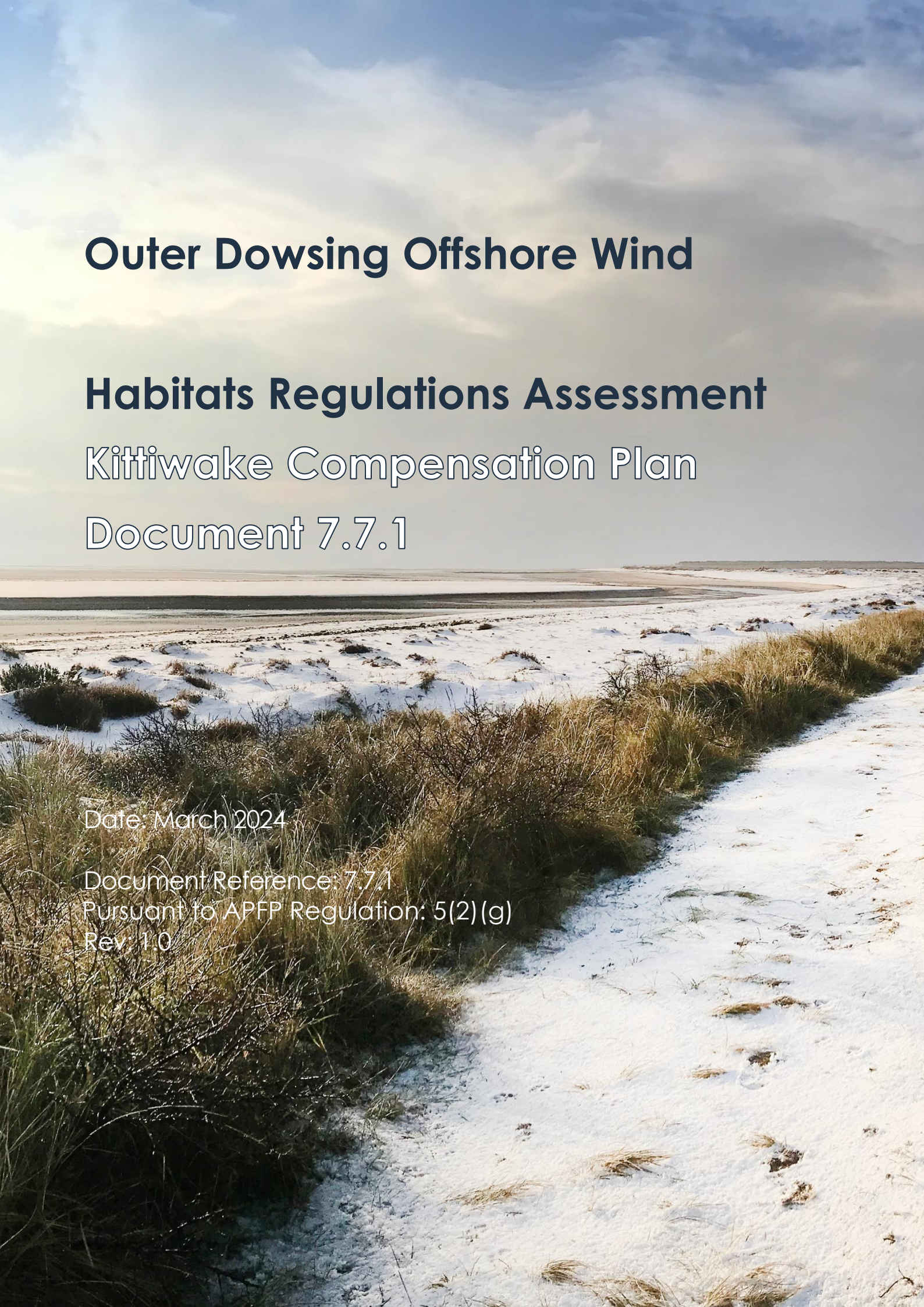

Outer Dowsing Offshore Wind

Habitats Regulations Assessment

Kittiwake Compensation Plan

Document 7.7.1

Date: March 2024

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Acronyms & Definitions

Abbreviations / Acronym

Abbreviation / Acronym	Description
AEoI	Adverse Effect on Integrity
ANS	Artificial Nesting Structure
BESS	British Energy Security Strategy
BEIS	Business, Energy and Industrial Strategy (now the Department for Energy Security and Net Zero (DESNZ))
COWSC	Collaboration on Offshore Wind Strategic Compensation
DAS	Digital Aerial Survey
DBSE	Dogger Bank South East
DBSW	Dogger Bank South West
DCO	Development Consent Order
Defra	Department for Environment, Food and Rural Affairs
DESNZ	Department for Energy Security and Net Zero, formerly Department of Business, Energy and Industrial Strategy (BEIS), which was previously Department of Energy & Climate Change (DECC)
EPP	Evidence Plan Process
ETG	Expert Technical Group
FFC	Flamborough and Filey Coast
GT R4 Ltd	The Applicant. The special project vehicle created in partnership between Corio Generation (a wholly owned Green Investment Group portfolio company), Gulf Energy Development and TotalEnergies
HPAI	Highly Pathogenic Avian Influenza
HRA	Habitats Regulations Assessment
IFCA	Inshore Fisheries and Conservation Authority
IROPI	imperative Reasons of Overriding Public Interest
JNCC	Joint Nature Conservation Committee
KCIMP	Kittiwake Compensation Implementation and Monitoring Plan
KSCP	Kittiwake Strategic Compensation Plan
KSIMP	Kittiwake Strategic Implementation and Monitoring Plan
MMF	Mean Max Foraging
MMO	Marine Management Organisation
MRF	Marine Recovery Fund
MPA	Marine Protected Area
MRF	Marine Recovery Fund
NSIP	Nationally Significant Infrastructure Project
ORCP	Offshore Reactive Compensation Platform
OWF	Offshore Wind Farm
OWIC	Offshore Wind Industry Council
PINS	Planning Inspectorate
RIAA	Report to Inform Appropriate Assessment
RSPB	Royal Society for the Protection of Birds

