NORTH FALLS

Offshore Wind Farm

HABITATS REGULATIONS ASSESSMENT DEROGATION

Appendix 4 Kittiwake Compensation Document (Clean)

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NORTH FALLS
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1	March 2025	Deadline 2	RHDHV	NFOW	NFOW
2	June 2025	Deadline 6	RHDHV	NFOW	NFOW

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Glossary of Acronyms

AEoI	Adverse Effect on Integrity
ANS	Artificial nest sites
AON	apparently occupied nests
CIMP	Compensation Implementation and Monitoring Plan
DCO	Development Consent Order
Defra	Department for Environment, Food & Rural Affairs
DEP	Dudgeon Extension project
DESNZ	Department for Energy Security and Net Zero
EPP	Evidence Plan Process
ETG	Expert Topic Group
FFC	Flamborough and Filey Coast
GGOW	Greater Gabbard Offshore Wind Farm
HP3	Hornsea Project Three
HP4	Hornsea Project Four
HRA	Habitats regulations Assessment
JNCC	Joint Nature Conservation Committee
Km	Kilometre
MMO	Marine Management Organisation
MRF	Marine Recovery Fund
NFOW	North Falls Offshore Wind Farm Limited
OWF	Offshore wind farm
OWIC	Offshore Wind Industry Council
PEIR	Preliminary Environmental Impact Assessment Report
R2	Rampion 2
RIAA	Report to Inform Appropriate Assessment
RSPB	Royal Society for the Protection of Birds
RWE	Renewables UK Swindon Limited
SAC	Special Area of Conservation
SACOs	Supplementary advice on the conservation objectives
SEP	Sheringham Shoal Extension Project
SoS	Secretary of State
SPA	Special Protection Area
SSER	SSE Renewables Offshore Windfarm Holdings Limited
SWL	Shoney (Seonaidh) Wind Ltd
UCL	Upper confidence interval or limit
UK	United Kingdom
EU	European Union

Glossary of Terminology

Habitats Regulations	Refers to both the Conservation of Habitats and Species Regulations 2017 and the Conservation of Offshore Marine Habitats and Species Regulations 2017
The Applicant	North Falls Offshore Wind Farm Limited (NFOW).
The Project Or 'North Falls'	North Falls Offshore Wind Farm, including all onshore and offshore infrastructure.

1 Revision 2 Updates at Deadline 6

1. This document has been updated at Deadline 6 to provide updates on the scale of compensation in response to Natural England's Deadline 4 Kittiwake Compensation Advice on the Applicant's Deadline 1 and 2 Document (REP4-062).
2. In addition, detail regarding the delivery of the compensatory measures has been included in an updated version of the Outline Kittiwake Compensation Implementation and Monitoring Plan (CIMP) **[Document Reference 7.2.4.1, Rev 2**], also submitted at Deadline 6.

2 Introduction

2.1 Background

3. The North Falls Offshore Wind Farm (hereafter 'North Falls' or 'the Project') is an extension to the existing Greater Gabbard Offshore Wind Farm (GGOW), located approximately 40km from the East Anglian coast in England. When operational, North Falls would have the potential to generate renewable power for approximately 400,000 UK homes from up to 57 wind turbines.
4. The Applicant, North Falls Offshore Wind Farm Limited (NFOW), is a joint venture between SSE Renewables Offshore Windfarm Holdings Limited (SSER) and RWE Renewables UK Swindon Limited (RWE), both of which are highly experienced developers.
5. As part of the Development Consent Order (DCO) application, the Applicant must provide information to support the Habitats Regulations Assessment (HRA) to be completed by the Competent Authority, the Secretary of State for the Department for Energy Security and Net Zero (DESNZ).

2.2 Purpose of document

6. This Kittiwake Compensation Document is produced in response to consultation with the Statutory Nature Conservation Body (SNCB). In addition, it is noted that in consenting Rampion 2 (R2), the Secretary of State concluded that an Adverse Effect on Integrity (AEoI) could not be ruled out beyond reasonable scientific doubt for in-combination effects on Kittiwake at Flamborough and Filey Coast (FFC) Special Protection Area (SPA). Noting that the effects of R2 are similar to North Falls for this species, the Applicant accepts that the Competent Authority is likely to consider the contribution of North Falls to be material also. Thus, the Applicant has developed compensatory measures to fully compensate for the predicted effects, which are summarised in Section 4 and detailed in the RIAA Part 4 **(Document Reference 7.1.4 [APP-178]).**
7. This document demonstrates how the proposed compensatory measures can be delivered to ensure that the overall coherence of the National Site Network is protected, in accordance with Regulation 68 of the Conservation of Habitats and Species Regulations 2017 and Regulation 36 of the Conservation of Offshore Marine Habitats and Species Regulations 2017 (both sets of regulations together

referred to as the “Habitats Regulations”) and provides evidence that appropriate measures have been selected which will be ecologically effective.

8. A Kittiwake Compensation Implementation and Monitoring Plan (CIMP) will be produced by the Applicant and approved by the Secretary of State (SoS) post-consent, in accordance with the Outline Kittiwake Compensation Implementation and Monitoring Plan **[Document Reference 7.2.4.1, Rev 2].** Amendments to or variations of the Kittiwake CIMP would be in accordance with the principles and evidence base set out in this Compensation Document or informed by new evidence which may emerge. This would be discussed with the Kittiwake Compensation Steering Group (KCSG) and agreed with the SoS.

9. The Kittiwake CIMP is legally secured through Schedule 15 of the draft DCO **[Document Reference 6.1, Rev 7].**

2.3 The Kittiwake Feature of Flamborough and Filey Coast SPA

2.3.1 Conservation objectives

10. The conservation objectives of the FFC SPA 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 Wild 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.

2.3.2 Supplementary Advice on Conservation Objectives for Kittiwake

11. There is no specified status on the Natural England website regarding the condition of the qualifying features of the FCC SPA, although the Supplementary Advice on Conservation Objectives (SACOs) have a target to restore the size of the population of the kittiwake feature (Natural England, 2023).

12. Despite uncertainty in the population trends of kittiwake from FFC SPA (discussed further in the RIAA Part 4 **(Document Reference 7.1.4 [APP-178])),** the SACOs are based on the premise that the population has undergone a marked long-term decline, with the target for the ‘breeding population abundance’ attribute being to restore the size of the breeding population at a level which is above an apparent peak count in 1987 of 83,700 pairs at Flamborough and Bempton Cliffs, whilst avoiding deterioration from its current level (Natural England, 2023).

3 Development of compensatory measures – methodology

3.1 General Approach

13. The approach taken by the Applicant to identify potential compensatory measures and for considering their suitability considers the policy and guidance described in Appendix 1 Compensatory Measures Overview **[Document Reference: 7.2.1, Rev 2]** and was as follows:

    - Review of compensatory measures discussed in Furness *et al.* (2013);
    - Consultation with relevant stakeholders including:
        - Natural England and Royal Society for the Protection of Birds (RSPB) to develop proposals through the Offshore Ornithology Expert Topic Group (ETG) as part of the Project's Evidence Plan Process (EPP);
        - Department for Environment, Food & Rural Affairs (Defra);
        - Other offshore wind farm (OWF) developers, directly and through RWE and SSER's involvement in the Offshore Wind Industry Council (OWIC) Derogation Subgroup;
    - Ongoing review of other consented OWF applications for which compensatory measures have been accepted for kittiwake (including East Anglia ONE North, East Anglia TWO, Hornsea Project Three, Hornsea Project Four, Sheringham Shoal Offshore Wind Farm Extension Project (SEP) and Dudgeon Offshore Wind Farm Extension Project (DEP), Norfolk Boreas, Norfolk Vanguard and R2); and
    - The options identified through this process were then considered in relation to various criteria (e.g. feasible delivery mechanism, location, spatial scale, timing and monitoring) as described in Section 8).

14. Project-led, collaborative and strategic compensatory measures which have been considered are described in Section 5.

