# RWE Renewables UK Dogger Bank South (West) Limited

# RWE Renewables UK Dogger Bank South (East) Limited

# Dogger Bank South Offshore Wind Farms

**Habitat Regulations Derogation: Provision of Evidence**

**Volume 6**

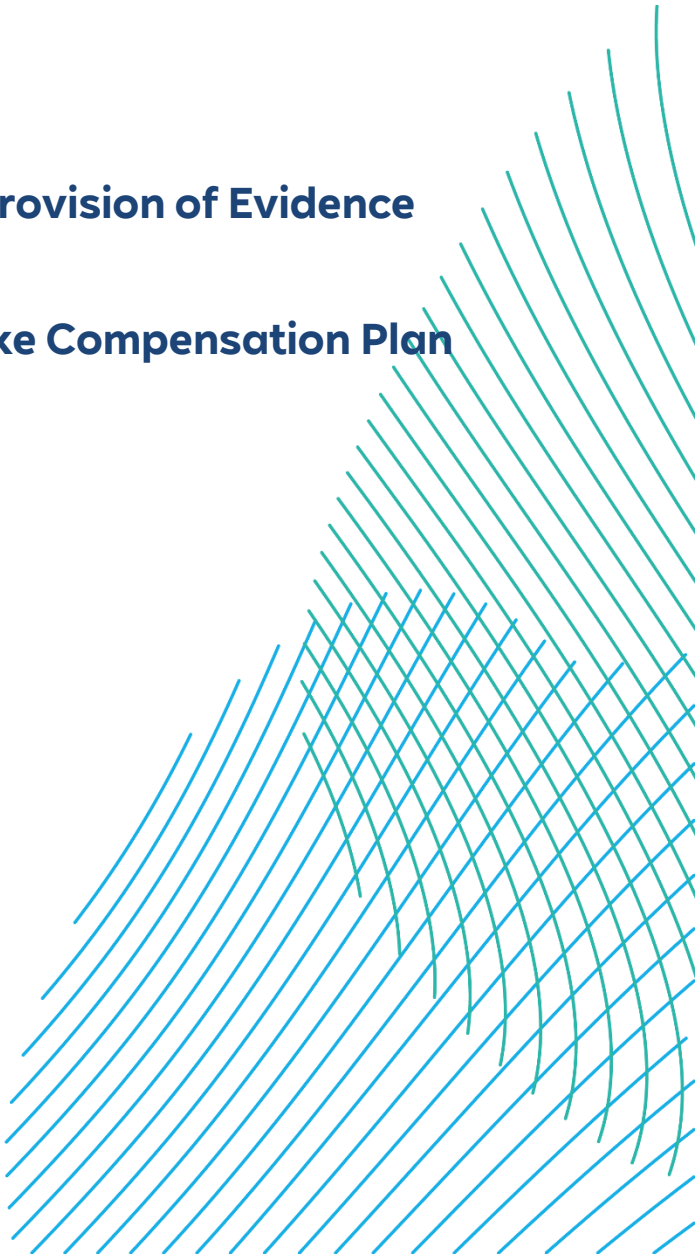
**Appendix 1 - Project-Level Kittiwake Compensation Plan**

**June 2024**

**Application Reference: 6.2.1**

**APFP Regulation: 5(2)(q)**

**Revision: 01**



**Unrestricted**

| | | | |
|---|---|---|---|
| Company: | **RWE Renewables UK Dogger Bank South (West) Limited and RWE Renewables UK Dogger Bank South (East) Limited** | Asset: | **Development** |
| Project: | **Dogger Bank South Offshore Wind Farms** | Sub Project / Package: | **Consents** |
| Document Title or Description: | Appendix 1 - Project-Level Kittiwake Compensation Plan | | |
| Document Number: | 005028820-01 | Contractor Reference Number: | C01516_RWE_REP_D0294 |



| Rev No. | Date | Status/Reason for Issue | Author | Checked by | Approved by |
|---|---|---|---|---|---|
| 01 | June 2024 | Final for DCO Application | CEA | RWE | RWE |

## Contents

## Tables

## Figures

## Glossary

| Term | Definition |
|---|---|
| Apparently Occupied Nests (AON) | An active nest occupied by a bird, pair of birds, or with eggs or chicks present. |
| Biologically Defined Minimum Population Size | An estimate of the number of individuals required for a high probability of survival of a population over a given period of time. |
| Competent authority | Is either a public body that decides to give a licence, permit, consent or other permission for work to happen, adopt a plan or carry out work for itself (such as a local planning authority), a statutory undertaker carrying out its work (such as a water company or an energy provider); a minister or department of government; or anyone holding public office (such as a planning inspector). |
| Concurrent scenario | A potential construction scenario for the Projects where DBS East and DBS West are both constructed at the same time. |
| Development Consent Order (DCO) | An order made under the Planning Act 2008 granting development consent for one or more Nationally Significant Infrastructure Project (NSIP). |
| Development Scenario | Description of how the DBS East and/or DBS West Projects would be constructed either in isolation, sequentially or concurrently. |
| Dogger Bank South (DBS) Offshore Wind Farms | The collective name for the two Projects, DBS East and DBS West. |
| Effect | Term used to express the consequence of an impact. The significance of an effect is determined by correlating the magnitude of the impact with the value, or sensitivity, of the receptor or resource in accordance with defined significance criteria. |
| Environmental Statement (ES) | A document reporting the findings of the EIA and produced in accordance with the EIA Directive as transposed into UK law by the EIA Regulations. |

| Term | Definition |
|---|---|
| European site | Sites designated for nature conservation under the Habitats Directive and Birds Directive. This includes candidate Special Areas of Conservation, Sites of Community Importance, Special Areas of Conservation and Special Protection Areas, and is defined in regulation 8 of the Conservation of Habitats and Species Regulations 2017. |
| Evidence Plan Process (EPP) | A voluntary consultation process with specialist stakeholders to agree the approach, and information to support, the Environmental Impact Assessment (EIA) and Habitats Regulations Assessment (HRA) for certain topics. |
| Expert Topic Group (ETG) | A forum for targeted engagement with regulators and interested stakeholders through the EPP. |
| Habitats Regulations Assessment (HRA) | The process that determines whether or not a plan or project may have an adverse effect on the integrity of a European Site or European Offshore Marine Site. |
| Impact | Used to describe a change resulting from an activity via the Projects, i.e. increased suspended sediments / increased noise. |
| In Isolation Scenario | A potential construction scenario for one Project which includes either the DBS East or DBS West array, associated offshore and onshore cabling and only the eastern Onshore Converter Station within the Onshore Substation Zone and only the northern route of the onward cable route to the proposed Birkhill Wood National Grid Substation. |
| Intraspecific | Produced, occurring or existing within a species or between individuals of a single species. |

| Term | Definition |
|---|---|
| Kittiwake Strategic Compensation Plan (KSCP) | Document produced as part of The Crown Estate's Derogation Case in support of the Round 4 Plan which must be adhered to by Dogger Bank South West, Dogger Bank East and Outer Dowsing through their agreement for lease conditions. The overall objective of the KSCP is "*to detail the development and delivery of strategic compensation to ensure the overall coherence of the UK NSN in relation to kittiwake by identifying suitable measures, providing a pathway to those measures and in turn providing assurance that compensation will be delivered for the impact on kittiwake, subject to refinement during the project level HRA process which is required as a matter of law*". |
| Kittiwake Steering Group | The Strategic Steering Group formed by The Crown Estate to develop kittiwake compensation for the Round 4 Plan. This group includes representatives from The Crown Estate and their technical advisor NIRAS Group (UK), Natural England, Joint Nature Conservation Committee, Department for Foor, Environment and Rural Affairs, Department for Energy Security and Net Zero, Outer Dowsing Offshore Wind and RWE Renewables UK. |
| Marine Protected Area (MPA) | Areas of the ocean established to protect habitats, species and processes essential for healthy, functioning marine ecosystems. In England, MPAs are designated to protect specific habitats or species (also known as 'features') and have conservation objectives which state what conservation outcomes the MPA is designed to achieve. |
| Round 4 Plan | The Fourth Offshore Wind Seabed Leasing Round undertaken by The Crown Estate and adopted in January 2023. |
| Sequential Scenario | A potential construction scenario for the Projects where DBS East and DBS West are constructed with a lag between the commencement of construction activities. Either Project could be built first. |
| Special Areas of Conservation (SAC) | Strictly protected sites designated pursuant to Article 3 of the Habitats Directive (via the Habitats Regulations) for habitats listed on Annex I and species listed on Annex II of the Directive |

| Term | Definition |
|---|---|
| Special Protection Area (SPA) | Strictly protected sites designated pursuant to Article 4 of the Birds Directive (via the Habitats Regulations) for species listed on Annex I of the Directive and for regularly occurring migratory species |
| Statutory Nature Conservation Bodies (SNCBs) | Comprised of the Joint Nature Conservation Committee, Natural Resources Wales, Department of Agriculture, Environment and Rural Affairs/Northern Ireland Environment Agency, Natural England and Scottish Natural Heritage, these agencies provide advice in relation to nature conservation to government |
| The Applicants | RWE Renewables UK Dogger Bank South (East) Limited and RWE Renewables UK Dogger Bank South (West) Limited. The Applicants are themselves jointly owned by the RWE Group of companies (51% stake) and Masdar (49% stake). |
| The Projects | DBS East and DBS West (collectively referred to as the Dogger Bank South (DBS) Offshore Wind Farms). |

## Acronyms

| Term | Definition |
|---|---|
| AA | Appropriate Assessment |
| AfL | Agreement for Lease |
| AEoI | Adverse Effect on Integrity |
| AON | Apparently Occupied Nests |
| AONB | Areas of Outstanding Natural Beauty |
| ANS | Artificial Nesting Structure |
| BDMPS | Biologically Defined Minimum Population Size |
| BEIS | Department for Business, Energy and Industrial Strategy |
| BESS | British Energy Security Strategy |
| BGS | British Geological Survey |
| BRAG | Black, Red, Amber, Green |
| CI | Confidence Interval |

| Term | Definition |
|---|---|
| CIMP | Compensation Implementation and Monitoring Plan |
| COWSC | Collaboration on Offshore Wind Strategy Compensation |
| CPT | Cone Penetration Test |
| CRM | Collision Risk Modelling |
| DAS | Digital Aerial Survey |
| DBS | Dogger Bank South offshore wind farms |
| DCO | Development Consent Order |
| Defra | Department for the Environment and Rural Affairs |
| DEP | Dudgeon Extension Project |
| DESNZ | Department for Energy Security and Net Zero |
| DIN | Dissolved Inorganic Nitrogen |
| DML | Deemed Marine Licence |
| DO | Dissolved Oxygen |
| EC | European Commission |
| EIA | Environmental Impact Assessment |
| EPP | Evidence Plan Process |
| ES | Environmental Statement |
| ETG | Expert Topic Group |
| EU | European Union |
| EWG | Expert Working Group |
| FFC SPA | Flamborough and Filey Coast Special Protection Area |
| FID | Final Investment Decision |
| HPAI | Highly Pathogenic Avian Influenza |
| HRA | Habitats Regulations Assessment |
| IROPI | Imperative Reasons of Over-riding Public Interest |
| JNCC | Joint Nature Conservation Committee |
| KCSG | Kittiwake Compensation Steering Group |

| Term | Definition |
|---|---|
| KSCP | Kittiwake Strategic Compensation Plan |
| KSIMP | Kittiwake Strategic Implementation and Monitoring Plan |
| LoSCM | Library of Strategic Compensatory Measures |
| MBES | Multibeam Echosounder |
| MCA | Maritime and Coastguard Agency |
| MCZ | Marine Conservation Zone |
| MMO | Marine Management Organisation |
| MoD | Ministry of Defence |
| MPA | Marine Protected Area |
| MRF | Marine Recovery Fund |
| NFFO | National Federation of Fishermen's Organisations |
| NGO | Non-Governmental Organisation |
| NPS | National Policy Statement |
| NSIP | Nationally Significant Infrastructure Project |
| NSN | National Site Network |
| OCP | Offshore Converter Platform |
| ODOW | Outer Dowsing Offshore Wind |
| OWIC | Offshore Wind Industry Council |
| OWEIP | Offshore Wind Environmental Improvement Package |
| OWF | Offshore Wind Farm |
| P2P | Pathways to Growth |
| RIAA | Report to Inform Appropriate Assessment |
| RSPB | Royal Society for the Protection of Birds |
| SAC | Special Area of Conservation |
| SEP | Sheringham Shoal Extension Project |
| SNCB | Statutory Nature Conservation Body |
| SoS | Secretary of State |

| Term | Definition |
|---|---|
| SPA | Special Protection Area |
| SSS | Side Scan Sonar |
| ToR | Terms of Reference |
| UK | United Kingdom |

# 1 Introduction

## 1.1 Project Background

1. RWE Renewables UK Dogger Bank South East Limited and RWE Renewables UK Dogger Bank South West Limited ('the Applicants') are applying for a single Development Consent Order (DCO) for both the Dogger Bank South (DBS) East and DBS West offshore wind farms (hereafter referred to as 'the Projects'). When fully operational, the Projects would have the potential to generate renewable power for over 3 million homes in the United Kingdom (UK) from up to 200 wind turbines[1].

2. The Applicants are submitting as part of their DCO application **Volume 6, Report to Inform Appropriate Assessment (RIAA) (application ref: 6.1)**, which provides the information necessary for the competent authority to undertake an Appropriate Assessment (AA) to determine if there is any Adverse Effect on Integrity (AEoI) on the UK National Site Network (NSN).

3. For kittiwake (*Rissa tridactyla*) from the Flamborough and Filey Coast Special Protection Area (FFC SPA), the Applicants' **Volume 6, RIAA (application ref: 6.1)** concludes that AEoI cannot be ruled out as a result of predicted collision mortality, when considered in-combination with other offshore wind farms (OWFs). This conclusion is consistent with the outcome of The Crown Estate's Plan Level Habitats Regulations Assessment (HRA) with respect to FFC SPA kittiwake (see section 3.1 below for further information) and the Secretary of State's (SoS) conclusion for recently consented OWF projects (e.g. Hornsea Three, Norfolk Vanguard, Norfolk Boreas, East Anglia One North, East Anglia Two, Hornsea Four and the Sheringham Shoal and Dudgeon Extension Projects (SEP & DEP)). As such, the Applicants have put forward, as part of their consent application, measures to compensate for the predicted impacts of the Projects, which are described in this Project-Level Kittiwake Compensation Plan. This document forms part of the Applicants' overarching **Volume 6, Habitats Regulations Derogation: Provision of Evidence (application ref: 6.2).**

[1] Calculation based on 2021 generation, and assuming average (mean) annual household consumption of 3,509 kWh, based on latest statistics from Department of Energy Security and Net Zero (Subnational Electricity and Gas Consumption Statistics Regional and Local Authority, Great Britain, 2021, Mean domestic electricity consumption (kWh per meter) by country/region, Great Britain, 2021.

## 1.2 The Crown Estate's Plan Level HRA

4. As part of the Plan Level HRA for the Fourth Offshore Wind Seabed Leasing Round (the 'Round 4 Plan') (The Crown Estate, 2022), The Crown Estate (as the competent authority) concluded that an AEoI as a result of the Round 4 Plan could not be ruled out for the FFC SPA breeding kittiwake feature and the Dogger Bank Special Area of Conservation (SAC) sandbanks feature, in-combination with other plans and projects. With respect to kittiwake, this conclusion was reached due to the potential increase in mortality of FFC SPA breeding kittiwakes resulting from the operation of the Outer Dowsing and the Dogger Bank South OWFs, estimated to be 108 collisions per annum (The Crown Estate, 2022).

5. The Crown Estate submitted a 'derogation case' to the SoS alongside their RIAA (The Crown Estate, 2022) which included a commitment to develop a Kittiwake Strategic Compensation Plan (KSCP). The overall objective of the KSCP was "*to detail the development and delivery of strategic compensation to ensure the overall coherence of the UK NSN in relation to kittiwake by identifying suitable measures, providing a pathway to those measures and in turn providing assurance that compensation will be delivered for the impact on kittiwake, subject to refinement during the project level HRA process which is required as a matter of law*".

6. Strategic kittiwake compensation for the purposes of Round 4 is defined in this document as compensatory measures delivered collectively to address the AEoI of the FFC SPA from the Round 4 Plan (i.e. from Outer Dowsing and the Dogger Bank South OWFs).

7. On 15th July 2022, the SoS for Business, Energy and Industrial Strategy (BEIS) (now the Department for Energy Security and Net Zero (DESNZ)) approved The Crown Estate's derogation case and thus, The Crown Estate adopted the Round 4 Plan and subsequently entered into Agreements for Lease (AfL) for the six projects comprising Round 4.

8. The SoS's approval of the derogation case was conditional upon The Crown Estate establishing a steering group tasked with developing and agreeing upon the KSCP, monitoring the compensatory measures and putting in place adaptive management if necessary. Following the adoption of the Round 4 Plan, The Crown Estate formed a Round 4 Plan Strategic Steering Group for kittiwake compensation (hereafter referred to as the 'Kittiwake Steering Group') in accordance with the agreed Terms of Reference (ToR). The Crown Estate subsequently published the KSCP in February 2024, following 14 months of engagement and development by the Kittiwake Steering Group.

9. In accordance with the KSCP, The Crown Estate is required to submit a Kittiwake Strategic Implementation and Monitoring Plan (KSIMP) to the SoS for DESNZ prior to the operation of any wind turbine generator of Outer Dowsing and the Dogger Bank South OWFs. This document will provide further details on the delivery and implementation of the plan level compensatory measures. It will also secure the necessary funding and ensure the benefits of the compensatory measures are shared across the Round 4 Plan. An outline version of the KSIMP (which details the proposed content of the KSIMP) was published by The Crown Estate as an appendix to the KSCP.

10. The Projects are required to adhere to the KSCP under the terms of their AfL. The Applicants are required to participate in the process outlined in the KSCP and comply with, undertake, and maintain (as necessary) the compensatory measures required to be adopted pursuant to the KSCP. It, therefore, follows that the compensatory measures proposed by the Applicants as part of their project-level derogation case are expected to align with the measures and approach outlined in the KSCP and be secured as a requirement of the DCO.

11. The KSCP and supporting appendices have played a crucial role in shaping the Projects' approach to the development of compensatory measures for kittiwake. Hence, the KSCP and the associated appendices outlined below have been submitted as part of the Applicants' DCO application for consideration alongside this Project-Level Kittiwake Compensation Plan.

    - **Volume 6, Round 4 Kittiwake Strategic Compensation Plan (KSCP) (application ref: 6.2.1.1)**
        - Appendix A: Outline Kittiwake Strategic Implementation and Monitoring Plan
        - Appendix B: Letter of Acceptance from the Secretary of State
        - Appendix C: Kittiwake Strategic Compensation Plan – Agreement Log
        - Appendix D: Round 4 Strategic Compensation – Artificial Nesting Structure Site Selection

12. The measures agreed by the Kittiwake Steering Group and presented in **Volume 6, KSCP (application ref: 6.2.1.1)** for the Round 4 Plan to compensate for a predicted impact on the FFC SPA kittiwake feature of 108 collisions per annum (The Crown Estate, 2022) include (in order of anticipated ecological effectiveness):

    - Management of fisheries to increase prey availability; and

- Artificial Nesting Structures (ANS) (offshore is preferred over onshore structures).

13. Habitat creation and other enhancement measures to increase prey availability were also included within the KSCP as a resilience measure, capable of supporting the other measures outlined above. It cannot be considered a primary compensation measure for delivery in isolation owing to the limited evidence available to support the ability of this measure to adequately compensate for predicted impacts to kittiwake.

14. Under the ToR, the Kittiwake Steering Group will continue to exist until all obligations have been discharged, including post-consent requirements such as development and submission of the KSIMP to the SoS for approval. Thus, the Kittiwake Steering Group will continue to operate following submission of the Applicants' DCO application and during its examination. Any questions related to **Volume 6, KSCP (application ref: 6.2.1.1)** from the Examining Authority during the DCO examination process will be directed by the Applicants to The Crown Estate as chair of the Kittiwake Steering Group for a response.

15. Further information about The Crown Estate's approach to the development of the plan level compensatory measures can be found in section 3.1 below.

## 1.3 Strategic Compensation for Offshore Wind

16. In April 2022, the UK Government published the 'British Energy Security Strategy' (BESS) (HM Government, 2022). The BESS committed to implementing an Offshore Wind Environmental Improvement Package (OWEIP), which included, among others, measures to:

- Revise the HRA process for offshore wind to facilitate the delivery of compensation measures whilst maintaining valued protection for wildlife.
- Facilitate the delivery of strategic environmental compensation measures, including development of a library of compensation measures, through the Collaboration on Offshore Wind Strategic Compensation (COWSC)[2].

[2]Collaboration on Offshore Wind Strategy Compensation (COWSC) brings together industry, environmental non-government organisations (NGOs), statutory nature conservation bodies (SNCBs), the UK Government and Devolved administrations and other relevant stakeholders with the purpose of finding strategic compensation solutions that enable the required development of offshore wind, whilst offsetting any impacts to the environment.

- Implement an industry-funded Marine Recovery Fund (MRF) to which developers can choose to contribute to meet their environmental compensation obligations; and
- Implement a strategic monitoring programme to improve understanding of the environmental impacts of offshore wind projects.

17. The purpose of the OWEIP and these measures is to accelerate and de-risk the consenting of offshore wind, whilst ensuring environmental protections are maintained and domestic and international law is adhered to.

18. As outlined in the National Policy Statement (NPS) for renewable energy infrastructure (EN-3) (DESNZ, 2023), the UK Government is still developing its policies on strategic compensation through the COWSC programme. However, in February 2024, the SoS for the Department for the Environment and Rural Affairs (Defra) approved the following compensatory measures recommended by COWSC for inclusion within the library of strategic compensatory measures (LoSCM) and for strategic delivery as compensation for offshore wind projects (Defra, 2024a):

- For benthic habitats:
  - Designation and/or extension of Marine Protected Areas (MPAs).
- For seabirds:
  - Offshore ANS for kittiwake in English waters (only available for projects up to and including Round 4); and
  - Predator eradication and reduction.