Abbreviation / Acronym	Description
SAC	Special Areas of Conservation
SCI	Sites of Community Importance
SNCB	Statutory Nature Conservation Body
SPA	Special Protection Area
TCE	The Crown Estate

Terminology

Term	Definition
Array area	The area offshore within which the generating station (including wind turbine generators (WTG) and inter array cables), offshore accommodation platforms, offshore transformer substations and associated cabling will be positioned.
Baseline	The status of the environment at the time of assessment without the development in place.
Development Consent Order (DCO)	An order made under the Planning Act 2008 granting development consent for a Nationally Significant Infrastructure Project (NSIP).
Effect	Term used to express the consequence of an impact. The significance of an effect is determined by correlating the magnitude of an impact with the sensitivity of a receptor, in accordance with defined significance criteria.
Evidence Plan	A voluntary process of stakeholder consultation with appropriate Expert Topic Groups (ETGs) that discusses and, where possible, agrees the detailed approach to the Environmental Impact Assessment (EIA) and information to support Habitats Regulations Assessment (HRA) for those relevant topics included in the process, undertaken during the pre-application period.
Habitats Regulations Assessment (HRA)	A process which helps determine likely significant effects and (where appropriate) assesses adverse impacts on the integrity of European conservation sites and Ramsar sites. The process consists of up to four stages of assessment: screening, appropriate assessment, assessment of alternative solutions and assessment of imperative reasons of over-riding public interest (IROPI) and compensatory measures.
Impact	An impact to the receiving environment is defined as any change to its baseline condition, either adverse or beneficial.
Landfall	The location at the land-sea interface where the offshore export cables and fibre optic cables will come ashore.
Mitigation	Mitigation measures are commitments made by the Project to reduce and/or eliminate the potential for significant effects to arise as a result of the Project. Mitigation measures can be embedded (part of the project design) or secondarily added to reduce impacts in the case of potentially significant effects.
Outer Dowsing Offshore Wind	The Project.

Term	Definition
Onshore Infrastructure	The combined name for all onshore infrastructure associated with the Project from landfall to grid connection.
Offshore Reactive Compensation Platform (ORCP)	A structure attached to the seabed by means of a foundation, with one or more decks and a helicopter platform (including bird deterrents) housing electrical reactors and switchgear for the purpose of the efficient transfer of power in the course of HVAC transmission by providing reactive compensation
Preliminary Environmental Information Report (PEIR)	The PEIR was written in the style of a draft Environmental Statement (ES) and provided information to support and inform the statutory
The Applicant	GT R4 Ltd. The Applicant making the application for a DCO. The Applicant is GT R4 Limited (a joint venture between Corio Generation, TotalEnergies and Gulf Energy Development (GULF)), trading as Outer Dowsing Offshore Wind. The project is being developed by Corio Generation (a wholly owned Green Investment Group portfolio company), TotalEnergies and GULF.
The Project	Outer Dowsing Offshore Wind including proposed onshore and offshore infrastructure.
The Planning Inspectorate	The agency responsible for operating the planning process for Nationally Significant Infrastructure Projects (NSIPs).
Wind turbine generator (WTG)	All the components of a wind turbine, including the tower, nacelle, and rotor.

Reference Documentation

Document Number	Title
6.1.3	Project Description
7.1	Report to Inform Appropriate Assessment
7.1.1	Offshore and Intertidal Ornithology Apportioning
7.5	Derogation Case
7.7	Ornithology Compensation Strategy
7.7.1.1	Kittiwake Compensation Implementation and Monitoring Plan
7.7.4	Artificial Nesting Structures Evidence Base and Roadmap

1 Introduction

1. GT R4 Limited (trading as Outer Dowsing Offshore Wind) hereafter referred to as the 'Applicant', is proposing to develop Outer Dowsing Offshore Wind (the Project). The Project will include both offshore and onshore infrastructure including an offshore generating station (windfarm) approximately 54km from the Lincolnshire coastline in the southern North Sea, export cables to landfall, Offshore Reactive Compensation Platforms (ORCPs), onshore cables, connection to the electricity transmission network, ancillary and associated development and areas for the delivery of up to two Artificial Nesting Structures (ANS) and the creation and recreation of a biogenic reef (if these compensation measures are deemed to be required by the Secretary of State) (see Volume 1, Chapter 3: Project Description (document reference 6.1.3) for full details).
2. As part of the Habitats Regulations Assessment (HRA) process, following the assessment of impacts, where it is concluded that despite mitigation, an adverse effect on the integrity (AEoI) of a designated site (Special Protection Areas (SPAs), Sites of Community Importance (SCI) and Special Areas of Conservation (SAC) forming part of the 'National Site Network') cannot be excluded (beyond reasonable scientific doubt), projects can undergo a derogation process to gain approval, provided there are 'imperative reasons of overriding public interest' (IROPI), 'no alternatives' and any necessary compensatory measures are secured to ensure that the overall network coherence is protected.
3. Defra has produced best practice guidance for developing compensatory measures in relation to Marine Protected Areas (MPAs) (Defra, 20211) and is currently consulting on draft policies to update this guidance. The current consultation held as part of Defra's Offshore Wind Environmental Improvement Package (OWEIP) focusses on 'ecological effectiveness' and 'local circumstances' as the primary consideration when identifying compensatory measures, with measures that benefit the specific feature at risk being encouraged over measures that would benefit different qualifying features at risk but which could provide 'functional equivalence'.
4. The Flamborough and Filey Coast (FFC) SPA is approximately 93km away from the Project array area, which is within the mean-max foraging range (MMF) of breeding kittiwake and therefore there is potential connectivity between the SPA and the Project array during the breeding and non-breeding seasons. The main species considered in this document is:
    - Black-legged kittiwake (*Rissa tridactyla*, hereafter kittiwake),

[1] New guidance was published whilst this document was being finalised (https://consult.defra.gov.uk/offshore-wind-environmental-improvement-package/consultation-on-updated-guidance-for-environmental/supporting_documents/090224%20OWEIP%20Consultation%20on%20updated%20policies%20to%20inform%20guidance%20for%20MPA%20assessments_.pdf). Whilst the Applicant is aware of this documentation it is noted that (1) the documentation is still out for consultation and (2) the Project delivery programme did not allow for full inclusion of the recommendations.

