Department of Energy & Climate Change

RECORD OF THE HABITATS REGULATIONS ASSESSMENT UNDERTAKEN UNDER REGULATION 25 OF THE OFFSHORE MARINE CONSERVATION REGULATIONS 2007 (AS AMENDED) FOR AN APPLICATION UNDER THE PLANNING ACT 2008 (AS AMENDED)

***Project Title*: EAST ANGLIA ONE OFFSHORE WIND FARM**

28 May 2014

CONTENTS

TABLES

FIGURES

1. INTRODUCTION

Background

1.1 This is a record of the Habitats Regulations Assessment (HRA) that the Secretary of State for Energy and Climate Change has undertaken under Regulation 25 of the Offshore Marine Conservation (Natural Habitats & c.) Regulations 2007 (as amended) in respect of the Development Consent Order (DCO) and Deemed Marine Licences (DMLs) for the proposed East Anglia One Offshore Wind Farm and on and offshore connection works (the Project). For the purposes of Regulation 25, the Secretary of State is the competent authority.

1.2 On 8 November 2012, East Anglia One Ltd. (EAOL) submitted an application to the Planning Inspectorate (PINS), for consent under Section 37 of the Planning Act 2008 (as amended) for the construction and operation of a 1,200 MW offshore wind farm, its associated offshore infrastructure and connection works. The proposed wind farm is approximately 43.4 km off the coast of Suffolk and lies wholly outside the 12 nautical mile (nm) limit of territorial waters. The electrical systems that will take generated electricity from the site to the national grid (i.e. subsea export cabling and onshore grid connection infrastructure) also form part of the Project application and it is proposed that an offshore cable will connect the wind farm to a landfall site at Bawdsey, Suffolk. The Project application is described in more detail in **Section 2.**

1.3 In England and Wales, offshore energy generating stations 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 1,200 MW.

1.4 The Project was accepted by PINS on 14 December 2012, and on 28 March 2013, the Secretary of State for Communities and Local Government appointed a four-member Panel of Inspectors (the Panel) as the Examining Authority for the application. The examination of the Project application began on 25 June 2013 and was completed on 23 December 2013. The Panel submitted its report of the examination including its recommendation (the Panel's Report) to the Secretary of State on 18 March 2014.

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

1.6 Natural England (NE) is the Statutory Nature Conservation Body (SNCB) for England and for English waters within the 12nm limit. The Joint Nature Conservation Committee (JNCC) is a UK-wide SNCB, responsible for, amongst other matters, UK waters beyond the 12nm limit. They are jointly referred to in this report as SNCBs as both participated in the examination and co-ordinated and submitted joint responses, although some separate ornithological reports and written responses were submitted.

Habitats Regulation Assessment (HRA)

1.7 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.

1.8 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.

1.9 Beyond the 12 nm limit of territorial waters, the Offshore Marine Conservation (Natural Habitats & c.) Regulations 2007 (as amended) (the Offshore Habitats Regulations) transpose the Habitats and Birds Directives into national law. The Convention on Wetlands of International Importance 1972 (the Ramsar Convention) provides for the listing of wetlands of international importance. These sites are termed "Ramsar sites". UK Government policy is to afford Ramsar sites the same protection as European sites.

1.10 Regulation 25 of the Offshore Habitats Regulations provides that:

"…..*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 an 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.*"

1.11 This project is not directly connected with, or necessary to, the management of a European site or a European marine site. However, likely significant effects (LSEs) on such sites cannot be excluded and so an Appropriate Assessment (AA) is required by Regulation 25 of the 2007 Offshore Habitats Regulations. The purpose of the AA section of this report (**Sections 4-8)** is to determine whether adverse effects on the integrity of European sites or European marine sites can be ruled out in view of their Conservation Objectives.

1.12 In considering the possible impacts of the Project and in reaching his conclusions, the Secretary of State has also taken into account duties and obligations provided for under the Offshore Marine Conservation (Natural Habitats, & c.) (Amendment) Regulations 2012, SI 2012 No. 1928, which came into force on 16th August 2012 and amend the Offshore Regulations, transposing aspects of the Birds Directive to secure compliance. The Secretary of State is satisfied that in reaching his conclusions he has taken these into account.

The RIES and Statutory Consultation

1.13 Under Regulation 25 of the Offshore 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 specify.

1.14 The Panel, with support from PINS, prepared a RIES, using working matrices prepared by EAOL. The RIES compiles, documents and signposts the information received with the application and during its examination from the applicant and Interested Parties. It presents the Panel's understanding of the main facts regarding any AA to be carried out by the Secretary of State as part of his statutory duties as competent authority.

1.15 The RIES was published on PINS planning portal website and circulated to interested parties on 5 November 2013 for a period of 21 days for the purposes of statutory consultation. Formal responses raising specific issues on the RIES were received from: EAOL, the SNCBs, the Royal Society for the Protection of Birds (RSPB), and other offshore wind farm developers (SMartwind and Forewind). The Panel's report notes that SNCBs are satisfied that all European sites which could experience significant effects as a result of the project have been assessed (Panel's Report 4.54). The Panel does, however, highlight that significant differences remained between the applicant and the SNCBs regarding the outcomes of assessments on site integrity (Panel's Report 4.63). The Secretary of State is confident that these differences have been examined in full in the Panel's report and that the RIES, written responses to it, and source materials set out below can be relied on to inform his assessment on the impact of the project on European sites and species.

Source Materials

1.16 This report should be read in conjunction with the following documents that provide extensive background information:

Reports from the Panel and PINs

- The Planning Act 2008 East Anglia One Wind Farm – Examining Authority's Report of Findings and Conclusions and Recommendation to the Secretary of State, 18 April 2014 (the Panel's Report)
- Report on the Implications for European Sites. Proposed East Anglia ONE Offshore Wind Farm. An Examining Authority report prepared with the support of the Environmental Services Team. Appendix F to the Panel's report, 5 November 2013 (the RIES)

Application documents

- East Anglia ONE Offshore Wind Farm – Appropriate Assessment Report. Revision A. Document Reference 6.3 Scottish Power Renewables & Vattenfall. November 2012 (the original AA) (APP-045);

- Environmental Statement (the ES), in particular Vol. 2 Ch. 12 (Ornithology (Marine and Coastal)) (APP-081)
- Habitats Regulations Assessment Report Version 2. 9 September 2013 - submitted in response to Rule 17 Request (the revised HRA) (REP-269)
- Addendum to the Ornithology (Marine and Coastal) Chapter of the ES, 9 September 2013 - submitted in response to Rule 17 request (the revised ES) (REP-269)

1.17 Further information was provided in the Statements of Common Ground and Written Representations and these are referenced in this report by adopting the same system as the Panel, i.e. by REP number. These representations are listed in **Annex A**. The Panel also held an Issue-Specific Hearing on Ornithology, Protected Species and Habitats in Ipswich on 17 September 2013. All the submission documentation, representations and audio recordings from the hearings can be accessed on the East Anglia One project pages of the PINS infrastructure portal. http://infrastructure.planningportal.gov.uk/projects/eastern/east-anglia-one-offshore-windfarm/

1.18 The key information from these documents and representations is summarised and referenced in this report.

2. PROJECT DESCRIPTION

Project Components

2.1 The Project will comprise the construction and operation of up to 240 wind turbines, with a maximum installed capacity of up to 1,200 MW. This was reduced from an original proposal of 325 turbines for the reasons set out in paragraphs 2.12 to 2.14. The Development Consent Order (DCO) also authorises:

- up to five offshore substations (converter / collector stations);
- one meteorological mast;
- inter-array cables between the turbines and the offshore substations and export cables to take the electricity generated to shore;
- onshore electrical works consisting of underground cables running from mean low water at Bawdsey to a new onshore converter station adjacent to the National Grid substation at Bramford in Suffolk; and
- an underground connection between East Anglia One converter station and the National Grid collector station.

2.2 Each of the wind turbines will have a maximum blade tip height of up to 200 metres above lowest astronomical tide (LAT); a maximum hub height of up to 120 metres above LAT; and a maximum rotor diameter of 170 metres. No turbine will have a distance of less than 22 metres between the lowest point of the rotating blade of the wind turbine and the Mean High Water Springs (MHWS) tide level.

2.3 Whilst the ES envisaged up to 5 different types of foundation to fix the turbines to the seabed, the DCO now includes provision for only three, namely jacket, gravity base and suction caisson. A meteorological mast will be used to collect meteorological and oceanographic data and will be fixed to the seabed by jacket, gravity base, suction caisson or monopile foundations.

2.4 Up to three High Voltage Alternative Current (HVAC) collector substations, fixed to the seabed by jacket or gravity base foundations, will be used to collect power from multiple wind turbine generators and convert the electricity for transmission. This will require up to 680 km of inter-array cabling, with the final layout to be agreed with the Marine Management Organisation (MMO) via the Deemed Marine Licence (DML).

2.5 The offshore associated development includes up to two High Voltage Direct Current (HVDC) converter stations, fixed to the seabed by gravity base or jacket foundations. These will receive the generated electricity from the HVAC collector stations. Up to 400km of HVDC export cables will transport this electricity to the MHWS tide level at the landfall at Bawdsey. The ES also assesses the laying of additional minor cabling of up to 2 fibre optic cables, maximum 100 km long, which may be either embedded in a power cable or bundled alongside, with no additional laying operation.

2.6 The onshore associated development principally consists of underground cabling from Mean Low Water Springs (MLWS) at Bawdsey to a new onshore converter station adjacent to the National Grid substation at Bramford, Suffolk and an underground connection between the two substations. It also includes proposals for some overcapacity infrastructure i.e. the laying of ducts for planned future offshore wind farm projects, East Anglia Three and Four. Also included are: ramps, means of access, fencing, and other works which have been assessed in the ES.

2.7 Full details of the infrastructure to be used in the Project are detailed in Schedule A of the DCO under "Authorised Development" - Works No.1 – 41.

Project Design (Rochdale) Envelope

2.8 The precise wind turbine models and foundation types which would be procured for the project had not been agreed at the point of submission of the Project application, due to commercial and supply chain constraints. Therefore, EAOL seeks to retain flexibility in its final project design by framing its application to allow for multiple design options, in accordance with the Rochdale Envelope concept as set out in PINS Advice Note 9[1]. This allows flexibility for different sizes of turbines, foundation types, and layout as long as they lie within the limits of an authorised project design, or "Rochdale Envelope". The need to preserve flexibility is set out in the Explanatory Memorandum [APP-029] and was a matter considered throughout the examination (Panel's Report: paragraph 2.22).

2.9 Prescriptive locations for individual turbines are not set out in consents for offshore wind farms, as flexibility is required to ensure that the scheme can be delivered optimally post-consent. Nevertheless, three indicative locations for offshore structures were developed and assessed by EAOL to inform their ES and consultation. However, the precise layout of the turbines will be determined post-consent, once detailed ground investigations and design optimisation work have been undertaken, alongside the results of procurement tendering exercises. For example, the optimum orientation of the rows of wind turbines will depend on the local wind regime and navigational requirements. In-row spacing and inter-row spacing could vary across the site area where different types of wind turbine are used. In developing its final layout, EAOL has committed in its ES to optimising the layout of the wind farm in order to minimise environmental impacts, whilst maximising energy yield and cost-efficiency.

2.10 To ensure that the potential impacts of all variants of the Project are adequately assessed, a worst realistic case assessment of the parameters included within the project design envelope was addressed in the ES. Elements of the project where flexibility is required include: wind turbine type, foundation type, and scour protection. 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.

2.11 The ES has assessed a range of turbine types (from a maximum of 325 wind turbines of 3 to 5 MW generating capacity each though to 150 wind turbines each of 8 MW capacity) to achieve

[1] http://infrastructure.planningportal.gov.uk/legislation-and-advice/advice-notes/

the 1,200 MW maximum generating capacity of the project. The extremes of the range are set out in **Table 2.1.**

Table 2.1: Project Design Envelope: Range of Turbine Parameters in the ES

Wind Turbine type	Number of turbines	Tip Height	Rotor Diameter	Hub Height
3 MW	325 would be used in-combination with larger turbines to achieve generating capacity of up to 1,200MW	Minimum 135m (LAT)	Minimum 110m	Minimum 80m (LAT)
8 MW	150	Maximum 200m (LAT)	Maximum 170m	Maximum 120m (LAT)

Source: Vol 1 the ES: Table 4.4.

Turbine Reduction Offer

2.12 At the final stage of the examination, EAOL submitted a written representation [REP-342] stating that it had made sufficient progress with its procurement activities to be able to reduce the number of wind turbines proposed in the draft DCO from a maximum of 325 to 240, thereby reducing the size of the Rochdale Envelope required. The Panel found that the letter fell short of proposing such a change and that such a change was not necessary (Panel's Report: paras. 2.32, 4.129-4.138). The Panel recommended against any reduction in the Project's generating capacity, in light of the need case for all types of energy infrastructure as set out in the Overarching National Policy Statement for Energy (NPS EN-1) (DECC, 2011a).

