DOGGER BANK D
WIND FARM

Kittiwake Compensation

Roadmap & Evidence

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Glossary

Term	Definition
Areas of Search (AoS)	Broad geographical areas considered during the site selection process for siting infrastructure.
DBD Array Area	The area within which the wind turbines, inter-array cables and Offshore Platform(s) will be located.
Deemed Marine Licence (dML)	A consent required under the Marine and Coastal Access Act 2009 for certain activities undertaken within the UK marine area, which may be granted as part of the Development Consent Order.
Development Consent Order (DCO)	A consent required under the Planning Act 2008 to authorise the development of a Nationally Significant Infrastructure Project, which is granted by the relevant Secretary of State following an application to the Planning Inspectorate.
Effect	An effect is the consequence of an impact when considered in combination with the receptor's sensitivity/value/importance, defined in terms of significance.
Environmental Impact Assessment (EIA)	A statutory process by which certain planned projects must be assessed before a formal decision to proceed can be made. It involves the collection and consideration of environmental information and includes the publication of an Environmental Statement.
Environmental Impact Assessment (EIA) Regulations	Infrastructure Planning (Environmental Impact Assessment) Regulations 2017, which sets out the EIA process for assessing the likely significant effects of a project on the environment.
Environmental Statement (ES)	A document reporting the findings of the EIA which describes the measures proposed to mitigate any likely significant effects.
Evidence Plan Process (EPP)	A voluntary consultation process with technical stakeholders via Expert Topic Group (ETG) meetings to encourage upfront agreement on the nature, volume and range of supporting evidence required to inform the EIA and HRA process.
Expert Topic Group (ETG)	A forum for targeted technical engagement with relevant stakeholders through the EPP.
Habitat Regulations	As set out in the Planning Inspectorate's Advice Note 10 (Habitats Regulations Assessment relevant to nationally significant infrastructure projects) the following are covered by the term 'Habitats Regulations': the Conservation of Habitats and Species Regulations 2017 (as amended), and the Conservation of Offshore Marine Habitats and Species Regulations 2017 (as amended) (for plans and projects beyond UK territorial waters (12 nautical miles). Such regulations set out the requirement for Competent Authorities to consider whether a development will have a likely significant effect (LSE) on a European site (now known as National Network Sites). Where LSE are likely and a project is not directly connected with or necessary to the management of that site(s), an appropriate assessment (AA) is required of the implications of the plan or project for that site(s) in view of its conservation objectives.
Horizontal Directional Drilling (HDD)	A type of trenchless cable or duct installation method (see the definition for Trenchless Techniques).
HRA Stage 1: Screening	In Stage 1 of the HRA process, European sites are screened for LSE (either alone or in-combination with other plans or projects). Where it can be determined that there is no potential for LSE to occur to qualifying features of a site, that site is sought to be 'screened out'.
HRA Stage 2: Appropriate Assessment	In Stage 2 of the HRA process, for sites where LSE cannot be excluded in HRA Stage 1: Screening, further information to inform an appropriate assessment is prepared by the Applicant. The assessment will determine whether the Project alone or in-combination could adversely affect the integrity of the European site in view of its conservation objectives. The Competent Authority (CA) will then draw its own conclusions based on this Report to Inform Appropriate Assessment (RIAA).
Impact	An impact is a change resulting from an activity associated with the Project, defined in terms of magnitude.
Mitigation	Any action or process designed to avoid, prevent, reduce or, if possible, offset potentially significant adverse effects of a development.
Mitigation Hierarchy	A systematic approach to guide decision-making and prioritise mitigation design. The hierarchy comprises four stages in order of preference and effectiveness: avoid, prevent, reduce and offset.
Monitoring	Measures to ensure the systematic and ongoing collection, analysis and evaluation of data related to the implementation and performance of a development. Monitoring can be undertaken to monitor conditions in the future to verify any environmental effects identified by the EIA, the effectiveness of mitigation or enhancement measures or ensure remedial action are taken should adverse effects above a set threshold occur. All monitoring measures adopted by the Project are provided in the Commitment Register.

Term	Definition
National Site Network	A network of core breeding and resting sites for rare and threatened species and habitats on land and at sea in the UK, adapted from the European Union's Natura 2000 ecological network post-Brexit. National Site Network sites are formerly known as European protected sites.
Offshore Development Area	The area in which all offshore infrastructure associated with the Project will be located, including any temporary works area during construction, which extends seaward of Mean High-Water Springs.
Offshore Export Cable Corridor (ECC)	The area within which the offshore export cables will be located, extending from the DBD Array Area to Mean High Water Springs at the landfall.
The Applicant	SSE Renewables and Equinor acting through Dogger Bank Offshore Wind Farm Project 4 Projco Limited.
The Project	Dogger Bank D (DBD) Offshore Wind Farm Project
Wind Turbine	Power generating devices located within the DBD Array Area that convert kinetic energy from wind into electricity.

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1 Introduction

1.1 Background

1. As part of its third licensing round in 2008, The Crown Estate identified the Dogger Bank Zone, located between 125km and 290km off the east coast of Yorkshire, as one of the nine offshore wind farm (OWF) development zones in the UK. Following the 2008 licensing round, four project areas were identified within the zone to take to development consent, namely Creyke Beck A, Creyke Beck B, Teesside A, and Teesside B. In 2015, development consent was granted for all four project areas.

2. In 2017, the four project areas were restructured under new ownership arrangements. Creyke Beck A, Creyke Beck B, and Teesside A were renamed as Dogger Bank A (DBA), Dogger Bank B (DBB), and Dogger Bank C (DBC) respectively and would progress collectively as the Dogger Bank Wind Farm in three build-out phases developed by SSE Renewables, Equinor and Vårgrønn. Teesside B was renamed as Sofia Offshore Wind Farm and would be progressed separately from the Dogger Bank Wind Farm by RWE.

3. In 2021, an opportunity was identified by the Applicant to maximise the capacity of the third phase of the Dogger Bank Wind Farm, namely DBC, such that additional capacity of up to 1.5 Gigawatts (GW) of renewable energy could potentially be consented and constructed in the eastern part of the original DBC site. This new development phase is known as Dogger Bank D (DBD) and is an independent project being promoted by a separate commercial entity from the previous phases of the Dogger Bank Wind Farm.

4. The Dogger Bank D Offshore Wind Farm (hereafter referred to as the "Project") is a proposed OWF located on a shallow sandbank known as the Dogger Bank in the North Sea. The DBD Array Area covers an area of approximately 262km^2 and is located approximately 210km off the north-east coast of England. The Project will have an overall capacity of over 100 Megawatts (MW) and therefore constitute a Nationally Significant Infrastructure Project (NSIP) under Section 15 (3) of the Planning Act 2008. Full details are presented in the Project Description (**Volume 1, Chapter 4 Project Description**)

5. SSE Renewables and Equinor acting through 'Dogger Bank Offshore Wind Farm Project 4 Projco Limited', hereafter referred to as "The Applicant", is applying for a Development Consent Order (DCO) supported by a range of plans and documents, including an Environmental Statement (ES), which will set out the results of the Environmental Impact Assessment (EIA). The Applicant has also provided a Report to Inform Appropriate Assessment (RIAA) (**document reference 5.3**) alongside the Preliminary Environmental Impact Report (PEIR) for consultation. When submitted as final, these documents will set out the information necessary for the Competent Authority (CA), in this case the Department for Energy Security and Net Zero (DESNZ) Secretary of State (SoS), to fulfil its statutory duty to carry out an Appropriate Assessment (AA). The Habitats Regulations Assessment (HRA) process and AA will evaluate potential impacts of the Project on species and habitats protected under the Habitats Regulations (the collective term used for the Conservation of Habitats and Species Regulations 2017; and the Conservation of Offshore Marine Habitats and Species Regulations 2017). If the AA process concludes that Adverse Effect on Integrity (AEoI) on designated features of protected sites cannot be excluded, a derogation from the requirements of the Habitats Regulations is required. If no suitable alternatives are available, and if there are Imperative Reasons of Overriding Public Interest (IROPI), the Project may proceed, provided that appropriate compensation measures are secured to offset the adverse effects of the Project on a site's protected features.

6. The full details of the **RIAA** are presented in **document reference 5.3**. This compensation roadmap has been prepared to present a roadmap for securing a compensation measures to support a potential HRA derogation case for potential Project impacts to the blacklegged kittiwake *Rissa tridactyla* (kittiwake) feature of the Flamborough and Filey Coast (FFC) Special Protection Area (SPA).

7. In 2023, The Crown Estate confirmed that a Plan-Level Habitat Regulations Assessment (HRA) would be undertaken to assess the collective environmental impact at plan level of DBD together with six other offshore wind projects identified in either The Crown Estate's Offshore Wind Leasing Round 3 or The Crown Estate's 2021 Offshore Wind Extensions opportunity, collectively known as the Capacity Increase Programme (CIP). The Crown Estate's Capacity Increase Programme (CIP) Plan Level HRA was published in March 2025 (The Crown Estate, 2025). In relation to kittiwake the CIP Plan Level HRA concludes there is potential for AEoI at FFC SPA in relation to the projects included in the Plan. The CIP Plan Level HRA therefore goes on to present a derogation case and potentially suitable compensation measures for all of the relevant projects. This document sets out the Applicant's roadmap for securing and delivering compensation, taking into account the recommendations for compensation set out in the CIP HRA.

1.2 Compensation Approach

8. The proposed Array Area and offshore export cable corridor (offshore ECC) constitute the Project's Offshore Development Area and have been developed through extensive site and route selection and evaluation work, taking into account environmental and engineering constraints (see **Volume 1, Chapter 5 Site Selection and Consideration of Alternatives**).

9. The Project's proposed Array Area falls within mean-maximum foraging range (MMF) ± 1 standard deviation (SD) for kittiwake (300.6km; Woodward et al., 2019) of the FFC SPA. The FFC SPA is located 207km (at sea) from the DBD Array Area and there is, therefore, potential connectivity between kittiwake from the FFC SPA and the Project when

operational. Further detail on project impacts to the designated kittiwake feature of the FFC SPA are presented in the **RIAA** (**document reference 5.3**).

10. The **RIAA** (**document reference 5.3**) has not been able to rule out potential AEoI for kittiwake connected to the FFC SPA in combination with other plans and projects at this stage.

11. Department for Environment, Food and Rural Affairs (Defra) guidance on HRA implementation states that all necessary compensation measures should be taken to ensure that the overall coherence of the Marine Protected Area (MPA) network is secured (Defra, 2021). It asserts that developers with unavoidable impacts should consider the derogation route or the requirement to satisfy the appropriate authority that there is no adverse effect. This should be done early in the consenting or authorising process to ensure that developers can deliver compensatory measures within reasonable timeframes.

12. On the basis of the conclusions of the Project's **RIAA** (**document reference 5.3**), precedent demonstrated by the conclusions of the Crown Estate's Round 4 Plan Level RIAA and conclusions of The Crown Estate's CIP HRA (The Crown Estate, 2025), the Applicant intends to provide a derogation case to support the final DCO application (on a with and/or without prejudice basis, depending on the conclusions of the final RIAA) and this will supersede the conclusions of the CIP Plan Level HRA. The derogation case relates to the following features and designated sites:

- Flamborough and Filey Coast SPA – Kittiwake (collision risk during the O&M phase);
- Flamborough and Filey Coast SPA – Guillemot and razorbill (displacement during the O&M phase) (on a without prejudice basis); and
- Dogger Bank SAC - Sandbanks (habitat loss).

13. To support this derogation case, from the outset of the Project, the Applicant has:

- Ensured the mitigation hierarchy is observed at the EIA and AA stages;
- Continued to ensure that all relevant alternative solutions (that meet the Project's objectives) have been considered and evaluated as the Project has progressed to ensure should any alterative solution that avoids the AEoI outcome be identified it has been pursued wherever feasible; and
- Progressed options for compensatory measures in discussion with stakeholders via the EPP and additional meetings, with the aim of progressing compensation measures to a suitable mature stage prior to submission of the DCO application.

14. Work undertaken to date on compensation measures and proposed next steps are set out in the following roadmap documents:

- Kittiwake Compensation - Roadmap & Evidence;
- Guillemot and Razorbill Compensation - Roadmap & Evidence (without prejudice); and
- Benthic HRA Derogation Compensation - Roadmap & Evidence.

15. Alongside the final DCO application the Applicant will produce a derogation case document. Further details are provided in the RIAA (document reference 5.3).