19. The COWSC group will be responsible for implementing the measures in the LoSCM, with the exception of the designation and/or extension of MPAs which will be implemented and delivered by Defra.

20. COWSC is currently in the process of developing implementation groups for each of the strategic compensation measures. It is the Applicants' understanding that these groups will be responsible for developing delivery plans which will outline key aspects of implementation, for example, site selection, design, delivery timescales, monitoring and adaptive management, etc. However, the timescales for the establishment of the COWSC implementation groups and delivery of the implementation plans as well as the measures themselves are currently unknown. The Applicants will continue to engage with Defra, the COWSC group and relevant industry forums post-application on progress with respect to the implementation of these strategic compensatory measures.

21. Sections 291 and 292 of the Energy Act 2023 enable the use of strategic compensation measures and the SoS to make regulations related to the establishment, operation and management of one or more MRFs for the development of offshore wind and associated infrastructure, respectively. The MRF is expected to be operational in 2025.

22. It is the Applicants' understanding that DESNZ is currently preparing advice for OWF developers on how strategic compensation and the MRF can be referred to in planning applications in advance of any statutory instruments coming into force. However, this information was not available at the time of writing. Further information with respect to strategic compensation will be provided to the Examining Authority during DCO examination at appropriate points and as it becomes available.

### 1.3.1 Offshore Wind Industry Council (OWIC)

23. The Applicants are active members of the Offshore Wind Industry Council (OWIC) derogation sub-group which was formed in 2021 to support the work of the Pathways to Growth[3] (P2G) Coordination Group and to aid collaboration across the offshore wind industry. The P2G is the Sector Deal's workstream focussed on identifying and addressing the key environmental and consenting challenges that will be a barrier to the UK meeting its offshore wind 2030 target and playing its full role in delivering net zero. This includes HRA derogation, which is recognised as a key barrier to the growth of offshore wind.

24. The OWIC derogation sub-group has supported the work of the COWSC group in developing strategic compensation measures for offshore wind. The Applicants will continue to actively engage in the OWIC derogation sub-group and support the development and delivery of strategic compensation measures for the relevant sites / features through this collaborative initiative.

[3] OWIC (2024). The Sector Deal's workstream focussed on identifying and addressing the key environmental and consenting challenges that will be a barrier to the UK meeting its offshore wind 2030 target and playing its full role in delivering net zero. Recognising the scale of the challenge, P2G brings together government representatives, SNCBs and industry across the UK's Devolved Administrations to work together in partnership.

## 1.4 Purpose of Document

25. This document sets out the details of the proposed project-level compensatory measures for kittiwake from the FFC SPA. It builds upon the information presented in **Volume 6, KSCP (application ref: 6.2.1.1)** and the supporting appendices to demonstrate how the measures identified and secured at the plan level can be implemented by the Projects to compensate for their predicted impact on breeding kittiwakes from the FFC SPA.

26. As such, this document provides the following details in line with the Natural England Checklist (where relevant) for each of the proposed compensation options:

- Overview;
- Scale;
- Delivery mechanism i.e. how the measures are proposed to be delivered;
- Location;
- Outline design details;
- Timescales;
- Monitoring, maintenance and adaptive management;
- Outline implementation and delivery roadmap; and
- Potential impacts from implementation of the compensation.

27. This Project Level Kittiwake Compensation Plan is accompanied by a **Volume 6, Outline Kittiwake Compensation Implementation and Monitoring Plan (CIMP) (application ref: 6.2.1.2)**. Should a Kittiwake CIMP be required in addition to the KSIMP (i.e. the equivalent document for the Round 4 Plan), this will be produced by the Applicants and approved by the SoS prior to the start of the offshore works. The Kittiwake CIMP will set out detailed delivery proposals for the agreed compensatory measures based on the information provided in this document and the supporting annexes.

## 1.5 Implications of the Project Development Scenarios

28. The Projects may be delivered under a range of project development scenarios. Details of the scenarios and how these are assessed in the DCO application are set out in section 5.1.1 of **Volume 7, Chapter 5 Project Description (application ref: 7.5)** of the Environmental Statement (ES). The Applicants' approach to the development of the proposed compensatory measures has assumed that both DBS East and DBS West are developed and that the package of measures proposed for each of the relevant sites and features outlined in section 1.1 is considered to deliver the necessary level of compensation (factoring in the risks and uncertainty associated with delivering successful compensation) to address the worst-case impacts of both DBS East and DBS West, as required by draft Defra guidance (Defra, 2021).

29. The development scenarios for the Projects include:

- In Isolation Scenario – where only DBS East or DBS West is developed.
- Concurrent Scenario– where DBS East and DBS West are both constructed at the same time.
- Sequential Scenario – both DBS East and DBS West are developed sequentially.

30. As outlined in **Volume 7, Chapter 5 Project Description (application ref: 7.5)** of the ES, the Applicants would develop DBS East and DBS West transmission infrastructure as co-ordinated projects and, where practicable, the Projects would co-locate infrastructure to reduce overall environmental impacts and disruption. However, there is no predicted impact on kittiwake from the development of the Projects' transmission infrastructure.

31. For kittiwake, it is the predicted impact of birds colliding with the Projects' operational offshore wind turbines that requires compensation. In all three development scenarios, first power of one or both Projects is expected in Q4 2029 at the earliest. Up to 100 wind turbines will be installed at each of DBS East and DBS West (subject to the final turbine technology), equating to a maximum of 200 turbines across the two Projects.

32. Where DBS East and DBS West are delivered in the Sequential Scenario, the overall final package of compensation to be delivered will be the same as in the Concurrent Scenario. The Applicants therefore consider it practical to deliver all of the compensation under a single Compensation Plan. If two offshore ANS are delivered these may be delivered either at the same time or at different times and will be agreed through the Kittiwake CIMP (should this be required in addition to the KSIMP). If a Sequential or Concurrent Scenario is taken forward the compensation will be split across both projects and potentially across other developers on a strategic basis rather than identifying a single offshore ANS per project. In the Sequential Scenario, this may mean that one project delivers compensation earlier than may have otherwise been required if it were a standalone project, which could be at risk e.g. prior to Final Investment Decision (FID). The Applicants consider however that the second project would have the benefit of the compensation being in place slightly longer than the first project thereby reducing pressure on the onward project programme.

33. Should DBS East or DBS West be delivered in isolation then it would be necessary to deliver only the scale of measures required to achieve adequate compensation in proportion to the impacts predicted from the given project (DBS East or DBS West). Compensation would be delivered on a scale appropriate to the nature and extent of the predicted impact from DBS East, or DBS West.

34. The scale of compensation to be delivered by the Projects will be confirmed within the Kittiwake CIMP (should this be required in addition to the KSIMP) once project-level impacts have been determined by the SoS.

# 2 Legislation & Guidance

35. The HRA process covers those features designated under the European Council Directive 2009/147/EC on the Conservation of Wild Birds (the 'Birds Directive') and Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the 'Habitats Directive'). The UK is also required to meet its obligations under relevant international agreements such as the Ramsar Convention.

36. The Birds Directive provides a framework for the conservation and management of wild birds in Europe. The relevant provisions of the Directive are the identification and classification of Special Protection Areas (SPAs) for rare or vulnerable species listed in Annex I of the Directive and for all regularly occurring migratory species (required by Article 4). The Directive requires national Governments to establish SPAs and to have in place mechanisms to protect and manage them. The SPA protection procedures originally set out in Article 4 of the Birds Directive have been replaced by the Article 6 provisions of the Habitats Directive.

37. Further details of the relevant legislative and policy context are provided in **Volume 6, Habitats Regulations Derogation Provision of Evidence (application ref: 6.2).**

## 2.1 UK National Legislation

38. In England and Wales, the Conservation of Habitats and Species Regulations 2017 ('the Habitats Regulations'), the Wildlife and Countryside Act 1981 and the Conservation of Offshore Marine Habitats and Species Regulations 2017 (the Offshore Habitats Regulations) (which applies outside of 12 nautical miles) transposed the Habitats Directive and Birds Directive into English and Welsh law.

39. The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 (the EU Exit Regulations) make changes to the Habitats Regulations so that they continue to work (are operable) following the UK's exit from the EU on 31st January 2020. While the basic legal framework for HRA is maintained, the EU Exit Regulations transfer functions previously undertaken by the European Commission (EC) to UK Ministers. Furthermore, where the Habitats Regulations continue to use the term 'European sites', those sites now form part of a UK NSN rather than the European 'Natura 2000' site network.

40. The Habitats Regulations place an obligation on 'competent authorities' to carry out an AA of any proposal likely to significantly affect a designated site, to seek advice from Natural England and not to approve an application that would have an adverse effect on a designated site unless certain conditions are met (where there are no alternative solutions, the plan or project can only proceed if there are Imperative Reasons of Over-riding Public Interest (IROPI) and if the necessary compensatory measures can be secured). The competent authority in the case of the Projects is the SoS for the DESNZ.

## 2.2 Guidance on Compensatory Measures

41. If the competent authority determines, after conducting an AA, that an AEoI on a European site cannot be ruled out, and that there are no alternative solutions and IROPI, Regulation 36 of the Conservation of Offshore Marine Habitats and Species Regulations 2017 requires that "The appropriate authority must secure that any necessary compensatory measures are taken to ensure that the overall coherence of Natura 2000 is protected."

42. EC (2019) explains that for SPAs, the overall coherence of the European site network can be maintained by:

- Compensation that fulfils the same purposes that motivated the site's designation.
- Compensation that fulfils the same function along the same migration path.
- The compensation site(s) are accessible with certainty by the birds usually occurring on the site affected by the project.

43. Defra has recently released for consultation[4], updated policy information for MPA assessments (Defra, 2024b). This document expands upon the best practice guidance for developing compensatory measures in relation to MPAs which was consulted upon in July 2021 (Defra, 2021) and is intended to inform updated guidance which is anticipated to be published in late 2024.

[4] Consultation ran from 9th February 2024 to 1st April 2024. The consultation document (Defra, 2024b) expressly states in section 3.1 that "*the draft guidance set out below for consultation should not be relied upon by stakeholders, statutory bodies or decision makers during the planning process*".

44. Defra (2021) introduced a hierarchical approach for determining appropriate compensatory measures within the marine environment. The central tenet of this approach is to prioritise compensatory measures that address the same impact at the same location. However, in cases where this is not feasible, measures supporting similar or comparable ecological functions at alternative locations could serve as adequate compensation and should be considered. This hierarchical approach offers flexibility, acknowledging that it may not always be practical to compensate for the same feature at risk within the impacted site. Defra (2024b) proposes refinements to the hierarchical approach outlined in Defra (2021) but maintains this core principle.

45. Ideally, compensation should be functioning before the effect takes place, although it is recognised that this may not always be possible, as stated in the Defra (2021) guidance: "*A protected feature should not be impacted before compensation is secured. Ideally, measures should be in place, functioning and contributing to the network before development begins. Defra recognises that in some cases and for certain habitats and species this could take several years and therefore it may not be feasible for the compensatory measures to be complete before the impact takes place. Where this is not possible, it is important that necessary licences are in place, finances are secured, and realistic implementation plans have been agreed with the appropriate bodies to demonstrate that the compensatory measure is secured.*"

46. Compensatory measures for the kittiwake feature of the FFC SPA are presented in the following sections in line with Defra's draft best practice guidance (Defra, 2021) and the hierarchy presented within it.

47. In addition, Natural England has developed a list of those aspects of compensatory measures that it considers need to be described in detail when developers are submitting or updating applications where impacts on MPA are anticipated. Whilst not exhaustive, it lists key areas where Natural England considers sufficient detail is needed to provide the SoS with appropriate confidence that compensatory measures can be secured. The checklist is summarised below:

    - What, where, when: clear and detailed statements regarding the location and design of the proposal.
    - Why and how: ecological evidence to demonstrate compensation for the impacted site feature is deliverable in the proposed locations.

- Demonstrate that on-ground construction deliverability is secured and not just the requirement to deliver in the DCO i.e. landowner agreement is in place.
- Policy/legislative mechanism for delivering the compensation (where needed).
- Agreed DCO/ DML conditions.
- Clear aims and objectives of the compensation.
- Mechanism for further commitments if the original compensation objectives are not met – i.e. adaptive management.
- Clear governance proposals for the post-consent phase – we do not consider simply proposing a steering group is sufficient.
- Ensure development of compensatory measures is open and transparent as a matter of public interest, including how information on the compensation would be publicly available.
- Timescales for implementation especially where compensation is part of a strategic project, including how timescales relate to the ecological impacts from the development.
- Commitments to monitoring specified success criteria.
- Proposals for an ongoing 'sign off' procedure for implementing compensation measures throughout the lifetime of the project, including implementing feedback loops from monitoring.
- Continued annual management of the compensation area to ensure other factors are not hindering the success of the compensation e.g. changes in habitat, increased disturbance as a result of subsequent plans/projects.

48. This list, and an equivalent list proposed by the Royal Society for the Protection of Birds (RSPB) has been used to help guide the development of the proposed compensatory measures at the pre-application stage.

49. The Applicants have prepared this Project Level Compensation Plan in accordance with the Natural England checklist outlined above. The necessary information is presented in section 104 and includes an outline implementation and delivery roadmap (see section 6.3.8) detailing how certain aspects of the Applicants primary compensation measure for kittiwake (offshore ANS) will be further developed post application to meet the objectives of this checklist. A summary of the status of the Applicants overall compensatory proposal for kittiwake against the Natural England checklist is provided in section 8.

# 3 The Development of Compensatory Measures

50. This section provides an overview of The Crown Estate's plan level approach to developing compensatory measures, highlighting key aspects that have informed the Projects' approach to the development of compensatory measures. Further information on The Crown Estate's proposed compensation approach is presented in **Volume 6, KSCP (application ref: 6.2.1.1).**

## 3.1 The Crown Estate's Approach to Developing Plan Level Compensatory Measures

### 3.1.1 Review of Compensatory Measures

51. An initial appraisal was undertaken in 2022 to identify potential compensatory measures for kittiwake which took account of options that:

- Have been proposed for other Southern North Sea OWF projects (e.g. Ørsted's Hornsea Three and Hornsea Four, Vattenfall's Norfolk Vanguard and Norfolk Boreas and Scottish Power Renewable's East Anglia ONE/TWO North) which have been subject to the DCO examination process and granted consent;
- Are being considered by the COWSC group for strategic delivery; and
- Are considered new or novel (i.e. untested).

52. This exercise identified a list of 14 potential compensatory measures (see Table 3.2 in **Volume 6, KSCP (application ref: 6.2.1.1)**) which were subsequently appraised using a qualitative approach based on Defra's draft guidance (Defra, 2021). From this, the Kittiwake Steering Group determined a shortlist of three measures that were deemed to have merit and were thus taken forward for further consideration. In order of anticipated ecological effectiveness, these measures included:

- Management of fisheries to increase prey availability;
- Onshore or offshore ANS; and
- Habitat enhancement and other enhancement measures to increase prey availability.

53. Of these potential options, the Kittiwake Steering Group considered prey enhancement via the management of sandeel fisheries (a key prey species for kittiwake) and the development of offshore ANS to be the preferred compensatory measures for kittiwake. Section 5 of **Volume 6, KSCP (application ref: 6.2.1.1)** outlines the ecological evidence which supports the proposal of these measures, drawing upon published literature and the large body of information that has been collated and presented as part of the OWF DCO applications outlined above (see **Volume 6, KSCP (application ref: 6.2.1.1)** for further information).

54. Offshore ANS is preferred by the Kittiwake Steering Group over onshore structures on the basis of the ecological evidence considered and uncertainty regarding the ecological effectiveness of developing further onshore ANS (in addition to those already implemented or planned). Nonetheless, as evidenced by the agreement log presented in **Volume 6, KSCP (application ref: 6.2.1.1)**, the Applicants maintain the position that onshore ANS is a viable compensation option and offers many practical benefits over offshore structures. Furthermore, the Kittiwake Steering Group determined that a purpose-built ANS is more likely to result in a larger and more productive colony than if an existing platform were to be utilised.

55. The Kittiwake Steering Group considered 'habitat creation and other enhancement measures to increase prey availability' to be a resilience measure rather than a primary measure capable of compensating for the predicted impacts of the Round 4 Plan. This conclusion was reached due to the high level of uncertainty regarding the appropriate enhancement method and the challenges in demonstrating benefits for kittiwake. As such, the Kittiwake Steering Group advised that this measure would only be progressed following further discussion post-consent or via adaptive management following the implementation of the other compensatory measures identified. It was therefore not considered further within **Volume 6, KSCP (application ref: 6.2.1.1).**

### 3.1.2 Proposed Compensation Approach

56. Prey enhancement via the management of sandeel fisheries and associated ecosystem-based management is considered by the Kittiwake Steering Group to be the most ecologically effective means of increasing the breeding success of FFC SPA kittiwake. However, as acknowledged in **Volume 6, KSCP (application ref: 6.2.1.1)**, the permanent closure of sandeel fisheries in English waters of the North Sea from 1st April 2024 raised doubts as to the viability of this option as a compensatory measure. Despite this uncertainty, the option remains within **Volume 6, KSCP (application ref: 6.2.1.1)**, pending formal confirmation from Defra SoS regarding whether the closure could serve as compensation for offshore wind. However, no further information is provided within **Volume 6, KSCP (application ref: 6.2.1.1)** with respect to this potential measure.

57. The Applicants acknowledge that since the publication of **Volume 6, KSCP (application ref: 6.2.1.10),** the European Union (EU) has requested consultations with the UK under the post-Brexit trade deal dispute settlement mechanism regarding the UK's decision to prohibit sandeel fishing in English North Sea and Scottish waters[5]. The consultation period is 30 days and should a mutually agreeable solution not be identified within this timescale then the EU may request formation of an arbitration tribunal to adjudicate on the compatibility of the UK's fishery closure measures with the EU-UK Trade and Cooperation Agreement. This process creates further uncertainty with respect to the validity of the sandeel closures and availability as compensation for offshore wind.

58. In the absence of a clear steer from Government that fisheries management is an accepted and appropriate compensatory measure for offshore wind, the Kittiwake Steering Group recommends that strategic delivery of offshore ANS should be pursued as an alternative measure which can be delivered by developers (rather than relying on Government action). Several delivery options are presented in section 11 of the **Volume 6, KSCP (application ref: 6.2.1.1)**:

- The construction of two offshore ANS.
- The construction of an additional two tiers (500 to 1,500 nesting spaces) to Ørsted's Hornsea Four offshore kittiwake ANS, and the construction of one additional standalone offshore ANS.

[5] https://ec.europa.eu/commission/presscorner/detail/en/ip_24_2050 [accessed 25th April 2024]

- The construction of an additional two tiers (500 to 1,500 nesting spaces) to Ørsted's Hornsea Four offshore kittiwake ANS, and the construction of one standalone offshore ANS as adaptive management; or
- The construction of an additional two tiers (500 to 1,500 nesting spaces) to Ørsted's Hornsea Four offshore kittiwake ANS, and one onshore ANS.

59. **Volume 6, KSCP (application ref: 6.2.1.1)** provides a framework for delivering offshore ANS for FFC SPA kittiwake and how this measure can be secured, implemented, monitored and adapted. Further information can be found in **Volume 6, KSCP (application ref: 6.2.1.1)** and is signposted in **Table** 3-1 below.

*Table 3-1 Signposting Key Information Presented In* ***Volume 6, KSCP (Application Ref: 6.2.1.1)***

| Topic | Section of KSCP |
|---|---|
| Approach for determining the scale of compensation required for the Round 4 Plan | Section 8 |
| Initial appraisal of suitable locations for siting offshore ANS | Section 9 and Appendix D |
| Design principles | Section 10 |
| Delivery mechanism and how compensation will be secured | Section 11 |
| Monitoring | Section 12 |
| Adaptive Management | Section 13 |

## 3.2 The Applicants' Approach to Developing Project-level Compensatory Measures

60. The Applicants' approach to identifying and developing compensatory measures for kittiwake at the project level seeks to align with the outcomes of The Crown Estate's plan level approach where possible, as well as broader strategic opportunities emerging from government and industry-led initiatives such as the OWEIP and COWSC.

61. This approach acknowledges emerging policy drivers for more collaborative and/or strategic delivery of compensation and recognises the Applicants' commitment to supporting an industry-scale approach to delivering compensation. It also acknowledges the considerable amount of work that has been undertaken to date by various parties (including the Kittiwake Steering Group, HRA Expert Working Group (EWG)[6], COWSC, and other OWF developers as part of their DCO applications) to:

[6] HRA EWG's role is to provide advice on the process of determining compensation and recommended outcomes. The EWG includes Natural England, the Joint Nature Conservation Committee (JNCC), Defra, DESNZ, Natural Resources Wales, NatureScot, Marine Scotland, the Department for Agriculture, Environment and Rural Affairs of Northern Ireland, the Marine Management Organisation (MMO), the Wildlife Trusts, RSPB, and Whale and Dolphin Conservation.

- Identify and appraise potential compensatory measures, including novel options, in relation to various criteria (e.g. aims and objectives, ecological effectiveness, technical feasibility, spatial and temporal scale, additionality etc.).
- Iteratively develop proposals through a detailed process of consultation with stakeholders, including but not limited to, Natural England, JNCC, MMO, RSPB, the Wildlife Trust, National Trust; and
- Engage with other stakeholders where necessary including OWF developers, the Planning Inspectorate, DESNZ and the devolved administrations and Natural England and Defra through the OWIC derogation sub-group.

62. The NPS EN-3 (DESNZ, 2023) provides in-principle support to the implementation of strategic and collaborative compensation and to the Applicants' proposed commitment to delivering compensation for the Projects, where possible, on a more strategic and/or collaborative basis.

