disagreement had been agreed. In this submission they went on to state that they agree with the Applicant that if built Dogger Bank Teesside A & B will not cause an AEoI on any SPA/pSPA site and its seabird features, alone and in combination.

9.32 **In agreement with NE, the ExA and the Applicant, the SoS concludes that predicted guillemot and razorbill mortality due to displacement from the project alone or in combination with other plans/projects will not have an AEoI of the Farne Island SPA.**

Puffin

9.33 The JNCC website notes that during the breeding season there are 34,710 pairs of puffin representing at least 3.9% of the breeding population.

9.34 The RIES identifies a LSE for displacement for puffin from the project alone and in combination with other projects and plans.

9.35 The RIES notes that in relation to puffin at the Farne Islands SPA, the Applicant does not predict significant effects in terms of collision risk. In response to a question by the ExA relating to bird species of concern for collision risk these species were not raised by Interested Parties (including NE and RSPB) and the conclusion of no AEoI has not been disputed during the examination. The SoS accepts this position and does not consider this further.

9.36 Displacement during construction can be viewed as the beginning of the displacement impact for the entire lifecycle of the project, the magnitude of the impact may vary as construction progresses through to operation. The Applicant assessed the displacement impact for species and SPAs solely for the operational phase of the project. NE confirmed at the first ISH that they accepted this approach as construction effects are predicted to be smaller than those predicted during the operational phase and over a smaller period of time. NE concluded the construction phase will have no significant effect on atlantic puffin.

9.37 In respect of puffin, displacement of these birds could cause significant mortality by causing an effective loss of foraging resource. Those auks that are displaced from the wind farm site and the surrounding area are likely to suffer from increased mortality as they will need to compete with other birds for scarcer resources. It is the magnitude of that mortality which will determine whether the project will result in an adverse effect upon the species.

9.38 As noted above in section 7.68 there is a two-stage process to evaluating the magnitude of the displacement effects. *Table 7* shows puffin are considered to have low vulnerability to disturbance. A precautionary displacement rate of 25% and mortality rate of 5% were identified by the Applicant. For puffin, a 2km buffer has been used in calculating the displacement effect on birds that may be present outside of the developed area. This is in line with the recommended approach set out in JNCC/NE (2012). The Applicant's approach included variable displacement rates in two bands of distance from the wind farm: 0-1km, 75% of the displacement rate for the wind farm; and 1km-2km, 25% of the displacement rate.

9.39 NE raised puffin in their relevant representation as a species of concern. However NE did not raise puffin as a species of concern in HRA terms in their written representation. NE's written summary of their oral case at the first ISH did list puffin at the Farne islands SPA as an area of disagreement. This was in relation to displacement effects on puffin, particularly in relation to the use of a variable displacement rate across the windfarm development zone and buffer. NE advised that displacement effects should be assessed at a constant rate within the defined buffer area until such a time that evidence suggests otherwise. NE also disagreed with the Applicant's assertion that displacement effects should be viewed as a one off loss and would not be repeated annually. NE's view is that displacement and associated mortality should be considered as a year on year effect.

9.40 The RIES reports that following further information provided by the Applicant, Natural England agreed with the Applicant that the PBR threshold for puffin was unlikely to be exceeded either

alone or in combination. NE agreed with the Applicant's conclusion of no AEoI from the project alone and that for in combination effects no further work was required for this species at this site due to non-discernible contribution from the site alone.

9.41 **The SoS concludes that predicted impacts on puffins from the Project alone and in combination with other projects will not have an AEoI of the Farne Islands SPA.**

Forth Islands SPA

10.0 The Forth Islands are located in or near to the Firth of Forth on the east coast of central Scotland[6]. The SPA comprises a series of separate islands or island groups, principally Inchmickery (together with the nearby Cow and Calves) off Edinburgh, Fidra, Lamb and Craigleith together with the Bass Rock off North Berwick, and the much larger Isle of May in the outer part of the Firth. The site also includes additional other small islands. The inner islands are very low lying whilst those in the outer Firth are higher, steeper and rockier. This applies especially to the Bass Rock which is a volcanic plug rising to over 100 m, and to the Isle of May, which is surrounded by cliffs up to 50 m. The islands support important numbers of a range of breeding seabirds, in particular terns, auks and gulls. The colony of Gannets *Morus bassanus* is the largest on the east coast of the UK. The seabirds feed outside the SPA in nearby waters, as well as more distantly in the North Sea.

Table 11 Conservation objectives for the Forth Islands SPA.

Conservation Objectives	To avoid deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and To ensure for the qualifying species that the following are maintained in the long term: Ø Population of the species as a viable component of the site Ø Distribution of the species within site Ø Distribution and extent of habitats supporting the species Ø Structure, function and supporting processes of habitats supporting the species Ø No significant disturbance of the species This site also qualifies under Article 4.2 of the Directive (79/409/EEC) by supporting populations of European importance of the following migratory species: Ø Puffin *Fratercula arctica* Ø Lesser black-backed gull *Larus fuscus* Ø Gannet *Morus bassanus* Ø Shag *Phalacrocorax aristotelis* The area qualifies under Article 4.2 of the Directive (79/409/EEC) by regularly supporting at least 20,000 seabirds (a seabird assemblage of international importance).

10.1 The site is 190km from the export cable corridor and 309km from the offshore windfarm itself. The RIES notes that the features disputed during the examination for this site were black legged

[6] *http://jncc.defra.gov.uk/page-1970*

kittiwake, common guillemot, northern gannet (breeding), puffin (breeding) and razorbill. The RIES found LSE as a result of habitat loss, displacement, collision risk and in combination effects.

10.2 SNH are the statutory nature conservation body responsible for this site.

10.3 It should be noted that the discussion and conclusions on habitat loss /alteration relating to habitat loss in sections 7.32 onwards are applicable to this site. The conclusions on barrier effects in section 9.6 are also relevant here. The RIES notes SNH and RSPB did not raise this as an area of disagreement and as such it is not discussed further.

Gannet

10.4 The JNCC website notes that the site supports 34,400 pairs of gannet representing at least 13.1% of the breeding North Atlantic population (count as at 1994).

10.5 The RIES notes that the Project is not within the maximum foraging range of gannet (230km) that could derive from this SPA, however, on the basis of tagging data, it is possible that birds from this SPA may forage within the Dogger Bank zone.

10.6 The IfAA notes that for northern gannet, the species may show strong macro-avoidance of offshore wind farms (Krijgsveld *et al*. 2010 and 2011). Following recent JNCC/NE (2012) guidance, a 75% displacement rate was applied in the assessment. The Applicant concluded a 0% mortality rate in terms of displacement of northern gannet for the project alone.

10.7 During the examination SNH and RSPB did not identify northern gannet as a species of concern in terms of displacement mortality. The RIES states that the Applicant's conclusions of no AEoI from displacement mortality for gannet have not been disputed.

10.8 The IfAA calculated that apportioning of the annual collision estimate during the breeding season attributes a collision loss of 14.1 adults representing 0.01% of the SPA population. For non-breeding birds (summer and winter), 20.5 birds lost through collision are attributed to this SPA population, representing 0.01% of the designated SPA population. In total the loss of adult birds through collision at this SPA would represent an increase in background mortality of 0.36%. The Applicant's view is that this falls below the threshold for AEoI.

10.9 SNH raised in combination mortality arising from collision as an area of concern during the examination. It should be noted that SNH agree to the Applicant's conclusion in terms of the project alone.

10.10 The concerns raised by RSPB in section 7.27 are also applicable here.

10.11 In correspondence between the Applicant and SNH submitted in October 2014 for deadline V SNH stated that the numbers of gannets that the Project is likely to kill are very small and well short of the mortality required for this proposal on its own to have a LSE on Scottish SPA populations. SNH note that in terms of cumulative impacts the mortality from this proposal is less than 1% of the estimated effects of the three Forth and Tay windfarms. SNH conclude that given the difference in magnitude and the unknown but probably large amount of uncertainty associated with collision risk estimates these small additional levels of mortality are likely to be trivial but they could not advise that for certain.

10.12 The RIES summarised evidence available to the ExA at the date of its production as identifying no AEoI for the Forth Islands SPA.

10.13 The SoS agrees that there are significant levels of uncertainty associated with both the scale of future projects and their associated impacts. **The SoS has had regard for the advice from RSPB but defers to the advice of SNH as the SNCB and agrees with SNH, the Applicant and the ExA that there will not be an AEoI for gannet as a result of the project, alone or in combination.**

Kittiwake

10.14 Kittiwake is part of the seabird assemblage for this site.

10.15 The RIES notes that the Applicant did not predict any displacement impact associated with the proposed development on kittiwake. SNH and RSPB did not identify kittiwake as a species of concern in terms of displacement mortality. The Applicant's conclusion of no AEoI was not disputed during the examination.

10.16 The Project is outside the maximum foraging range of kittiwake (230km) that could derive from the Forth islands SPA. Using a 98% avoidance rate, collision risk modelling analysis by the Applicant provided an estimate of 134 (87 during the breeding season and 48 outside the breeding season) based on the mean of collisions estimates. Of these 134 birds, assuming that 80% form part of designated SPA populations, the total number of collisions attributable to SPAs is 107 (56 during the breeding season and 52 outside the breeding season).

10.17 For SPAs located outside of the maximum foraging range of Dogger Bank Teesside the IfAA states that apportioning of the annual collision estimate (i.e. non-breeding birds in summer and winter), attributes a collision loss of 1.07 adults representing 0.01% of the SPA population. This would represent an increase in the background mortality of 0.17%.

10.18 During the examination SNH raised in combination mortality arising from collision outside the breeding season as an area of concern.

10.19 SNH note that in terms of cumulative impacts the mortality from this proposal is less than 1% of the estimated effects of the three Forth and Tay windfarms. SNH conclude that given the difference in magnitude and the unknown but probably large amount of uncertainty associated with collision risk estimates these small additional levels of mortality are likely to be trivial but they could not advise that for certain.

10.20 The Applicant found that the losses of black-legged kittiwake that could occur as a result of collision would not have any consequences at population levels, both for the Project alone and in combination with other assessed plans and projects. They therefore concluded that there was no AEoI on this feature of the Forth Island SPA.

10.21 The concerns raised by RSPB in section 7.27 are also applicable here.

10.22 **Given the very small impact for kittiwake it is concluded that alone and in combination with other projects collision impacts would not constitute an adverse effect on the Forth Islands SPA.**

Guillemot and Razorbill

10.23 Guillemot and razorbill are part of the seabird assemblage for this site.

10.24 The RIES notes that in relation to guillemot and razorbill at the Forth Islands SPA, the applicant does not predict significant effects in terms of collision risk. In addition these species were not raised by any Interested Parties, including SNH and RSPB and the conclusions of no AEoI have not been disputed during the examination.

10.25 Displacement was identified as a LSE for these two species. Displacement during construction can be viewed as the beginning of the displacement impact for the entire lifecycle of the project, the magnitude of the impact may vary as construction progresses through to operation. The Applicant assessed the displacement impact for species and SPAs solely for the operational phase of the project.

10.26 In respect of guillemot and razorbill, displacement of these birds could cause significant mortality by causing an effective loss of foraging resource. Those auks that are displaced from the wind farm site and the surrounding area are likely to suffer from increased mortality as they will need to compete with other birds for scarcer resources. It is the magnitude of that mortality which will determine whether the project will result in an adverse effect upon the species.

10.27 There is a two-stage process to evaluating the magnitude of the displacement effects, as discussed in sections 7.68. As listed in *Table 7* both guillemot and razorbill have been identified as having a displacement rate of 50%. The mortality rate has been identified at 5%. For these species, a 2km buffer has been used in calculating the displacement effect on birds that may be present outside of the developed area. This is in line with the recommended approach set out in JNCC/NE (2012). The Applicant's approach included variable displacement rates in two bands of distance from the wind farm: 0-1km, 75% of the displacement rate for the wind farm; and 1km-2km, 25% of the displacement rate.