16. As part of the process of developing the HRA derogation case, the Applicant has developed a 'shortlist' of possible compensation options based on the current Project design, recent DCO decisions which have been consented on the basis of derogation and compensation, The Crown Estate's CIP Plan Level HRA (The Crown Estate, 2025) and stakeholder feedback received to date.

1.3 Purpose of this Document

17. This document introduces the compensation measures considered by the Applicant to support the HRA derogation case in relation to predicted in-combination impacts on the FCC SPA. The derogation case relates to potential collision risk and associated increase in baseline mortality rate in combination with other plans and projects within MMF ± 1 SD for kittiwake (300.6km; Woodward *et al.*, 2019) of the FFC SPA.

18. A longlisting and shortlisting process to identify potential compensation measures has been conducted in consultation with stakeholders as part of the Evidence Plan Process (EPP). The shortlisting process has concluded that at this stage, a single option is preferred for kittiwake compensation. Further details and justifications on the longlisting and shortlisting process are presented in Section 3 and details regarding the delivery of the measure are presented in **Section 4.3**.

19. The preferred measure currently being considered by the Project is:

- Development of an offshore Artificial Nesting Structure (ANS).

20. This measure will deliver compensation through increasing the productivity of kittiwake within the species' biogeographic range. This will be achieved by providing additional nesting space within the vicinity of productive foraging grounds and encourage the creation of a new offshore colony. Further evidence to support this measure is presented is **Section 4.2.**

21. To secure delivery of the preferred measure, the Applicant is considering several delivery mechanisms including via Project alone, in collaboration with other offshore wind projects and/or strategically through contribution to the Marine Recovery Fund (MRF).

22. The Applicant is mindful of Natural England's advice that they do not support onshore ANS due to several issues including that onshore nesting space is not a limiting factor for onshore nesting kittiwake. However, alongside offshore ANS, the Applicant will continue

to monitor Natural England's feedback on other projects regarding onshore ANS, and evidence that may support further development of such structures. The Applicant may further investigate this option should offshore ANS face insurmountable engineering or commercial challenges as site selection and design work packages progress.

23. The purpose of this compensation roadmap is to present progress on proposed compensation measures, and gather stakeholder feedback on the measure proposed, and identify any additional factors requiring consideration ahead of a formal DCO application submission to the Planning Inspectorate (PINS). This document also presents a roadmap for delivering kittiwake compensation as the Project progresses including a timeframe for delivery and consideration of adaptive management measures.

1.4 Consultation

24. Stakeholder engagement with Natural England, the Marine Management Organisation (MMO) and the Royal Society for the Protection of Birds (RSPB) has been established through the EPP to document pre-application engagement and has continued as the Project has progressed its compensation measures.

25. Compensatory measures considered by the Applicant have been presented to stakeholders during Expert Topic Group (ETG) meetings in line with the EPP (see **Volume 1, Chapter 6 Environmental Impact Assessment Methodology** and **Volume 1, Chapter 7 Consultation)**. To date, the Applicant has engaged the following stakeholders on the dates listed in **Table 1-1**.

Table 1-1 Summary of Stakeholder Engagement

Date	Meeting Forum	Attendees
15 February 2024 10 May 2024 29 August 2024 13 March 2025	Meetings to discuss Project progress, matters related to strategic compensation and receive feedback from Defra.	Defra
July 2023 - present	Project monthly meetings (compensation matters discussed in addition to wider development topics)	Natural England
July 2023- present	Monthly meetings to discuss Project progress and matters relating to derogation and compensation	MMO
28 May 2024	ETG 4 - Offshore Ornithology Compensation (Meeting 1)	Natural England, RSPB & MMO
6 November 2024	ETG 4 - Offshore Ornithology Compensation (Meeting 2)	Natural England, RSPB & MMO
24 February 2025	Offshore ANS site selection and data analysis workshop.	Natural England
6 March 2025	Meeting to discuss application of kittiwake tracking data for site selection and to present work and processes employed by the Project to date.	Natural England & RSPB
13 November 2024	Project progress and matters relating to derogation and compensation discussed.	PINS

26. Engagement has also taken place with Defra and through the Offshore Wind Industry Council (OWIC) (via relevant Developer Group meetings) regarding progress of strategic compensation workstreams via Collaboration on Offshore Wind Strategic Compensation (COWSC) Implementation Groups. The Applicant has also responded to DESNZ call to industry on quantities of seabird strategic compensation in February 2025. A response was submitted to DESNZ on 19 February 2025, providing details of the anticipated impacts to relevant SPAs, based on project parameters current at the time of consultation.

27. In addition, the Applicant has also engaged with other offshore wind developers regarding potential collaborative delivery of compensation measures. Details on further discussion on collaborative and strategic delivery of compensation are outlined in **Sections 4.3.2** to **4.3.3**.

28. Key discussion points have informed the Applicant's compensation approach, and the details presented in this document. Consultation relating to such key discussion points on the delivery of compensation via an ANS are presented in **Table 1-2.**

Table 1-2 Consultee Responses in Relation to Kittiwake Compensation

Consultee	Comment	**Applicant Response**
Repurposing of an existing Oil and Gas Structure for an Offshore ANS		
Natural England Discretionary Advice Service (DAS) Advice response to ETG 4 Meeting 1 on 28 May 2024 (DAS/477591) Received 12 June 2024	Natural England advised that at present, mechanisms for repurposing and / or maintaining oil and gas infrastructure, such as offshore platforms, as offshore ANS are limited. This is due to: • Lack of publicly available information; and • Legal issues surrounding infrastructure liability. Natural England anticipate this compensation measure may become more viable between now and the Applicant's submission in 2026	The Applicant has acknowledged this response and continues to maintain a watching brief over the possibility of repurposing an existing oil and gas structure. However, the Applicant also notes the position that Offshore Petroleum Regulator for Environment and Decommissioning (OPRED) have presented in their position paper (OPRED, 2023) on benthic compensation which presented issues around ownership and regulatory requirements regarding oil and gas structures, which also applies for re-purposing decommissioned structures. The Applicant is therefore prioritising the development of a new structure.
Longlist and Shortlisting of Measures		
Comment made by Natural England at ETG 4 Meeting 1, 28 May 2024 & Natural England DAS Advice response to ETG 4 Meeting 1 on 28 May 2024, (DAS/477591). Received 12 June 2024	A long list of potential measures was presented and discussed at ETG 4 Meeting 1, and Natural England and RSPB subsequently provided written responses on material presented at the meeting. The outcome of the discussion and the written feedback was that offshore artificial nesting for kittiwake, predator control and predator reduction were noted to warrant further consideration, with it being noted that bycatch reduction may have potential to deliver compensation but there is currently a lack of evidence of impacts or available techniques. Recreational disturbance reduction and onshore ANS were noted as having less ecological merit for kittiwake by Natural England than the other measures discussed. Natural England does not support the provision of further onshore or near-shore ANS as compensation for the Project. Whilst these have been supported as options for previous projects, Natural England considers this measure is at full capacity until evidence is collated to demonstrate its effectiveness as a measure.	The Applicant has considered all feedback received on potential compensation measures and further details of the longlisting and shortlisting are provided in **Section 1**.
Discussion Surrounding Offshore Artificial Nesting Structures		
Statement made by Natural England at Monthly Project Update, 13 March 2024 & Natural England DAS Advice response to ETG 4 Meeting 1 on 28 May 2024, (DAS/477591). Received 12 June 2024 & ETG 4 Meeting 2, 06 November 2024 &	Natural England suggested the Applicant use the methodology used by Hornsea Four Project and the Round 4 plan for siting an offshore ANS. Further to this, Natural England advised that the Project remains up to date with the kittiwake metapopulation research undertaken by the Offshore Renewable Joint Industry Programme (ORJIP). At ETG 4 Meeting 2 and the subsequent site selection workshop with Natural England it was indicated that tracking data collected by the FFC Seabird Monitoring Group could be used to further inform offshore ANS site selection. Natural England provided positive feedback on the approach laid out for site selection and highlighted they were pleased that feedback provided in ETGs has been followed by the Applicant. This includes the search area for offshore ANS being extended to 150 km from the shore to reflect the foraging range of kittiwake from the FFC SPA.	The Applicant has used the R4 Plan Level HRA Kittiwake Strategic Compensation Plan (KSCP) (The Crown Estate, 2024) offshore ANS site selection methodology as a basis for their initial site selection work and continues to follow progress on the ORJIP research. Further detail is presented in **Section 4.3.5.** The Applicant has also gathered information on satellite populations of kittiwake within the North Sea. This includes the commissioning of a survey (conducted in summer 2024) to investigate the presence of kittiwake on oil and gas structures. Further survey work is scheduled for 2025. The Applicant has considered all feedback received from Natural England on data and information that should be used to inform offshore ANS site selection (see Section 4.3.5). The Applicant has considered this additional data in site selection work and used it to provide contextual information to inform site selection and refinement, alongside other factors including engineering constraints and other sea users.

Consultee	Comment	Applicant Response
Statement made by Natural England at Monthly Project Update, 19 December 2024 & Post ETG site selection workshop with Natural England 245 February 2025		
Natural England DAS Advice response to ETG 4 Meeting 1 on 28 May 2024 (DAS/477591) Received 12 June 2024	Natural England recommend building resilience into the design at an early stage, including providing structures with a compensation ratio greater that 1:1, and consider spreading the structures across different biogeographic regions within the Northern North Sea and supporting satellite populations to widen the FFC SPA recruitment pool.	Details on the considered compensation quantum to consider resilience are presented in **Section 2.5** The Applicant has commissioned an engineering and design concept study which will inform the final offshore ANS structure design. The Applicant continues to seek to collaborate with other projects, as well as undertaking site selection for a Project alone offshore ANS to ensure a suitable quantum of nesting space is delivered.
Discussions on Collaborative Engagement for Offshore ANS		
Discussions with other OWF developers and The Crown Estate	The Applicant has engaged various developers and The Crown Estate (via the Capacity Increase Programme (CIP) Plan Level HRA) since February 2024 regarding the potential for collaboration on compensation measures.	The Applicant acknowledges the challenges encountered when securing ornithological compensation measures and has been seeking to explore whether these difficulties could be addressed through a more collaborative approach. Discussions have taken place with several relevant developers, but with limited firm outcomes to date, largely due to project priorities and focus on respective applications, as well as the perception that the Applicant is at an earlier stage in the process.
Memorandum of Understanding (MoU) between another developer and DBD 29 November 2024	The Applicant has signed an MoU with another developer to establish a framework for collaboration and coordination of compensation measures where possible, including artificial nesting structures.	The Applicant will continue engaging to explore collaborative opportunities to deliver compensation.
Ongoing Engagement with OWIC since 2021	The Applicant has actively engaged with OWIC since project inception and is an active member of the derogation group.	The Applicant has responded to OWIC's request to complete a compensation questionnaire to support the advancement of work packages within the Strategic Compensation Studies project. The information gathered from various offshore wind projects will help to address any gaps in existing knowledge and enhance the value of work already completed, ensuring that the final outputs are beneficial to the industry.
Strategic Delivery of Offshore ANS		
Statement made by Natural England at Monthly Project Update 08 February 2024	Natural England highlighted to the Applicant that there would soon be a report published by the Crown Estate's kittiwake compensation group providing details regarding strategic compensation measures for kittiwake.	The Applicant acknowledges this information and awaits guidance on kittiwake strategic compensation measures from The Crown Estate and updated information from Natural England.

Consultee	Comment	**Applicant Response**
Defra Written Ministerial Statement (WMS) (published 29 January 2025) & DESNZ MRF Interim Guidance (published 29 January 2025)	Defra's WMS (Defra, 2025) and supporting Interim Guidance on the strategic compensation measures and the MRF (DESNZ, 2025) have suggested that an offshore ANS could be delivered strategically through Project contributions to an MRF once it is available. Guidance states that where possible, applicants should work collaboratively to ensure that larger and fewer ANSs are placed in optimal sites, and that where applicants wish to rely on offshore ANSs for kittiwake compensation ahead of the MRF being operational, they will need to be able to deliver the measure themselves, or in collaboration with other projects.	The Applicant welcomes this commitment but there remains uncertainty on the timescale for implementing an MRF in relation to the Applicant's consenting timeline. Further information is presented in **Section 2.8**.
DESNZ Call for Information on Quantities of Seabird Strategic Compensation Response issued 19 February 2025.	The Applicant via the OWIC Developer Derogation Group, was asked to respond to the DESNZ call for information on quantities of seabird strategic compensation (completed questionnaire returned by the Applicant on 19 February 2025).	The Project response provided details of the anticipated impacts to relevant SPAs based on Project parameters, at the time of consultation.
Discussion on Other Factors Influencing Compensation Delivery – Secondary Measures		
Comment by Natural England in ETG 4 Meeting 2 06 November 2024	Natural England are not aware of any secondary / supporting measures to compensate for impacts on kittiwake at this time but are happy to engage in the future should any be identified.	The Applicant acknowledges Natural England's position and welcomes future engagement with Natural England regarding compensation measures for impacts on kittiwake.