63. As outlined in section 1.2, the two measures short-listed within **Volume 6, KSCP (application ref: 6.2.1.1)** to compensate for the predicted impacts of the Round 4 Plan included:

- Management of fisheries to increase prey availability; and
- Onshore and offshore ANS, with a preference for offshore ANS.

64. The Applicants consider these measures to be the most ecologically effective and feasible means of delivering the necessary level of compensation for the Projects. As such, these measures were taken forward for consideration at the project level.

65. In line with **Volume 6, KSCP (application ref: 6.2.1.1)**, 'habitat enhancement and other enhancement measures to increase prey availability' has not been taken forward as a compensatory measure at the project level at this time. However, the Applicants acknowledge this to be a potential resilience measure that could be delivered strategically at a later date to support, if required, the principal compensation measures outlined within section 104 of this plan.

66. Compensatory measures have been considered in the context of three potential delivery models: strategic, collaborative and project-led. For the purpose of this plan, strategic, collaborative and project-led delivery is described as follows:

- **Strategic** – refers to measures that could be delivered via a Strategic Compensation Fund (e.g. the MRF - see section 1.3) which the UK

Government has confirmed will be available for Round 4 projects to access or other strategic initiatives should these become available in the appropriate timescale for the Projects.

- **Collaborative** – refers to measures that would be appropriate to take forward as part of a collaborative approach with other developers either through bilateral or multilateral agreements.
- **Project-led** – refers to measures that could be taken forward for delivery solely by the Applicants.

67. The Projects expect to deliver their kittiwake compensation requirements in collaboration with Outer Dowsing OWF, in accordance with **Volume 6, KSCP (application ref: 6.2.1.1)**. However, it is considered necessary for the Projects to also develop compensation options at the individual project level to ensure that its compensation requirements can be delivered should Outer Dowsing OWF not proceed.

## 3.3 Stakeholder Engagement

68. The Applicants are active participants of the Kittiwake Steering Group and have engaged with a range of stakeholders through this forum at regular intervals during the Projects' pre-application phase to support the development of **Volume 6, KSCP (application ref: 6.2.1.1)** and to inform this project-level Kittiwake Compensation Plan. Feedback from this and other project-level consultations has informed the development of the Projects compensatory measures proposal.

69. Section 2 of **Volume 6, KSCP (application ref: 6.2.1.1)** sets out the engagement process for the Kittiwake Steering Group and provides details of the 12 meetings held between 9th December 2022 and 18th January 2024. An agreement log for the Kittiwake Steering Group is also presented in section 4 and Appendix C of **Volume 6, KSCP (application ref: 6.2.1.1).**

70. Additional stakeholder engagement has been undertaken during the pre-application phase to further inform the Applicants' approach to compensation at the project level. This engagement including key details is summarised in **Table** 3-2 below.

71. The Applicants are active members of the OWIC derogation sub-group which is also working on strategic initiatives for the delivery of compensation for offshore wind (see section 1.3.1 for further information).

*Table 3-2 Summary Of Pre-Application Consultation Undertaken For The Projects.*

| Date | Consultee(s) | Activity | Details |
|---|---|---|---|
| 11th April 2024 | Defra | Strategic compensation meeting | Meeting to discuss the Applicants' proposals with respect to strategic delivery of compensation and how this should be referred to in the DCO application. During this meeting, Defra confirmed that DESNZ would be publishing guidance imminently for OWF developers on how strategic compensation can be referred to in planning applications in advance of any necessary statutory instruments coming into force. |
| 23rd April 2024 | Planning Inspectorate | Projects update meeting | Meeting to appraise the Planning Inspectorate of the intended approach to the derogation case for the Projects and the development of the associated compensatory measures. |
| 25th April 2024 | MMO, Natural England and RSPB | Kittiwake Expert Topic Group (ETG) meeting | The purpose of this meeting was to set out for stakeholders how the Projects intended to build upon the outcomes of **Volume 6, KSCP (application ref: 6.2.1.1)** and to outline the level of information that would be provided as part of the DCO application, and the aspects that would be matured further post-submission. Specific information related to the Applicants project-led proposal for an offshore ANS was also presented. This included work undertaken to mature the initial Area of Search (AoS) appraisal undertaken by NIRAS (see Appendix D of **Volume 6, KSCP (application ref: 6.2.1.1))** to identify a shortlist of potential AoS for siting offshore ANS. Natural England provided feedback on compensation ratios and the framing of the compensatory measures proposed by the Applicants which has been reflected in this plan. |

# 4 Flamborough & Filey Coast SPA

## 4.1 Overview

72. The FFC SPA was designated in 2018. It is a geographical extension to the former Flamborough Head and Bempton Cliffs SPA, which was designated in 1993 (Natural England, 2018a).

73. The SPA is located on the Yorkshire coast between Bridlington and Scarborough and is composed of two sections. The northern section runs from Cunstone Nab to Filey Brigg, and the southern section from Speeton, around Flamborough Head, to South Landing. The seaward boundary extends 2km offshore and applies to both sections of the SPA.

## 4.2 Conservation Objectives

74. The conservation objectives for the FFC SPA site are to ensure that, subject to natural change, the integrity of the site is maintained or restored as appropriate, and that the site contributes to achieving the aims of the Birds Directive, by maintaining or restoring:

- 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 each of the qualifying features.
- The distribution of qualifying features within the site.

75. Natural England (2023a) has stated the target is to restore the size of the kittiwake breeding population at a level which is above 83,700 breeding pairs, whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent.

## 4.3 Breeding Kittiwake Feature

76. The FFC SPA supports an internationally significant population of migratory kittiwake and contains the largest population in the UK. The SPA breeding population at classification was cited as 44,520 pairs or 89,040 breeding adults, for the period 2008 to 2011 (Natural England, 2018). Clarkson *et al.* (2022) reported the 2022 population was 44,574 apparently occupied nests (AON), or 89,148 breeding adults, while Burnell *et al.* (2023) reported a small increase to 45,504 AON, or 91,008 individuals. The baseline mortality of this population using the most recent figure is 13,287 breeding adult birds per year based on the published adult mortality rate of 14.6% (Horswill and Robinson, 2015).

77. The breeding season for kittiwake at FFC SPA commences in March when the kittiwake utilise the sheer cliff faces for nesting, using even the smallest of outcrops for nesting. Eggs are typically laid in May, with an average of two eggs per pair. Kittiwake chicks hatch in June, are fully fledged by July or August and have usually vacated the site by the end of August (Natural England, 2012). Typically, the breeding season for kittiwake is considered to commence on 1st March and end on 31st August.

78. Kittiwake also use the FFC SPA for important maintenance behaviours such as loafing, preening and bathing. The highest density of kittiwake at sea are usually found within 1km from the main colony during breeding season (McSorley *et al.* 2003) though they may forage up to 150km in single journeys and have a mean foraging range of 24.8 ± 12.1 km (Thaxter *et al.* 2012). Kittiwake feed on small shoaling fish near the surface of the water column, including sandeel, sprat and juvenile herring but also scavenge discards from fishing vessels in the local area when their preferred food sources are less abundant during the breeding season (Mitchell *et al.* 2004).

79. Supplementary advice on the conservation objectives was added for qualifying features of the FFC SPA in 2020 (Natural England, 2023a). For kittiwake, these are:

- Restore the size of the breeding population at a level which is above 83,700 breeding pairs, whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent.
- Restore safe passage of birds moving between nesting and feeding areas.
- Restrict the frequency, duration and / or intensity of disturbance affecting roosting, nesting, foraging, feeding, moulting and/or loafing birds so that they are not significantly disturbed.
- Restrict predation and disturbance caused by native and non-native predators.
- Maintain concentrations and deposition of air pollutants at below the site-relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System.
- Restore the structure, function and supporting processes associated with the feature and its supporting habitat through management or other measures (whether within and/or outside the site boundary as appropriate) and ensure these measures are not being undermined or compromised.

- Maintain the extent, distribution and availability of suitable breeding habitat which supports the feature for all necessary stages of its breeding cycle (courtship, nesting, feeding) at its current extent.
- Restore the distribution, abundance and availability of key food and prey items (e.g. sandeel, sprat, cod Gadidae spp., squid, shrimps Decapoda spp.) at preferred sizes.
- Restrict aqueous contaminants to levels equating to High Status according to Annex VIII and Good Status according to Annex X of the Water Framework Directive, avoiding deterioration from existing levels.
- Maintain the dissolved oxygen (DO) concentration at levels equating to High Ecological Status (specifically ≥5.7mg per litre (at 35 salinity) for 95% of the year), avoiding deterioration from existing levels.
- Maintain water quality and specifically mean winter dissolved inorganic nitrogen (DIN) at a concentration equating to High Ecological Status (specifically mean winter DIN is <12µM for coastal waters), avoiding deterioration from existing levels.
- Maintain natural levels of turbidity (e.g. concentrations of suspended sediment, plankton and other material) across the habitat.

## 4.4 Summary of Potential Impacts

80. The following sections provide a summary of the potential impact of the Projects on FFC SPA kittiwake as set out in the Applicants' **Volume 6, RIAA (application ref: 6.1),** and include precautionary estimates derived by following SNCB guidance. This information sets the context for the compensatory measures. The SoS will ultimately determine the extent of the predicted impacts of the Projects on breeding adult kittiwakes from FFC SPA based on the conclusions of the AA.

### 4.4.1 Quantification of Collision Risk

81. Potential collision risk for kittiwake associated with the Projects was estimated using the Band (2012) Collision Risk Model (CRM). Full details of the input parameters used are provided in **Volume 7, ES Appendix 12.9 Collision Risk Modelling Inputs and Outputs (application ref: 7.12.12.9).**

#### 4.4.1.1 Project Alone

82. **Table** 4-1 presents a summary of the total collisions apportioned to the FFC SPA requiring compensation assuming two different breeding season impact scenarios (53% vs. 100%). The 53% adult value is derived from the stable age distribution which is an output obtained from the kittiwake population model following the method in Furness (2015). Natural England advised the Applicants to consider using observations of age class in the aerial survey data to calculate the proportion of adults present or else assume 100% are adults. Whilst deriving this estimate from survey data is a reasonable suggestion, in practice digital aerial imagery can only reliably distinguish two age classes: immatures (1st year) and older. A review of the survey data collected during the breeding season found that more than 95% of birds for which an age estimate was provided were categorised as adults. It is known that younger age classes associate with breeding colonies prior to reaching maturity at four years or older. Thus, basing age proportions on survey-based estimates will almost certainly overestimate the proportion of adults present since it will include 2nd and 3rd year birds. Therefore, the demographic-based adult percentage (53%) is considered to be a more realistic guide than the known overestimate obtained from survey data. Nonetheless, following Natural England's advice, a scenario whereby 100% of kittiwakes present during the breeding season were assumed to be adults is also presented.

83. It is also of note that there is increasing evidence of a large population of breeding kittiwake on oil and gas platforms in the North Sea, with estimates that around 30% of structures may be colonised with average counts in the region of 100 to 200 pairs (Outer Dowsing, 2024b). The presence of these birds will reduce the proportion assigned to the FFC SPA, further highlighting the considerable precaution attached to an impact derived from the assumption that all adults in the breeding season are breeding adults from FFC SPA.

84. Based on an adult kittiwake proportion of 53% applied to the breeding season, the combined mean annual total collision rate for DBS East and DBS West together is estimated to be 99.6 (95% CIs 49.8 – 195.6) FFC SPA breeding adult kittiwakes. This level of impact would increase the existing mortality of the SPA breeding population by 0.75% (0.33% from DBS East and 0.42% from DBS West). Assuming 100% adult kittiwake during the breeding season, the combined mean annual total collision rate for DBS East and DBS West together would be 182.2 (CIs 91.4 – 359.3). This would increase the existing mortality of the SPA breeding population by 0.75% to 1.37%.

85. The Applicants' **Volume 6, RIAA (document reference 6.1)** concluded that predicted kittiwake mortality due to operational phase collision risk at DBS East, DBS West, and the Projects together would not adversely affect the integrity of the FFC SPA.

86. For the purpose of this Project-Level Kittiwake Compensation Plan, the scale of compensation is presented in the context of the mean and upper 95% CI collision rates assuming either 53% or 100% adult kittiwake proportions applied to the breeding season impact (**Table** 4-1). The worst-case impact from the operation of DBS East and DBS West together based on the upper 95% CI is 359 birds per year.

*Table 4-1 Summary of Kittiwake Total Collisions Apportioned to the FFC SPA Requiring Compensation. Note that breeding season impacts have been estimated assuming 53% of birds present were adults and also 100%*

| Site | Mean Annual Collisions (upper 95% CI) – assuming 53% | Mean Annual Collisions (upper 95% CI) – assuming 100% |
|---|---|---|
| DBS East | 44 (89) | 80 (162) |
| DBS West | 56 (143) | 102 (265) |
| Total (DBS East + DBS West) | 100 (196) | 182 (359) |

#### 4.4.1.2 In-combination

87. The total predicted annual in-combination collision mortality for breeding adult kittiwakes from the FFC SPA assuming either 53% or 100% adult proportion from DBS is 351 and 434, respectively. The predicted annual in-combination collision mortality would result in a predicted change in adult mortality rate of 2.6 – 3.3%.

88. Based on these results and the assessment outlined in section 9.5.2.1.2 of **Volume 6, RIAA (application ref: 6.1),** the Applicants have concluded that the collision impacts predicted at DBS East and DBS West in-combination with other projects, will not adversely affect the integrity of the FFC SPA.

89. Notwithstanding the above conclusion, the Applicants acknowledge that previous decisions on offshore wind farms by the SoS have concluded that an AEoI for kittiwake at the Flamborough and Filey Coast SPA could not be ruled out for in-combination collision risk (e.g. Hornsea Three, Norfolk Vanguard, Norfolk Boreas, East Anglia One North / Two, Hornsea Four and SEP and DEP). The Plan Level HRA conducted by The Crown Estate also concluded that an AEoI could not be ruled out. Given this, the Applicants assume that the SoS will conclude AEoI in this case also. Therefore, the Applicants do not consider it worthwhile to contest this point and on this basis concede AEoI on the Flamborough and Filey Coast SPA.

# 5 Compensation Quantum

## 5.1 Projects Alone

90. The impact of the Projects on adult kittiwakes from FFC SPA is estimated to be 100 to 182 birds per year (depending on the percentage of adult kittiwake proportions applied to the breeding season impact), with an upper 95% CI of 196 to 359 birds per year (section 4.4.1).

91. To determine the appropriate scale of compensation required to offset the predicted impacts of the Projects, the Applicants have considered two approaches: the 'New Colony Approach' proposed by Hornsea Three (Ørsted, 2020) and the Hornsea Four approach (APEM, 2021). This is consistent with **Volume 6, KSCP (application ref: 6.2.1.1)** which presents the number of nests required for the strategic delivery of offshore ANS for the Round 4 Plan using both methods. Further information on the two approaches can be found in section 8.2 of **Volume 6, KSCP (application ref: 6.2.1.1).**

92. **Table** 5-1 presents the number of breeding pairs required to compensate for the predicted annual collision mortality from the Projects, calculated using the Hornsea Three and Hornsea Four approaches. The upper 95% CI values are provided in line with SNCB guidance, although the Applicants consider it likely that the impacts of the Projects will prove to be much less than these precautionary estimates.

93. Whilst the New Colony Approach is favoured by Natural England, several aspects of this method are considered by the Applicants to result in an overestimation of compensation quantum. Therefore the Applicants consider Hornsea Four's approach to be more appropriate.

94. The New Colony Approach contains age-related details on recruitment rates which makes the calculations difficult to follow. Examination of this approach indicates that a detailed age breakdown is unnecessary since the result from the age-based calculation is almost identical to that obtained by dividing the mortality by the overall (all age) natal dispersal rate. As such, there is no need to introduce this extra complexity.

95. The next step in the New Colony Approach estimates how many chicks are required to produce the number of adults estimated in the first step. This process is again undertaken through a complicated age-based procedure. However, this complexity is also unnecessary and simply dividing the mortality (allowing for natal dispersal obtained above) by survival to maturity (i.e. from fledging to age five) gives the same answer in a single step and has the distinct advantage of being straightforward to understand.

96. The next step is to calculate the number of nests required to produce the target chick number. This is calculated by dividing the number of chicks by the productivity rate. The result is the baseline number of nests required prior to the application of any compensation ratios (i.e. at a 1:1 ratio) and the same method is used by both the Hornsea Three and Hornsea Four methods, which the Applicants consider to be appropriate.

97. However, the New Colony Approach goes on to make a further calculation which is intended to allow for annual adult mortality from the 'new' colony. As above, this is based on a complicated age-specific calculation. However, this step amounts to a double-counting of adult mortality. By incorporating this, the New Colony approach effectively treats the new colony as if it existed in isolation from the wider kittiwake population. However, in reality, it will be subject to immigration and emigration, just as all colonies are, and recruitment of new breeding birds to the colony to replace natural loss of adults is an integral aspect of this which does not require special consideration. Consequently, the additional 'allowance' for adult mortality amounts to double counting of this rate (i.e. effectively adult mortality is doubled in the Hornsea three calculations), whereas this is already present in the demographic rates upon which the calculations are based. Thus, the Hornsea Three approach is considered to result in an overestimation of compensation quantum and is regarded by the Applicants to be unnecessarily complex.

98. The Applicants therefore consider that the level of compensation required (not taking into account any compensation ratio) should be based on the Hornsea Four approach which derives a compensation requirement of 267 to 486 kittiwake pairs per annum (upper 95% CI 523 to 960 kittiwake pairs per annum).

99. The Applicants have put forward compensation measures that could be scaled to deliver the full range of estimates presented in **Table** 5-1**.** The exact quantum of compensation required to be delivered by the Projects will be determined as part of the SoS consent decision. The Applicants consider it important that this decision seeks to avoid the likelihood of over-compensating for the predicted impacts of the Projects at the risk of eroding compensation opportunities for future projects.

*Table 5-1 Combined Impact Of The Project's Based On Mean Collision Risk Modelling Values (95% Upper CI) And The Predicted Level Of Compensation Required Calculated Using The Hornsea Three And Hornsea Four Approaches. Note that values have been presented based on different breeding season impacts estimated assuming 53% of birds present were adults and also 100%.*

| **Site** | **Annual FFC SPA Apportioned Impact (individuals)** | | **Hornsea Four Approach – numbers of pairs required to offset impact** | | **Hornsea Three Approach – numbers of pairs required to offset impact** | |
|---|---|---|---|---|---|---|
| | Assuming 53% adult birds | Assuming 100% adult birds | Assuming 53% adult birds | Assuming 100% adult birds | Assuming 53% adult birds | Assuming 100% adult birds |
| DBS East | 44 (89) | 80 (162) | 118 (238) | 214 (433) | 243 (492) | 442 (896) |
| DBS West | 56 (143) | 102 (265) | 150 (382) | 273 (708) | 310 (791) | 564 (1465) |
| Total (DBS East + DBS West) | 100 (196) | 182 (359) | 267 (523) | 486 (960) | 553 (1084) | 1006 (1985) |

## 5.2 Round 4 Plan

100. To inform calculations of the level of compensation required for the Round 4 Plan, the Kittiwake Steering Group proposed an 'envelope approach' to generate upper and lower estimates of the compensation population based on preliminary collision risk modelling results presented in the **Volume 6, KSCP (application ref: 6.2.1.1)**. The lower and upper estimates of the combined predicted impact of DBS East, DBS West and Outer Dowsing were agreed by the Kittiwake Steering Group in relation to an offshore ANS (which is considered to be the most viable measure to compensate for the predicted impacts of the Round 4 Plan) to be 2,500 and 5,000 nesting spaces, respectively.

101. Using the Hornsea Four and Hornsea Three approaches outlined above, Outer Dowsing OWF has calculated its compensation requirement to be 40 and 94 breeding pairs[7], respectively (ODOW, 2024a). Considering these estimates and those presented in **Table** 5-1, the combined predicted impact of DBS East, DBS West and Outer Dowsing ranges from 307 to 2,079 pairs per annum depending on the proportion of adults assumed during the breeding season, whether means or upper 95% CI is considered and which approach is used (Hornsea Three or Hornsea Four) to derive the values. This range falls below the lower limit of the 'compensation envelope' presented within **Volume 6, KSCP (application ref: 6.2.1.1)** indicating that this, which does not take into account a compensation ratio, is likely to be highly conservative.

## 5.3 Compensation Ratios

102. **Volume 6, KSCP (application ref: 6.2.1.1)** states that "*based on the provision of an offshore [Strategic] ANS of the scale proposed, and in line with the potential locations discussed below, a ratio of above 1:1 is proposed*". However, no specific compensation ratio is applied to determine the overall scale of compensation potentially required by the Round 4 Plan as there remain several factors (e.g. location of offshore ANS) still to be refined and agreed by the Kittiwake Steering Group and which may have a bearing on what would be considered an appropriate ratio. However, **Volume 6, KSCP (application ref: 6.2.1.1)** does state that the final compensation quantum would fall within the 'compensation envelope' outlined above.

[7] These estimates are based on the summed mean peak bio-seasonal occurrence. The proportion of adults within the population is defined using adult proportions from the from the site-specific Digital Aerial
Survey (DAS) data, with birds apportioned to the FFC SPA using the NatureScot apportioning. method and including offshore breeding birds, as agreed with Natural England.

103. The Applicants have sought to align this project-level compensation plan with **Volume 6, KSCP (application ref: 6.2.1.1)** as far as possible in accordance with their AfL conditions. In light of this and taking account of project-specific advice from Natural England, it is proposed that a compensation ratio of 2:1 be applied to the Projects' predicted impacts. The overall compensation quantum required to offset the predicted impacts of the Projects[8] would therefore be 534 to 972 kittiwake pairs per annum (upper 95% CI 972 to 1,920 kittiwake pairs per annum).