10.28 The IfAA states that apportioning estimates to individual protected sites indicates that for all of the SPAs within maximum foraging range during the breeding season less than 0.1% of the guillemot populations could potentially be affected. The average increase in flight distance due to the barrier presented by Dogger Bank Teesside A & B is approximately 25km (7.4% of the common guillemot's maximum foraging range of 340km). The proposed development area is between 164km and 340km from the protected sites within foraging range that potentially could be exposed to this effect. This increase might prevent birds from this site reaching foraging areas beyond the project area.

10.29 The IfAA states that apportioning estimates to individual protected sites indicates that for all of the SPAs within maximum foraging range during the breeding season less than 0.15% of the razorbill populations could potentially be affected. The average increase in flight distance due to the barrier presented by Dogger Bank Teesside A & B is approximately 25km (8.0% of the razorbill's maximum foraging range of 312km). The proposed development area is between 164km and 308km from the protected sites within foraging range that potentially could be exposed to this effect. This increase might prevent birds from this site reaching foraging areas beyond the project area.

10.30 The RIES notes that SNH did not raise guillemot or razorbill at any SPA as an area of concern.

10.31 The concerns raised by RSPB in section 7.27 are also applicable here.

10.32 **The SoS has considered the representations made by RSPB but defers to the advice of SNH as the Statutory Nature Conservation Body and agrees with SNH, the Applicant and the ExA that there will not be an AEoI for guillemot and razorbill as a result of the project, alone or in-combination.**

Puffin

10.33 The JNCC website notes that the site supports 21,000 pairs of puffin representing at least 2.3% of the breeding Northern European population (count as at 1987).

10.34 The RIES notes that in relation to puffin at the Forth Islands SPA, the Applicant does not predict significant effects in terms of collision risk. In response to a question by the ExA relating to bird species of concern for collision risk these species were not raised by Interested Parties and the conclusion of no AEoI have not been disputed during the examination. The SoS accepts this position and does not consider this further.

10.35 The RIES identifies a LSE for displacement of puffin from the project alone and in combination with other projects and plans.

10.36 As noted in section 7.68 there is a two-stage process to evaluating the magnitude of the displacement effects. As noted in *Table 7* puffin are considered to have low vulnerability to disturbance. A precautionary displacement rate of 25% and mortality rate of 5% were identified by the Applicant. For puffin, a 2km buffer has been used in calculating the displacement effect on birds that may be present outside of the developed area. This is in line with the recommended approach set out in JNCC/NE (2012). The Applicant's approach included variable displacement rates in two bands of distance from the wind farm: 0-1km, 75% of the displacement rate for the wind farm; and 1km-2km, 25% of the displacement rate.

10.37 SNH raised impacts on site integrity in combination due to mortality from displacement impacts in winter as an area of concern. SNH agree with the Applicant's conclusion in terms of impacts of the project alone (i.e. that there will not be an AEoI).

10.38 The IfAA found that the Project is outside the mean maximum foraging range during the breeding season of any SPAs supporting qualifying populations of puffin. Displacement led mortality across all of the SPAs in the greater North Sea region results in the loss of 8 birds. For all SPAs screened into the assessment, the impact of the calculated displacement-led mortality is less than 0.01% of the designated populations. This predicted magnitude of impact is not considered to be significant at the population level and will not result in an AEoI of SPAs designated for their puffin populations.

10.39 The Applicant also considered mortality losses resulting from displacement in combination with other projects. The relatively small numbers of puffin affected by the Project results in near zero percentage impact on relevant SPA populations. Therefore any contribution from the Project would always remain at a negligible level.

10.40 The concerns raised by RSPB in section 7.27 are also applicable here.

10.41 **Given the very small population impact for all SPA populations assessed it is concluded that alone and in combination with other projects displacement impacts would not constitute an AEoI on the Forth Islands SPA.**

10.42 **The SoS has carefully considered all of the information presented on potential impacts from the Project on the Forth Islands SPA, before and during the Panel's examination. This includes representations made by Interested Parties and the Panel report itself. The SoS considers that the Project, when considered both alone and in combination with other plans and projects, will not have an AEoI of the Forth Islands SPA.**

Fowlsheugh SPA

11.0 Fowlsheugh is located on the east coast of Aberdeenshire in north-east Scotland, overlooking the North Sea. The sheer cliffs are between 30-60 m high and are cut mostly in basalt and conglomerate of Old Red Sandstone age. They form a rock face with diverse structure providing ideal nesting sites for seabirds. The cliffs support major numbers of breeding seabirds, especially gulls and auks. The seabirds feed outside the SPA in nearby waters, as well as more distantly in the North Sea.

Table 12 Conservation Objectives for Fowlsheugh SPA

Conservation Objectives	*To avoid deterioration of the habitats of the qualifying species (listed below) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and* *To ensure for the qualifying species that the following are maintained in the long term:* · *Population of the species as a viable component of the site;* · *Distribution of the species within site;* · *Distribution and extent of habitats supporting the species;* · *Structure, function and supporting processes of habitats supporting the species; and* · *No significant disturbance of the species.* This site qualifies under Article 4.2 of the Directive (79/409/EEC) by supporting populations of European importance of the following migratory species: Ø Guillemot *Uria aalge* Ø Kittiwake *Rissa tridactyla* The area also qualifies under Article 4.2 of the Directive (79/409/EEC) by regularly supporting at least 20,000 seabirds (a seabird assemblage of international importance).

11.1 SNH are the statutory nature conservation body responsible for this site. The only feature of the SPA which was disputed during the examination was black legged kittiwake, as a result this is the only feature considered further here.

Kittiwake

11.2 The JNCC website notes that the site supports 34,870 pairs of kittiwake, representing at least 1.1% of the Eastern Atlantic Breeding population (Count, as at 1992).The SPA is 264km from the export cable corridor and 332km from the proposed windfarm itself.

11.3 It should be noted that the discussion and conclusions on habitat loss /alteration relating to habitat loss in sections 7.32 onwards are applicable to this site. The conclusions on barrier effects in section 9.6 are also relevant here. SNH and RSPB did not raise this as an area of

disagreement and as such it is not discussed further here. In addition the RIES notes that SNH did not identify kittiwake as a species of concern with regards to displacement mortality.

11.4 The RIES notes that SNH identified kittiwake collisions outside of the breeding season as the only area of concern in relation to the Applicant's conclusions for this SPA. The RSPB did not list the Fowlsheugh SPA as a site of concern.

11.5 The Project is outside the maximum foraging range of kittiwake (230km) that could derive from the Fowlsheugh SPA. Using a 98% avoidance rate, collision risk modelling analysis by the Applicant provided an estimate of 134 (87 during the breeding season and 48 outside the breeding season) based on the mean of collisions estimates. Of these 134 birds, assuming that 80% form part of designated SPA populations, the total number of collisions attributable to SPAs reported in the IfAA is 107 (56 during the breeding season and 52 outside the breeding season).

11.6 For SPAs located outside of the maximum foraging range of the Project area the IfAA reports that apportioning of the annual collision estimate (i.e. non-breeding birds in summer and winter), attributes a collision loss of 2.64 adults representing 0.01% of this SPA population. This would represent an increase in the background mortality of 0.17%.

11.7 SNH agree that there will be no AEoI on this site as a result of the Project alone. In terms of cumulative impacts the mortality from this proposal is less than 1% of the estimated effects of the three Forth and Tay windfarms. SNH conclude that given the difference in magnitude and the unknown but probably large amount of uncertainty associated with collision risk estimates these small additional levels of mortality are likely to be trivial but they could not advise that for certain.

11.8 The Applicant concluded that the losses of kittiwake that could occur as a result of collision would not have any consequences at population levels, both for the Project alone and in combination with other assessed plans and projects. They therefore concluded that there was no AEoI on this feature of the Fowlsheugh SPA.

11.9 The Panel recommends that, in line with SNH advice the likely 'trivial' scale of impact suggests that an AEoI can be excluded when considering this feature of the Fowlsheugh SPA, in view of the site's conservation objectives, during construction and operation of the project.

11.10 **Given the very small impact for kittiwake, the SoS concludes that alone and in combination with other projects and plans collision impacts would not constitute an AEoI on the Forth Islands SPA.**

Southern North Sea recommended dSAC (Harbour porpoise)

12.1 The Dogger Bank SCI which forms part of the project zone is not currently designated for supporting any Annex II marine mammal populations. However as noted in paragraph 2.1, following close of the Examination the SoS has been made aware of a list of sites that may be recommended as draft (d)SACs.

12.2 The sites are still at the early stages of consideration for possible future designation with approvals and formal consultation to follow. The SoS has decided to consider this in this HRA as she does not wish to take a decision on the Project without first satisfying herself that it would not damage the possibility of future cSAC designation. As the Southern North Sea recommended dSAC is the closest to the Project, this will be considered here and if adverse effects can be ruled out for this site, then the conclusions would also apply to more distant sites. This approach recognises the highly mobile nature of harbour porpoise.

12.3 Harbour porpoises (*Phocoena phocoena*) are the most abundant cetacean in the UK waters, and the North Sea is considered to be a geographically important area for the species (Reid et al, 2003). Harbour porpoises forage over very large areas (up to 11,289 km^2; Johnstone et al, 2005), feeding on a wide range of fish species, typically small shoaling species from demersal or pelagic habitats such as whiting and sand eels (Santos and Pierce, 2003; Santos et al, 2006). In addition to site specific protection, such as may be proposed for the Southern North Sea, Harbour porpoises are protected from "deliberate killing" and "deliberate disturbance…particularly during the period of breeding, rearing, hibernation and migration" (Habitats Directive, article 12(1)(a) and (b)).

12.4 The SCANS II project aimed to update estimated figures of the baseline cetacean populations in various UK waters including the North Sea. In 2005, the North Sea harbour porpoise population was estimated at 323,968 (95% confidence interval of 256,300 to 549,700) (Hammond *et al.* 2013). The Southern North Sea population in 2005 was estimated to be 140,229; the Northern North Sea 33,598; the Central North Sea 58,623; and a European wide population of 375,358 (95% confidence interval of 256,304 to 549,713) (SCANS II, 2008). The IfAA noted that it is highly likely that harbour porpoise observed within the Project site forms part of the overall mobile southern North Sea population.

12.5 As sites are still at an early state of consideration, no specific conditions for Favourable Conservation Status have yet been agreed. However under Article 1 of the Habitats Directive, a species is considered to be at 'Favourable Conservation Status' when the conditions identified in *Table 14* are met.

Table 13 *General favourable Conservation Status for Cetaceans and Pinnipeds*

Conservation Objectives	Under Article 1 of the Habitats Directive, a species is considered to be at a 'Favourable Conservation Status' (FCS) when the following conditions are met: · population dynamics data on the species concerned indicate that it is

	maintaining itself on a long-term basis as a viable component of its natural habitats, and · the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and · there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

12.6 The Applicant's screening work identified that the main potential impacts to marine mammals resulting from the Project would relate to:

- potential disturbance and displacement as a result of increased noise levels generated during construction work;
- reduction in prey availability, again due to disturbance and displacement of fish during construction, and
- increased collision risk with vessels during construction and operation.

12.7 The IfAA predicts short-term and temporary minor adverse impacts to fish populations from increased suspended sediment concentrations, seabed disturbance and construction (particularly piling) noise. The report notes that the mobility of harbour porpoise and their flexibility in prey selection suggests that any short-term and localised changes in fish abundance during construction would not compromise the ability of harbour porpoise to gain sufficient prey. In addition, any alteration to prey abundance would be unlikely to occur in the areas that harbour porpoise have moved in to as a result of disturbance effects, and would not have any discernible implications for the harbour porpoise population.

12.8 The IfAA considered that the risk of causing injury to harbour porpoises was very low because it would require an animal to be in close proximity (<700 m for 3000 kJ hammer energy) to the pile driving. To ensure avoidance of potential harm to harbour porpoise the Applicant has identified a number of mitigation measures (including the application of an effective zone of exclusion and a marine mammal observer to establish that there are no marine mammals within the immediate area). The Applicant also proposes the use of soft-start approach when commencing piling activity. This involves slowly ramping up the pile driving energy to give any unseen marine mammals the opportunity to leave the area before injury occurs at maximum piling energy. The IfAA notes that the final approach to be taken for marine mammal mitigation for Dogger Bank Teesside A & B will be determined during the design and implementation of a project-specific Marine Mammal Mitigation Protocol (MMMP). This will follow JNCC (2010) guidelines. The development and implementation of this will be secured through condition 16 of the offshore generation DML's and condition 13 of the offshore transmission DMLs.