2.13 The Panel recognised the environmental benefits of the proposed turbine reduction on bird species and balanced these against the dis-benefits of reducing the energy generating capacity of the Project. Given this balance and the lateness in the examination of the arrival of the offer, the Panel placed little weight on it as a potential revision to the application.

2.14 The Secretary of State undertook a consultation exercise with Interested Parties after receipt of the Panel's Report (8 April to 6 May 2014). The aim of this was to better understand whether the proposed reduction in turbine numbers did in fact represent a reduction in total generating capacity of the Project or whether it was a refinement of the Rochdale Envelope as a consequence of recent procurement decisions. Based on the responses he received, he concludes that if the project were to be consented at the reduced number of turbines this would not necessarily affect the ability of EAOL to achieve the maximum generating capacity from the Project of 1,200 MW and is, therefore compliant with NPS EN1. Furthermore, he notes that the operation of fewer, larger turbines (at least 5 MW each) will reduce the predicted collision mortality levels for a number of bird species. So whilst the Secretary of State agrees with the Panel that it is not necessary to reduce the number of turbines from 325 to 240 on HRA grounds, he considers that there is strong advantage in consenting the lesser number of

turbines because the potential impact on the environment is reduced to as low an extent as possible without affecting the maximum generating capacity of the wind farm.

2.15 This HRA is, therefore, for a DCO authorising a wind farm of no more than 240 turbines. The majority of the environmental information submitted as part of the examination of the Project addresses the impact of the original 325 turbine proposal which would have posed a greater collision risk to birds, estimated by EAOL to be of the order of 26% for gannet and kittiwake. Therefore, the assessment upon which the Panel relied can be considered to be very precautionary for the final DCO which the Secretary of State is issuing.

2.16 EAOL's HRA, ES and representations made during the examination are based on the impact of a 325 turbine proposal. The Secretary of State draws on these documents and the Panel's conclusion to inform his assessment and makes the assumption that the reduced 240 turbine proposal which he is authorising will have a lesser impact on bird species. Where collision risk modelling figures have been supplied for 240 turbines, these are shown in this report to indicate the level of reduction that can be expected.

2.17 The RSPB, in its letters of 22 April and 6 May 2014, queried EAOL's assertion that a c26% reduction the number of wind turbines would result in a directly proportional reduction in the number of bird collisions. EAOL in its responses of 17 April and 1 May 2014 set out the methodology and assumptions that had been used to calculate the revised collision figures. EAOL states that this is consistent with the approach adopted in its previous submissions. The response from EAOL is clear that the fact that there happens to be a 26% reduction in turbine numbers resulting in an approximate 26% reduction in bird collisions is coincidental. Natural England, on behalf of the SNCBs, in its letter dated 16 April 2014, welcomes the mitigation measure as it reduces the overall impacts of the project on nature conservation and states that the proposed reduction fits within the Rochdale Envelope assessed by the ES. This view is supported by the MMO in its letter of 17 April 2014.

2.18 The Secretary of State considers that the degree of flexibility provided for in the final DCO is reasonable, necessary and compliant with the flexibility intended in the National Policy Statement for Renewable Energy Infrastructure (NPS EN-3) (DECC, 2011b). In addition to his duties under the Habitats Regulations, the Secretary of State is also mindful of his wider biodiversity duties under, for example, Section 40 the Natural Environment and Rural Communities Act 2006. He notes that Natural England and the RSPB are supportive of the reduction as regards mitigating some of the impact of the Project. A more detailed description of the consultation; an evaluation of responses; and the reasoning behind the Secretary of State's acceptance of the turbine reduction offer is given in his decision letter.

Indicative Construction Schedule

2.19 EAOL sets out its onshore and offshore construction methodologies in its ES (Vol. 4), alongside indicative timelines. The offshore construction works are anticipated to take up to two and a half years to complete and assume a multiphase rolling construction process. The multi-phase

approach is as a result of the potential to use of up to three different wind turbine types and to ensure these are constructed in distinct areas.

2.20 The DCO also contains a requirement for construction to commence within 5 years of issue (PART 3, 2).

Operation and Maintenance

2.21 EAOL states in its ES the operation and control of the wind farm will be assessed by a Supervisory Control and Data Acquisition (SCADA) system, installed at each turbine and at the onshore control base. The SCADA system will enable the remote control of individual turbines or the wind farm in general, as well as information transfer, storage and the shutdown of any wind turbine in emergency circumstances. Access to the wind turbines and the site would be made by work boats launched from shore, from crew transfer vessels launched from accommodation and support vessels, from helicopters or from large craned vessels depending on the nature of the works to be undertaken. It is not anticipated that the export or inter-array cables would require any regular maintenance.

2.22 A number of maintenance options are under consideration for the Project. At the close of the examination, the final selection of the port facilities to construct and operate the Project had not been determined.

Decommissioning and Repowering

2.23 The Project falls within the scope of the Energy Act 2004 which includes decommissioning provisions. Broadly speaking, the Secretary of State shall require a person who is responsible for an offshore renewable energy installation to prepare a costed decommissioning programme and ensure that it is carried out. The Secretary of State can approve, modify or reject a decommissioning programme at any point. In addition, the agreement for lease between EAOL and The Crown Estate, places conditions upon EAOL to decommission its offshore assets. Decommissioning requirements are set out in the ES (Vol. 1 Ch. 4. 4.2.7).

2.24 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 DECC and in consultation with the MMO, SNCBs or their respective successors.

2.25 Decommissioning will take place at the end of the Project lifetime and will involve the removal of all accessible installed components of the wind turbine including parts of the wind turbine foundation structures (those above seabed level) and the sections of the inter-array cables close to the offshore structures, as well as sections of the export cable(s). The decision on repowering would be taken on commercial grounds, based on the performance of the wind farm and would be subject to a future consents application and a fresh assessment under the Offshore Habitats Regulations by the relevant authorities at that time.

3. PROJECT LOCATION AND EUROPEAN SITES

Location

3.1 The wind turbine array will be located in the Southern North Sea approximately 43.4 km off the coast of Suffolk, the closest coastal town being Lowestoft at 45.4 km. The offshore site covers an area of approximately 300 km^2 and is up to 15 km wide in an east-west direction and 34.3 km in length (north to south). It is entirely within the UK's Renewable Energy Zone (REZ), situated 142 km from the Netherlands and 152 km from Belgium at its nearest point.

3.2 The western site boundary is delineated by the Bacton to Zeebrugge high pressure gas pipeline and the eastern boundary by an International Maritime Organisation (IMO) Deep Water Shipping Route. The array lies within The Crown Estate's offshore wind Round 3 leasing Zone 5, which has been assessed as being able to deliver up to 7,200 MW of capacity.

3.3 An offshore cable route is proposed between the wind farm site and the landfall site at Bawdsey, Suffolk. The proposed offshore cable corridor would be 73 km in length and 9 km in width to accommodate 4 individual cables and up to 2 fibre optic cables to Bawdsey, Suffolk.

3.4 The onshore site consists of a landfall site at Bawdsey, Suffolk and an onshore cable corridor 37 km in length and 55 m wide to accommodate 4 plus 2 cables and up to 8 ducts. The corridor runs west from the landfall site to the eastern boundary of Ipswich before diverting around the north of the town to a substation site at Bramford, Suffolk. A map of the Project location is given in **Figure 3.1.**

European Sites

3.5 The RIES identifies 51 European sites that were included in EAOL's HRA and reports that screening for Likely Significant Effect (LSE) was carried out as a two-stage filter process, with iteration after the consultation stages and following discussions with the SNCBs post-submission. The SNCBs have not raised any concerns about the selection of sites considered, although did provide updated information about Flamborough and Filey Coast pSPA during the examination.

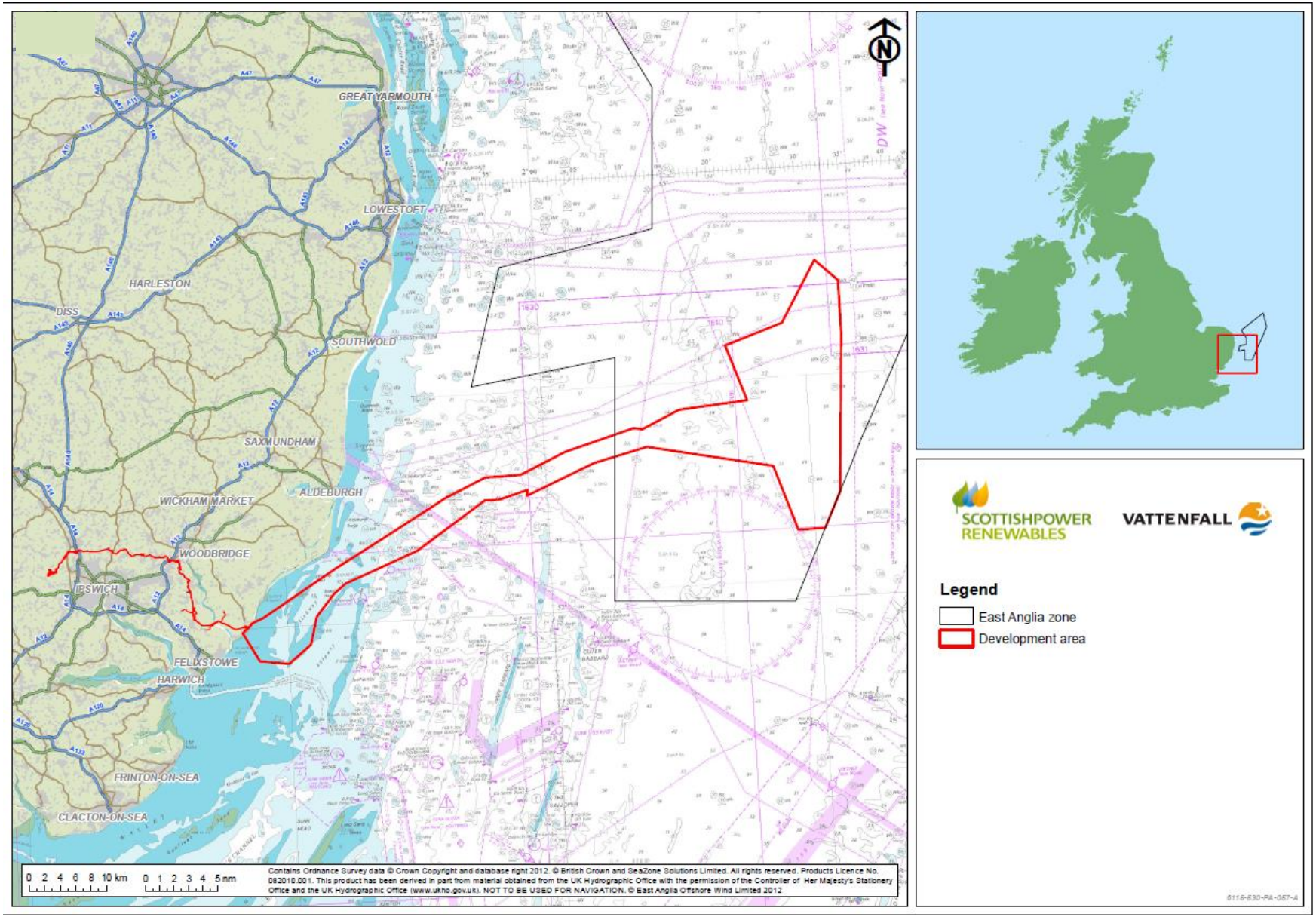
3.6 NE proposes to extend the existing SPA at Flamborough Head and Bempton Cliffs and rename it the Flamborough and Filey Coast SPA. Formal public consultation on the proposals took place from 20 January to 14 April 2014. An assessment of the impacts of this new SPA is given in **Section 7.**

Likely Significant Effects (LSE)

3.7 Matrices 3.1 – 3.51 in the RIES present the potential interactions of each stage of the Project alone and in combination with other plans and projects on the qualifying features of the 51 sites.

3.8 An LSE is considered to be any effect that may be reasonably predicted to occur that may affect the conservation objectives of the features for which the site was designated, and that therefore could have an adverse effect on the integrity of the site. This follows EC guidance on habitats

Figure 3.1. Location of the Project



3.9 assessment (EC 2000 and 2001) – “Assessment of plans and projects significantly affecting Natura 2000 sites” (2001).