2 Flamborough and Filey Coast Special Protection Area and Project Impact

2.1 Overview

29. FFC SPA is 207km (at sea) from the DBD Array Area. Given the distance from the SPA, the Project does not directly overlap with the SPA boundary. The FFC SPA site description is as follows (Natural England, 2018):

30. "*The Flamborough and Filey Coast SPA is located on the Yorkshire coast between Bridlington and Scarborough. It includes the RSPB reserve at Bempton Cliffs, the Yorkshire Wildlife Trust Flamborough Cliffs nature reserve and the East Riding of Yorkshire Council Flamborough Head local nature reserve. The cliffs of Flamborough head rise to 135 m and are composed of chalk and other sedimentary rocks. These soft cliffs have been eroded into a series of bays, arches, pinnacles and gullies with an extensive system of caves at sea-level. The cliffs from Filey Brigg to Cunstone Nab comprise maritime grassland vegetation growing alongside species more typical of chalk grassland. The intertidal area below the cliffs is predominantly rocky and part of a series of reefs that extend into the subtidal area. The adjacent sea out to 2km off Flamborough Head as well as Filey Brigg to Cunstone Nab is characterised by reefs supporting kelp forest communities in the shallow subtidal and faunal turf communities below 2 m water depths. The southern side of Filey Brigg shelves off gently from the rocks to the sandy bottom of Filey Bay*"

31. The FFC SPA supports internationally important breeding populations of kittiwake and contains the largest population in the UK. The colony count at citation was 89,040 individuals (Natural England, 2018) and at the latest count, in 2023 was referenced as 91,008 individuals (Burnell *et al.*, 2023).

2.2 Conservation Objectives

32. 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; and
- The distribution of qualifying features within the site.

33. Natural England (2023) has stated the target for kittiwake is to 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.

34. The SPA breeding population at classification in 2018 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 & Robinson, 2015).

2.3 Summary of Potential Impact

35. The **RIAA** (**document reference 5.3**) has considered the potential impact of increased mortality as a result of collisions to the designated FFC SPA kittiwake population as the result of the placement of infrastructure within the within the MMF ± 1 SD for kittiwake (300.6km; Woodward *et al.*, 2019).

36. The predicted mortality across all defined bio-seasons from the Project alone attributed to FFC SPA is 53 (52.68) breeding adult kittiwakes per annum. The addition of 53 predicted mortalities per annum would result in an increase to the baseline mortality rate of 0.405%. This level of impact would be indistinguishable from natural fluctuations in the populations. Therefore, the **RIAA** (**document reference 5.3)** has concluded that the potential for an AEoI to the conservation objectives of the kittiwake feature of FFC SPA in relation to collision risk in the operation and maintenance phase from the Project alone can be confidently ruled out. Therefore, subject to natural change, the population of the kittiwake feature will be maintained in the long term.

37. However, the predicted resultant mortality across all defined bio-seasons from all projects in-combination, attributed to FFC SPA, is 471 (470.8) breeding adult kittiwakes. This would result in an increase in baseline mortality of 3.617%. When considering an increase in predicted mortality in-combination with other plans and projects, the **RIAA** (**document reference 5.3**) concluded that there is a risk that the addition of 471 mortalities per annum may compromise the integrity of the kittiwake feature at FFC SPA. The potential for an AEoI therefore could not be ruled out for in-combination effects at this stage. Further consideration of the population consequences of the predicted impact poses will be determined using Population Viability Analysis (PVA) alongside further engagement with Natural England to inform the conclusions drawn on project impacts in the final RIAA submitted to support the ES. The Applicant is also preparing a derogation case document for submission with the final application. This document will demonstrate that all feasible alternatives have been considered to deliver the Project along with IROPI considerations.

2.4 Kittiwake Ecology

38. Kittiwakes are small gulls, measuring around 38–40cm in length (del Hoyo, Elliott, & Sargatal, 1996), that feed primarily at the water's surface (Robinson, 2005; Coulson J. C., 2011). Their diet mainly consists of energy-rich prey, particularly sandeel *Ammodytes sp*. during the breeding season, along with other fish species such as gadoids and clupeids, as well as discards from fishing vessels (Harris & Wanless, 1997; Bull, et al., 2004; Swann, Harris, & Aiton, 2008; Chivers, Lundy, Colhoun, & Newton, 2012). Kittiwakes are long-lived birds, with an average lifespan of 12 years (Robinson, 2005), and they reach maturity at approximately four years old (3.97 years for males and 4.7 years for females) (Coulson J. C., 2011).

39. The UK hosts an estimated 380,000 breeding pairs, with around 76,000 pairs (20%) nesting in England (JNCC, 2023). During the breeding season, kittiwakes traditionally build their nests on narrow ledges along steep cliffs (Coulson J. C., 2019; Furness, 2015). However, kittiwake have also been noted to utilise artificial structures in urban environments including towns on the northeast and east coasts of England. Their use of window ledges, drainpipes, streetlights, rooftops and road infrastructure are thought to mimic the properties of steep cliffs (Wilson, 2021). Outside of the breeding season, they are predominantly pelagic, dispersing across the North Atlantic and North Sea during winter (Bogdanova, et al., 2011; Frederiksen, et al., 2011). They undertake two key migrations: the post-breeding migration from August to December and the return migration between January and April (Furness, 2015).

40. 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, 2018). Natural England have defined the designated breeding population of kittiwake are present at the FFC SPA between 1st March and 31st August. Kittiwake also use the FFC SPA for important courting and maintenance behaviours during this time such as loafing, preening and bathing.

41. The highest density of kittiwake at sea are usually found within 1km from the main colony during breeding season (McSorely , Dean, Webb, & Reid, 2003) though they may forage up to 150km in single journeys and have a mean foraging range of 24.8 ± 12.1km whilst incubating chicks on nests (Thaxter, et al., 2012).

2.5 Estimated Compensation Quantum

42. To calculate the appropriate level of compensation for a given impact it is necessary to consider what the impact is (for kittiwake predicted mortalities as a result of collision) and what form the compensation will take (like-for-like replacement or at a different location or a different species, etc. - see **Section 4.1** and draft Defra guidance on compensation hierarchy (Defra, 2021). The aim of compensation is to offset the losses caused by the impact with additional headroom where necessary to allow for factors such as uncertainty in the compensation method or in acknowledgement of non-like for like compensation.

43. For seabirds, the currently accepted compensation currency for adult mortality is typically provision for additional breeding pairs, the number of which is calculated on the basis of their productivity (chicks per pair) and the natural mortality which occurs between fledging and reaching breeding age, at which point individuals produced by the compensation colony are considered to be available to recruit to the impacted colony, thereby replacing the losses due to mortality.

44. Natural England's current advice to developers[1] is to calculate the number of pairs using the method presented by the Hornsea Three Project. This method includes details of age-related recruitment and contributions to colony productivity as well as estimates of what proportion of birds disperse from their natal colonies (where they were hatched) to recruit at other colonies. The full details of this calculation are not repeated here, however on the assumption that all the same demographic rates are used, the Hornsea Three Project method can be simply applied using a multiplier of 6.395 (assuming a natal dispersal rate of 0.77) or 5.53 (for a natal dispersal rate of 0.89). Thus, for the current predicted mean impact of 53 adults, 339 or 293 pairs are required, respectively. Natural England also recommend that compensation should account for uncertainty in the impact assessment methods, applied in this context by using the upper 95% confidence interval (CI) for compensation calculation. The upper 95% CI for kittiwake collisions apportioned to FFC SPA is 170 pairs which using the Hornsea Three Project method yields compensation pair requirements of 1086 to 939 pairs using the natal dispersal rates of 0.77 and 0.89 respectively.

45. However, other projects (Dogger Bank South, Outer Dowsing Offshore Wind, Five Estuaries) have identified potential errors in the Hornsea Three Project method and have noted excessive levels of precaution that are built into the approach, prompting Natural England to commission the British Trust for Ornithology (BTO) to undertake a review of

[1] https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010115/EN010115-001655-Natural England - Appendix D8 %E2%80%93 Natural England%E2%80%99s Advice on the Applicant%E2%80%99s Proposed Seabird Compensation Measures.pdf

compensation calculation methods. A less complicated and more transparent approach for estimating the number of pairs required follows the approach presented by the Hornsea Four Project – this is known as the "Hornsea 4" method. Natural England has recently recommended this method for estimating compensation quantum for some species such as auks, though to date, not for kittiwake. Hence, compensation quantum estimates calculated using both the "Hornsea 3" and "Hornsea 4" methods are provided.

46. As with the Hornsea Three Project method, the demographic rates used are reflected in the result obtained. Natal dispersal can be set at either 0.77 or 0.89, and these correspond to multipliers of compensation of 3.22 and 2.79. Thus, for the predicted mean impact of 53 these give compensation pair requirements (at 1:1) of 171 and 148. The upper 95% CI for kittiwake collisions apportioned to FFC SPA is 170 pairs, which using the H4 method yields equivalent compensation pair requirements of 454 pairs.

47. On top of the precaution introduced through use of the upper 95% CI value, Natural England's advice is to apply a compensation ratio to account for any uncertainty surrounding the success of compensation methods. The Applicant considers that compensation ratios should be applied on a case-by-case basis to reflect the degree of confidence in the success of the measure. Recent examples of ratios applied when determining compensation quantum by other offshore wind projects in the North Sea range from 2:1 (Sheringham and Dudgeon Extension Projects and Hornsea Four Project, proposed by Dogger Bank South and ODOW) to 3:1 (proposed by Five Estuaries using the Hornsea Four Project calculation method and mean impact number). Application of the lower ratio (2:1) to the mean impact increases the number of pairs to 678, while an application of 3:1 increases the number of pairs to 1,017. If applied to the upper 95% CI estimate at 2:1 the pair requirement increases to 907, and again to 1361 at 3:1. Note that the ratios consented (or proposed within DCO documentation) for each offshore wind project above are dependent on the impact calculation used (Hornsea Three Project method, or Hornsea Four Project method; mean or 95% upper CI) and apportionment applied when determining compensation quantum.

48. The methods for quantifying compensation continue to progress via the Dogger Bank South examination and determination of the Outer Dowsing and Five Estuaries projects. The Applicant will continue to monitor developments in order to inform compensation quantums.

2.6 Guidance

49. The Applicant has considered international, national and regional guidance in developing the compensation measures for the Project including guidance on managing Natura 2000 sites from the European commission for shortlisting measures (European Commission, 2018) and national guidance from Defra and Natural England to provide specific detail on the delivery of compensation. Defra's compensation hierarchy (Defra, 2021), outlined in their draft best practice guidance, has been considered alongside feedback from Natural England to define the draft compensation proposals set out in this report.

50. Natural England's checklist for compensatory measures (Natural England, 2021) was developed to help ensure that compensation plans meet legal and ecological standards. The checklist is intended to cover aspects of compensatory measures that should be described in detail when developers are submitting or updating applications where impacts on MPAs are anticipated. Whilst not exhaustive, it lists key areas where sufficient detail is needed to provide the SoS with appropriate confidence that compensatory measures can be secured. This checklist has been considered in the development of compensation measures to ensure that all key aspects are being considered sufficiently. The Natural England checklist summarising compensation measures considered by the Applicant for the Project is presented in **Section 5.**

2.7 Delivery Approach

51. The Applicant has considered three forms of delivery mechanism for compensatory measures: Project alone, collaborative and strategic delivery. All mechanisms have been evaluated to ensure that the chosen measure progresses in the most effective way and maximises the ecological benefit while reducing consenting risk.

Project Alone Measures: These are project alone compensation options tailored to address the ecological impacts of the Project specifically. They focus on offsetting the effects of the Project and are aimed at offsetting project specific impacts.