5. Kittiwake are a designated feature at FFC SPA, and are considered a collision risk species due to their flight behaviour.
6. The Crown Estate's Round 4 Plan Level HRA, determined that it was not possible to conclude no adverse effect on integrity (AEoI) for the kittiwake population at the Flamborough and Filey Coast Special Protection Area (FFC SPA). The Project was one of three developments identified to contribute towards the conclusion of AEoI, and as such is required to contribute towards kittiwake compensation through The Crown Estate's Kittiwake Strategic Compensation Plan (KSCP, document reference 7.8).
7. A number of recent projects within the southern North Sea have provided a without prejudice derogation case for kittiwake, along with guillemot, and razorbill at application (Hornsea Project Four, Sheringham Shoal and Dudgeon Extension).
8. Following completion of the Report to Inform Appropriate Assessment for this Project (RIAA; Document 7.1), the Applicant has been unable to rule out the potential for an Adverse Effect on Integrity (AEoI) to the kittiwake feature of the Flamborough and Filey Coast (FFC) Special Protection Area (SPA) FFC SPA due to mortality from collisions with the wind turbine generators, when considering the Project in combination with other plans or projects. The Applicant has therefore provided a derogation case for the Project and has developed a full derogation case for kittiwake (from in-combination effects) alongside appropriate compensation measures.
9. The Derogation Case (document 7.5) provides consideration of the alternatives assessed, the need for the Project and has identified Imperative Reasons of Overriding Public Interest (IROPI) for the Project to proceed despite the potential for an AEoI in accordance with the requirements of the Habitats Regulations.
10. The RIAA provides insight into the impacts to the relevant species predicted to occur from the Project. The quantum of potential compensation to be delivered is identified within this document and the supporting Artificial Nesting Structures Evidence Base and Roadmap (document reference 7.7.4) provides the evidence to support the effectiveness of the primary proposed compensatory measure.

1.1 Purpose

11. This plan sets out how the compensation measures for impacts to kittiwake at the FFC SPA can be secured at the time of the DCO being granted (should the SoS determine that compensation is required). The plan provides a suite of measures, including potential strategic measures and also resilience measures. At this stage is it important to note that the site selection, detailed design and monitoring of the proposed measures will be developed in consultation relevant stakeholders.
12. A compensation implementation and monitoring plan to deliver any required compensation for this species will be prepared based on the strategy set out in the final version of this Plan, as secured in Schedule 22 of the Development Consent Order.

2 Quantum of Compensation

2.1 Kittiwake

13. The predicted impact from the Project, for which compensation will be required to be delivered is 14.5 birds, using the Applicant's approach (as detailed within the RIAA (document 7.1)). This number is based on the summed mean peak bio-seasonal occurrence. The proportion of adults within the population is defined using adult proportions from the site-specific Digital Aerial Survey (DAS) data, with birds apportioned to the FFC SPA using the NatureScot apportioning method and including offshore breeding birds (document reference 7.1.1), as agreed with Natural England. On the basis of a 2:1 ratio (minimum ratio advised by Natural England), this would require the delivery of 77.8 pairs of nesting adults to replace those individuals impacted by the Project. The compensation requirement calculated with both the Applicant's and Natural England's approaches are presented in Table 2.1.
14. The presentation of the Applicant and Natural England's preferred methods for determining compensation quantum are aligned with those presented in the KSCP (document reference 7.8). Further information on these methods is provided in the KSCP. Note that the values presented in the KSCP are the range of quantum based on the methods and ratios presented below, but under the combined scenario from the Project and RWE's Dogger Bank South West (DBSW) and Dogger Bank South East (DBSE) projects, as at the time of the KSCP finalisation (February 2024).

Table 2.1 Compensation requirements calculated using the Hornsea 4 and Hornsea 3 methods for the Applicant's impact value.

Predicted impact	Calculation method	Compensation requirement (breeding pairs)	2:1 compensation ratio (breeding pairs)	3:1 compensation ratio (breeding pairs)
14.5	Hornsea 4 (Applicant)	38.9	77.8	116.7
14.5	Hornsea 3 'part 2' (Natural England)	93.9	187.8	281.7

3 Development of Compensation Options

3.1 Overview

15. The following sections outline the approach taken to the development of the long-list and the short-list of measures for the compensation options for kittiwake. The Applicant commenced the identification and development of suitable compensation measures early on in the development process and has continued to consult on these measures through the Evidence Plan Process (EPP).

3.2 Consultation

16. Consultation on the compensation measures was commenced through the Evidence Plan Process (EPP), with the set-up of a Derogation and Compensation specific Expert Technical Group (ETG) early on in the development process. After the initial meetings, this group was split into the two relevant technical workstreams (one for benthic ecology and the other for offshore ornithology) and discussions on kittiwake compensation continued through the renamed Offshore Ornithology and Compensation ETG.
17. Details of the relevant consultation, and where comments are addressed within this document or within the suite of documents provided in relation to Ornithological Compensation Strategy, are provided in Table 3.1 below. Additional technical consultation undertaken in relation to compensation is detailed in the Technical Consultation Report (document reference 6.1.6).