3.2 Consultation

15. The Applicant has regularly consulted with relevant stakeholders throughout the pre-application and post-submission stages, as discussed in Appendix 1 Compensatory Measures Overview (clean and tracked) [**REP1-015 and REP1-016**]. Feedback from the stakeholders has informed the development of the compensatory measures and is detailed in Annex 1A Habitats Regulations Assessment Compensation Consultation **(Document Reference: 7.2.1.1, Rev 2).**

16. Consultation with relevant stakeholders will continue throughout the examination and post consent phases of compensation development and delivery. Details of proposed future engagements during post consent development of the compensatory measure will be set out in the Kittiwake CIMP, in accordance with the Outline CIMP [**7.2.4.1, Rev 2**].

4 Quantification of effect

17. This section provides a summary of the Project's impacts on the kittiwake at FFC SPA and outlines the context for the proposed without prejudice compensatory measures. The SoS will determine the level of effect based on the Appropriate Assessment conclusions for North Falls on the breeding adult birds associated with the FFC SPA and whether North Falls contributes to the in-combination AEoI on Kittiwake.

18. The RIAA Part 4 [**APP-178**] presents an assessment of predicted collision mortality affecting kittiwake from the FFC SPA population of breeding adults, which results in an annual in-combination total of 443 mortalities. This number can be reduced when taking into account OWFs which have recently been consented subject to compensation for kittiwake collisions, leaving an in-combination total of 305 individuals (RIAA Part 4, Section 4.4.4.5.3.2, [**APP-178**]).

19. The North Falls contribution to the in-combination collision risk is **0.76 individuals** (95% CLs 0.09 – 2.72) based on an avoidance rate of 99.28% (RIAA Part 4, Section 4.4.4.5.3.1 [**APP-178**])[1]. This represents 0.2% of the in-combination total collisions at FFC SPA, without accounting for compensated projects, and 0.3% of the in combination total excluding collisions predicted at compensation sites.

5 Scale of compensation

20. This section details the calculations made to predict the required number of kittiwake breeding pairs to produce enough new recruits into the breeding population to replace predicted collision mortality to the FFC SPA population from North Falls. Natural England has advised (see NE-36, NE-202, and NE-298 (Applicant's references) in Applicant's Responses to Relevant Representations Received from Natural England, **Document Reference 9.1, Rev 0 [REP1-044],** and [REP4-062]) that North Falls should follow the method adopted by Hornsea Project Three (HP3)[2] (Niras and GoBe, 2020). This model was devised specifically for kittiwake.

21. Given that there is minimal information on how the HP3 model works and functions in the Hornsea Three documentation, the Applicant initially used an alternative method deemed to accurately and adequately calculate compensation

[1] Note that since the DCO Application for North Falls was submitted, new SNCB advice on avoidance rates has been published. Under this new guidance (SNCBs, 2024), a small change has been made to the recommended avoidance rate for kittiwake, from the value used for the North Falls DCO submission; from 0.9928 (±0.0003) to 0.9929 (±0.0003) for the basic stochastic model (MacGregor *et al.*, 2018; Caneco *et al.*, 2022) (see also [REP3-040]). Applying this small reduction changes the predicted collisions at North Falls apportioned to the AOE SPA to 0.75 (95% confidence limits 0.08 - 2.18). Given the very small change, no updates have been made here to the compensation quantum.

[2] It is noted that in [REP4-062] Natural England refer to the Hornsea 3 part 2 method, although in this document the method is referred to as HP3.

requirements to cover a variety of uncertainties, specifically based on the Hornsea Project Four (HP4) approach (APEM, 2022) and also taking into account philopatry and natal dispersal (respectively the proportion of fledglings from a given colony surviving to breeding age that would be expected to nest or recruit into the same (natal) colony, and the proportion predicted to disperse to recruit into a different colony). This approach was discussed with Natural England during an Expert Topic Group meeting on the 15th of January 2025.

22. In this document, the Applicant has included calculation of compensation scale using the HP3 approach as well as the HP4 methodology.

5.1 Hornsea Project Four (HP4) approach

23. The HP4 approach calculates the number of breeding pairs required to produce enough fledglings to replace the predicted annual collision mortalities from the project, accounting for those birds that are not likely survive to breeding age. The calculations are based on available information on demographic rates, shown in Table 5.1, specifically:

- Age at which kittiwakes first breed, or recruit into breeding colonies;
- Productivity rate; and
- Survival rate of immature and adult kittiwakes.

24. The calculations for North Falls use observations from Coulson (2011) that detail the proportions of first-time breeders across different age classes at the North Shields colony (Table 5.1) which is approximately 9 – 10 km from the North Falls compensation location (Section 8.2.1) and so is suitably comparable due to the proximity. The number of new recruits required (which in this case would be equal to the predicted mortality of birds from the project) is divided across the percentage of recruits per age class, giving the number of new recruits expected from each age class.

25. Table 5.1 also contains the other demographic parameters used in the following equations such as survival rates and productivity, which are taken from Horswill and Robinson (2015). Breeding recruitment for kittiwake is typically at four years (Horswill and Robinson, 2015), with the detailed demographic information in Coulson (2011) showing that the majority of recruitment occurs between ages three to six.

Table 5.1 Demographic parameters used in the compensation quantum equations using the Hornsea 4 method.

Age at Recruitment (first breeding) (Years)[1]		1	2	3	4	5	6	7	8	9	10
% of Recruits[1]		**0.0**	**0.7**	**26.5**	**35.2**	**22.7**	**10.5**	**2.5**	**0.9**	**0.9**	**0.4**
Number of New Recruits[2] at 1:1	Mean 0.76	0.00	0.01	0.20	0.27	0.17	0.08	0.02	0.01	0.01	<0.01
	UCL 2.72	0.00	0.02	0.72	0.96	0.62	0.29	0.07	0.02	0.02	0.01
Juvenile Survival (<1)[3]		0.790									
Adult Survival (≥1)[3]		0.854									
Natal dispersal[2]		0.890									
Tyne colonies Average Productivity[4]		0.945									
East of England Average Productivity[3]		0.819									
National Average Productivity[3]		0.690									

1. Taken from age-specific breeding recruitment data for the North Shields colony in Coulson (2011).

2. Calculated by multiplying the required number of new recruits (to replace predicted losses) with the percentage of recruits found across each age class 1-10 inclusive.

3. From Horswill and Robinson (2015)

4. Average Tyne colonies productivity taken for a 10-year period (2014 – 2024) from colony count / productivity data available on Natural History Society of Northumbria (nhsn.org,uk), surveys conducted by D. Turner. This average excludes the Tynemouth cliffs site, only including artificial sites (buildings / kittiwake towers).

26. The example below details the calculations used to estimate the number of additional breeding pairs required to compensate for North Falls' predicted impacts on kittiwakes based on an estimated mortality of 2.72 birds (the upper confidence interval or limit (UCL) of the predicted annual mortality of FFC breeding birds at North Falls), at the East of England average productivity rate. The numbers of new recruits that will come from each year group is calculated using the recruitment age class proportions in Table 5.1 within the initial equation below:

$$New\ recruits_{Age=i} = (Total\ new\ recruits\ required\ [2.72]) \times Proportion\ of\ new\ recruits_{Age=i}$$

27. The final cumulative number of fledglings required across all age classes ($All\ birds_{Age=0}$) is calculated in a stepwise manner and the number of breeding pairs is calculated from this:

$$N_{Breeding\ pairs} = \frac{All\ birds_{Age=0}}{\text{Productivity}}$$

28. To get to $All\ birds_{Age=0}$, a number of sequential calculations is required to derive this final number, starting with the top end of the scale at $New\ recruits_{Age=10}$ (taken from Table 5.1 above; in the equation this is the number of new recruits aged 10 years, based on the UCL mortality estimate) The quantity of new recruits aged 10 should be equal to the remainder of age nine birds that firstly do not recruit during that ninth year , and secondly, survive the ninth year to become 10 years of age:

$$New\ recruits_{Age=10} = \left(All\ birds_{Age=9} - New\ recruits_{Age=9}\right) \times Survival_{Age=9}$$