3.10 As a result of the screening assessment, it was concluded that significant effects could not be excluded on four features of three European sites listed in **Table 3.1**. Following the provision of further information, an LSE on Herring Gull was subsequently discounted alone and in combination. The scope of the screening exercise and its conclusions were agreed with SNCBs, following submission of additional information during the examination.

Table 3.1: Qualifying features for which an LSE cannot be excluded

European Site	Qualifying feature	Reasons why LSE cannot be excluded
Alde-Ore Estuary SPA	Herring Gull (*Larus argentatus)* (Breeding population)	Collisions with operational wind turbines as a result of the Project **alone and in combination** with other plans and projects. [LSE subsequently ruled out – see paras. 3.133.11 and 3.12]
Alde-Ore Estuary SPA / Ramsar[2]	Lesser Black Backed Gull (*Larus fuscus*) *(*Breeding population)	Collisions with operational wind turbines as a result of the Project **alone and in combination** with other plans and projects. [EAOL consider no LSE alone].
Flamborough Head and Bempton Cliffs SPA (to be subsumed into Flamborough Head and Filey Coast pSPA)	Gannet (*Morus bassanus)* (Breeding population)	In combination only
	Kittiwake (*Rissa tridactyla)* (Breeding population*)*	In combination only

Source: RIES Stage 1 Matrices 3.17, 3.18, 3.19, 3.30 and 3.31 amended to take into account NE advice in the Offshore SoCG [REP-236 and REP-276]

3.11 SNCBs initially advised that likely significant effects as a result of the Project alone could not be ruled out for the **Herring Gull** feature of the Alde-Ore Estuary SPA**.** Herring Gulls are known to fly at a height that places them at risk of collisions with operational turbines (Cook *et al*. 2012) and are likely to be present in the wind farm footprint. The SNCBs requested further information from EAOL as regards apportionment to confirm that there would be no LSE. This is documented in the Offshore SoCG (REP-236).

3.12 The predicted impacts on Herring Gulls were estimated using Band Collision Risk Model (CRM) Options 1, 2 and 3 and an avoidance rate of 98%. The revised calculations took into account the use of biogeographic reference populations and clarified how the collisions had been apportioned to the relevant SPAs. The level of mortality expected to result from the Project alone for all CRM types is at most 0.35 birds per annum and a relative change in the number of

[2]Breeding Lesser Black Backed Gull are a feature of the Alde-Ore Estuary SPA and also part of the Ramsar qualifying criteria.

birds subject to mortality of 0.17% (using Basic Band CRM Option 1). On this basis, it was concluded that there would be no LSE on the Herring Gull feature of the Alde-Ore Estuary SPA and Ramsar (REP-269, Section D. Herring Gull).

3.13 Following the provision of this additional information, the SNCBs subsequently agreed with EAOL at the Issue Specific Hearing on Ornithology, Protected Species and Habitats. They concluded that the Project alone would not have an LSE on the Alde-Ore Estuary SPA/Ramsar as a result of Herring Gull collisions. It was agreed that the predicted mortality of less than 1 bird per annum would be so small as not to alter materially any overall in-combination figure [REP-269 App 1 p.90] and [REP-273 para. 23]. The Panel agreed with this conclusion (Panel's Report: para. 4.69). For this reason, the Secretary of State does not consider it necessary to consider impacts on Herring Gull in his AA, either alone or in combination.

3.14 EAOL considered that there would be no LSE on **LBBGs** alone [REP-236]. EAOL estimated in its ES that mortality would be of the order of 14 birds per annum during the breeding season. The SNCBs, however, considered that an AA was required and that the Project makes a relatively small contribution to an existing in-combination total from consented and built wind farms that is unacceptably high.

3.15 EAOL then undertook tagging analysis of 24 LBBG to better understand the distribution of the birds compared to the wind farm footprint. This is considered further in the **Section 5** of the AA (Alde-Ore Estuary SPA and Ramsar). Impacts on **Black-legged Kittiwake (Kittiwake)** and **Northern Gannets (Gannets)** are considered in **Section 6** (Flamborough Head and Bempton Cliffs SPA) and again in **Section 7** for the proposed new site (Flamborough and Filey Coast pSPA).

Conclusions on Likely Significant Effects

3.16 The Secretary of State agrees with the Panel that LSE cannot be ruled out as a result of the project alone and in-combination with other plans and projects, on the European sites and features listed below and it is these features that are relevant to his AA.

- Alde-Ore Estuary SPA and Ramsar site (LBBG)
- Flamborough Head and Bempton Cliffs (gannet and kittiwake)
- Flamborough and Filey Coast pSPA (gannet and kittiwake)

3.17 The Secretary of State considers that sufficient information has been provided to inform a robust assessment in line with his duties under Regulation 25. The Secretary of State agrees with the Panel that there are no LSEs on any other site.

4 APPROPRIATE ASSESSMENT

4.1 An AA is triggered when the competent authority, in this case the Secretary of State, determines that a plan or project may result in a LSE on a European site. Guidance issued by the European Commission (EC) 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).

4.2 The purpose of this AA is therefore to determine whether or not adverse effects on the integrity of those sites and features identified at the screening stage in Table 3.1 can be ruled out as a result of the Project alone or in-combination with other plans and projects in view of site conservation objectives and using the best available scientific evidence.

4.3 If the competent authority is not convinced of the absence of an adverse effect on site integrity, then alternative solutions should be sought. In the absence of an acceptable alternative, under the terms of Article 6(4) of the Habitats Directive, a project can proceed only if there are imperative reasons of overriding public interest (IROPI) and compensatory measures are secured to maintain the integrity of the Natura 2000 network. Article 6(4) considerations were not addressed during the examination of the Project and are beyond the scope of this AA.

Conservation Objectives

4.4 EC guidance 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 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."

4.5 Conservation objectives outline the desired state for any European site, in terms of the interest features for which they have 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 adverse effect on integrity 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).

4.6 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. The conservation objectives for the three sites in Table 3.1 for which LSE were identified have been taken into account by the Secretary of State in reaching his decision, alongside the potential for adverse impacts on integrity, as a result of the project alone and in-combination with other plans and projects.

5 ALDE-ORE ESTUARY SPA AND RAMSAR

Introduction

5.1 The Alde-Ore Estuary SPA/Ramsar site covers 2,417 ha and is located on and around the Suffolk coast, being some 54 km from the Project at its closest point. It comprises an estuarine complex of the rivers Alde, Butley and Ore. The Alde-Ore Estuary was also listed as a Ramsar site in October 1996 for its internationally important wetland assemblage. The SPA citation was published in January 1996 and the site was classified by the UK Government as an SPA under the provisions of the Birds Directive in August 1998. The site also includes the Alde-Ore Estuary SSSI, which was notified in 1952, with the SSSI boundary being coincident with that of the SPA and Ramsar sites. The shingle and saline lagoon habitats of the SSSI comprise the Orfordness to Shingle Street SAC, while its estuary habitats comprise the Alde, Ore and Butley Estuaries SAC. The SPA/Ramsar site also forms part of the Alde-Ore and Butley European Marine Site.

5.2 There are a variety of habitats within the site, including intertidal mud-flats, saltmarsh, vegetated shingle (including the second-largest and best-preserved area in Britain at Orfordness), saline lagoons and semi-intensified grazing marsh. The Orfordness/Shingle Street land form is geomorphologically unique within the UK in combining a shingle spit with a cuspate foreland. The diversity of wetland habitat types present is of particular significance to the birds occurring on the site, as these provide a range of opportunities for feeding, roosting and nesting within the site complex. At different times of the year, the site supports notable assemblages of wetland birds including seabirds, wildfowl and waders. As well as being an important wintering area for waterbirds, the Alde-Ore Estuary provides important breeding habitat for several species of seabird, wader and birds of prey. During the breeding season, gulls and terns feed substantially outside the SPA/Ramsar site (JNCC, 2011).

5.3 The Suffolk Wildlife Trust, the National Trust and the RSPB have nature reserves within the SPA/Ramsar.

5.4 JNCC's SPA site description (as published in 2001) indicates that the Alde-Ore Estuary qualifies as an SPA under Article 4.1 of the Wild Birds Directive (79/409/EEC) by regularly supporting populations of the following Annex I species of European importance: Avocet *Recurvirostra avosetta* (both breeding and wintering); breeding populations of Little Tern *Sterna albifrons*; Marsh Harrier *Circus aeruginosus*; and Sandwich Tern *Sterna sandvicensis*.

5.5 The site also qualifies under Article 4.2 of the Directive by supporting two Annex II species - a breeding population of LBBG *Larus fuscus* and a wintering population of Redshank *Tringus totanus*.

5.6 Following the UK SPA review (Stroud *et al*. 2001), additional Article 4.2 qualifying features were identified as needing protection:

- a breeding seabird assemblage of international importance (at least 20,000 seabirds) and

- a wintering waterbird assemblage of international importance (at least 20,000 waterbirds).

5.7 During the breeding season, the site regularly supports 59,118 individual seabirds including: Herring Gull *Larus argentatus*; Black-headed Gull *Larus ridibundus*; Lesser Black-Backed Gull (LBBG) *Larus fuscus*; Little Tern *Sterna albifrons*; and Sandwich Tern *Sterna sandvicensis*.

Conservation Objectives

5.8 The conservation objectives of the site are as set out in **Table 5.1** and include restoring the LBBG population to 14,074 pairs, subject to natural change.

Table 5.1 Conservation Objectives for the Alde-Ore Estuary SPA

Conservation Objectives	Avoid the deterioration of the habitats of the qualifying features, and the 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 [for each qualifying feature]: ➢ The extent and distribution of the habitats of the qualifying features; ➢ The structure and function of the habitats of the qualifying features; ➢ The supporting processes on which the habitats of the qualifying ➢ features rely; ➢ The populations of the qualifying features; and ➢ The distribution of the qualifying features within the site.
Target	The site qualifies under Article 4.2 of the Directive (79/409/EEC) by supporting populations of European importance of the following species listed on Annex II of the Directive: Lesser Black-backed Gull *Larus Fuscus (Breeding)* 14,074 pairs (4 year mean peak (1994-1997).

Source: European Site Conservation Objectives for the Alde-Ore Estuary SPA, as set by NE

Feature: Lesser Black-Backed Gull

5.9 The Alde-Ore Estuary SPA/Ramsar site holds approximately 1,600 breeding pairs of LBBG, a large reduction from the estimated 21,000 pairs present in the colony in 1998. The breeding population of LBBG is a qualifying feature of the SPA under Article 4.2 of the Birds Directive (79/409/EEC). The changing fortunes of gulls at the Alde-Ore Estuary SPA/Ramsar site and reasons for the current unfavourable declining status are documented in the Appropriate Assessment for Galloper Offshore Wind Farm (DECC, 2013a) and elsewhere, for example, Mason (2010).

5.10 The proposed wind farm array is located approximately 54 km from the SPA/Ramsar site at its nearest point. This is within the 141 km (+/- 50.8km) mean maximum foraging range of LBBGs from the Alde-Ore Estuary SPA/Ramsar (Thaxter *et al,* 2012a) and within the 91 km mean maximum breeding season foraging range (Thaxter *et al*, 2012b). This assessment is concerned with the breeding season LBBG for which the Alde-Ore Estuary SPA/Ramsar site is

designated and considers risk of collision mortality only as disturbance, displacement and barrier effects to movements were screened out in the RIES.

5.11 Tagging data by the RSPB from studies in 2010 and 2011 of birds from this breeding colony show that around two thirds of birds feed offshore and of those birds, none flew out as far as the Project site during the breeding season. A BTO study by Thaxter *et al* (2012a) suggests that upwards of 60% of birds from the Alde-Ore Estuary SPA/Ramsar colonies forage at some point within the entire East Anglia Round 3 development zone. However, more specific information on whether tagged birds actually flew in the East Anglia ONE (Project) site within the zone is not known. It is accepted that these data sets are limited in their extent, although they do suggest that the population of LBBG within the Project site during the breeding season includes birds from the Alde-Ore Estuary SPA/Ramsar site as well as other regional colonies.

Collision Risk (alone)

ES calculations and EAOL's apportionment of LBBG to the SPA

5.12 To calculate the potential impact from collision risk to birds from the Alde-Ore Estuary SPA/Ramsar site, an apportionment exercise was undertaken in the ES on the basis that:

- The Alde-Ore Estuary SPA breeding population of approximately 1,600 pairs represents approximately **31.5%** of the regional breeding population of 10,178 individuals within the maximum (181 km) foraging range during the breeding season.
- Breeding colonies along the east coast of East Anglia are homogenously distributed within the regional population.
- Collision risk modelling has predicted that the maximum number of birds from all populations at risk of collision during the breeding period (May to July) is a total of **58 birds** using a 98% avoidance rate, the "Basic" Band Model Option 1 (Band, 2000) and a site-specific Potential Collision Height (PCH) of 26.2m, drawn from the results of 24 months of data.