Collaborative Measures: These involve delivering compensation alongside other developers, to implement compensation strategies that benefit a broader ecological area or species. They aim to address cumulative impacts across multiple projects or regions, often through shared funding or joint efforts.

Strategic Measures: These are long-term, large-scale initiatives aimed at improving overall ecological resilience at a regional or national level and would be delivered by an organisation such as Defra, via the MRF. They are led by stakeholders such as government and industry bodies. They focus on delivering compensation as well as achieving broader conservation goals that wouldn't or couldn't be deliverable by a single project and are often planned and implemented over extended periods, potentially beyond the life of a single OWF project.

2.8 Strategic Compensation Delivery

52. Defra's (2021) definition of 'strategic compensatory measures' are those: *"that work across a wide area, joining up across projects and organisations to deliver an ecological benefit greater than the sum of its parts and/or measures that can only be delivered by*

Government (e.g., enhanced protection of MPAs).” The Applicant understands that Natural England regards strategic compensation as ecologically effective and could provide a solution to species or habitats impacted by multiple offshore windfarms.

53. A key challenge in delivering ecological compensation is ensuring that measures are secure and robust in the eyes of regulators and their advisors. To address this, since 2021, Defra has been developing a library of ecologically robust strategic compensation measures to support compensation cases for offshore wind projects in partnership with industry and SNCBs. The Applicant has been fully engaged with this consultation process though the OWIC P2G programme in supporting the development of the Library of Strategic Measures (LoSCM).

54. The British Energy Security Strategy (BESS) commits to both accelerating the deployment of offshore wind and to the measures proposed in the Offshore Wind Environmental Improvement Package (OWEIP) policy paper, including strategic compensatory measures and a centralised MRF to help facilitate delivery of these measures. The OWEIP is being developed by Government industry bodies to help offshore wind project applicants address unavoidable impacts to MPAs at a strategic level, facilitated through one or more MRFs into which applicants can choose to pay to discharge environmental compensation obligations.

55. The Energy Act (2023), provides the legislative basis for OWF developers to be able to adopt strategic compensation measures, provided they have exhausted all options to mitigate any impacts of development through the application of the mitigation hierarchy. The Applicant notes that secondary legislation will also be required, to set up and operate the MRF. At present, the timeline of this secondary legislation is not yet available.

56. Further commitment and guidance on the MRF were provided via the publication of the Strategic Compensation Measures for Offshore Wind Activities: Marine Recovery Fund Interim Guidance (DESNZ, 2025). The purpose of this guidance is to set out how projects can refer to strategic compensation measures in the OWEIP LoSCM during the planning and application stages of a DCO application whilst the measures are still in development.

57. Once in place, the proposed MRF will provide a framework to allow developers to contribute towards strategic compensation measures in a coordinated way through contributions to the fund and discharge their requirements to the Habitats Regulations. The MRF would provide a mechanism for the delivery of strategic compensation measures, with appropriate input from regulators and SNCBs. This coordinated approach should enable ecological benefit to the national site networks (NSNs) to be maximised and delivered in a timely manner.

58. Delivery of compensation via a strategically led programme is considered to be a potential option by the Applicant for the Project. The Applicant has been engaged with the relevant Government industry bodies including Renewable UK as strategic measures have developed. We note that progress on strategic delivery is out of the Applicant’s control and that there is currently no guarantee strategic measures will be available to the Applicant within the Project’s consenting timeframe. The Strategic Compensation Measures for Offshore Wind Activities: Marine Recovery Fund Interim Guidance (DESNZ, 2025) states “*where applicants wish to rely on offshore ANS for potential adverse effects on kittiwake ahead of the MRF being operational, they will need to be able to deliver the measure themselves, or in collaboration with other projects.”*

59. Given the uncertain timeline on when an MRF would be operational, the Applicant has considered Project alone and collaborative delivery of this measure in parallel. However, the Applicant maintains the option to contribute into the MRF as an alternative to delivery of Project alone, should ornithology compensation be made available through the MRF within the necessary timescales.

60. The Crown Estate’s CIP Plan Level HRA (The Crown Estate, 2025) was published in March 2025, and supports strategic / Project alone compensation delivery. The Applicant has considered strategic delivery alongside Project alone and collaborative measures (see **Section 3.2**).

3 Developing and Refining Compensation Measures

3.1 Method

61. This roadmap sets out the current status of the longlisted and shortlisted options being considered by the Applicant.

62. The longlist was developed based on the current understanding of the Project's impacts and compensation requirement, understanding of offshore wind HRA derogation matters in the UK, precedent for other offshore wind projects and stakeholder feedback delivered through the ETG process. Following the establishment of a longlist, a shortlist of viable options was identified through the appraisal of advice and guidance on derogation matters, available supporting evidence, timescale of implementation and experience from other projects in the UK who have completed compensation cases in support of an offshore wind DCO application. The longlist options were then assessed for suitability based on the ability of the options to deliver the required compensation, as well as ecological and technical feasibility according to guidance outlined in **Section 3.2**. Consultation feedback from key stakeholders also helped shape the appraisal of these options. The shortlist options were further appraised and refined, as outlined in **Section 3.3**.

63. The longlist, and shortlist options are outlined in **Table 3-1** along with rationale for inclusion, or exclusion of each measure from the shortlist.

3.2 Longlist

64. The preliminary stages of the ornithology HRA derogation strategy involved the creation of a longlist of measures that might be considered appropriate to compensate for project impacts to kittiwake feature of the FFC SPA. The aim of the longlist was to put forward all foreseeable measures to deliver a HRA derogation case for stakeholder input during the pre-application engagement stage. The longlist was based on the project proposal, experience with HRA within other OWFs in similar geographic regions and stakeholder feedback from ETG meetings.

65. To determine which longlist measures were going to be further developed and shortlisted, the Applicant originally proposed to use a rank and scoring methodology based on the European Commission (2018) guidance. This methodology has also been used as the favoured approach by other OWFs. However, after the second ETG 4 meeting (2 May 2024) it was clear that a limited number of measures were deemed viable by both the Applicant and Natural England. The Applicant has therefore combined publicly available information with project-specific stakeholder feedback to develop a narrative-based rationale for progressing compensation measures to the shortlist for further consideration. This is presented in **Table 3-1**.

3.3 Shortlist

66. Following a detailed appraisal of the longlist of measures identified by the Applicant, based upon evidence provided in **Table 3-1** the measure shortlisted for further investigation and consideration was:

- New / repurposing nearshore or offshore nesting structures.

67. This measure, as it was considered during the longlisting process, was further refined based on feedback from stakeholders during the EPP. The proposed measure is now 'delivery of a new offshore nesting structure'. The Applicant is continuing to consider onshore nesting structure as an option to deliver compensation for the Project, on the basis of delivery precedent for other projects but notes Natural England's concerns regarding onshore nesting structures (see **Table 1-2**). The progression from shortlisting to identifying a favoured measure for the Project is outlined in **Section 4**.

Table 3-1: Longlist of Measures to Deliver Compensation for Kittiwake

Measure	Delivery Mechanism	Summary	Rationale for Exclusion or Development of measure
Marine SPA creation covering key offshore foraging grounds	Strategic	The Applicant considered designation of an MPA based on protecting preferred foraging grounds for marine birds. MPA designation for birds is not currently within the scope of an approved MPA designation measure. Defra are collaborating with legal advisers and an MPA team to understand potential and demand for this measure.	Feedback from stakeholders was that this measure may have ecological merit, but a new designation would need to be delivered by Defra. This measure has not been considered as part of the LoSCM presented as part of the Strategic Compensation Measures for Offshore Wind Activities: Marine Recovery Fund Interim Guidance (DESNZ, 2025). As such, this measure has been **excluded** from progression to the shortlist by the Applicant.
New / repurposing onshore nesting structures / habitats	Project Alone, Collaborative	Natural England have stated that they "*do not support the provision of further onshore or nearshore Artificial Nesting Structures (ANS) as compensation for the Dogger Bank D project.*" In their formal advice (reference DAS/477591). Following the ETG 4 Meeting 2, Natural England provided discretionary advice to reiterate their position that onshore ANS remained as an unviable compensation option for the Project. This is due to a lack of evidence for onshore nesting availability being a limitation to kittiwake FFC SPA breeding success (reference DAS/493520).	Although onshore and nearshore ANS has been supported with other projects, like Hornsea Three Project and Dudgeon and Sheringham Shoal Extensions, this measure is currently considered to have reached full capacity by Natural England. Therefore, Natural England has indicated that further data and information is needed to evidence the ecological merit of onshore and nearshore ANS before this measure can be reopened again. The Applicant is mindful of Natural England's advice that they have concerns regarding the ecological merit of onshore ANS. However, the Applicant is maintaining a watching brief over the developments of other project onshore and nearshore ANS structures and will continue to monitor Natural England's feedback on other projects regarding onshore ANS. The Applicant may further investigate this measure should offshore ANS face insurmountable engineering or commercial challenges as site selection and engineering design work progresses. This measure has been **excluded** from progression to the shortlist by the Applicant at this time but may be revisited if further investigation supports its inclusion.
New / repurposing nearshore or offshore nesting structures	Project Alone, Collaborative, Strategic	Kittiwake colonies frequently nest on anthropogenic structures both onshore and offshore that may mimic features they seek on cliffs in their natural habitat, such as narrow ledges on steep sided buildings. As a compensation measure for the Project, this comes with several benefits including: • The structure can be sized according to requirements. • The structure can be placed within foraging areas. • There is ongoing decommissioning of oil & gas installations in the North Sea which will likely displace many thousands of kittiwake pairs. This will provide recruits for new offshore ANS. and • This measure is more appropriate for compensating larger scale impacts (e.g. >100 collisions). Defra has identified offshore ANS as a suitable strategic measure for wind farms 'up to and including Round 4', which includes the Project. Natural England has expressed their support for this measure, in line with the Round 4 strategic plan. In their formal guidance note (reference DAS/493520) Natural England also encouraged the Applicant to consider collaborative delivery of this measure where possible.	Offshore ANS to compensate for impacts to kittiwake from FFC SPA has been approved as a measure in the OWEIP LoSCM. This provides confidence that this approach is centrally approved as an ecologically viable option. Furthermore, there is now precedent for DCO consent for projects progressing this measure (Hornsea Four Project). Other offshore wind developers are also looking to deliver offshore ANS due to support from SNCBs for this measure. The development of a new or repurposed offshore ANS is supported by SNCBs provided it can deliver a compensation ratio greater that 1:1. This compensation measure is being explored by several other developers (Dogger Bank South, ODOW) in the North Sea. The Crown Estate's CIP Plan Level HRA (The Crown Estate, 2025) concluded that despite a level of uncertainty in regard to the effectiveness of offshore ANS it is a feasible form of compensation based on existing precedent for other OWF projects and the Round 4 Plan Level HRA. It is expected that this measure will be delivered on a strategic level once the MRF is operational. However, if the MRF is not in place before construction of the Project begins, collaborative and project-alone delivery will be progressed for offshore ANS. As such, this measure has been **shortlisted** and is discussed in detail under **Section 4**.