29. This equation is rearranged to calculate the total birds aged nine required to satisfy that condition i.e.:

$$\therefore All\ birds_{Age=9} = \frac{New\ recruits_{Age=10}}{Survival_{Age=9}} + New\ recruits_{Age=9}$$

$$All\ birds_{Age=9} = \frac{0.01}{0.854} + 0.02 = 0.04$$

30. This same logic then cascades down through each age class until accumulating at $All\ birds_{Age=0}$:

$$All\ birds_{Age=0\leq i\leq 8} = \frac{All\ birds_{Age=i+1}}{Survival_{Age=i}} + New\ recruits_{Age=i}$$

$$All\ birds_{Age=8} = \frac{0.04}{0.854} + 0.02 = 0.07$$

$$All\ birds_{Age=7} = \frac{0.07}{0.854} + 0.07 = 0.15$$

$$All\ birds_{Age=6} = \frac{0.15}{0.854} + 0.29 = 0.46$$

$$All\ birds_{Age=5} = \frac{0.46}{0.854} + 0.62 = 1.15$$

$$All\ birds_{Age=4} = \frac{1.15}{0.854} + 0.96 = 2.31$$

$$All\ birds_{Age=3} = \frac{2.31}{0.854} + 0.72 = 3.42$$

$$All\ birds_{Age=2} = \frac{3.42}{0.854} + 0.02 = 4.03$$

$$All\ birds_{Age=1} = \frac{4.03}{0.790} + 0.00 = 5.10$$

$$All\ birds_{Age=0} = \frac{5.10}{0.790} + 0.00 = 6.46$$

31. Based on the sequential calculations (paragraphs 28 to 30 above), a total of 6.46 fledglings are required to replace the UCL of mortality (2.72), which feeds into the equation detailed in Paragraph 2727 above, to calculate the number of breeding pairs required:

$$N_{Breeding\ pairs} = \frac{6.46}{0.819} = 7.90$$

32. In summary, the production of 6.46 fledglings is required in a given year to result in a sufficient number of birds that survive to breeding age to replace a predicted annual loss of 2.72 breeding adults from the FFC population; and 7.90 breeding pairs are required to produce this number of fledglings – when considering the East of England average productivity rate of 0.819.

33. The number of fledglings and breeding pairs required for compensation as calculated by the HP4 method for the mean and UCL of predicted collisions is shown in Table 5.2, for a number of different values of productivity and ratios of 1:1 to 1:3. Scaling up the predicted number of pairs through use of ratios above 1:1 may be considered to account for uncertainty in the predictions, for example, due to variation in demographic rates between colonies.

Table 5.2 Calculated compensation numbers for kittiwake mortalities in North Falls OWF using the HP4 methodology

Method	North Falls predicted mortalities	Average Productivity Rates	Number of breeding pairs required for compensation			Number of fledglings produced/required for compensation		
			1:1	2:1	3:1	1:1	2:1	3:1
Hornsea Project Four	0.76 (mean)	Tyne – 0.945	1.91	3.82	5.73	1.80	3.61	5.41
		E of England – 0.819	2.20	4.41	6.61			
		National – 0.690	2.61	5.23	7.84			
	2.72 (Upper 95% CI)	Tyne – 0.945	6.83	13.66	20.50	6.46	12.91	19.37
		E of England – 0.819	7.88	15.77	23.65			
		National – 0.690	9.36	18.71	28.07			

34. The HP4 method calculates the number of breeding pairs required to produce an adequate number of fledglings each year that will replace the predicted mortalities from the project with breeding age birds, whilst accounting for birds that are not likely survive to breeding age (see Table 5.1 for age specific survival rates). To further alleviate uncertainty around the production of fledglings to replace predicted losses from the project and the recruitment of these birds in the Artificial Nesting Structure (ANS) versus the wider population / National Site Network, philopatry/natal dispersal rates can be used to predict where the birds are likely to recruit.

35. In this instance, with a natal dispersal rate of 0.890 for Kittiwake (Horswill and Robinson (2015), Table 5.1), 89% of fledglings produced in the compensation colony that survive to recruit into the breeding population, will do so at a new colony and not the colony where they were hatched. Given that the aim of the compensation is to replace predicted losses to collision at FFC SPA, within the National Site Network, it is considered appropriate to scale the compensation so that the number of fledglings which survive to breed and disperse from the natal colony is equal to the predicted annual losses at FFC SPA as a result of North Falls.

36. Table 5.3 below shows a further break-down from the results in Table 5.2, showing how fledglings from the compensation colony that survive to breeding age are expected to disperse and then recruit i.e., remain in the natal colony or disperse to recruit at other colonies. For example, to compensate at a 3:1 ratio for the mean predicted annual mortality (0.76 x 3 = 2.28), 6.61 breeding pairs would be required to provide the 2.28 recruits, of which 2.03 would be expected to disperse away from the natal colony, and the remaining 0.25 would likely recruit into the compensation colony. This would more than cover the predicted mean mortalities from the project through birds dispersing into the wider population, and potentially recruiting into the national site network and/or the FFC SPA.

Table 5.3 Summary of breeding pairs needed to produce fledglings to compensate for North Falls predicted mortalities based on HP4. Values presented at compensation ratios of 1:1 to 3:1, and for three productivity rates (see Table 5.2). Natal dispersal / philopatry of adult birds produced by the breeding pairs detail how birds are anticipated to distribute at recruitment.

North Falls predicted mortalities	Productivity rate	Breeding pairs	Total fledglings required	Birds surviving to breeding age	Birds recruiting into natal colony	Birds dispersing away from natal colony
Compensation ratio 1:1						
Mean – 0.76	Tyne– 0.945	1.91	1.80	0.76	0.08	0.68
	E of England– 0.819	2.20				
	National– 0.690	2.61				
UCL – 2.72	Tyne– 0.945	6.83	6.46	2.72	0.30	2.42
	E of England– 0.819	7.88				

North Falls predicted mortalities	Productivity rate	Breeding pairs	Total fledglings required	Birds surviving to breeding age	Birds recruiting into natal colony	Birds dispersing away from natal colony
	National– 0.690	9.36				
Compensation ratio 2:1						
Mean – 0.76	Tyne– 0.945	3.82	3.61	1.52	0.17	1.35
	E of England– 0.819	4.41				
	National– 0.690	5.23				
UCL – 2.72	Tyne– 0.945	13.66	12.91	5.44	0.60	4.84
	E of England– 0.819	15.77				
	National– 0.690	18.71				
Compensation ratio 3:1						
Mean – 0.76	Tyne– 0.945	5.73	5.41	2.28	0.25	2.03
	E of England– 0.819	6.61				
	National– 0.690	7.84				
UCL – 2.72	Tyne– 0.945	20.50	19.37	8.16	0.90	7.26
	E of England– 0.819	23.65				
	National– 0.690	28.07				

5.2 Hornsea Project 3 (HP3) approach

37. As stated above, the HP3 approach is derived from Niras and GoBe (2020).

38. Natural England has provided the Applicant with an in-press copy of a report commissioned from BTO which reviews methods to calculate the required scale of artificial nesting structures proposed as a compensation measure for kittiwake mortality at offshore wind farms (Rhoades *et al.* in press). The review considers methodologies used by all OWFs in English Offshore waters that have been consented to date subject to compensation measures for kittiwake, as well as three Round-4 OWF projects included in The Crown Estate's Kittiwake Strategic Compensation Plan (TCE, 2024).

39. The key steps in the HP3 approach are as follows (Rhoades *et al.* in press; The Crown Estate, 2024):

    - Calculate required number of recruits to replace predicted losses from collisions at the OWF to be compensated for;
    - Calculate predicted age distribution of recruits;
    - Calculate number of fledglings needed by calculating number of birds in each age category required to contribute number of new recruits, plus those that survived the previous age category;
    - Calculate number of breeding pairs required to achieve number of fledglings based on productivity rate, and taking into account the estimated number of birds that recruit to breed at their natal colony (natal philopatry) and the estimated number of birds that disperse away to recruit into the breeding population of another colony (natal dispersal); and
    - Calculate number of breeding pairs required, accounting for age distribution of population, adult survival and adult dispersal.

