THE PLANNING ACT 2008

THE INFRASTRUCTURE PLANNING (EXAMINATION PROCEDURE) RULES 2010

Dogger Bank South Wind Farm

Appendix G8 to Natural England's Deadline 8 Submission

Natural England's End of Examination position on Offshore Ornithology

For:

The construction and operation of the Dogger Bank South (East and West) Offshore Wind Farm located approximately 100-122 km off the Northeast Coast in the Southern North Sea

Planning Inspectorate Reference EN010125

3rd July 2025

Appendix G8 – Natural England's End of Examination position on Offshore Ornithology for the Dogger Bank South (East and West) Offshore Windfarms

In formulating these comments, the following documents have been considered:

- [REP6-016] 7.12 ES Chapter 12 – Offshore Ornithology (Revision 4)
- [REP6-019] 7.12.12.13 ES Appendix 12-13 Population Viability Analyses (Revision 3)
- [REP6-009] 6.1 RIAA HRA Part 4 of 4 – Marine Ornithological Features (Revision 5)
- [REP6-053] 16.5 Potential Auk Displacement Between Dogger Bank South Array Areas
- [REP6-050] 14.8 Effects on Prey Species Technical Note (Revision 2)
- [REP5-031] 8.23 In Principle Monitoring Plan (Revision 4)
- [REP4-082] 10.42 Ornithological Mitigation Option Report (Revision 2)
- [REP3-030] 13.5 Precaution in the Ornithology Assessment and Implications for Compensation Quantum
- [AS-084] 10.43 Offshore Ornithology Assessment Cover Letter
- [AS-060] 7.12.12.3 ES Appendix 12-3a-c Monthly Abundance – All, Sitting, Flying (Revision 2)
- [AS-062] 7.12.12.4 ES Appendix 12-4a-c Monthly Densities – All, Sitting, Flying (Revision 2)
- [AS-064] 7.12.12.5 ES Appendix 12-5a-c Seasonal Peak Abundance – All, Sitting, Flying (Revision 2)
- [AS-066] 7.12.12.6 ES Appendix 12-6a-c Seasonal Peak Density – All, Sitting, Flying (Revision 2)
- [AS-068] 7.12.12.7 ES Appendix 12-7a-c Survey Abundances – All, Sitting, Flying (Revision 2)
- [AS-070] 7.12.12.8 ES Appendix 12-8a-c Survey Densities – All, Sitting, Flying (Revision 2)
- [APP-105] 7.12.12.2 Appendix 12-2 Technical Appendix
- [APP-112] 7.12.12.9 Collision Risk Modelling Outputs
- [APP-113] 7.12.12.10 ES Appendix 12-10 Species Distribution Figures
- [APP-115] 7.12.12.12 ES Appendix 12-12 Seasonal Displacement Matrices Upper Lower C.I. Abundance
- [APP-050] 6.1.2 Appendix B Sandeel Habitat Potential in the Dogger Bank SAC and Southern North Sea SAC
- [REP6-052] 16.4 The Applicants' Responses to Deadline 5 Documents

1. Introduction

This document provides an overview of Natural England's final positions on the potential for significant adverse impacts (Environmental Impact Assessment, EIA) and the potential for Adverse Effects on Integrity (AEoI) (Habitats Regulations Assessments, HRA) from the Dogger Bank South (East and West) Offshore Wind Farms (OWF) on key seabird species at Deadline 8. When compiling this document, we have primarily used the submissions from the Applicant listed above.

Natural England recognise and welcome the significant efforts made by the Applicant to update the ornithology assessment during Examination. With respect to the assessment methodology, all issues in our Risk and Issues log have been satisfactorily resolved. The only remaining issues and/or areas of disagreement relate to the provision of density hotspot modelling (discussed further in Section 4 and our response to the Examining Authority's Schedule of Recommended Amendments to the Applicant's draft Development Consent Order [REP7-151]) and conclusions regarding indirect effects (Section 3 and response to the RIES [REP7-152]).

2. Methods

Natural England have previously provided detailed advice on the rationale for our advised approach to the ornithology assessment and the Applicant's comments regarding precaution in [REP3-057] and [REP4-124]. We have not repeated this advice within this document, but have referenced it within the text so it can be read alongside as needed.

2.1 Abundance and density estimates

The Applicant has estimated density and abundance using design-based methods, which Natural England agree are appropriate. Natural England advise that, in order to account for the limitations and uncertainties associated with the estimation of seabird abundance and density estimates, the seasonal mean peak abundance and density estimates should be used in the assessment of impacts, and these impacts should then be summed to obtain an assessment of annual impacts. **The Applicant has followed Natural England's advice in this matter.**

Because this application covers two arrays (Dogger Bank South-East (DBS E) and Dogger Bank South-West (DBS W); 'the Projects'), each of which in other circumstances would be considered an NSIP in its own right, Natural England advised that the seasonal mean peak abundances of the two arrays should be summed to assess displacement impacts of the arrays combined. **The Applicant has followed Natural England's advice in this matter.**

2.2 Displacement

Natural England's approach to displacement is that we provide values as a range of displacement and mortality rates bounded by species-specific upper and lower ranges, applied to the estimates of abundance of seabirds in the array area plus 2km buffer zone. The species-specific rates are defined in the species sections below. **The Applicant has provided impact values in accordance with Natural England's advice.**

The two DBS arrays are in close proximity to one another (8 km at the nearest point). The baseline surveys showed high densities of guillemot and razorbill in the area between the two arrays that Natural England consider may be vulnerable to cumulative displacement impacts from both arrays, even beyond the current 2km buffer zones. Natural England therefore requested an additional assessment of the potential impacts from displacement on guillemot and razorbill in the area between the arrays, which the Applicant have provided [REP6-053]. While we feel this provides valuable additional context to the potential impacts of the Projects on these species, Natural England have agreed that the impacts from this additional assessment do not need to be quantitatively reflected in the EIA or HRA impact assessment totals.

2.3 Collision

The Applicant has used the stochastic Band Collision Risk Model, Option 2 (Caneco 2022), using the parameters advised by Natural England for stochastic collision risk modelling (CRM) in our interim advice (Natural England 2022). While this advice has recently been updated (SNCBs 2024), Natural England agrees that the changes are minimal, therefore **the parameters used by the Applicant are appropriate**.

The Applicant has undertaken CRM for two different turbine design scenarios, but collision impacts have been presented and assessed for the worst-case scenario (200 small turbines). **Natural England agrees that this is appropriate.**

2.4 Apportioning of impacts to Special Protection Areas (SPAs)

Natural England's approach to apportioning impacts from projects to Special Protection Areas (SPAs) is as follows:

- Not applying sabbatical rates to exclude proportions of individuals assumed to be 'on sabbatical' from breeding. **The Applicant has followed Natural England's advice on this matter.**
- Using site-specific data from baseline surveys to determine proportions of individuals belonging to different age classes, rather than applying a theoretical generalised stable

age structure to remove estimated proportions of immature birds. Where site-specific data is not available, Natural England advise that all 'adult-type' birds should be assumed to be breeding adults. **The Applicant has presented impacts according to both a stable age approach and following Natural England's advice on age-apportioning.** Natural England's conclusions are based on the results as calculated following our advice.

- For breeding season apportioning, the Applicant has used the NatureScot apportioning tool (NatureScot, 2018), except for gannet, for which 100% were apportioned to Flamborough & Filey Coast (FFC) SPA due to the proximity of the array area to the SPA, and evidence showing high segregation in foraging areas between UK gannet colonies. **Natural England agrees that this is appropriate.**
- For non-breeding season apportioning, Natural England advise using the Tables presented within Appendix A of Furness (2015) to determine the proportion of birds from each colony against the total relevant biologically defined minimum population scale (BDMPS) population, for all species except for guillemot and razorbill at the FFC SPA. For these two species, a bespoke approach was advised by Natural England.

2.4.1 Bespoke approach to apportioning guillemot and razorbill to Flamborough & Filey Coast SPA

The need for a bespoke approach was identified due to high abundance and density figures for both species within the array areas in August and September in the Applicant's baseline surveys, indicating a high degree of importance of the array area for these species during this period, when birds may be vulnerable to impacts due to flightless moult and chick-rearing. The risk here is that the standard BDMPS apportioning method at this time is likely to underestimate impacts on guillemot and razorbill at Flamborough and Filey Coast SPA. We note that this advice is similar to the approach advised by Natural England for Hornsea Project 4 and Outer Dowsing (ODOW) OWF.

For guillemot, where the standard BDMPS approach considers only two seasons – breeding and non-breeding – Natural England's advised bespoke approach involved consideration of an additional 'chick rearing and moult' season (August and September), for which an apportioning rate of 68.2% is applied. This rate takes account of the likely connectivity with FFC SPA as well as likely proportions of juveniles.

For razorbill, where the standard BDMPS approach is to apply four seasons – breeding, post-breeding migration, winter and pre-breeding migration – Natural England's advised bespoke approach involved the application of an apportioning rate of 69.93% during the post-breeding

migration season (August to October). Again, this takes account of the likely connectivity with FFC SPA as well as likely proportions of juveniles.

Please refer to Annex G1 of Appendix G to our Relevant Representations [RR-039] for the full details and supporting evidence for the advised approach.

The Applicant has followed Natural England's advice on non-breeding season apportioning, including the bespoke approach for guillemot and razorbill at FFC SPA.

2.5 Approach to Interpretation of Predicted Impacts and Application of Population Viability Analysis (PVA)

Natural England advise that, where predicted impacts lead to a change of greater than 1% in the baseline mortality rate of the relevant reference population, further investigation of the potential impacts should be carried out. This generally requires the use of Population Viability Analysis (PVA) to assess how the predicted impacts of the development may affect the population's size and growth, relative to an unimpacted scenario. Natural England and JNCC have published the 'Seabird PVA Tool', which has been created in order to allow PVAs to be developed using a standard approach with recommended criteria (Parker et al 2023).

Cook & Robinson (2016) and Jital et al (2017) recommend considering both the counterfactual of population growth rate (CGR) and the counterfactual of population size (CPS) metrics to assess the effects of predicted impacts, as these are the two metrics that have been shown to be the least sensitive metrics to mis-specification of the population trend and demographic rates used in the PVA model. Natural England therefore recommend that assessments consider both the CGR and CPS when assessing the effect on populations of predicted anthropogenic impacts.

Natural England advise that a range of site- and project-specific factors need to be considered when making integrity judgements based on the results of PVA. Population metrics need to be considered with reference to the site trend, population status and designated site Conservation Objectives (CO) for HRA. It is not known what the growth rate of a specific population will be over the next 30 years (lifespan of the Projects), therefore this uncertainty should be considered when assessing the significance of predicted impacts against site COs for each feature.