Table 3.1. Consultation for ornithology compensation measures

Date and consultation phase/type	Consultation and key issues raised	Section where comment addressed
12 July 2022, Offshore Ornithology, Derogation and Compensation Expert Topic Group	Fisheries management. Natural England noted that the most appropriate measure for compensation (subject to additionality) may be improving the availability of forage fish, but recognise that may not be within the gift of an individual project level as needs Government intervention.	Section 5.5
28 November 2022, Offshore Ornithology, Derogation and Compensation Expert Topic Group	Natural England queried the interplay between project-specific and strategic compensation workstreams – The Project confirmed that the project was progressing both project-alone options and actively engaging in collaborative/strategic measures equally rather than solely relying on the strategic measures.	Section 3.5

Date and consultation phase/type	Consultation and key issues raised	Section where comment addressed
9 January 2024, Ornithology Compensation Workshop With Natural England	Kittiwake compensation with ANS. The Applicant asked Natural England: To review whether a single ANS (solely for Kittiwake) would be acceptable compensation as a project alone measure[1]; whether there was an advised minimum distance between structures should multiple structures be deployed; and, whether the deployment of multiple structures could allow a reduced breeding season lead in time. Natural England advised that greater distance between ANS increased resilience and likelihood of success.	Section 3.5, with further details in the ANS Evidence Roadmap (document 7.7.4), and the KSCP document 7.8.
9 January 2024, Ornithology Compensation Workshop With Natural England	Compensation calculation. The Project confirmed they are using Hornsea Four method and for kittiwake and guillemot. Natural England explained that they prefer Hornsea three method. This is supported by a NIRAS report looking at the methods that argues the Hornsea three method is more ecologically robust (kittiwake).	Compensation quanta are presented in Section 2. Compensation quanta calculated using both methods are presented in the KSCP (document 7.8).
9 January 2024, Ornithology Compensation Workshop With Natural England	Compensation ratios. The Project enquired whether using the Hornsea three method negates the need to apply a ratio. Natural England explained that compensation measures have a lot of uncertainty, therefore a ratio is still required. They highlighted that any ratio agreed has to be across all projects and there is a need for an approach across all projects	Compensation quanta calculated at a 2:1 ratio for both the Project and Natural England's preferred method are presented in Section 2.

1. At the point of discussion the KSCP was not finalised so discussions focussed on Project alone measures as details of the KSCP could not be shared.

3.3 Longlist

18. The first stage of the compensation strategy involved reviewing all offshore wind projects that have proposed compensation to date. A longlist of compensation options was collated based on previous offshore windfarm (OWF) derogation cases (including compensation measures provided on a 'without prejudice' basis), guidance and advice from Statutory Nature Conservation Bodies (SNCBs), and a review of peer-reviewed literature. The review focused primarily on projects that have submitted DCO applications within the southern North Sea region because these are located within the same geographic region as the Project and are likely to impact similar species and sites. Nevertheless, compensation considered elsewhere in the UK and global examples was also incorporated within the longlist where relevant. In addition, some more novel ideas yet to be put forward by other projects were also included. The long list of compensatory measures was drawn up appropriate to the species and habitats affected and issued to Natural England for review.

3.4 Shortlist Ranking System

19. From the longlist, each compensation option was evaluated using a set of criteria established from principles outlined in the then current Defra guidance (Defra, 2021), and were consulted on with relevant stakeholders (Natural England and Royal Society for the Protection of Birds (RSPB)) through the EPP (Table 3.1). Five ranking criteria were developed, which aimed to fairly rate each measure and produce a shortlist of the most viable options (Table 3.2). This provided a clear, replicable, and robust method to rank compensation options relative to each other.
20. Each rating criterion was scored on a scale between 1 and 5, (5 being the maximum). The scores were summed for all five criteria for each compensation measure to provide a final score which was used to rank the measure. For each species, a shortlist of compensation options that scored greater than 15 out of a possible 25 was created, as presented below. The key measures currently being progressed by the Project are supported by Natural England.

3.5 Strategic Options

21. Consideration was given to the delivery of compensation through strategic measures as well as the development of Project-alone options. There are currently multiple workstreams looking to develop options for strategic compensation delivery, including the Marine Recovery Fund (MRF) which the UK Government has confirmed will be available for Round 4 projects to access. One strategic compensation measure which is specific to ornithology has been accepted by the Secretary of State for inclusion within the MRF:
    - Artificial Nesting Structures (ANS) (only for Round 4 projects).
22. This measure has been developed by the Project for project-alone impacts, and could be adapted to be delivered strategically if appropriate (see section 3.6) .
23. The Project understands that Natural England regard strategic compensation as highly ecologically effective and that it could provide a solution to species or habitats impacted by multiple windfarms.

24. Other strategic initiatives include the development of measures led by organisations such as the Offshore Wind Industry Council (OWIC), for which the Applicant is a member of the Derogation Subgroup. In addition, measures that can be developed through collaboration between multiple projects or developers are also considered to be strategic options. Consideration as to whether measures could be delivered strategically is provided throughout this document. More detail on the delivery mechanisms for strategic options through the KSCP is provided in Section 3.6

3.6 The KSCP

25. As part of the Round 4 Plan-Level HRA derogation, the Project was engaged in the Round 4 strategic Steering Group for kittiwake compensation which was formed by TCE in accordance with agreed Terms of Reference. The Steering Group has overseen the development of the Kittiwake Strategic Compensation Plan (KSCP) which has been finalised and is presented in document 7.8. Full details on the Round 4 plan process and the associated commitment to develop the KSCP are provided in that document (document reference 7.8).
26. In summary, TCE's Derogation Case included a commitment to develop a KSCP (document reference 7.8) which must be adhered to by the Project (and also RWE's Dogger Bank South West (DBSW) and Dogger Bank South East (DBSE) projects) through its agreement for lease conditions. The overall objective of the KSCP is to detail the development and delivery of strategic compensation to ensure the overall coherence of the UK National Site Network in relation to kittiwake by identifying suitable measures, providing a pathway to those measures and in turn providing assurance that compensation will be delivered for the impact on kittiwake, subject to refinement during the Project level HRA process.
27. Strategic compensation for the purposes of Round 4 is defined here as compensatory measures delivered collectively to address the AEoI of the FFC SPA from the Plan. The KSCP provides a framework to determine the scale and location of proposed strategic compensation measures for the effects on kittiwake and how these can be secured, delivered, monitored and adapted.
28. The KSCP reflects the ecological preference of potential compensation measures but includes different options to address the potential delivery issues relevant to some measures identified. Further details on the precise delivery method for the measures would be provided post consent in a Kittiwake Strategic Implementation and Monitoring Plan ("KSIMP" Appendix A of the KSCP) submitted to the Secretary of State at the Department for Energy Security and Net Zero (DESNZ) prior to the operation of any wind turbine generator of the Project. The KSIMP would be required to be approved by the Secretary of State (DESNZ) in consultation with the Marine Management Organisation (MMO) and/or local planning authority and Natural England as the relevant Statutory Nature Conservation Body.
29. The Project expects to deliver the kittiwake compensation (by way of Artificial Nesting Structures – see KSCP) as outlined within the KSCP and collaboratively with RWE. However, it is necessary for the Project to also develop the compensation at the individual project level to ensure that it can be delivered either on a Project alone basis or strategically. Therefore, wherever possible the content of the KSCP aligns with the Project's proposals.