104. Based on the Hornsea Four approach and assuming the same compensation ratio (2:1), Outer Dowsing's predicted impact is estimated to be 77.8 breeding pairs (ODOW, 2024a). Therefore, the overall compensation requirement for the Round 4 Plan would be 661 to 1050 kittiwake pairs per annum (upper 95% CI 1,050 to 1,998 kittiwake pairs per annum), which remains below the lower limit of the 'compensation envelope' presented in **Volume 6, KSCP (application ref: 6.2.1.1)**.

[8] Based on the Hornsea Four approach and assuming either 53% or 100% of birds present during the breeding season were adults.

# 6 Compensatory Measures

## 6.1 Overview

105. **Table** 6-1 provides an overview of the compensatory measures proposed by the Applicants for kittiwake and the delivery options available for each measure. The principal compensatory measures include the management of fisheries to increase prey availability and offshore ANS. It is considered that each of these measures is capable of fully compensating for the predicted impacts of the Projects and therefore only one would be required to deliver the necessary level of compensation for the Projects.

106. The Applicants' preferred compensation measure is the management of fisheries to increase prey availability which can only be delivered strategically by the UK Government. However, as outlined in section 3.1.1 there is uncertainty as to whether this strategic option is available to compensate for the predicted impacts of the Round 4 plan and the Projects specifically. Thus, offshore ANS is proposed as an alternative option which could be delivered via several mechanisms including strategically, collaboratively and on a project-led basis.

107. As evidenced by the SoS's decision for the Hornsea Four Project, offshore ANS is an accepted compensation measure for FFC SPA kittiwake and has also recently been approved as a strategic compensatory measure (Defra, 2024a). Two ANS have already been installed by the Hornsea Three Project in the nearshore environment and further offshore structures are expected to be implemented by the Hornsea Four Project in the coming years in accordance with their DCO. Considering this alongside the evidence provided in **Volume 6, KSCP (application ref: 6.2.1.1)** and summarised in section 6.3 below, offshore ANS is considered to be both feasible and implementable. Offshore ANS is therefore being taken forward by the Applicants as the principal compensatory measure for kittiwake.

108. In October 2022, the Applicants applied for planning permission to install a single onshore ANS on the River Tyne, adjacent to an existing kittiwake nesting structure (known as the Saltmeadows tower) at Gateshead. This scheme was pursued in anticipation of the Projects' potential requirement to deliver kittiwake compensation. At the time, several OWF Projects had been consented with onshore ANS as a compensation measure for kittiwake and therefore it was considered a viable option that could potentially deliver all or part of the Projects' compensation needs. The Applicants took a proactive approach, seeking to develop an onshore ANS in advance of DCO application, to maximise the time available for this structure to become functioning and contribute to the coherence of the UK NSN before any impact from the Projects occurred. Planning was granted in December 2022 and the structure was installed in February 2023.

109. Whilst the Kittiwake Steering Group acknowledge that onshore ANS has merit as a compensation measure, concerns have been raised regarding the ecological evidence and lack of certainty in the effectiveness of further onshore ANS (in addition to those already implemented or in planning) (**Volume 6, KSCP (application ref: 6.2.1.1)**). As such, the Kittiwake Steering Groups preference is for offshore ANS over onshore ANS as a strategic compensation measure for the Round 4 Plan.

110. Furthermore, the Applicants understand that whilst Natural England does not typically support onshore ANS for kittiwake, it is considered acceptable and a proportionate option for OWF projects where they are predicted to have only a small impact. Based on the current capacity of the Applicants onshore ANS at Gateshead and the predicted impacts of the Projects outlined in section 4.4.1, this structure is unlikely to be capable of fully delivering the necessary level of compensation.

111. In light of this and feedback from the Kittiwake Steering Group and ETG members, the Applicants' existing onshore ANS located on the River Tyne, Gateshead is proposed as a supporting or adaptive management measure rather than a primary compensatory measure. This option could be relied upon either as compensation or adaptive management to, for example, discharge a proportion of the Projects' derogation requirements should any issues arise with respect to the primary compensation measure taken forward. It is therefore considered to add resilience to the Applicants' overall compensation proposal for kittiwake. It is acknowledged that other OWF developers have an interest in this structure in potentially delivering their own compensation needs for kittiwake – this is discussed in section 6.4.3 below.

112. Given the significant work that is being undertaken by industry and Government to develop strategic compensation options for offshore wind (see section 1.3), the Applicants consider it possible that alternative strategic options to offshore ANS may become available either as compensation or adaptive management within the timescales of the Projects. Given the strategic nature of such options, it is likely that these would be capable of fully compensating for the predicted impacts of the Projects. However, given the uncertainty with respect to the nature of these measures and if/when they may become available, this option is only included as a supporting or adaptive management measure and is not considered further in this plan.

113. The remaining measures outlined in **Table** 6-1 are discussed in further detail within the subsequent sections, in accordance with the Natural England checklist (see section 2.2) where appropriate.

*Table 6-1 Summary of Compensatory Measures For Kittiwake and The Associated Delivery Options*

| Measure | Strategically | Collaboratively | Project-led |
|---|---|---|---|
| **Primary measures** | | | |
| Management of fisheries to in-crease prey availability | ✓ | × | × |
| Offshore ANS | ✓ | ✓ | ✓ |
| **Supporting / adaptive management measures** | | | |
| Existing onshore ANS at Gateshead | × | ✓ | ✓ |
| Alternative strategic options | ✓ | × | × |

## 6.2 Management of Fisheries to Increase Prey Availability

### 6.2.1 Overview

114. During the breeding season kittiwake at most colonies around the North Sea feed on small shoaling fish near the surface of the water column, including sandeel, sprat and juvenile herring (Furness and Tasker, 2000; Coulson, 2011). Sandeel abundance has been found to strongly influence breeding success of kittiwakes (Frederiksen *et al.* 2004; Cury *et al.* 2011; Carroll *et al.* 2017; Christensen-Dalsgaard *et al.* 2018), which in turn influences breeding numbers at nearby kittiwake colonies (Monnat *et al.* 1990; Cadiou *et al.* 1994; Coulson 2011, 2017).

115. Recent and current OWF consent applications provide extensive evidence that measures to increase the abundance of sandeels can be expected to provide several benefits for kittiwake colonies including increased breeding success, adult survival, and breeding numbers (MacArthur Green, 2022a; 2022b; SSE, 2023). Thus, such measures are considered to be a targeted and highly effective means of compensating for the predicted impacts of offshore wind projects.

116. Fishing of sandeels is one of the main factors that reduces the abundance of sandeels in the North Sea (Lindegren *et al.* 2018 and reviewed in MacArthur Green, 2022a). Ecopath-Ecosim ecosystem modelling (Bayes and Kharadi 2022) concluded that a closure of the sandeel fishery in the North Sea would lead to a 40% increase in the biomass of the sandeel stock and a 42% increase in the number of seabirds dependant on this prey resource within the first 10 to15 years after closure of the sandeel fishery (Bayes and Kharadi, 2022). Further evidence to support the assertion that management of fisheries to increase prey availability is considered by the Kittiwake Steering Group and the Applicants to be the most ecologically effective means of increasing breeding success and therefore populations of kittiwake.

117. With respect to draft Defra guidance (Defra, 2021), this compensatory measure is consistent with the top level of the compensation hierarchy as it would benefit the same feature that is impacted by the Projects (FFC SPA kittiwake). The Applicants are confident that this measure would be effective in delivering vastly more compensation than required by the Projects and other UK OWF project proposals, even under the most precautionary estimates of losses and would support the conservation objectives for the site and the overall coherence of the UK NSN.

### 6.2.2 Delivery Mechanism

118. Several potential delivery mechanisms have been explored to date (Ørsted, 2021; MacArthur Green, 2022b; 2022c; Equinor, 2022), however; these require changes to ICES fisheries management practices with a great focus on 'ecosystem-based management' or Defra to legislate to reduce fishing pressure on sandeels in UK waters as strategic compensation.

119. As outlined in section 3.1.1 and **Volume 6, KSCP (application ref: 6.2.1.1),** Defra ran a public consultation from 7th March 2023 to 30th May 2023 to gather views on the management measures of industrial sandeel fishing in English waters of the North Sea. This consultation considered the closure of the sandeel fishery for ecological purposes rather than to deliver compensation for offshore wind.

120. This consultation considered several potential delivery mechanisms including:

- Full closure of English waters within the North Sea. This option would see full closure of industrial sandeel fishing within the English waters of SA 1 r, SA3r and SA4.
- Closure of English waters within SA4 and SA3r. This option would be a partial closure in English waters, with industrial fishing prohibited in English areas of SA4 and SA3r; and
- Closure of English waters within SA 1 r. This option would be a partial closure in English waters, with industrial fishing prohibited in English area of SA1r.

121. In January 2024, Defra announced that effective from 1st April 2024, the UK Government would permanently close sandeel fisheries in English waters of the North Sea. As such, there is potential that the management of fisheries to increase prey availability may not be an available compensation option for Round 4; however, no formal announcement has been made by Defra with respect to this. The EU has also recently challenged the compatibility of the fisheries closures with the EU-UK Trade and Cooperation Agreement (see section 3.1.2) which casts further doubt on the viability of this measure as compensation for OWFs.

122. Notwithstanding this, there is still considered to be some prospect that fisheries management to increase prey availability could be delivered strategically as compensation for offshore wind. Thus, this measure has been put forward as part of the Applicants project level compensation proposal in accordance with **Volume 6, KSCP (application ref: 6.2.1.1)** and an option for the Projects to pay a financial contribution towards the management of fisheries to increase prey availability as a strategic compensation measure has been included in **Volume 3, Draft DCO (application ref: 3.1).**

123. The scale of fisheries management required to compensate for the predicted impact of the Projects would be assessed following confirmation from Defra that this measure is viable (i.e. the UK Government indicates an appetite to deliver fisheries management as compensation for offshore wind) and deliverable within the relevant timescales. The assessment of the required compensation quantum would be undertaken in consultation with the Kittiwake Steering Group to align with the level of compensation required at the plan level for the Projects.

## 6.3 Offshore ANS

### 6.3.1 Overview

124. UK kittiwake populations have experienced considerable decline over the last 40 years, with an overall decline of 55% since 1985. Whilst English colonies have remained relatively stable over the last 21 years (2000 – 2021), substantial declines have been observed at Scottish, Welsh, and Irish colonies (Burnell *et al*. 2023). As outlined above, there is good evidence to suggest that the decline in UK kittiwake populations is likely to have been driven by low breeding productivity related in turn to changes in sandeel populations (Frederiksen *et al*. 2005; Coulson, 2017).

125. Offshore ANS aim to increase the productivity of kittiwake within the species' biogeographic range by providing additional nesting space within the vicinity of productive foraging grounds to encourage the creation of a new offshore colony.

126. As evidenced in section 5.3 of **Volume 6, KSCP (application ref: 6.2.1.1),** kittiwakes are known to readily utilise man-made structures for nesting both onshore and offshore (NIRAS, 2020; MacArthur Green, 2021a; 2021b; MacArthur Green and Royal HaskoningDHV, 2022; Niras, 2021a and 2021b; MacArthur Green, 2022a). Although to date, no offshore ANS have been implemented specifically for this purpose, there are successful examples of onshore structures (e.g. Saltmeadows tower in Gateshead). ANS both onshore and nearshore have been installed in recent years for the purpose of delivering compensation although the efficacy of these is still to be established (Ørsted, 2023; Vattenfall, 2023).

127. Kittiwakes have, however, been recorded successfully breeding offshore on platforms in the Norwegian Sea, North Sea, and Dutch North Sea since the early 1990s (Unwin, 1999; Christensen-Dalsgaard *et al*. 2019). The presence of breeding kittiwakes has been established on at least 100 oil and gas rigs in northern European waters although only 26 are currently known to support established breeding kittiwake colonies (Ørsted, 2021 and references therein). To support the proposal of offshore ANS as a viable compensation measure, several OWF developers have recently undertaken surveys to increase the evidence base regarding the extent of kittiwake breeding on offshore structures in the southern North Sea.

128. During the 2021 breeding season, Ørsted commissioned a series of boat-based and aerial surveys to better understand the status of breeding pairs on offshore installations in the North Sea (NIRAS, 2021b). These surveys identified the presence of nine breeding colonies in the southern North Sea which combined, were estimated to support at least 1,500 breeding pairs (Ørsted, 2021). A further 12 offshore installations were observed to support roosting populations, breeding was suspected at two of these but could not be confirmed.

129. To build on the evidence base provided by Ørsted (2021), ODOW completed surveys of breeding kittiwake populations in the southern North Sea in summer 2022 and 2023 (ODOW, 2024b). Boat-based surveys of 17 offshore installations within a 20km radius of the proposed Outer Dowsing array areas found that six offshore installations supported nests each year.

130. In addition to the above investigations, an aerial survey of offshore installations was undertaken by the Applicants in 2022 to assess the presence of kittiwake colonies within the vicinity of the DBS array areas. Of the 13 offshore oil and gas installations surveyed, kittiwake populations were present at five and evidence of breeding colonies was observed at a further four sites (RWE, 2022a).

131. The data collected by OWF developers in the North Sea supports the understanding that kittiwake colonise offshore structures and where environmental conditions are suitable, can breed successfully on these structures.

132. There are several advantages to establishing colonies offshore for kittiwake. Firstly, predation levels are likely to be lower on isolated offshore structures (e.g. oil rigs) compared with natural coastal breeding sites (Christensen-Dalsgaard *et al.* 2019). Secondly, breeding birds are likely to be located much closer to foraging grounds, thus reducing energy expenditure and increasing foraging efficiency compared to birds breeding onshore. Thirdly, there is evidence that breeding success may be reduced at large coastal colonies as a result of increased competition for high-quality nest sites and food in the surrounding coastal waters (Acker *et al.* 2017; Wakefield *et al.* 2017). The combined effect of these factors is that breeding success at offshore colonies has been found to be higher than breeding colonies on natural cliffs (Christensen-Dalsgaard *et al.* 2019). Similarly, higher mean productivity has been observed at urban artificial nesting sites (e.g. in Scarborough, North Yorkshire) compared with nearby nesting sites on natural cliffs (RWE Renewables UK, 2024). Predation risk can be further reduced on both onshore and offshore purpose-built structures through specific design considerations to prevent large gull roosters and reduce exposure to adverse weather conditions.

133. Growth patterns of kittiwake colonies at offshore installations are understood to reflect those observed at natural nesting sites (Ørsted, 2021). The size of the annual pool of breeding kittiwake available for recruitment to new offshore structures can be estimated by observing local populations at established colonies – in the case of the Projects, this is primarily the FFC SPA population.

134. Though the size and pool of kittiwake recruits available in the North Sea are uncertain (Ruffino *et al.* 2020), OWF developers have made estimates based on the best available data. ODOW calculated the potential pool of kittiwake recruits by considering the local breeding population size within exploratory range of an ANS in the North Sea, dispersal rates, local productivity rates, survival rates to breeding age and colony population maintenance as a consequence of natural mortality and current colony growth rate (ODOW, 2024b). It was determined that using a low estimate of the natal dispersal rate (64%), the colony size of FFC SPA (39,653 AONs), and a standard rate of productivity (0.819) the colony may produce up to 20,785 prospecting juveniles per annum that could potentially be recruited to an offshore ANS within dispersal range. Note that this potential population available for recruitment only includes kittiwake from FFC SPA. Therefore, prospecting juveniles from other colonies such as those established on offshore oil and gas installations, and from other North Sea coast populations represent additional pools for recruitment.

135. Estimations of recruitment potential have also been undertaken by Ørsted for the Hornsea Four Project (Ørsted, 2021). The potential production of breeding juveniles at SPA sites on the North Sea coast was calculated under a range of philopatry scenarios (low, medium, and high). This assessment concluded that the largest SPA colonies could produce several thousand recruiting breeders annually, regardless of philopatry rate. For example, Flamborough Head estimations ranged from >1,000 in the most conservative prediction to >20,000 individuals in 2030 under an optimistic scenario.

136. The approaches taken in calculating the pool of potential recruits for offshore ANS by developers are relatively simple and depend on a range of assumptions. However, some broad conclusions can be made. Firstly, there is an annual input of juvenile kittiwakes that will survive to breeding age (three to four years) within the southern North Sea. Secondly, under the assumption that nesting preferences at coastal colonies including FFC SPA are reflected in conditions provided by offshore ANS, then ANS within prospecting distance of established kittiwake colonies (within 100km of their natal colony) have the potential to provide large numbers of recruits annually.

137. The chances of success for offshore ANS as a compensatory measure for kittiwake with good design and siting are considered by the Applicants to be high. This is supported by the inclusion of the measure as a preferred option in **Volume 6, KSCP (application ref: 6.2.1.1)** and demonstrated by ecological evidence presented in this plan and by other OWF developers (Ørsted, 2021; ODOW, 2024b).

### 6.3.2 Scale

138. In accordance with **Volume 6, KSCP (application ref: 6.2.1.1)**, the provision of up to two ANS structures is secured within the **Volume 3, Draft DCO (application ref: 3.1)**. These two structures, each with a maximum capacity of 2,250 nesting spaces (4,500 nesting spaces in total) would accommodate the predicted upper limit of compensation required at the plan level for DBS West, DBS East and Outer Dowsing (see section 5.2) and more than compensate for even the most precautionary collision risk estimates for the Projects (see section 5.1). The impact of the Projects on adult kittiwakes from FFC SPA is estimated to be 100 to 182 birds per year (depending on the percentage of adult kittiwake proportions applied to the breeding season impact), with an upper 95% CI of 196 to 359 birds per year.

139. Should one or more of the three projects (DBS West, DBS East or Outer Dowsing) not proceed, **Volume 6, KSCP (application ref: 6.2.1.1)** outlines that the number of structures required would be reviewed in light of the anticipated reduction in predicted collisions.

### 6.3.3 Delivery Mechanism

140. The Applicants propose to deliver two offshore ANS via one, or a combination of, the following mechanisms:

- Collaboratively with one or more OWF developer via a unilateral or bilateral collaboration agreement; or
- On a project-led basis (one offshore ANS only); and
- Strategically via a Strategic Compensation Fund (e.g. the MRF).

141. The Applicants' preferred option is to deliver both offshore ANS in collaboration with one or more OWF developers via a unilateral or bilateral collaboration agreement. Differing project programmes have previously limited opportunities for collaboration but with several OWF projects coming forward with offshore ANS proposals and others in the process of implementing this measure, the Applicants consider there to be several viable options for collaboration. There are operational examples of collaborative compensation delivery for example, the Norfolk Projects (Norfolk Boreas and Norfolk Vanguard) and East Anglia ONE North and TWO Project's onshore ANS project at Lowestoft (Vattenfall, 2022) which demonstrates that ANS implementation via this mechanism can be secured and delivered.

142. Collaborative delivery is one of the mechanisms proposed in **Volume 6, KSCP (application ref: 6.2.1.1)** and engagement with other OWF developers through the Kittiwake Steering Group has been undertaken during the pre-application stage to explore opportunities for collaboration between the Applicants, Outer Dowsing and other OWF developers. This approach aligns with the preference expressed by the Defra SoS (Defra, 2024a) for 'developers to work collaboratively to ensure larger (and likely, fewer) towers are placed in optimal sites within English Waters'.

143. The Applicants have submitted a Letter of Intent alongside this plan, to demonstrate the positive direction of travel with respect to collaborative discussions between the Applicants and ODOW (see **Volume 6, Collaborative Delivery of Kittiwake Compensation: Letter of Intent (application ref: 6.2.1.3)**). The Applicants' discussions with ODOW and other OWF developers remain ongoing. An update on the progress of collaborative compensation options will be provided to the Examining Authority during DCO examination.

144. In the unlikely event that one or more of the OWF projects with which the Applicants are currently engaged in relation to collaborative compensation delivery, do not proceed, and no other prospective collaborative partners come forward within the appropriate timescales, then it will be necessary for the Applicants to take forward offshore ANS via an alternative delivery mechanism.

145. An alternative option is the strategic delivery of offshore ANS via a Strategic Compensation Fund such as the MRF. The MRF is an optional mechanism through which strategic compensation measures such as offshore ANS provision will be available to developers. This fund is expected to be operational in 2025 and is therefore considered to be a viable delivery mechanism that could be relied upon to deliver offshore ANS either wholly or partly in substitution of collaborative or project-led options or as part of an adaptive management approach.

146. In addition, the Applicants are also exploring the delivery of a single offshore ANS on a project-led basis. This option could be relied upon to deliver a proportion of the compensation required with the remainder met by either collaborative or strategic delivery of offshore ANS, or an alternative compensation measure altogether. The Applicants project-led proposal for offshore ANS is being progressed in parallel to collaborative discussions. Further information regarding the proposed location, design and implementation timescales for this option is provided in sections 6.3.4 to 6.3.8 below.

147. The information presented above outlines how offshore ANS can be secured and demonstrates that several mechanisms for delivery are available to the Applicants and can be implemented. The Kittiwake CIMP (if required in addition to the KSIMP) will set out the detailed delivery proposals for the agreed compensatory measures based on those set out in this Project Level Kittiwake Compensation Plan. The Kittiwake CIMP will be produced by the Applicants and approved by the SoS prior to the start of the offshore works. **Volume 6, Outline Kittiwake CIMP (application ref: 6.2.1.2)** is provided as part of the Applicants derogation case.

### 6.3.4 Location

148. As outlined in section 9 and Appendix D of **Volume 6, KSCP (application ref: 6.2.1.1)**, NIRAS on behalf of TCE, undertook a site selection process in consultation with the Kittiwake Steering Group to identify a long list of candidate areas of search (AoS) for installation of ANS both onshore and offshore in English, North Sea waters. This exercise aimed to identify AoS that were ecologically suitable and technically feasible (i.e. avoided 'hard constraints'). Ecological suitability was assessed by taking account of several factors that were deemed critical or would help optimise the likely success of the measure. These included:

- Proximity to foraging areas e.g. tidal mixing fronts and areas of high predicted prey (i.e. sandeel) abundance.
- Proximity to small (<5,000 pairs) existing kittiwake colonies i.e. to attract prospective birds whilst minimising competition for resources.
- Avoidance of areas where intraspecific competition is likely to be high (e.g. intense foraging areas for kittiwakes in UK waters).
- Likelihood of exchange with FFC SPA population while avoiding direct competition for resources i.e. within 100km of FFC SPA (Coulson, 2011) but not overlapping with the mean (core) foraging range from the SPA.