Measure	Delivery Mechanism	Summary	Rationale for Exclusion or Development of measure
		Natural England supports the use of The Crown Estate plan level search areas as a basis to inform site selection at this stage. Further to this, Natural England advises the Applicant remains up to date with the kittiwake metapopulation research undertaken by the ORJIP (DAS/477591). Additionally, Natural England recommend building resilience into the design at an early stage, including providing structures with a compensation ratio greater that 1:1. Natural England support spreading structures across different biogeographic regions within the Northern North Sea in support of satellite populations to widen the FFC SPA recruitment pool (DAS/477591). Natural England are interested in understanding the Applicant's engineering and maintenance concerns surrounding offshore ANS to inform future discussions (DAS/493520). The areas of search (AoS) for the placement of an offshore ANS by the Applicant has used The Crown Estate plan level search areas (The Crown Estate, 2024) as a starting point, with further refinement of the preferred AoS in line with engineering and logistical constraints unique to the Project.	
Enhancing colony establishment either at an onshore artificial nesting site or a natural colony	Project Alone	Enhancing breeding success of kittiwake at artificial locations by encouraging them to breed on optimal nesting ledges or by providing additional nesting locations where the colony size has increased beyond nesting availability.	There is a lack of evidence of location where the measure is relevant and a low degree of confidence that the measure would be feasible at the scale required for this Project. As such, this measure has been **excluded** from progression to the shortlist by the Applicant.
Herring gull control	Project Alone	This would involve the removal of herring gull from the FFC SPA through lethal methods to reduce their impact on the kittiwake population.	The implementation of this measure would be legally and ethically dubious particularly given the species conservation status. As such, this measure has been **excluded** from progression to the shortlist by the Applicant.
Predator management	Collaborative, Strategic	This measure would involve the reduction of predator species through lethal methods within the FFC SPA. These would be predators such as rats or scavenger species which take eggs and chicks from the nest. It would be important to establish the presence of predator species through trapping and camera surveys before progressing this measure further.	The Crown Estate's CIP Level Plan HRA (The Crown Estate, 2025) supports compensation for kittiwake through predator eradication, when used as a package with other compensation measures. The CIP Plan Level HRA however does acknowledge there is currently no evidence of predation to kittiwake from mammalian predators within the FFC SPA. Due to the nature of kittiwake nesting on ledges, chick predation by mammalian predators is not currently thought to be a driving factor behind species decline at FFC SPA. As such, this measure has been **excluded** from progression to the shortlist by the Applicant at this stage.
Peregrine falcon diversionary feeding / prey enhancement	Project Alone	The Applicant considered reducing impacts of predation on established colonies from Peregrine falcon diversionary feeding or prey enhancements.	The success of this measure was considered very uncertain to implement and logistically challenging. As such, this measure has been **excluded** from progression to the shortlist by the Applicant.
Great skua exclusion	Project Alone	Management of avian predators such as skuas which are known to predate kittiwake, their chicks and eggs.	This presence of great skua is not considered to be a significant pressure on the target populations of kittiwake at the FFC SPA.

Measure	Delivery Mechanism	Summary	Rationale for Exclusion or Development of measure
			As such, this measure has been **excluded** from progression to the shortlist by the Applicant.
Fisheries control measures	Collaborative, Strategic	The management of key fisheries such as sandeel for kittiwake could result in an increased food supply, thus increasing the productivity for FFC SPA kittiwake. The UK sandeel fishery in the North Sea is currently closed following an announcement by Defra to this effect in early 2024 (although the EU has lodged a challenge to this decision). Consequently, sandeel fisheries closure is not a securable compensation option at this stage. However, sandeel fisheries closures remains the most ecologically beneficial measure to offset impacts of offshore wind development, and this conclusion was supported in both the Round 4 and CIP Plan Level HRA. The Applicant therefore continues to engage with Defra and government industry bodies on this measure. Other species of forage fish that kittiwake prey on include sprat and juvenile herring. There may be options to manage or purchase quota for these fisheries in order to reduce competition with seabirds, although this would not be without its challenges.	There is the possibility of delivering this measure on a strategic basis, but delivery would be beyond the Applicant's control. This measure would need to be delivered by Defra with input from the MMO and relevant inshore fisheries conservation authorities (IFCAs). The Crown Estate's CIP Plan Level HRA (The Crown Estate, 2025) acknowledges the ecological benefit of sandeel fishery closures on kittiwake population. However, the CIP Plan Level HRA also states "*Defra announced plans on 31 January 2024 for a permanent closure of 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 available as a compensation measure.*". Currently sandeel fishery closures is not a securable compensation option as a Project alone option at this stage. However, the Applicant would support this option should it become available and will continue to engage with Defra and government industry bodies on this measure. As such, this measure has been **excluded** from progression to the shortlist by the Applicant.
Prey habitat enhancement	Project Alone	Where like-for-like compensation is not achievable, it may be necessary to consider alternative options, such as measures that would provide a comparable ecological function. For example, the Dogger Bank SAC SACO identifies that as part of a sandbank's function it provides nutritional resource to prey species, which benefits foraging seabirds like kittiwake, whose population within the FFC SPA will spatially overlap. Kittiwake rely heavily on sandeel, sprat and juvenile herring as part of their diet. The Applicant proposed measures that could increase food resources, particularly sandeel biomass, to be employed as compensation for potential impacts on kittiwake as a result of the Project.	This measure was considered to be challenging at the required scale, and there is limited knowledge of what (if any) habitat enhancement might be necessary for prey species of kittiwake in the North Sea. As such, this measure has been **excluded** from progression to the shortlist by the Applicant.
Supplementary feeding	Project Alone	Unplanned supplementary feeding is already common in the North Sea, with the dumping of offal from commercial fisheries providing important sustenance to seabirds, particularly during periods of low prey availability. This option has also been suggested as a potential adaptive management option for other offshore wind project progressing with ANS options. Controlled supplementary feeding could increase survival rates for kittiwake affected by the Project operation. However, this method of feeding cannot be targeted when carried out in the North Sea, with the potential for non-target species to also benefit from the provision of offal. This is important when considering predatory or competitor species for kittiwake, such as gulls, which often steal food from kittiwake.	The success of this measure is very uncertain and to implement it will be logistically challenging. Additionally, supplementary feeding of wild bird populations can lead to unintended consequences such as: • By-catch -birds relying on this method of feeding may be more susceptible to being caught by commercial fishing vessels as they associate vessels with food supply; • Introduction of invasive and non-native species (INNS) and disease - if animal products are outsourced, there is a risk of INNS and non-native diseases being introduced to the ecosystem; • Changes in behaviour - bird community composition can be altered as birds become accustomed to anthropogenic presence and rely less on natural foraging behaviours; and • Ecosystem dynamics - leftover animal products from supplementary feeding can alter marine ecosystem dynamics such as biogeochemical cycling.

Measure	Delivery Mechanism	Summary	Rationale for Exclusion or Development of measure
			As such, this measure has been **excluded** from progression to the shortlist for offshore ANS by the Applicant at this stage.
Wardening, signage, diverting trails, funding to increase awareness	Project Alone	Due to the kittiwake population of the FFC SPA utilising high, steep cliffs for nesting there is little chance of disturbance from visitors to the site. The addition of wardens, signage and trail diversions are more suitable for habitats accessible to human visitors and likely to be accidentally disturbed. Funding to increase awareness may be useful to reduce stigma around the kittiwake in areas where it may be less welcome due to issues with noise and guano (e.g., Newcastle) but the FFC SPA does not suffer from these conflicts.	There is no evidence that the kittiwake population at the FFC SPA are affected by human visitors to the site. As such, this measure has been **excluded** from progression to the shortlist by the Applicant.
Entanglement, oil spill management	Project Alone	An increasingly prevalent anthropogenic pressure on seabirds in the North Sea is entanglement with fishing gear. In particular, long lines can lead to the mortality of multiple birds along their length when not deployed with foraging seabird species in mind. Oil spill management relates to Project-operated vessels during the construction, operation and decommissioning of the Project. Embedded mitigation measures, such as following developing an oil pollution emergency plan (OPEP), can reduce the impacts on marine life should an oil spill occur. This measure is difficult to implement on a Project alone basis, particularly entanglement. Oil spill management can be controlled under embedded mitigation measures.	There is currently little indication that impacts from entanglement and oil spills affect the kittiwake population of the FFC SPA in the wider North Sea. As such, this measure has been **excluded** from progression to the shortlist by the Applicant.

4 Offshore Artificial Nesting Structures

4.1 Overview

68. Following consultation with ETG members, and further research into the viability of each compensation measure, the shortlist was reduced to a single preferred option for further development by the Applicant at this time: provision of additional nesting spaces through the development of an offshore ANS.

69. The position on this measure was determined on the basis of it being approved as ecologically viable through the OWEIP LoSCM and The Crown Estate's KSCP (The Crown Estate, 2024) and following consultation through ETG 4 meeting 1 on 28 May 2025 which identified this measure as the most viable option to deliver effective compensation. The conclusions for the CIP-Level RIAA will also be taken into account for this measure when the final document is published in due course.

70. The Applicant is developing a HRA derogation case based on the development of an offshore ANS which will provide a suitable number of nesting structures. The measure will provide additional available nesting spaces equivalent to the agreed final impact quantum that the Project is having on the kittiwake feature of the FFC SPA. This would provide additional numbers of kittiwake into the wider population that would be available to recruit into the FFC SPA.

71. Offshore ANS aim to increase the productivity of kittiwake within the species' biogeographic range by providing additional nesting space within foraging range to productive feeding grounds and encourage the creation of an additional colony.

72. Kittiwakes are known to readily utilise man-made structures for nesting both onshore and offshore. The Hornsea Three Project have implemented a nearshore ANS off the coast Lowestoft in Suffolk, specifically for the purpose of compensating Project impacts to kittiwake populations designated to the FFC SPA. Onshore ANS have also been installed in recent years for the purpose of delivering compensation (Vattenfall, 2023). Further information is presented in **Section 4.2.2**.

73. By adding numbers of birds to the wider North Sea meta-population which would then be available to recruit to the FFC SPA population, this approach delivers compensation via addressing "supporting function in a different location" level of the Defra Compensation Hierarchy (Defra, 2021). SNCBs have confirmed that delivery of an offshore ANS measure has ecological merit for the Project impacts.

74. The Applicant has considered three potential delivery mechanisms for this measure: Project alone, in collaboration with other OWF projects needing to compensate for the same impact to the same feature, and strategically through the delivery via a contribution to the MRF. SNCBs have advised that the Applicant prioritises Project alone and collaborative measures as a priority due to the current uncertainty on the availability of an MRF to deliver offshore ANS as a strategic compensation measure. This position was corroborated by the release of the Interim Guidance on OWF use of an MRF to facilitate strategic compensation which stated: "*where applicants wish to rely on offshore ANSs for potential adverse effects on kittiwake ahead of the MRF being operational, they will need to be able to deliver the measure themselves, or in collaboration with other projects*". Should ornithology compensation via the MRF become available within the necessary timescales for the Project and be relied upon to discharge the Applicants' ornithology compensation requirements, the Applicant may seek to contribute to the MRF in place of Project alone or collaborative delivery.

4.2 Ecological Evidence for ANS as compensation

4.2.1 Nesting Site Availability

75. Between the late 1960s and mid-1980s, the UK kittiwake population increased rapidly, at the same time kittiwakes began breeding on artificial structures in coastal urban environments (Coulson J. C., 2011). From 1995 the UK population declined rapidly and despite a slight population recovery, UK kittiwake populations remain ~50% under the 1986 baseline (JNCC, 2024). Regardless of population declines this species continues to urbanise, with kittiwakes increasingly colonising on buildings and piers (Coulson 2011; Christensen-Dalsgaard *et al*., 2020). These man-made structures provide similar and, in certain circumstances, better (e.g., positioning can be created to maximise use and success, i.e., north facing etc.) nesting requirements than the species natural sites (i.e., narrow ledges on steep cliffs near water) and refuge to kittiwakes as natural populations decline (Coulson, 2011 Christensen-Dalsgaard *et al*., 2020).

76. Many OWF developers have considered the construction of onshore and nearshore nesting structures to deliver compensation for the impacts of their projects including the Hornsea Three Project and Hornsea Four Project, Norfolk Boreas, Norfolk Vanguard and Sheringham and Dudgeon Extension Projects. The Applicant has received feedback from Natural England (see **Table 1-2**) that, given the amount of progress made by other projects on developing onshore ANS, they do not consider nesting space to be a limiting factor for kittiwake seeking to breed closer to shore. However, given that there is clear historic evidence of kittiwake nesting on man-made offshore structures (see **Section 4.2.2**), and no developer has yet built an ANS offshore, capacity remains for the provision of nesting space offshore. Further to this, many of the existing structures in the North Sea (predominantly oil and gas structures) built in the 1970s and 1980s are coming to the end of their working life, these structures will need to be decommissioned therefore potentially reducing the nesting space capacity available to the North Sea population of kittiwake. The Applicant has commissioned a two-year digital aerial video survey campaign to supplement existing knowledge on presence and distribution of

kittiwake on offshore structures in the North Sea. This information is being used to inform site selection and definition.

4.2.2 Evidence for Artificial Nesting Structures

77. Kittiwake have been recorded colonising and breeding on man-made offshore structures since the early 1990s, across the Norwegian and North Sea (Christensen-Dalsgaard, Langset, & Anker-Nilssen, 2020). In 2019, 1,164 breeding pairs were recorded across four offshore oil rigs, on the Norwegian shelf (Christensen-Dalsgaard, Langset, & Anker-Nilssen, 2020). In the UK, the first known successful breeding on a UK offshore ANS occurred in 1998 at Morecambe Gas Platform (Irish Sea) (Unwin, 1999). The presence of kittiwakes has been established at least 100 ANS in northern European waters, with 26 of those confirmed to be supporting breeding pairs (Ørsted, 2021). The number of offshore breeding colonies are also thought to be increasing, with kittiwake colonising new structures as recently as 2016 (Christensen-Dalsgaard, Langset, & Anker-Nilssen, 2020).