When interpreting the results of a PVA, the CPG and CPS metrics at the end of the impact (e.g. after 30 years) should be considered against a realistic assessment of the current and potential future population trend. Where a specific feature of a site has a CO to restore the population size to a given level (as is the case for kittiwake at FFC SPA), reductions in population growth rates and population size due to additional anthropogenic impacts are likely

to be counter to these objectives. However, if a specific feature has a conservation objective to maintain the population size at or above a given level (as is the case for gannet, guillemot and razorbill at FFC SPA), consideration will need to be given to a range of plausible future growth rates in order to assess whether the PVA results suggest that the population can be maintained at, or be able to grow above, the target population size.

The Applicant has followed Natural England's advice when conducting PVAs for the assessment. However, Natural England disagree with some of the Applicant's assessments of current and potential future population trends. This in turn leads to disagreements on conclusions of Adverse Effect on Integrity (HRA) and significant adverse impacts (EIA). More detail is provided in the species accounts in Annex 1 (HRA) and Annex 2 (EIA) of this document.

2.6 Approach to Cumulative and In-combination Assessments

Natural England note that there are discrepancies between the totals presented by the Applicant for cumulative and in-combination totals and those presented by other recent projects. This reflects different approaches taken by different projects when calculating and presenting cumulative and in-combination impacts, as well as changes to SNCB advice on assessment methods over time and, in some cases, bespoke project-specific advice. Notwithstanding these discrepancies, Natural England consider that sufficient information has been provided for us to be able to make our integrity judgements.

A number of North Sea offshore wind farm projects have recently completed or are currently within Examination, namely Five Estuaries, Outer Dowsing and North Falls. Natural England acknowledge that impact figures may change within and beyond the Examination timeframe, and thus there may be difficulties associated with obtaining and including the most up-to-date impact figures for these projects.

Another North Sea offshore wind farm, Dogger Bank D (DBD), has also recently submitted their Section 42 Preliminary Environmental Information Report (PEIR) consultation which is now in the public domain. Natural England advised at Deadline 7 [REP7-154] that it would not be proportionate for the Applicant to update the in-combination assessment before the close of the Examination; however, we note that they have submitted a document giving consideration to the DBD PEIR [REP7-133]. Natural England are currently in the process of reviewing the PEIR and therefore cannot provide further comment on the appropriateness of [REP7-133] at this time. We therefore maintain the advice provided at Deadline 7 [REP7-154], that when determining the DBS windfarms, the Secretary of State considers Dogger Bank D in their HRA.

Natural England note that the Applicant has stated that lower than expected cumulative and in-combination totals presented for several species (guillemot, razorbill and great black-backed gull) are partially explained by the fact that they have not included several Scottish projects for which applications have been submitted, but not consented [REP6-016]. We note that, as per our Best Practice advice (Parker et al 2023), these projects should have been included by the Applicant. However, we do not consider that it is necessary for the Applicant to update their cumulative and in-combination assessments with this information at this late stage of the Examination, and we note that the inclusion of these projects is unlikely to affect our integrity judgements.

Impacts from previous projects on some SPA features are subject to compensation. In the in-combination assessments for these features, the Applicant has presented totals both inclusive and exclusive of 'compensated-for' impacts. This is in line with Natural England's advice, and takes into account the current uncertainty regarding the effectiveness of compensatory measures for seabirds. In these instances, we have considered both totals when drawing our conclusions and found that it has not resulted in changes to our conclusions on adverse effects.

3. Indirect impacts

Natural England advise that the DBS array areas are located within areas that are considered to be important for sandeel in the North Sea. This is clearly evidenced by mapping work done by Langton et al (2021), by the Applicant themselves, as presented in their 'Sandeel Habitat Potential in the Dogger Bank SAC and Southern North Sea SAC' [APP-050], and by Reach et al (2024), as presented by the Applicant in their 'Effects of Prey Species Technical Note' [REP6-050]. These maps show that the DBS array areas, particularly DBS West, are located in areas with high habitat potential for sandeel.

Sandeel are a key prey species for seabirds in the North Sea, particularly for kittiwake, guillemot, razorbill, and puffin, and seabirds are known to congregate in areas where foraging opportunities are higher. The baseline data for the Projects shows high densities of these species within the array areas, which lead to high levels of predicted impacts on these species. Tracking data from kittiwake breeding at FFC SPA also clearly show that not only is there a high level of connectivity between the SPA and the array areas (particularly DBS West), but that the array areas (particularly DBS West) appear to be an important foraging location for FFC SPA kittiwake (Wischnewski et al 2017; Figure 1), which could be explained by high availability of sandeel in the area. Baseline densities of guillemot, razorbill, puffin, and kittiwake during the breeding season were also higher in DBS West than in DBS East. This may reflect the higher habitat potential for sandeel in DBS West as well as its closer proximity to FFC

SPA. We note that, while no tracking data is available for guillemot or razorbill breeding at FFC SPA, both array areas are well within the standard mean maximum foraging range plus 1SD (Woodward et al 2024) from the SPA for these species. Natural England therefore consider that breeding season connectivity is likely to be significant for guillemot and razorbill, and this is reflected in our apportioning advice. We therefore consider that there is potential for indirect impacts on these seabird features of FFC SPA via impacts of the Projects on their sandeel prey.

The Applicant has provided an assessment of potential impacts on seabird prey species within their 'Effects of Prey Species Technical Note' [REP6-050]. While we acknowledge the difficulties associated with quantifying these potential impacts, Natural England do not agree with the Applicant's conclusions that they will not result in indirect impacts on seabird features. In particular, we consider that for those FFC SPA features where AEoI cannot be ruled out (kittiwake, guillemot, and razorbill), this impact pathway will, without resulting in an AEoI in its own right, intensify the effects of the Projects [REP7-152]. We consider this to be important context when considering impacts on these features, as well as a potential source of under-precaution in the assessment.

Please see Appendix E8 of our Deadline 8 submission for further comments on Indirect Effects.

4. Mitigation

OWF sizes vary and therefore comparisons are not straight-forward, however, DBS is the highest impacting OWF on FFC SPA kittiwake to date, for the Projects both alone and combined (Figure 1). We highlight that the impacts illustrated for DBS East (83.8) and West (107.3) alone in Figure 1 are according to SNCB advised apportioning rates, and therefore are more likely to be comparable with those of the other projects presented. However, were the Applicant's approach to be applied, DBS West (58.3) would remain a higher impact than all other single OWF (the combined impacts of Dogger Bank A&B are 59), and only Hornsea 3 (50.1) and Hornsea 4 (48.1) would have a higher impact than DBS East (45.9).

Given the scale of the predicted impacts of the Projects on seabird features, Natural England advised that further consideration should be given to potential mitigation measures to reduce impacts, noting the requirements set out in the HRA mitigation hierarchy. We advised that these could include array reductions, changes to the design and/or layout of arrays, or increasing the hub height of turbines to reduce collision impacts. We have also advised since the pre-application stage that the Applicant should undertake hotspot modelling of seabird densities and distributions within the Project areas, in order to identify areas where impacts

may be particularly high, and that may therefore be suitable for changes to array size or layout to mitigate impacts.

The Applicant has stated that they do not consider density hotspot modelling to be an appropriate way of investigating potential ornithological mitigation measures, due to the variability of seabird distributions over time. Natural England disagree with this position, noting

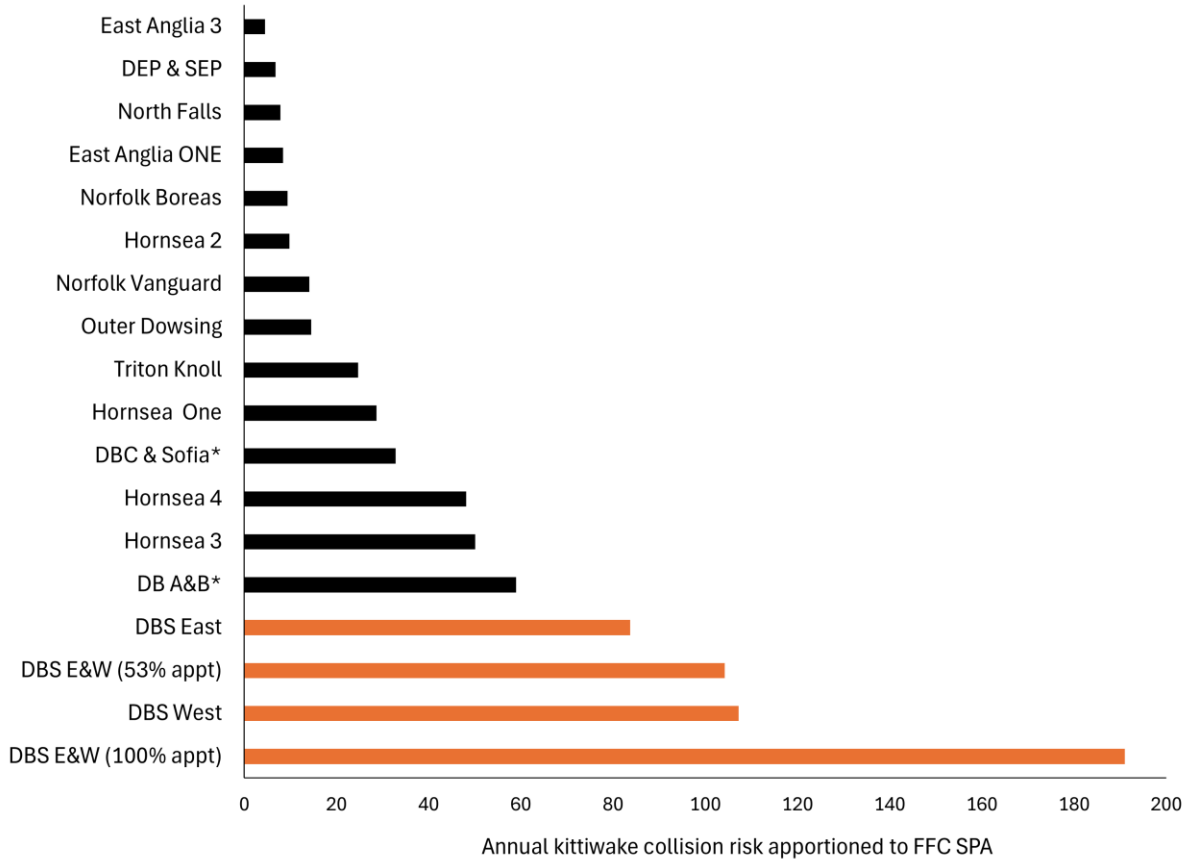

Figure 1: Mean annual kittiwake collision risk apportioned to FFC SPA for the DBS array areas compared to other offshore wind farms. Figure compiled from data within [REP6-009].
(*Values presented are for the impacts of two array areas.)