5.13 The predicted annual mortality for birds from the Alde-Ore Estuary SPA/Ramsar is presented in **Table 5.2.**

Table 5.2 Collision estimates for LBBG from the Alde–Ore Estuary SPA/Ramsar (Band CRM Option 1)

Avoidance Rate	Breeding season annual mortality (individuals)		Non-breeding season	Total annual mortality
	All birds	Adults		
98%	18	14	2	20

Source: REP 269, Section 5. Table 5.1

5.14 Annually, at a 98% avoidance rate, 20 lesser black-backed gulls from the Alde-Ore Estuary SPA were predicted to collide with the proposed East Anglia ONE offshore windfarm (including all adult, sub-adult birds and juvenile birds). EAOL also presented results for 99% and 99.5% avoidance. The results of site-specific surveys (APEM, 2012) indicate that 78% of the birds

observed are adults: therefore, it is assumed that a similar proportion of collisions will involve adult birds i.e. 16 adult birds per annum. 14 of these collisions involving adult birds would be during the May to July breeding season.

Findings from Tagging Data Analysis

5.15 Following submission of DCO application for the Project to PINS, data from a tagging study of LBBGs became available (Thaxter *et al,* 2012b). This included information from 24 LBBGs which were GPS-tagged at Orfordness, part of the Alde-Ore Estuary SPA/Ramsar site in 2010 and 2011.

5.16 Using these data, EAOL's ornithological consultant, APEM, analysed the average number of minutes per day SPA birds spent in the East Anglia ONE wind farm array area during the breeding season. This was used to calculate the percentage of LBBG minutes spent in the wind farm array (i.e. "at collision risk") per day.

5.17 The overall percentage of LBBGs attributable to the Alde-Ore Estuary SPA/Ramsar recorded in the wind farm array area was calculated to be 1.53%, which, following collision risk modelling, equates to an estimated of 0.7 adult collisions during the breeding season. As a precaution, these calculations were then repeated to include the extended breeding season of February to August. This gave the overall percentage of LBBGs recorded in the EA ONE surveys attributable to the Alde-Ore Estuary SPA/Ramsar as 1.27%, equating to 0.78 adult collisions. These estimates are based on collision risk analysis, assuming a precautionary 50% nocturnal activity.

5.18 Therefore, the number of collisions in each breeding season as a result of the Project is extremely small with the more recent tagging data providing a much lower figure than had been estimated in the ES and EAOL's original HRA (0.7 adult birds compared to 14 during the breeding season). EAOL considers that this number of collisions should be considered *de minimis*. With the inclusion of mortality during the autumn and winter periods, the annual mean predicted mortality for LBBGs from the Alde-Ore Estuary SPA through collision increased to less than 3 adults in total. Both the RSPB and SNCBs commented on the small sample size of tagged birds [REP-254 and REP-155].

SNCB assessment of LBBG collisions

5.19 SNCB advice on potential impacts on LBBG is set out in Dr. Richard Caldow's expert report on Coastal and Offshore Ornithology (REP-155). Dr. Caldow confirmed at the issue-specific hearing that he had adopted a different approach to the apportionment of collision mortality to that used by EAOL. Based on his assessment of the data, the bulk of the collisions are likely to occur outwith the breeding season and this is of the order of 10-33 birds. He estimates that collisions during the breeding season (to which some degree of confidence can be attached) is around **3-7 birds** per annum. Following this further assessment, NE concluded that no reasonable scientific doubt remains as to the absence of an adverse effect on the integrity of the Alde-Ore Estuary SPA arising from the development alone (REP-276).

Population Viability Analysis (PVA)

5.20 To determine the likely effect of collisions on the Alde-Ore Estuary SPA/Ramsar breeding colony of LBBGs a Population Viability Analysis (PVA) was commissioned from MacArthur Green (Trinder, 2012). Future populations were estimated under low and medium scenarios. The medium scenario was thought to be the most realistic as it assumes that SPA site management measures are implemented which reduce predation – this was considered to be a reasonable assumption as it is Natural England's responsibility to restore the SPA population condition from the starting 'unfavourable declining' 2011 population level of 1,600 pairs to 'unfavourable increasing'. It is understood that such measures are currently under discussion with the relevant parties.

5.21 Under the medium scenario, 3,758 breeding pairs would be expected in the SPA after 25 years without the wind farm. An additional 20 adult LBBG mortalities per annum (more than the 16 adults predicted in the ES) was programmed into the PVA. This led to a prediction of 3,590 breeding pairs after 25 years, which is a difference of less than 5%. This difference is likely to be within the margins of error for the model and, more importantly does not stop the gradual upward trend in breeding pairs. Therefore, removal of 20 birds or less per annum would have a negligible effect on the number of breeding pairs of LBBGs expected to be at the Alde-Ore Estuary SPA after 25 years under the medium scenario.

Conclusions – LBBG collision risk (alone)

5.22 On the basis of the PVA medium scenario and range of collision risk estimates supplied, the Secretary of State concludes that there would be no adverse impacts on the LBBG interest feature of the Alde-Ore Estuary SPA/Ramsar due to collision mortality from the operation of the Project alone. He notes the different collision risk figures provided by NE's ornithological advisor and the results of the GPS tagging studies and considers that they are not inconsistent with this conclusion.

In-combination collision impacts

5.23 The SNCB's main concern was the impact of the Project in combination with other offshore wind farms - current and proposed. EAOL has undertaken predictions of in-combination mortality for ten consented, under construction and operational wind farms. Using a 98% avoidance rate and the Basic Band Model (Option 1), it estimated a total annual in-combination mortality of 249 LBBGs. These in-combination wind farms are show in **Table 5.3.** This in-combination mortality represents an increase in background mortality of 89.6%, of which the Project contributes 1.07% (assuming a current population of 3,200 LBBGs and a background mortality of 8.7% per annum (278 birds)).

Table 5.3 In-combination mortality of LBBG (revised Band 1 CRM, 98% AR)

Wind Farm	Alde-Ore SPA mortality
East Anglia ONE	3
Greater Gabbard	120*
Galloper	0
London Array I & II	-
Gunfleet Sands I & II	4*
Scroby Sands	-
Kentish Flats and Extension	4
Thanet	64*
Sheringham Shoal	16
Dudgeon	38
Overall mortality	**249**

* values corrected from 99% to 98% AR

Source [REP-269, Table 6.1, p.124].

5.24 Whilst the selection of wind farms included in the in-combination analysis was disputed, the SNCBs agreed that the number of predicted collisions attributable to the Project **is so small as to not materially alter the overall in-combination mortality figure** or the likelihood of an adverse effect on the integrity of the Alde-Ore Estuary SPA / Ramsar site [REP-150].

5.25 The Panel highlights that the effect of the Project on the LBBG population will be insignificant compared to other factors (Panel's Report: Paragraph 4.73). Factors at the SPA/Ramsar breeding site thought to contribute to a sharp decline in numbers include: predators, recreational access and vegetation. The SNCBs have legal obligations to implement measures at the SPA/Ramsar site to tackle these problems. Additional funding is also being put in place by Galloper Offshore Wind Ltd. to implement "top up" measures at the site as part of a Unilateral Agreement required as part of its DCO (DECC, 2013).

5.26 There are other issues affecting LBBG populations on a national scale. Since the late 1990s to early 2000s, populations in parts of England and Wales have shown widespread declines attributed to changes in fishing discards and refuse disposal practices (i.e. the closure of landfill sites and the covering of waste) reducing scavenging opportunities and food availability (Olsen and Larsson 2003, Mitchell et al. 2004, Barcena et al. 1984, del Hoyo et al. 1996).

5.27 NE advise that there is little to be gained from exploring mitigation options for the Project, given the small number of additional mortalities that can be attributed to the Project and the Panel agrees with this advice (Panel's Report: Paragraph 4.72).

Comparison with Galloper Offshore Wind Farm AA

5.28 In his AA for Galloper Offshore Wind Farm (DECC, 2013), the Secretary of State also considered in-combination effects on the LBBG at the Alde-Ore Estuary SPA and Ramsar site. He examined the results of stochastic PVA modelling under a range of scenarios. Of these, the

"Baseline" scenario most closely equates to the medium scenario described in paragraph 5.20 and 5.21.

5.29 Under the baseline scenario, growth is projected to occur over a 25-year period to 3,400 pairs. Without immigration, it would take over 50 years before the favourable conservation status target is met. Population growth is predicted until additional mortality reaches approximately 250 birds during the breeding season. Based on the lower confidence level, 95% of simulations have positive growth on average, until mortality reaches around 160 individuals.

5.30 The probability of the SPA population declining below the starting size increases from approximately 23% (no additional mortality) to approximately 83% (250 additional deaths). The probability of the SPA population declining by 5% increases from 2% (no additional mortality) to 62% (250 additional deaths).

5.31 From the Galloper PVA, it can be concluded that an in-combination additional mortality of the order of 250 poses a risk of population decline. On this basis, the Secretary of State agreed with the Panel to mitigate all of the projected 119 LBBG casualties per annum as a result of Galloper by a combination of project mitigation and SPA management measures. The Secretary of State acknowledged the precaution built into the PVA model in that it does not take into account possible immigration into the colony as gulls are known to change their breeding sites in response to more or less favourable conditions. Were immigration to be factored in, then more favourable growth rates might be expected in response to the creation of a more attractive breeding site at the SPA. In his AA for Galloper, he concluded that there would be no adverse impact on the Alde-Ore Estuary SPA.Ramsar site, if all predicted LBBG collision mortalities as a result of Galloper (119 with a 99% avoidance rate) were mitigated. This is the same conclusion that he reaches for East Anglia ONE in combination, given the *de minimis* contribution of the Project alone.

Conclusions – in-combination LBBG collision risk

5.32 Using a 98% avoidance rate and the Basic Band Model (Option 1), it is estimated that the annual in-combination mortality with other wind farm totals 249 LBBGs. This represents an increase in background mortality of 89.6%, of which the Project contributes 1.07%. This in-combination mortality is high when compared to the 2011 population of around 1,600 breeding pairs. However, with planned improvements to the SPA, the Secretary of State considers that immigration from other colonies is likely and will boost numbers, should favourable breeding conditions be created. He agrees with the Panel and the SNCBs that the number of predicted collisions that can be attributed to the project is so small as to not materially alter the overall in-combination mortality figure or the likelihood of an adverse effect on the integrity of the Alde-Ore Estuary SPA / Ramsar site. The Secretary of State agrees with the Panel that mortality from offshore wind farms is insignificant compared to other factors affecting the population, such as those highlighted in paragraphs 5.25 and 5.26.

5.33 The Secretary of State has taken into account data from tagged birds (24) indicating that collisions could be as low as 0.7 adult birds during the breeding season and an estimate provided by the SNCBs that gives a range of 3-7 adult birds during the breeding season.

6 FLAMBOROUGH HEAD AND BEMPTON CLIFFS SPA

Introduction

6.1 Flamborough Head and Bempton Cliffs SPA is located on the East Riding of Yorkshire, North Yorkshire coast. It was designated in 1993 and holds the only mainland breeding colony of gannet *Morus bassanus* in the UK as well as supporting large numbers of other breeding seabirds, including black-legged kittiwake *Rissa tridactyla* and various auk species (e.g. common guillemot *Uria aalge* and razorbill *Alca torda)*. The seabirds feed and raft in the waters around the cliffs, outside the SPA, as well as feeding more distantly in the North Sea. The intertidal chalk platforms are also used as roosting sites, particularly at low water and notably by juvenile kittiwakes. The majority of the SPA comprises shingle and sea cliff habitat, with dry grassland and deciduous woodland (JNCC, 2011b).

6.2 The Flamborough Head and Bempton Cliffs site qualifies as an SPA under Article 4.2 of the Birds Directive (79/409/EEC) by supporting populations of European importance of the following migratory species:

- Breeding black-legged Kittiwake (kittiwake); and
- A seabird assemblage of international importance (at least 20,000 seabirds) including breeding gannet, kittiwake, herring gull, common guillemot and razorbill.

6.3 At the time of citation, the site regularly supported 83,370 breeding pairs of kittiwake (2.6% of the breeding Eastern Atlantic population) (count as of 1987) and 305,784 individual seabirds. However, more recent estimates of kittiwake numbers (JNCC Seabird Colony Register Counts, accessed 06/05/2014)[3] show a substantial decline to some 37,617 pairs or 75,234 breeding adults in 2008.

6.4 The citation (JNCC, 2011b) notes that the SPA designations were reviewed in 2000, at which point kittiwakes were the only notified feature of the site. The seabird assemblage of international importance was added in 2001 as part of the UK SPA Review (Stroud *et al*, 2001).