12.9 The Applicant also estimated the potential impact of piling works to cause displacement of harbour porpoises. The potential for piling works to displace harbour porpoises may occur, as whilst the works may not be loud enough to cause injury or death, they might still be loud enough to invoke a behavioural response form harbour porpoises such that they leave and subsequently avoid an area.

12.10 The Applicant has undertaken calculations to estimate the number of harbour porpoises which might be displaced by the piling activity in the North Sea. The assessment considered the impact on Harbour Porpoise for the duration of construction (i.e. a maximum of 6 years). The assessment work undertaken assumes that within each year harbour porpoise do not return to the area under construction due to behavioural exclusion for the duration of the piling programme. Those results estimate a worst case displacement (including likely and possible avoidance) scenario of approximately 8,233 harbour porpoises affected. This is the equivalent of approximately 3.62 % of the North Sea population (table 5.19 IfAA). This displacement impact assumes a 100% response from individuals in the likely avoidance area and so is considered a precautionary approach.

12.11 The Applicant found the key potential impact during construction is displacement from piling and to a lesser degree vessel movement. The Applicant felt that there would be no adverse effect on porpoises given their range, the wide extent of alternative available habitats and prey species and that harbour porpoises would avoid the disturbed areas during construction. The Applicant also made a comparison with mortality arising from fisheries by-catch for which it is calculated that a mortality rate exceeding 48% of displaced individuals would need to be achieved in order for a significant impact at the population level to arise. This level of mortality is not predicted in the IfAA.

12.12 The IfAA notes that the construction phase would use mostly large (>100m) vessels, which are likely to travel at slow speeds of around 10 knots or less; whilst only small workboats and crew transfer vessels (~25m) are likely to operate at greater speed. Given that harbour porpoise would be able to detect such vessels and are likely to avoid them, it is considered unlikely that healthy harbour porpoises would be impacted by vessel collisions during construction.

In-combination

12.13 The IfAA assesses the activities and effects of the Project against the potential activities of other plans and projects, in order to assess the in-combination effects on the harbour porpoise population. The IfAA considers the scale of North Sea harbour porpoise population and movements. The projects considered for in-combination effects are those listed in *Table 2*.

12.14 The IfAA identified and considered the following effects in-combination as the main factors likely to have an effect on harbour porpoise:

- Changes in harbour porpoise prey species (fish) distribution, density or quality;
- Direct physical damage (mortality) and indirect physical damage (avoidance) to harbour porpoise population as a result of underwater noise due to pile driving and vessel movements;
- Direct physical damage (mortality) to harbour porpoise population as a result of collisions with vessels;

12.15 The IfAA reports that the mobility of harbour porpoise and flexibility in prey selection suggests that any short-term and localised changes in fish abundance during construction of Dogger Bank Teesside A & B in-combination with the other projects would not compromise the ability of harbour porpoise that are present within and around all projects to gain sufficient prey. In addition, any disturbance to prey species would occur within areas harbour porpoise are likely to avoid due to

noise disturbance. Consequently, it is concluded that there would be no discernible implications for the harbour porpoise population during the construction phase. The IfAA identifies evidence from operational windfarms which demonstrates no observable change to harbour porpoise activity. As such it is predicted that there is no in-combination effect during the operation of the Project.

12.16 The key potential impact identified by the Applicant during construction is PTS and TTS (fleeing response and avoidance) arising from underwater noise from piling and to a significantly lesser extent vessel movements. *Table 2* lists the projects considered in combination. As noted for the Project alone it is considered that the use of soft-start would prevent potential mortality arising to harbour porpoise either directly or indirectly from PTS.

12.17 The Applicant calculated that between 5% and 11% of the habitat available to harbour porpoise in the North Sea between 2015 and 2018 potentially could be subject to levels of underwater noise due to piling, such that this area could be actively avoided. The Applicant notes that while it is possible that a large percentage of the population could be displaced annually for the duration of piling, the in combination risk of mortality and subsequent impact on the population in the long-term is considered to be negligible, particularly as even in the worst case, at least 89% of the foraging available to harbour porpoise would remain unaffected at any time, and only for one year, prior to and after which a greater foraging area would be undisturbed and available. In addition given the existing levels of vessel traffic within the area of Dogger Bank and other areas of the North Sea in which the relevant projects are located, particularly inshore areas, it is not expected that the presence and movement of vessels associated with project development and maintenance would significantly increase the underwater noise above that of the baseline. Consequently, it is predicted that a measurable behavioural response to vessel movements and associated underwater noise would not arise on harbour porpoise from the construction of Dogger Bank Teesside A & B in combination with other projects.

12.18 The IfAA reports that in-combination impacts of collision risk are hard to quantify, and the potential for collision varies between projects, vessel types, vessel speeds and vessel activity. Although all projects will increase the amount of vessel activity over the home range of harbour porpoise, there are already large numbers of commercial vessel movements across the inshore area and large numbers of fishing vessel movements across the Dogger Bank Zone. Given that there is a negligible risk of collision predicted for Dogger Bank Teesside A & B, similarly collision risk is considered to be low for the other projects considered in the in-combination assessment. Furthermore, given that harbour porpoise would be able to detect vessels and avoid them, it is considered unlikely that healthy harbour porpoise would be impacted by vessel collisions in-combination with other projects. As numbers of vessel movements for the Project will reduce during operation no measurable effect on mortality and subsequent impact on the North Sea harbour porpoise population is predicted in-combination with other projects.

12.19 The Applicant considered that the construction and operation of the Project in combination with other plans and projects would not impact harbour porpoise populations. This view has not been challenged during examination. The Panel report notes that NE/JNCC raised no concerns over the Applicant's assessment of harbour porpoise.

Mitigation Measures

12.20 In order to reduce any impacts to harbour porpoise within the Project zone mitigation measures have been proposed. To ensure avoidance of potential harm the Applicant has identified a number of mitigation measures (including the application of an effective zone of exclusion, marine mammal observer and soft start piling). The IfAA notes that the final approach to be taken for marine mammal mitigation for Dogger Bank Teesside A & B will be determined during the design and implementation of a project-specific Marine Mammal Mitigation Protocol (MMMP). The development and implementation of this will be secured through DML condition 16 of the offshore generation DMLs and conditions 13 of the offshore transmission DMLs. Offshore works could not commence until such a mitigation strategy was in place.

12.21 NE, in their written response on the 20th November 2014, highlighted that due to the use of a Rochdale envelope the eventual project design may alter and the proposed mitigation allows them to ensure appropriate mitigation in accordance with final details at a later date.

12.22 **The SoS is satisfied that condition 16 of the offshore generation DMLs and conditions 13 of the offshore transmission DMLs will require the Applicant to follow JNCC Guidelines (JNCC, 2010) and are sufficient mitigation measures to protect harbour porpoise. As a result the SoS can conclude that there will not be an AEoI of the Harbour Porpoise feature of the proposed Southern North Sea dSAC with the mitigation and monitoring as secured by those conditions.**

Habitats Regulations Assessment Conclusions

13.1 The SoS has carefully considered all of the information presented before and during the Examination, including the ES, the IfAA, representations made by Interested Parties, and the Panel's report itself. She considers that the Project has the potential to have an LSE on six European sites when considered alone and in combination with other plans and projects. These comprise sites in England and Scotland and are listed below. In addition the SoS has considered the Southern North Sea (d)SAC to ensure that the Project would not damage the possibility of future cSAC designation.

- Dogger Bank cSAC and SCI
- Flamborough and Filey Coast pSPA
- Flamborough Head and Bempton Cliffs SPA
- Farne Islands SPA
- Forth Islands SPA (Scottish site)
- Fowlsheugh SPA (Scottish site)

13.2 The SoS is confident that, with the mitigation measures in the DCO and DML Conditions, the MMO's functions under the Marine Licences and Part 4 of the Marine and Coastal Access Act 2009 and the SoS's functions under the DCO and Part 2 of the Energy Act 2004, there will be no AEoI of any of these sites.

13.3 Mitigation for the Project will be secured and delivered through the DCO within:

- Part 2, Principal Powers, 12 Offshore works: abandonment, decay or removal.

Requirements:

- Requirement 3 Detailed offshore design parameters;
- Requirement 4 Detailed offshore design parameters;
- Requirement 5 Detailed offshore design parameters;
- Requirement 6 Detailed offshore design parameters;
- Requirement 7 Detailed offshore design parameters;
- Requirement 8 Detailed offshore design parameters;
- Requirement 9 Detailed offshore design parameters;
- Requirement 10 Detailed offshore design parameters;
- Requirement 11 Detailed offshore design parameters;
- Requirement 12 Detailed offshore design parameters;
- Requirement 13 Layout Rules;
- Requirement 15 Offshore Decommissioning;
- Requirement 40 Amendments to plans etc.

DML Conditions:

DML 1 & 2

- Conditions 3 to 11 Detailed offshore design parameters;
- Condition 12 Layout rules;
- Condition 14 Chemicals, drilling and debris;
- Condition 16 and 17 Pre-construction plans and documentation;
- Condition 21 Pre-construction monitoring;
- Condition 22 Construction monitoring;
- Condition 23 Post construction surveys;
- Condition 24 Offshore maintenance plan;
- Condition 33 Amendments to plans, etc.

DML 3 & 4

- Condition 3 to 9 Detailed offshore design parameters;
- Condition 11 Chemicals, drilling and debris;
- Condition 13 and 14 Pre-construction plans and documentation;

- Condition 18 Pre-construction monitoring;
- Condition 19 Construction monitoring;
- Condition 20 Post construction surveys;
- Condition 21 Offshore maintenance plan;
- Condition 30 Amendments to plans, etc.

14.1 The SoS has undertaken an AA in respect of those European sites' Conservation Objectives listed in *Table 1*, alongside the Southern North Sea (d)SAC to determine whether the project, either alone or in combination with other plans and projects, will result in an AEoI.

14.2 **The SoS has determined that the Dogger Bank Teesside A & B Offshore Wind Farm will not have an AEoI on any European site either alone or in combination with other plans or projects. She has undertaken a robust assessment using all of the information available to her, not least the advice from the SNCB's, the recommendation of the ExA and the views of Interested Parties.**

Transboundary Assessment

15.0 Given the potential for this Project to affect mobile features across a wide geographical area; the SoS believes it important to consider the potential impacts on European sites in other EU Member States, known as transboundary sites, in further detail. The ExA also considered the implications for these sites, in the context of looking at the wider EIA considerations. The results of the ExA's considerations and the SoS own views on this matter are presented below.

15.1 The Applicant identified an extensive list of European sites to be considered. There were:

- 27 sites in Germany
- 33 in the Netherlands
- 6 in Belgium
- 33 in Denmark
- 28 in Sweden
- 22 in France
- 3 in Norway

15.2 The Panel report notes that the Applicant identified potential impacts on European Sites outside the UK or UK waters in other EEA states, these are listed in *Table 15* below.

Table 14 Screening of Likely Significant Effect for transboundary SAC Sites from the Applicant's IfAA document.