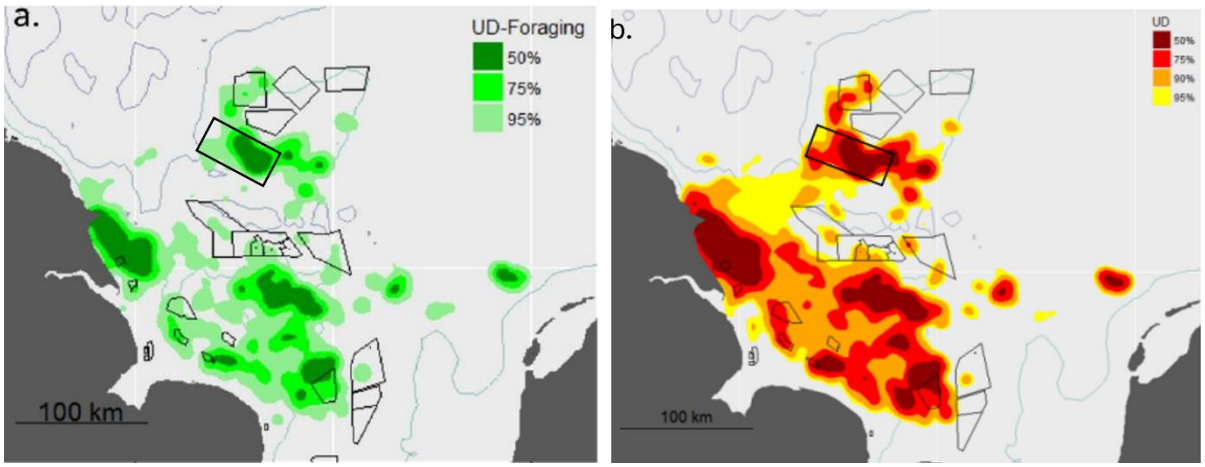

Figure 2: Foraging (a) and overall (b) utilisation distributions of kittiwakes breeding at FFC SPA. Data is from kittiwake tracked during the 2017 breeding season, based on 168 trips from 18 birds and showing 50, 75, 90 and 95% utilisation distributions. Taken from Wischnewski et al (2017). N.B. The

black rectangle has been added by NE and shows the approximate location of the DBS East and West arrays. Figure (b) was previously provided and explained in further detail in our response to ExQ OR.1.39 [REP3-057].

that seabird distributions during the breeding season are constrained to areas within foraging range, and their distribution is also strongly affected by the availability of prey. Given that the Projects (particularly DBS West) are located within areas that are likely to be of high importance for sandeel, and that sandeel are relatively sedentary, Natural England consider that these areas may represent a consistent food source for breeding seabirds. Furthermore, tracking data for FFC SPA kittiwake demonstrates repeated use of areas overlapping with the Projects (Wischnewski et al 2017; Figure 2). We note that if, as the Applicant claims, there are no areas of consistent high usage within the Project areas, then density hotspot modelling would demonstrate this.

Whilst the Applicant has now provided spatial mapping for the array areas [REP7-137], the raw data has only been provided for gannet and limited information has been provided on the modelling undertaken. The combining of the data for the two survey years and the lack of a breakdown by species-specific seasons or individual months also makes it difficult to identify consistent areas of high usage based on this mapping (please see our Deadline 8 cover letter for further comments). It is therefore welcome, but insufficient to address our concerns. We therefore maintain that this avenue for potential mitigation has not been sufficiently explored. Please also see our comments [REP7-151] on the draft DCO condition proposed by the ExA to address this [PD-028].

We further note that the Applicant has stated [REP6-052] that any reductions in the developable area would risk making the Projects economically unviable. The Applicant has also stated previously that they are unable to raise the hub height of turbines as a mitigation measure to reduce collision impacts for reasons relating to the technical and commercial viability of the Projects [REP4-082]. Natural England note that, as these are not ecological arguments, it is not within Natural England's field of expertise to comment on them.

The Applicant has also claimed that site selection is an embedded mitigation measure because connectivity with FFC SPA is low. Natural England disagree strongly with this position. Given the high levels of predicted impact, particularly to kittiwake, we do not consider site selection to have been an effective embedded mitigation measure for the Projects with respect to FFC SPA seabird features (see section 3 above, OR.1.4 and 1.39 in [REP3-057] and ISH7 in [REP5-060]).

5. Highly Pathogenic Avian Influenza (HPAI) Epidemic

We must highlight that the long-term impacts of the recent and ongoing outbreaks of avian influenza on the seabird SPA populations are presently not fully understood. We note that the

most severe outbreak of Highly Pathogenic Avian Influenza (HPAI) in wild birds ever recorded began in 2021, with severe impacts on seabird populations in 2021, 2022 and 2023, and that there has therefore not been time to fully assess the long-term impacts of this outbreak on seabird populations (Tremlett et al, 2024). We also note that, at the time of writing, this outbreak continues globally and in the UK, and future impacts on UK seabird populations cannot be ruled out. This means there is considerable uncertainty regarding the likely population sizes and growth rates in the future. The future population size will have implications for the numbers of birds present in the DBS project areas and the likely levels of impact arising from DBS, and also the robustness of the population and therefore its resilience to impacts.

The ornithological baseline data for the Projects was collected between March 2021 and February 2023. As this includes periods both before and during HPAI outbreaks (which began to affect seabirds in the region from summer 2022), Natural England advised that the Applicant should consider the interannual variation in their survey data, along with other relevant datasets for the area, in order to assess the representativeness of their baseline data. We welcome that the Applicant provided such an assessment [REP6-016], comparing their baseline survey data with data collected for nearby projects (Hornsea Four, Dogger Bank A and B, and Dogger Bank C and Sofia) as well as the modelled MERP seabird distribution datasets presented in Waggitt et al (2019). Although we note high levels of variation within the Projects' baseline data, we agree with the Applicant's conclusion that this falls within the patterns typically seen in other comparable datasets for the region, and that no adjustment to the treatment of the baseline characterisation data was required.

Nonetheless, Natural England considers there is a need to have regard for the potential long-term impacts of HPAI on seabird populations when drawing conclusions and undertaking integrity judgements for the reasons outlined above. As outlined in Natural England's Best Practice Advice (Parker et al. 2023), when interpreting the outputs of PVAs in order to make integrity judgements, "*population metrics need to be considered with reference to the site trend, population status and SPA conservation objective for HRA, or to the relevant reference population trend and conservation status of the species for EIA. As it is not known what the growth rate of a specific feature of a colony will be over the next 30 years, this uncertainty should be considered when judging the significance of predicted impacts against the conservation objectives for the features*." This includes consideration of the PVA metrics against a realistic assessment of the current and potential future population trends (growth rates and population sizes), and this in turn should consider, using expert judgement, how the long-term impacts of pressures such as HPAI and climate change may influence these trends.

Annex 1: Natural England's Position regarding potential for Adverse Effects on Integrity (AEoI) on SPAs under Habitats Regulations Assessment (HRA)

1.1 Summary

Table 1 represents Natural England's current position on the potential for AEoI for the Dogger Bank South (DBS; East and West) projects alone and in-combination with other plans and projects at Deadline 8. This table should be considered in relation to the information provided above and the detailed comments and conclusions on HRA impacts provided in this Annex.

Table 1: Summary of HRA conclusions for assessments of the Dogger Bank South (East and West) projects alone and in-combination with other plans and projects.

HRA Species and Site	Dogger Bank South (East and West) alone	Dogger Bank South (East and West) in-combination with other OWF projects
Gannet, Flamborough & Filey Coast SPA: collision + displacement	No AEoI	No AEoI
Kittiwake, Flamborough & Filey Coast SPA: collision	Unable to rule out AEoI	Unable to rule out AEoI
Guillemot, Flamborough & Filey Coast SPA: displacement	No AEoI	Unable to rule out AEoI
Razorbill, Flamborough & Filey Coast SPA: displacement	No AEoI	Unable to rule out AEoI
Breeding seabird assemblage, Flamborough & Filey Coast SPA: collision and/or displacement	No AEoI	Unable to rule out AEoI
Guillemot, Farne Islands SPA: displacement	No AEoI	Unable to rule out AEoI
Red-throated diver, Greater Wash SPA: displacement	No AEoI	No AEoI

1.2 Detailed Comments and Conclusions on Dogger Bank South (East and West) OWFs Alone and In-combination Impacts for HRA

This paper is a technical document submitted into the DBS (East and West) OWFs Examination to provide scientific justification for Natural England's advice provided on the significance of the impacts of the Projects alone and in combination, and the potential for adverse effects on integrity (AEoI) of SPAs, in relation to Habitats Regulation Assessment (HRA). Our advice is based on best available evidence at the time of writing and is subject to change in the future should further evidence be presented.

Potential for Adverse Effects on Integrity of Designated Seabird Features of Flamborough and Filey Coast Special Protection Area (FFC SPA)

FFC SPA Gannet

Displacement

Natural England's advised approach to displacement assessment is to provide impact values based on a species-specific range of displacement rates and mortality rates. For gannet, this range is 60%-80% displacement, along with a single value of 1% mortality. The Applicant has provided their assessment according to Natural England's advice (REP6-009, Table 9-14). Applying Natural England's advised 100% adult apportioning, this results in annual displacement impacts of the Projects combined on FFC SPA gannet of between 9.87 and 13.17 adult birds (see Table 2).

Collision

The Applicant has followed Natural England's advice on collision risk modelling (CRM), as outlined in our interim advice note (Natural England, 2022). Natural England advise that macro-avoidance be included in gannet collision risk assessment, using rates between 65 and 85% or a single rate of 70%. In the RIAA (REP6-009), the Applicant has presented impacts using a single macro-avoidance rate of 70%. Applying Natural England's advised 100% adult apportioning, this results in annual collision impacts of the Projects combined on FFC SPA gannet of 8.4 adult birds (REP6-009, Table 9-15 and see Table 2).

Combined displacement and collision impacts

The annual combined displacement and collision impacts of the Projects are between 18.27 and 21.6 adult birds (see Table 2).