Conservation Objectives

6.5 The conservation objectives of the site are as set out in **Table 6.1** and include restoring the kittiwake population to 83,370 pairs, subject to natural change.

Table 6.1 Conservation Objectives for Flamborough Head and Bempton Cliffs SPA

Conservation Objectives	Avoid the deterioration of the habitats of the qualifying features, and the 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 [for each qualifying feature]: ➢ The extent and distribution of the habitats of the qualifying features;

[3] http://jncc.defra.gov.uk/smp/searchCounts.aspx

	➢ The structure and function of the habitats of the qualifying features; ➢ The supporting processes on which the habitats of the qualifying features rely; ➢ The populations of the qualifying features; and ➢ The distribution of the qualifying features within the site.
Target	The site qualifies under Article 4.2 of the Directive (79/409/EEC) by supporting populations of European importance of the following species listed in Annex II of the Directive: Black-legged Kittiwake *Rissa tridactyla* (Breeding) 83,370 pairs (count as of 1987).

6.6 An LSE could not be ruled out for kittiwake and gannet features of Flamborough Head and Bempton Cliffs SPA / Ramsar as a result of collision with the Project's operational turbines in-combination with other wind farms. Collision risk and population modelling was undertaken by EAOL in order to determine the levels of additional mortality that can be supported without risk of population decline. The potential impact on both features is discussed in turn in below.

Feature: Kittiwakes

6.7 This assessment is concerned with the kittiwakes for which the Flamborough Head and Bempton Cliffs SPA Estuary is designated, both as an Annex II qualifying feature and also as part of the breeding seabird assemblage. It considers the risk of collision mortality in-combination with other plans and projects. Disturbance, displacement and barrier effects to movements have already been screened out in the RIES.

6.8 Flamborough Head and Bempton Cliffs SPA lies approximately 259 km from the Project and, based on the mean maximum foraging range of 60 km for kittiwake (Thaxter *et al,* 2012b) the Secretary of State considers that it is unlikely that breeding birds from the SPA would regularly reach the Project site as it lies around 200km beyond their mean maximum foraging range and there is no risk of LSE for the breeding kittiwake feature of the site. The Project is likely to give rise to higher levels of mortality during the kittiwake's annual migration, where birds from the SPA depart for Atlantic waters through the straits of Dover. The means of apportioning kittiwake at the project site to Flamborough Head and Bempton Cliffs SPA and estimating annual collision mortality across seasons is discussed below

Collision Risk (alone)

Apportionment of kittiwake across biogeographic areas

6.9 In response to comments from the SNCBs about the need to consider annual mortality across an appropriate reference population, EAOL re-apportioned the breeding and non-breeding season mortalities across sub-populations based on more recent data (Frederickson *et al* (2012) to split the total flyway population referenced from Stienen *et al* (2007) (and used in the ES) into more biogeographically relevant populations. The purpose of this apportionment was to more accurately calculate the percentage of the Flamborough Head and Bempton Cliffs SPA/Ramsar population of kittiwakes that resides within the North Sea, during the breeding, wintering and migration periods respectively.

6.10 Based on a total of 75,234 breeding individuals, it was estimated that birds from Flamborough Head and Bempton Cliffs SPA/Ramsar make up: 3.37% of the North Sea wintering population, 10.27% of the North Sea spring/autumn passage population, and 12.08% of the North Sea breeding population. These proportions were used to apportion the CRM results to assess the significance of kittiwake impacts on the Flamborough Head and Bempton Cliffs colony [REP-269. Section C2.].

Collision Risk Modelling

6.11 In its updated HRA report [REP-269. Section C3.] EAOL recalculates and reassess kittiwake collisions presenting alternative scenarios to the Basic Band CRM Option 1. These are shown in **Table 6.2** where:

- ***CRM Band Option 2*** is based on the same parameters as the Basic Band Option 1 Model, but with a species-specific PCH of 14.3% from the Cook *et al* (2012) review of flight heights[4], rather than site-specific survey data.
- ***CRM Band Option 3*** applies the detailed flight height distribution data from Cook *et al* (2012) to an extended and revised version of the Band Model (Band, 2012).

6.12 The results are shown as total annual collisions and also for adults only, where the proportion of adults in the population is taken to be 81.44% (derived from EAOL's boat-based data). The Flamborough Head and Bempton Cliffs kittiwake population is taken to be its 2008 value of 75,234 breeding adults.

Table 6.2 Results of applying the three alternate CRM options: kittiwake (98% AR and 325 turbines)

CRM option	% at PCH	Collisions (all annual)	All FHBC collisions (annual)	Adult only collisions (annual)	Inc. in mortality levels	Effect on baseline mortality (19%)
1	23.1%	1056	85	69	0.48%	19.09%
2	14.3%	780	63	51	0.36%	19.07%
3	n/a	33	3	2	0.01%	19.00%

Source: REP-269, Table 3.4.

6.13 Using a 98% avoidance rate, the three model types produce a range of predicted collision mortalities for adult kittiwakes from 2 birds (Band Option 3) to 69 birds (Band Option 1). The maximum change in annual baseline mortality resulting from this is an increase from 19.00% to 19.09%. This level of additional mortality is considered too small to have an effect on population levels and EAOL considered that further analysis through population modelling was not justified.

SNCB assessment of kittiwake collisions

6.14 SNCB advice on potential impacts on kittiwake is set out in Dr. Richard Caldow's expert report on Coastal and Offshore Ornithology (REP-155). In this, he estimates the potential annual mortality as 114 kittiwakes as a result of the project alone (93 adults). This is using slightly

[4] 62,975 observations from 26 study sites.

different apportionment factors to EAOL. This equates to only a 0.65% increase relative to baseline mortality and increases the absolute mortality as a result of the Project from 19.0% to 19.12%.He advises on this basis that the impact is unlikely to be of great significance.

6.15 The Potential Biological Removal (PBR) conducted by NE predicts that a precautionary value of 250-350 kittiwakes could be sustainably removed from the SPA without substantially compromising the population trajectory quantitatively or temporarily. Based on his calculations, the Project alone will remove no more than 52% of that total. He is, therefore, of the view that there is sufficient margin of error to conclude that no reasonable scientific doubt remains as to the absence of an adverse effect on the integrity of the SPA due to collision risk mortality at the project alone [REP-155 p.13 paragraph 44]. The Panel agrees with this conclusion (Panel's Report: Paragraph 4.82).

Conclusions: kittiwake collision risk alone

6.16 The Secretary of State considers that there will be no adverse impact on the kittiwake feature of the Flamborough Head and Bempton cliffs SPA as a result of the Project alone as the potential annual mortality lies within the PBR sustainable yield of 250-359 birds per annum. He notes that the turbine reduction to 240, rather than 325, as originally assessed, means that the projected kittiwake mortality levels will be reduced.

Collision Risk: in-combination with operational and consented wind farms

6.17 EAOL has presented an in-combination assessment for 17 offshore wind farms in UK North Sea Waters that are operational, under construction, or have been consented, but not constructed and estimated annual mortality levels using a 98%. The in-combination mortality figures for the Project in combination with these North Sea wind farms is shown in **Table 6.3.**

6.18 This additional mortality has then been translated into the likely effect on baseline mortality levels [REP-269, Tables 3.5, 3.6, 3.7 and 3.8] assuming a population of 75,234 adult breeding birds and an annual mortality of 14,294 (19%). For all CRM options, EAOL estimates that the relative change in the number of birds subject to mortality each year will increase by, at most, 1.09% at a North Sea scale. This is for CRM Basic Band Option. This represents a change in the annual baseline mortality from the current 19% to 19.21%. EAOL considers that this level of additional mortality would have little impact on the current population trends of the Flamborough Head and Bempton Cliffs SPA kittiwake population and further analysis of the effect of predicted in-combination mortality, through for instance population modelling, is not justified.

Table 6.3 Predicted in-combination mortality for kittiwake under three CRM options (98% AR and 325 turbines)

Offshore wind farm	Total collisions	Birds from FHBC (EAOL calcs.)	Birds from FHBC (NE calcs.)
Beatrice Demonstrator	9	< 1	
Greater Gabbard	50	5	
Gunfleet Sands	<1	<1	
Lynn and Inner Dowsing	n/a	n/a	
Sheringham Shoal	n/a	n/a	
Scroby Sands	n/a	n/a	
Thanet	2	<1	
London Array I & II	10	1	
Kentish Flats and extension	4	<1	
Teeside	140	5	
Lincs	5	1	
Dudgeon	n/a	n/a	
Galloper	148	15	
Humber Gateway	14	4	
Westermost Rough	1	<1	
Race Bank	57	6	
Triton Knoll	440	45	
North sea total consented and operational	**881**	**82**	**111**
EA ONE (CRM Band 1)	1,056	108*	128
EA ONE (CRM Band 2)	780	80	
EA ONE (CRM Band 3)	33	3	
Total (CRM Band 1)		**191**	**239**
Total (CRM Band 2)		**163**	
Total (CRM Band 3)		**86**	

* reduces from 108 to 80 birds with turbine reduction to 240, leading to an in-combination total of 162, rather than 191 from CRM Band 1.

Source: REP-269, Table 3.7, p. 65, plus REP-155 (NE estimates)

SNCB assessment of kittiwake collisions in-combination

6.19 In his expert report [REP-155] Dr Caldow applied his revised apportionment figures for the North Sea wind farms in **Table 6.3**. This resulted in an in-combination figure of 111 birds of all ages, rather than 82 as provided by EAOL and 128 birds of all ages for the Project (rather than 108). This gives a cumulative total of 239, rather than 191 for the Band Option 1 CRM. NE notes that 239 overall fatalities equates to 195 adult fatalities (239*0.8144) which in turn equates to 1.36% of baseline mortality (195/0.19*75,237).

6.20 As set out in paragraph 6.15, the PBR conducted by NE predicts that a precautionary value of between 250 and 350 kittiwakes could be sustainably removed from the SPA without compromising the population trajectory, either quantitatively or temporally. The Project in-combination with operational/consented wind farms as set out in **Table 6.3** is predicted to remove no more than 78% of that total and perhaps only 56%. NE is of the view that that there is sufficient margin of error to safely conclude that no reasonable scientific doubt remains as to the absence of an adverse effect on the integrity of the SPA due to collision risk mortality of

kittiwake from the Project in-combination with the consented and/or built wind farms set out in **Table 6.3**.

Impact of turbine reduction to 240

6.21 EAOL has estimated the likely reduction in mortality for the proposed reduction in turbines from 325 to 240. This is contained in its 13 December 2013 submission [REP-342]. Taking a 98% avoidance rate, EAOL estimates that the predicted number of collisions of kittiwake will reduce from 108 to 80 birds at Flamborough Head and Bempton Cliffs SPA using the Basic Band CRM Option 1. This reduction is shown in **Table 6.3**.

Conclusions: kittiwake collisions in combination with operational and consented wind farms

6.22 The Secretary of State is satisfied that an adverse effect on Flamborough Head and Bempton Cliffs SPA can be ruled out as a result of collisions with kittiwake from the Project in-combination with the other consented and/or built wind farms within the North Sea. This takes into account the revised in-combination assessment undertaken by EAOL and is in accord with the advice from NE and the recommendation of the Panel. He considers that this is an appropriate level to conduct a quantitative assessment, at which some weight can be placed on assessment findings.

6.23 He is mindful, however, that the North Sea "consented/built windfarms" in-combination assessment does not include all the offshore wind farms that the SNCBs recommend should be taken into account [REP-150]. SNCBs also raised other concerns [Panel's Report – paragraphs 4.87, 4.88] which included the lack of information on collisions with Scottish offshore wind farms and querying the collision mortality figures attributed to Hornsea offshore wind farm (currently at examination stage). They indicate that they cannot rule out an adverse in-combination impact on kittiwake at the Flamborough Head and Bempton Cliffs SPA if offshore wind farms that are currently under examination, such as Dogger Bank Creyke Beck and Hornsea Project 1 are included in this assessment. These issues are discussed below.

Collision Risk: kittiwake in-combination with pre-consent wind farms

6.24 In taking his decision on applications for development consent, the Secretary of State as competent authority is required to consider "reasonably foreseeable" plans and projects (EC, 1999) in order to ascertain that the application will not have an effect on site integrity either alone or in combination. Guidance suggests that, in considering the combined effects with other plans and projects, it will normally be appropriate to take account of:

- Outstanding consents that are not fully implemented;
- Ongoing activities or operations that are subject to continuing regulation; and
- Other proposals that are subject to a current application of any kind of authorisation, permission or licence (ODPM, 2005b).