Special Area of Conservation site	Country	Site feature screened in	Likely Significant Effect (LSE)	Distance from Project (closest point)
Récifs et lands de la Hague SCI	France	Harbour porpoise, and grey seal.	Potential for a LSE on the designated grey seal and harbour porpoise populations.	632km
Doggerbank SCI	Germany	sandbanks which are slightly covered by sea water all the time, and harbour porpoise	Potential for a LSE on designated harbour porpoise populations.	43 km
NTP S-H Wattenmeer und angrenzende Kustengebiete SCI	Germany	Harbour porpoise, and grey seal.	Potential for a LSE on the designated grey seal and harbour porpoise populations.	311 km
Borkum-Riffgrund (Borkum Reef Ground) SAC	Germany	Harbour porpoise and grey seal.	Potential for a LSE on the designated grey seal and harbour porpoise populations.	224km
Sylter Außenriff (Sylt Outer Reef) SAC	Germany	Harbour porpoise and grey seal.	Potential for a LSE on the designated grey seal and harbour porpoise populations.	207km
Steingrund SCI	Germany	Grey seal and harbour porpoise.	Potential for a LSE on the designated grey seal and harbour porpoise populations.	328km
Helgoland mit	Germany	Grey seal and harbour	Potential for a LSE on the	320km

Helgoländer Felssockelp SCI		porpoise.	designated grey seal and harbour porpoise populations.	
Hamburgisches Wattenmeer SCI (and Ramsar)	Germany	Grey seal and harbour porpoise.	Potential for a LSE on the designated grey seal and harbour porpoise populations.	353km
Küsten- und Dünenlandschaften Amrumsp SCI	Germany	Grey seal.	Potential for a LSE on the designated grey seal population.	336km
Unterelbe SCI	Germany	Harbour porpoise.	Potential for a LSE on the designated harbour porpoise population.	401km
Doggersbank SCI	Netherlands	Sandbanks which are slightly covered by sea water all the time, grey seal and harbour porpoise.	Potential for a LSE on designated harbour porpoise and grey seal populations.	0km
Klaverbank SCI	Netherlands	Grey seal and harbour porpoise.	Potential for a LSE on the designated grey seal and harbour porpoise populations.	78km
Noordzeekustzone SCI	Netherlands	Grey seal and harbour porpoise.	Potential for a LSE on the designated grey seal and harbour porpoise populations.	220km
Noordzeekustzone II pSCI	Netherlands	Grey seal and harbour porpoise.	Potential for a LSE on the designated grey seal and harbour porpoise populations.	220km
Waddenzee pSCI	Netherlands	Grey seal.	Potential for a LSE on the designated grey seal population.	227km
Voordelta SCI	Netherlands	Grey seal.	Potential for a LSE on the designated grey seal population.	333km
Vlatke Van der Raan pSCI	Netherlands	Grey seal and harbour porpoise.	Potential for a LSE on the designated grey seal, and harbour porpoise populations.	369km
SBZ 1 / ZPS 1, SBZ 2 / ZPS 2, and SBZ 3 / ZPS 3 pSCI	Belgium	Harbour porpoise and grey seal.	Potential for a LSE on the designated grey seal, and harbour porpoise populations.	380km
Vlakte van de Raan pSCI	Belgium	Harbour porpoise and grey seal.	Potential for a LSE on the designated grey seal, and harbour porpoise populations.	380km
Agger Tange, Nissum Bredning, Skibsted Fjord og Agerø SCI	Denmark	Harbour porpoise.	Potential for a LSE on the designated harbour porpoise population.	365km
Hirsholmene, havet vestherfor og Ellinge Å's udløb SCI	Denmark	Grey Seal	Potential for a LSE on the designated grey seal population.	528km
Horsens Fjord, havet øst for og Endelave SCI	Denmark	Grey Seal	Potential for a LSE on the designated grey seal population.	451km
Sydlige Nordsø SCI	Denmark	Harbour porpoise and grey seal.	Potential for a LSE on the designated grey seal, and	255km

			harbour porpoise populations.	
Vadehavet med Ribe Å, Tved Å og Varde Å vest for Varde SCI	Denmark	Harbour porpoise and grey seal.	Potential for a LSE on the designated grey seal, and harbour porpoise populations.	330km
Venø, VenøSundp SCI	Denmark	Harbour porpoise.	Potential for a LSE on the designated harbour porpoise populations.	420km
Rott-Hastein Kjor Ramsar	Norway	Harbour porpoise.	Potential for a LSE on the designated harbour porpoise populations	394km
Kosterfjorden-Väderöfjorden SCI	Sweden	Harbour porpoise.	Potential for a LSE on the designated harbour porpoise populations.	615km
Vrangoskargarden SCI	Sweden	Harbour porpoise.	Potential for a LSE on the designated harbour porpoise populations.	595km

15.3 The transboundary sites and the interest features considered to be at risk from the Project were mostly several hundreds of kilometres away from the location of the proposed Project. The exception being sites in the Netherlands' and German waters (Doggersbank pSCI, Klaverbank SCI and Doggerbank pSCI). There were only three interest features found to have a potential LSE at all these sites, these included sandbanks which are slightly covered by sea water all the time, grey seals and harbour porpoise.

15.4 Germany and the Netherlands were the only states which stated a wish to participate in the Regulation 24 process of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2009. The German Federal Maritime and Hydrographic Agency responded to the consultation noting that "from the current state of knowledge and due to the distance to the German EEZ [Exclusive Economic Zone] border no significant impacts on nature conservation concerns in German EEZ, in particular on the Dogger Bank Special Area of Conservation, can be expected". No response to the consultation was received from the Netherlands. The ExA report notes that whilst the Applicant identified potential impacts on European sites outside the UK or UK waters in other European Economic Area ("EEA") states, no evidence was submitted to the examination of any specific adverse effects on the integrity of these sites, either from the EEA States where the European sites are located or interested parties.

Sandbanks which are slightly covered by sea water all the time

15.5 The Applicant's conclusions for the nearest two sites Doggersbank SCI (Netherlands) and Doggerbank SCI (Germany) were that there would be no AEoI on either site. The assessment in relation to construction noted that no direct or indirect effects would extend to the Doggerbank SCI (Germany).With regards to the impacts that could occur within and around the Doggersbank SCI (Netherlands) they would be temporary, short-term, small-scale in magnitude, and remain within the existing range experienced and to which the species and communities of the subtidal sandbank feature are adapted. Furthermore the IfAA noted that, where species and communities would be temporarily affected, they have a low to moderate sensitivity to the disturbance impact

and would recover within five years. Consequently, the construction phase for the project would not affect the achievement of favourable condition of the Doggersbank SCI (Netherlands).

15.6 The assessment of operation indicates that the impacts for the Doggersbank SCI (Netherlands) boundary would be temporary, short-term, small-scale in magnitude, and remain within the existing range experienced and to which the species and communities of the subtidal sandbank feature are adapted. The assessment identified that no operation phase impacts (direct or indirect) would extend to the Doggerbank SCI (Germany), and therefore no impact would arise on the subtidal sandbank feature. This is discussed in the IfAA document in section 4.10.3 onwards.

Grey seals

15.7 Grey seals (*Halichoerus grypus*) populations are a feature of 25 transboundary sites identified at the HRA screening stage. Only the sites nearest to the Project were screened in due to the potential for a LSE from noise and subsequent effects on their respective populations, namely Doggersbank SCI which is adjacent to the eastern boundary of the Dogger Bank Teesside A and Klaverbank SCI which is located some 78km from the boundary of Dogger Bank Teesside A. These sites provide foraging grounds for grey seal from colonies located in the Wadden Sea. The remaining 23 transboundary sites are, as for the UK SACs, key breeding and haul out sites for this species and, therefore, are located at significant distance from Dogger Bank Teesside A & B. Consequently, those sites listed were screened out from specific assessment of direct impacts.

15.8 The Applicant identified the following as the main risks to grey seals from the construction of the Project:

- Indirect physical damage to the grey seal population as a result of alteration to prey species (fish) distribution, abundance or quality arising from increased suspended sediment concentrations in the water column and re-deposition of sediment from the water column due to construction;
- Direct physical damage (mortality) as a result of underwater noise due to pile driving and vessel movements; and
- Direct physical damage (mortality) to the grey seal population as a result of collisions with construction vessels.

15.9 The assessment predicts short-term and temporary minor adverse impacts to fish populations from increased suspended sediment concentrations, seabed disturbance and construction (particularly piling) noise. The Applicant concludes that the mobility of seals and their flexibility in prey selection suggests that any short term and localised changes in fish abundance during construction would not compromise the ability of grey seal present within the Project area to gain sufficient prey. It is, therefore, concluded that this impact would not have any discernible implications for grey seal populations as a whole or with respect to the designated sites' populations.

15.10 The IfAA notes that only a very small number of the overall reference grey seal population would be at risk of instantaneous injury that would cause PTS. The IfAA calculates <0.0001% in terms

of the grey seal population in the worst case scenario. This level of potential impact in respect of risk of PTS is considered negligible.

15.11 The piling works, whilst unlikely to injure grey seals, might still be sufficient to cause displacement over a relatively large area. The applicant predicts that displacement of grey seals could occur up to 1.7km from the piling works. However, this should not have an adverse effect given the distance between the Project and the European sites and the large extent of alternative foraging areas available to those populations.

15.12 The Applicant notes that given the existing levels of vessel traffic which indicate numbers of around 3,650 a year around Dogger Bank Teesside A & B, it is not expected that the presence and movement of additional vessels during construction would significantly increase underwater noise levels above that of the baseline, such that a measurable behavioural response in grey seal would arise. In addition the IfAA notes that given the agility and manoeuvrability of grey seal, and the relatively large size and slower speeds of construction vessels likely to be used during construction, it is considered unlikely that healthy grey seals would be impacted by vessel collisions during construction, except in extreme circumstances.

15.13 The Applicant identified potential operational impacts as:

· Indirect effects on the grey seal population as a result of alteration to prey species (fish) distribution, abundance or quality arising from the obstruction of the seabed and scour induced increase in suspended sediment concentrations in the water column;

· Indirect effects on the grey seal population as a result of behavioural changes arising from the increase in underwater noise levels due to the operation of the wind turbines;

· Direct physical damage (mortality) to grey seal population as a result of collisions with maintenance vessels; and

· Indirect physical damage to harbour porpoise as a result of behavioural changes arising from the presence of structures resulting in a barrier effect.

15.14 The IfAA document notes that the mobility of seals and flexibility in prey selection, together with evidence indicating that prey abundance is not depleted by offshore wind farm development, suggests that the grey seal foraging resource within the Project area would not be affected in the operation phase.

15.15 In addition the Applicant notes that underwater noise levels generated during the operation of wind turbines are at a much lower level than the noise levels generated during construction. The low level noise generated by wind turbines during the operation phase is likely to be detectable only at short distances over background noise levels and below levels that would elicit a response from marine mammals. Empirical data exists to support no lasting disturbance or exclusion of seals from around or within wind farm sites during the operation phase.

15.16 Given the lower numbers of vessels expected to be present or travelling to and from Dogger Bank Teesside A & B during the operation phase, the Applicant concludes a negligible risk of physical damage as a result of vessel collisions.

15.17 The presence of a wind farm could be seen as having the potential to create a physical barrier, preventing movement or migration of grey seals between important feeding and / or between breeding areas and populations. The Applicant provides evidence from the Egmond aan Zee offshore wind farm which suggests that marine mammals (including grey seals) may be attracted to the site for foraging. As a result, no population level impact is predicted on grey seal.

Mitigation Measures

15.18 To ensure avoidance of potential harm to grey seals the Applicant has identified a number of mitigation measures (including the application of an effective zone of exclusion, marine mammal observer and soft start piling). The IfAA notes that the final approach to be taken for marine mammal mitigation for Dogger Bank Teesside A & B will be determined during the design and implementation of a project-specific Marine Mammal Mitigation Protocol ("MMMP"). The development and implementation of this will be secured through condition 16 of the offshore generation DMLs and condition 13 of the offshore transmission DMLs.

In combination

15.19 The Applicant assessed the effects identified during construction and operation against other plans and projects which have the potential to interact with the effects of the Project on grey seals. Other projects considered are shown in Figure 6.

15.20 The Applicant identified a total of 63 projects; 24 relate to offshore wind farm projects (only one of which is outside the UK), 14 relate to the cable elements of the same developments. The remainder comprise of 16 marine aggregate extraction projects, four oil and gas developments, and five wave and tidal developments. In total 49 projects were considered. The projects are located within a 'study area' which encompasses the range of the North Sea grey seal population based on their known foraging range of up to 145km from their haul out sites as well as known interaction between grey seal colonies in the UK, Netherlands, Belgium and eastern North Sea.