78. 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. These surveys identified the presence of nine breeding colonies in the Southern North Sea which 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.

79. ODOW completed surveys of offshore breeding kittiwake populations in the Southern North Sea in summer 2022 and 2023 (Outer Dowsing Offshore Wind Farm, 2024). Boat-based surveys of 17 offshore installations within a 20km radius of the proposed ODOW array areas found that six offshore installations supported nests each year.

80. The Applicant has commissioned offshore oil and gas platform surveys in North Sea to understand current nesting capacity and the number of structures to be decommissioned within the area. These data have been a consideration when comparing the relative merits of candidate AoS in the site selection work.

4.3 Delivery

81. The Applicant has considered delivery of the measure: provision of additional nesting spaces through the development of an offshore ANS, via three mechanisms:

    1. A single Project alone ANS developed by the Applicant;
    2. Sharing nesting capacity on an offshore ANS constructed by another developer; and
    3. Provision of funding into the MRF to allow for an offshore ANS structure to be delivered strategically by centralised government.

82. The mechanism for delivery may involve one or a combination of the above.

4.3.1 Delivery as a Project Alone Measure

83. The Applicant is principally considering the option to deliver an offshore ANS structure as a Project alone measure due to uncertainty regarding timelines for the delivery of the MRF and guidance from DESNZ (DESNZ, 2025) which states that where applicants wish to rely on offshore ANSs for kittiwake ahead of the MRF being operational, they will need to be able to deliver the measure themselves, or in collaboration with other projects. As such, the Applicant has undertaken site selection work to identify a suitable site that could be developed, and it is confident that an offshore ANS structure developed at this site would provide suitable nesting capacity to fulfil its compensation requirements.

4.3.2 Delivery as a Collaborative Measure

84. The Applicant is exploring the potential for collaborative delivery, actively engaging in collaborative opportunities in parallel to progressing Project alone delivery. Delivery of nesting spaces via an ANS delivered by a third party will be pursued if it has the potential to deliver effective compensation within the timeframes required by the Project, subject to appropriate commercial agreements. Should discussions on collaboration progress, the Applicant will provide evidence of any agreements to demonstrate the forward motion of collaboration and commitments made.

85. Collaboration with other developers is supported through the Strategic Compensation for Offshore Wind Activities: Marine Recovery Fund Interim Guidance (DESNZ, 2025):

> *"Where possible, applicants should work collaboratively to ensure that larger and fewer offshore ANS are placed in optimal sites. Evidence of this planned collaboration should be included in applications."*

86. Collaborative delivery could provide benefits for the Project in terms of securing nesting space and being able to demonstrate ecological functionality ahead of any project timelines associated with a Project alone measure. Securing nesting space on an offshore ANS being delivered by another developer working to a more advanced programme would accelerate the ability of the Applicant to provide compensation. The Applicant is currently engaging with Round 4 projects either undergoing DCO examination or in the determination stage to assess the potential for a commercial collaborative agreement.

4.3.3 Delivery as a Strategic Measure

87. Primary legislation through the Energy Act 2023 is in place to allow offshore wind developers access to strategic compensation measures. However, for developers to access these strategic measures, secondary legislation, which is still forthcoming, will be required to allow for the creation and management of an MRF. It is intended that offshore wind developers will be able to contribute to these strategic measures via contributions to the MRF. Further information on the status of strategic compensation is detailed in the Strategic Compensation for Offshore Wind Activities: Marine Recovery Fund Interim Guidance (DESNZ, 2025). The interim guidance states:

> "*Defra Secretary of State has approved this measure [offshore ANS] for inclusion as a strategic compensation measure in the LoSCM on the basis that it should only be used by proposed developments up to and including Leasing Round 4. Where applicants wish to rely on offshore ANSs for potential adverse effects on kittiwake ahead of the MRF being operational, they will need to be able to deliver the measure themselves, or in collaboration with other projects*."

88. Given the uncertain timeline on strategic delivery of offshore ANS, and the suggestion in this statement that ahead of the MRF being operational these measures should be delivered by the projects themselves or in collaboration with other projects, the Applicant is unable to provide any further information on the adoption of this measure via a contribution to the MRF. However, the Applicant would be open to utilising the method of delivery for compensation as an alternative to Project alone should this come forward within required timescales. The Applicant will continue to engage actively through OWIC in the work of the COWSC Implementation Groups, and the development and delivery of strategic ornithology compensation via the MRF.

4.3.4 Scale

89. Preference has been given to compensatory measures which are able to provide compensation for the entire compensation requirement for the Project. It is preferable for the Applicant to be able to compensate for impacts to kittiwake utilising a single measure, though it is recognised that a suite of measures may be necessary. The need for any adaptive management should a single measure prove insufficient will be assessed once the Project is operational, the impacts of collision are better understood, and the performance of compensation measures can be determined. As explained in **Section 2.5**, the estimated number of pairs required by the Project to compensate for a mean of 53 annual collisions is 339 (at a 1:1 ratio). If the upper 95% CI is substituted for this, the number of pairs required is 170 pairs. In recent advice to developers Natural England has also advised a compensation ratio on top of this of 3:1 (i.e. multiply these values by three). The Applicant considers this to represent an unnecessary level of inflation and that either the upper 95% CI value with no extra ratio should be applied, or the mean value with a 3:1 ratio applied, but not both sources of precaution.

4.3.5 Project Led offshore ANS - Site Selection

90. Considerable site selection work has been undertaken by a number of organisations seeking to deploy an offshore ANS, including NIRAS (The Crown Estate, 2024), Ørsted (2023) and ODOW (2024).

91. NIRAS, on behalf of The Crown Estate, as part of the Round 4 Plan level HRA Round 4 KSCP, carried out a site selection exercise to identify areas within the North Sea for the possible placement of an offshore ANS (KSCP: The Crown Estate, 2024). This study acknowledged that the areas it identified were not considered to be an exhaustive representation of potentially suitable areas for siting an offshore ANS and noted that their initial site selection should not rule out the further consideration of remaining areas as new information may become available in the future. An appraisal of the AoS presented in the KSCP, along with a review of the data used to inform the NIRAS site selection work, was conducted. Additionally, an assessment of processes undertaken by Round 4 OWF developers on offshore ANS site selection resulted in the Applicant identifying the value in carrying out its own site selection work for consideration, in addition to the work undertaken as part of the KSCP. Natural England has supported the Applicant's approach in identifying potentially new AoS previously not identified in the KSCP or by other OWF projects.

92. The Applicant's site selection work has been split into several phases:

93. **Initial site identification** – The Applicant applied established methods (see KSCP, The Crown Estate, 2024) to identify AoS which may be suitable for offshore ANS development by the Applicant. 'Hard' and 'soft' constraints data were used to identify all potentially suitable areas within the North Sea for the installation of an offshore ANS. The locations proposed by other OWF developers were also considered during this phase of work to enable appraisal of these locations in addition to those identified by the Applicant.

94. **Shortlisting of sites** – The Applicant engaged with Natural England (via ETG on 6 November 2024 and a detailed workshop meeting on 24 February 2024) and engineers to understand the merits and limitations of each AoS identified in Phase 1. The Applicant also engaged with RSPB and Natural England with regards to available data from the FFC Seabird Monitoring Group to help build context on potential ecological site suitability. This is further discussed below. A constraints assessment allowed for the down selection of sites to a shortlist for further consideration. Each of the shortlisted sites was considered to be suitable from an ecological and physical standpoint, with further investigations required to better understand individual site conditions.

95. **Down selection and site refinement** –The Applicant used project commissioned data from shipping and navigation assessments to refine the shortlisted AoS to smaller sites representing minimal risk for shipping and navigation. The purpose of this phase was to identify smaller AoS to be progressed for site investigation surveys.

96. **Final site selection for DCO submission** - The Applicant is currently progressing with coarse gridded geophysical surveys of the down selected AoS and preliminary desk based geotechnical risk assessment in order to inform further site refinement and down selection. Engagement with the ETG will continue throughout this process to ensure ecological merit continues to be a key driver of site selection. The final site selection for DCO submission will consider feedback from PEIR consultation.

97. The Applicant utilised hard constraints data, adapted and updated from the data provided in the KSCP, to identify areas of planned or existing infrastructure and offshore developments and licenced activity areas that should be excluded from the wider AoS. This was used alongside the NIRAS ecological suitability data (The Crown Estate, 2024) during the development of the initial site selection work to identify potentially suitable locations that had not been identified by other OWF projects, or in the KSCP. Identification of new AoS also incorporated high level overview of vessel traffic and seabed depth suitable for installing a fixed bottom structure.

98. As well as seeking to identify new sites not previously considered by other projects, site selection work also incorporated sites identified as part of the Round 4 KSCP and sites identified separately by ODOW. These sites were considered to ensure that the Applicant were fully appraised of their suitability should an offshore ANS located at one of these sites be brought forward as an option to deliver this measure collaboratively.

99. The NIRAS ecological suitability score was used as the basis for ecological justification in the initial site selection work. This score has been developed and approved for The Crown Estate Round 4 Plan Level delivery of an offshore ANS through consultation with regulators, SNCBs, government departments and Environmental Non-Governmental Organisations (eNGOs) as part of the Round 4 Strategic Compensation Plan (The Crown Estate, 2024). This scoring system was developed by NIRAS to summarise representative data sets of various key parameters that would suggest potential areas of preference for kittiwake based on known behaviour. These scores were summed into 10km^2 grids. The NIRAS ecological suitability score criteria and data used is outlined in **Table 4-1.** The Applicant gave preference to areas which scored highest in this suitability score that were not also constrained by other factors.

Table 4-1 NIRAS ecological suitability score Criteria and Data

Criteria	Data used
Proximity to foraging areas – proximity to tidal fronts	Miller & Christodoulou (Frequent locations of ocean fronts as an, 2014) produced maps identifying frontal locations which have been widely used in the recommendation of UK MPAs.
Proximity to foraging areas – proximity to sand eel habitat or other proxies indicating high likelihood of prey availability	Marine Scotland (Langton, Boulcott, & Wright, 2021) produced verified distribution models for the lesser sandeel *Ammodytes marinus*, with maps predicting the occurrence and likely density of sandeel in parts of the North Sea. The probability of presence of buried sandeel in the North Sea study region was used in the heatmap process to identify potential prey resources for kittiwake.
Proximity to existing kittiwake colonies	Proximity to existing small colonies (<5,000 pairs), with higher value given to sites closer (likely to be within visual range) with decreasing value based on dispersal distances detailed in Coulson (2011).
Avoidance of areas where intra specific competition is high	Predictive modelling informed by seabird tracking data used to map key hotspots for Kittiwake (Cleasby, et al., 2020);(Wakefield *et al.*, 2017)
Likelihood of exchange with FFC population but avoiding direct competition	A 55km buffer to avoid core foraging range (based on (Woodward, Thaxter, Owen, & Cook, 2019) but within 100km to ensure connectivity on the basis of (Coulson J. C., 2011).

100. Following presentation of these methods and data at ETG 4 Meeting 2, held on the 6 November 2024, Natural England suggested the following amendments/ clarifications to the site selection process:

- Incorporation of kittiwake tracking data collected by the FFC Seabird Monitoring Group (SMG); and
- Use a 150km buffer from the FFC SPA to represent connectivity from the FFC SPA.

101. The FFC SMG is a cross-sector group which comprises SNCBs, eNGOs, local government organisation, local bird observers and offshore wind developers. Since 2017, long term monitoring has been in place including colony counts, breeding success and tracking data. It is this tracking data which Natural England have suggested the Applicant incorporate into AoS site refinement.

102. The Applicant understands that tracking data to understand kittiwake foraging distances from the FFC SPA during the breeding season have been collected each year since 2017. To date the Applicant has received the 2017 FFC seabird tracking fieldwork report (Wischnewski *et al*., 2017) and a relevant extract from the 2018 report from RSPB (Harris, et al., 2019).