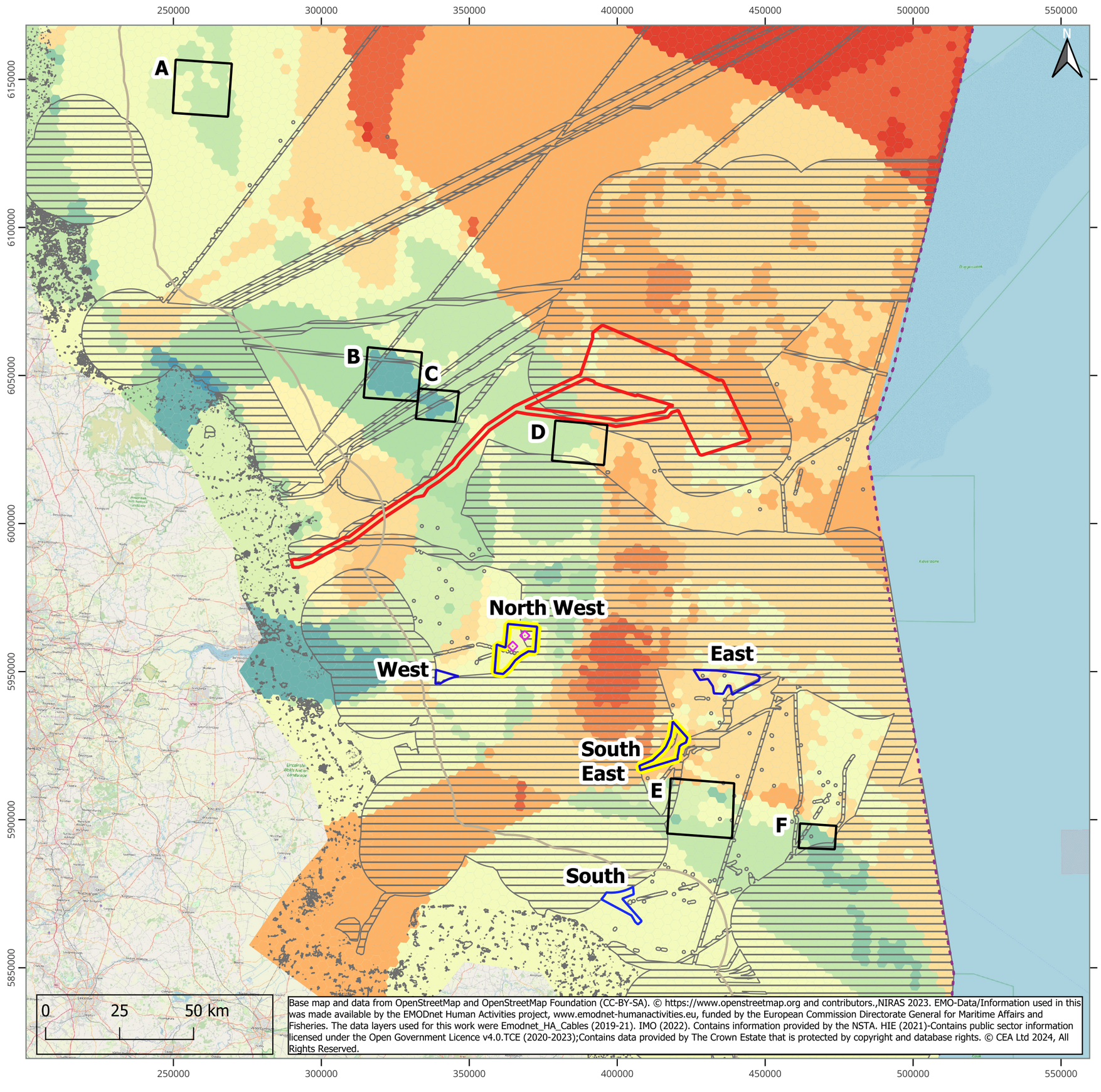
149. Hard constraints included existing infrastructure or activities where the seabed is already occupied and therefore not available (e.g. oil and gas platforms, cables and pipelines, aggregates, OWFs, protected monuments and wrecks, navigational channels, military areas etc.). A full list is presented in Appendix D of the **Volume 6, KSCP (application ref: 6.2.1.1).**

150. **Figure** 6-1 presents the six offshore AoS identified by NIRAS which are of relevance to this compensatory measure, and a further five offshore AoS that were considered within **Volume 6, KSCP (application ref: 6.2.1.1)**. Four of these were proposed by ODOW, two of which have been taken forward within their DCO application as possible locations for the siting of two offshore ANS (ODOW, 2024b). The remaining AoS represents the proposed location[9] for a further two offshore ANS which the Hornsea Four Project is required to deliver in accordance with its DCO. The purpose of outlining the AoS proposed by ODOW and Ørsted's Hornsea Four Project is to indicate the potential locations of offshore ANS that could be delivered collaboratively in partnership with the Applicants.

151. Further site selection work has been undertaken to support the Applicants' project-led offshore ANS proposal, building on the initial appraisal undertaken by NIRAS, to take account of additional constraints and identify a short list of AoS.

152. Acknowledging the Kittiwake Steering Group's preference for the construction of two offshore ANS at two different locations (in order to maximise likely success), this further appraisal work has focused on the six offshore AoS identified by NIRAS. The three AoS proposed by ODOW that were not taken forward as part of their DCO application have also been considered as these were not explicitly discounted by ODOW based on the constraints examined (ODOW, 2024b).

[9] As outlined in MLA/2023/00390 which is still to be decided upon by the MMO. Supporting site selection information can be found in Ørsted (2021).




Legend:

- 12NM Limit
- Exclusive Economic Zone Limit
- Project Red Line Boundary
- Proposed locations of Hornsea Four Project offshore ANS
- AoS identified by NIRAS
- AoS identified by Outer Dowsing
- AoS identified and taken forward by ODOW
- NIRAS Hard Constraints Layer

NIRAS Ecological Suitability Scores

| | |
|---|---|
| -1 | 7 |
| 1 | 8 |
| 2 | 9 |
| 3 | 10 |
| 4 | 11 |
| 5 | 12 |
| 6 | 14 |

| SUI | REV | DATE | DESCRIPTION | DRW | CHK | APR |
|---|---|---|---|---|---|---|
| S2 | P04 | 13/05/2024 | Suitable for information | JC | JDW | |
| S2 | P03 | 02/05/2024 | Suitable for information | JC | SP | HA |
| S2 | P02 | 30/04/2024 | Suitable for information | JC | SP | HA |
| S2 | P01 | 23/04/2024 | Suitable for information | JC | SP | |

Title:

Figure 6-1: Offshore ANS Areas of Search (AoS) presented in the KSCP

| | | |
|---|---|---|
| Figure: 0001 | Drawing No: PB2340-CEA-OF-ZZ-DR-Z-0001- OffshoreANSAoS | |
| Co-ordinate system: WGS 84 / UTM zone 31N | Page Size: A3 | Scale: 1:1,300,000 |
| Project: Dogger Bank South Offshore Wind Farms | Title: Project-Level Kittiwake Compensation Plan | |

collaborative environmental advisers

RWE

153. In accordance with the recommendations outlined in Appendix D of **Volume 6, KSCP (application ref: 6.2.1.1)**, the Applicants have examined the additional constraints outlined in **Table** 6-2 to refine the long list of AoS identified.

*Table 6-2 Constraints Analysed To Refine Long List Of AoS For Offshore ANS*

| Constraint category | Constraint sub-topic | Data source |
|---|---|---|
| Biological | Designated Sites (e.g. SACs, SPAs, Marine Conservation Zones and Highly Protected Marine Areas) | Natural England (2023b)<br>Natural England (2024a; 2024b) |
| | Annex I habitats (e.g. sandbank and reef Habitat) | JNCC (2019; 2021) |
| Physical / Engineering | Bathymetry – water depth | EMODnet (2021) |
| | Bedforms | EMODnet (2021) |
| | Distance to Projects | N/A |
| | Marine bedrock type and thickness | British Geological Survey (BGS) (2022) |
| Socio-economic | Proximity to Areas of Outstanding Natural Beauty (AONB) | Natural England (2023c) |
| | Disposal sites | Cefas (2023) |
| | Dredging sites | EMODnet (2023a) |
| | Commercial fishing type and intensity | EMODnet (2023b) |
| | Shipping activity (vessel density) | EMODnet (2019) |

154. Following the collation of spatial data, a Black, Red, Amber, Green (BRAG) assessment was undertaken which subjected each of the constraints outlined above to scrutiny using a standardised assessment method. The BRAG scoring system (see **Table** 6-3) was used to assess the level of constraint for each of the AoS against the biological, physical/engineering, and socio-economic factors outlined in **Table** 6-2. AoS which scored the highest were deemed to be the most favourable based on the constraints examined.

*Table 6-3 BRAG Assessment Scoring System.*

| Risk Category | Score | Score description |
|---|---|---|
| Low (green) | 2 | No significant risk identified. No consenting risks. |
| Medium (amber) | 1 | Less favourable option. Some risks identified but there is potential to overcome / mitigate risks with relative ease. |
| High (red) | 0 | Significant risks identified. Mitigating / overcoming risks challenging. Least preferred option. Potential for option elimination. |
| Showstopper (black) | -1 | Significant risks identified. Mitigating risks not possible. Option cannot be progressed. |

155. An initial 'pre-mitigation' BRAG score was given to each constraint for each of the AoS examined. Any mitigation which could be applied to lower any risks identified for each constraint was then considered, following which a second 'post-mitigation' score was given. This allowed for the identification of possible mitigation strategies that could lower the risks associated with the biological, physical/engineering, and socio-economic constraints. For example, if a proportion of an AoS was characterised in part by unsuitable water depths, then mitigation to avoid areas of unsuitable water depths was applied. This would enable the post-mitigation BRAG rating to be reduced (e.g. from 'medium' to 'low') and the score being increased (e.g. from '1' to '2').

156. Following the scoring of individual constraints, the combined score for each constraint category within each site was calculated. The scores for each constraint category for each of the nine AoS were then ranked and combined which enabled the identification of the most favourable AoS based on the constraints examined.

157. The post-mitigation BRAG scores are presented in **Table** 6-4. The key constraint driving differences between the AoS included designated sites, the presence of Annex I habitats, water depths (bathymetry), commercial fishing and shipping activity. These constraints are shown on **Figure** 6-2 to **Figure** 6-5**.**

158. As shown on **Figure** 6-3**,** the AoS considered were characterised by water depths ranging from approximately <10m to >100m. An initial assessment of engineering feasibility suggested that industry capability in terms of vessel size, foundation design etc., would likely limit offshore ANS installation to water depths of between 18 – 60m, with shallower water depths (20 – 40m) preferred. This depth range was consulted upon during the kittiwake ETG in April 2024. However, further engineering assessment has confirmed that installation in water depths greater than 50m is unlikely to be practicable.

159. This information has informed the appraisal of the AoS with respect to water depths with shallower sites (20 – 40m) scoring most favourably. Whilst installation within water depths of 18 – 50m is considered potentially feasible at this stage, further engineering assessment (e.g. of site-specific conditions and the supply chain market) is required to confirm.

160. Following the Applicants' assessment, areas 'A' 'B', 'C' and 'E' have not been taken forward to the short list of AoS based on the reasons outlined in **Table** 6-4. All remaining AoS have been taken for further consideration.

*Table 6-4 Post-Mitigation BRAG Assessment Scores And Descriptions. Note AoS ranked in order of BRAG score with the highest score representing the most favourable AoS based on the constraints examined*

| AoS | Post-mitigation score | Score description |
|---|---|---|
| East | 22 | Overlaps entirely with the Southern North Sea SAC although mitigation measures are available if required to reduce underwater noise impacts to marine mammals. No evidence of Annex I habitats present. Favourable bedrock type and water depths; no evidence of sandwaves. Low to high shipping activity across the area but areas of high traffic are avoidable. Relatively high areas of fishing activity (beam trawling) in parts of AoS. |
| D | 20 | Overlaps entirely with the Southern North Sea SAC although mitigation measures are available if required to reduce underwater noise impacts to marine mammals. No evidence of Annex I habitats present. Favourable bedrock type and suitable water depths in limited locations; however, evidence of sandwaves across AoS. |

| AoS | Post-mitigation score | Score description |
|---|---|---|
| | | The mobility of the site is unknown. Low level of shipping activity and a relatively low level of fishing activity. |
| West | 20 | No overlap with designated sites though the northern edge of the AoS borders Holderness Offshore Marine Conservation Zone (MCZ). No Annex I habitat but given proximity to the MCZ, there is potential for features to be present. Favourable bedrock type and water depths; no evidence of sandwaves. Relatively high vessel activity in the majority of this AoS though fishing activity is low. |
| South | 19 | Does not overlap any designated sites though overlaps with Annex I sandbank along the eastern border in limited pockets of seabed. Favourable bedrock type and suitable water depths across AoS. Vessel traffic is very high within this area though fishing activity is minimal. A considerable distance from the Projects. |
| F | 19 | Overlaps with the North Norfolk Sandbanks and Saturn Reef SAC and Annex I reef and sandbank habitat (for which the site is designated) are present but both are considered to be avoidable. Favourable bedrock type and water depths across AoS. Relatively high level of shipping activity throughout AoS and some fishing activity present. A considerable distance from the Projects. |
| B | 19 | No overlap with designated sites and no evidence of Annex I habitats present. Areas of hard rock present. Unfavourable water depths across the entirety of AoS, water depths of >50m are not considered feasible for ANS installation. There is a potential interaction with relatively high shipping activity in this area (likely to be linked to the oil & gas platform to the east). |
| C | 19 | Overlaps partly with the Southern North Sea SAC. Evidence of Annex I reef habitat present. Although favourable bedrock type across much of the AoS, water depths of >50m are not considered feasible for ANS installation. Low level of shipping and fishing activity. |
| E | 15 | Overlaps entirely with the Southern North Sea SAC and North Norfolk Sandbanks and Saturn Reef SAC. Annex I sandbank and sandwaves which are likely to be a feature of this habitat are present across the entire AoS. Water depths are highly variable with depths ranging from approximately 7m to 35m. Sediment dominated by mudstone and limestone with areas of halite-stone and |

| AoS | Post-mitigation score | Score description |
|---|---|---|
| | | tuff in the eastern portion of the site. Region of high shipping activity in north-eastern corner which could potentially be avoided. Comparatively high level of fishing activity present, particularly beam trawling. A considerable distance from Projects. |
| A | 13 | Hard bedrock type and water depths (>80m) across the AoS would preclude viable installation of offshore ANS. This AoS has therefore not been taken forward by the Applicant. A considerable distance from Projects. |

161. The final stage of the analysis was to combine the post-mitigation BRAG scores (for the biological, physical / engineering and socio-economic constraints) with the ecological suitability scores generated by NIRAS to determine which areas are likely to be most favourable overall. An approximate average ecological suitability score for each of the AoS was derived from the NIRAS GIS layer but included only those areas within each AoS where water depths are likely to permit offshore ANS installation (i.e. 18 – 50m). The results of this analysis are presented in **Table** 6-5.

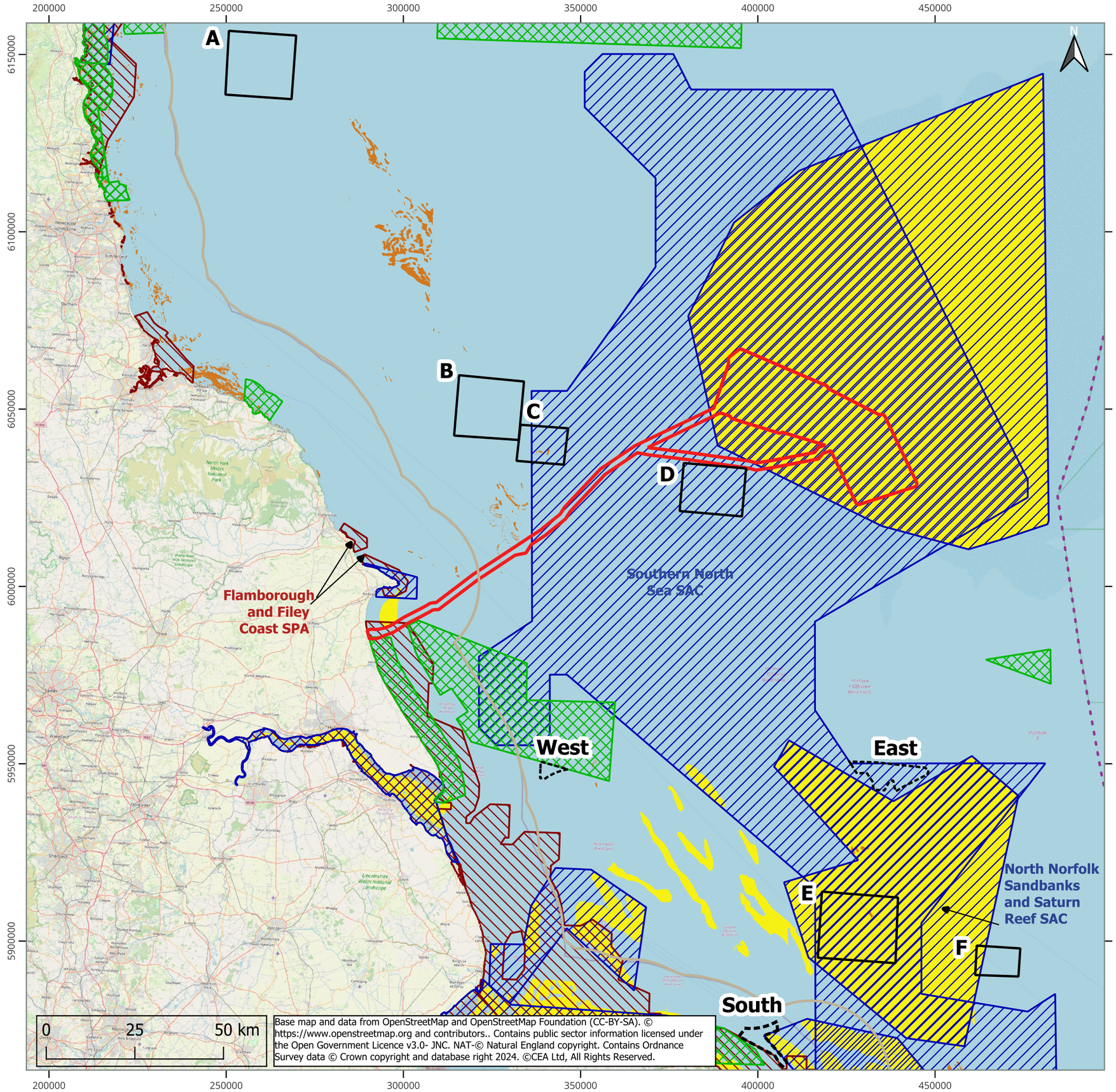
*Table 6-5 Final Appraisal Scores For Offshore ANS AoS Taken Forward By The Applicants For Further Consideration.*

| AoS | Post-mitigation BRAG score | Approximate average ecological suitability score | Total Appraisal Score |
|---|---|---|---|
| East | 22 | 6.0 | 28.0 |
| F | 19 | 8.9 | 27.9 |
| D | 20 | 7.8 | 27.8 |
| West | 20 | 6.8 | 26.8 |
| South | 19 | 7.0 | 26.0 |

162. The next stage of the appraisal process will be to undertake a more detailed technical assessment of certain constraints such as shipping and navigation and commercial fisheries in consultation with key stakeholders including:

- The Ministry of Defence (MoD).
- Maritime and Coastguard Agency (MCA).
- Trinity House.
- Oil & Gas operators.
- MMO; and the
- National Federation of Fishermen's Organisations (NFFO).

163. This exercise will be undertaken post-application to further refine the shortlist of AoS. Further updates will be provided to the Examining Authority as appropriate during DCO examination.