15.21 The Applicant predicted no in combination effect on transboundary sites. Their conclusion is supported by observed data that grey seals spend the majority of their time at sea within relative proximity to their breeding colonies. The proportion of the grey seal population at individual colonies spending a significant amount of time foraging in offshore waters at distance from colonies is likely to be small. Grey seals are therefore more likely to be affected by projects that lie within their normal foraging range. In combination, the contribution of foraging effort within Dogger Bank is likely to be very small in comparison to the total effort taking place close to colonies. Given this, the in combination impact of the Project on grey seal populations / colonies is considered to be no greater than that likely to arise with respect to individual projects in closer proximity to sites where this species is a designated feature.

15.22 The Applicant concluded that for the Project alone short term and localised changes in fish abundance during construction and operation would not compromise the ability of grey seal populations in the North Sea to gain sufficient prey due to the mobility of seals and their flexibility in prey selection. The Applicant notes that this is also likely for other projects where short-term changes in habitat conditions and disturbance to prey species may occur. The IfAA notes that

there is no evidence to suggest that the in combination effects of infrastructure development / human activities within the North Sea over previous decades have resulted in any detrimental impact on the prey species of grey seal.

15.23 It is expected that underwater noise generated by vessels associated with activities such as dredging and cable-laying would be unlikely to give rise to risk of PTS. TTS could arise locally in the vicinity of vessels, particularly where vessels are slow moving, but given the intermittent, temporary and localised nature of such activities and related noise disturbance effects the Applicant concludes that any impacts on grey seal would be of a similar intermittent and temporary nature.

15.24 In respect of the in combination effect of wind farm development, where underwater noise effects associated with piling may be of significance, the work undertaken for the Project was used by the Applicant as an indicator as to the likely in combination effect with other offshore wind farms. They found only a very small percentage of the overall grey seal population would be at risk of PTS, and taking into account the proposed mitigation measures (see Section 15.18 above) which would minimise any potential risk of grey seal being affected, the risk of PTS is considered negligible. It is considered that similar mitigation measures would be expected for marine piling for the other wind farm projects. Consequently, the Project in combination with other projects is not predicted to adversely affect the grey seal populations within the North Sea as a result of PTS.

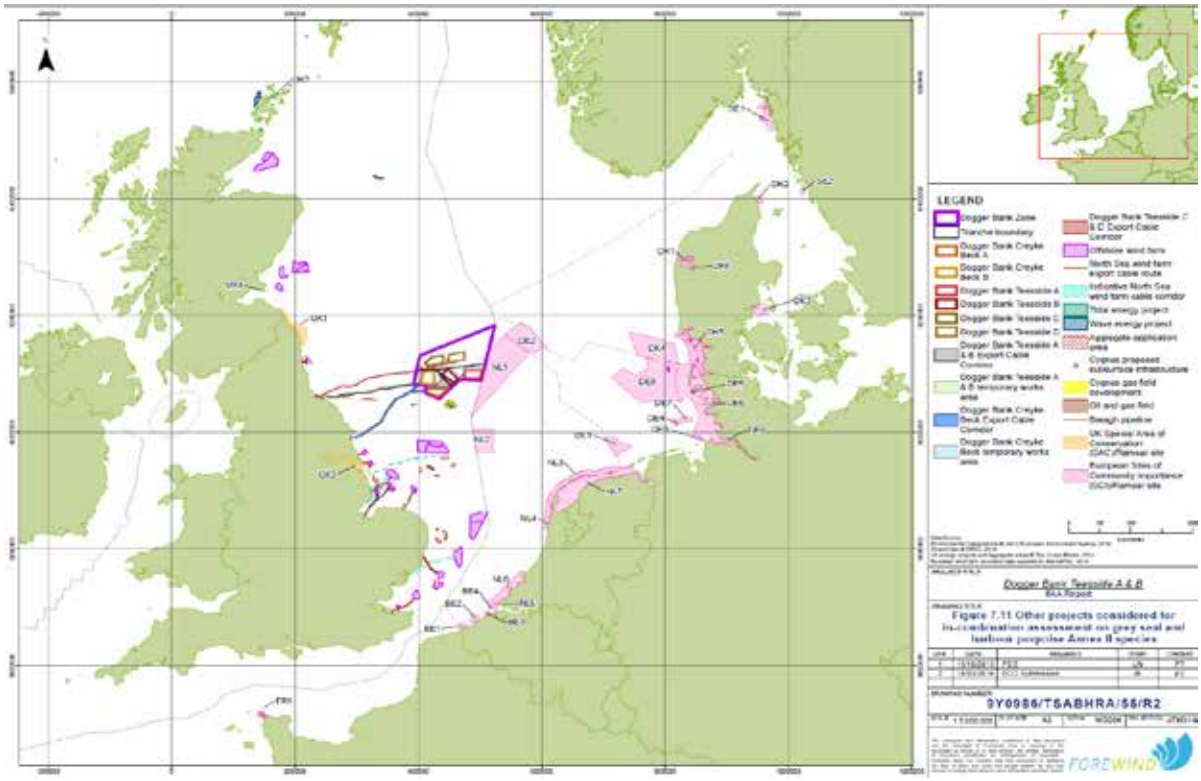

Figure 6 Other projects considered for in combination assessment on grey seal and harbour porpoise Annex II species.

15.25 Whilst the Project alone could disturb and result in displacement through avoidance of up to 0.019% of the North Sea grey seal population, as piling would be progressive and effectively

represent a sequence of localised individual disturbance events, seals that may be present in the vicinity of piling would be able to relocate to adjacent areas in order to avoid potential exposure to high underwater noise levels. Similarly, there is a significant distance between piling that would take place at the Project location and other projects (including Dogger Bank Creyke Beck) such that there would be no overlap of areas affected by this disturbance effect. Given this characteristic of the in combination displacement, together with the extent of available alternative foraging area, and the low sensitivity of grey seals to underwater noise, the Project in combination with other projects is not predicted to compromise the grey seal populations within the North Sea as a result of TTS, and any disturbance and displacement would be short-term and temporary.

15.26 Given the existing high levels of vessel traffic in much of the southern North Sea it is considered that the in combination effect of additional vessel traffic for spatially discreet projects would not significantly contribute to any increase in underwater noise levels above that of the baseline such that a measurable behavioural response in grey seals would arise. Subsequently, no in combination effect is predicted in relation to the grey seal populations within the North Sea.

15.27 In relation to vessel movements and collision risk for grey seal, the Applicant notes that there are already very high numbers of vessel movements in the locations around the seal colonies and, as such, the grey seal populations may display habituation to vessel movements and would therefore already display avoidance reactions. Consequently, whilst a risk is present in combination with other projects, the risk would be temporary and is predicted to result in a negligible influence through mortality on the North Sea grey seal population.

15.28 The Applicant concluded that the Project would not result in an adverse effect on the integrity of the grey seal populations of the transboundary sites screened into the assessment both alone and in combination. The SoS is satisfied that condition 16 of the offshore generation DMLs and condition 13 of the offshore transmission DMLs will ensure that the Applicant follows JNCC Guidelines (JNCC, 2010) and provides sufficient mitigation measures to protect any grey seals that are using the immediate area when piling works commence. **The SoS is also satisfied that the potential displacement effects of the piling works will not have an AEoI given the highly mobile and wide foraging nature of grey seals and their ability to feed on a wide range of prey sources.**

Harbour porpoise

15.29 The North Sea is considered to be a geographically important area for harbour porpoise (Reid *et al*, 2003). Harbour porpoises forage over very large areas (up to 11,289 km^2; Johnstone *et al*, 2005), feeding on a wide range of fish species, typically small shoaling species from demersal or pelagic habitats such as whiting and sand eels (Santos and Pierce, 2003; Santos *et al*, 2006).

15.30 The Applicant's Screening Stage identified 24 European sites supporting this Annex II species where a potential LSE could arise as a result of the construction and operation of the Project. These include sites in the Belgian, Danish, Dutch, French, German, and Swedish territorial sectors of the North Sea, see Figure 7. Harbour porpoise are considered to be at risk because of

the potential for the Project to cause physical injury, disturbance, displacement, behavioural changes, and changes in their prey availability.

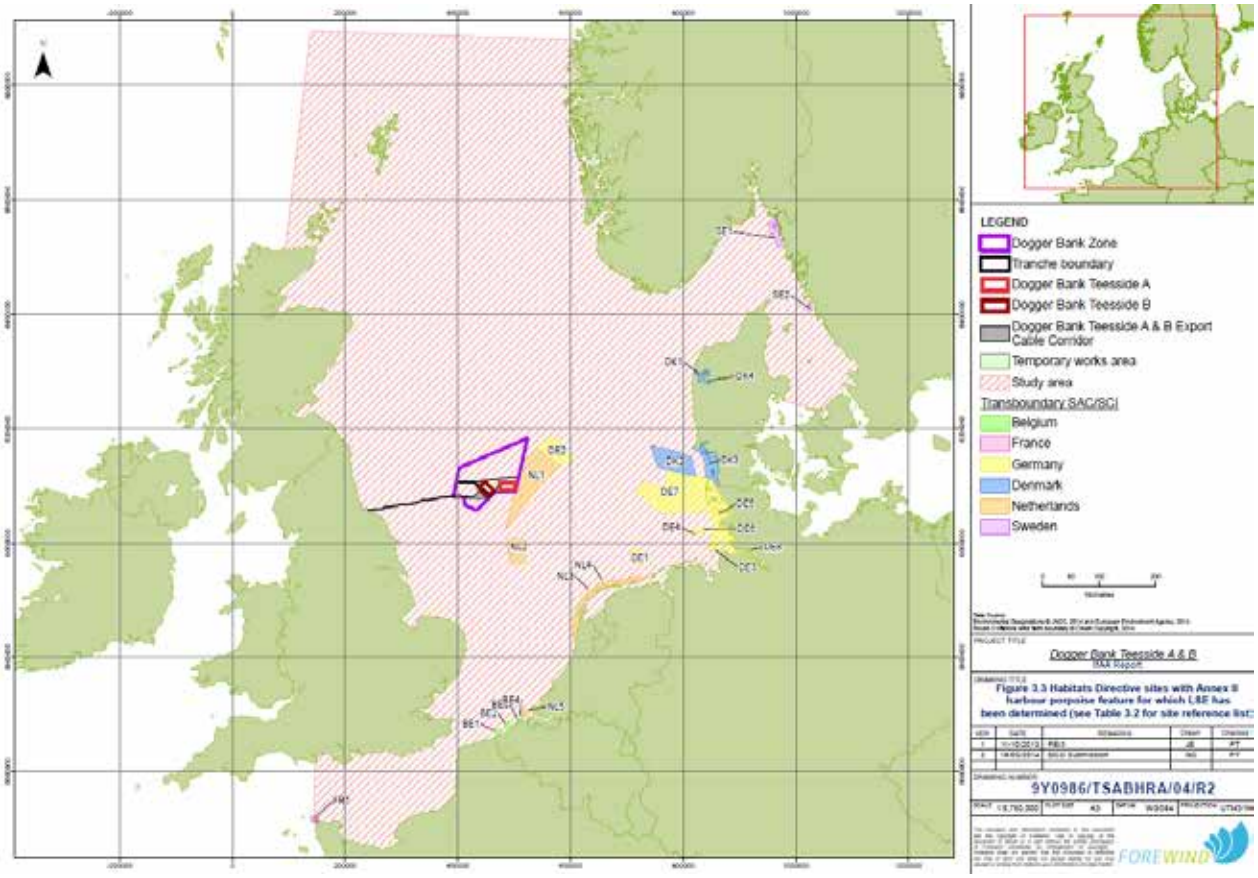

Figure 7 The Dogger Bank Zone and harbour porpoise sites for which the Applicant found a potential LSE.

15.31 The Applicant identified potential construction impacts as:

· Changes in harbour porpoise prey species (fish) distribution, abundance or quality arising from increased suspended sediment concentrations in the water column and re-deposition of sediment;

· Direct physical damage (mortality) as a result of underwater noise due to pile driving and vessel movements; and

· Direct physical damage (mortality) to harbour porpoise as a result of collisions with construction vessels.

15.32 The IfAA predicts short-term and temporary minor adverse impacts to fish populations from increased suspended sediment concentrations, seabed disturbance and construction (particularly piling) noise. The report notes that the mobility of harbour porpoise and their flexibility in prey selection suggests that any short-term and localised changes in fish abundance during construction would not compromise the ability of harbour porpoise to gain sufficient prey. In addition any alteration to prey abundance would be unlikely to occur in the areas that harbour porpoise have moved in to as a result of disturbance effects.