6.25 To assist with providing a framework for in-combination (cumulative) assessments, the SNCBs suggested an approach [REP-278 Annex] that involved dividing projects into tiers according to their stage in the planning process. The earlier the stage that the project is at, then the greater the uncertainty associated with the data and the assessment. The later the stage, then the more reliable the data can be considered to be.

6.26 Given the number of offshore wind farm projects in the pipeline, for which some information is known, the Secretary of State considers that this tiered approach provides a helpful framework for a qualitative assessment and provides a more strategic understanding of the contributions of different projects and proposals. He has considered EAOL's response to the Tiered Approach to Inform Cumulative and In Combination Assessment of 21 October 2013 [REP-310] which provides a structured and helpful context to his consideration of this case.

Conclusions: kittiwake collisions in-combination with pre-consent wind farms

6.27 The Secretary of State acknowledges the potentially large number of kittiwake collisions that could result if all "reasonably foreseeable" projects are consented and constructed to their full potential. He notes NE's estimates that a figure of some 274 birds (or 223 adult kittiwake) would be an underestimate. As this represents some 90% of the precautionary PBR threshold of 250 adults, NE advise that there is insufficient certainty to allow an adverse impact on the SPA to be ruled out by the Project due to in-combination collision risk (including pre-consent/Tier 4 + offshore wind farm sites) at this stage.

6.28 In deciding what weight to place on this information for pre-consent wind farms, where limited data are available, the Secretary of State considers it appropriate to adopt the reasoning that he applied in his Habitat Regulations Assessment for Kentish Flats Offshore Wind Farm Extension (DECC, 2013b). He considers that there is no risk of adverse effects on the integrity of the Flamborough Head and Bempton Cliffs SPA from the Project in combination with yet to be determined project applications because he is the decision maker for offshore wind farms above 100 MW. The Habitats and Wild Birds Directives prevent the Secretary of State from granting consent to any plan or project where he could not rule out adverse effects on integrity of European sites (unless Article 6(4) were invoked).

6.29 The Secretary of State is mindful of the fact that not all offshore wind farms are built out to their consented capacity; and that constructed projects rarely resemble the "worst case scenarios" assessed in ESs and it is these "worst case" scenarios that are used for in-combination assessments, rather than "as built" scenarios. However, unless evidence is presented to reliably quantify "as built" scenarios and confirm that worst case scenarios will not materialise, this is a factor that he finds difficult to give any meaningful weight to at this time. The Secretary of State is satisfied that his conclusions are based on sound evidence and the best data that is available to him and without prejudice to any decision on future applications.

Feature: Gannets

6.30 This assessment is concerned with the breeding population of gannet which form part of the Flamborough Head and Bempton Cliffs SPA seabird assemblage. It considers the risk of collision mortality in combination with other plans and projects. Disturbance, displacement and barrier effects to movement have already been screened out in the RIES.

6.31 The mean maximum foraging range presented for gannet by Thaxter *et al* (2012) is 229.4 km and the maximum is 590 km. At 259 km from the SPA, the Project is well within the maximum foraging range of the species but below the mean maximum. RSPB tracking studies of post-breeding gannets from Flamborough Head and Bempton Cliffs SPA show gannet activity in the southern and central North Sea soon after dispersal. Data indicate that Bempton gannets make their way south towards Africa, either via the English Channel or around the northern tip of the UK and down the west coast of Ireland (RSPB, 2012).

6.32 This pattern of foraging and migration was supported by site surveys conducted by EAOL which indicate generally low numbers of gannet within the wind farm footprint, apart from during the autumn migration. Given the large foraging range of gannets and the low densities observed during the baseline surveys within the Project it is reasonable to conclude that the proposed wind farm array site is not of regular importance for birds foraging from the colony.

6.33 The breeding population was cited as 2,501 pairs (JNCC, 2001) at the time of designation. However, the population has grown rapidly with estimates of some 11,061 pairs or 22,122 breeding individuals in 2012 (JNCC Seabird Colony Register Counts, accessed 06/05/2014)[5].

Collision Risk (alone)

Apportionment of gannet across biogeographic areas

6.34 The apportionment methodology used in the ES and original HRA was considered by the SNCBs to potentially overestimate the relevant population against which impacts should be assessed, as not all gannets from the flyway population reside in or pass through the North Sea on migration. For this reason, EAOL submitted in its revised HRA [REP-269 Section 2] a reconsideration of gannet populations, including additional colonies within the North Sea and the latest colony counts to better apportion collisions to the Flamborough Head and Bempton cliffs colony. This took on board the most recent gannet geographical distribution from the SOSS-04 Report (WWT *et a*l, 2012). The purpose of this apportionment was to more accurately calculate the percentage of Flamborough Head and Bempton Cliffs SPA/Ramsar population that resides within the North Sea during the breeding, wintering and migration periods respectively.

6.35 Based on a total of 22,122 breeding individuals, it was estimated that gannets from Flamborough Head and Bempton Cliffs SPA/Ramsar make up: 8.61% of the North Sea wintering population; 9.97% of the North Sea spring/autumn passage population; and 53.2% of

[5] http://jncc.defra.gov.uk/smp/searchCounts.aspx

the North Sea breeding population. These proportions were used to apportion the CRM results to assess the significance of impacts gannet impacts on the Flamborough Head and Bempton Cliffs colony [REP-269. Section B2.].

Collision Risk Modelling

6.36 In its updated HRA report [REP-269. Section B3]. EAOL recalculates and reassesses gannet collisions, presenting alternative scenarios to the Basic Band CRM Option 1. As with the kittiwake revised CRM estimates, these comprised:

- ***CRM Band Option 2*** - based on the same parameters as the Basic Band Option 1 CRM, but with a species-specific PCH of 9.6% from the Cook *et al* (2012) review of flight heights[6], rather than the site-specific survey data.
- ***CRM Band Option 3*** – applies the detailed flight height distribution data from Cook *et al* (2012) to an extended and revised version of the Band Model (Band, 2012).

6.37 These results are shown in **Tables 6.4** and **6.5** for avoidance rates of 98% and 99% respectively. The results are shown as total annual collisions and also for adults only, where the proportion of adults in the population is taken to be 71.61% (derived from EAOL's boat-based data). The Flamborough Head and Bempton Cliffs SPA gannet population is taken to be its 2012 value of 22,122 breeding adults.

Table 6.4 Results of applying the three alternate CRM options: gannets (98% AR, 325 turbines)

CRM option	% at PCH	Collisions (all annual)	All FHBC collisions (annual)	Adult only collisions (annual)	Inc. in mortality levels
1	25.4%	850	91	65	3.65%
2	9.6%	324	35	25	1.38%
3	n/a	92	10	7	0.40%

Source: REP-269, Table 3.4, p19.

Table 6.5 Results of applying the three alternate CRM options: gannets (99% AR, 325 turbines)

CRM option	% at PCH	All collisions (annual	All FHBC collisions (annual)	Adult only collisions (annual)	Inc. in mortality levels
1	25.4%	425	46	33	1.83%
2	9.6%	162	7	12	0.69%
3	n/a	46	5	4	0.20%

Source: REP-269, Table 3.4, p19.

6.38 These assessments predict the collision mortality of adult gannets from the Flamborough Head and Bempton Cliffs SPA to be within a range of 4 to 33 individuals per annum using a 99% avoidance rate and 7-65 collisions per annum using a 98% avoidance rate. This represents an increase in annual mortality of 0.20%-3.65% against a baseline of 8.1%.

[6] 62,975 observations from 26 study sites.

SNCB assessment of gannet collisions

6.39 SNCB advice on potential impact on gannet is set out in Dr Richard Caldow's exert report on Coastal and Offshore Ornithology (REP-155). In this, he estimates 74 collisions year round as a result of the Project alone, using an avoidance rate of 98% and the Band Option 1 CRM. On the basis of available evidence, he advises that no reasonable scientific doubt remained as to the absence of an adverse effect on the integrity of the site due to collision risk mortality as a result of the Project alone.

Population Viability Analysis (PVA)

6.40 The effect of mortality on breeding colonies around the UK coast was considered by EAOL as part of a population viability analysis (PVA) (WWT *et al* 2012). With a 2012 starting population of 22,122 breeding adult gannets, the point at which mortality would be expected to lead to decline on a 50% probability basis would be an additional 160 birds per year. The EAOL gannet surveys were predominantly undertaken in 2011. When assessed against a projected 2011 gannet population of 20,000, this gives a 95% probability of no decline with an additional mortality of 144 birds.

6.41 There was disagreement between EAOL and the SNCBs as to the precise number of gannet predicted to collide with the wind farm, giving a range of between 4 and 65 breeding adults, depending on the choice of CRM and avoidance rate. In any event, all figures are well below the (WWT, 2012) PVA acceptable thresholds of acceptable mortality of 144-160 birds.

Conclusions: gannet collision risk alone

6.42 The Secretary of State considers that there will be no adverse impact on the gannet feature of the Flamborough Head and Bempton cliffs SPA as a result of the Project alone as the potential annual mortality (4 to 65 birds) lies well within the PVA threshold of 144-166 birds. He notes that the turbine reduction to 240, rather than 325, as originally assessed, means that the projected gannet mortality levels will be reduced.

6.43 This is in line with the Panel's conclusions (Panel's Report: paragraph 4.96) and SCNB advice in the Offshore SoCG [REP-150 and REP-236].

Collision Risk: in-combination with operational and consented wind farms

6.44 EAOL has presented an in-combination assessment for 17 offshore wind farms in UK North Sea Waters that are operational, under construction, or have been consented, but not constructed and estimated annual mortality levels for gannets at a 99% avoidance rate . The in-combination mortality figure for the Project in combination with these North Sea wind farms is shown in **Table 6.6**.

Table 6.6 Predicted in-combination mortality for gannet under three CRM options (99% AR and 325 turbines)

Offshore wind farm	Total collisions	Birds from FHBC (EAOL calcs.)	Birds from FHBC (NE calcs.)
Beatrice Demonstrator	2	0	
Greater Gabbard	25	2	
Gunfleet Sands	n/a	n/a	
Lynn and Inner Dowsing	0.5	0	
Sheringham Shoal	16	3	
Scroby Sands	n/a	n/a	
Thanet	1	0	
London Array I & II	5	0	
Kentish Flats and extension	3	0	
Teeside	6	2	
Lincs	4.5	1	
Dudgeon	72.5	15	
Galloper	56	6	
Humber Gateway	4	1	
Westermost Rough	0.5	0	
Race Bank	99	26	
Triton Knoll	127.5	36	
North sea total consented and operational		**94**	**147**
EA ONE (CRM Band 1)		33*	37
EA ONE (CRM Band 2)		12	
EA ONE (CRM Band 3)		4	
Total (CRM Band 1)		**127**	**184 at 99% AR 368 at 98% AR**
Total (CRM Band 2)		**106**	
Total (CRM Band 3)		**98**	

* reduces from 33 to 24 birds with turbine reduction to 240, giving a total in-combination collision estimate of 118 birds, rather than 127 for CRM Band 1.

Source: REP-269, Table 3.7, p. 24, plus REP-155 (NE estimates) and REP-342 (turbine reduction estimate)

6.45 The EAOL's assessment predicts an annual collision mortality of 127 breeding individuals, of which the Project contributes 26% (33 birds). For Band Options 2 and 3, these in-combination assessments result in 106 and 98 collisions of adult birds per annum respectively.

6.46 As set out in paragraph 6.40, the PVA model predicts that maximum additional mortality per year as 144 birds, at which point there is a 95% probability of no decline. The predicted collision mortality of 127 birds is below this threshold.

SNCB assessment of gannet collisions in combination

6.47 In his expert report [REP-150], Dr Caldow does not agree that it is appropriate to focus the in-combination assessment solely on figures derived from a 99% avoidance rate and considers that equal consideration should be given to figures based on a 98% avoidance rate. He also makes the point that the collision figures for the Project generated using Option 1 of the CRM should be considered in combination with other offshore wind farms to ensure comparability. He estimates an in combination value of 184 collisions, using a 99% avoidance rate and 368 collisions with an avoidance rate of 98%. Based on NE's PBR for gannet, he advises that a

point has now been reached where there is considerable uncertainty as to whether an adverse effect on the integrity of the SPA can be ruled out due to in-combination mortality figures. However, given NE's previous position that 98% "may be considered precautionary" [for gannet], he advises that on balance, no reasonable scientific doubt remains as to the absence of an adverse effect on the SPA, both alone and in combination with the wind farms considered in **Table 6.6**. He also notes that no consideration is given to gannet collisions outside UK waters and the difficulty in obtaining reliable figures for these. Nonetheless, he considers that there is a need to acknowledge and account for this additional impact qualitatively.