40. Rhoades *et al*. (in press) describes the HP3 methodology for calculating compensation scale for kittiwake as the most comprehensive in terms of the number of steps and biological features involved in the methodology, considering breeding adult mortality and the required contribution of recruits for each age class, while also accounting for adult and natal philopatric rates, and separating birds recruiting back into an ANS from those dispersing and potentially recruiting back into the SPA network. It is also noted that H3 is the most parameter rich approach, and the adequacy of parameter choices is difficult to assess – which is understood to refer to the robustness of available estimates of demographic parameters for kittiwake and whether these might be applicable to a breeding colony at an ANS.

41. The parameters used in the HP3 approach are included in Table 5.4 below.

Table 5.4 Demographic parameters used in the HP3 method (from Rhoades *et al.* in press).

Demographic parameter	Value	Source
Juvenile survival rate	0.790	Horswill and Robinson (2015)
Adult survival rate	0.854	Horswill and Robinson (2015)
Breeding productivity (ANS)	0.819	Derived from Horswill and Robinson (2015)
Recruitment age	Proportional estimates from 2-10 years (see Table 5.1 Demographic parameters used in the compensation quantum equations using the Hornsea 4 method.Table 5.1)	Coulson (2011)
Natal dispersal	Two scenarios, 0.77 and 0.89	Coulson (2011); Horswill and Robinson (2015)
Adult dispersal	0.012	Horswill and Robinson (2015)

42. The predicted number of breeding pairs required to compensate for predicted collision mortality at North Falls to the FFC SPA population based on the HP3 methodology, at two values of natal dispersal, and three values of productivity, and scales of 1:1 to 1:3, is shown in Table 5.4. With regard to natal dispersal, the estimate of 0.77 (i.e. 77% of chicks that fledge from a given colony and survive to breeding age will recruit into a different colony), is more conservative than the 89% from Horswill and Robinson (2015), so that for given estimates of predicted mortality and productivity, more breeding pairs are predicted to be required to compensate for collision mortality at a natal dispersal of 0.77 than at 0.89.

Table 5.5 Calculated compensation numbers for predicted kittiwake mortalities at North Falls OWF using the HP3 methodology. Applicant's proposed appropriate compensation scale highlighted in red/bold text.

Predicted mortality	Natal dispersal rate	Productivity	Number of breeding pairs required for compensation		
			1:1	2:1	3:1
Mean – 0.76	0.77	0.945	3.96	7.91	11.87
		0.819	4.86	**9.72**	14.58
		0.690	6.26	12.53	18.79
	0.89	0.945	3.42	6.84	10.27
		0.819	4.21	8.41	12.62
		0.690	5.42	10.84	16.26
UCL – 2.72	0.77	0.945	14.16	28.31	42.47
		0.819	17.40	34.79	52.19
		0.690	22.41	44.83	67.24
	0.89	0.945	12.25	24.49	36.74
		0.819	15.05	30.10	45.15
		0.690	19.39	38.78	58.18

5.3 Recommended scale of compensation

43. In consenting R2, the SoS considered that use of the CIV, the HP3 methodology, and a 2:1 ratio was appropriate to calculate compensation scale (DESNZ, 2025a). Based on a mean predicted collision risk of 0.72 birds per annum at R2, the SoS concluded a compensation quantum of 9.32 breeding pairs of kittiwake and the provision of 10 nesting spaces on an ANS would be sufficient to compensate for the impact of R2 on the kittiwake feature of the FFC SPA.

44. In the context of the R2 decision, it is noted that mean predicted collisions at North Falls, 0.76 birds per annum, is very similar to that at R2, and, as for R2, connectivity between North Falls and the kittiwake population of the FFC SPA is identified only in the non-breeding season. Using the method adopted by the SoS in determining the compensation scale for R2, a compensation quantum of 9.72 breeding pairs of kittiwake and the provision of 10 nesting spaces on an ANS is proposed for North Falls.

6 Selection of compensatory measure(s)

45. The process for identifying potential kittiwake compensatory measures considered the ecology and existing pressures on kittiwake to identify measures which would aim to reduce mortality from other causes, increase survival through other means and/or increase productivity to offset the collision effects described in Section 4.

46. An In Principle Compensation Options Review was submitted alongside Preliminary Environmental Impact Assessment Report (PEIR) (NFOW, 2023) which reviewed potential compensatory measures. Following consultation on the In Principle Compensation Options Review and further technical consultation through the Evidence Plan Process, an ANS (discussed further in Sections 7 and 8) was selected as the preferred measure using a collaborative option with other developers, should the Appropriate Assessment conclude and AEoI on the kittiwake feature of the FFC SPA.

47. Contribution to a strategic measure or fund (Section 10) is also included as an option to deliver compensation.

48. Table 6.1 provides a summary of the considered measures and conclusions reached in consultation with Natural England and RSPB.

Table 6.1 Screening of compensation measures for kittiwake (selected options in bold)

Measure	Conclusions
Closure of sandeel and sprat fisheries close to breeding areas	It is recognised that a permanent closure of sandeel fisheries in English North Sea waters was introduced from April 2024 (Defra, 2024) and that the Energy Act 2023 provides the powers to allow this measure to be allocated as compensation for offshore wind projects. The process whereby sandeel closures can be used as compensation is still in development and at this stage, it is not considered further as a potential compensatory measure for North Falls. However, the Applicant recognises that sandeel closures could be a compensatory measure that the SoS could rely on in the future to provide compensation either for North Falls alone or as part of a strategic approach to compensation. This option is not considered further by the Applicant. However, should this become available as a strategic option, the Applicant may give this further consideration.

Measure	Conclusions
Provision of additional nesting habitat – artificial structure – for new kittiwake breeding colonies	Kittiwakes will readily use a range of ANS – harbour walls, buildings, bridges, oil and gas platforms, purpose-built structures – where natural sites (narrow cliff ledges) are not available. Providing new artificial colonies in areas where kittiwakes are unable to breed due to lack of natural nesting habitat is a potential compensation measure for mortality due to OWFs (and has been proposed for a number of developments – see text below). Evidence indicates that artificial sites have the potential for higher breeding success than natural sites which is important in terms of potential for compensation to offset collision mortality. Compensation measures to provide additional breeding adult kittiwakes to recruit into the FFC SPA population, to replace predicted losses from collisions, have been accepted for eight consented OWFs and are currently proposed as without-prejudice compensation measures for other OWFs. A comprehensive review of the potential location of sites for creation of new kittiwake colonies that could supply recruits to the FFC SPA (Ørsted, 2020) identified a number of potential onshore and offshore sites for installing ANS or for enhancing / expanding existing artificial structures. Thus, there are opportunities for North Falls to find suitable location(s) to implement such measures. This measure is discussed further in Sections 7 and 8.
Predator management (mink, feral cat, rat) / exclusion (foxes, great skuas)	Predation on kittiwake nests by mammals is rare because nests tend to be inaccessible. Great skuas predate kittiwakes breeding in north and west Scotland, but not in colonies bordering the southern North Sea. The SACO for the kittiwake feature at FFC SPA notes that: *"Predation of juvenile and adult birds by carrion crow (Corvus corone) and peregrine falcons (Falco peregrinus) is known to occur, particularly around Filey Brigg and the Briel Newk section of Flamborough Head. However, it is not thought to be significantly affecting the population size or productivity of the kittiwake feature. Due to the nature of the sheer cliffs, mammalian predation is not deemed to be a significant problem at this site."* Consequently, any measures to control predators at the FFC SPA are unlikely to result in a sufficient increase in kittiwake productivity or survival to compensate for North Falls mortality. Therefore, the Applicant has not investigated this compensatory measure further.
Designation of additional SPAs	Natural England advised that any areas that meet the requirement to be designated as SPAs should have been or should be designated. This measure is therefore not considered further, however, should this become available as a strategic option, the Applicant may give this further consideration.
Contribution to a strategic fund	In accordance with the Shoal Extension Project and Dudgeon Extension project (SEP&DEP) DCO, which enables compensation to be delivered through contribution to a Strategic Compensation Fund, this option is included for North Falls.