103. The tracking data collected in 2017 by the FFC Monitoring Group has been presented as utilisation distributions (UDs) for kittiwake. The UDs identify the areas used by tagged birds (i.e. their 'home ranges') and within that the areas which are used most frequently. This information has been used to supplement the other available data on ecological suitability and constraints. As well as identifying foraging areas, the UDs also indicate the intensity of that usage. Thus, the degree of importance to kittiwake from FFC SPA, ranked from high (50% UD) to low (90% UD), provides a more refined guide to provide context for offshore ANS site selection and allows a greater emphasis to be placed on avoiding the most highly utilised areas. Additionally, modelled utilisation distribution data from Cleasby et al. (2020) was appraised, and furthermore, the Applicant notes that this data was incorporated into the ecological suitability data polygons produced by NIRAS and considered in the initial site selection stages (The Crown Estate, 2024). The Applicant has engaged with key stakeholders including Natural England and RSPB throughout the site selection process and are content that they have considered all of the available evidence in the site selection process to date.

104. The 50% UDs contour has been interpreted to suggest areas to avoid in order to minimise the risk of resource competition with birds from FFC SPA. This approach was supported by Natural England in advice received on 19 December 2025, and during a subsequent meeting held on 24 February 2025.

105. However, given that these data were only derived from two years and from just 18 birds (168 trips) and 15 birds (102 trips) respectively, there is not sufficient confidence to utilise the tracking data alone and therefore these tracking data are being used as guidance for site refinement and context in determining site suitability. A position which was subsequently confirmed in consultation with Natural England in meetings held 24 February 2025, and 6 March 2025.

106. Recruitment from the offshore ANS to FFC SPA is also a factor to be considered (e.g. through the application of a maximum connectivity distance to FFC SPA). This has previously been applied as 100km to 150km, derived from observations of recruitment between colonies (Coulson J. C., 2011). The Applicant considered it is pertinent to note that these results were obtained between coastal colonies, which offer a wider range of sites (and hence distances) for recruitment. In contrast, emigrants from an isolated island colony (e.g. an offshore ANS) would not simply fail to recruit to FFC SPA because it was located 200km away, since that colony, being the largest in the UK, would remain attractive at much greater distances, and there are likely to be few alternatives.

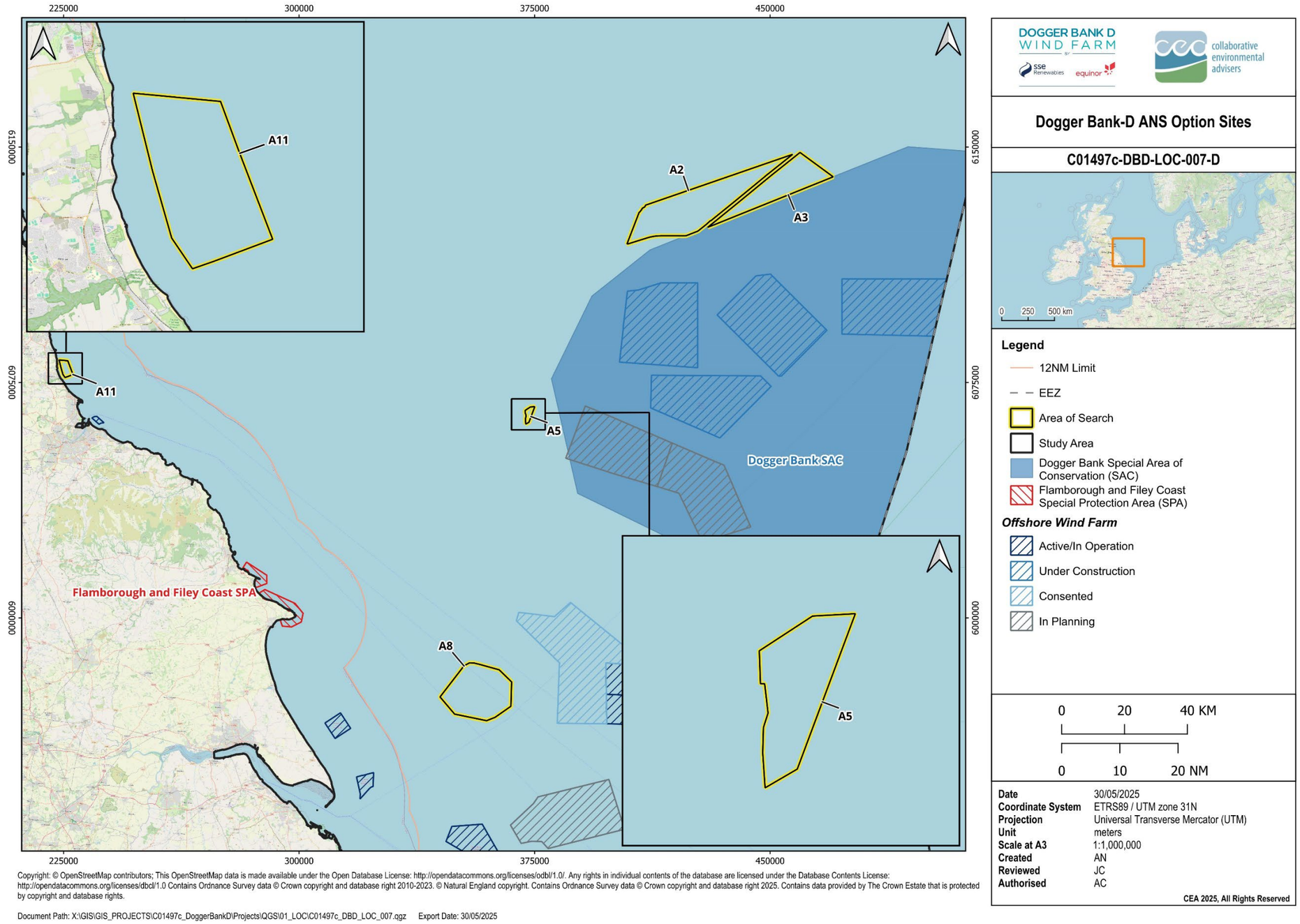
107. Nonetheless, it is likely that a proportion of emigrants from an offshore ANS would recruit to colonies on other offshore platforms (e.g. oil and gas) since it is almost certain there will be one or more closer than FFC SPA. This potential is illustrated in the presence / absence results from the survey of kittiwake on platforms conducted by the Applicant in 2024. However, given the uncertain future for many of these platforms, the provision of a bespoke nesting structure would also be beneficial to the birds using these platforms, and overall inter-connectivity between these populations will benefit the kittiwake population's resilience more generally. It is also of note that some existing colonies are found close to FFC SPA UDs, however given the likely comparative size of platform populations, these will not represent notable competition to the tens of thousands that breed at FFC SPA. The same is also likely to be true for an offshore ANS population numbering no more than a few thousand pairs.

108. Taking all these factors into account, the Applicant proposes to proceed with site selection with the following ecological constraints:

- Use foraging preference as an inverse guide for offshore ANS site locations (e.g. highest foraging preference – 50% UD to be avoided wherever feasible).
- Distance to FFC SPA >55km and ideally <150km, but some flexibility in the latter (i.e. could be >150km if required to satisfy other factors).

109. The Applicant applied these factors alongside further engineering, operational and maintenance constraints to identify its final proposed sites, details of the constraints considered, and the locations of the final sites are illustrated in **Figure 4-1.**

Figure 4-1 Map of candidate sites within the ANS search area



Document Path: X:\GIS\GIS_PROJECTS\C01497c_DoggerBankD\Projects\QGS\01_LOC\C01497c_DBD_LOC_007.qgz Export Date: 30/05/2025

4.3.6 Measure of Success & Timeline

110. The measure will be considered successful if it delivers the required number of adult kittiwakes to offset the predicted impacts of the Project on the North Sea meta-population, thereby supporting the population available to recruit to the FFC SPA. Details regarding the compensation quantum and the scale of the proposed offshore ANS are provided in **Section 2.5** and **Section 4.3.4.**

111. 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.

112. Kittiwakes are known to start breeding on average at four years old (Horswill & Robinson, 2015) although a proportion of kittiwakes (26.5%) breed for the first time at three years old (Coulson J. C., 2011). These timelines have been the historic precedent for wind farms seeking to compensate impacts through the delivery of additional nesting capacity. However, recent decisions to accept non-material changes for several OWF developments have suggested that demonstration of success can be achieved in two full kittiwake breeding seasons rather than four full breeding seasons. This was based on ecological modelling which demonstrated that ANS would deliver sufficient compensation over the structure's lifetime. The Applicant will prepare its own case using the same models and project specific numbers for offshore ANS to be installed two years prior to construction, to be provided in support of the DCO submission.

4.3.7 Monitoring and Adaptive Management

113. The Applicant would need to demonstrate that any offshore ANS is successfully delivering the required compensation quantum and would do this by monitoring of the ANS. Suitable monitoring methods will be determined following the identification of a development location and the completion of the ANS concept design. All monitoring will be conducted in accordance with best practice guidance where available.

114. The KSCP presented for the Round 4 Plan Level HRA (The Crown Estate, 2024) recommends that monitoring the success of an ANS 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).

115. The monitoring plan for the Project will build on the monitoring regimes that have been consented by other projects intending to deliver ANS as well as expert advice from ornithologists, as well as the recommendations made in the CIP Plan Level HRA, and any subsequent Plan Level HRA Compensation Plan.

116. Details on the process for determining potential trigger points for adaptive management are provided in Round 4 Plan Level HRA KSCP (The Crown Estate, 2024) along with possible adaptive management measures. Adaptive management measures will continue to be considered as the Project progresses with outline proposals submitted with the final application. Where appropriate to do so, the Applicant will take account of any updated guidance from COWSC (such as a finalised Kittiwake CIMP), as well as any applicable documents published as part of the CIP Plan Level RIAA package.

4.3.8 Next Steps

117. The Applicant will continue to progress options for the delivery of a Project alone or collaborative offshore ANS for kittiwake. The Applicant will also continue to engage with Defra and maintain a watching brief on the operation of the MRF and its applicability and availability to the Project. The next steps for delivery for each option are presented below in **Sections 4.3.8.1** - **4.3.8.3**.

4.3.8.1 Project Alone Delivery

118. The next steps for Project alone delivery of kittiwake compensation via offshore ANS are outlined in **Table 4-2**.

Table 4-2 Summary of next steps for delivery of offshore ANS

Task	Date
Stakeholder engagement with key parties including Trinity House, Maritime and Coastguard Agency (MCA), The Crown Estate, MMO, Natural England & RSPB.	Ongoing
Continued engagement with OWF developers regarding collaborative delivery of offshore ANS.	Ongoing
Desk-based ANS AoS site refinement to identify candidate sites to progress geophysical and geotechnical surveys.	Q1 - Q2 2025
ANS concept design process - development of topside and foundation designs.	Q2 - Q4 2025
Geophysical and benthic surveys of candidate sites to establish ground conditions and inform site characterisation.	Q2 - Q3 2025
Selection of final ANS location based on survey data and consultation with project engineers and outcome of CIP Plan Level RIAA.	Q3/Q4 2025
Provision of a PEIR of offshore ANS and targeted S42 consultation.	Q4 2025

Task	Date
Development of monitoring strategy and adaptive management plans following the confirmation of the ANS site to be progressed.	Q3 - Q4 2025
Submission of detailed compensation case including final impact numbers, compensation quantum and high-level kittiwake compensation monitoring plan with the final application.	Q3 2026

4.3.8.2 Collaborative Delivery

119. The next steps for collaborative delivery of kittiwake compensation via offshore ANS are outlined in **Table 4-3**.

Table 4-3 Summary of next steps for collaborative delivery of offshore ANS

Task	Date
Stakeholder engagement with key parties including Natural England & RSPB.	Ongoing
Continued engagement with OWF developers regarding collaborative delivery of offshore ANS.	Ongoing
Development of commercial agreements should an opportunity for collaboration via apportioned nesting spaces on another developers ANS be identified.	2025 - 2026

4.3.8.3 Strategic Delivery

120. As per the latest Interim Guidance on the strategic compensation measures for offshore wind activities (DESNZ, 2025). OWF projects requiring compensation for kittiwake have been advised not to rely solely on a strategic option to deliver offshore ANS ahead of the MRF being operational. Given that there is currently no date for implementation of strategically delivered offshore ANS, and little clarity on how the MRF will operate once operational in late 2025, the Applicant will closely monitor the evolution of this delivery option.

121. Following guidance from DESNZ (2025), the Applicant will continue to work closely with SNCBs, Defra and the relevant regulators and stakeholders to develop a without prejudice compensation plan to submit with their DCO application.