Predicted Impacts and Integrity Judgement: Dogger Bank South (East and West) alone

The combined displacement and collision impacts of the Projects alone result in an increase in the baseline mortality rate of 1%. Further assessment using PVA is therefore required. The PVAs run by the Applicant showed that, after 30 years, the population growth rate was reduced by 0.1% per annum (CGR 0.99904), and the population size was reduced by 3% (CPS 0.9701, see Table 2).

FFC SPA has a conservation objective for gannet to maintain the size of the breeding population at a level which is above 8,469 pairs, whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent.

At this level of impact, the colony would be predicted to maintain its current size or increase for a growth rate scenario of ≥1%. The average growth rate of the breeding gannet population

at FFC SPA between 2000 and 2023 was 9.5% per annum. However, it is not known what the growth rate of the colony will be over the next 30 years, and FFC SPA is a relatively 'young' colony. Natural England carried out a review of population growth trends at a suite of long-established gannet colonies for the Hornsea 4 Examination, which was presented in our Hornsea 4 closing statement [REP7-104[1]] and referenced in our closing statement for Sheringham and Dudgeon Extension Projects [REP8-102] and Outer Dowsing Project [REP6-149] Examinations. This stated:

"We note that the gannet population of FFC SPA increased (compound growth rate) at 9.9% per annum (between 2003/4 and 2015, JNCC Seabird Monitoring Programme 'SMP' data). Using FFC SPA data for 2000-2017 the growth rate was 10.2% per annum.

However, it is not known what the growth rate of the colony will be over the next 35 years and the FFC SPA colony is a relatively 'young' colony (90 years or so). To define possible population trajectories, Natural England reviewed growth rates for the 22 gannet colonies across Britain, Channel Islands and Ireland with repeated census data (see H4 for full review), and found that the average annual growth rate calculated over a period of >90 years across the 8 gannet colonies with records exceeding 90 years is 1.8%.

Given the analysis of trends in gannet colony growth rates amongst a suite of long-established colonies, it is highly likely that its annual growth rate averaged over the whole period since founding will drop from its current average of approximately 11% over the first 80 years. The highest annual colony growth rate calculated over a period of >100 years is 4.5% at Grassholm. The Flamborough colony is unlikely to achieve a higher annual growth rate than this. The analysis suggests that in the long term it is likely the growth rate at FFC SPA will decrease from approx. 10%, potentially to something in the order of 1.8-4.5%.

Even when taking into account the uncertain long-term population implications of HPAI, it would seem unlikely that the population growth rate for gannets at FFC SPA would decrease from approximately 10% per annum to under 1% in the next 35 years. However, this conclusion can only be drawn with reduced confidence until there is a greater understanding of the long-term impacts of HPAI.

Natural England can therefore advise that there is no adverse effect on integrity (AEoI) on FFC SPA due to impacts on the gannet feature for Dogger Bank South (East and West) alone.

[1] Hornsea Four Deadline 7 Submission - Natural England's End of Examination Position on Offshore Ornithology

Predicted Impacts and Integrity Judgement: *Dogger Bank South (East and West) in-combination with other plans and projects*

In combination, the predicted combined displacement and collision impacts range between 149 and 172 adult birds, which result in increases of baseline mortality of between 6.6 and 8.1% (see Table 2). Further consideration of the potential population-level impacts is thus required, as the increase in baseline mortality rate is above 1%. The PVAs run by the Applicant showed that, after 30 years, the population growth rate was reduced by up to 0.77% per annum (CGR 0.9923), and the population size was reduced by up to 21.42% (CPS 0.7858, see Table 2).

FFC SPA has a conservation objective for gannet to maintain the size of the breeding population at a level which is above 8,469 pairs, whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent.

At this impact, the colony would be predicted to maintain its current size or increase for a growth rate scenario of ≥1%. The average growth rate of the breeding gannet population at FFC SPA between 2000 and 2023 was 9.5% per annum. While it is not known what the growth rate of the colony will be over the next 30 years, a review of gannet population trends conducted by Natural England for the Hornsea 4 examination concluded that it would be unlikely for the population growth rate at FFC SPA to decrease to below 1% per annum in the next 35 years, although this conclusion can only be drawn with reduced confidence until there is a greater understanding of the long-term impacts of HPAI (see previous section).

On this basis Natural England can advise that there is no adverse effect on integrity (AEoI) on FFC SPA due to impacts on the gannet feature for Dogger Bank South (East and West) in-combination with other plans and projects.

Table 2: Predicted combined collision and displacement impacts on the gannet FFC SPA population for the range of mortality impacts as presented in the RIAA [REP6-009] for Dogger Bank South (East and West) alone and in-combination with other plans and projects.

Gannet: Flamborough and Filey Coast SPA						
Assessment description	Displacement mortality (adult birds)	Collision mortality* (adult birds)	Combined collision and displacement mortality (adult birds)	% Baseline mortality using 2022 count data**	Reduction in population growth rate per annum after 30 years (CGR***)	Reduction in population size after 30 years (CPS***)
Dogger Bank South (East and West) alone****	9.87 - 13.17 (11.52)	8.4	18.27 - 21.6 (19.9)	1	0.096% (0.99904)	3% (0.9701)
Consented projects, plus Tier 1d with all projects at	70 - 93	79	149 - 172	6.6 - 8.1	0.67 – 0.77% (0.9933 - 0.9923)	18.84 – 21.42% (0.8116-0.7858)

60-80% displacement and 1% mortality						

* For the Projects alone, collision was assessed using an avoidance rate of 99.3% and a macro-avoidance rate of 70%. This follows Natural England's advice for stochastic CRM in our interim advice (Natural England 2022). While this advice has recently been updated (SNCBs 2024), Natural England agrees that the changes are minimal, therefore the parameters used by the Applicant are appropriate. For in-combination assessment, the majority of collision numbers were updated at SEP&DEP to reflect the updated avoidance rate of 99.2% and macro-avoidance rate of 70%, which the exception of Kentish Flats Extension and Methil where the avoidance rate used was not known, and therefore no adjustment was made

** 26,250 breeding adults, baseline mortality of 2,126

*** CGR (counterfactual of growth rate) and CPS (counterfactual of population size) values are mean values derived from PVA

**** at 60-80% displacement and mortality 1% (mean)

FFC SPA Kittiwake

Predicted Impacts and Integrity Judgement: Dogger Bank South (East and West) alone

The Applicant has followed Natural England's advice on CRM, as outlined in our interim advice note (Natural England 2022). Applying Natural England's advised 100% adult apportioning, this results in annual collision impacts of the Projects combined on FFC SPA kittiwake of 191 adult birds (REP6-009, Table 9-21 and see Table 3). This results in an increase in the baseline mortality rate of 1.47%, therefore further investigation of population-level impacts via PVA is required.

The PVA run by the Applicants showed that, after 30 years, the population growth rate was reduced by 0.25% per annum (CGR 0.9975) and the population size by 7.58% (CPS 0.9242; REP6-009, Table 9-24 and see Table 3).

FFC SPA has a conservation objective for kittiwake to restore the size of the breeding population to a level which is above 83,700 breeding pairs, whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent. The most recent count in 2022 indicated a population size of 44,574 pairs, which was a 2% decrease compared to the previous count in 2017 of 45,504 breeding pairs. The predicted impact from the Projects is the largest impact predicted from any offshore wind farm development to date (see Section 4), and accounts for approximately a third of all in-combination impacts on this feature (see section below). Furthermore, Natural England consider that indirect impacts on sandeel are likely to intensify the direct impacts of the Projects on FFC SPA kittiwake (see Section 3). The potential effects of HPAI and future predicted impacts of climate change on this species add further uncertainty to the potential long-term status of kittiwake at FFC SPA. Natural England therefore consider that the level of impact predicted for the Projects is likely to negatively affect this conservation objective.

Natural England cannot, therefore, rule out adverse effect on integrity (AEoI) on FFC SPA due to impacts on the kittiwake feature for Dogger Bank South (East and West) alone.

Predicted Impacts and Integrity Judgement: Dogger Bank South (East and West) in-combination with other plans and projects

For the in-combination assessment of impacts from the Projects along with other consented and Tier 1d projects, the Applicant has estimated the total number of collisions according to the most recent CRM guidance using an updated avoidance rate of 99.23% (SNCBs 2024) and presented the results in Table 9-23 of the RIAA [REP6-009].

According to the Applicant's estimates, the total in-combination impacts on FFC kittiwake are 591 adult birds if compensated projects are included, and 461 adult birds if compensated projects are excluded. Both scenarios result in increases on the baseline mortality rate of greater than 1%, so further assessment of population-level impacts using PVA is required.

The PVAs run by the Applicant showed that total impacts excluding compensated projects reduced the population growth rate by 0.61% (CGR 0.9939) and reduced the population size by 17.34% (CPS 0.8266), while the total impacts including compensated projects reduced the population growth rate by 0.79% per annum (CGR 0.9921) and reduced the population size by 21.69% (CPS 0.7831). Both scenarios indicate that the population could decline from current levels.

Table 3: Predicted impacts on the kittiwake FFC SPA population, as presented in the RIAA [REP6-009] for Dogger Bank South (East and West) alone and in-combination collision impacts.

Kittiwake: Flamborough and Filey Coast SPA				
Assessment description	Collision mortality*(adult birds)	% Baseline Mortality using the 2022 count data**	Reduction in population growth rate per annum after 30 years (CGR***)	Reduction in population size after 30 years (CPS***)
Dogger Bank South (East and West) alone	191	1.47	0.25% (0.9975)	7.58% (0.9242)
Consented projects, plus Tier 1d minus 'compensated projects'****	461.2	3.5	0.61% (0.9939)	17.34% (0.8266)
Consented projects, plus Tier 1d incl. 'compensated projects'****	590.7	4.5	0.79% (0.9921)	21.69% (0.7831)

* For the Projects alone, collision was assessed using an avoidance rate of 99.3%. This follows Natural England's advice for stochastic CRM in our interim advice (Natural England 2022). While this advice has recently been updated (SNCBs 2024), Natural England agrees that the changes are minimal, therefore the parameters used by the Applicant are appropriate. For in-combination assessment, the Applicant has estimated total collisions based on the most recent guidance, using an updated avoidance rate of 99.23% (SNCBs 2024).
**89,148 breeding adults, baseline mortality of 13,016
*** CGR (counterfactual of growth rate) and CPS (counterfactual of population size) values are mean values derived from PVA
****'compensated projects are Hornsea Three, Norfolk Boreas, Norfolk Vanguard, East Anglia One North, East Anglia Two, Hornsea Four and Sheringham Shoal and Dudgeon Extension Projects Note that Rampion 2 has now also been consented with compensation requirements for 0.72 FFC kittiwake, which would bring the in-combination total excluding compensated projects to 460.