15.33 The IfAA considered that the risk of causing injury to harbour porpoises was very low because it would require an animal to be in close proximity (<700 m for 3000 kJ hammer energy) to the pile driving. To ensure avoidance of potential harm to harbour porpoise the Applicant has identified a

number of mitigation measures (including the application of an effective zone of exclusion and a marine mammal observer to establish that there are no marine mammals within the immediate area). The Applicant also proposes the use of soft-start approach when commencing piling activity. This involves slowly ramping up the pile driving energy to give any unseen marine mammals the opportunity to leave the area before injury occurs at maximum piling energy. The IfAA notes that the final approach to be taken for marine mammal mitigation for Dogger Bank Teesside A & B will be determined during the design and implementation of a project-specific MMMP. This will follow JNCC (2010) guidelines. The development and implementation of this will be secured through condition 16 of the offshore generation DMLs and condition 13 of the offshore transmission DMLs.

15.34 The Applicant also estimated the potential impact of piling works to cause the displacement of harbour porpoise. The potential for piling works to displace harbour porpoises may occur, as whilst the works may not be loud enough to cause injury or death, they might still be loud enough to invoke a behavioural response from harbour porpoises such that they leave and subsequently actively avoid an area.

15.35 The Applicant has undertaken calculations to estimate the number of harbour porpoises which might be displaced by the piling activity in the North Sea. Those results estimate a worst case displacement (including likely and possible avoidance) scenario of approximately 8233 harbour porpoise affected. This is the equivalent of approximately 3.62 % of the North Sea population (table 5.19 IfAA). This displacement impact assumes a 100% response from individuals in the likely avoidance area.

15.36 The Applicant found the key potential impact during construction is displacement from piling and to a lesser degree vessel movement. The Applicant felt that there would be no adverse effect on porpoises given their range, the wide extent of alternative available habitats and prey species and that harbour porpoises would avoid the disturbed areas during construction. The Applicant also made a comparison with mortality arising from fisheries by-catch for which it is calculated that a mortality rate exceeding 48% of displaced individuals would need to be achieved in order for a significant impact at the population level to arise. This level of mortality is not predicted in the IfAA.

15.37 The IfAA notes that the construction phase would use mostly large (>100m) vessels, which are likely to travel at slow speeds of around 10 knots or less; whilst only small workboats and crew transfer vessels (~25m) are likely to operate at greater speed. Given that harbour porpoise would be able to detect such vessels and are likely to avoid them, it is considered unlikely that healthy harbour porpoise would be impacted by vessel collisions during construction.

15.38 The Applicant identified potential operational impacts as:

- Changes in harbour porpoise prey species (fish) distribution, abundance or quality arising from increased suspended sediment concentrations in the water column and re-deposition of sediment;

- Indirect physical damage to harbour porpoise as a result of behavioural changes arising from the increase in underwater noise levels due to the operation of the wind turbines;
- Direct physical damage (mortality) to harbour porpoise population as a result of collisions with maintenance vessels;
- Indirect physical damage to harbour porpoise as a result of behavioural changes arising from the presence of EMF from underwater electrical cables; and
- Indirect physical damage to harbour porpoise as a result of behavioural changes arising from the presence of structures resulting in a barrier effect.

15.39 The Applicant notes that evidence from monitoring suggests that prey species abundance is not negatively affected within wind farms. Consequently, no adverse change in the prey resource available to harbour porpoise within the development area is predicted.

15.40 For the operational phase of the Project, disturbance effects (e.g. from underwater noise levels) that could give rise to significant impacts on harbour porpoise populations would not be expected. Studies used by the Applicant indicate that there is no evidence of a reduction in harbour porpoise use of existing wind farms, and potentially indicate there may even be an increase in numbers within wind farms. Modelling for the Project indicates that noise from wind turbines would not be significant and would not be expected to result in an avoidance response. As such it is concluded that the operational phase for the Project will not adversely affect harbour porpoise behaviour such that a significant impact on the North Sea population would result.

15.41 In addition it is not expected that the presence and movement of maintenance vessels would significantly increase underwater noise levels above that of the baseline. Whilst some localised disturbance may arise, given the relatively low increase in comparison to the baseline levels and the habituation of harbour porpoise (and their ability to avoid vessels), it is predicted that a measurable behavioural response would not arise and no measurable impact on the harbour porpoise population is predicted.

15.42 Given the lower numbers of vessels predicted to be present or travelling to and from the Project during operation, the Applicant predicts a negligible risk of collision impact. Consequently, no measurable impact on mortality and subsequent impact on the North Sea harbour porpoise population from collision is predicted.

15.43 The Applicant noted that there may be potential for marine mammals to exhibit behavioural changes including displacement due to the presence of EMF around inter-array cables. It is noted that there is at present, no evidence to suggest that existing subsea cables have influenced cetacean movements. The Applicant confirmed that the export, inter-array and inter-platform cables would be shielded to meet industry standards, buried or, if burial is not possible, protected by other methods such as mattressing or rock armour. The strength of the EMF reduces with distance from the cable and with burial or shielding the EMF levels emitting into the water column are likely to be negligible, as such no measurable impact is predicted on the movement (for foraging or migration) of harbour porpoise and, therefore, no impact is predicted on the North Sea harbour porpoise population.

15.44 The presence of a wind farm could be seen as having the potential to create a physical barrier, preventing movement or migration of harbour porpoise between or to feeding and / or breeding areas. As noted above there is evidence that marine mammals such as harbour porpoise may be attracted to the windfarm site for foraging and so no population level impact is predicted on the North Sea population of harbour porpoise.

15.45 The Applicant concluded that the Project would not have an AEoI of the transboundary European sites or affect the achievement of favourable condition with respect to the conservation objectives related to the harbour porpoise feature of the transboundary European sites (SCIs and pSCIs).

In combination

15.46 The Applicant identified the following effects to screen against other projects to determine those projects that have the potential to interact with the effects of Dogger Bank Teesside A & B, and the potential to result in effects on harbour porpoise populations within the North Sea:

- Changes in harbour porpoise prey species (fish) distribution, density or quality arising from increased suspended sediment concentrations in the water column and re-deposition of sediment from the water column;
- Direct effects on the harbour porpoise population as a result of behavioural changes arising from a barrier effect due to the presence and operation of the wind turbines;
- Direct physical damage (mortality) and indirect physical damage (avoidance) to harbour porpoise population as a result of underwater noise due to pile driving and vessel movements;
- Direct physical damage (mortality) to harbour porpoise population as a result of collisions with vessels;
- Indirect physical damage to harbour porpoise as a result of behavioural changes arising from the presence of electromagnetic fields from underwater electrical cables; and
- Indirect effects on the harbour porpoise population as a result of behavioural changes arising from the increase in underwater noise levels due to the operation of the wind turbines.

15.47 The IfAA shows that an extremely small percentage of the harbour porpoise population for the North Sea would be affected as a result of the Project alone. The mobility of harbour porpoise and flexibility in prey selection suggests that any short-term and localised changes in fish abundance during construction of Dogger Bank Teesside A & B in combination with the other projects would not compromise the ability of harbour porpoise that are present within and around all projects to gain sufficient prey. Therefore no measurable effects on the harbour porpoise population are expected to arise from alteration of prey species abundance. In addition disturbance to prey species is not predicted to extend to areas outside of the area that harbour porpoise are predicted to avoid due to piling for the duration of construction. Furthermore, collision risk is considered to be low due to the likelihood that harbour porpoise can detect and avoid vessels. Consequently, no in combination effect is predicted. With regards to behavioural change as a result of electro-magnetic fields as identified for Dogger Bank Teesside A & B alone, existing cables under the Baltic have not been shown to influence harbour porpoise migration and movement into and out of the Baltic, and given the shielding used as an industry standard, no population level impact is predicted on harbour porpoise in the North Sea.

15.48 The key potential impact identified by the Applicant during construction is PTS and TTS (fleeing response and avoidance) arising from underwater noise from piling and to a significantly lesser extent vessel movements. Figure 6 shows the projects considered in combination. It is considered that the use of soft-start would prevent potential mortality arising to harbour porpoise either directly or indirectly from PTS.

15.49 The Applicant calculated that between 5% and 11% of the habitat available to harbour porpoise in the North Sea between 2015 and 2018 potentially could be subject to levels of underwater noise due to piling, such that this area could be actively avoided. The Applicant notes that while it is possible that a large percentage of the population could be displaced annually for the duration of piling, the in combination risk of mortality and subsequent impact on the population in the long-term is considered to be negligible, particularly as even in the worst case, at least 89% of the foraging available to harbour porpoise would remain unaffected at any time, and only for one year, prior to and after which a greater area of foraging area would be undisturbed and available. In addition given the existing levels of vessel traffic within the area of Dogger Bank and other areas of the North Sea in which the relevant projects are located, particularly inshore areas, it is not expected that the presence and movement of vessels associated with project development and maintenance would significantly increase the underwater noise above that of the baseline. Consequently, it is predicted that a measurable behavioural response to vessel movements and associated underwater noise would not arise on harbour porpoise from the construction and operation of the Project in combination with other projects.

15.50 For the operational phase of wind farms, the Applicant finds no evidence to indicate a reduction in harbour porpoise use of existing wind farms either as a barrier effect or in terms of noise. Studies cited in the IfAA actually indicate that potentially there may be an increase in the use of wind farms by harbour porpoise.

15.51 The Applicant considered that the construction and operation of the Project in combination with other plans and projects would not result in an AEoI of the harbour porpoise populations of transboundary sites. This view has not been challenged during examination. **The SoS is satisfied that there are no AEoI from the Project construction or operation on the harbour porpoise feature of any transboundary SACs.**

Special Protection Areas

15.52 Many SPAs and Ramsar sites, notably those designated for their migratory waterbird populations were screened into the assessment process by the Applicant prior to any detailed assessment work. As a consequence, a precautionary view was taken that the potential for LSEs could apply to a large number of designated SPA and Ramsar site bird populations. The subsequent assessment work following screening demonstrated that the impact of the Project, both alone and in combination with other projects, on many designated bird populations could be considered to represent no LSEs. The screening for LSEs was not revisited as the findings for these sites were not disputed during the examination. See Figure 3 for all the SPA sites assessed as part of the HRA including transboundary sites. The Applicant concluded no LSE or AEoI for all non-UK

European sites. This finding was not challenged during examination and a similar finding was reported by the Panel's report. This transboundary assessment has therefore included a summary of these findings.

Habitat loss

15.53 The Applicant concluded that benthic habitat loss / alteration as a result of the installation and operation of wind turbines and other structures in the wind farm would not affect the overall prey resource available to foraging seabirds. No significant impact on designated seabird populations is therefore predicted.

15.54 The IfAA found that seabird prey resources (specifically fish) within the Project area could be temporarily affected by increased underwater noise levels during construction. However, this effect would be localised to the immediate area of piling works and temporary displacement of the resource is predicted rather than loss or decrease in availability. During operation of the wind farm, the turbine structures could act as attractants for some fish species. The Applicant concluded that direct habitat loss and alteration would have no significant impact on designated seabird populations.

Collision risk

15.55 For all of the SPAs examined by the Applicant, the conclusion was reached that losses that could occur as a result of collision from the project alone would not have consequences at population levels such that an AEoI of SPAs would arise.

15.56 The Applicant's collision risk estimates suggest that on an annual basis the potential mortality associated with the Project is likely to represent significantly less than 0.1% of the GB or GB / Ireland population of each of the 45 species that have a migration zone that overlaps with the Project area. For many species there is significant movement of migratory birds between continental sites (in the Netherlands in particular) and the UK. Many of these sites are designated SPAs (e.g. the Waddenzee). As such, the results of the analysis also apply to SPAs that form staging posts for onward migration to the UK or sites used by birds on return migration from the UK. As a result of collision losses, no AEoI of the screened SPAs designated for their migratory bird populations is therefore predicted.