7 Ecological Evidence

7.1 Provision of artificial nesting structures to increase breeding populations and productivity

7.1.1 Evidence of kittiwake using artificial nest sites

49. Evidence indicates that kittiwake nesting on man-made structures may achieve high breeding success at such sites, often higher than at nearby natural colonies (Turner, 2010, 2019; Coleman *et al*., 2011; Christensen-Dalsgaard *et al*., 2019; Reiertsen *et al*., 2019). This high breeding success may be due to colonies on man-made structures tending to be smaller than many of the monitored natural colonies so that competition for resources is lower (i.e. a consequence of density-

dependence, which is known to particularly affect breeding kittiwakes (Furness and Birkhead, 1984; Coulson, 2011, 2017; Wakefield *et al*., 2017)). It may also be due to nest sites on artificial structures being better than those on natural cliffs in terms of some features such as protection from predators, weather and rough seas (Christensen-Dalsgaard *et al*., 2019). It may also be due to some artificial sites being closer to foraging grounds than are natural cliffs, and so reducing the energy costs and time required to commute from nest sites to feeding areas (Christensen-Dalsgaard *et al*., 2019).

50. RWE previously commissioned Shoney (Seonaidh) Wind Ltd (SWL) to undertake an extensive review on kittiwake thermoregulation and the importance of solar irradiation and wind exposure in nesting site selection (Stevenson, 2022). This review considered successful and failed ANS in Boulogne sur Mer, Mumbles Pier in Swansea, McNulty's ANS in South Shields, Saltmeadows ANS in Gateshead, and Akzo Nobel ledges in Gateshead. The report also incorporated survey data from urban kittiwake colonies in Scarborough (Addey & Stevenson, 2021) and Hartlepool (Leakey, 2021) and historical Apparently Occupied Nests (AON) and productivity for the Baltic Arts Centre and Saltmeadows (Turner, 2009-2021). In 2022, RWE commissioned SWL to undertake 'early occupation studies' to identify which urban and coastal locations were occupied earliest in the season and examine occupation rates in the context of differences in solar and wind exposure (Stevenson & Kitching, 2022).

51. Kittiwakes were observed to have selected nest sites based on a variety of factors, Stevenson (2022) hypothesised that solar irradiation exposure and adverse weather events were critical to breeding success (due to narrow upper and lower critical thermoregulatory thresholds in kittiwake) and proposed that optimal nesting sites would be occupied earlier than sub optimal locations. The early occupation studies (Stevenson & Kitching, 2022) demonstrated that experienced breeders arrive early to select previously successful, i.e. optimal nesting sites. They also observed that first arrivals at urban Tyne locations were up to three weeks ahead of arrivals at natural coastal locations, suggesting that urban nest sites offer an advantage over coastal nests sites.

7.1.2 Source of kittiwakes available to occupy additional artificial nest sites

52. Key to the success of ANS, is the availability of kittiwake that would otherwise be unlikely to find breeding locations. The non-breeding portion of seabird populations is always very poorly understood and almost impossible to quantify, due to these individuals not returning to land to breed where they can be counted (e.g. McKnight *et al*., 2019). Note, sabbatical birds take a year off breeding but will then usually return in subsequent years to continue breeding at the same colony. These sabbatical individuals would not be expected to start breeding at ANS unless they had repeated breeding failures at their original colony. Therefore, it is younger birds that have yet to start breeding that are most likely to colonise ANS or adult birds that have lost their breeding habitat for some reason. Productivity, survival rate of juvenile and immature age classes and age at first breeding will determine the size of the non-breeding population. Productivity is monitored at some kittiwake colonies (SMP, 2020) and age at first breeding is relatively well quantified (Horswill & Robinson, 2015). However, quantifying juvenile and immature survival rate is reliant on resighting of birds colour ringed as chicks. As resighting rates are low, there is high uncertainty

associated with estimates of juvenile and immature survival. Both colour-ringing chicks and then resighting those individuals several years later is very challenging in kittiwakes and currently an insufficient number of chicks are colour ringed and resighted to provide reliable estimates of immature survival and age at first breeding (O'Hanlon *et al*., 2021). Consequently, the size of the non-breeding population in kittiwakes can only be inferred indirectly.

7.1.2.1 Offshore Oil & Gas Installations

53. The kittiwake non-breeding population will also be supplemented by adults that were nesting on offshore oil and gas platforms that have subsequently been decommissioned. Kittiwakes are known to nest on artificial structures, including urban buildings, bridges and piers (e.g. Coulson, 2011; Turner, 2010). They also nest on offshore installations, including oil and gas platforms and FPSOs (Floating Production, Storage and Offloading vessels) (e.g. Christensen-Dalsgaard *et al*., 2019; Camphuysen & Leopold, 2007; Geelhoed *et al*., 2011; Niras, 2021; GoBe, 2023). Offshore installations offer an ideal location of seabirds to nest, usually being closer to high quality foraging areas than land-based colonies, and usually free from any mammalian predators. Some species of avian predators, e.g. carrion crow, are likely to be rare although large gulls are likely to be present (Niras, 2021). Furthermore, oil and gas platforms can be unmanned for several years between being taken out of production and full decommissioning, meaning the platform is generally free from human disturbance. These factors combined can result in both large numbers of kittiwakes nesting on offshore installations and high productivity (Christensen-Dalsgaard *et al*., 2019; Niras, 2021).

54. Numbers of kittiwakes breeding on offshore installations is unknown as they are challenging to count and information on breeding numbers is not always made freely available (e.g. Christensen-Dalsgaard *et al*., 2019). Draft decommissioning programmes[3] do not mention breeding kittiwakes on installations, even when operators are aware of kittiwakes being present (with Wenlock an exception to this (Alpha Petroleum, 2022), discussed further below). The Conservation of Offshore Marine Habitats and Species Regulations 2017 and The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 stipulate that it is an offence to destroy birds' nests, eggs and chicks during the breeding season without a license, meaning that decommissioning of offshore structures on which kittiwakes and other seabird species are nesting can be problematic (Thompson, 2021). However, there is evidence that incidence of kittiwakes nesting on offshore structures is widespread and frequent:

    - Kittiwakes are known to be present at a sufficient number of platforms to warrant Joint Nature Conservation Committee (JNCC) developing guidance on methods for counting nesting seabirds (Thompson, 2021).

[3] https://www.gov.uk/guidance/oil-and-gas-decommissioning-of-offshore-installations-and-pipelines#draft-decommissioning-programmes-under-consideration

- Counts of breeding kittiwakes from seven platforms in Liverpool Bay and four platforms offshore from Norfolk have been incorporated into the Seabird Monitoring Programme database (SMP, 2024).
- In July 2005, 45 apparently occupied nests (AON) were recorded on the platform L8-P, approximately 65km from the Dutch coast. Nearby unmanned platforms were investigated in summer 2006 and kittiwakes were found prospecting at six out of nine platforms visited, with confirmed breeding at three platforms in the Frisian Front and Klaverbank region (Camphuysen & Leopold, 2007). In July 2010, 16-25 pairs of kittiwakes were recorded breeding on the Dutch platform K15-FC-1, 75km from the Dutch coast (Geelhoed *et al*., 2011).
- Six offshore installations (including FPSOs) in Norwegian waters reported breeding kittiwakes present, with between 40 and 674 AON on each installation in 2019 (Christensen-Dalsgaard *et al*., 2019).
- Kittiwakes were also known to be breeding on other platforms, including some that have already been completely removed (e.g. Schooner Offshore Platform Three60 Energy, 2022), i.e. these kittiwakes have already lost their breeding habitat.
- For Hornsea Project 4, Orsted commissioned boat-based surveys to document the prevalence of kittiwakes nesting on some man-made structures in the southern North Sea (Niras, 2021). In June 2021, 16 offshore platforms were inspected for evidence of nesting kittiwakes. Of these, eight had breeding kittiwakes, with number of AONs ranging from 1 to 409 per platform (mean = 174 AONs, total = 1,394 AONs).
- Outer Dowsing Offshore Wind Farm (GoBe, 2023) commissioned a census of 19 offshore oil and gas platforms in the southern North Sea in July 2022 and found kittiwakes breeding on six structures. On these installations, the average number of AONs was 42 (range 17-67 AON per installation, total 253 AONs across all installations).
- The Schooner offshore installation off the east coast of England had 224 kittiwake nests with 316 eggs and 307 chicks, in 2021. Birds of prey were used during 2022 to discourage kittiwakes from nesting to enable decommissioning of the platform. A follow up survey[4] in April 2023 found 22% of nests remained (i.e. 179 pairs of kittiwakes had either moved to alternative nesting habitat or failed to breed in 2023).
- Orsted has entered into discussions with the operator of the Wenlock gas platform[5], on which 69 kittiwake nests were recorded in June 2022. The Wenlock platform is due to be taken out of production shortly and would eventually be completely removed. Orsted is investigating the feasibility of

[4] https://www.nbcenvironment.co.uk/bird-control/projects/falconry-programme-in-the-north-sea-supports-platform-decommissioning/

[5] https://orsted.co.uk/media/newsroom/news/2022/08/wenlock-mou

repurposing the Wenlock platform to providing nesting habitat for kittiwakes, as a compensatory measure for the Hornsea 4 offshore wind farm.