The potential effects of HPAI and future predicted impacts of climate change on this species add further uncertainty to the potential long-term status of kittiwake at FFC SPA. Natural England's advice regarding in-combination collision impacts to FFC SPA kittiwakes remains the same as that set out in our end of examination response since the Hornsea 3 Examination. Namely that, as this feature has a restore conservation objective requiring the population to be returned to previous levels, and because there are indications that the predicted level of mortality would mean the population could decline from current levels should it currently be stable, **it is not possible to rule out AEoI on FFC SPA due to collision impacts on the kittiwake feature from Dogger Bank South (East and West) in-combination with other plans and projects.** This conclusion is drawn whether compensated projects are included in totals or not.

We note that the Secretary of State (SoS) has drawn similar conclusions for all OWF projects from Hornsea 3 onwards and that, while the Applicant has concluded no AEoI on FFC SPA kittiwake alone or in combination, they have conceded AEoI in combination on the basis of these previous decisions and have proposed compensation measures.

FFC SPA Guillemot

Predicted Impacts and Integrity Judgement: Dogger Bank South (East and West) alone

Natural England's advised approach to displacement assessment is to provide impact values based on a species-specific range of displacement rates and mortality rates. For guillemot, this range is 30%-70% displacement and 1%-10% displacement. The Applicant has stated that their preferred approach is to use single rates of 50% displacement and 1% mortality, and has presented impacts according to these values. Natural England disagree with the Applicant's preferred approach and have outlined our reasons in detail in earlier submissions [REP3-057, REP4-124]. The Applicant has also provided their assessment according to Natural England's advice (REP6-009, Table 9-26), and we have based our conclusions based on these impact figures.

Applying Natural England's advice on displacement and mortality rates and apportioning (see Section 2), annual displacement impacts of the Projects combined on FFC SPA guillemot are predicted of between 98 and 2279 adult birds (see Table 4). Acknowledging that recent consent decisions have generally been based on impacts at a 70% displacement rate and 2% mortality rate, Natural England will focus on these values. At a 70% displacement and 2% mortality rate, the predicted impacts of the Projects are 456 adult birds (Table 4).

Natural England note that the Applicant also provided an assessment of potential cumulative displacement impacts on auks in the area between the two Dogger Bank South arrays. At 30%-70% displacement and 1%-10% mortality, this concluded that between 13 and 302 additional FFC SPA adult guillemot could be impacted, while at 70% displacement and 2% mortality, 60 additional FFC SPA adult guillemot could be impacted. Natural England considers that this information provides valuable additional context to the potential impacts of the Projects on guillemot, but have agreed that these figures do not need to be included in the assessment totals (see section 2). Furthermore, Natural England consider that indirect impacts on sandeel are likely to intensify direct impacts of the Projects on FFC SPA guillemot (see Section 3).

For every level of impact within the range presented, the baseline mortality rate is increased by more than 1%. Further investigation of population-level impacts is therefore required via PVA.

The PVAs run by the Applicant showed that, after 30 years, the impact of the Projects at 70% displacement and 2% mortality would result in a reduction in population growth rate per annum of 0.34 (CGR 0.9966) and a reduction in population size of 10% (CPS 0.8999).

FFC SPA has a conservation objective for guillemot to maintain the size of the breeding population to a level which is above 41,607 breeding pairs, whilst avoiding deterioration from

its current level as indicated by the latest mean peak count or equivalent. The most recent count indicates a population size of 74,989 breeding pairs, and the population grew by an average of 3.8% annually between 1986 and 2017. While this annual average growth rate cannot be assumed to continue for the next 30 years, particularly given recent declines in productivity, Natural England considers it unlikely that the predicted level of impact from the Projects alone would affect the conservation objective for the species.

Natural England can therefore advise no AEoI on FFC SPA due to impacts on the guillemot feature for Dogger Bank South (East and West) alone.

Predicted Impacts and Integrity Judgement: Projects In-combination with Other Plans and Projects

For the in-combination assessment, the Applicant has estimated the total abundance of guillemot at other relevant projects and applied displacement and mortality rates to these. At Natural England's reference rates of 70% displacement and 2% mortality, the total in-combination impact excluding compensated projects is 1,079 adult birds (Table 4). For Hornsea Project 4, Natural England advised that 70% displacement and 5% mortality should be used, to take into account the particularly high number of guillemot recorded in the Hornsea 4 array area and the proximity of the Hornsea 4 array area to FFC SPA. For the in-combination total including compensated projects, therefore, Natural England will refer to the figure obtained when applying 70% displacement and 2% mortality to all projects except for Hornsea 4, for which 70% displacement and 5% mortality is used. This results in a total of 2,219 adult birds.

Natural England has run the PVA for this figure, as the Applicant had not (Table 4). At this level of impact, the PVA showed that, after 30 years, the population growth rate per annum would be reduced by 1.7% (CGR 0.983) and the population size would be reduced by 40.4% (CPS 0.596). The PVA results for the in-combination total excluding compensated projects (1079) showed that, after 30 years, the population growth rate would be reduced by 0.8% per annum (CGR 0.992) and the population size would be reduced by 22.14% (CPS 0.7786).

For the Hornsea 4, Sheringham and Dudgeon Extensions, Rampion 2, Five Estuaries and Outer Dowsing projects, Natural England concluded that when considering the colony's current and likely future growth rates, and evidence of recent declines in productivity, an AEoI could not be ruled out for in-combination impacts on the guillemot feature of the FFC SPA. These considerations remain valid. We highlight the Projects will be contributing significant numbers to the in-combination impacts on this species at FFC SPA, equivalent to those of the Hornsea 4 project.

Table 4: Predicted impacts on the guillemot FFC SPA population as presented in the Applicant's RIAA [REP6-009] for project alone and in-combination displacement impacts.

Guillemot: Flamborough & Filey Coast SPA				
Assessment description	Displacement mortality (adult birds)	% Baseline mortality using 2022 count data*	Reduction in population growth rate per annum after 30 years (CGR**)	Reduction in population size after 30 years (CPS**)
Dogger Bank South (East and West) alone (30% displacement, 1% mortality)	98	1.07	PVA not run	PVA not run
Dogger Bank South (East and West) alone (70% displacement, 10% mortality	2279	24.9	1.7% (0.983)	41.2% (0.588)
Dogger Bank South (East and West) alone (70% displacement, 2% mortality)	456	4.9	0.34% (0.9966)	10.01% (0.8999)
Consented projects, plus Tier 1d, applying 70% displacement and 2% mortality to all projects, minus compensated projects****	1079	11.8	0.8% (0.9920)	22.14% (0.7786)
Consented projects, plus Tier 1d, applying 70% displacement and 2% mortality to all projects, incl. compensated projects****	1541	16.8	1.15% (0.9885)	30.1% (0.699)
Consented projects, plus Tier 1d, applying 70% displacement and 2% mortality to all projects except H4 at 70% displacement and 5% mortality*** (inc. compensated projects****)	2219	24.25	1.7% (0.983)	40.4% (0.596)

* 149,978 breeding adults, baseline mortality of 9149

** CGR (counterfactual of growth rate) and CPS (counterfactual of population size) values are mean values derived from PVA

*** Guillemot impacts of H4 are assessed at 70% displacement and 5% mortality, as per Natural England's advice. The total number of birds at H4 subject to displacement is 32,309, so applying 70% displacement and 5% mortality rate gives an impact of 678, and increases the in-combination impact to 2219. Note that this PVA was run by Natural England, not by the Applicant.

****Compensated projects identified by the Appllicant were Hornsea 4 and SEP&DEP. Note that Rampion 2 has now also been consented with compensation requirements for 3.53 FFC guillemot, which would bring the in-combination total excluding compensated projects to 1075.

With the recent HPAI outbreaks and predicted impacts of climate change on this species adding further uncertainty to the potential long-term population status for guillemot at FFC

SPA, Natural England's advice regarding in-combination displacement impacts to FFC SPA guillemot therefore remains unchanged from that set out in our end of examination response during recent North Sea OWF Examinations. Namely that, because there are indications that the predicted level of mortality would mean the population could decline from current levels should the current population growth rate not be sustained, **it is therefore not possible to rule out AEoI on FFC SPA due to displacement impacts of Dogger Bank South (East and West) on the guillemot feature in-combination with other plans and projects.** This conclusion is drawn whether compensated projects are included in totals or not.

We note that the Secretary of State (SoS) has drawn similar conclusions for all OWF projects from Hornsea 4 onwards and that, while the Applicant has concluded no AEoI on FFC SPA guillemot alone or in combination, they have conceded AEoI in combination on the basis of these previous decisions and proposed compensation measures.

FFC SPA Razorbill

Predicted Impacts and Integrity Judgement: Dogger Bank South (East and West) alone

Natural England's advised approach to displacement assessment is to provide impact values based on a species-specific range of displacement rates and mortality rates. For razorbill, this range is 30%-70% displacement and 1%-10% displacement. The Applicant has stated that their preferred approach is to use single rates of 50% displacement and 1% mortality, and has presented impacts according to these values. Natural England disagree with the Applicant's preferred approach and have outlined our reasons in detail in [REP3-057] and [REP4-124]. The Applicant has also provided their assessment according to Natural England's advice ([REP6-009], Table 9-34), and we have based our conclusions based on these impact figures.

Applying Natural England's advice on displacement and mortality rates and apportioning (see Section 2), annual displacement impacts of the Projects combined on FFC SPA guillemot are predicted of between 30 and 702 adult birds (see Table 4). Acknowledging that recent consent decisions have generally been based on impacts at a 70% displacement rate and 2% mortality rate, Natural England will focus on these values. At a 70% displacement and 2% mortality rate, the predicted impacts of the Projects are 140 adult birds (Table 5). This results in an increase in baseline mortality rate of 2.18%, therefore further investigation of population-level impacts is therefore required via PVA.

Natural England note that the Applicant also provided an assessment of potential cumulative displacement impacts on auks in the area between the two Dogger Bank South arrays. At 30%-70% displacement and 1%-10% mortality, this concluded that between 2 and 42 additional FFC SPA adult razorbill could be impacted, while at 70% displacement and 2% mortality, 8 additional FFC SPA adult razorbill could be impacted. Natural England considers that this information provides valuable additional context to the potential impacts of the Projects on razorbill, but have agreed that these figures do not need to be included in the assessment totals (see section 2). Furthermore, Natural England consider that indirect impacts on sandeel are likely to intensify direct impacts of the Projects on FFC SPA razorbill (see section 3).