Table 3.2: Criteria used to rank compensation options and scoring principles.

Rating	Targeted	Effectiveness	Technical delivery	Delivery lag	Scale of Impact
Definition	Following the Hierarchy Approach (Defra, 2021). Measures should focus on objectives and targets for the affected species within the National Site Network. They must clearly refer to the structural and functional aspects of the site integrity, and the related types of habitats and species populations that are affected. Higher scores given for like-for-like compensation - lower scores for non-like-for-like.	Confidence that the measure will deliver effective and sustainable compensation for the impact of the project. Ensure the overall coherence of the designated sites network is maintained.	The confidence that the measure can be delivered successfully and be monitored and managed accordingly.	How quickly compensatory measures are expected to be functioning and contributing to the network?	The scale at which the compensatory measure acts can be accurately predicted/quantified
5	Same species, same location. Measure can with certainty benefit birds at the same site (within, adjacent to, within usual foraging range of)	There is strong evidence that the measure is effective, provides a similar ecological function (i.e. where a measure provides additional breeding space for a breeding population), and does not negatively impact any other sites or features	Technical delivery of measure is well evidenced and achievable without any substantial challenges and there is certainty in the outcomes	Agreed certainty that measures will be functioning before impact occurs with timeframe <2 years	Confident that the benefit can be accurately predicted and adapted to match the required compensation at a defined ratio

Rating	Targeted	Effectiveness	Technical delivery	Delivery lag	Scale of Impact
4	Same species, with connectivity to SPA Measure can be utilised by affected species from the affected site	There is some evidence that the measure is effective and will provide a similar ecological function	Technical delivery is evidenced but some challenges with delivery and some uncertainty in the outcomes	Some certainty that measures will be functioning prior to impact occurring < 3 years	Some uncertainty in the predicted benefit but measure can be adapted to match the required compensation at a defined ratio
3	Same species, different location. Measure can be reached by the species and is within the biogeographic region	There is strong evidence that the measure is effective but does not directly target the same feature or site	There is some evidence of delivery and some uncertainty regarding outcomes	Some certainty that measures will be functioning prior to impact occurring <5 years but would likely assume a higher compensation ratio to allow for uncertainty	Confident that the benefit can be accurately predicted but unlikely to compensate for the desired ratio
2	Same species, different location. Measure can be reached by the species and is within the biogeographic region	There is some evidence that the measure is effective but does not directly target the same feature or site	Little to no evidence of delivery and considerable uncertainty in outcomes	Little to no certainty that measures will be functioning <10 years and would assume a higher compensation ratio to allow for uncertainty	Some uncertainty in the predicted benefit and unlikely to compensate at the desired ratio
1	Different species Measure compensates for a different species	There is little to no evidence that the measure is effective and there is considerable uncertainty in outcomes	No evidence of delivery and considerable uncertainty in outcomes	No certainty within 10-year timeframe and perhaps poorly evidenced and as such acceptance of higher ratio required	Large uncertainty in the predicted benefit and unlikely to compensate at the desired ratio

4 Kittiwake

30. It is considered that the potential for an AEoI cannot be ruled out for the kittiwake feature at the FFC SPA as a result of in-combination impacts (document reference 7.1). FFC SPA is the only SPA in England with kittiwakes as a qualifying feature and there are only three other sites where kittiwakes are an assemblage feature (Table 4.1).

Table 4.1. SPAs with kittiwake listed as a feature or as part of an assemblage

SPA	Kittiwake
Flamborough & Filey Coast	Qualifying feature
Farne Islands	Named assemblage feature
Coquet Island	Un-named component of the seabird assemblage
Isles of Scilly	Un-named component of the seabird assemblage

31. Other projects such as Hornsea Project Three Offshore Wind Farm (Hornsea Three), Hornsea Project Four Offshore Wind Farm (Hornsea Four), Norfolk Boreas, Norfolk Vanguard, Sheringham Shoal and Dudgeon Extension Projects, East Anglia One North and East Anglia Two are providing compensation for adverse effects on kittiwakes at FFC SPA. The primary compensation options identified for kittiwakes were:
    - Offshore artificial nesting structures;
    - Onshore artificial nesting structures;
    - Urban deterrents;
    - Reductions in fisheries quotas; and
    - Purchase of fisheries quotas.
32. A detailed ranking and evaluation of shortlist options is provided in Table 4.2. Note that a similar exercise has been undertaken within the Round 4 KSCP (see Section 3.6).

4.1 Offshore Artificial Nesting Structure

33. An offshore artificial nesting structure, providing additional nesting space to encourage the formation of a new offshore colony, was identified as the highest ranked compensation option for kittiwake. It scored four for each criterion and has the potential to be delivered strategically. Evidence of kittiwake nesting on offshore artificial structures is widespread across the North Sea in UK waters (e.g. Coulson, 2011; Christensen-Dalsgaard et al., 2019; Ørsted, 2021a). An offshore structure would preferably be located near to productive foraging grounds and away from the impacts of OWFs. Hornsea Four Offshore Wind Farm was the first UK offshore wind farm to have the requirement within the DCO for an offshore artificial nesting structure(s) as compensation for kittiwake.