5 Summary

122. A summary of the Projects preferred compensation measure to offset potential impacts against kittiwake (offshore ANS) is provided in the form of the Natural England checklist for compensation measures in **Table 5-1**. Each of the possible delivery mechanisms is provided for clarity on differences between the three options being progressed in parallel by the Project at present.

Table 5-1: Checklist for Compensation Measures as per Natural England (2021)

Natural England Compensation Checklist	Delivery of an offshore ANS (delivered by the Project alone)	Delivery of an offshore ANS (delivered in collaboration with other developers)	Delivery of an offshore ANS (delivered by via a contribution to the MRF / strategically via Government)
What, where, when: clear and detailed statements regarding the location and design of the proposal.	**What**: Increasing the number of available nesting spaces by developing and installing an offshore ANS within an area of the North Sea which ensures connectivity to the existing FFC SPA population. **Where**: At a site selected by the Applicant which has undergone a suitable site selection process to identify a location which would maximise the potential for kittiwake colonisation and connectivity with the FFC SPA. **When:** The Applicant would have control over the development of the infrastructure. The aim would be to have the structure in place and functioning in line with timelines agreed.	**What:** Increasing the number of available nesting spaces by developing and installing an offshore ANS within an area of the North Sea which ensures connectivity to the existing FFC SPA population. **Where**: At a site selected by the Applicant developing the measure. The site selection and project design will have been through robust consultation in line with the Project alone measure presented by the Applicant. **When**: Timeline would tally with the offshore ANS developer building the structure.	As per the Strategic Compensation for Offshore Wind Activities: Marine Recovery Fund Interim Guidance (DESNZ, 2025) "*Defra Secretary of State has approved this measure for inclusion as a strategic compensation measure in the LoSCM on the basis that it should only be used by proposed developments up to and including Leasing Round 4. Where applicants wish to rely on offshore ANSs for potential adverse effects on kittiwake ahead of the MRF being operational, they will need to be able to deliver the measure themselves, or in collaboration with other projects.*" The MRF will be operational in 2025, but it is unclear when compensation will be delivered for this measure. The written ministerial statement suggests that offshore ANS should be delivered by projects themselves or collaboratively with other projects.
Why and how: ecological evidence to demonstrate compensation for the impacted site feature is deliverable in the proposed locations.	To be further addressed as site selection progresses and information comes forward from other projects' offshore ANS. Information on ecological evidence is provided in **Section 3.2** above.	To be further addressed as site selection progresses and information comes forward from other projects' offshore ANS. Information on ecological evidence is provided in **Section 3.2** above.	This measure has been included in the LoSCM on the basis that it is ecologically and technically suitable for the strategic delivery of compensation for kittiwake.
For measures at sea, demonstrate that measures have been secured e.g. agreements with other sea or seabed users.	The Applicant will be engaging with The Crown Estate over the coming months to determine lease requirements for this measure.	As the Applicant will be securing nesting space on a structure consented by another project currently ahead of the Applicant in their consenting regime. Commercial collaboration agreements will be secured by both parties, and details provided within respective CIMPs as appropriate.	Any provision allowing for a contribution to be made to the MRF in substitution for delivering ANS on a Project alone basis will restrict works until evidence has been provided that: • an appropriate level of compensation has been secured through the MRF; • the amount of any such contribution into the MRF has been agreed between Defra/the MRF Operator and the applicant; and • payment (or the first of a series of instalments) has been made to the MRF for the compensation measure. This provision does not guarantee that such measures, which form part of the MRF will be available and the relevant SNCB will be consulted regarding any such provisions.
Policy/legislative mechanism for delivering the compensation (where needed).	The compensation will be delivered via the Applicants' DCO application.	The developer leading the measures will secure the consent.	The policy / legislative mechanism has not been confirmed in guidance provided by Defra (2025) and DESNZ (2025) to date.

Natural England Compensation Checklist	Delivery of an offshore ANS (delivered by the Project alone)	Delivery of an offshore ANS (delivered in collaboration with other developers)	Delivery of an offshore ANS (delivered by via a contribution to the MRF / strategically via Government)
Agreed DCO / deemed Marine Licence (dML) conditions.	An appropriate DCO schedule will be developed and included within the Applicant's DCO application, following best drafting practice from other examinations and reflecting comments from Natural England and stakeholders. This drafting will include optionality for strategic compensation should that become applicable.	This will be developed on further discussion with collaborative partners.	The Projects draft DCO will include a provision for allowing for a contribution to be made into the MRF in substitution for delivering the offshore ANS on a Project alone or collaborative basis.
Clear aims and objectives of the compensation.	The provision of an offshore ANS aims to: • Compensate for unavoidable impacts of the Project during construction, operation and decommissioning to an agreed level to account for any uncertainty in the calculating the compensation quantum. The objectives are: • Develop and install an offshore ANS to provide adequate nesting space for a sufficient number of kittiwakes, ensuring compensation for the Project's estimated mortality impact on the kittiwake population of the FFC SPA.	The provision of an offshore ANS aims to: • Compensate for unavoidable impacts of the Project during construction, operation and decommissioning to an agreed level to account for any uncertainty in the calculating the compensation quantum. The objectives are: • Establish an agreement with a collaborative partner already constructing an offshore ANS to secure a designated number of nesting spaces attributable to the Project, ensuring sufficient additional capacity for kittiwakes to compensate for the Project's estimated mortality impact on the FFC SPA population.	Detail surrounding specific aims and objectives is likely to be outlined in the strategic Implementation and Monitoring plan (IMP) which it is anticipated will be published by the Marine Recovery Fund Operator (MRFO).
Mechanism for further commitments if the original compensation objectives are not met – i.e., adaptive management.	The kittiwake IMPs will outline proposed adaptive management measures – outline plans will be submitted with the DCO application.	The kittiwake IMPs will outline proposed adaptive management measures. These will likely be based on the IMP consented by offshore ANS owner.	Detail surrounding adaptive management are likely to be outlined in the strategic IMP which it is anticipated will be published by the MRFO.
Clear governance proposals for the post-consent phase – we do not consider simply proposing a steering group is sufficient.	The Applicant will seek to progress and secure the measure as much as possible prior to the submission of the application. Details for implementation and monitoring will be set out in the kittiwake IMP which will be consulted on in a targeted S.42 consultation.	The Applicant will seek to progress and secure an agreement to provide confidence that the measure can be delivered. A kittiwake IMP will be provided which aligns with that of any collaborative partner developer which will have already been consented. The Applicant will join and contribute to any ongoing steering and monitoring group calls.	Details surrounding governance are likely to be outlined in the strategic IMP which it is anticipated will be published by the MRFO.
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.	Evidence and roadmap documents, including an implementation plan will be submitted to PINS as part of the application and are publicly available. This initial roadmap has also been consulted on as part of the pre-application EPP with opportunities for regulators, advisors and SNCBs to comment.	Evidence and roadmap documents, including the implementation plans have been submitted to PINS as part of the application and are publicly available. Initial roadmaps have also been consulted on as part of the RIAA consultation.	Should this measure be delivered strategically, the sharing of information will be the responsibility of the MRFO.

Natural England Compensation Checklist	Delivery of an offshore ANS (delivered by the Project alone)	Delivery of an offshore ANS (delivered in collaboration with other developers)	Delivery of an offshore ANS (delivered by via a contribution to the MRF / strategically via Government)
Timescales for implementation especially where compensation is part of a strategic project, including how timescales relate to the ecological impacts from the development.	The Applicant is progressing a development program for the construction and installation of an offshore ANS to meet the OWF development schedule to ensure measures are in place and functioning before construction on the OWF takes place. The Applicant will review the construction timelines should any changes in the current consensus on the amount of time an offshore ANS needs to be in place and functioning prior to impacts occurring.	The Applicant will secure a letter of intent from its collaborative partners to secure space within their own structure. With any collaborative partner already ahead of the Applicant it is anticipated that the offshore ANS will be constructed and functioning prior to the Applicant seeking to install its offshore wind turbine generators (OWTG).	Timescales for the delivery of strategic compensation for kittiwake via offshore ANS are presently uncertain, though the MRF is due to be operational by Autumn 2025.
Commitments to ongoing monitoring of measure performance against specified success criteria.	The Applicant will conduct monitoring of the breeding colony within the compensation site to assess the success of the compensation measure. Details of monitoring will be presented in the kittiwake IMP submitted with the DCO application.	The Applicant will conduct monitoring of the breeding colony within the compensation site to assess the success of the compensation measure	Details surrounding ongoing monitoring will be outlined in the strategic IMP which it is anticipated will be published by the MRFO.
Proposals for ongoing 'sign off' procedure for implementing compensation measures throughout the lifetime of the Project, including implementing feedback loops from monitoring.	An adaptive management plan will be further developed in line with the IMP. This will be progressed in consultation with relevant stakeholders and a Steering Group if appropriate.	An adaptive management plan will be further developed in line with the IMP. This will be progressed in consultation with relevant stakeholders and a Steering Group if appropriate.	Details surrounding 'sign off procedure' will most likely be outlined in the strategic IMP, which is anticipated to be published by the MRFO.
Continued annual management of the compensation area including 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.	Management of the compensation area will be ongoing throughout the lifetime of the OWF including maintenance of the ANS.	Management of the compensation area will be ongoing throughout the lifetime of the OWF including maintenance of the ANS. Details on responsibility for the maintenance schedule will be developed in discussion with collaborative partners.	It is anticipated that annual management of a strategically delivered offshore ANS will be led by the MRFO and funded via developer contributions to the MRF.

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List of Tables and Figures

List of Acronyms

Acronym	Definition
AA	Appropriate Assessment
AEoI	Adverse Effect on Integrity
ANS	Artificial Nesting Structure
AON	Apparently Occupied Nests
AoS	Areas of Search
BESS	British Energy Security Strategy
BTO	British Trust for Ornithology
CA	Competent Authority
CI	Confidence Interval
CIP	Capacity Increase Programme
COWSC	Collaboration on Offshore Wind Strategic Compensation
DAS	Discretionary Advice Service
DB	Dogger Bank
DBA	Dogger Bank A
DBB	Dogger Bank B
DBC	Dogger Bank C
The Applicant	Dogger Bank D
DBS	Dogger Bank South
DCO	Development Consent Order
Defra	Department for Environment, Food and Rural Affairs
DESNZ	Department for Energy Security & Net Zero
dML	deemed Marine Licence
EIA	Environmental Impact Assessment
eNGO	Environmental Non-Governmental Organisations
ES	Environmental Statement
EPP	Evidence Plan Process
ETG	Expert Topic Group
FFC	Flamborough and Filey Coast
GW	Gigawatts
IFCAs	Inshore Fisheries Conservation Authorities
IMP	Implementation and Monitoring Plan
INNS	Invasive Non-Native Species
IROPI	Imperative Reasons of Overriding Public Interest
JNCC	Joint Nature Conservation Committee
Kittiwake	Black legged kittiwake *Rissa tridactyla*
km	kilometre
KSCP	Kittiwake Strategic Compensation Plan
LoSCM	Library of Strategic Compensation Measures
m	Meter
MCA	Maritime and Coastguard Agency
MMF	Mean-Maximum Foraging Range
MMO	Marine Management Organisation
MPA	Marine Protected Area
MRF	Marine Recovery Fund
MRFO	Marine Recovery Fund Operator
MW	Megawatts
NSIP	Nationally Significant Infrastructure Project

NSN	National Site Network
ODOW	Outer Dowsing Offshore Wind
ffshore ECC	Offshore Export Cable Corridor
OPEP	Oil Pollution Emergency Plan
OPRED	Offshore Petroleum Regulator for Environment and Decommissioning
ORJIP	Offshore Renewable Joint Industry Programme
OWEIP	Offshore Wind Environmental Improvement Package
OWF	Offshore Wind Farm
OWIC	Offshore Wind Industry Council
OWTG	Offshore Wind Turbine Generators
P2G	Pathways 2 Growth
PINS	Planning Inspectorate
PEIR	Preliminary Environmental Information Report
PVA	Population Viability Analysis
RIAA	Report to Inform Appropriate Assessment
RLB	Red Line Boundary
RSPB	Royal Society for the Protection of Birds
SD	Standard Deviation
SMG	Seabird Monitoring Group
SoS	Secretary of State
SPA	Special Protection Area
UD	Utilisation Distribution
WMS	Written Ministerial Statement