The PVAs run by the Applicant showed that, after 30 years, the impact of the Projects at 70% displacement and 2% mortality would result in a reduction in population growth rate per annum of 0.26% (CGR 0.9974) and a reduction in population size of 7.79% (CPS 0.9221). Based on this level of impact, **Natural England can advise no AEoI on FFC SPA due to displacement impacts on the razorbill feature for Dogger Bank South (East and West) alone.**

Predicted Impacts and Integrity Judgement: Dogger Bank South (East and West) In-Combination with Other Plans and Projects

For the in-combination assessment, the Applicant has estimated the total abundance of razorbill at other relevant projects and applied displacement and mortality rates to these. The Applicant has calculated totals both including and excluding compensated projects, but Natural England note that, to date, no projects have had to compensate for FFC SPA razorbill. We have therefore based our conclusions on the totals presented including all projects (Table 5). As for guillemot, for the in-combination total, Natural England will refer to the figure obtained when applying 70% displacement and 2% mortality to all projects except for Hornsea 4, for which 70% displacement and 5% mortality is used. This results in a total of 411 adult birds (Table 5).

Natural England has run the PVA for this figure, as the Applicant had not (Table 5). At this level of impact, the PVA showed that after 30 years the population growth rate would be reduced by 0.8% per annum (CGR 0.992), and the population size would be reduced by 21.2% (CPS 0.788).

FFC SPA has a conservation objective for razorbill to maintain the size of the breeding population to a level which is above 10,570 breeding pairs, whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent. The most recent count in 2022 indicated a population size of 30,673 pairs. While this represents an increase from the previous count in 2017 of 27,967 pairs, and the recent trend is of population growth with an average annual growth rate of 6%, this trend cannot be assumed to continue for the next 30 years, particularly given recent declines in productivity and uncertainty surrounding the long-term impacts of HPAI and climate change.

Table 5: Predicted impacts on the razorbill FFC SPA population as presented in the Applicant's RIAA [REP6-009] for project alone and in-combination displacement impacts.

Razorbill: Flamborough & Filey Coast SPA				
Assessment description	Displacement mortality (adult birds)	% Baseline mortality using 2022 count data*	Reduction in population growth rate per annum after 30 years (CGR**)	Reduction in population size after 30 years (CPS**)
Dogger Bank South (East and West) alone (30% displacement, 1% mortality)	30	Not calculated	PVA not run	PVA not run
Dogger Bank South (East and West) alone (70% displacement, 10% mortality)	702	10.9	1.31% (0.9869)	33.49% (0.6651)
Dogger Bank South (East and West) alone (70% displacement, 2% mortality)	140	2.18	0.26% (0.9974)	7.79% (0.9221)

Consented projects, plus Tier 1d, applying 70% displacement and 2% mortality to all projects	343	5.32	0.64% (0.9936)	17.98% (0.8202)
Consented projects, plus Tier 1d, applying 70% displacement and 2% mortality to all projects except H4 at 70% displacement and 5% mortality***	411	6.38	0.8% (0.992)	21.2% (0.788)

* 61,345 breeding adults, baseline mortality of 6,441
** CGR (counterfactual of growth rate) and CPS (counterfactual of population size) values are mean values derived from PVA
*** Razorbill impacts of H4 are assessed at 70% displacement and 5% mortality, as per Natural England's advice. The total number of birds at H4 subject to displacement is 3258, so applying 70% displacement and 5% mortality rate gives an impact of 68, increases the in-combination impact to 411. Note that this PVA was run by Natural England, not by the Applicant.

For the Hornsea 4, Sheringham and Dudgeon Extensions, Rampion 2, Five Estuaries and Outer Dowsing projects, Natural England concluded that, considering the colony's current and likely future growth rates, an AEoI could not be ruled out for the razorbill feature of the FFC SPA. These considerations remain valid, and the Projects will be contributing significant numbers to the in-combination impacts for this species at FFC SPA.

With the potential long-term impacts of HPAI and climate change adding further uncertainty to the potential long-term population status for razorbill at FFC SPA, Natural England's advice regarding in-combination displacement impacts to FFC SPA razorbill therefore remains unchanged from that set out in our End of Examination responses for recent North Sea OWF Examinations. Namely that, because there are indications that the predicted level of mortality would mean the population could decline from current levels should the current population growth rate not be sustained, **it is therefore not possible to rule out AEoI on FFC SPA due to displacement impacts from Dogger Bank South (East and West) on the razorbill feature in-combination with other plans and projects.**

FFC SPA Breeding seabird assemblage

Of the nine species comprising the seabird assemblage, gannet, kittiwake, guillemot and razorbill are qualifying species and therefore are covered above. Fulmar, cormorant, shag and herring gull were screened out of the assessment due to low sensitivity to displacement and collision impacts, alongside low connectivity with FFC SPA and low numbers recorded within the Project survey area. This leaves only puffin to be considered separately below.

Predicted Impacts and Integrity Judgement: Dogger Bank South (East and West) alone - Puffin

Natural England's advised approach to displacement assessment is to provide impact values based on a species-specific range of displacement rates and mortality rates. For puffin, this range is 30%-70% displacement and 1%-10% displacement. At these rates, the predicted impact of the Projects are between 0.07 and 1.67 adult birds (REP6-009, Table 9-31). The top end of this range (1.67) results in an increase in baseline mortality of 0.43% (<1%). No further investigation of population-level impacts is therefore required. Natural England do not, therefore, consider that there is a risk that the predicted impacts from the Projects alone will affect either the diversity or abundance of the breeding seabird assemblage feature of FFC SPA due to impacts on puffin.

Natural England advise no AEoI on the FFC SPA due to displacement impacts on the puffin component of the breeding seabird assemblage feature for Dogger Bank South (East and West) alone.

Assemblage of species: abundance

Whilst in-combination displacement effects from multiple OWF will exert a degree of pressure on the FFC SPA puffin population, at present we do not consider this would be sufficient to trigger an adverse effect on the seabird assemblage abundance attribute due to impacts on puffin. This reflects the fairly modest level of the in-combination impact and recognizes that the species is not a qualifying feature in its own right, or at the time of classification was a named component of the assemblage (albeit recent data suggest there are some grounds for treating it as such). Nonetheless, due to the predicted impacts of the Projects on the more numerous qualifying species comprising the assemblage, particularly kittiwake and guillemot (see previous sections), it cannot be concluded that the overall abundance of the assemblage will be maintained.

Therefore, Natural England's conclusions at recent North Sea OWF Examinations remain unchanged, and taken in combination with our conclusions above on the likelihood of AEoI on kittiwake, guillemot and razorbill as key components of the FFC seabird assemblage, this

means **that Natural England are not able to rule out a conclusion of AEoI on FFC SPA due to impacts on the seabird assemblage feature**.

However, we note that species-specific compensation for the above-mentioned species, once fully agreed, will also meet the required compensation for the seabird assemblage as a whole, therefore no specific compensation proposals relating to the seabird assemblage feature are required.

Potential for Adverse Effects on Integrity on Designated Seabird Features of Farne Islands SPA Special Protection Area

Guillemot

Predicted Impacts and Integrity Judgement: Dogger Bank South (East and West) alone

The guillemot feature of the Farne Islands SPA was assessed for impacts during the non-breeding season only, as the DBS array areas are beyond the mean maximum foraging range (plus 1 standard deviation). Natural England agree that this is appropriate.

Natural England's advised approach to displacement assessment is to provide impact values based on a species-specific range of displacement rates and mortality rates. For guillemot, this range is 30%-70% displacement and 1%-10% displacement. The Applicant has stated that their preferred approach is to use single rates of 50% displacement and 1% mortality, and has presented impacts according to these values. Natural England disagree with the Applicant's preferred approach and have outlined our reasons in detail in [REP3-057] and [REP4-124]. The Applicant has also provided their assessment according to Natural England's advice ([REP6-009], Table 9-44), and we have based our conclusions based on these impact figures.

Applying Natural England's advice on displacement and mortality rates, the annual displacement impacts of the Projects combined on Farne Islands guillemot are predicted to be between 3 and 65 adult birds (see Table 6). Acknowledging that recent consent decisions have generally been based on impacts at a 70% displacement rate and 2% mortality rate, Natural England will focus on these values. While the top end of this range results in an increase in baseline mortality greater than 1%, at a 70% displacement and 2% mortality rate, the predicted impacts of the Projects are 13 adult birds (Table 6), which leads to an increase in baseline mortality of 0.33% (<1%). Natural England agree that no further investigation of population-level impacts is therefore required.

Natural England advise no AEoI on the Farne Islands SPA due to displacement impacts on the guillemot feature for Dogger Bank South (East and West) alone.

Predicted Impacts and Integrity Judgement: Dogger Bank South (East and West) in combination with other plans and projects

For the in-combination assessment, the Applicant has estimated the total abundance of guillemot at other relevant projects and applied displacement and mortality rates to these. This results in predicted in-combination totals of between 93 and 2174 adult birds ([REP6-009], Table 9-46). At Natural England's reference rates of 70% displacement and 2% mortality, the total in-combination impact excluding compensated projects is 435 adult birds (Table 6). Every

impact level within this range results in an increase in baseline mortality greater than 1%. Further investigation of population-level impacts is therefore required via PVA.

The PVAs run by the Applicant showed that, after 30 years, the in-combination total at 70% displacement and 2% mortality of 435 adult birds results in a reduction in population growth rate of 0.76% per annum (CGR 0.9924) and a reduction in population size of 21% (CPS 0.7895).

Table 6: Predicted impacts on the guillemot Farne Islands SPA population as presented in the Applicant's RIAA [REP6-009] for project alone and in-combination displacement impacts.

Guillemot: Flamborough & Filey Coast SPA				
Assessment description	Displacement mortality (adult birds)	% Baseline mortality using 2019 count data*	Reduction in population growth rate per annum after 30 years (CGR**)	Reduction in population size after 30 years (CPS***)
Dogger Bank South (East and West) alone (30-70% displacement, 1-10% mortality)	3 - 65	0.08 - 1.66	PVAs not run	PVAs not run
Dogger Bank South (East and West) alone (70% displacement, 2% mortality)	13	0.33	PVAs not run	PVAs not run
Consented projects, plus Tier 1d (30-70% displacement, 1-10% mortality)	93 - 2174	2.3 - 55.7	PVAs not run	PVAs not run
Consented projects, plus Tier 1d, applying 70% displacement and 2% mortality to all projects.	435	11.1	0.76% (0.9924)	21.05% (0.7895)

* 64,042 breeding adults, baseline mortality of 3906

** CGR (counterfactual of growth rate) and CPS (counterfactual of population size) values are mean values derived from PVA

The Farne Islands SPA has a conservation objective for guillemot to maintain the size of the breeding population at a level which is above 37,875 breeding pairs, whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent. The 2019 count, used by the Applicant in their assessment, was of 32,021 breeding pairs. However, since then, the population size has declined to an estimated 21,446 breeding pairs in 2024, a 33% decrease, partly attributed to impacts of HPAI (SMP 2025, Tremlett et al 2024).