34. Offshore artificial nesting structures are considered a feasible compensation option for kittiwake, both strategically and at a project-level. Detailed information regarding the progress of this as a compensation measure, including ecological evidence and a roadmap to implementation, is provided in Offshore Artificial Nesting Structures Evidence Base and Roadmap (Document 7.7.4). This work also includes a preliminary site selection assessment and outlines design criteria for an artificial nesting structure for the target species, see particular detail in relation to the following sections:
    - Evidence for the effectiveness of offshore artificial nesting (section 3 of document 7.7.4);
    - Design considerations (section 4.2 of document 7.7.4);
    - Site selection (section 4.3 of document 7.7.4);
    - Monitoring and adaptive management (section 4.4 of document 7.7.4);
    - Scale of compensation delivery (section 4.5 of document 7.7.4);
    - Funding (section 4.6 of document 7.7.4); and
    - Programme for delivery (section 4.7 of document 7.7.4).
35. Artificial nesting structures are also the primary measure promoted within the KSCP (document reference 7.8) for the Round 4 Plan-level compensation delivery.

4.2 Onshore Artificial Nesting Structure

36. Onshore artificial nesting structures were ranked second in the rating process. Evidence of kittiwake nesting on onshore artificial structures is widespread (Hatch *et al.* 1993; Harris *et al.* 2019; Camphuysen & de Vreeze 2005; Camphuysen & Leopold 2007; Ponchon *et al*. 2017; Turner 2010). There are several projects, including Hornsea Three, Norfolk Boreas, Norfolk Vanguard, East Anglia One North and East Anglia Two, that are required by their DCOs to build onshore artificial nesting to compensate for their impact on kittiwakes from FFC SPA. The Hornsea Three project has provided three nearshore structures as an alternative to onshore, and the combined nesting space to be provided by these projects equates to roughly 2,500 nesting spaces (Ørsted, 2020; Royal HaskoningDHV, 2022). As such, there are currently thousands of nesting sites onshore or nearshore that require a pool of non-breeding adults available to colonise them.
37. Natural England has requested evidence that there is a sufficient pool of kittiwake recruits and suitable locations with adequate prey availability to maintain the new colonies (Natural England, 2022a). Natural England has also highlighted that further onshore artificial nesting may draw birds away from protected sites, such as FFC SPA, and, therefore, would not provide compensation.

38. There are considerable challenges in the delivery of onshore structures. For example, difficulties obtaining land rights and planning permission lead to the onshore artificial nesting structures originally proposed for the Hornsea Three project being moved into the nearshore environment where there are fewer barriers to consent. As a result, the Project does not consider onshore artificial nesting structures to be a preferred compensatory measure, however it has not been excluded as a potential option if it becomes appropriate in the future. This measure has not been proposed as a primary measure within the Round 4 KSCP (document reference 7.8).

4.3 Urban Deterrents

39. Every year, many kittiwakes are caught in urban deterrent netting resulting in a considerable number of mortalities. The main driver of these mortalities is poorly maintained netting or inappropriate deterrents. By investing in less impactful alternatives (e.g. AviShock) or taking steps to improve the management of currently implemented deterrents, there is the potential for annual mortalities to be reduced.
40. The main options to reduce this source of bird mortalities is to provide funding to maintain deterrents or to upgrade to less invasive options.
41. This option was dropped for the purposes of the compensation measure development for the Project post-PEIR as it was not possible to evidence that the measure would be able to deliver the required quantum of compensation for the Project. This was primarily because no robust record of bird entanglement in deterrents was found and therefore the evidence base was inconclusive with regard to the number of mortalities associated with urban deterrents. This measure was not considered within the KSCP.

4.4 Reduce Fisheries Quota/Purchase of Fishery Quota

42. Prey availability has been evidenced as a key limiting factor suppressing the breeding success of kittiwake and other seabird species (Mitchell *et al*., 2020; Frederiksen *et al.,* 2004, Cury *et al.,* 2011, Carroll *et al.,* 2017, Christensen-Dalsgaard *et al.*, 2018). At PEIR, the Project considered a reduction in the sandeel fishing quota within the North Sea, or the ability for developers to purchase a proportion of the fishery quota, as viable measures to increase the availability of kittiwake prey. The most effective way this could be achieved would be to restrict fishing on sandeel, sprat or juvenile herring in UK waters. However, this measure would be most effectively delivered by Government on a strategic basis. For example, this would need to be implemented by either Defra in the case of sandeel or the relevant Inshore Fisheries and Conservation Authority (IFCA) in the case of sprat and juvenile herring fisheries within UK inshore waters.
43. On 31st January 2024, the UK Government announced that the sandeel fishery in English waters would be permanently closed from 1st April 2024. This was matched by an announcement by the Scottish Government to close the sandeel fishery in Scottish waters from the same date.

44. Given the current uncertainty of whether, or how, these closures may be available for use as a compensation measure for an OWF, this measure has not been considered by the Project as a feasible compensation measure at this stage. It is noted that the option for fisheries closures remains a part of the Round 4 KSCP (document 7.8), but acknowledged within that document that, at the time of drafting, information was not available as to whether the closure would ever be permitted as compensation. Therefore, whilst the measure remains within the Round 4 KSCP, it is unclear as to whether it may be available as a compensation measure or within the appropriate timeframes. Due to these uncertainties, for the purposes of the project alone, this measure has not been progressed further at this stage.

Table 4.2: Shortlisted compensation measures for kittiwake.