Legend:

- 12NM Limit
- Exclusive Economic Zone Limit
- Project Red Line Boundary
- AoS identified by NIRAS
- AoS identified by Outer Dowsing: East, West, South only
- Special Area of Conservation (SAC)
- Special Protection Area (SPA)
- Marine Conservation Zone (MCZ)
- Annex I Reef
- Annex I Sandbank

| | | | | | | |
|---|---|---|---|---|---|---|
| S2 | P02 | 02/05/2024 | Suitable for information | JC | SP | HA |
| S2 | P02 | 30/04/2024 | Suitable for information | JC | SP | HA |
| S2 | P01 | 24/04/2024 | Suitable for information | JC | SP | |
| SUI | REV | DATE | DESCRIPTION | DRW | CHK | APR |

Title:

Figure 6-2 Biological Constraints

| | | |
|---|---|---|
| Figure: 0002 | Drawing No: PB2340-CEA-OF-ZZ-DR-Z-0002- Biological Constraints | |
| Co-ordinate system: WGS 84 / UTM zone 31N | Page Size: A3 | Scale: 1:1,100,000 |

Project:

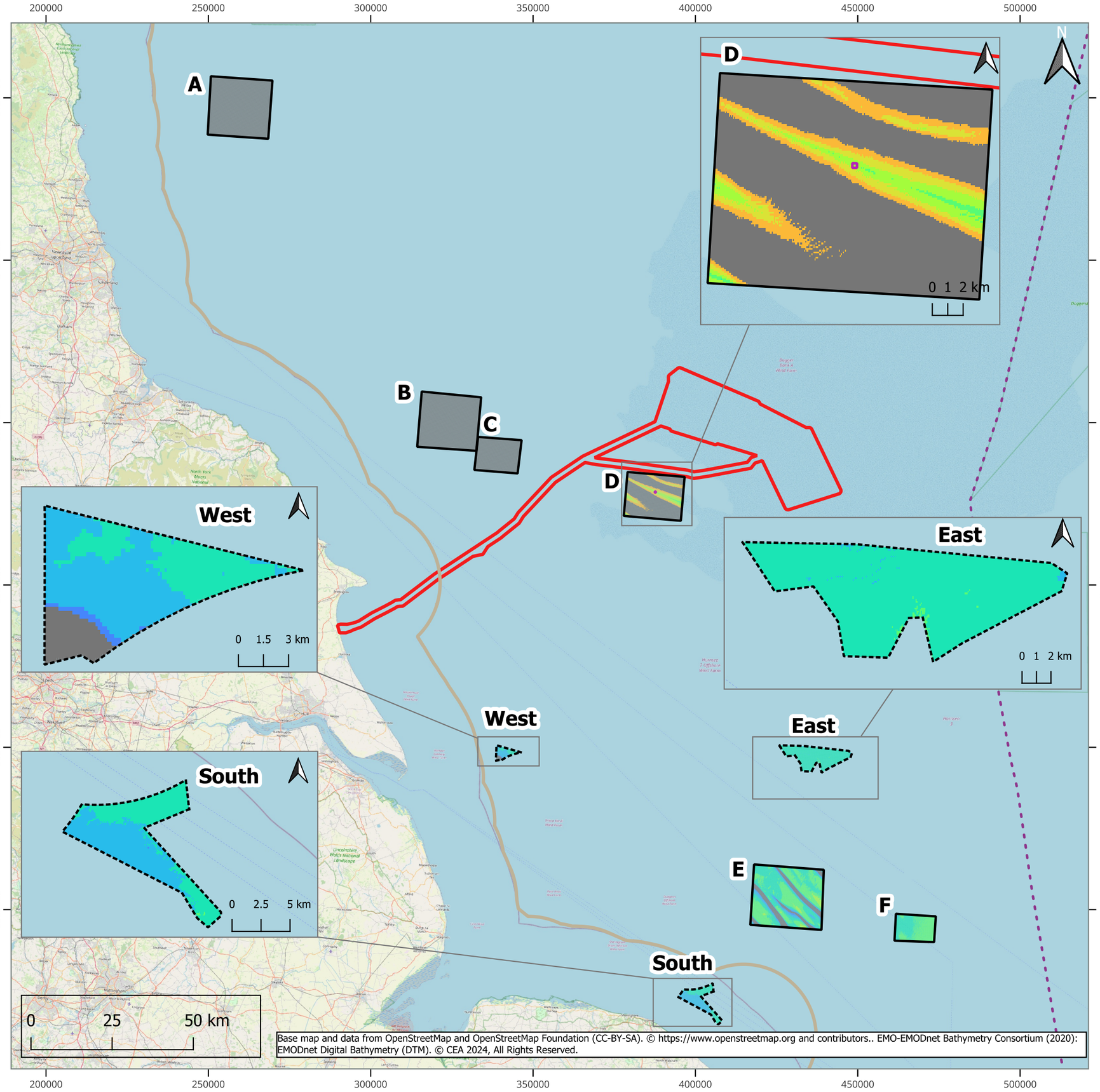
Dogger Bank South Offshore Wind Farms

Title:

Project-Level Kittiwake Compensation Plan

collaborative environmental advisers

RWE




Legend:

- 12NM Limit
- Exclusive Economic Zone Limit
- AoS identified by NIRAS
- AoS identified by Outer Dowsing; East, West, South only
- Project Red Line Boundary
- Indicative area required for siting offshore ANS

Bathymetry (m)

- -18m To -19.99m
- -20m To -24.99m
- -25m To -29.99m
- -30m To -34.99m
- -35m To -39.99m
- -40m To -44.99m
- -45m To -49.99m
- Areas of unsuitable bathymetry (above-18m & below -50m)

| SUI | REV | DATE | DESCRIPTION | DRW | CHK | APR |
|---|---|---|---|---|---|---|
| S2 | P05 | 16/05/2024 | Suitable for information | JC | HA | HA |
| S2 | P04 | 16/05/2024 | Suitable for information | JC | HA | HA |
| S2 | P03 | 02/05/2024 | Suitable for information | JC | HA | Client |
| S2 | P02 | 30/04/2024 | Suitable for information | JC | SP | HA |
| S2 | P01 | 24/04/2024 | Suitable for information | JC | SP | |

Title:

Figure 6-3 Bathymetry

| | |
|---|---|
| Figure: 0003 | Drawing No: PB2340-CEA-OF-ZZ-DR-Z-0003- Bathymetry |

| Co-ordinate system: | Page Size: | Scale: |
|---|---|---|
| WGS 84 / UTM zone 31N | A3 | 1:1,200,000 |

Project:

Dogger Bank South Offshore Wind Farms

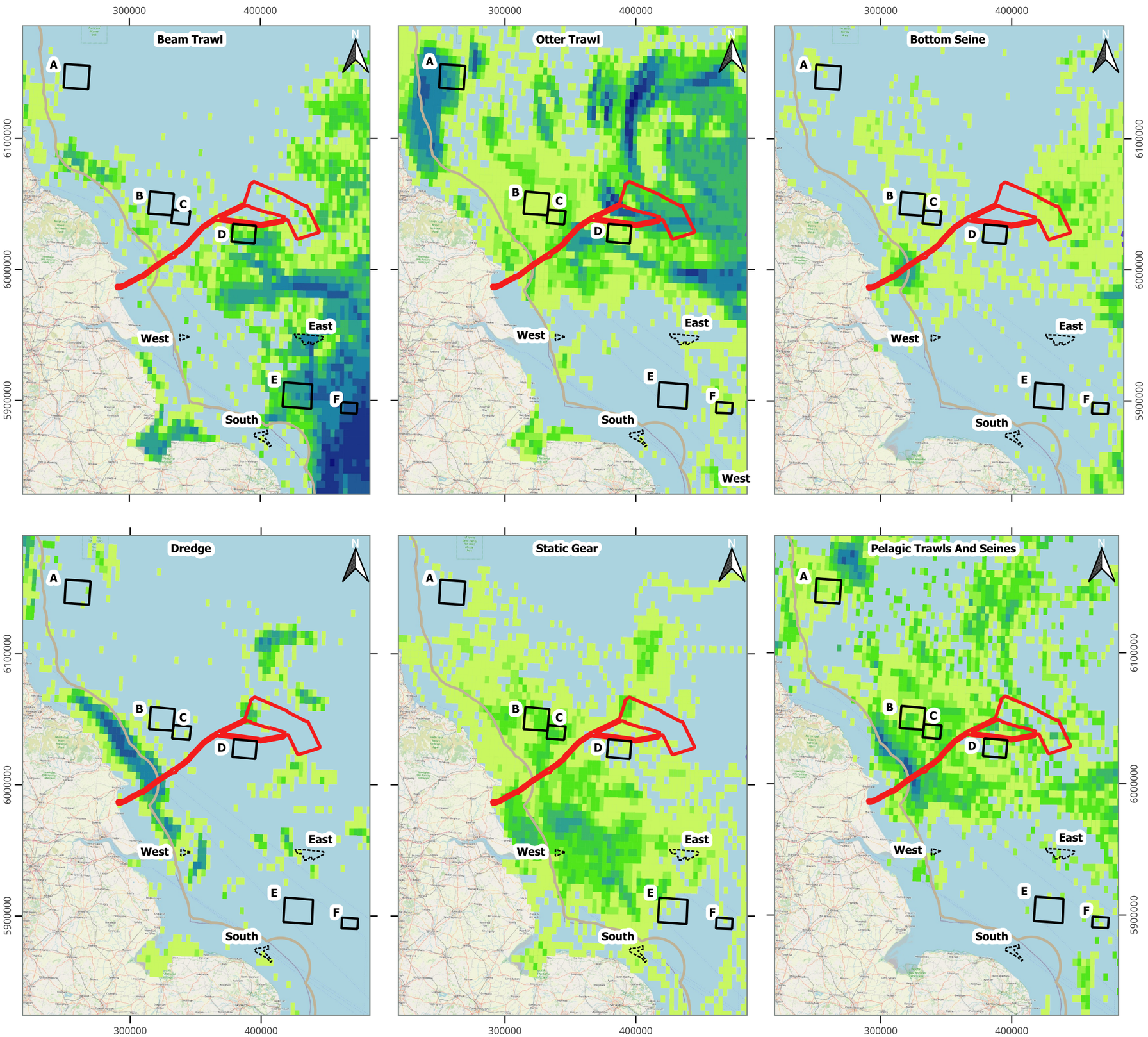
Title:

Project-Level Kittiwake Compensation Plan



collaborative environmental advisers

RWE




Legend:

- 12NM Limit
- Project Red Line Boundary
- AoS identified by NIRAS
- AoS identified by Outer Dowsing; East, West, South only

Average MW Fishing hours

- > 0 <= 1
- > 1 <= 2
- > 2 <= 5
- > 5 <= 10
- > 10 <= 20
- > 20 <= 50
- > 50 <= 100
- > 100 <= 200
- > 200 <= 500
- > 500

| | | | | | | |
|---|---|---|---|---|---|---|
| S2 | P03 | 02/05/2024 | Suitable for information | JC | SP | HA |
| S2 | P02 | 30/04/2024 | Suitable for information | JC | SP | HA |
| S2 | P01 | 29/04/2024 | Suitable for information | JC | SP | |
| SUI | REV | DATE | DESCRIPTION | DRW | CHK | APR |

Title:

Figure 6-4 Average Fishing Hours

| | | |
|---|---|---|
| Figure: 0004 | Drawing No: PB2340-CEA-OF-ZZ-DR-Z-0004- AvFishingHours | |
| Co-ordinate system: WGS 84 / UTM zone 31N | Page Size: A3 | Scale: 1:3,000,001 |

Project:

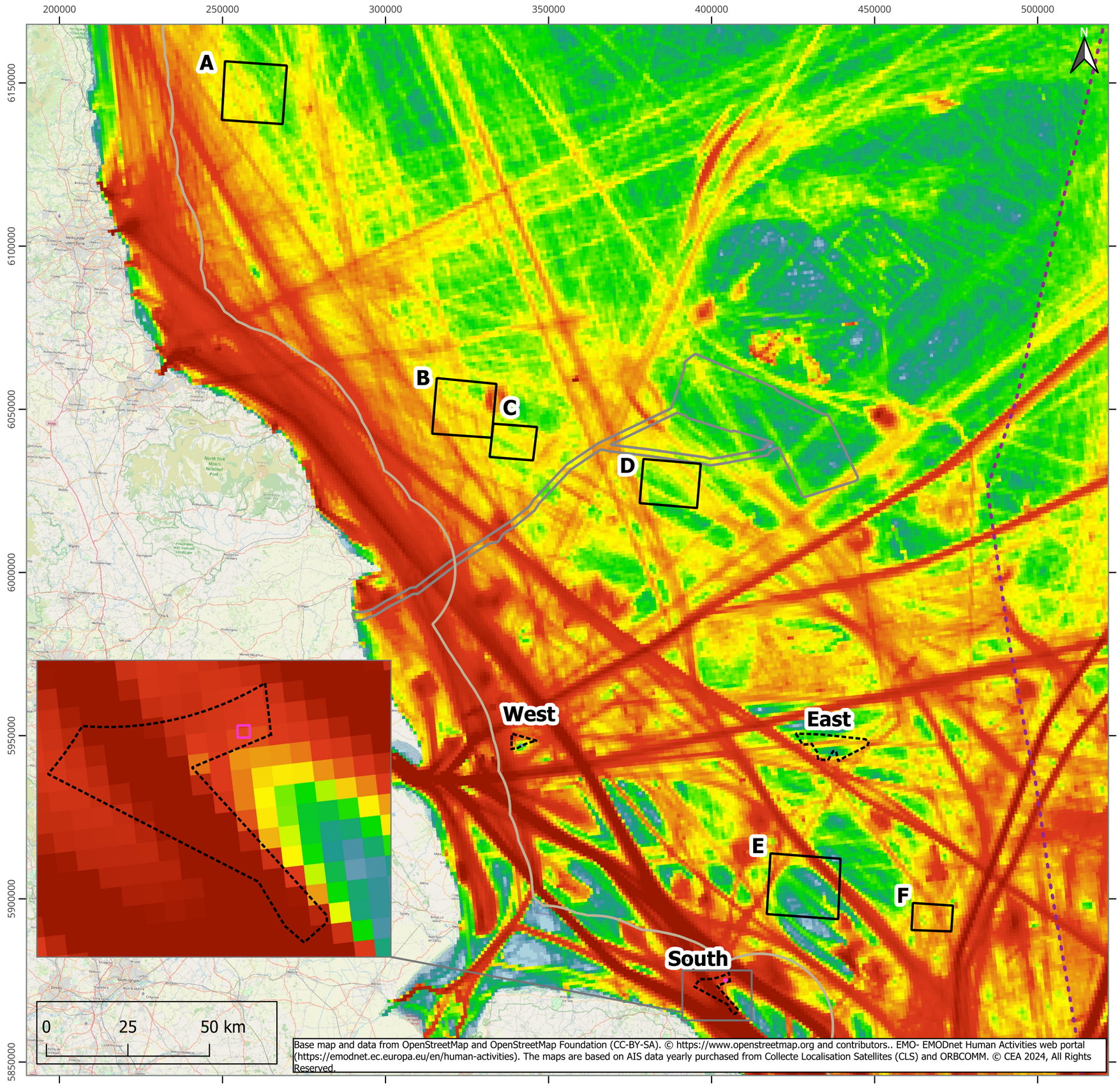
Dogger Bank South
Offshore Wind Farms

Title:

Project-Level Kittiwake
Compensation Plan

collaborative environmental advisers

RWE






## Legend:

- 12NM Limit
- Exclusive Economic Zone Limit
- Project Red Line Boundary
- AoS identified by NIRAS
- AoS identified by Outer Dowsing; East, West and South only
- Indicative area required for siting offshore ANS

Vessel Route Density (European Maritime Safety Agency- EMSA)
Annual Totals-All Types, routes per square km/year

- 1200+
- 240
- 120
- 60
- 24
- 6

| | | | | | | |
|---|---|---|---|---|---|---|
| S2 | P03 | 02/05/2024 | Suitable for information | JC | SP | HA |
| S2 | P02 | 30/04/2024 | Suitable for information | JC | SP | HA |
| S2 | P01 | 24/04/2024 | Suitable for information | JC | SP | |
| SUI | REV | DATE | DESCRIPTION | DRW | CHK | APR |

Title:

Figure 6-5 Vessel Route Density

| | | |
|---|---|---|
| Figure: 0005 | Drawing No: PB2340-CEA-OF-ZZ-DR-Z-0005- VesselDensity | |
| Co-ordinate system: WGS 84 / UTM zone 31N | Page Size: A3 | Scale: 1:1,200,000 |

Project:

Dogger Bank South Offshore Wind Farms

Title:

Project-Level Kittiwake Compensation Plan

collaborative environmental advisers

RWE

### 6.3.5 Outline Design Details

164. **Volume 6, KSCP (application ref: 6.2.1.1)** presents a set of design principles for offshore ANS which builds upon the evidence presented by NIRAS (NIRAS, 2021a and 2021b) for the Hornsea Four Project and the ecological criteria presented by LDA Design (2021) for the Hornsea Three Project. It also draws upon information presented in various other OWF DCO applications (e.g. Norfolk Boreas, Norfolk Vanguard, East Anglia One North / Two and SEP and DEP) which have been subject to stakeholder review during the consent application process. It therefore forms a robust framework for offshore ANS design with flexibility to incorporate further considerations where necessary.

165. Key design features of an offshore ANS which are considered essential for kittiwake include:

- High and steep sided structure with a near vertical back wall and narrow horizontal ledges.
- Adequate ledge dimensions: Horizontal ledges of 200mm width, length per pair from 300mm width (working length 400mm).
- Height between ledges at a minimum of 400mm and a maximum of 600mm.
- Lowest ledges located above the reach of wave action at highest astronomical tide.
- Minimum height should account for expected sea level rises and be above splash zone of highest astronomical tide for 2050.
- South facing aspects should be avoided where possible.
- The ANS should be as inaccessible to avian predators as possible, potentially including use of anti-predation features; and
- Capacity to deploy decoys to attract breeders, which can then be removed once the colony is established.

166. There are several other design features which are considered to optimise the potential success of a structure which include:

- An overhang or roof to protect against weather conditions and an additional predator deterrent. Roof pitch in excess of 25 degrees can be used to deter nesting (of avian predators such as large gulls).
- The ledge overhangs sufficiently to minimise lower ledge fouling, and potential for reducing avian predation; and
- Partitions should be provided between each discreet nesting site.

167. Members of the Kittiwake Steering Group agree that the design principles outlined above and in table 10.1 of **Volume 6, KSCP (application ref: 6.2.1.1)** are ecologically suitable and appropriate to inform the design of Round 4 offshore ANS. However, several additional principles were recommended for the final design to facilitate monitoring of the ANS post-installation including:

- Internal access to ANS and nesting ledges; and
- An external power source to support remote monitoring.

168. A design and engineering assessment will be undertaken by the Applicants following the identification of a suitable location for the implementation of an offshore ANS. The final design specification will be informed by the best principles outlined above and will be developed in consultation with relevant stakeholders and detailed within the Kittiwake CIMP (if required in addition to the KSIMP).

### 6.3.6 Timescales

169. Draft Defra guidance (Defra, 2021) states that compensation should ideally be in place, functioning and contributing to the coherence of the UK NSN prior to any impact occurring, which in this case is at the start of OWF operation. Kittiwakes are known to start breeding on average at four years old (Horswill and Robinson, 2015) although a proportion of kittiwakes (26.5%) breed for the first time at three years old (Coulson, 2011). To avoid any delay in the provision of compensation, offshore ANS should therefore be implemented three to four years before operation of the Projects to allow sufficient time for the recruitment of juveniles to the adult population. Should this timeframe not be possible, increasing the scale of compensation can offset any accumulated deficit that might result from kittiwake mortality during the early years of operation.

170. **Volume 6, KSCP (application ref: 6.2.1.1)** acknowledges that recent OWF projects have been required to deliver kittiwake compensation four breeding seasons before OWF operation but considers that a staggered approach to the implementation of two offshore ANS may be acceptable for the Round 4 Plan. This is providing that the first structure is in place four breeding seasons before impact, and it can be adequately demonstrated that the overall success of the measure in delivering the necessary level of compensation required over the lifetime of DBS West, DBS East and Outer Dowsing would not be significantly affected.

171. To meet these timescales, the Applicants are prioritising the delivery of at least one but ideally both offshore ANS in collaboration with other OWF developers whose projects are at the same or a more advanced stage of the consent or development process to the Projects. It is anticipated that at least one offshore ANS delivered via a collaborative arrangement could be implemented no less than four breeding seasons prior to operation of the Projects. However, this is subject to programme confirmation from prospective collaborative partners which at the time of writing is evolving.

172. For example, the DCO application for ODOW at the time of writing is live and will be subject to examination and determination by the SoS in due course. The duration of this process and outcome may influence the onward delivery programme for ODOW and its offshore ANS proposal. These factors have potential implications for the Projects offshore ANS implementation timescales if delivered in collaboration with ODOW.

173. Similarly, other developers such as Ørsted have recently (in May 2024) submitted a non-material change application for Hornsea Project Four to shorten the length of time their offshore ANS needs to be in place before operation from at least four full breeding seasons to at least two full breeding seasons (Ørsted, 2024). If this application is successful it could have implications for collaborative offshore ANS delivery.

174. The Applicants are continuing to consider their position with respect to collaborative compensation delivery timescales in light of ongoing discussions with other OWF developers. Further information will be provided to the Examining Authority during DCO examination when available.

175. In addition to the collaborative offshore ANS proposed above, the Applicants are also proposing to initiate surveys and initial engagement on a project-led offshore ANS to mitigate the risk if one of the collaborative ANS is not taken forward. This additional project-led ANS can be relied upon should it not be possible to secure more than one offshore ANS for collaborative delivery but will be discontinued subject to agreements between OWF developers being in place to ensure collaborative delivery. Based upon the current project programme (see section 6.3.8), the Applicants intend to implement this offshore ANS as soon as possible, but at least three breeding seasons prior to operation of the Projects, in accordance with **Volume 6, KSCP (application ref: 6.2.1.1).**

176. In the unlikely event that neither offshore ANS can be secured and delivered on a collaborative basis, the Applicants would seek to rely on strategic delivery of offshore ANS (i.e. via the MRF) either wholly or partly (i.e. alongside the project-led offshore ANS) to deliver the necessary level of compensation for the Projects.

177. The Applicants are confident that should there be a delay to the implementation and delivery of offshore ANS via any one of the delivery options (strategic, collaborative or project-led), any compensation deficit accrued would be small enough to be paid off over the lifespan of the Projects. However, the scale of compensation could also be increased (i.e. increase numbers of nesting spaces on the ANS), or alternative measures relied upon (e.g. onshore ANS at Gateshead) to offset any potential deficit accumulated during the earlier years of operation.

### 6.3.7 Monitoring, Maintenance, and Adaptive Management

178. Monitoring of the offshore ANS is required to demonstrate the success of this measure and to inform potential adaptive management if the offshore ANS are found to be under-performing. The measure can be deemed successful if it provides the required number of adult kittiwakes into the meta-population (and therefore the FFC SPA population) equivalent to the predicted impact of the Projects. Information regarding compensation quantum and therefore the scale of offshore ANS required is presented in sections 1 and 6.3.2 of this plan.

179. Monitoring of the offshore ANS would commence the first breeding season following implementation and would continue post-construction and at least until the success of the compensation has been demonstrated. This may potentially cover the duration of the operational phase for the Projects. It is also expected that ongoing monitoring of the condition of the offshore ANS and routine maintenance would be required for the lifetime of the Projects.