Natural England have previously advised regulators that we cannot rule out an AEoI on guillemot at the Farne Islands SPA in-combination, due to the substantial impacts of the Berwick Bank OWF both alone and in-combination with other plans and projects. The Dogger

Bank South projects will be contributing to this impact. Given this, along with uncertainty over the long-term impacts of HPAI and climate change on guillemot populations, Natural England consider that the predicted level of in-combination impacts on Farne Islands SPA guillemot are likely to negatively affect the conservation objectives for this species. **Therefore, we are unable to rule out AEoI on the Farne Islands SPA due to displacement impacts from Dogger Bank South (East and West) on the guillemot feature in combination with other projects.**

Potential for Adverse Effects on Integrity of Designated Seabird Features of the Greater Wash Special Protection Area

Red-throated diver

Potential impacts to the red-throated diver feature of the Greater Wash SPA are associated with disturbance and displacement caused by construction of the export cable corridor (ECC and operation and maintenance (O&M) vessels transiting from the port to the windfarm through the SPA. As the DBS array areas are more than 10km from the SPA, no displacement impacts from the array are predicted.

Displacement impacts during construction were assessed by the Applicant by applying 100% displacement and 1% mortality rates to predicted red-throated diver densities within a 2km buffer of the cable route or a 2km radius of vessels. Displacement impacts from vessels during operation and maintenance were not assessed, as the relevant port has not yet been identified, and mitigation measures for vessel movements have been embedded. Due to the low impact predicted from construction displacement, the Applicant considered that there was no risk that the Projects would make a material contribution to in-combination impacts on red-throated diver at the Greater Wash SPA.

Natural England note that the Applicant has not committed to a seasonal restriction on cable construction works within the Greater Wash SPA during the sensitive over-wintering period (1st of November to 31st March inclusive). However, while Natural England would welcome further discussion on the possibility of a seasonal restriction with the Applicant post-consent, we note that there is limited interaction between the cable works area and the Greater Wash SPA and 2km buffer. Therefore, Natural England agrees with the Applicant, that with mitigation in place, **displacement impacts on red-throated diver arising from the construction, operation and maintenance of Dogger Bank South (East and West) Projects alone would not adversely affect the integrity of the Greater Wash SPA, and there would be no measurable contribution to in-combination effects on red-throated diver at the Greater Wash SPA.**

Annex 2: Summary of Natural England's Position regarding potential for significant adverse impacts under Environmental Impact Assessment (EIA)

2.1 Summary

Table 8 represents Natural England's position on the potential for significant adverse impacts of the Dogger Bank South (DBS; East and West) projects alone and cumulatively (EIA) other plans and projects at Deadline 8. Table 9 presents the key data used to inform these positions. These tables should be considered in relation to the information provided at the start of this document and the detailed comments and conclusions on EIA impacts in the species accounts within this Annex.

Table 8: Summary of Natural England's EIA conclusions for assessments of Dogger Bank South (East and West) alone and cumulatively with other plans and projects.

Species & impact pathway	Dogger Bank South (East and West) alone	Dogger Bank South (East and West) cumulatively
Gannet: displacement + collision	No significant adverse impact	Unable to rule out significant adverse impact
Kittiwake: collision	No significant adverse impact	Unable to rule out significant adverse impact
Guillemot: displacement	No significant adverse impact	Unable to rule out significant adverse impact
Razorbill: displacement	No significant adverse impact	Unable to rule out significant adverse impact
Puffin: displacement	No significant adverse impact	No significant adverse impact
Great black-backed gull: collision	No significant adverse impact	Unable to rule out significant adverse impact
Lesser black-backed gull: collision	No significant adverse impact	No significant adverse impact
Herring gull: collision	No significant adverse impact	No significant adverse impact
Red-throated diver: displacement	No significant adverse impact	No significant adverse impact

Table 9: Summary of predicted operational impacts of Dogger Bank South (East and West) at the EIA scale, assessed against the relevant Biologically Defined Minimum Population Scales (BDMPS). Impacts are as presented by the Applicant within the ES (REP6-016), unless otherwise stated.

Species	Assessment	Predicted Impact		Largest BDMPS	% increase in baseline mortality (BDMPS)	
		DBS (East and West) alone	Cumulative		DBS (East and West) alone	Cumulative
Gannet	Displacement (60-80% displacement, 1% mortality)	20-27	374-498	n/a		
	Collision	14.26	717			
Gannet	Displacement (80% displacement, 1% mortality) and Collision combined	41.26	1215	456,299	0.048	1.42
Kittiwake	Collision	299.94	3981	839,456	0.227	3
Guillemot	Displacement (70% displacement, 2% mortality)	846	8862	2,045,078	0.294	3.08
Razorbill	Displacement (70% displacement, 2% mortality)	404	3012	591,874	0.525	3.908
Puffin	Displacement (70% displacement, 2% mortality)	8	726	868,689	0.007	0.703
Great black-backed gull	Collision	4.9	1227.5	91,398	0.055	13.8
Lesser black-backed gull	Collision	1.21	706.2	209,006	0.005	2.7
Herring gull	Collision	2.18	1047	466,510	0.003	1.3
Red-throated diver (ECC)	Displacement*	0.2	42.9-459.5	13,277	0.0066	1.4-15.2

* Impacts from the Projects are calculated at 100% displacement and 1% mortality. Cumulative impacts are calculated as 90-100% displacement and 1-10% mortality, as presented by Outer Dowsing, to which the impacts from the Projects have been added (this has been calculated by Natural England).

2.2 Detailed Comments and Conclusions on Dogger Bank South (East and West) OWFs Alone and Cumulative Impacts for Environmental Impact Assessment (EIA)

Gannet

The predicted impact of the Projects alone, for displacement and collision impacts combined is of 41 birds, which increases the baseline mortality against the BDMPS by 0.048%. For the cumulative assessment, the Applicant has estimated the total number of collisions according to the most recent CRM guidance, using an updated avoidance rate of 99.2% and a 70% macro-avoidance rate (SNCBs 2024) and presented the results in Table 12-102 of the ES [REP6-016].

The total annual cumulative impact for collision and displacement impacts, as estimated by the Applicant, is between 1091 and 1215 birds (Table 9). This increases the baseline mortality against the BDMPS by 1.28-1.42%. As this is above 1%, further investigation of population-level impacts via PVA was required. The PVAs run by the Applicant showed that, after 30 years, the population growth rate was reduced by up to 0.28% per annum (CGR 0.9972) and the population size was reduced by up to 8.5% (CPS 0.9153).

Gannet is listed Amber under UK BOCC (Birds of Conservation Concern) and classed as 'Least Concern' under the GB IUCN assessment (Stanbury et al. 2024). While the UK gannet population has been increasing in recent decades (growth rates of 2-3% per annum), the recent HPAI outbreaks have had significant impacts, with Tremlett et al (2024) estimating that the UK gannet population declined by 25% between the last census and 2023. There is considerable uncertainty as regards the long-term population-level impacts of HPAI on gannets in the UK. This is particularly relevant at an EIA scale, as the population includes numerous Scottish colonies that have been very severely impacted by HPAI.

Natural England advise that, given uncertainty around the true level of cumulative impact and the future population trends for gannet, **we remain unable to rule out a significant adverse impact.** This is in line with previous advice to North Sea OWF Examinations.

Kittiwake

The predicted impact of the Projects alone is of 300 birds, which increases the baseline mortality against the BDMPS by 0.2% (Table 9). For the cumulative assessment, the Applicant has estimated the total number of collisions according to the most recent CRM guidance, using an updated avoidance rate of 99.23% (SNCBs 2024) and presented the results in Table 12-103 of the ES [REP6-016].

The cumulative total collisions for all projects including the DBS Projects, as estimated by the Applicant, is 3981 birds. This increases the baseline mortality against the BDMPS by 3% (Table 9). As this is above 1%, further investigation of population-level impacts via PVA was required. The PVAs run by the Applicant showed that, after 30 years, the population growth rate was reduced by 5.3% per annum (CGR 0.9471) and the population size was reduced by 81% (CPS 0.1853).

Kittiwake is listed Red under UK BOCC (Birds of Conservation Concern) and classed as 'Endangered' under the GB IUCN assessment (Stanbury et al. 2024). UK kittiwake populations have undergone long-term declines (Burnell et al 2023) and are predicted to decline further under climate change (Stanbury et al 2024). Populations have also been affected by the recent HPAI outbreaks, with Tremlett et al (2024) estimating that the English kittiwake population declined by 18% between the last census and 2023. There remains considerable uncertainty as regards the long-term population-level impacts of HPAI on kittiwakes in the UK.

Natural England's position remains as it was during recent North Sea OWF Examinations, that **we are unable to rule out a significant adverse impact on kittiwake due to cumulative impacts**.

Great black-backed gull

The predicted impact of the Projects alone is of 4.9 birds, which increases the baseline mortality against the BDMPS by 0.055% (Table 9). For the cumulative assessment, the Applicant has estimated the total number of collisions according to the most recent CRM guidance, using an updated avoidance rate of 99.4% (SNCBs 2024) and presented the results in Table 12-109 of the ES (REP6-016).

The cumulative total collisions for all projects including the DBS Projects, as estimated by the Applicant, is 1227. This increases the baseline mortality against the BDMPS by 13.8% (Table 9). As this is above 1%, further investigation of population-level impacts via PVA was required. The PVAs run by the Applicant used a cumulative total of 1222 and showed that, after 30 years, the population growth rate was reduced by 1.44% per annum (CGR 0.9856) and the population size was reduced by 36.2% (CPS 0.6383).

Great black-backed gull is listed Red under UK BOCC (Birds of Conservation Concern) and classed as 'Critically Endangered' under the GB IUCN assessment (Stanbury et al. 2024). The UK population has declined significantly in recent years (Burnell et al 2023) and is predicted to decline further due to climate change (Stanbury et al 2024). The species also appears to have also been affected by recent HPAI outbreaks, with Tremlett et al (2024) estimating that the English great black-backed gull population declined by 27% between the last census and

2023. There remains considerable uncertainty as regards the long-term population-level impacts of HPAI on great black-backed gull in the UK.