Compensation Measure	Targeted	Effectiveness	Technical delivery	Delivery lag	Scale of Impact	Potential to deliver at a strategic level?	Rating
Offshore artificial nesting structures	4 Direct benefits to kittiwake and likely to have some connectivity to FFC SPA.	4 Reasonable amount of evidence that the measure is effective with some examples. Strong evidence that kittiwake are limited by lack of nesting structures in the southern North Sea. Numerous examples of artificial nesting structures being used by kittiwake. Smaller colonies away from large colonies (such as FFC SPA) are likely to have higher breeding	4 Technical delivery is evidenced but some challenges with delivery and some uncertainty associated with the outcomes. However, onshore structure is well evidenced with numerous examples.	4 Offshore likely to be deliverable in short time frame (within 3 years) and therefore before anticipated impact.	4 Structure can be designed to compensate for the desired number of birds but some uncertainty in the numbers of kittiwake that will choose to nest there.	Yes	20

Compensation Measure	Targeted	Effectiveness	Technical delivery	Delivery lag	Scale of Impact	Potential to deliver at a strategic level?	Rating
		success due to weaker density dependant competition for food resources. There is no guarantee that kittiwake will use the new structure for nesting.					
Onshore artificial nesting structures	3 Directly benefits the target species but unlikely to be near FFC SPA because there are already kittiwake onshore nesting structures nearby	4 Large amount of evidence that the measure is effective with various examples. Strong evidence that kittiwake are limited by nesting structures in the southern North Sea. Smaller colonies away from large	3 Technical delivery is well evidenced but due to existing structures in proximity to FFC SPA it is likely to be challenging both to find an appropriate location for a new nesting structure and to provide evidence that further	4 Onshore likely to be deliverable in short time frame (within 3 years) and therefore before anticipated impact.	4 Structure can be designed to compensate for the desired number of birds but some uncertainty in the numbers of kittiwake that will choose to nest there.	Yes	18

Compensation Measure	Targeted	Effectiveness	Technical delivery	Delivery lag	Scale of Impact	Potential to deliver at a strategic level?	Rating
		colonies (such as FFC SPA) are likely to have higher breeding success due to weaker density dependant competition for food resources. There is no guarantee that kittiwake will use the new structure for nesting.	onshore nesting structures are beneficial to the population. Therefore, there is uncertainty associated with the outcomes.				
Urban deterrents	5 Direct benefits to kittiwake and likely to have connectivity to FFC SPA	3 Strong evidence that multiple kittiwake mortalities are attributable to current badly maintained netting and inappropriate deterrents. Evidence of	3 Direct benefits to kittiwake and likely to have some connectivity to FFC SPA	5 Measure likely to be deliverable in a short timeframe (<3 years).	2 Benefits can be delivered under a quick timeframe, though uncertainty on the number of kittiwake this measure could compensate for.	No	18

Compensation Measure	Targeted	Effectiveness	Technical delivery	Delivery lag	Scale of Impact	Potential to deliver at a strategic level?	Rating
		alternative methods is limited, but relatively simple in practice.					
Reduce fisheries quota	4 Can have direct connectivity for kittiwake at FFC SPA and the wider bio-geographic region	4 Prey availability is a key limiting factor in kittiwake breeding success. Excluding fisheries from a large area may increase prey availability. Climate change is also a limiting factor related to prey availability.	2 Feasible if delivered by government through the common fisheries policy. Only relevant bodies such as IFCAs and MMO have powers to implement closed areas to fishing in UK waters. As the sandeel fishery has been closed indefinitely, options for implementing further fisheries closures as	1 There is a high degree of uncertainty regarding the security of the measure and long term implementation. Consideration will need to be given to potential political issues or barriers. Some certainty that measure could be functioning within 10 years but uncertainty due to political landscape	4 Sufficient change in quota would likely provide benefit to kittiwake. Scale likely to be large and therefore compensate a significant margin above numbers of birds potentially impacted by the project. Measure would require calculations in relation to prey biomass and the requirements of	Yes	15

Compensation Measure	Targeted	Effectiveness	Technical delivery	Delivery lag	Scale of Impact	Potential to deliver at a strategic level?	Rating
			measures for compensation are likely not available.		breeding kittiwakes in order to quantify any impact.		
Purchase of fisheries quota	4 Can have direct connectivity for kittiwake at FFC SPA and the wider bio-geographic region	3 Prey availability is a key limiting factor in kittiwake breeding success. Purchasing the fisheries quota from a large proportion of the fleet may increase prey availability. Climate change is also a limiting factor related to prey availability.	1 No evidence of delivery and considerable uncertainty in outcomes. The purchase of quota by an offshore developer is unlikely to be a viable proposal under the current quota regulations. Different quota rules apply in different countries. In most cases quota cannot be	3 If achievable there is some certainty that measure could be functioning prior to impact (< 5 years).	4 Sufficient change in quota would likely provide benefit to kittiwake. Scale likely to be large and therefore compensate a significant margin above numbers of birds potentially impacted by the project. Measure would require calculations in relation to prey biomass and the	Yes	15

Compensation Measure	Targeted	Effectiveness	Technical delivery	Delivery lag	Scale of Impact	Potential to deliver at a strategic level?	Rating
			acquired or traded by non-fishing organisations and there are restrictions with regards to the amount of quota that a single organisation can hold.		requirements of breeding kittiwakes in order to quantify any impact.		

5 Further Considerations

45. The Applicant is confident that compensation could be provided in relation to kittiwake from the FFC SPA from the construction, operation and decommissioning of the Project in-combination with other plans or projects, if it is identified as necessary by the Secretary of State.
46. Although a variety of options have been identified for each of the species considered as part of this strategy, it is acknowledged that there are currently further considerations to be progressed to achieve successful implementation. For example, the inability for the Project to implement wide-scale measures across the UK and influence other industries to alter their practices. This means that some of the potentially most effective compensation options, such as fisheries management measures, would need to be strategically led by government (see Section 6). The Project is a member of the Offshore Wind Industry Council (OWIC), a senior Government and industry forum, which may provide a mechanism to aid collaboration across the industry. Strategic collaboration between developers will be supported by the Project where these have the potential to deliver effective compensation measures within the timeframe required.