Impact of turbine reduction to 240

6.48 EAOL has estimated the likely reduction in mortality for a reduction in turbines from 325 to 240 in its 13 December 2013 submission [REP-342]. Taking a 99% avoidance rate, EAOL estimates that the predicted number of collisions of gannet will reduce from 33 to 24 adult birds at Flamborough Head and Bempton Cliffs SPA using the Band CRM Option 1.

Conclusions: gannets in combination with operational and consented wind farms

6.49 The Secretary of State is confident that the collision mortality from the Project in combination with existing operational and consented wind farms will not have an adverse impact on the integrity of the Flamborough Head and Bempton Cliffs SPA/Ramsar site. The SNCBs presented revised estimates of gannet mortality that suggests an annual in-combination mortality of 184 at a 99% avoidance rate and 368 at a 98% avoidance rate [REP-150]. The Panel reports that NE considers that mortality figures at either avoidance rate are within the sustainable threshold suggested by their PBR model and that NE conclude that no reasonable scientific doubt exists as to the absence of an adverse effect on the integrity of the SPA due to gannet collision mortality alone [Panel's Report, paragraphs 4.100-4.102].

6.50 The Panel notes NE's advice [REP-325] that using the building block approach and a 99% avoidance rate, the impact of the project on baseline mortality would be below the lower PBR threshold. The Panel considers that there is sufficient evidence to justify a 99% avoidance rate for gannet, but considers that even on the basis of a 98% avoidance rate, there would be no adverse impact on the integrity of the site, if Tier 1-3 projects only were taken into account [Panel's Report, paragraphs 4.125-4.128].

Use of 99% avoidance rate for gannet

6.51 Data from the offshore wind farm wind farm post-construction monitoring programs shows that gannets strongly avoided the wind farms (e.g. Krijgsveld *et a*l. 2010; Leopold *et al*. 2011). EAOL presented evidence from a study at the Egmond an Zeeoffshore wind farm (Krijgsveld *et al,* 2011) which recorded a gannet macro-avoidance rate of 64%. When combined with an observed micro-avoidance rate of 97.7%, this results in an overall rate of 99.136%.

6.52 Post-construction data from Horns Rev found gannet numbers were lower than expected within the wind farm area. Petersen *et a*l (2006) found significant avoidance by gannet out to 2 km. However, they also recorded a peak in abundance in May 2004 (post-construction) –

presumably due to spring migration. SNCBs advise that 98% "is likely to be precautionary", given the observed large-scale avoidance/displacement behaviour of gannets. However, it is acknowledged that the occurrence of sporadic peaks around offshore wind farms makes accurate prediction of an avoidance rate for gannet very challenging [REP-276, Annex H. Dr Sophy Allen Expert Statement]. The RSPB consider that collision risk modelling for gannet should use a 98% avoidance rate, as there is very little evidence to show micro-avoidance (of individual turbines within a wind farm) in gannets and use of a 99% avoidance rate may underestimate collision risk.

6.53 The Secretary of State considers that there is sufficient evidence for the adoption of a 99% avoidance rate for gannets, based on the results of post-construction studies. The use of a 99% avoidance rate for gannets is consistent with the approach that the Secretary of State took for his most recent HRA for Triton Knoll offshore wind farm (DECC, 2013c), although a 98% avoidance rate has been adopted for some previous assessments of offshore wind farms, where it was advised at that time.

Collision Risk: gannet in-combination with pre-consent wind farms

6.54 The Secretary of State is mindful of his requirements to consider "reasonably foreseeable" plans and projects and of the tiered approach suggested by the SNCBs as set out in paragraphs 6.24-6.25. Given the number of offshore wind farm projects in the pipeline, for which some information is known, the Secretary of State considers that this tiered approach provides a helpful framework for a qualitative assessment and provides a more strategic understanding of the contributions of different projects and proposals. He has considered EAOL's response to the Tiered Approach to Inform Cumulative and In Combination Assessment of 21 October 2013 [REP-310] which provides a structured and helpful context to his consideration of this case.

Conclusions: gannet collisions in-combination with pre-consent wind farms

6.55 The Secretary of State acknowledges the potentially large number of gannet collisions that could occur if all offshore wind farms in the pipeline are consented and constructed to their full potential, especially if collision risk assessments continue to be made on the basis of the Basic Band Option 1 model and a 98% avoidance rate.

6.56 In deciding what weight to place on the information for pre-consent wind farms, where limited data are available, the Secretary of State considers it appropriate and consistent to adopt the reasoning that he applied in his Habitat Regulations Assessment for Kentish Flats Offshore Wind Farm Extension (DECC, 2013b). This reasoning is set out in paragraphs 6.28- 6.29 for kittiwakes. He notes that the contribution of the Project alone is estimated by EAOL to be some 33 gannet for a 325 turbine wind farm and 24 for a 240 turbine wind farm. In combination with consented and constructed offshore wind farms, this is below the sustainable yield for the breeding population at Flamborough Head and Bempton Cliffs SPA/Ramsar which is a thriving and growing colony.

6.57 The Panel is quite clear that, should gannet (and kittiwake) mortality data for the Tier 4+ projects be taken into account, those projects could not proceed without a significant risk of adversely affecting the integrity of the Flamborough Head and Bempton Cliffs SPA [REP-325 Annexes C and D].

7. FLAMBOROUGH AND FILEY COAST POTENTIAL (p)SPA

7.1 Between 20 January 2014 and 14 April 2014, Natural England held a formal public consultation on the designation of the Flamborough and Filey Coast potential (p)SPA. This pSPA, if confirmed by the Secretary of State for the Environment, Food and Rural Affairs, would represent a geographical extension to the existing Flamborough Head and Bempton Cliffs SPA and add several species to the citation list.

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 Secretary of State considers it important to consider the impacts of the Project and whether or not LSEs can be ruled out.

7.3 The pSPA consists of the following:

- 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 (*Morus bassanus)*, common guillemot (*Uria aalge)*, razorbill (*Alca torda*) and incorporates an update to the published population figures for migratory black-legged kittiwakes (*Rissa tridactyla*).

7.4 It should be noted that there are currently no conservation objectives available for the Flamborough and Filey Coast SPA. In order for the SoS to undertake his assessment in line with the Habitats Regulations, he has assumed that the new conservation objectives will be broadly similar to those for the existing Flamborough Head and Bempton Cliffs SPA but applicable to the additional species on the proposed citation.

7.5 The SoS is of the view that in order to properly consider the implications of the pSPA, particular emphasis should be placed on considering the additional interest features not already considered as part of the Flamborough Head and Bempton Cliffs assessment **(Section 6.)** These are the auk species i.e. common guillemots and razorbills. The Secretary of State considers that the boundary changes to the site (both terrestrial and marine) will not make a material change as such are not considered further.

Impacts on the guillemot and razorbill

7.6 The mean maximum foraging range of guillemot is 48.5 km and for razorbill it is 84 km (Thaxter *et al*, 2012). As the Project is located approximately 259 km from the boundary of the pSPA, it is very unlikely that these species would regularly forage within the wind farm footprint and be displaced into less suitable areas during the breeding season. This was confirmed by EAOL's

bird surveys that recorded a mean peak of 47 guillemot and 23 razorbill in the wind farm footprint during the breeding period.

7.7 However, both guillemot and razorbill were recorded in numbers of regional importance in the wind farm footprint during the wintering and the spring migration periods. Guillemot numbers peaked in the site footprint during the wintering period with a mean peak estimate of 1,640. The spring migration mean peak estimate was 983 guillemots and the highest monthly mean peak - 771. Razorbill numbers also peaked during the wintering period (389 birds mean peak) with relatively high numbers recorded during the spring (274 birds mean peak).

7.8 The SNCBs highlighted potential impacts from the Project due to displacement of auk [REP-150]. The extent to which guilemots and razorbills are displaced from areas of sea is difficult to quantify. Furness and Wade (2012) report that guillemots and razorbills are relatively prone to disturbance/displacement effects in comparison with other seabirds (listed 11 and 12, out of 38 species, respectively).

7.9 Subsequent to the ES, EAOL undertook further studies to estimate the potential extent of guillemot and razorbill displacement [REP-269, Section I]. This considered the sensitivity to disturbance based on Furness and Wade (2012) and used a methodology set out in NE/JNCC's Joint Interim Advice Note (NE/JNCC, 2012). This results in matrices to quantify the number of birds subject to mortality when different displacement levels and mortality rates are cross-tabulated. The displacement area was taken as the proposed wind turbine array area, plus a 1 km buffer, with results presented for wintering and spring migration periods. Displacement levels were taken to be 10-30% within this area and mortality rates from 0-10%.

7.10 The conclusions were that:

- The numbers of auks present in the site plus and 1 km buffer during the breeding and autumn dispersal / migration periods were sufficiently small as to not merit further consideration.
- The number of guillemot in winter predicted to be displaced and then subject to mortality ranges from 3 to 82. These levels would increase mortality in relation to baseline by 0.003% to 0.08% respectively.
- The number of razorbill in winter predicted to be displaced and then subject to mortality ranges from 1 to 20. These levels would increase mortality in relation to baseline by 0.004% to 0.08% respectively.
- The number of guillemot in Spring predicted to be displaced and then subject to mortality ranges from 1 to 43. These levels would increase mortality in relation to baseline by 0.001% to 0.04% respectively.
- The number of razorbill in Spring predicted to be displaced and then subject to mortality is 0 to 43. These levels would increase mortality in relation to baseline by 0% to 0.048% respectively.
- These mortality levels due to displacement are not significant.

7.11 During the examination and, after considering the findings above, the SNCBs were able to conclude that that there would be no likely significant effect on auk species as a result of the project alone [REP-150]. However, some concerns were expressed about the lack of an in-combination assessment. EAOL concluded that due to the extremely small contribution to predicted displacement mortality in winter and spring, any in-combination effects for auks in the North Sea would not be significant. The SNCBs did not challenge this conclusion and the Panel saw no reason to disagree [Panel's Report, paragraphs 4.148-4.150].

Conclusions

7.12 The Secretary of State considers that sufficient evidence has been presented by EAOL and given advice from the SNCBs, he can eule out an LSE on the new guillemot and razorbill features of the Flamborough and Filey Cliffs pSPA as a result of displacement. He recognises that an assessment of the in-combination effects of guillemots and razorbills have not been carried out as EAOL is of the view that the effects are extremely small and would not make any meaningful contribution to an in-combination total. In the absence of any evidence, or advice to the contrary from SNCBs or any other interested parties, the Secretary of State considers that the Project, in combination with other plans or projects, is not likely to have a significant effect upon the guillemot and razorbill features of the Flamborough and Filey Coast pSPA.

7.13 Given that impacts on kittiwakes and gannets and Flamborough Head and Bempton Cliffs have been addressed in the preceding section of this report (**Section 6**) based on the most recently available population figures and noting that the conservation objectives for the new site are likely to be unchanged from the existing SPA, the Secretary of State is satisfied that the Project, when considered alone and in combination with other plans or projects, is not likely to have a significant effect upon the interest features of the Flamborough and Filey Coast pSPA.

8 CONCLUSIONS ON SITE INTEGRITY

8.1 The Secretary of State agrees with the Panel that LSE cannot be ruled out as a result of the project alone and in-combination with other plans and projects, on the European sites and features listed below and it is these features that are relevant to his AA. These are:

- Alde-Ore Estuary SPA and Ramsar site (Feature: Lesser Black-Backed Gull (LBBG))
- Flamborough Head and Bempton Cliffs (Feature: gannet and kittiwake)
- Flamborough and Filey Coast pSPA (Feature: gannet and kittiwake)

8.2 The Secretary of State considers that sufficient information has been provided to inform a robust assessment in line with his duties under Regulation 25 of the Offshore Habitats Regulations. The Secretary of State agrees with the Panel that there are no LSEs on any other site.

Alde-Ore Estuary SPA and Ramsar site

Feature: lesser black-backed gull

8.3 EAOL conducted a GPS tagging study of 24 LBBGs to calculate the minutes per day that SPA birds spent in the wind farm array area during the breeding season. This indicated that collisions could be of the order of 0.7 adult birds during the breeding season. The RSPB and SNCBs commented on the small sample size. The SNCBs advised that the Project's contribution to the in-combination mortality total (to which some degree of confidence can be attached) is likely to be between 3 to 7 birds during the breeding season.

8.4 The Secretary of State concludes that the number of collisions of LBBG during the breeding season as a result of the Project alone is extremely small and can be considered *de minimis*. Using a 98% avoidance rate and the Basic Band Model (Option 1), the annual in-combination mortality with other wind farms is 249 LBBGs. This represents an increase in background mortality of 89.6%, of which the Project contributes 1.07%. The Secretary of State agrees with the Panel and the SNCBs that the number of predicted collisions that can be attributed to the project is sufficiently small as to not materially alter the overall in-combination mortality levels or the likelihood of an adverse effect on the integrity of the Alde-Ore Estuary SPA / Ramsar site. He concludes that the Project will not have an adverse impact on the site either alone or in combination with other plans and projects. He places weight on the wider factors affecting the gull populations, such as food availability and threats at the SPA breeding colony that are currently being addressed by the SCNBs and partners, such as the RSPB and Suffolk Wildlife Trust.