55. Whilst the numbers of kittiwakes breeding on offshore installations is not fully known, it is apparent that substantial numbers of installations are scheduled to be decommissioned over the next few years. OSPAR maintains an inventory of the status of offshore installations in the region[6].

56. In 2021 in UK waters, there were a total of 876 installations, of which 115 were closed down, 86 were being dismantled and 51 were decommissioned (36 of which were reported as removed or re-located). Applying the Outer Dowsing (2023) and Orsted (2021) rates of occupancy of installations and mean AONs per installation, it is possible to estimate the number of kittiwake pairs that were nesting on installations that have now been removed or will be (or are likely to be) removed in the near future (Table 7.1).

57. The southern North Sea, offshore from the FFC SPA, has a large number of gas platforms and extensive kittiwake foraging habitat on the Dogger Bank and so many installations can be assumed to support large numbers of breeding kittiwakes. Whilst there is uncertainty around these figures, as accurate information on numbers of AONs on each installation is not available, it is clear that there is a large pool of breeding kittiwakes that have either already lost their nesting habitat or will do so in the near future. Of these 252 installations, many of them are likely to have supported breeding kittiwakes, which are now looking for alternative nesting habitat. Furthermore, decommissioning of remaining installations will continue over future decades, maintaining a supply of adult kittiwakes requiring new breeding habitat. Many of these are gas platforms in the southern North Sea in the vicinity of the FFC SPA where compensation is required (Lawrence & Fernandes, 2022).

Table 7.1 Estimated numbers of pairs of kittiwakes potentially requiring new nesting habitat due to decommissioning of offshore installations. Status of UK installations (closed down, being dismantled or decommissioned) is based on the OSPAR inventory (2021)[7]. Estimates are based on proportion of installations with breeding kittiwakes present (31%-50%) and estimated kittiwake AONs per installation (42-174) from Outer Dowsing (2023) and Orsted (2021), respectively.

Status of installations	No. of installations in UK waters	Estimated no. of installations with breeding kittiwakes	Estimated no. of AONs across installations in UK waters
Closed down	115	27-43	1,141-7,482
Being dismantled	86	36-58	1,525-10,005
Decommissioned	51	16-26	676-4,437
Total	**252**	**79-127**	**3,342-21,924**

58. These pairs may move to other installations as they are taken out of production, meaning there is alternative nesting habitat available to these birds. However,

[6] https://odims.ospar.org/en/submissions/ospar_offshore_installations_2021_02/
[7] ODIMS - Submission: OSPAR Inventory of Offshore Installations - 2021

increasing awareness among operators of the challenges of decommissioning and dismantling installations that support breeding kittiwakes, means that there is an increase in the use of bird deterrents to stop seabirds moving in. For example, Chrysaor note[8] that,

"*kittiwake and herring gull are utilising artificial nest locations and successfully rearing chicks. In some instances, colonies of several hundred birds have established and return each year. Although for most offshore platforms, the number of breeding birds remains very low…. Chrysaor has been undertaking surveys to determine the presence (and if so type) of birds nesting on our platforms. We are committed to deterring birds from their installations out with the breeding season to mitigate against nesting birds on the platform. Chrysaor may employ a range of non-lethal deterrents to prevent birds nesting if required.".*

59. Therefore, new nesting habitat is unlikely to be widely available other than where deliberately installed as compensation.

7.1.2.2 Higher productivity in the southern North Sea

60. The UK kittiwake population has undergone a sustained decline in breeding abundance and productivity since the mid-1990s[9]. A declining population would be expected to have relatively few non-breeders as birds reaching age of maturity would not have to compete with a large population of adults to secure suitable nesting habitat. However, declines in both breeding abundance and productivity in kittiwake colonies in England have been small, compared to declines in Scotland. Productivity at FFC SPA in 2023 continued to rise to its highest level since 2009, of 1.02 chicks per pair (Butcher *et al*., 2023). This productivity is high, compared to the average UK productivity between 2014 and 2019 of 0.62 chicks per pair[9]. For comparison with offshore nest sites, Niras (2021), found a mean breeding success at six offshore installations in the southern North Sea to be 0.95 chicks per pair (range 0.63-1.12) and, similarly, Christensen-Dalsgaard *et al*. (2019) found a productivity rate of 0.88 chicks per pair (range 0.61-1.02) on three Norwegian offshore installations in 2019.

61. This relatively high productivity at both FFC SPA and at offshore installations in the southern North Sea, coupled with removal of offshore installations during decommissioning provides evidence of the existence of a surplus of kittiwakes requiring new nest sites.

7.1.3 Onshore vs Offshore artificial nesting sites

62. Seven offshore wind farms have been consented subject to ANS as a compensatory measure for kittiwakes from FFC SPA. Following multiple onshore ANS, Natural England has recommended that projects seek to install offshore ANS, although it has indicated that for projects with a small impact (e.g. Dudgeon and Sheringham Extensions, with a predicted mean value of six collisions per annum), onshore ANS may be acceptable (Natural England, 2023b).

[8] https://www.harbourenergy.com/media/mpdna43h/cdp3-dp-draft-2022-02-28-issued.pdf
[9] https://jncc.gov.uk/our-work/black-legged-kittiwake-rissa-tridactyla/#uk-population-estimates-and-change-1969-2008

63. In reaching this position, Natural England stated that the compensation for DEP&SEP will only need to produce a modest number of additional recruits into the national site network and this indicated that an onshore ANS would have the potential to be successful (for these projects). Furthermore, Natural England (2023b) stated that they would continue to appraise the potential for onshore ANS to compensate for future OWF projects with smaller contributions on a case-by-case basis. The predicted contribution of North Falls to the in-combination adverse effect on the FFC SPA kittiwake feature is 0.76, which is clearly lower than that of Sheringham and Dudgeon OWF Extensions.

64. With respect to offshore ANS, Natural England (2023b) recommended that developers should work together to select suitable shared offshore sites because, in their opinion, there is more likely to be a shortage of suitable nest spaces offshore and such sites offer opportunities to access foraging grounds which are beyond the range of coastal kittiwakes. Although Natural England (2023b) suggests that kittiwakes nesting on offshore ANS may benefit from better access to foraging grounds, and that seems likely to be the case, there is only one published study so far (Christensen-Dalsgaard *et al*., 2019) that assesses the breeding success of kittiwakes at offshore sites (in the Barents Sea and Norwegian Sea) compared to breeding success at coastal artificial sites and coastal natural sites (in Norway). There is therefore limited evidence to support or refute this hypothesis, and none for the UK. The Norwegian study estimated breeding success by asking workers on oil and gas platforms to photograph samples of accessible kittiwake nests on three platforms, two in 2018 and 2019, and one in 2019 only. For four of the estimates of productivity, the number of AONs was estimated from a photograph taken “in the early breeding season” and the number of large chicks counted in a photograph taken “later in the season”. Exact timing in relation to the kittiwake breeding season was not reported. Nests where an adult obscured the view of nest contents were assumed to produce no chicks. For one site in one year the estimate was based on a count of the total number of chicks plus newly-fledged kittiwakes on the oil rig in relation to the estimated number of AONs counted earlier.