Barrier effects

15.57 Considering both the small percentage of migrating bird populations likely to be involved and the relative increase in flight distance that Dogger Bank Teesside A & B could exert, it is concluded that the potential barrier posed by wind farm development would be unlikely to have a detrimental impact upon the energetics of migratory birds. No AEoI of designated SPA migratory bird populations as a result of the potential barrier posed by the wind farm is therefore predicted.

In Combination

15.58 The Applicant also looked at in combination impacts for bird species where there was a LSE. The IfAA notes that based on the spatial extent, duration and magnitude of the types of effects

associated with a range of project types that occur in the offshore marine environment, it is clear that, in the case of Dogger Bank Teesside A & B, the only project type that presents any significant potential for the interaction of effects is other offshore wind farm projects. The assessment therefore focussed on these. The findings were that the Project would not result in a displacement/ barrier/ habitat loss/ or collision risk impact that would constitute an AEoI of the screened SPAs designated for any bird populations.

Transboundary summary

16.0 The SoS has considered the potential for the Project to affect transboundary European sites in Germany, the Netherlands, Belgium, Denmark, Sweden, France and Norway. Those sites support harbour porpoises, grey seals, sandbanks which are slightly covered by seawater all the time and waterbirds.

16.1 The SoS has considered all of the information available, particularly noting the lack of objections from any of the Member States potentially affected by the development and the recommendation made by the Panel report. The Panel report notes that whilst the Applicant identified potential impacts on European sites outside the UK or UK waters in other European Economic Area ("EEA") states, no evidence was submitted to the examination of any specific adverse effects on the integrity of these sites, either from the EEA States where the European sites are located or interested parties.

16.2 **The SoS is satisfied that the Project, either alone or in combination with other plans or projects, will not adversely effect the integrity of any of the transboundary European sites. This conclusion is based on the evidence from the IfAA, the distance to the majority of the sites and the views of the German Government who are responsible for one of the closest sites, part of the German Dogger Bank SCI.**

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Date: **4th August 2015**

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Annex A

Table 15 Showing the UK European sites identified by the Applicant and considered during the examination from the RIES.

Column 1: European Sites listed in the Applicant's HRA Report, which are located within the UK	**Column 2: European Sites for which the Applicant concluded No LSE**	**Column 3: European Sites for which the Applicant concluded LSE**	**Column 4: European Sites for which the Applicant's conclusion of No AEOI was not disputed**	**Column 5: European Sites for which the Applicant's conclusion of No AEOI was disputed**
Abberton Reservoir SPA		Abberton Reservoir SPA	Abberton Reservoir SPA	
Abberton Reservoir Ramsar		Abberton Reservoir Ramsar	Abberton Reservoir Ramsar	
Alde–Ore Estuary SPA		Alde–Ore Estuary SPA	Alde–Ore Estuary SPA	
Alde–Ore Estuary Ramsar		Alde–Ore Estuary Ramsar	Alde–Ore Estuary Ramsar	
Arun Valley SPA		Arun Valley SPA	Arun Valley SPA	
Arun Valley Ramsar		Arun Valley Ramsar	Arun Valley Ramsar	
Auskerry SPA	Auskerry SPA			
Avon Valley SPA		Avon Valley SPA	Avon Valley SPA	
Avon Valley Ramsar		Avon Valley Ramsar	Avon Valley Ramsar	
Beast Cliff - Whitby (Robin Hood's Bay SAC)	Beast Cliff - Whitby (Robin Hood's Bay SAC)			
Benacre to Easton Bavents SPA		Benacre to Easton Bavents SPA	Benacre to Easton Bavents SPA	
Benfleet and Southend Marshes SPA		Benfleet and Southend Marshes SPA	Benfleet and Southend Marshes SPA	
Benfleet and Southend Marshes Ramsar		Benfleet and Southend Marshes Ramsar	Benfleet and Southend Marshes Ramsar	
Berriedale and Langwell Waters SAC	Berriedale and Langwell Waters SAC			
Berwickshire and North Northumberland Coast SAC		Berwickshire and North Northumberland Coast SAC	Berwickshire and North Northumberland Coast SAC	
Blackwater Estuary (Mid-Essex Coast Phase 4) SPA		Blackwater Estuary (Mid-Essex Coast Phase 4) SPA	Blackwater Estuary (Mid-Essex Coast Phase 4) SPA	
Blackwater Estuary (Mid-Essex Coast Phase 4) Ramsar		Blackwater Estuary (Mid-Essex Coast Phase 4) Ramsar	Blackwater Estuary (Mid-Essex Coast Phase 4) Ramsar	
Breydon Water SPA		Breydon Water SPA	Breydon Water SPA	
Breydon Water Ramsar		Breydon Water Ramsar	Breydon Water Ramsar	
Broadland SPA		Broadland SPA	Broadland SPA	
Broadland Ramsar		Broadland Ramsar	Broadland Ramsar	
Buchan Ness to Collieston		Buchan Ness to Collieston	Buchan Ness to Collieston	

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Coast SPA		Coast SPA	Coast SPA	
Caithness and Sutherland Peatlands SPA	Caithness and Sutherland Peatlands SPA			
Caithness and Sutherland Peatlands Ramsar	Caithness and Sutherland Peatlands Ramsar			
Caithness Lochs SPA	Caithness Lochs SPA			
Caithness Lochs Ramsar	Caithness Lochs Ramsar			
Calf of Eday SPA		Calf of Eday SPA	Calf of Eday SPA	
Cape Wrath SPA		Cape Wrath SPA	Cape Wrath SPA	
Chesil Beach and the Fleet SPA	Chesil Beach and the Fleet SPA			
Chesil Beach and the Fleet Ramsar	Chesil Beach and the Fleet Ramsar			
Chichester and Langstone Harbours SPA		Chichester and Langstone Harbours SPA	Chichester and Langstone Harbours SPA	
Chichester and Langstone Harbours Ramsar		Chichester and Langstone Harbours Ramsar	Chichester and Langstone Harbours Ramsar	
Colne Estuary (Mid-Essex Coast Phase 2) SPA		Colne Estuary (Mid-Essex Coast Phase 2) SPA	Colne Estuary (Mid-Essex Coast Phase 2) SPA	
Colne Estuary (Mid-Essex Coast Phase 2) Ramsar		Colne Estuary (Mid-Essex Coast Phase 2) Ramsar	Colne Estuary (Mid-Essex Coast Phase 2) Ramsar	
Copinsay SPA		Copinsay SPA	Copinsay SPA	
Coquet Island SPA		Coquet Island SPA	Coquet Island SPA	
Cromarty Firth SPA		Cromarty Firth SPA	Cromarty Firth SPA	
Cromarty Firth Ramsar		Cromarty Firth Ramsar	Cromarty Firth Ramsar	
Crouch and Roach Estuaries (Mid-Essex Coast Phase 3) SPA	Crouch and Roach Estuaries (Mid-Essex Coast Phase 3) SPA			
Crouch and Roach Estuaries (Mid-Essex Coast Phase 3) Ramsar		Crouch and Roach Estuaries (Mid-Essex Coast Phase 3) Ramsar	Crouch and Roach Estuaries (Mid-Essex Coast Phase 3) Ramsar	

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Deben Estuary SPA	Deben Estuary SPA			
Deben Estuary Ramsar	Deben Estuary Ramsar			
Dengie (Mid-Essex Coast Phase 1) SPA		Dengie (Mid-Essex Coast Phase 1) SPA	Dengie (Mid-Essex Coast Phase 1) SPA	
Dengie (Mid-Essex Coast Phase 1) Ramsar		Dengie (Mid-Essex Coast Phase 1) Ramsar	Dengie (Mid-Essex Coast Phase 1) Ramsar	
Dogger Bank c SCI		Dogger Bank SCI		Dogger Bank SCI
Dornoch Firth and Loch Fleet SPA		Dornoch Firth and Loch Fleet SPA	Dornoch Firth and Loch Fleet SPA	
Dornoch Firth and Loch Fleet Ramsar		Dornoch Firth and Loch Fleet Ramsar	Dornoch Firth and Loch Fleet Ramsar	
Dorset Heathlands SPA		Dorset Heathlands SPA	Dorset Heathlands SPA	
Dorset Heathlands Ramsar	Dorset Heathlands Ramsar			
Duddon Estuary SPA		Duddon Estuary SPA	Duddon Estuary SPA	
Duddon Estuary Ramsar		Duddon Estuary Ramsar	Duddon Estuary Ramsar	
Dungeness - Pett Level SPA		Dungeness - Pett Level SPA	Dungeness - Pett Level SPA	
Dungeness to Pett Level Ramsar		Dungeness to Pett Level Ramsar	Dungeness to Pett Level Ramsar	
East Caithness Cliffs SPA		East Caithness Cliffs SPA	East Caithness Cliffs SPA	
East Sanday Coast SPA		East Sanday Coast SPA	East Sanday Coast SPA	
East Sanday Coast Ramsar		East Sanday Coast Ramsar	East Sanday Coast Ramsar	
Exe Estuary SPA		Exe Estuary SPA	Exe Estuary SPA	
Exe Estuary Ramsar		Exe Estuary Ramsar	Exe Estuary Ramsar	
Fair Isle SPA		Fair Isle SPA	Fair Isle SPA	
Faray and Holm of Faray SAC		Faray and Holm of Faray SAC	Faray and Holm of Faray SAC	
Farne Islands SPA		Farne Islands SPA		Farne Islands SPA
Fetlar SPA		Fetlar SPA	Fetlar SPA	
Firth of Forth SPA		Firth of Forth SPA	Firth of Forth SPA	
Firth of Forth Ramsar		Firth of Forth Ramsar	Firth of Forth Ramsar	

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Firth of Tay and Eden Estuary SPA		Firth of Tay and Eden Estuary SPA	Firth of Tay and Eden Estuary SPA	
Firth of Tay and Eden Estuary Ramsar		Firth of Tay and Eden Estuary Ramsar	Firth of Tay and Eden Estuary Ramsar	
Flamborough and Filey Coast pSPA[1]		Flamborough and Filey Coast pSPA[1]		Flamborough and Filey Coast pSPA[1]
Flamborough Head SAC	Flamborough Head SAC			
Forth Islands SPA		Forth Islands SPA		Forth Islands SPA
Foula SPA		Foula SPA	Foula SPA	
Foulness (Mid-Essex Coast Phase 5) SPA		Foulness (Mid-Essex Coast Phase 5) SPA	Foulness (Mid-Essex Coast Phase 5) SPA	
Foulness (Mid-Essex Coast Phase 5) Ramsar		Foulness (Mid-Essex Coast Phase 5) Ramsar	Foulness (Mid-Essex Coast Phase 5) Ramsar	
Fowlsheugh SPA		Fowlsheugh SPA		Fowlsheugh SPA
Gibraltar Point SPA		Gibraltar Point SPA	Gibraltar Point SPA	
Gibraltar Point Ramsar		Gibraltar Point Ramsar	Gibraltar Point Ramsar	
Great Yarmouth North Denes SPA	Great Yarmouth North Denes SPA			
Haisborough, Hammond and Winterton cSAC	Haisborough, Hammond and Winterton cSAC			
Hamford Water SPA		Hamford Water SPA	Hamford Water SPA	
Hamford Water Ramsar		Hamford Water Ramsar	Hamford Water Ramsar	

[1] In July 2013, NE began formal consultation on the extension of the Flamborough Head and Bempton Cliffs SPA. At that stage the extension became a potential SPA and was renamed Flamborough and Filey Coast pSPA. The pSPA is based on a revised site boundary, revised interest features and new reference populations. During the pre-application stages of the Dogger Bank Teesside A & B application NE advised the Applicant of the proposed site alterations, and NE are of the view that they have been appropriately included in their assessments (Footnote 56 of NE/JNCC's Written Representations **REP-132**).
Flamborough and Filey Coast pSPA has superseded the previous designation of Flamborough Head and Bempton Cliffs SPA and the Applicant was instructed by NE to use the pSPA qualifying features as the basis of their assessment (section 3.2 of Annex E: Expert Report on offshore ornithology (**REP-132**)). However, NE also note that until the status of the pSPA boundaries have been confirmed, it is necessary, under Habitat Regulations, that both the original SPA and new pSPA are both considered in the assessment (section 3.2 of Annex E: Expert Report on offshore ornithology (**REP-132**)).