5.1 Highly Pathogenic Avian Influenza (HPAI)

47. The recent outbreak of HPAI among seabirds is likely to influence populations for a considerable time. If seabird populations have reduced in size and there are insufficient numbers of non-breeders in the population to occupy available nesting spaces, then compensation measures aiming to provide additional nesting sites may not be so effective in the short term because nesting site availability may not currently be a limiting factor on population growth. Currently, there is uncertainty in the size of the non-breeding pool of adults and it is helpful to develop this understanding to support the use of artificial nesting as a compensation measure. The monitoring of artificial nesting structures currently being developed and monitoring of colonies that have suffered from the effects of HPAI are expected to provide evidence in this respect.

6 Strategic delivery

6.1 Overview

48. To date, it has been the responsibility of individual developers to develop and provide compensation. This has been driven predominantly by the differences in timings of individual projects coming forwards which has created challenges for strategic/collaborative approaches, but also because there has been a lack of a strategic framework in the regulatory process and with clear Government support. Individual projects developing compensation can also create challenges, for example, competition for preferred compensation sites, differences in approaches to evidence, design and/or monitoring, limitations in the ability to share information and learning, issues around success liability, and importantly, having to evidence small scale (project-level) results.
49. An alternative solution is to adopt a coordinated large-scale, strategic-level approach to compensation delivery for OWFs in the UK. There are numerous benefits to delivering at scale, including delivering compensation on a collaborative basis, which in turn will help reduce ecological risk and provide confidence in achieving the required population level (e.g. by spreading the risk over multiple measures) resulting in a substantially enhanced outcome. Furthermore, developing small scale measures tends to be very expensive, with unknown future liabilities which can cause commercial issues which whilst not a consideration within Habitats Regulations Assessment (HRA) decision making, are central to the operational success of delivering an OWF project, and consequently the compensation measure. A co-ordinated approach can also avoid the need for individual projects to overcompensate which subsequently reduces the range of options for subsequent projects (i.e. multiple developers could benefit from one measure), as well as providing a mechanism to deliver compensation measures that cannot be delivered by developers e.g. measures that require Government such as fisheries management.
50. A key target within the British Energy Security Strategy (BESS) is to reduce the time taken to consent offshore wind projects, with the development of ecological compensation flagged as time critical. Likewise, a Cross-government Nationally Significant Infrastructure Projects (NSIP) Action Plan 2023 (DLUHC, 2023), and a "Nature Recovery Green Paper: Protected Sites and Species" have been published with the aim to reduce consenting times (Defra, 2022). These measures include the Marine Recovery Fund (MRF) to enable an accelerated build out of projects, by delivering compensation strategically ahead of project operation.

6.2 Round Four Plan-Level HRA

51. As part of the Plan-Level HRA for the Round Four projects, The Crown Estate (the competent authority) concluded an AEoI in-combination for the Round Four Plan for kittiwake at FFC SPA. The Plan-Level HRA proceeded on the basis of a derogation, with compensation required in the form of a Kittiwake Strategic Compensation Plan. The Round 4 KSCP is a forum through which the strategic delivery of compensation for the Round Four Plan will be delivered. The Project, as part of the Round Four Plan and one of the three projects contributing to an AEoI, is committed to supporting The Crown Estate in its delivery of the KSCP to enable strategic compensation for kittiwake.
52. As noted in section 3.6 of this document, the KSCP has been produced (document 7.8) and the primary measure proposed for the delivery of the required compensation is offshore artificial nesting structures. The Project will continue to engage with the KSCP throughout the post-application phase.

6.3 OWIC

53. The Applicant is an active member of OWIC and has contributed towards the delivery of various strategic compensation case studies that have been completed to date. The OWIC group is currently developing four topics as strategic compensation for a pilot approach, two of which are relevant to seabirds:
    - Artificial nesting structures; and
    - Predator control or eradication.
54. The Project also has members contributing towards the Collaboration on Offshore Wind Strategic Compensation (COWSC) Expert and Delivery groups.
55. The Applicant will continue to engage actively in the OWIC workstreams and support the development of the strategic delivery of compensation measures for the relevant sites/features through this collaborative initiative. The two measures listed above have recently been accepted by the Secretary of State for inclusion within the MRF as collaborative compensation options.

6.4 Marine Recovery Fund (MRF)

56. The creation of the MRF is a clear step forward in establishing a mechanism through which multiple projects can secure access to suitable compensatory measures that are delivered at a strategic level. The Applicant believes this mechanism has the potential to enable the greatest ecological benefit to the National Site Network, whilst also enabling the timely delivery of required measures and as a result accelerating the deployment of offshore wind in line with Government policy.
57. The Applicant understands that the MRF will be in place prior to the determination of the consent for the Project and therefore will be available to rely upon for the purpose of delivering compensation if required. Defra have advised that two measures for ornithology compensation will be available through the MRF:

- Offshore artificial nesting structures (Round Four projects only); and
- Predator control.

58. For both these measures, the evidence collated for the respective project-alone measures are equally valid for the purposes of the strategic delivery of these measures.

7 Conclusion

59. This document presents the strategy which has been followed by the Applicant in the development of the compensatory measures proposed for the Project for impacts to kittiwake at the FFC SPA in combination with other plans or projects.
60. The document has provided the compensation quantum and has detailed the Project's approach to the development of the long-list and short-list of measures to be explored which could provide this quantum, as well as the reasoning for the subsequent progression or rejection of measures. It also provides some background on relevant strategic workstreams in which the Project is engaged.
61. A compensation implementation and monitoring plan to deliver any required compensation for this species will be prepared based on the strategy set out in the final version of this Plan, as secured in Schedule 22 of the Development Consent Order.
62. An evidence base and roadmap has been developed for Offshore Artificial Nesting Structures which includes kittiwake which demonstrates the robustness of the compensation measure, how it would contribute to the maintenance of the National Site Network if implemented, and how it could deliver the necessary quantum of compensation for the range of predicted impacts.

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