65. These methods differ from the standard approved methods for monitoring kittiwake productivity (Walsh *et al*., 1995). In particular, it may be unsafe to assume that newly-fledged kittiwakes resting on an oil platform were all derived from nests on that platform, and it is perhaps relevant that this estimate (for Heidrun in 2018) gave the highest estimate of productivity of all the offshore sites studied. In contrast, breeding success at Norwegian coastal colonies (artificial or natural) was estimated using standard approved methods (Walsh *et al*., 1995). The results suggest that kittiwake productivity on the offshore structures (between 0.61 and 1.07 with a mean of 0.88 chicks per nest) was higher than at coastal sites (artificial sites mean of 0.69 chicks per nest, natural sites mean of 0.32 chicks per nest). However, the difference between offshore artificial sites and coastal artificial sites was relatively small, especially in 2019 (offshore mean 0.82 chicks per nest, coastal mean 0.74 chicks per nest), compared to the difference between natural sites and artificial sites (Christensen-Dalsgaard *et al*., 2019).

66. The authors speculate that higher productivity might be achieved on offshore structures because adults have less far to commute to foraging grounds and may be less exposed to predation and disturbance. This would be consistent with

observations that kittiwake productivity at some natural colonies in Norway has been strongly affected by presence of white-tailed eagles (Anker-Nilssen *et al*., 2023) which are less likely to occur close to offshore colonies or to human habitation where coastal kittiwake colonies occur on buildings. Other avian predators may also be less numerous at artificial colonies than at natural colonies, although Christensen-Dalsgaard *et al*. (2019) point out that herring gulls and great black-backed gulls congregate at offshore platforms and have an adverse effect on kittiwake productivity at nests open to gull attack.

67. Where breeding kittiwakes forage at offshore grounds, provision of offshore ANS may indeed allow kittiwakes to achieve high productivity and maintain better body condition by having to spend less time commuting from the nest site to foraging area. However, not all kittiwake foraging occurs offshore. At some colonies, such as Lowestoft, and islands in the inner Firth of Forth, breeding kittiwakes feed extensively on sprats, which are mostly present in inshore and estuarine habitat (MacArthur Green, 2024).

68. There was evidence that some breeding kittiwakes at FFC SPA fed much more in coastal areas in 2023 than in previous years, which might suggest foraging on sprats rather than sandeels (Saskia Wischnewski pers. comm.) which may be a reflection of the large increase in sprat stock biomass between 2022 and 2023 (ICES, 2023). Diet sampling from kittiwakes breeding at Gateshead also provided evidence of sprat in the diet at that colony in 2023 (Bob Furness, pers. Comm.).

69. It is therefore conceivable that there could be situations where kittiwakes would have to commute further to foraging grounds from offshore ANS than would be the case if they nested at coastal sites. However, evidence from tracking studies suggests that kittiwakes may not be constrained by having to commute from breeding sites to foraging grounds. Breeding success of kittiwakes nesting inland at Newcastle is just as good as at coastal colonies closer to their shared offshore foraging grounds (Redfern & Bevan, 2014) leading these authors to conclude that "data suggest that factors other than proximity to foraging areas may be more important".

70. Taking account of the evidence described above, as well as consultation with the SNCB and experience from other consented OWFs, the Applicant has selected onshore ANS as the preferred measure. However, contribution to an offshore ANS as part of a strategic measure (Section 10) is also retained as an option to deliver compensation for North Falls.

8 Implementation and Delivery Roadmap

8.1 Overview

71. The steps that would be followed by the Applicant to implement and deliver the ANS compensation measure are as follows:

    - Pre-consent discussions are underway with RWE Renewables UK Dogger Bank South (East) Limited, the leaseholder of the Kittiwakery, to reach formal agreement for a 20% share of the 240 nests (i.e. 48) at the existing Gateshead ANS (hereafter the 'Kittiwakery') (Section 8.2.1 below).

- Prior to consent award, collaboration will be undertaken between RWE Renewables UK Dogger Bank South (East) Limited and North Falls Offshore Wind Ltd, in accordance with the Letter of Intent (Annex 1C) [APP-187], to secure the 20% allocation of artificial nests.
- Consultation will also be undertaken with the Marine Management Organisation (MMO) and Natural England, Gateshead Council, the RSPB and the Tyne Kittiwake Partnership. These parties will be invited to form a Kittiwake Compensation Steering Group (KCSG);
- Secure the allocation of artificial nests at least three full kittiwake breeding seasons prior to the operation of any turbine. The exact timescale will be agreed with relevant stakeholders through the development of the CIMP, including any implications for the scale of compensation required to account for when measures to increase breeding success are able to be put in place in the unlikely event of any delays;
- The detailed delivery proposals for the compensatory measure will be set out in the Kittiwake CIMP. This will be produced post-consent and be based on the Outline Kittiwake CIMP [**7.2.4.1, Rev 2**]. The CIMP is secured through the draft DCO [**6.1, Rev 7**] and it must be submitted to the SoS for approval prior to construction;
- Amendments to or variations of the approved Kittiwake CIMP would be in accordance with the principles set out in this Kittiwake Compensation Document. They may only be approved where it has been agreed with the SoS that they are unlikely to give rise to any materially new or materially different environmental effects and that the required level of compensation will continue to be delivered;
- The compensatory measures will be monitored in accordance with the Outline Kittiwake CIMP [**7.2.4.1, Rev 2**] and the results provided to stakeholders on an annual basis to allow for discussion and feedback and to inform any requirement for adaptive management;
- The ANS will remain in place and be maintained for the operational lifetime of the Project if they are colonised.
- Should the ANS be unsuccessful, adaptive management measures and monitoring would be adopted in accordance with the Outline Kittiwake CIMP [**7.2.4.1, Rev 2**] . Consultation would be undertaken with the KCSG to help determine the most appropriate course of action.

8.2 Delivery Mechanism

72. The Applicant is proposing delivery of onshore ANS as part of a collaborative delivery model, through a partnership arrangement with one or more other OWF developers.

73. It is considered that the compensatory measure can be implemented by use of the existing Kittiwakery built by RWE to support compensatory measures for its projects. No AONs were identified at the Kittiwakery in 2023/24 however monitoring shows kittiwake activity on the Kittiwakery in 2024 and 2025 and

suggests that the ANS is seen as a site available for future colony establishment (RWE, 2024; Shoney Wind Ltd, 2025).

74. Alternatively, the Applicant may consider strategic compensation, as described in Section 10.

8.2.1 Location of compensation measure

75. The Kittiwakery is a four-sided tower located in the H. Nichol storage yard, South Shore Road, Gateshead (Figure 8.1). The tower is approximately 33m from an existing ANS at Saltmeadows established in 2001, and adjacent to the south shore of the River Tyne. The four-sided tower was installed in February 2023 as a pilot study to test and experiment with the design and different ledge types. The locations of the Kittiwakery and Saltmeadows ANS are shown in Figure 8.1.

76. It is considered by the Applicant that the Kittiwakery is in an appropriate location as man-made structures are already utilised in the area (Turner, 2010; RWE, 2024). Monitoring undertaken by RWE (2024) supports this. The east coast of England kittiwake population is mainly found on the stretch of coast between Humberside and Northumberland, therefore it is considered that the location of the Kittiwakery has sufficient connectivity with existing colonies and feeding areas. Furthermore, as outlined in Section 7.1.2.2, there is evidence of a surplus of kittiwake requiring new sites within the southern North Sea.

77. The Kittiwakery has 240 available nesting spaces, of which North Falls would have a 20% share (48 nests), which exceeds North Falls' compensation requirement for this species.