Natural England's position remains as it was during recent North Sea OWF Examinations, that **we are unable to rule out a significant adverse impact on great black-backed gull due to cumulative impacts**.

Lesser black-backed gull

The predicted impact of the Projects alone is of 1.21 birds, which increases the baseline mortality against the BDMPS by 0.005% (Table 9). For the cumulative assessment, the Applicant has estimated the total number of collisions according to the most recent CRM guidance, using an updated avoidance rate of 99.4% (SNCBs 2024) and presented the results in Table 12-105 of the ES (REP6-016).

The cumulative total collisions for all projects including the DBS Projects, as estimated by the Applicant, is 706.2 birds, which increases the baseline mortality against the BDMPS by 2.7% (Table 9). As this is above 1%, further investigation of population-level impacts via PVA was required. The PVAs run by the Applicant showed that, after 30 years, the population growth rate was reduced by 0.39% per annum (CGR 0.9961) and the population size was reduced by 11.27% (CPS 0.8873).

Lesser black-backed gull is listed Amber under UK BOCC (Birds of Conservation Concern) and classed as 'Least Concern' under the GB IUCN assessment (Stanbury et al. 2024). UK population trends are unclear, due to the difficulties associated with counting urban-nesting birds. Declines in natural habitats have been steep, but may at least partly be compensated by increases in urban areas (Burnell et al 2023). The species also appears to have also been affected by recent HPAI outbreaks, with Tremlett et al (2024) estimating that UK natural-nesting lesser black-backed gull population declined by 25% between the last census and 2023. There remains considerable uncertainty as regards the long-term population-level impacts of HPAI on lesser black-backed gull in the UK.

Coupled with the uncertainty around the status and trend of the population, the PVA counterfactuals indicate the potential for OWF to be cumulatively exerting an increasing influence on the biogeographic population. However, in light of the low impact values from DBS on this species and therefore little likelihood of a material contribution to the overall level of pressure, Natural England advise that **we can rule out a significant adverse impact on lesser black-backed gull due to cumulative impacts**.

Herring gull

The predicted impact of the Projects alone is of 2.18 birds, which increases the baseline mortality against the BDMPS by 0.003% (Table 9). For the cumulative assessment, the Applicant has estimated the total number of collisions according to the most recent CRM guidance, using an updated avoidance rate of 99.4% (SNCBs 2024) and presented the results in Table 12-107 of the ES (REP6-016).

The cumulative total collisions for all projects including the DBS Projects, as estimated by the Applicant, is 1047 birds, which increases the baseline mortality against the BDMPS by 1.3% (Table 9). As this is above 1%, further investigation of population-level impacts via PVA was required. The PVAs run by the Applicant showed that, after 30 years, the population growth rate was reduced by 0.27% per annum (CGR 0.9973) and the population size was reduced by 8.09% (CPS 0.9191).

Herring gull is listed Red under UK BOCC (Birds of Conservation Concern) and classed as 'Endangered' under the GB IUCN assessment (Stanbury et al. 2024). UK population trends are unclear, due to the difficulties associated with counting urban-nesting birds. Declines in natural habitats have been steep, but may at least partly be compensated by increases in urban areas (Burnell et al 2023). UK populations are predicted to decline further under climate change (Stanbury et al 2024). The species also appears to have also been affected by recent HPAI outbreaks, with Tremlett et al (2024) estimating that UK natural-nesting herring gull population declined by 7% between the last census and 2023. There remains considerable uncertainty as regards the long-term population-level impacts of HPAI on herring gull in the UK.

Coupled with the uncertainty around the status and trend of the population, the PVA counterfactuals indicate the potential for OWF to be cumulatively exerting an increasing influence on the biogeographic populations. However, in ight of the low impact values from DBS on this species and therefore little likelihood of a material contribution to the overall level of pressure, Natural England advise that **we can rule out a significant adverse impact on herring gull due to cumulative impacts**.

Guillemot

The predicted impact of the Projects alone is between 181 and 4231 birds (30% x 1% to 70%x10% displacement and mortality). At Natural England's reference rates of 70% displacement and 2% mortality, the predicted impact is of 846 birds which increases the baseline mortality against the BDMPS by 0.294% (Table 9). For the cumulative assessment, the Applicant has estimated the total number of birds at risk, and applied displacement and

mortality rates to them (REP6-016, Table 12-93). At Natural England's reference rates of 70% displacement and 2% mortality, the cumulative total for all projects including the Dogger Bank South Projects, as estimated by the Applicant, is 8862 birds, which increases the baseline mortality against the BDMPS by 3.08% (Table 9). As this is above 1%, further investigation of population-level impacts via PVA was required. The PVAs run by the Applicant showed that, for this level of impact, after 30 years, the population growth rate was reduced by 0.17% per annum (CGR 0.9983) and the population size was reduced by 5.26% (CPS 0.9474).

Natural England note that the Applicant also provided an assessment of potential cumulative displacement impacts on auks in the area between the two Dogger Bank South arrays. At 30%-70% displacement and 1%-10% mortality, this concluded that between 19 and 434 additional guillemot could be impacted, while at 70% displacement and 2% mortality, 87 additional guillemot could be impacted. Natural England considers that this information provides valuable additional context to the potential impacts of the Projects on guillemot, but have agreed that these figures do not need to be included in the assessment totals (see section 2).

Guillemot is listed Amber under UK BOCC (Birds of Conservation Concern) and classed as 'Vulnerable' under the GB IUCN assessment (Stanbury et al. 2024). UK guillemot populations have declined in recent years (Burnell et al 2023) and are predicted to decline further under climate change (Stanbury et al 2024). Recent HPAI outbreaks have also affected the species, with Tremlett et al (2024) estimating that the English guillemot population declined by 20% between the last census and 2023. There is considerable uncertainty as regards the long-term population-level impacts of HPAI on guillemots in the UK.

Natural England's position remains as it was during recent North Sea OWF examinations, that **we are unable to rule out a significant adverse impact on guillemot due to cumulative impacts**.

Razorbill

The predicted impact of the Projects alone is between 87 and 2022 birds (30% x 1% to 70% x 10% displacement and mortality). At Natural England's reference rates of 70% displacement and 2% mortality, the predicted impact is of 404 birds which increases the baseline mortality against the BDMPS by 0.525% (Table 9). For the cumulative assessment, the Applicant has estimated the total number of birds at risk, and applied displacement and mortality rates to them (REP6-016, Table 12-97). At Natural England's reference rates of 70% displacement and 2% mortality, the cumulative total for all projects including the DBS Projects, as estimated by the Applicant, is 3012 birds, which increases the baseline mortality against the BDMPS by 3.908% (Table 9). As this is above 1%, further investigation of population-level impacts via

PVA was required. The PVAs run by the Applicant showed that, for this level of impact, after 30 years, the population growth rate was reduced by 0.58% per annum (CGR 0.9942) and the population size was reduced by 16.55% (CPS 0.8345).

Natural England note that the Applicant also provided an assessment of potential cumulative displacement impacts on auks in the area between the two DBS arrays. At 30%-70% displacement and 1%-10% mortality, this concluded that between 5 and 110 additional razorbill could be impacted, while at 70% displacement and 2% mortality, 22 additional razorbill could be impacted. Natural England considers that this information provides valuable additional context to the potential impacts of the Projects on razorbill, but have agreed that these figures do not need to be included in the assessment totals (see section 2).

Razorbill is listed Amber under UK BOCC (Birds of Conservation Concern) and classed as 'Vulnerable' under the GB IUCN assessment (Stanbury et al. 2024). While the UK population has increased recently (Burnell et al 2023), it is predicted to decrease under climate change (Stanbury et al 2024). The species may also have been affected by recent HPAI outbreaks (Tremlett et al 2024).

Natural England's position remains as it was during recent North Sea OWF examinations, that **we are unable to rule out a significant adverse impact on razorbill due to cumulative impacts**.

Puffin

The predicted impact of the Projects alone is between 2 and 38 birds (30% x 1% to 70% x 10% displacement and mortality). At Natural England's reference rates of 70% displacement and 2% mortality, the predicted impact is of 8 birds which increases the baseline mortality against the BDMPS by 0.007% (Table 9). For the cumulative assessment, the Applicant has estimated the total number of birds at risk, and applied displacement and mortality rates to them (REP6-016, Table 12-101). At Natural England's reference rates of 70% displacement and 2% mortality, the cumulative total for all projects including the DBS Projects, as estimated by the Applicant, is 726 birds, which increases the baseline mortality against the BDMPS by 0.703% (Table 9). As this is below 1%, there was no need for further investigation of population-level impacts.

Puffin is listed Red under UK BOCC (Birds of Conservation Concern) and classed as 'Critically Endangered' under the GB IUCN assessment (Stanbury et al. 2024). UK puffin populations have undergone long-term declines (Burnell et al 2023), and are predicted to decline further under climate change (Stanbury et al 2024). The species may also have been affected by the

recent HPAI outbreaks (Tremlett et al 2024). However, the cumulative impacts from offshore wind farms do not appear to be large enough to significantly impact puffin populations.

Natural England advise that **we can rule out a significant adverse impact on puffin due to cumulative impacts**.

Red-throated diver

The predicted impact of the Projects on red-throated diver from construction displacement is of 0.2 birds, which increases the baseline mortality against the BDMPS by 0.0066%. For the cumulative assessment, the Applicant reviewed the cumulative assessment presented by ODOW, which they presented as construction displacement impacts of up to 64 birds. The Applicant reduced this total to 6.4 birds by applying a single mortality rate of 1%, thereby arriving at a cumulative construction displacement impact total of 6.6 birds, which increases the baseline mortality against the BDMPS population by 0.218%. Natural England note that this does not take into account the cumulative impacts from operational displacement from other projects. The total cumulative impact presented by ODOW was 42.7-459.3. Adding the impacts of the Projects increases this impact to 42.9-459.5, which increases the baseline mortality against the BDMPS by 1.4-15.2%.

For some time Natural England's position on cumulative impacts on red-throated diver at the EIA scale has been that significant adverse impacts could not be ruled out. However, because the predicted impacts of the Projects are low, and mitigation measures for vessel movements have been embedded, Natural England consider that it is unlikely that the Projects will make a material contribution to cumulative impacts. Therefore, Natural England agrees that with mitigation in place, **we can rule out a significant adverse impact from cumulative impacts on red-throated diver at the EIA scale**.

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