180. **Volume 6, KSCP (application ref: 6.2.1.1)** outlines a framework for the monitoring of offshore ANS as well as principles for adaptive management to address any unexpected shortfalls in the level of compensation provided by this measure. It is recommended that monitoring to determine success should focus on:

- Colony counts (i.e. AON, counts of site holding birds or nests capable of containing eggs).
- Productivity monitoring (i.e. number and age of chicks observed).
- Colonisation monitoring (i.e. counts of AON, trace nests or prospective birds); and
- Monitoring of natal dispersal (if possible).

181. Further details on this and the process for determining potential trigger points for adaptive management are provided in **Volume 6, KSCP (application ref: 6.2.1.1)** along with possible adaptive management measures. Information on the monitoring and adaptive management approach for the Round 4 offshore ANS will be developed post-consent in consultation with the Kittiwake Steering Group and presented within the KSIMP.

182. The Applicants' proposal for monitoring, maintenance and adaptive management will be developed in accordance with **Volume 6, KSCP (application ref: 6.2.1.1)** and in consultation with the Kittiwake Steering Group once the location and design of the offshore ANS has been finalised. This information will be presented in the Kittiwake CIMP (if required in addition to the KSIMP) which will be developed post-consent in consultation with the relevant stakeholders.

### 6.3.8 Outline Implementation and Delivery Roadmap

183. Discussions with other OWF developers with respect to collaborative compensation opportunities for offshore ANS delivery remain ongoing. As evidenced by **Volume 6, Collaborative Delivery of Kittiwake Compensation: Letter of Intent (application ref: 6.2.1.3)**, ODOW is open to progressing offshore ANS in collaboration with the Applicants. Updates concerning discussions with ODOW and other OWF developers, including an outline implementation roadmap for collaborative offshore ANS delivery will be provided to the Examining Authority during DCO examination following confirmation of programme details which are currently under development.

184. The remainder of this section focuses on the implementation and delivery of the Applicants' Project-led offshore ANS proposal.

185. The Applicants will take the following steps to implement and deliver an offshore ANS on a project-led basis:

- Ongoing consultation will be undertaken as required with all relevant stakeholders, including members of the kittiwake ETG and, where appropriate, the Kittiwake Steering Group. If granted consent, the Projects may be required to establish a separate Kittiwake Compensation Steering Group (KCSG) to oversee the development, implementation, monitoring and report of the compensation at the project level. Core members of the KCSG will include the MMO and Natural England, as well as any key local stakeholders. The RSPB will also be invited to participate. Whether or not a separate governance process is required for the Projects compensation proposals, in addition to that

already in place at the plan level is expected to be confirmed by the SoS as part of the consent decision.

- As outlined in section 6.3.4, further technical and engineering assessment work is required to refine the shortlist of AoS and to inform the design of the offshore ANS. This may include geotechnical and geophysical surveys for which, the necessary consents will be sought. This work will be undertaken post-application and developed in consultation with members of the kittiwake ETG as well as other key stakeholders.
- As outlined in section 6.3.6, it is anticipated that project-led offshore ANS will be installed a minimum of three breeding seasons prior to first turbine operation of the Projects to allow for the recruitment of breeding adults to the population. The exact timescales will be agreed upon with the Kittiwake Steering Group including any implications for the scale of compensation required to account for when offshore ANS is implemented.
- ANS foundation and topside design will be undertaken in line with the design principles set out in section 5.3.5. Consultation will be undertaken with relevant stakeholders to reach an agreement on the design details and exact location of ANS within the shortlisted AoS. The design process will consider the potential impacts related to the installation of offshore ANS as outlined in section 5.3.9. Relevant stakeholders would be consulted on potential impacts and measures to avoid and mitigate adverse effects and maximise the wider benefits of the structure.
- A marine licence application will be submitted to the MMO to ensure that the appropriate consent is in place prior to ANS installation. The application documents will include all relevant environmental assessments (e.g. MCZ Assessment, Marine Plan Assessment, Underwater Noise Assessment and Marine Archaeology Assessment as appropriate).
- The necessary seabed rights will be secured from The Crown Estate, as owner of the seabed. Once the location of the offshore ANS has been identified, exclusivity will be sought by the Applicants with the intention of entering into a lease prior to construction.
- The detailed delivery proposal for the agreed kittiwake compensation measures will be set out in the Kittiwake CIMP (if required in addition to the KSIMP) which will be developed in consultation with the KCSG.

- The success of the offshore ANS will be monitored in line with the details provided in section 6.3.7. The results of monitoring will be communicated with the KCSG on a regular (annual) basis. The findings of the monitoring programme will inform the need for any adaptive management that may be required.

186. An outline implementation roadmap for the delivery of the project-led offshore ANS is provided in **Table** 6-6. Note that the dates provided are indicative and at this stage may be subject to change as the timings of key milestones e.g. consent award, FID, construction and start of operation are still to be confirmed.

*Table 6-6 Outline Implementation and Delivery Roadmap For Project-Led Offshore ANS.*

| Timing | Indicative date | Activity/milestone | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 |
|---|---|---|---|---|---|---|---|---|
| Pre-consent | 2024 (Q1 – Q2) | Development of project-led offshore ANS proposal (including AoS appraisal) following publication of **Volume 6, KSCP (application ref: 6.2.1.1)** and in consultation with Kittiwake ETG. | | | | | | |
| Pre-consent | 2024 (Q2) | Projects' DCO application submitted to SoS | | | | | | |
| Pre-consent | 2024 (Q2) – 2025 (Q1) | Further technical and engineering assessment work undertaken to refine the offshore ANS AoS shortlist. Develop offshore ANS design. | | | | | | |
| Pre-consent | 2024 (Q2) – 2025 (Q1) | Ongoing stakeholder engagement regarding the design and siting of offshore ANS as well as marine licensing, consents and lease application requirements. | | | | | | |
| Pre-consent | 2025 (Q1 – Q3) | Secure necessary licences, consents, and seabed lease. | | | | | | |
| Year 0 | 2025 (Q3) | Anticipated DCO consent granted for the Projects. | | | | | | |

| Timing | Indicative date | Activity/milestone | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 |
|---|---|---|---|---|---|---|---|---|
| Year 0 | 2025 (Q3- Q4) | Fabrication of offshore ANS. | | | | | | |
| Year 0 | 2025 (Q4) – 2026 (Q2) | Installation of offshore ANS. | | | | | | |
| Year 1 - 3 | 2027 - 2029 | Kittiwake compensation monitoring – Year 1, 2 & 3 | | | | | | |
| Year 4 | 2029 (Q4) | Earliest first power for DBS. Continue compensation and annual monitoring programme as per the Kittiwake CIMP (if required in addition to the KSIMP), and any necessary adaptive management. | | | | | | |

### 6.3.9 Consideration of Potential Impacts from Implementation

187. A preliminary assessment of potential impacts that may arise as a result of the installation of offshore ANS is outlined in **Table** 6-7 along with potential approaches that may be taken to avoid, reduce or mitigate negative impacts. This assessment should be regarded as preliminary acknowledging that site selection work is ongoing and likely to inform the scope of predicted impacts on the marine environment. A more detailed environmental assessment will be undertaken as part of any future consent or planning application as required.

*Table 6-7 Potential Impacts From Implementation Of Offshore ANS.*

| Potential impacts | Details | Measures to avoid, reduce or mitigate impact |
|---|---|---|
| Impacts on other designated sites and protected features | Some of the shortlisted AoS for offshore ANS placement overlap with the Southern North Sea SAC. | An underwater noise assessment would be carried out. Time restrictions for piling activities could be applied (if required). |
| | Some of the shortlisted AoS for ANS placement are located in relatively close proximity to DB SAC (e.g. AoS D which is approximately 2.7km away) and may result in temporary indirect habitat disturbance for sandbank feature. | Impacts would be temporary and intermittent (with installation expected to be carried out in a series of phases taking a total of approximately nine months). Sediment would settle out of the water column rapidly and due to high dispersal potential, smothering is considered highly unlikely. Given this, mitigation is not considered necessary. |

| | | |
|---|---|---|
| Diminishing returns from the introduction of additional structures | There are concerns surrounding the potential for diminishing returns with an increasing number of structures in the southern North Sea. | An annual monitoring programme will ensure that offshore ANS colonisation and kittiwake numbers are recorded and shared with the relevant stakeholders. Adaptive management measures will be introduced if necessary. Within the lifespan of the Projects, oil and gas infrastructure in the North Sea may be removed which could in turn increase the value of offshore ANS. |

## 6.4 Onshore ANS

188. As outlined in section 6.1 and in line with SNCB guidance, onshore ANS is proposed by the Applicants as a supporting or adaptive management measure rather than a primary compensation measure. It specifically relates to the Applicants existing onshore ANS at Gateshead which could only be relied upon to deliver a proportion of the kittiwake compensation required for the Projects for example, to offset any deficit linked to the primary compensation measure (i.e. offshore ANS). The Applicants are not proposing to implement any new onshore ANS in addition to the structure already in place at Gateshead.

189. Further information regarding the Applicants existing onshore ANS at Gateshead is provided below.

### 6.4.1 Overview

190. As well as colonising offshore man-made structures, kittiwake are known to utilise artificial structures inland for breeding purposes. First noted in 1994, kittiwakes have successfully bred on various man-made structures along the River Tyne, Newcastle (Turner, 2010; RWE Renewables UK, 2024). The most notable colony in this area can be found on the Tyne Bridge, approximately 17km inland, which in recent years has supported ~1,000 breeding pairs (Turner, 2010). In 1997 a dedicated onshore ANS (known as the Saltmeadows tower) was built by Gateshead council to compensate for kittiwake displaced from the Baltic Flour Mill which was developed into an Arts centre (Turner, 2010). In 2000/2001, the structure was moved more than 1km downstream to its current location at Saltmeadows and many kittiwake pairs immediately relocated onto the tower at its current location. This structure has in recent years supported around 100 pairs (Turner, 2021).

191. Onshore ANS have been proposed for several OWF projects as a compensatory measure for predicted impacts on kittiwake and several structures have now been implemented on the east coast of England in relation to Hornsea Three Project, Norfolk Projects, East Anglia ONE North and East Anglia TWO. In addition, SEP and DEP has recently been granted consent with a requirement to deliver compensation for kittiwake by modifying the existing Saltmeadows tower at Gateshead to increase its overall productivity (Equinor, 2022). This shows the measure is both feasible and implementable both in the onshore and nearshore environment.

192. In February 2023, the Applicants installed a single onshore ANS at Gateshead, on the site adjacent to the existing Saltmeadows tower to increase kittiwake breeding success in the area. It was designed by Shoney Wind Ltd and Francis and Lews International Structures following an extensive survey programme of urban and natural coastal colonies to determine the factors that most influenced productivity (RWE Renewables UK, 2022b). The final design of this structure incorporated many of the design principles outlined in **Volume 6, KSCP (application ref: 6.2.1.1)** and is tailored specifically to the site and local environmental conditions. To ensure the structure can achieve the desired breeding success, it has been designed to be easily adapted if necessary (e.g. ledges can be altered, additional nesting cabins added, and the overall structure can be raised, lowered, realigned, or extended).

193. Monitoring has been ongoing since installation to assess the colonisation and productivity of the structure compared to other urban artificial nesting sites in the Tyne area (RWE Renewables UK, 2024). While the ANS was not occupied by breeding kittiwakes in 2023, kittiwakes from the adjacent tower were observed to visit and inspect the structure. At the time of writing, monitoring of the 2024 breeding season was in progress. Although no nesting kittiwakes have been observed on the ANS to date, as recorded in 2023, individuals have been observed visiting the structure and taking nest material for their nests on the Saltmeadows tower.

### 6.4.2 Scale

194. The Applicants' existing onshore ANS can support up to 200 breeding pairs of kittiwakes which is insufficient to deliver the Projects' potential compensation requirement for kittiwakes of 534 to 972 pairs per annum (upper 95% CI 972 to 1,920 pairs per annum)[10] (see section 5.3).

195. Several OWF projects currently in the consent process also have an interest in the Applicants' onshore ANS at Gateshead to potentially deliver their own compensation requirements for kittiwake. These include Rampion 2 and Five Estuaries which have both submitted without prejudice derogation cases for their predicted impacts to FFC SPA kittiwake (Rampion Extension Development (RED), 2023; Five Estuaries Offshore Wind Farm Limited (VE OWFL), 2024a).

196. The predicted impact of Rampion 2 and Five Estuaries OWFs is 0.8 kittiwake per annum each (1.6 birds per annum in total) (RED, 2024; VE OWFL, 2024b). VE OWFL is looking to secure space for between six to 16 pairs depending on the compensation ratio applied (Five Estuaries OWFL, 2024b) while RED is seeking to secure space for between two and 33 pairs depending on a range of factors, including calculation approach and compensation ratio applied (RED, 2024). Should a defined share of the Applicants' existing onshore ANS be allocated to one or both OWF projects, there would be a small reduction (8 – 49 pairs) in the capacity potential available to the Applicants should this need to be relied upon.

[10] Based on the Hornsea Four compensation calculations (see section 5.1) and assuming 100% adult kittiwake during the breeding season.

197. North Falls OWF also has expressed an interest in obtaining nesting space on the Applicants' onshore ANS to compensate for their predicted impacts to FFC SPA kittiwake which are believed to be in the range of those predicted for Rampion 2 and Five Estuaries. North Falls OWF is due to submit its DCO application later in the year (2024) at which time the scale of their compensation requirements will be confirmed.

198. The apportionment of nests between OWF developers is subject to commercial agreements that are yet to be confirmed. Nonetheless, there would remain sufficient capacity for this onshore ANS to potentially make a notable contribution to the Applicants' overall compensation requirement should it be required.

### 6.4.3 Delivery Mechanism

199. Given that the Applicants' existing onshore ANS is already implemented, this measure is considered to be readily available to deliver a proportion of predicted compensation requirements for the Projects if required. The land on which the tower is located has been leased for 60 years, in line with the seabed lease for the Projects. This timeframe will adequately cover the duration for which compensation will be required (i.e. the operational lifetime of the Projects).

200. Should Rampion 2 and VE OWFL need to rely on the Applicants' existing onshore ANS to deliver compensation then this would be delivered collaboratively via a formal collaboration agreement between the relevant parties. Letters of Intent between the Applicants and both RED and VE OWFL have been submitted as part of DCO applications for Rampion 2 and Five Estuaries, indicating the Applicants' willingness to allocate capacity of its existing onshore ANS to third parties should they be required to deliver compensation.

201. Onshore ANS is not an approved strategic compensation measure for kittiwake and therefore there is no strategic mechanism for the delivery of this measure.

# 7 Highly Pathogenic Avian Influenza (HPAI)

202. In 2022 Highly Pathogenic Avian Influenza (HPAI) adversely affected survival and productivity within seabird colonies across the UK, and investigations are underway to determine the long-term effects on species' populations.

203. The success of compensatory measures intended to increase available nesting spaces (e.g. onshore and offshore ANS) is based on an assumption that nesting site availability can be a limiting factor in certain parts of their range and also on the negative relationship between productivity and colony size observed at very large colonies such as FFC SPA (i.e. a density-dependent effect). There is also an assumption that there is a sufficient pool of kittiwake recruits to take up additional nesting spaces on ANS which would otherwise either not breed at all or would have lowered productivity due to intraspecific competition at a large colony.

204. Should it be identified that kittiwake populations have been significantly reduced as a result of HPAI such that there are insufficient numbers of immature kittiwakes seeking to occupy available nesting spaces, then compensatory measures aimed at providing additional nesting sites may prove less effective in the short term.

205. Currently, there is some uncertainty regarding the size of the potential pool of kittiwake recruits as well as the scale of the impact of HPAI on kittiwake populations. Ongoing monitoring of ANS currently in place as well as natural colonies that have suffered from the effects of HPAI will provide valuable evidence in this respect. This will help evidence the long-term efficacy of ANS as compensation for offshore wind in light of future potential HPAI outbreaks. To date, the evidence does not appear to indicate that kittiwake populations in the southern North Sea have been significantly affected (Butcher *et al.* 2023).

# 8 Funding

206. Funding information for the compensatory measures outlined in this plan, including those to be delivered on a project-led basis, collaboratively and / or strategically can be found in **Volume 4, Funding Statement (application ref: 4.4)**.

207. The provision of up to two ANS structures is secured by the DCO, and two ANS have been identified as potentially necessary to deliver the strategic compensation for kittiwake within **Volume 6, KSCP (application ref: 6.2.1.1)**. Other OWF developers (further details to be confirmed subject to commercial agreements) are expected to deliver one of these structures with DBS East, DBS West and ODOW sharing the cost of the extension to this structure to accommodate their project needs. The second structure would be delivered either collaboratively with ODOW or by the Applicants alone. Should the second structure be delivered collaboratively then the total cost would be shared between DBS East, DBS West and ODOW and the Projects' contribution would be expected to be a maximum of two thirds of the total cost. However, should the second offshore ANS be delivered on a project-led basis then the Applicants would cover the full cost of this structure. Thus, in the event of one structure being delivered collaboratively and only on a project-led basis, the overall cost is anticipated to be slightly higher than if both structures were delivered collaboratively. For the purpose of the **Funding Statement (application ref: 4.4)**, the worst-case cost scenario has been assumed.

208. Based on the information presented in **Volume 4, Funding Statement (application ref: 4.4)**, the SoS can be satisfied that the financial viability of the Projects will not be compromised by the delivery of all or some of the compensatory measures proposed by the Applicants and set out in the compensation plans and that these compensatory measures can be financed through the existing financial arrangements in place to develop, construct and operate the Projects.

# 9 Summary

209. **Table** 9-1 provides a summary of the Applicants' offshore ANS compensation measures for kittiwake and outlines the details that have been established for application and those aspects that will be developed following DCO submission.

*Table 9-1 Summary Of The Applicants Compensation Proposal For Kittiwake In Relation To Natural England's Checklist Criteria*

| NE Compensation Criteria | Offshore ANS (primary compensation measure) | Onshore ANS (supporting or adaptive management measure) |
|---|---|---|
| a) What, where, when: clear and detailed statements regarding the location and design of the proposal. | What – Two offshore ANS to be delivered via one or a combination of the follow mechanisms:<br>• collaboratively with other OWF developers;<br>• on a project-led basis (one offshore ANS only); and/or<br>• strategically via a Strategic Compensation Fund (e.g. MRF).<br><br>Where – The location of the offshore ANS is dependent on the delivery mechanism.<br>The location of offshore ANS delivered collaboratively will be determined subject to confirmation of delivery partners. The potential location of offshore ANS proposed by prospective collaborative partners is presented on **Table** 6-1 and discussed in section 6.3.4.<br>Should a project-led offshore ANS be required, this would be located in the southern North Sea. | What – The Applicants existing onshore ANS at Gateshead.<br><br>Where – Gateshead, River Tyne's southern bank. The onshore ANS was constructed next to the Saltmeadows tower which supports approximately 100 pairs of breeding kittiwake.<br><br>When –The Applicants onshore ANS at Gateshead was installed in 2023. |

| NE Compensation Criteria | Offshore ANS (primary compensation measure) | Onshore ANS (supporting or adaptive management measure) |
|---|---|---|
| | Currently, five AoS have been short-listed for further appraisal work which will be carried out post-application. Further information is presented in section 6.3.4.<br>Strategic delivery of offshore ANS would be overseen by Defra in collaboration with COWSC - the location of strategic ANS is still to be confirmed.<br><br>When – At least one offshore ANS would be installed at least four breeding seasons prior to operation of the Projects, if possible (and no later than three breeding seasons), with the second installed at least three breeding seasons in advance of operation of the Projects. | |
| b) Why and how: ecological evidence to demonstrate compensation for the impacted site feature is deliverable in the proposed locations. | As evidenced by the SoS's decision for the Hornsea Four Project, offshore ANS is an accepted compensation measure for FFC SPA kittiwake and has also recently been approved as a strategic compensatory measure (Defra, 2024a). Offshore ANS is therefore considered to be both feasible and implementable. Niras on behalf of The Crown Estate identified six | Onshore ANS are proven to support breeding kittiwake. The Applicants onshore ANS is located adjacent to an existing ANS (Saltmeadows tower) that supports over 100 kittiwake pairs. |

| NE Compensation Criteria | Offshore ANS (primary compensation measure) | Onshore ANS (supporting or adaptive management measure) |
|---|---|---|
| | ecologically suitable offshore AoS for implementation of ANS with a further five identified by ODOW (Appendix D of the **Volume 6, KSCP (application ref: 6.2.1.1)**). Of these, five have been taken forward by the Applicants for further appraisal to identify a shortlist of AoS which are both ecological suitable and technically feasible. | |
| c) For measures on land, demonstrate that on ground construction deliverability is secured and not just the requirement to deliver in the DCO e.g., landowner agreement is in place. For measures at sea, demonstrate that measures have been secured e.g. agreements with other sea or seabed users. | As outlined in section 6.3.8, work is in progress to secure the deliverability of offshore ANS on either a collaborative or project-led basis. This includes the necessary agreements, consents, licences and leases. Further updates with be provided to the Examining Authority as appropriate during the course of DCO examination. | The Applicants existing onshore ANS is already implemented and is therefore readily available to deliver a proportion of predicted compensation requirements for the Projects if required. |