Flamborough Head and Bempton Cliffs SPA

Feature: kittiwake

8.5 Using a 98% avoidance rate, three versions of the Band collision risk model were used to predict annual collision mortalities for kittiwakes. This ranged from two (using Band Option 3) to 69 adult birds (using the Basic Band Option 1). This would increase the annual baseline mortality levels from the current 19.00% to a maximum 19.09% for adult kittiwake. The SNCBs conducted an

assessment of the population level effects of collision mortalities and advised that that that there is sufficient margin of error to conclude that no reasonable scientific doubt remains as to the absence of an adverse effect on the integrity of the SPA due to kittiwake collision mortalities due to the Project alone.

8.6 The SNCBs advise and the Panel agree that there is sufficient margin of error to safely conclude that no reasonable scientific doubt remains as to the absence of an adverse effect on the integrity of the SPA due to collision risk mortality of kittiwake from the Project in-combination with 17 consented and/or built wind farms located in the North Sea. The Secretary of State agrees with this advice, based on the evidence presented.

Feature: gannet – annual mortality

8.7 Using 98% and 99% avoidance rates, three versions of the Band collision risk model were used to predict annual collision mortalities for adult gannets. This ranged from 4 birds (using a 99% avoidance rate, Band Option 3) to 65 birds (98% avoidance rate, Basic Band Option 1). The Secretary of State considers that there is sufficient post-construction monitoring for offshore wind farms to demonstrate that a 99% avoidance rate for gannets is suitably precautionary, given the large-scale avoidance/displacement behaviour displayed by gannets. This gives an annual mortality of around 33 birds with Band Option 1. This represents an increase on the 8.1% baseline mortality of 1.83%. [The SNCBs do not disagree with this position, describing 98% as "precautionary" although the RSPB considers that collision risk modelling for gannet should utilise a 98% avoidance rate.]

8.8 An in-combination assessment with 17 offshore wind farms in the North Sea that are operational, in construction, or have been consented, estimated annual mortality levels for gannets using a 99% avoidance rate. For the most precautionary Basic Band Option 1, this predicted an annual collision mortality of 127 individuals, of which the Project contributes 26% (33 gannets). The preferred population model predicts the maximum additional mortality per year as 144 birds, at which point there is a 95% probability of no decline. The predicted in-combination collision mortality of 127 gannets (based on a 99% avoidance rate) is below this threshold and so the Secretary of State is confident that the collision mortality from the Project in combination with existing operational and consented wind farms in the North Sea will not have an adverse impact on the integrity of the Flamborough Head and Bempton Cliffs SPA.

Flamborough and Filey Cliffs pSPA

Feature: guillemot and razorbill

8.9 The Secretary of State considers that sufficient evidence has been presented by EAOL to rule out an LSE on the new guillemot and razorbill features of the Flamborough and Filey Cliffs pSPA as a result of displacement. He recognises that an assessment of the in-combination effects of guillemots and razorbills has not been carried out as EAOL is of the view that the effects are extremely small. In the absence of any evidence, or advice to the contrary from SNCBs or any other interested parties, the Secretary of State considers that the Project, in combination with

other plans or projects, is not likely to have a significant effect upon the guillemot and razorbill features of the Flamborough and Filey Coast pSPA.

8.10 Given that impacts on kittiwakes and gannets and Flamborough Head and Bempton Cliffs have been addressed, based on the most recently available population figures and that the conservation objectives for the new site are likely to be unchanged from the existing SPA, the Secretary of State is satisfied that the Project, when considered alone and in combination with other plans or projects, is not likely to have a significant effect upon the interest features of the Flamborough and Filey Coast pSPA.

Turbine reduction offer

8.11 At the final stage of the examination, EAOL indicated that it had made sufficient progress with its procurement activities to be able to reduce the number of wind turbines proposed in the draft DCO from a maximum of 325 to 240, thereby reducing the size of the Rochdale Envelope. The responses from a consultation exercise after the close of the examination confirmed that this would not affect the ability of EAOL to construct the project up to its maximum capacity of 1,200 MW. Use of turbines of 5 MW and greater would result in a reduction in collision rates, compared to 3 MW turbines as fewer, larger turbines pose less of a threat to birds than a larger number of smaller turbines achieving the same energy output. On these grounds, the Secretary of State has restricted the number of turbines in the DCO to 240. He places weight on the SNCB's advice that the reduction is within the parameters of the Rochdale Envelope assessed in the ES and that the measure is welcomed as it reduces the overall impacts of the Project on nature conservation.

Collision risk in-combination with other offshore wind farms (tiered approach)

8.12 In taking his decision on applications for development consent, the Secretary of State as competent authority is required to consider "reasonably foreseeable" plans and projects in order to ascertain that the application will not have an effect on the integrity of any European site alone or in combination. Guidance suggests that it will normally be appropriate to take account of proposals that are subject to a current application of any kind. He acknowledges the potentially large number of additional gannet and kittiwake collisions that could occur if all offshore wind application and proposals that he is aware of are consented and constructed to their full potential, especially if collision risk assessments continue to be made on the basis of the Basic Band Option 1 model. He is also mindful of recommendations, such as those by the RSPB that he should take a strategic approach to the determination of this Project, Hornsea Project 1 and Dogger Bank Creyke Beck to maximise energy production, whilst minimising environmental effects. Whilst he is sympathetic to the intended outcome of such an approach, he considers that he has sufficient information before him to assess the application for this Project.

8.13 Given the number of offshore wind farm projects in the pipeline, for which some information is known, the Secretary of State considers that the tiered approach, suggested by the SNCBs provides a helpful framework for a qualitative assessment and provides a more strategic understanding of the contributions of different projects and proposals. In deciding what weight to

place on this information, in particular for tiers 4+, where limited data are available, the Secretary of State considers it appropriate and consistent to adopt the reasoning that he applied in his Habitat Regulations Assessment for Kentish Flats Offshore Wind Farm Extension.

8.14 He considers that there is no risk of adverse effects on the integrity of the Flamborough Head and Bempton Cliffs SPA from the Project in combination pre-consent wind farms because:

- He is the decision maker for offshore wind farms that are currently in the planning system. Tier 4+ projects will need to take into account in-combination impacts with EA ONE, if consented. The Habitats and Wild Birds Directives prevent the Secretary of State from granting consent to any plan or project where he could not rule out adverse effects on integrity of European sites (unless Article 6(4) were invoked).
- The Secretary of State acknowledges that there are different modelled figures showing the likely levels of collision, with variants of the Band Model (2 and 3) providing less precautionary figures that are considered by some parties to be more realistic. However, there remains disagreement as to how limited information should be interpreted and what might be a suitably precautionary avoidance rate to apply.
- The Secretary of State is mindful of the fact that not all offshore wind farms are built out to their consented capacity; and that constructed projects rarely resemble the "worst case scenarios" assessed in applicants' ESs and it is these historic "worst case" scenario collision figures that are used for in-combination assessments, rather than the lesser and more realistic "as built" scenarios. However, unless evidence is presented to quantify "as built" scenarios and confirm that worst case scenarios will not materialise, this is a factor that he finds difficult to give any meaningful weight to in his decisions.

8.15 The Secretary of State is satisfied that his conclusions are based on sound evidence and the best data that is available to him at this time. He makes his assessment of this Project without prejudice to any decision on future applications. He notes the Panel's recommendations (Panel's Report, paragraph 4.112) that even if Tier 4 projects are taken into account, little weight can be placed in the currently available data, due to the lack of certainty prior to detailed examination. Should further research confirm that alternative data, models or assumptions are more appropriate in informing his decisions on future applications, then the Secretary of State will take account of these at that time.

Author: Mandy King, Team Leader - Environment
National Infrastructure Consents Team, Department of Energy and Climate Change

Date: 28 May 2014

ANNEX A – STATEMENTS OF COMMON GROUND AND WRITTEN REPRESENTATIONS

Statements of Common Ground

- EAOL's Statement of Common Ground with JNCC and NE (offshore) (July 2013) (the Offshore SoCG) (REP-236)
- EAOL's Statement of Common Ground with Suffolk County Council; Mid-Suffolk District Council; Suffolk Coastal District Council; the Environmental Agency; Internal Drainage Boards; Natural England; and the Suffolk Wildlife Trust (REP-242).

Written Representations

- EAOL – Diver Displacement Technical Note, 30 July 2013 for Deadline I (REP-203)
- EAOL – Gannet Technical Clarification Note, 30 July 2013 for Deadline I (REP-207)
- EAOL – Kittiwake Technical Clarification Note, 30 July 2013 for Deadline I (REP-211)
- EAOL – Lesser Black Backed Gull Tagging Data Analysis, 30 July 2013 for Deadline I (REP-214)
- EAOL – Lesser Black Backed Gull Technical Clarification Note, 30 July 2013 for Deadline I (REP-215)
- NE and JNCC Written Representations, 30 July 2013 for Deadline I (REPs-150-162)
- RSPB Written Representation, 26 July 2013 for Deadline I (REP-166)
- Suffolk Wildlife Trust Written Representation, 30 July for Deadline I (REP-169)
- EAOL – updated information on HRA and DCO for Deadline II (REP-252)
- EAOL – Appendices A-D, Updated Assessments of Potential Impacts on Herring Gull, Gannet and Kittiwake, 27 August for Deadline II (REPs-261-263)
- RSPB – Comments on Written Representations and Statements of Common Ground and summary document, 23 August 2013 for Deadline II (REPs-254 and 255)
- NE and JNCC covering letter to accompany 27 August submission for Deadline II (REP-267)
- NE and JNCC – Written Summary of the Oral Case put at Issue Specific Hearings on HRA on 17 and 18 September 2013, 18 October 2013 for Deadline III [REP-276].
- EAOL - Response to the Tiered Approach, 21 October 2013 for Deadline III (REP-310)
- NE and JNCC - Response to RIES, 25 November 2013 for Deadline IV (REP-325)
- RSPB – Response to RIES, 26 November 2013 for Deadline IV (REP-329)
- EAOL – Comments on ExA's Matrices to inform RIES, Appendix 4, 26 November 2013 for Deadline IV (REP-335)

- EAOL – Response to Rule 17 Request and Appendix 1, 13 December 2013 for Deadline V (REPs-341,342)
- Forewind Ltd. - Comments on Natural England's Deadline IV response, 13 December 2013 for Deadline V (REP-347)
- SMartwind Ltd. - Comments on Natural England's Deadline IV response, 13 December 2013 for Deadline V (REP-348)
- RSPB - Comments on Natural England's Deadline IV response, 13 December 2013 for Deadline V (REP-349)
- NE and JNCC - Interested Parties Deadline IV: Further Advice, 13 December 2013 for Deadline V (REP-350)

ANNEX B: European Sites where an LSE could not be ruled out and their qualifying features

Designated site	Site qualifying features	Distance to East Anglia ONE
Alde-Ore Estuary SPA and Ramsar	Common redshank (*Tringa totanus*) (SPA and Ramsar over-winter) Eurasian marsh harrier (*Circus aeruginosus*) (SPA only breeding) Lesser black-backed gull (*Larus fuscus*) (SPA and Ramsar breeding) Little tern (*Sterna albifrons*) (SPA only breeding) Pied avocet (*Recurvirostra avosetta*) (SPA only breeding and SPA and Ramsar over-winter) Ruff (*Philomachus pugnax*) (SPA only over-winter) Sandwich tern (*Sterna sandvicensis*) (SPA only breeding) Breeding seabird assemblage (SPA) Wintering waterbird assemblage (SPA)	54 km to wind farm array and <2 km from cable landfall
Flamborough Head and Bempton Cliffs SPA	Gannet*, Morus bassanus* (breeding) Kittiwake, *Rissa tridactyla* (breeding) Razorbill*, Alca torda* (assemblage species) Guillemot*, Uria aalge* (assemblage species) Puffin, *Fratercula arctica* (assemblage species) Herring gull, *Larus argentatus* (assemblage species)	254 km
Flamborough and Filey Coast pSPA	Gannet*, Morus bassanus* (breeding) Kittiwake, *Rissa tridactyla* (breeding) Razorbill*, Alca torda* (assemblage species) Guillemot*, Uria aalge* (assemblage species) Puffin, *Fratercula arctica* (assemblage species) Herring gull, *Larus argentatus* (assemblage species)	254 km

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