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Hermaness, Saxa Vord and Valla Field SPA		Hermaness, Saxa Vord and Valla Field SPA	Hermaness, Saxa Vord and Valla Field SPA	
Holburn Lake and Moss SPA	Holburn Lake and Moss SPA			
Holburn Lake and Moss Ramsar		Holburn Lake and Moss Ramsar	Holburn Lake and Moss Ramsar	
Hornsea Mere SPA		Hornsea Mere SPA	Hornsea Mere SPA	
Hoy SPA		Hoy SPA	Hoy SPA	
Humber Estuary SAC		Humber Estuary SAC	Humber Estuary SAC	
Humber Estuary Ramsar		Humber Estuary Ramsar	Humber Estuary Ramsar	
Humber Flats, Marshes and Coast SPA		Humber Flats, Marshes and Coast SPA	Humber Flats, Marshes and Coast SPA	
Inner Dowsing, Race Bank and North Ridge cSAC	Inner Dowsing, Race Bank and North Ridge cSAC			
Inner Moray Firth SPA		Inner Moray Firth SPA	Inner Moray Firth SPA	
Inner Moray Firth Ramsar		Inner Moray Firth Ramsar	Inner Moray Firth Ramsar	
Isle of May SAC		Isle of May SAC	Isle of May SAC	
Lee Valley SPA		Lee Valley SPA	Lee Valley SPA	
Lee Valley Ramsar		Lee Valley Ramsar	Lee Valley Ramsar	
Leighton Moss SPA		Leighton Moss SPA	Leighton Moss SPA	
Leighton Moss Ramsar		Leighton Moss Ramsar	Leighton Moss Ramsar	
Lindisfarne SPA		Lindisfarne SPA	Lindisfarne SPA	
Lindisfarne Ramsar		Lindisfarne Ramsar	Lindisfarne Ramsar	
Loch of Strathbeg SPA		Loch of Strathbeg SPA	Loch of Strathbeg SPA	
Loch of Strathbeg Ramsar		Loch of Strathbeg Ramsar	Loch of Strathbeg Ramsar	
Lower Derwent Valley SPA		Lower Derwent Valley SPA	Lower Derwent Valley SPA	
Lower Derwent Valley Ramsar		Lower Derwent Valley Ramsar	Lower Derwent Valley Ramsar	
Marazion Marsh SPA		Marazion Marsh SPA	Marazion Marsh SPA	
Martin Mere SPA		Martin Mere SPA	Martin Mere SPA	
Martin Mere Ramsar		Martin Mere Ramsar	Martin Mere Ramsar	

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Marwick Head SPA		Marwick Head SPA	Marwick Head SPA	
Medway Estuary and Marshes SPA		Medway Estuary and Marshes SPA	Medway Estuary and Marshes SPA	
Medway Estuary and Marshes Ramsar		Medway Estuary and Marshes Ramsar	Medway Estuary and Marshes Ramsar	
Mersey Estuary SPA		Mersey Estuary SPA	Mersey Estuary SPA	
Mersey Estuary Ramsar		Mersey Estuary Ramsar	Mersey Estuary Ramsar	
Mersey Narrows and North Wirral Foreshore SPA		Mersey Narrows and North Wirral Foreshore SPA	Mersey Narrows and North Wirral Foreshore SPA	
Mersey Narrows and North Wirral Foreshore Ramsar		Mersey Narrows and North Wirral Foreshore Ramsar	Mersey Narrows and North Wirral Foreshore Ramsar	
Minsmere-Walberswick SPA		Minsmere-Walberswick SPA	Minsmere-Walberswick SPA	
Minsmere-Walberswick Ramsar		Minsmere-Walberswick Ramsar	Minsmere-Walberswick Ramsar	
Montrose Basin SPA		Montrose Basin SPA	Montrose Basin SPA	
Montrose Basin Ramsar		Montrose Basin Ramsar	Montrose Basin Ramsar	
Moray and Nairn Coast SPA		Moray and Nairn Coast SPA	Moray and Nairn Coast SPA	
Moray and Nairn Coast Ramsar		Moray and Nairn Coast Ramsar	Moray and Nairn Coast Ramsar	
Morecambe Bay SPA		Morecambe Bay SPA	Morecambe Bay SPA	
Morecambe Bay Ramsar		Morecambe Bay Ramsar	Morecambe Bay Ramsar	
Mousa SPA	Mousa SPA			
Nene Washes SPA		Nene Washes SPA	Nene Washes SPA	
Nene Washes Ramsar		Nene Washes Ramsar	Nene Washes Ramsar	
New Forest SPA		New Forest SPA	New Forest SPA	
North Caithness Cliffs SPA		North Caithness Cliffs SPA	North Caithness Cliffs SPA	
North Norfolk Coast SAC	North Norfolk Coast SAC			
North Norfolk Coast SPA		North Norfolk Coast SPA	North Norfolk Coast SPA	
North Norfolk Coast Ramsar		North Norfolk Coast Ramsar	North Norfolk Coast Ramsar	
North Norfolk Sandbanks and Saturn Reef cSAC	North Norfolk Sandbanks and Saturn Reef cSAC			

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Northumbria Coast SPA		Northumbria Coast SPA	Northumbria Coast SPA	
Northumbria Coast Ramsar		Northumbria Coast Ramsar	Northumbria Coast Ramsar	
Noss SPA		Noss SPA	Noss SPA	
Orkney Mainland Moors SPA		Orkney Mainland Moors SPA	Orkney Mainland Moors SPA	
Otterswick and Graveland SPA	Otterswick and Graveland SPA			
Ouse Washes SPA		Ouse Washes SPA	Ouse Washes SPA	
Ouse Washes Ramsar		Ouse Washes Ramsar	Ouse Washes Ramsar	
Outer Thames Estuary SPA	Outer Thames Estuary SPA			
Pagham Harbour SPA		Pagham Harbour SPA	Pagham Harbour SPA	
Pagham Harbour Ramsar		Pagham Harbour Ramsar	Pagham Harbour Ramsar	
Papa Stour SPA	Papa Stour SPA			
Papa Westray (North Hill and Holm) SPA		Papa Westray (North Hill and Holm) SPA	Papa Westray (North Hill and Holm) SPA	
Pentland Firth Islands SPA	Pentland Firth Islands SPA			
Poole Harbour SPA		Poole Harbour SPA	Poole Harbour SPA	
Poole Harbour Ramsar		Poole Harbour Ramsar	Poole Harbour Ramsar	
Ramna Stacks and Gruney SPA	Ramna Stacks and Gruney SPA			
Ribble and Alt Estuaries SPA		Ribble and Alt Estuaries SPA	Ribble and Alt Estuaries SPA	
Ribble and Alt Estuaries Ramsar		Ribble and Alt Estuaries Ramsar	Ribble and Alt Estuaries Ramsar	
River Derwent SAC	River Derwent SAC			
River Oykel SAC	River Oykel SAC			
River South Esk SAC	River South Esk SAC			
River Spey SAC	River Spey SAC			
River Tay SAC	River Tay SAC			
River Teith SAC	River Teith SAC			
River Thurso SAC	River Thurso SAC			
River Tweed SAC	River Tweed SAC			
Ronas Hill – North Roe and	Ronas Hill – North Roe and			

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Tingon SPA	Tingon SPA			
Ronas Hill - North Roe and Tingon Ramsar	Ronas Hill - North Roe and Tingon Ramsar			
Rousay SPA		Rousay SPA	Rousay SPA	
Rutland Water SPA		Rutland Water SPA	Rutland Water SPA	
Rutland Water Ramsar		Rutland Water Ramsar	Rutland Water Ramsar	
Salisbury Plain SPA		Salisbury Plain SPA	Salisbury Plain SPA	
Saltfleetby-Theddlethorpe Dunes and Gibraltar Point SAC	Saltfleetby-Theddlethorpe Dunes and Gibraltar Point SAC			
Severn Estuary SPA		Severn Estuary SPA	Severn Estuary SPA	
Severn Estuary Ramsar		Severn Estuary Ramsar	Severn Estuary Ramsar	
Solent and Southampton Water SPA		Solent and Southampton Water SPA	Solent and Southampton Water SPA	
Solent and Southampton Water Ramsar		Solent and Southampton Water Ramsar	Solent and Southampton Water Ramsar	
Somerset Levels and Moors SPA		Somerset Levels and Moors SPA	Somerset Levels and Moors SPA	
Somerset Levels and Moors Ramsar		Somerset Levels and Moors Ramsar	Somerset Levels and Moors Ramsar	
South West London Waterbodies SPA		South West London Waterbodies SPA	South West London Waterbodies SPA	
South West London Waterbodies Ramsar		South West London Waterbodies Ramsar	South West London Waterbodies Ramsar	
St Abb's Head to Fast Castle SPA		St Abb's Head to Fast Castle SPA	St Abb's Head to Fast Castle SPA	
Stodmarsh SPA		Stodmarsh SPA	Stodmarsh SPA	
Stodmarsh Ramsar		Stodmarsh Ramsar	Stodmarsh Ramsar	
Stour and Orwell Estuaries SPA		Stour and Orwell Estuaries SPA	Stour and Orwell Estuaries SPA	
Stour and Orwell Estuaries		Stour and Orwell Estuaries	Stour and Orwell Estuaries	

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Ramsar		Ramsar	Ramsar	
Sule Skerry and Sule Stack SPA		Sule Skerry and Sule Stack SPA	Sule Skerry and Sule Stack SPA	
Sumburgh Head SPA		Sumburgh Head SPA	Sumburgh Head SPA	
Switha SPA	Switha SPA			
Teesmouth and Cleveland Coast SPA		Teesmouth and Cleveland Coast SPA	Teesmouth and Cleveland Coast SPA	
Teesmouth and Cleveland Coast Ramsar		Teesmouth and Cleveland Coast Ramsar	Teesmouth and Cleveland Coast Ramsar	
Thames Estuary and Marshes SPA		Thames Estuary and Marshes SPA	Thames Estuary and Marshes SPA	
Thames Estuary and Marshes Ramsar		Thames Estuary and Marshes Ramsar	Thames Estuary and Marshes Ramsar	
Thanet Coast and Sandwich Bay SPA		Thanet Coast and Sandwich Bay SPA	Thanet Coast and Sandwich Bay SPA	
Thanet Coast and Sandwich Bay Ramsar		Thanet Coast and Sandwich Bay Ramsar	Thanet Coast and Sandwich Bay Ramsar	
The Dee Estuary SPA		The Dee Estuary SPA	The Dee Estuary SPA	
The Dee Estuary Ramsar		The Dee Estuary Ramsar	The Dee Estuary Ramsar	
The River Dee SAC	The River Dee SAC			
The Swale SPA		The Swale SPA	The Swale SPA	
The Swale Ramsar		The Swale Ramsar	The Swale Ramsar	
The Wash SPA		The Wash SPA	The Wash SPA	
The Wash Ramsar		The Wash Ramsar	The Wash Ramsar	
The Wash and North Norfolk Coast SAC	The Wash and North Norfolk Coast SAC			
Troup, Pennan and Lion's Heads SPA		Troup, Pennan and Lion's Heads SPA	Troup, Pennan and Lion's Heads SPA	
Tweed Estuary SAC	Tweed Estuary SAC			
Upper Solway Flats and Marshes SPA		Upper Solway Flats and Marshes SPA	Upper Solway Flats and Marshes SPA	

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Upper Solway Flats and Marshes Ramsar		Upper Solway Flats and Marshes Ramsar	Upper Solway Flats and Marshes Ramsar	
West Westray SPA		West Westray SPA	West Westray SPA	
Ythan Estuary, Sands of Forvie and Meikle Loch SPA		Ythan Estuary, Sands of Forvie and Meikle Loch SPA	Ythan Estuary, Sands of Forvie and Meikle Loch SPA	
Ythan Estuary and Meikle Loch Ramsar		Ythan Estuary and Meikle Loch Ramsar	Ythan Estuary and Meikle Loch Ramsar	