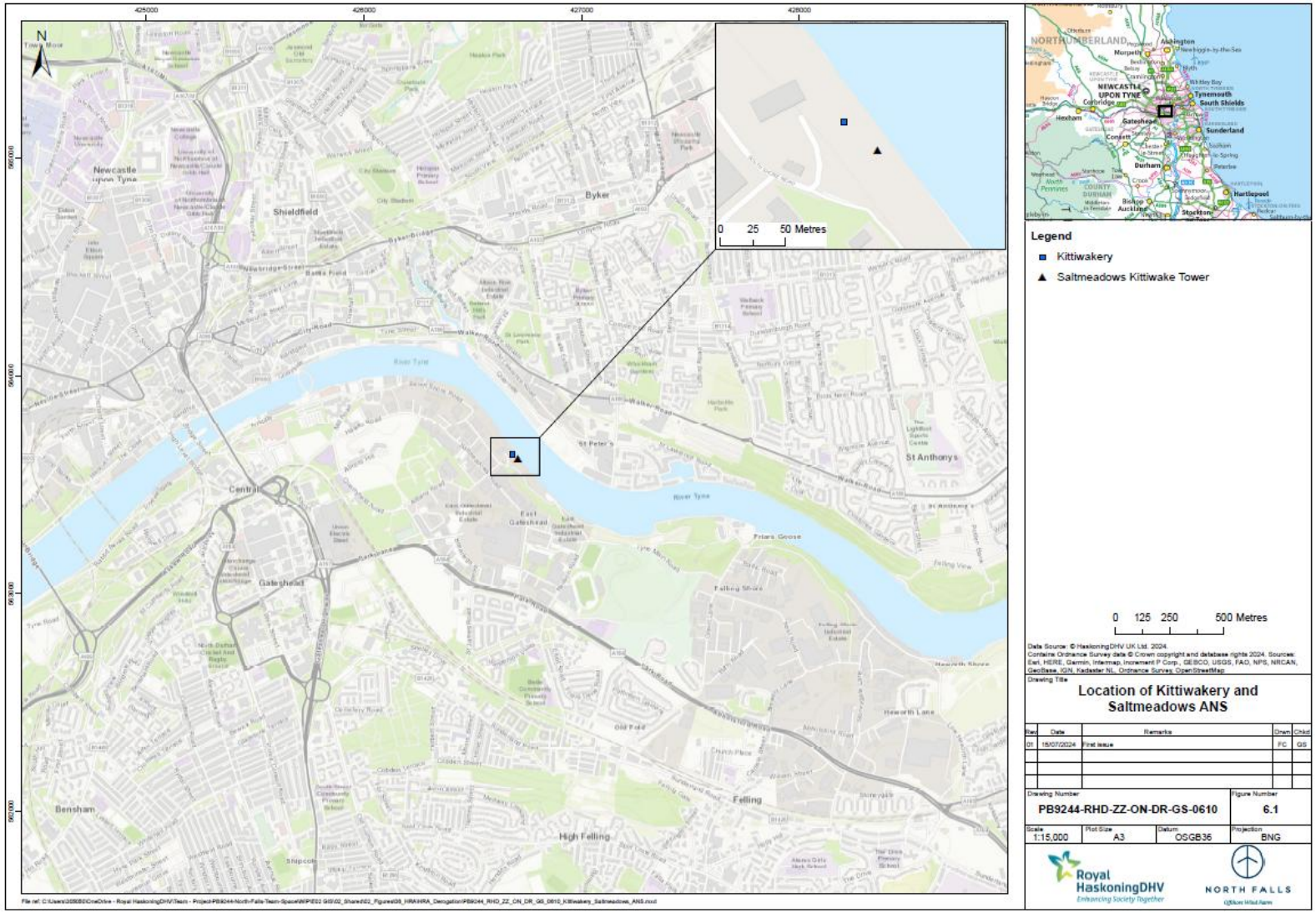

Figure 8.1 Location of Kittiwakery and Saltmeadows ANS (source: RWE, 2024)

9 Impact of Proposed Compensatory Measure

78. Consideration has been given to any potential impacts that might arise as a result of the implementation of compensation using the Kittiwakery, noting the existing presence of the ANS. The potential impacts identified are described in Table 9.1 together with details, where relevant, of how these would be avoided, reduced or mitigated.

Table 9.1 Potential impact of proposed compensation measure

Potential impacts	Details	Measures required to avoid, reduce or mitigate	Effect significance
Impacts on other protected areas and features	The land on which the Kittiwakery is situated is a Local Nature Reserve (which is aimed at protecting the kittiwake tower and the kittiwakes that nest on it and which this proposal seeks to benefit). There are no protected area features nearby that are likely to be affected by an increase in numbers of nesting kittiwakes.	N/A	There would be no likely significant effect on protected areas or features
Disturbance of existing kittiwake nesting activity	If works to install new ledges or adjust existing structures were undertaken during the kittiwake breeding season existing nesting activity could be disturbed.	Monitoring and adaptive management activities will be undertaken outside of the kittiwake breeding season (March to August inclusive).	There would be no likely significant effect on the kittiwake as a result of maintenance works, taking account of the mitigation.
Visual impact of nest site improvements during monitoring and adaptive management activities	The nest site improvements will be undertaken in the context of the existing built environment in Gateshead.	N/A	There would be no likely significant effect on the local landscape.
Disturbance to local communities during monitoring and adaptive management activities	As above	Measures to minimise any potential disturbance to local communities will be discussed with the relevant local authority via the KCSG.	There would be no likely significant effect on the local community as a result of disturbance.

10 Strategic compensation and Marine Recovery Fund

79. It is recognised that discussions are ongoing in Government and with industry regarding strategic compensation measures, with ANS on the Department for Environment, Food & Rural Affairs (Defra) (2024) list of approved measures which are suitable for strategic compensation. The Applicant will continue to monitor the progress of strategic measures, including progress in relation to The Crown Estate (2024) Offshore Wind Leasing Round 4 Kittiwake Strategic Compensation Plan.

80. In accordance with DESNZ (2025), contribution to the Marine Recovery Fund (MRF) could be implemented wholly in substitution of the collaborative onshore ANS compensatory measure, at a level proportionate to the effects described in Section 4; or partly in substitution, in the unlikely event the proposed onshore collaborative ANS was not able to deliver the full compensation requirement.

81. DESNZ's intention to establish the MRF (as confirmed by DESNZ, 2025) and the consent award for SEP and DEP should give decision-makers confidence that a strategic solution can be put in place to support North Falls and can therefore be relied upon by the SoS in their decision to grant the Project's development consent. Notwithstanding, the Applicant has proposed project specific collaborative compensation which can be relied upon.

11 Summary

82. A range of compensatory measures for kittiwake have been considered by the Applicant and developed through a process of pre-application consultation with stakeholders. The delivery of ANS for kittiwakes has been identified by the Applicant as the measure that could be taken forward as a collaborative delivery model, whereby the Applicant would seek to deliver compensation (or adaptive management) through a partnership arrangement with one or more other OWF developers.

83. The Applicant's preferred compensation measure is to secure an allocation of ANS at the Gateshead Kittiwakery ANS, in the event that an AEoI is concluded in the Appropriate Assessment.

84. The Applicant is seeking to enter into a formal agreement with RWE Renewables UK Dogger Bank South (East) Limited regarding the Kittiwakery ANS for an allocation proportionate to the effects associated with North Falls, in accordance with the Letter of Intent (Annex 1C) [**APP-187**]. North Falls would have a 20% share of 240 nests (i.e. 48) at the Gateshead Kittiwakery (Section 8.2.1 below), which is anticipated to exceed the compensation requirement for this species for North Falls.

85. Alternatively, the Applicant considers that strategic compensation (such as the MRF) for kittiwake is a measure that could be wholly or partly substituted in place of the Applicant's proposed measure or as an adaptive management measure, if required.

86. The information provided demonstrates the ecological evidence for the measure, how the measure can be secured and that the mechanism for delivery can be implemented.

87. There are no likely significant effects associated with the compensatory measures.

88. The Kittiwake CIMP will set out the detailed delivery proposals for the agreed compensatory measures based on those set out in this Kittiwake Compensation Document and in accordance with the Outline Kittiwake CIMP [**7.2.4.1, Rev 2**]. The Kittiwake CIMP will be produced by the Applicant and approved by the SoS prior to the start of construction.

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To contact please email contact@northfallsoffshore.com

North Falls Offshore Wind Farm Limited Registered Address: Windmill Hill Business Park, Whitehill Way, Swindon, Wiltshire, SN5 6PB, United Kingdom

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