| NE Compensation Criteria | Offshore ANS (primary compensation measure) | Onshore ANS (supporting or adaptive management measure) |
|---|---|---|
| d) Policy/legislative mechanism for delivering the compensation | The mechanism is outlined in Volume 6, Habitats Regulation Derogation: Provision of Evidence (application ref: 6.2). | |
| e) Agreed DCO/DML conditions | A draft schedule for FFC SPA kittiwake compensation is provided within **Volume 3, Draft DCO (application ref: 3.1)**. The condition wording proposed is still to be agreed upon with the relevant statutory stakeholders. | |
| f) Clear aims & objectives & links to the conservation objectives of the site or feature. | The Applicants aim to compensate for the kittiwake losses incurred as a result of mortality associated with the development of the Projects through the provision of new nesting sites either onshore or offshore. This aligns with the conservation objective for FFC SPA of maintaining or restoring the population of the qualifying feature (breeding kittiwake) (section 4.2). | |
| g) Mechanism for further commitments if the original compensation objectives are not met - i.e., adaptive management. | **Volume 6, KSCP (application ref: 6.2.1.1)** outlines several potential adaptive management measures and possible trigger points that were discussed with the KSCP Steering Group. Final adaptive management options and approaches will be refined post-consent following agreement on specific aspects of the compensatory measures. The Applicants have sought to align with this approach within this project level plan and as such, specific details regarding adaptive management will be developed post-consent in consultation with the relevant stakeholders and presented within the KSIMP and project level Kittiwake CIMP (if required). | |

| NE Compensation Criteria | Offshore ANS (primary compensation measure) | Onshore ANS (supporting or adaptive management measure) |
|---|---|---|
| h) Clear governance proposal for the post-consent phase (e.g. ToR agreed) | The Applicants offshore ANS proposal aligns closely with the information provided in **Volume 6, KSCP (application ref: 6.2.1.1)** which was developed in accordance with the ToR for the Kittiwake Steering Group. Under these ToR, the Kittiwake Steering Group will continue to operate until all obligations have been discharged, including all post-consent requirements. It is currently unclear whether a separate governance process will be required for the delivery of compensation in accordance with the project-level derogation case (in addition to that required at the plan level). Nonetheless, a separate governance process has been outlined with respect to this project-level plan subject to the SoS confirming whether this is required. Further details will be agreed with the relevant stakeholders and provided post-consent in the KSIMP and project level Kittiwake CIMP (if required). | Installation of the onshore ANS was completed in 2023. Further details will be provided post-consent in the KSIMP and project level Kittiwake CIMP (if required). |
| i) Ensure development of compensatory measures is open and transparent | The Applicants have actively participated in the Kittiwake Steering Group during the pre-application phase to support development of the **Volume 6, KSCP (application ref: 6.2.1.1).** This engagement has informed the Applicants' approach to compen- | The planning application process for the Applicants onshore ANS at Gateshead was undertaken in consultation with local and statutory stakeholders. All planning documents are publicly |

| NE Compensation Criteria | Offshore ANS (primary compensation measure) | Onshore ANS (supporting or adaptive management measure) |
|---|---|---|
| | sation at the project level and has been supplemented with additional engagement with the kittiwake ETG, Defra and PINS in respect of the Applicants project level offshore ANS proposal. Key details in accordance with the NE Checklist, including an outline implementation and delivery roadmap (see section 6.3.8) is presented in this project level plan. Stakeholder engagement will continue post-application to support further development of the Applicants offshore ANS proposal. | available (Gateshead Council, 2022 - DC/22/01188/FUL). |
| j) Timescales for implementation & how quickly the measures will contribute to the network | At least one offshore ANS would be installed at least four breeding seasons prior to operation of the Projects, if possible (and no later than three breeding seasons), with the second installed at least three breeding seasons in advance of operation of the Projects. The timescales for delivery of strategic measures are to be confirmed by Defra and DESNZ in due course. | Installation of the onshore ANS was completed in 2023. |
| k) Commitments to ongoing monitoring of | The Applicants have committed to commence monitoring the first breeding season following implementation of the measure. Monitoring would continue post-construction and at least until the success of | Monitoring has been ongoing since installation in 2023 to assess the colonisation and productivity of the onshore ANS structure. Should this measure |

| NE Compensation Criteria | Offshore ANS (primary compensation measure) | Onshore ANS (supporting or adaptive management measure) |
|---|---|---|
| measure performance against specified success criteria. | the compensation has been demonstrated. The criteria against which success will be determined will be developed post-consent in consultation with the relevant stakeholders and presented within the KSIMP and project level Kittiwake CIMP (if required). | need to be relied upon either as compensation or adaptive management, a monitoring programme would be agreed in consultation with the relevant stakeholders and presented within the KSIMP and project level Kittiwake CIMP (if required). |
| l) Proposals for ongoing sign off' procedure for implementing compensation measures throughout the lifetime of the project, including implementing feedback loops from monitoring. | A robust sign-off procedure will be developed post-consent in consultation with the relevant stakeholders and presented within the KSIMP and project level Kittiwake CIMP (if required). | Should this measure need to be relied upon either as compensation or adaptive management, a robust sign-off procedure would be agreed upon in consultation with the relevant stakeholders and presented within the KSIMP and project level Kittiwake CIMP (if required). |
| m) Commitment to continued annual management of the compensation area | The Applicants have committed to regular management and maintenance of its offshore ANS throughout the lifetime of the Projects. Where there is room for improvements, modifications will be undertaken | The Applicants are committed to managing and maintaining its onshore ANS at Gateshead for the lifetime of the Projects. Where there is room for im- |

| NE Compensation Criteria | Offshore ANS (primary compensation measure) | Onshore ANS (supporting or adaptive management measure) |
|---|---|---|
| throughout the lifetime of the project | to help maximise the potential of the site. Further details regarding the maintenance programme for offshore ANS will be provided in the KSIMP and project level Kittiwake CIMP (if required) post-consent. | provements, modifications will be undertaken to help maximise the potential of the site. Should this measure need to be relied upon either as compensation or adaptive management, information on monitoring and maintenance will be provided in the KSIMP and project level Kittiwake CIMP (if required) post-consent. |

# References

Acker, P., Besnard, A., Monnat, J-Y. and Cam, E. (2017) Breeding habitat selection across spatial scales: is grass always greener on the other side? Ecology 98: 2684-2697.

APEM. (2021) Calculation Methods of Hornsea Four's Proposed Compensation Measures for Features of the FFC SPA. Ørsted Hornsea Project Four Ltd. November 2021.

Band, W. (2012) SOSS-02: Using a Collision Risk Model to Assess Bird Collision Risks for Offshore Wind Farms (No. SOSS-02).

Bayes J. and Kharadi, N. (2022) Marine natural capital accounting: impacts of the sandeel fishery in the North Sea. UKNEE Webinar July 2022. UKNEE.

British Geological Survey (BGS) (2022) GBR BGS Offshore 1:250 000 scale sea bed sediment -BR BGS British Geological Survey (BGS) offshore marine products. https://map.bgs.ac.uk/arcgis/services/Offshore/Products_WMS/MapServer/WmsServer.

Burnell, D., Perkins, A.J., Newton, S.F., Bolton, M., Tierney, T.D. and Dunn, T.E., (2023) Seabirds Count: A census of breeding seabirds in Britain and Ireland (2015 – 2021). Lynx Nature Books. Barcelona.

Butcher, J., Aitken, D., O'Hara, D. (2023) Flamborough and Filey Coast SPA Seabird Monitoring Programme 2023 Report. RSPB Bempton Cliffs, 9 Cliff Lane, Bempton, East Riding of Yorkshire, YO15 1JD.

Cadiou, B., Monnat, J.Y. and Danchin, E. (1994) Prospecting in the kittiwake, *Rissa tridactyla* – different behavioural patterns and the role of squatting in recruitment. Animal Behaviour 47: 847-856.

Carroll, M.J., Bolton, M., Owen, E., Anderson, G.Q.A., Mackley, E.K., Dunn, E.K. and Furness, R.W. (2017) Kittiwake breeding success in the southern North Sea correlates with prior sandeel fishing mortality. Aquatic Conservation: Marine and Freshwater Ecosystems 27: 1164-1175.

Cefas (2023) UK Disposal Site Layer. Available at: Cefas Data Portal - View Accessed 25/04/2024.

Christensen-Dalsgaard, S., May, R.F., Barrett, R.T., Langset, M., Sandercock, B.K. and Lorentsen, S-H. (2018) Prevailing weather conditions and diet composition affect chick growth and survival in the black-legged kittiwake. Marine Ecology Progress Series 604: 237-249.

Christensen-Dalsgaard, S., Langset, M. and Anker-Nilssen, T. (2019) Offshore oil rigs – a breeding refuge for Norwegian black-legged kittiwakes Rissa tridactyla? Seabird 32: 20-32.

Clarkson, K. (2008) The Flamborough Head and RSPB Cliffs SPA Seabird Colony Census 2008: The Royal Society for the Protection of Birds.

Clarkson, K., Aitken, D., Cope, R., & O'Hara, D. (2022) Flamborough and Filey Coast SPA seabird colony count 2022. RSPB, The Lodge, Sandy, Bedfordshire SG19 2DL

Coulson, J. (2011) The Kittiwake. T & A D Poyser, London.

Coulson, J.C. 2017. Productivity of the black-legged kittiwake *Rissa tridactyla* required to maintain numbers. Bird Study 64: 84-89.

Cury, P.M., Boyd, I.L., Bonhommeau, S., Anker-Nilssen, T., Crawford, R.J.M., Furness, R.W., Mills, J.A., Murphy, E.J., Österblom, H., Paleczny, M., Piatt, J.F., Roux, J-P., Shannon, L. and Sydeman, W.J. 2011. Global seabird response to forage fish depletion – one-third for the birds. Science 334: 1703-1706.

Defra (2021) Best Practice Guidance for Developing Compensatory Measures in Relation to Marine Protected Areas.

Defra (2024a) Letter to the Offshore Wind Industry Council. Approval of strategic compensation measures for offshore wind developments. 2 pp.

Defra (2024b) Consultation on policies to inform updated guidance for Marine Protected Area (MPA) assessment. 31 pp.

DESNZ (2023) National Policy Statement for Renewable Energy Infrastructure (EN-3).

EC (2012) Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC Clarification of the Concepts of: Alternative Solutions, Imperative Reasons of Overriding Public Interest, Compensatory Measures, Overall Coherence, Opinion of the Commission. https://ec.europa.eu/environment/nature/natura2000/management/docs/art6/new_guidance_art6_4_en.pdf Accessed 14/03/2024.

EC (2019) Managing Natura 2000 sites. The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC. Brussels, 25.1.2019 2019/C 33/1 62 pp.

EMODnet (2019) EMODnet Human Activities, EMSA Route Density Map. Available at: EMODnet Product Catalogue (europa.eu) Accessed 25/04/2024.

EMODnet (2021) EMODnet Digital Bathymetry: Map Viewer. Available at: EMODnet Map Viewer (europa.eu) Accessed 25/04/2024.

EMODnet (2023a) EMODnet Human Activities, Human Activities, Dredging. Available at: EMODnet Product Catalogue (europa.eu) Accessed 25/04/2024.

EMODnet (2023b) EMODnet Human Activities, Fisheries, Fishing Intensity. Available at: EMODnet Product Catalogue (europa.eu) Accessed 25/04/2024.

Equinor (2022) Sheringham Shoal and Dudgeon Offshore Wind Farm Extension Projects. Appendix 3 - Kittiwake Compensation Document. August 2022. Document Reference: 5.5.3.

Five Estuaries Offshore Wind Farm Limited (2024a) Kittiwake Implementation & Monitoring Plan. Volume 5, Report 5.7. Application Reference: 5.5.7.

Five Estuaries Offshore Wind Farm Limited (2024b) Volume 5, Report 5: Habitats Regulations Assessment Derogation Case. Application Reference: 5.5.

Frederiksen, M., Wright, P.J., Harris, M.P., Mavor, R.A., Heubeck, M. and Wanless, S. (2005) Regional patterns of kittiwake Rissa tridactyla breeding success are related to variability in sandeel recruitment. Marine Ecology Progress Series 300: 201-211.

Furness, R. (2015) Non-breeding season populations of seabirds in UK waters: Population sizes for Biologically Defined Minimum Population Scales (BDMPS). Nat. Engl. Comm. Rep. 164.

Furness, R.W. and Tasker, M.L. (2000) Seabird-fishery interactions: Quantifying the sensitivity of seabirds to reductions in sandeel abundance, and identification of key areas for sensitive seabirds in the North Sea. Marine Ecology Progress Series 202: 253–264.

Gateshead Council (2022). Planning Application (DC/22/01188/FUL) for Installation of 15m high Kittiwake tower in south-eastern corner of site. Available at: https://public.gateshead.gov.uk/online-applications/applicationDetails.do?keyVal=RJSA80HKG7900&activeTab=summary Accessed 15/05/2024.

HM Government (2022) British Energy Security Strategy. 38 pp. Available at: British energy security strategy - GOV.UK (www.gov.uk) Accessed 25/04/2024.

Horswill, C. and Robinson, R. (2015) Review of seabird demographic rates and density dependence. JNCC Report No. 552. JNCC, Peterborough.

JNCC (2019) Annex I Sandbanks in the UK version 3 Polygons. Available at: Annex I Sandbanks in the UK version 3 - 2019 (Public) Polygons | JNCC Resource Hub Accessed 25/04/2024.

JNCC (2021) Annex I Reefs in UK waters (Open Data) (Version 8.3, 2022). Available at: Annex I Reefs in UK waters (Open Data) (Version 8.3, 2022) | JNCC Resource Hub Accessed 25/04/2024.

Lindegren, M., van Deurs, M., MacKenzie, B.R., Clausen, L.W., Christensen, A. and Rindorf, A. (2018) Productivity and recovery of forage fish under climate change and fishing: North Sea sandeel as a case study. Fisheries Oceanography 27: 212-221.

LDA Design (2021) Hornsea Three KIMP Appendix A Design Report Appendix 1 Pattern Book. Report to Ørsted. Available at: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010080/EN010080-003657-Hornsea_Three_KIMP_Appendix_A_Design_Report%20Redacted.pdf Accessed 27/03/2024.

MacArthur Green (2021a) Norfolk Boreas: Appendix 1 Flamborough and Filey Coast SPA In Principle Compensation. Report for Vattenfall.

MacArthur Green (2021b) Norfolk Vanguard: Appendix 1 Flamborough and Filey Coast SPA In Principle Compensation. Report for Vattenfall.

MacArthur Green (2022a) Annex 1 B Sandwich Tern and Kittiwake Ecological Evidence. Sheringham Shoal and Dudgeon Offshore Wind Farm Extension Projects. Available at: [https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010109/EN010109-000449-5.5.1.2%20Annex%201B%20Sandwich%20Tern%20and%20Kittiwake%20Ecological%20Evidence.pdf] [Accessed on 15 April 2024].

MacArthur Green (2022b) Berwick Bank Wind Farm Application - 3. Derogation Case - Fisheries Compensatory Measures Evidence Report. Marine Scotland. Available at https://marine.gov.scot/sites/default/files/eor0766_berwick_bank_ wind_farm_application_ -_3.derogation_ case_ -_fisheries_ com pensatory_measures_ evidence_report.pdf [Accessed on 15 April 2024].

MacArthur Green (2022c) Assessment of compensatory measures for impacts of offshore windfarms on seabirds. 361 pp.

MacArthur Green and Royal Haskoning DHV (2022) East Anglia ONE North Offshore Windfarm: Offshore Ornithology Without Prejudice Compensation Measures. Report for Scottish Power Renewables.

McSorley, C., Dean, B., Webb, A. and Reid, J. (2003) Seabird use of waters adjacent to colonies: Joint Nature Conservation Committee.

Mitchell, P., Newton, S., Ratcliffe, N. and Dunn, T. (eds.) (2004) Seabird Populations of Britain and Ireland: results of the Seabird 2000 census (1998-2002), London: T & A.D. Poyser.

Monnat, J.Y., Danchin, E. and Estrella, R.R. (1990) Assessment of environmental quality within the framework of prospecting and recruitment – the squatterism in the kittiwake. Comptes Rendus de l'Academie des Sciences Serie III Life Sciences 311: 391-396.

Natural England (2012) Black-legged kittiwake: species information for marine Special Protection Area consultations. Natural England Technical Information Note TIN128.

Natural England (2018) Flamborough and Filey Coast SPA Citation. Available at: Marine site detail (naturalengland.org.uk) Accessed 25/04/2024.

Natural England (2023a) Flamborough and Filey SPA Supplementary Advice on Conservation Objectives. Available at: Designated Sites View (naturalengland.org.uk) Accessed 25/04/2024.

Natural England (2023b) Marine Conservation Zones (England) Marine Conservation Zones (England) | Marine Conservation Zones (England) | Natural England Open Data Geoportal (arcgis.com) Accessed 25/04/2024.

Natural England (2023c) Areas of Outstanding Natural Beauty (England). Available at: Areas of Outstanding Natural Beauty (England) - data.gov.uk Accessed 25/04/2024.

NIRAS (2020) Hornsea Project Three: Response to the Secretary of State's Minded to Approve Letter Annex 2 to Appendix 2: Kittiwake Artificial Nest Provisioning: Ecological Evidence. Report prepared for Ørsted.

NIRAS (2021a) Hornsea Project Four: Derogation Information Volume B2 Annex 7.3 Compensation Measures for FFC SPA Onshore Artificial Nesting Ecological Evidence. The Planning Inspectorate Document Reference: B2.7.3 APFP Regulation: 5(2)(q).

NIRAS (2021b) Hornsea Project Four: Derogation Information Volume B2 Annex 7.1 Compensation measures for FFC SPA Offshore Artificial Nesting Ecological Evidence. PINS Document Reference: B2.7.1 APFP Regulation: 5(2)(q).

Ørsted (2020) Response to the Secretary of State's Minded to Approve Letter Annex 2 to Appendix 2: Kittiwake Artificial Nest Provisioning: Ecological Evidence. Ørsted Hornsea Project Three (UK) Ltd.

Ørsted (2021) Hornsea Project Four: Derogation Information. Volume B2, Annex 6.2: Compensation measures for FFC SPA Prey Resource Evidence. PINS Document Reference: B2.6.2.

Ørsted (2023) Ørsted completes industry-first nearshore artificial nesting structures. Available at: https://orsted.co.uk/media/newsroom/news/2023/07 /how03-nesting-structures [Accessed on 15 April 2024].

Ørsted (2024) Non-material Change – Regulation 7 Letter – 2nd May 2024. Pinsent Masons LLP on behalf of Ørsted Hornsea Project Four Limited.

Outer Dowsing Offshore Wind (2024a). Habitats Regulations Assessment. Kittiwake Compensation Plan. Document reference: 7.7.1. 35 pp.

Outer Dowsing Offshore Wind Farm (2024b) Habitats Regulations Assessment – Offshore artificial nesting structures evidence base and roadmap. The Planning Inspectorate reference: 7.7.4. 42 pp.

OWIC (2024) Consenting and Environment by RenewableUK. https://www.owic.org.uk/our-work/pathways-to-growth.

Rampion Extension Development (2023) Habitats Regulations Assessment (Without Prejudice) Derogation Case. Document reference: 5.10.

Rampion Extension Development (2024) Kittiwake Implementation and Monitoring Plan (Clean). Document reference: 8.64.

Ruffino, L., Thompson, D. & O'Brien, S. (2020) JNCC Report No. 651: Black-legged kittiwake population dynamics and drivers of population change in the context of offshore wind development. JNCC, Peterborough, UK.

RWE Renewables UK (2022a) Dogger Bank oil and gas platform aerial surveys report, version 1.2. Document Reference: P8016.

RWE Renewables UK (2022b) 'Installation of a Kittiwake Tower' Document reference: 004551509-01.

RWE Renewables UK (2024) Dogger Bank South Offshore Wind Farms. Kittiwakery and Urbank Coastal Surveyed Sites Summary Paper. 41 pp.

SSE (2023) Addendum to the Derogation Case Section 3 Implementation, Monitoring and Adaptive Management- Additional Environmental Information - Berwick Bank Wind Farm. Available at: https://marine.gov.scot/sites/defau lt/files/aei02_ -_addendum_to_the_derogation_case_ -_section_3_ -_implementation_monitoring.pdf [Accessed on 15 April 2024].

Thaxter, C.B., Lascelles, B., Sugar, K., Cook, A.S.C.P., Roos, S., Bolton, M., Langston, R.H.W. and Burton, N.H.K. (2012) Seabird foraging ranges as a preliminary tool for identifying candidate Marine Protected Areas. Biological Conservation. 156: 53 – 61.

The Crown Estate (2022) Offshore Wind Leasing Round 4. Record of the Habitats Regulations Assessment. 102 pp.

Turner, D. M. (2010) Counts and breeding success of Black-legged Kittiwakes *Rissa tridactyla* nesting on man-made structures along the River Tyne, northeast England, 1994-2009. Seabird, 23: 111-126.

Turner, D.M. (2021) Black-legged kittiwake Rissa tridactyla breeding data recorded on the River Tyne during 2021.

Unwin, B. (1999) Birds breed on gas platforms. Available at: https://www.independent.co.uk/news/birds-breed-on-gas-platform-1073077.html Accessed 25/04/2024.

Vattenfall (2022) Norfolk Projects Offshore Wind Farms. Kittiwake Implementation and Monitoring Plan. Document Reference: PB5640.009.0004. 34 pp.

Vattenfall (2023) Lowestoft kittiwake hotels open for business. Available at: https://group.vattenfall.com/uk/newsroom/pressreleases/2023/kittiwake-hotel-in-lowestoft [Accessed on 15 April 2024].

Wakefield, E.D., Owen, E., Baer, J., Carroll, M.J., Daunt, F., Dodd, S.G., Green, J.A., Guilford, T., Mavor, R.A., Miller, P.I., Newell, M.A., Newton, S.F., Robertson, G.S., Shoji, A., Soanes, L.M., Votier, S.C., Wanless, S. and Bolton, M. (2017) Breeding density, fine-scale tracking, and large-scale modelling reveal the regional distribution of four seabird species. Ecological Applications 27: 2074-2091.

**RWE Renewables UK Dogger Bank South (West) Limited**

**RWE Renewables UK Dogger Bank South (East) Limited**

**Windmill Hill Business Park**
**Whitehill Way**
**Swindon**
**Wiltshire, SN5 6PB**